AUTOMAÇÃO, PROTEÇÃO, COMANDO, CONTROLO E COMUNICAÇÕES

Controlador de Transformador de Distribuição (Distribution Transformer Controller – DTC) para instalação em Postos de Transformação MT/BT

Especificação protocolo HES-DTC

Elaboração: DIT

Homologação: conforme despacho do CA de 2020-07-20

Edição: 1ª

Acesso: **X** **Livre** Restrito Confidencial

Emissão: EDP Distribuição – Energia, S.A.
DIT – Direção de Inovação e Desenvolvimento Tecnologico
R. Camilo Castelo Branco, 43 • 1050-044 Lisboa • Tel.: 210021400
E-mail: dti@edpdistribuicao.pt

TABLE OF CONTENT

0 CHANGE LOG

Date	Version	Release	Author	Modifications
07/2020	1.0		DIT-ARI	First version of the DTC-HES protocol specification by EDPD.

1 INTRODUCTION

This document defines the information exchange between the Head End System (HES) and the Distribution Transformer Controllers (DTC).

The present document was based on IBERDROLA DISTRIBUCIÓN S.A.U STG-DC INTERFACE SPECIFICATION Version 3.4 from October 2015. Several modifications were done to clarify the expected implementation and some specific orders and reports were included.

2 GENERAL PURPOSE

This interface is designed for the following objective:

HES should be able to manage, configure and retrieve every piece of information of DTCs and Meters through this protocol definition.

This protocol definition should include capabilities for managing all the requirements specified in the DTC Functional Specification made by EDP Distribuição on its latest version [DEF-C98-405].

3 SCOPE

Equipment involved in the present protocol implementation are DTCs, MDTC and the HES. These devices should be prepared to comply with enhancements to the present protocol specification in order to comply with **all the requirements** included in the equipment technical specification.

Specifically, manufacturers should comply with enhancements related to:

- Cyber security related enhancements. This document will include all new messagens with all parameters required at DTC level to be able to manage cyber security. All the details are specified at the cyber security functional specification document;
- Several Web Services created by EDP D are detailed on this document;
- Some Naturgy (ex-GNF) web services related to the communication link between the HES and DTC were included;

4 REFERENCIES

Especif interfaz_STG-CD_Ver.3.4	2015-10	STG – DC INTERFACE SPECIFICATION from IBERDROLA DISTRIBUCIÓN S.A.U
DEF-C98-405	2020-07	Controlador de Transformador de Distribuição (Distribution Transformer Controller – DTC) para instalação em Postos de Transformação MT/BT – Especificação funcional
DEF-C98-408	2020-07	Controlador de Transformador de Distribuição (Distribution Transformer Controller – DTC) para instalação em Postos de Transformação MT/BT – Security Functional Specification

5 ACRONYMS

On this document are used the following acronyms:

3GPP – 3rd *Generation* Partnership Project.
AKP Meter in active key pending failure
AKW Meter in active key wrong failure
DMA – Documento Normativo de Materiais e Aparelhos – Características e Ensaios;
DTC Distribution Transformer Controller
EN – Norma Europeia;
ETSI – *European Telecommunications Standards Institute;*
GAK *Global Authentication ket*
GBEK *Global Broadcast Encryption Key*
GPRS – *General Packet Radio Service.*
GSM – *Global System for Mobile Communications;*
GUEK *Global Unicast Encryption key*
HES Head End System
HLS *High Level Security*
IEC – Comissão Eletrotécnica Internacional;
ITU-T – *International Telecommunication Union – Telecommunication Standardization Sector;*
LLS *Low Level Security*
PF *Permanent failure*
SBC *Secure Broadcast Client*
SGC *Secure General Client*
TF *Meter in temporary failure*
WS Web service

6 MESSAGES EXCHANGE

This document specifies que messages exchanged between the DTC and the HES. These messages will be in both directions:

- The HES can send an order or request a report to the DTC which will proceed to the corresponding actions or answer with the requested values
- The DTC will be able to send to the HES information such as:
  - Data programmed to be sent to the HES in DTC internal tasks;
  - Events occurred in a meter or in the DTC itself;
  - Specific requests related to cybersecurity.

The data exchanges between HES and DTC takes place through XML messages.

Several orders and reports are specified in this document and each one of those have an unambiguous identifier for both systems:

- Bnn or Dnn for orders from the HES to the DTC;
- Snn or Pnn for reports from the DTC to the HES.

It was agreed within the PRIME ALLIANCE that all the orders and reports already defined will keep the same name (Bnn and Snn). New order or services created by any member need to have a different and for EDP it will be used Dnn for orders and Pnn for reports.

Fields that compose each order (Bnn or Dnn) will be shown below in blue tables and reports (Snn or Pnn) will be shown in green tables.

Each table defines one register; a report is formed by many registers corresponding to different meters, dates, etc.

Each definition table is designed as follows:

- The first column in a table shows the data number. If no number is present, the line represents a label, not data
- The FIELD column shows a short name description of the data, that corresponds to the XML tag that carries the value for data in the report.
- The DESCRIPTION column shows a short description of the data.
- The VALUE column identifies the data type :
  - If the field has a typified list of possible values, that column also specifies the possible values and their respective meaning.
  - When needed, this column also specifies the data type (integer, real …) and the Units to be used (W, Wh…).

In yellow on this document, is marked the major changes made on the services/orders already specified on the reference version “Especif interfaz_STG-CD_Ver.3.4.”. It was also marked some paragraphs with complementary informantion, included to clarify the expected implementation.

Annex A shows samples of different reports in XML format.

Annex B specifies the representation mode for meter COSEM information.

In some cases, the column DLMS is also included. This column is used to link the information stored in that field with the DLMS identification of the data as described in the DEF-C44-507N EDP specification.

Regarding report content, when no data is present, the corresponding tag(s) may be omitted (e.g. in S23 report for nonexistent tariffs or contracts).

6.1 Requests Identification (IdPet)

All requests made by the HES to a DTC will include an **IdPet** parameter or field which is the numerical identifier of the request. The IdPet value present on the HES request, should be different for each request made to a specific DTC.

The value for IdPet is unique within each DTC: it is assigned by the HES in the request and inherited by all the reports generated by the DTC related to that request.

The field IdPet is the identifier number for any given request made to a DTC.

This number is unique per DTC:

- Two different requests made to two different DTCs at the same time by the HES may have the same IdPet.
- Two different requests made at the same time to the same DTC by the HES will never have the same IdPet.

A Unique IdPet for each request will allow the HES to link them and to do a follow-up of the time used for delivering the answers, keep track of all messages (messages lost), link messages traces, etc.

The reports generated by initiative of the DTC (programmed reports, events or key requests) will not have an IdPet identifier (the value will be IdPet=0) since they do not correspond to a HES request.

The IdPet for some services will be repeated two times, once in the body of the service and another time inside the xml included. In this case, the two IdPet number must always have the same value. An example is the OrderRequest Service (order parameter) and Report Service (payload parameter).

6.2 DTC and Meter identification (IdDC and MeterID)

All requests sent by the HES should have an identification tag for the DTC. This **IdDC** tag comes in body of the service and identify the DTC which the request is addressed to. For order messages sent by the HES, in the xml included on the service it is also imperative to identify the DTC with the tag **Cnc**. This tag also appears in the reports sent by the DTC.

The meter identification is specified in **Annex B** and is composed by the manufacturer code and serial number. This is the **MeterID** and is the single meter identification used by meters, DTCs, HES and whatever other systems which interacts with HES or the meter itself (GME). The MeterID is identified on the messages sent by DTC or HES with the tag **Cnt Id**.

6.3 DTC Data keeping and programmed tasks

The DTC will save the historical information of the meters (collected either through task programming or explicit request from HES) and it will keep it in its database locally according to parameter TpStore. This information can be sent to the HES when requested or if the programmed task includes sending it to the HES.

Information of instant values will be read from the meters when a request is received. Those requests can spend some time depending on how many meters must be consulted.

On every request for data, made by the HES, it can explicitly ask the DTC to collect the data from the DTC, from the meter or give priority to the DTC but access to the meter if it is not available in the DTC.

6.4 Version identification

All messages (reports and orders) exchanged between the DTC and the HES will have a “Version” attribute (see XML samples). This “Version” attribute identify the protocol version and it should be “3.4_EDP_2.0”.

The xml version should also be included in the xml message of all messages.

```
<?xml version='1.0' encoding='UTF-8'?>
```

6.5 Meter Status error codes

In case of failure when reading values for a given meter, the encountered error must be indicated in the report at the meter tag level. This detailed information is crucial to the HES, because it gives the HES knowledge of what was the cause of the error and with that the HES operator can decide what to do next.

E.g. for a S01 report:

```
<Report IdRpt="S01" IdPet="48" Version="3.4_EDP_2.0">
    <Cnc Id="ABC0000000001">
        <Cnt Id=" XYZ0000000002" ErrCat=”(errcategory)” ErrCode=”(errcode)”/>
    </Cnc>
</Report>
```

These errors should be present on the Update Meter Status (UMS) message and on the reports from the DTC. The UMS error and report codes should be the same.

Error categories and codes are specified below (might be increased in the future):

Error Category	Error Code	Meaning
0	0	Unspecified error
1	Code	Category for DTC errors
1	0	Unspecified DTC error
1	1	Inactive meter (meter does not exist in DTC database)
1	2	DTC internal error (software)
1	3	DTC internal error (hardware)
2	Code	Category for PRIME errors
2	0	General/unspecified PRIME error
2	1	Meter in temporary failure (TF).
2	2	Meter in permanent failure (PF)
2	3	Meter in active key pending failure (AKP) for the SGC
2	4	Meter in active key wrong failure (AKW) for the SGC
2	5	Meter in active key pending failure (AKP) for the SBC
2	6	Meter in active key wrong failure (AKW) for the SBC
3	Code	Category for meter errors (COSEM)
3	0	General/unspecified COSEM error
3	1	Authentication failure.
3	2	Data error (malformed, partially received…).
3	3	No data found in meter
3	4	Order execution rejected from the meter (write).
3	5	Order execution accepted (write) but not confirmed (read).
3	6	Order execution rejected from DTC (e.g. because previous reports are not executed correctly, state initial incorrect for order execution…)
3	7	Meter “Master Key” Update Fails.
3	8	Meter “Global Unicast encryption Key” Update Fails.
3	9	Meter “Global authentication key” Update Fails.
3	10	Meter “LLS secret” Update Fails.
3	11	Meter “HLS secret” Update Fails.
3	12	Meter Security activate method fails.
3	13	Meter LLS_{GEN} Update Fail
3	14	Meter $GUEK_{GEN}$ Update Fail
3	15	Meter GAK_{GEN} Update Fail

3	16	Meter LLS_{BRO} Update Fail
3	17	Meter $GUEK_{BRO}$ Update Fail
3	18	Meter GAK_{BRO} Update Fail
3	19	Meter $GBEK_{BRO}$ Update Fail
Null	Null	Order has been executed but any after report is missing.

6.6 General considerations about Fh field.

The “Fh” attribute is used in numerous places along the document, xml reports, orders, report request, etc. It´s necessary to clarify some questions about the correct mapping time in the different situations.

For meter report like S04, S05, S4B, S5B, S06, S07, S08 S09, S21, S23, S26, S27, S29, S43 e S44 “Fh” field must be mapped to the timestamp of the registration of the periodical data embedded in the OBIS of the registered data.

For other reports requested to the meters, when the registered data timestamp is not embedded in the OBIS, the “Fh” field is the timestamp of the end of the data collection for each meter. This timestamp shall be retrieved by the DTC via a DLMS communication to the meter and by reading the clock of the meter, at the end of the reception of the rest of the data from the meter to form the report Sxx/Pxx.

For orders containing an action request, the order execution time must be mapped with the moment when the meter ActionResponse "success" is received at DTC.

For DTC or meter events “Fh” is the timestamp of the event registration inside the equipment.

For information reports on the DTC, the “Fh” field is the timestamp of the report creation with the DTC information. E.g. S12, S10, S36, S41

7 DATA FLOW

7.1 Principles

Data flow defined in this document regarding the HES and the Distribution Transformer Controller will follow these principles:

- Requests and Notification use WebServices on both sides;
- The DTC offers to the HES one main WebService in order to allow it to make a request:
  - And to get results immediately (synchronous request);
  - Or and to get results later (asynchronous request);
- The HES offers one main WebService to the DTC in order to be notified of:
  - DTC or meter Events;
  - Request processing status;
  - In some cases reports generated by the DTC;
- In other cases sending of reports is also made using FTP protocol.

In order to reduce the modeling complexity of WebServices, Requests to the DTC (codified “Bxx” or “Dxx”) as well as reports generated for a given request (codified “Sxx” or “Pxx”) consists in XML defined messages that are taken in charge as a payload by WebServices methods invocations.

Thus, WebServices added value consists in the flow control, independently of the kind of data transported.

Following chapters intend to define the precise dataflow in different use cases:

- Programmed reporting;
- Orders and Reports on-demand requests;
- Events management;
- Firmware management.

Each chapter defines the dynamics of the dialog between the two systems, and the use that have to be made of defined Services from each part.

The data flow to be used for specific report request or order request is defined for each message in the “Report index” **Annex D**.

7.1.1 Requests parameters

HES requests include a priority parameter. Neither order requests nor report requests include a time out. Timeouts are configured at DTC based in the parameterization of the PLC communication.

There are 10 priorities:

- Ultra High (0)
- Very high (1)
- High (2)
- Normal High (3)
- Normal (4)

- Normal Low (5)
- Low (6)
- Very Low (7)
- Super Low (8)
- Ultra Low (9)

The DTC should manage all order requests, report requests and scheduled tasks by its parameterization through these ten (10) categories or queues. This means that HES orders with same priority code than scheduled tasks are considered with the same priority.

Tasks or order requests with similar priority are managed under a FIFO (First in first out) philosophy: first task that reaches the DTC, is the first one done.

It must be clarified that, when a low priority task is in execution and other task with higher priority arrives at DTC, the execution of the running task shall finish the operation being done for the current meter and then start the execution of the higher priority. In other words, the access to the meters for running task will stop and the DTC starts accessing to the meters to perform the higher priority task. After completion of higher priority task, the access to the meters for lower priority task is retrieved from the point it was previously stopped.

Regarding the handling of priorities when the retry mechanism is activated please refer to the DTC specification.

The DTC should have a configurable parameter to define the maximum number of tasks, services or orders per queue (MaxQueueNum). If a request is sent to the DTC and the Queue has not reached the maximum value, the task will be queued and executed. Conversely, if the request is sent but the queue has reached the MaxQueueNum or a higher value, then the DTC should reject the request sending the proper URS error code (URS=10). This parameter is only applicable to messages (tasks, services or orders) from the HES to the DTC. This does not apply to schedule tasks, clycles or other DTC-HES messages.

7.2 Management of data flow by the DTC

7.2.1 Data retrieved from DTCs and Meters

DTCs will have a replica of information stored in meters (load profile, events, daily and monthly reports) according to parameter TpStore.

Every request from HES will be answered according to the parameter “source” in the request. This means data can be collected from the DTC database, from direct access to the meter or from a combination of both as specified (considering where data is available)

Only instantaneous values requests and meter parameterization requests will imply that the DTC always needs to go to the meter for collecting this information for answering the HES. Such requests are delivered though S01, S21 and S06 reports (clarifications: In other requests, access to the meter will depend on the data available in the DTC database and the “source” parameter included in the request).

DTCs will have scheduled tasks to send information to the HES through push mechanisms.

7.2.2 Requests to the DTC

Some requests from the HES require multiple answers from the DTC (different degrees of completion of the answer). Each of these answers must transport complete information for a meter and a day. The DTC includes two global parameters for defining the logic for splitting information:

- Max number of meters included in a message (NumMeters);

- Max time (seconds) DTC can spend collecting partial information for building a report to be sent to the HES (TimeSendReq).

  If this time is reached, even when there is no data to be sent to the HES, a health message with no data (UpdateRequestStatus=1 without "Reference" element or "Reference" to null for that IdPet) should be sent. Therefore, the DTC will not send any file in this case.

This means that when DTC sends information, this information is sent as it is being collected from the meters according the two parameters. When either of the two parameters is reached, the information is sent to the HES.

Eg1: request info for 500 meters, MaxNu=100, MaxTime=3600. As lots of 100 are collected OR 3600 sec. is reached, info is sent to the HES. These two parameters never imply the dismissing of the collection process (that is done by other parameters: RetryDisconMeter and TimeRetryInterval are global parameter in the DTC which apply individually for each meter involved with retries in requests).

Eg2: request info for 1 meter, load profiles of last 7 days: If Max time is reached, partial information is sent for the collected days at that time (and as in Eg1 the request doesn't stop, goes on until another time out parameter is reached or the request is finished).

Each message response sent to the HES includes a flag (ReqStatus in report content) which indicates if it is a partial answer (still further data pending) or if it is the final message for that request.

Additionally, depending on the WS requests, responses can be made in synchronous (on the fly as a return argument in the invoked WS) or asynchronous mode (through an independent message -WS or FTP- from DTC to HES).

If a Txx task is executed from the HES to stop some particular task, all tasks or reboot the DTC, the DTC should send the information it already has from the meters up to that moment and send a message response to the HES with the ReqStatus with value 9.

7.2.3 Managing scheduled tasks in DTCs

The HES can schedule and manage tasks in DTC.

As an example, there are a number of tasks that will typically exist, they can be included in the DTC configuration.

Note that for all meter data request, if the data is already in the DTC database, unless otherwise specified, it should be collected from there instead of asking for it again to the meter (as defined in flag "Source" in AsynchRequest request)

The management of exceptions and contingencies when running these periodic tasks is explained in section "Management of contingencies" bellow.

7.2.3.1. Collect daily billing values (S05/S5B report)

When this task starts, it collects information from the meters and sends it to the HES.

This task will be scheduled daily at a time, as an example at 00:10. Default timeframe is that given by the task periodicity and the time of execution. Eg. If the task is executed every day at 00:10, the timeframe is that day and S05/S5B collects values registered between previous day at 00:10 and that day at 00:10 which means 1 set of values(e.g. timeframe will be from 20110601001000S to 20110602001000S).

7.2.3.2. Collect end of billing profile (S04/S4B report)

When this task starts, it collects information from the meters and sends it to the HES. Default timeframe is that given by the task periodicity. Eg. If the task is executed every month at 01:10, the timeframe is 1 month starting at

01:10 of previous month and might collect several sets of values (e.g. timeframe will be from 20110501011000S to 20110601011000S).

7.2.3.3. Collect event reports (S09)

When this task starts, it collects information from the meters and sends it to the HES.

The execution of this task might include as attributes the Groups and codes of events to be delivered. Default timeframe is that given by the task periodicity. Eg. If the task is executed every week, the timeframe is 1 week. If attributes of Groups and Codes are not included, all events should be included in the response.

7.2.3.4. Management of contingencies

When a DTC does not succeed in delivering scheduled reports, the HES might ask for them with specific requests.

However, if even these explicit requests from the HES fail, the DTC might end up not delivering data for one day. Then, the following day at the periodic execution, if the DTC only collects and sends the default timeframe (eg. 1 day in S05/S5B) information, the HES will end up having data gaps.

For this, it is included the parameter TpCompl in programmed tasks. If set to Y the DTC should collect complement data and send it to the HES. This means it should include not only the data that is expected based on the periodicity of the task, but also all pending data not sent previously to the HES. That is, it should check the lastest data sent to HES and attempt to collect from there on, ordered in time, all data up to current time from the meter and include it in the report file sent to the HES. This means the DTC should keep a kind of pointer on each report for keeping track of data sent to the HES (either push or pull mechanisms will move the pointer, provided data is successfully sent to HES without gaps).

DTC must keep a pointer on each report and per each meter. These reference pointers are needed for S04, S05, S5B, S4B, S09, S14, S17 and S29.

DTC should be able to send the schedule tasks data to multiple FTP sources, but it will have only one data pointer for the HES 1. If some scheduled task data is set to be sent to FTP 1 and FTP2, the DTC should make sure that the data is sent to FTP1 and everytime it sends a report to FTP1, the DTC should send it also to FTP2. The DTC should have a FTP transfer retry mechanisms for each FTP.

For each report Sxx, the pointer is initiated when a scheduled task with TpCompl=”Y” for that Sxx is programed for the first time.

At this moment the depth of the first time data collection for filling up the gap is from the current time (first time execution of the scheduled task) back to the periodicity (TpPer) of the scheduled task (S05/S5B daily, S04 monthly, S09 weekly).

If the meter is discovered at PRIME level in a time between current time and (current time –TpPer), the data collection for the first time pointer initialization will be from the meter discovery time to actual time.

If two different scheduled tasks are programmed with the same name and periodicity, but once with TpComp=Y and the other with TpComp=N, the DTC must create and manage a pointer for that Sxx report for each meter. When the scheduled tasks with TpComp=Y is executed the DTC must send the reports from pointer time to current time. When the scheduled tasks with TpComp=N is executed the DTC must send the reports from (current time – TpPer) to current time only.

When a scheduled task with TpCompl=Y for Sxx is removed, The DTC must check if another scheduled task with the same Sxx report and TpPer programed exists. If it doesn´t exist, the pointer for this Sxx report must be deleted for all meters.

Information of these reference pointers should be kept, even if the DTC loses power, is rebooted or if is performed a firmware upgrade.

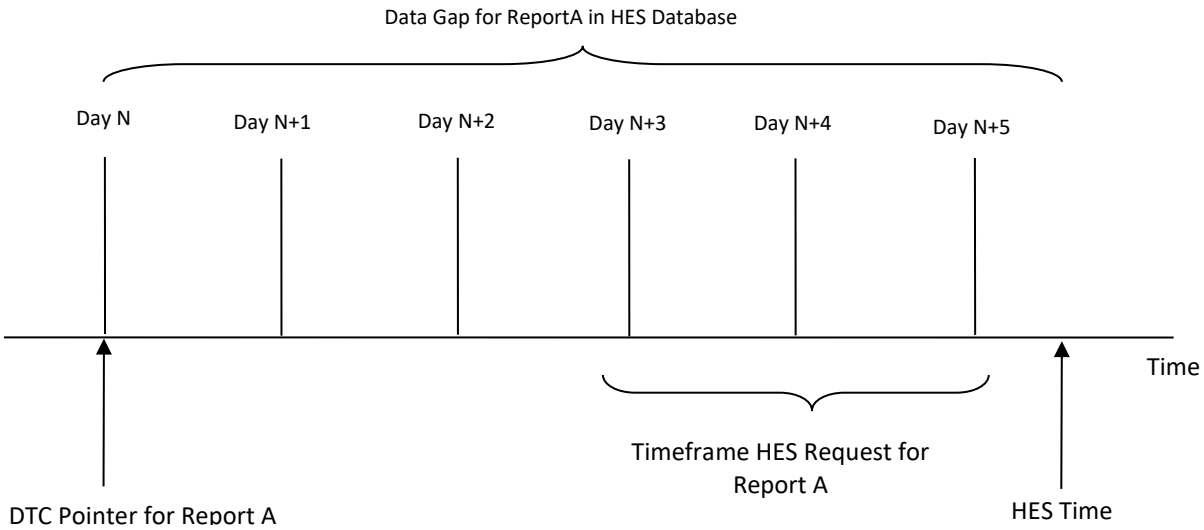
Note that this management of reference pointers with respect to information sent to the HES is independent from the management data collection between DTC and meters. This way, if for some reason, data is collected by the DTC (successful link meter-DTC) but reports don't succeed to be uploaded to HES (no link DTC-HES), pointers are not moved.

Note that TpCompl is not a parameter that controls the filling gap of data in the DTC database.

Reference pointers assigned for each report should only be moved ahead when the DTC can assure that there are no gaps of information not sent to the HES. This means that, when a pointer is in the past (eg several days behind current date), and there is an on-demand request from the HES which would lead to gaps, this request can be provided but pointers are not moved.

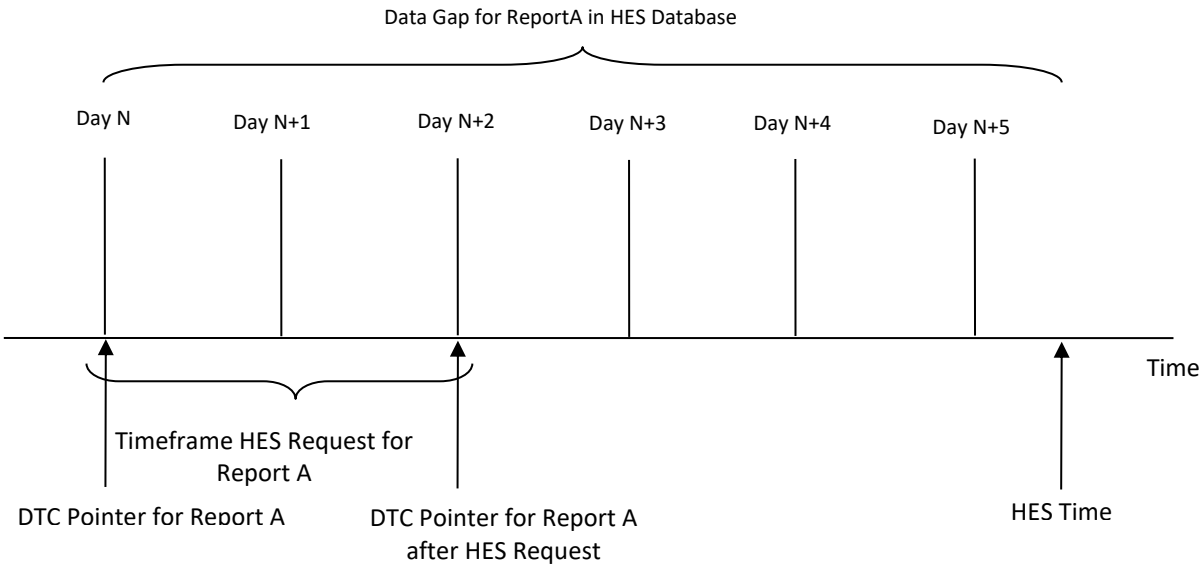
Some examples of this behavior are included below in two scenarios, namely A and B.

In situation A, the DTC must respond to the request from the HES with existing data between days N+3 and N+5,and should not move the pointer on the report A, since otherwise we would still have gaps in the HES database.



Situation A.

In situation B, the DTC must respond to the request from the HES with the data between the days N and N+2, moving the pointer for the report A on the day N+2, thus ensuring the absence of gaps on the HES database.


Data Gap for ReportA in HES Database
Day N
Day N+1
Day N+2
Day N+3
Day N+4
Day N+5
Time
Timeframe HES Request for Report A
DTC Pointer for Report A
DTC Pointer for Report A after HES Request
HES Time

7.2.3. Spontaneous Events from the meter and the DTC

When the DTC receives spontaneous events from the meters or generate spontaneous events itself, the events must be sent to the HES as soon as detected. The transmission of the event will contain all the information regarding it.

7.3. Web Services Specification

7.3.1. Compliance

The WebServices has to be compliant with WS-I Basic Profiles Version 1.1 as defined in http://www.ws-i.org/Profiles/BasicProfile-1.1.html

WebServices WSDL definitions are given in annex F.

The transport protocol to be used for WebServices is HTTP/1.1 or HTTPS for secure equipments.

7.3.2. Services send to the DTC

DTC offered services present following methods:

- AsynchReport Request

Reports are considered as any request for information of either a meter or the DTC.
The information report has to be delivered asynchronously (the DTC will answer with a web service or FTP).

Name	**AsynchRequest**			**Needed**
Parameters	IdPet	UInt32	Unique request Id	Mandatory
	IdRpt	String	Requested Report Id (“Sxx”)	Mandatory
	tfStart	String	Start of requested timeframe (Timestamp format “YYYYMMDDHHMNSSFFFX”) (1)	Optional (maybe empty string). If not specified, no bottom limitation for data timestamp.
	tfEnd	String	End of requested timeframe (Timestamp format “YYYYMMDDHHMNSSFFFX”)	Optional (maybe empty string). If not specified, no up limitation for data timestamp.
	IdMeters	String	Meters for which the report has to be produced (MeterIDs format) Comma-separated. Example : “00000A,00000B,00000C”	Optional (maybe null). If null applies to all meters
	Priority	UInt32	Indicates the report priority : • 0 : ultra high • 1 : very high • 2 : high • 3 : normal high • 4 : normal • 5: normal low • 6: low	Mandatory

			• 7: very low • 8: super low • 9: ultra low	
	Source	String	(1) Indicates if source data is DTC (when exist) or Meter: • DCC : (DTC Conditional) If data exists in DTC deliver it, otherwise, ask the meter • DCF: (DTC Forced) Deliver only data which is in the DTC, if data is not there, consider data is missing. • MET: Force meter reading	Mandatory
	STGSource	UInt32	Indicates to which HES the DTC should reply: • 1 • 2 • 3	Optional If not specified, the reply should go to HES 1.
	IdDC	String	Id of the DTC for which the request is addressed	Mandatory
Return Value		Boolean	Indicates that the DTC has taken the request in account	

(1) A source="MET" goes directly to the meter. While the report will contain the meter data, the DTC does not store the data when source="MET". It is effectively an HES to meter pass-through.
A source="DCC" however will go to the meter for any data not found on the DTC and then store the results prior to sending the report. When the DTC receives any errors from the meters (e.g. inactive meters, meters in permanent failure, any field report missing) in previous DCC request (or scheduled tasks), in the next DCC request, the DTC must go to the meter for request all information needed for build the requested report correctly.

- Report Query

This asynchronous WS is used for the retrieval of events in meters (S09) and DTCs (S17). Additionally in the future it might be used for other purposes.
Requests can be filtered by event codes or event groups. For this, this WS includes different parameters than the previous one: One parameter for the query identification and the other for the parameters needed.
The information report has to be delivered asynchronously (the DTC will answer with a web service or FTP).

Name	**ReportQuery**			**Needed**
Parameters	IdPet	UInt32	Unique request Id	Mandatory
	IdRpt	String	Requested Report Id (“Sxx”). Now only available for S09 and S17.	Mandatory
	tfStart	String	Start of requested timeframe (Timestamp format “YYYYMMDDHHMNSSFFFX”).	Optional (maybe empty string). If null

				applies since the beginning.
	tfEnd	String	End of requested timeframe (Timestamp format "YYYYMMDDHHMNSSFFFX").	Optional (maybe empty string). If null applies until the end.
	IdMeters	String	Meters for which the report has to be produced (MeterIDs format) Comma-separated. Example : "00000,00000,00000"	Optional (maybe null). If null applies to all meters
	Priority	UInt32	Indicates the report priority : • 0 : ultra high • 1 : very high • 2 : high • 3 : normal high • 4 : normal • 5: normal low • 6: low • 7: very low • 8: super low • 9: ultra low	Mandatory
	QueryID	String	This parameter is the query identification. For report S09 it will be "Q1". For S17, DTC events Q1 defines also event group and code.	Mandatory
	Parameters	String	In the case of Q1 there are two parameters, event group and event code (1): EvGroup: Several groups can be specified on each request. If null, it means that it applies to all event groups. EvCode: Several event codes can be included. They apply to the above mentioned EvGroup. If null, it applies to all event codes for the specified group.	Mandatory
	STGSource	UInt32	Indicates to which HES the DTC should reply: • 1 • 2 • 3	Optional If not specified, the reply should go to HES 1.
	IdDC	String	Id of the DTC for which the request is addressed	Mandatory
Return Value		Boolean	Indicates that the DTC has taken the request in account	

(1) In case of Q1, the ";" is the separator for the two entries, the ":" is a separator between code and value. The "," is the separator for specify possible several groups/codes inside EvGroup/EvCode parameter. The "+" is the separator for adding more than one filtering criteria and "-" is the separator for excluding some specific events of one group. Below there are some examples for further clarification:

- EvGroup:5;EvCode:1,6,9 (This example request for the event group 5, the 1, 6 and 9 event code);
- EvGroup:4;EvCode: (This example request all events for the event group 4);
- EvGroup:;EvCode: (This example request all events in all groups);
- EvGroup:1,2,3,4,5;EvCode:+EvGroup:6;EvCode:3,4,5,6 (This example request all events for the event group 1,2,3,4,5 and for the event group 6, the 3, 4, 5 and 6 event code);
- EvGroup:1;EvCode :+EvGroup:2;EvCode:1,2 +EvGroup:6;EvCode:3,4,5,6 (This example request all events for the event group 1 and for the event group 2, the 1 and 2 event code and for the event group 6, the 3, 4, 5 and 6 event code);
- EvGroup:1,2,3,4,5;EvCode: (This example request all events for the group 1, 2, 3, 4 and 5);
- EvGroup:1,2,3,4,5;EvCode:- EvGroup:5;EvCode:1,2,3 (This example request all events for the group 1, 2, 3, 4 and 5 except events 1,2 and 3 from group 5);

- SynchReport Request

Reports are considered as any request for information of either a meter or the DTC.
The report has to be generated as the result of the service invocation: the information is given on synchronous mode.

Name	Request			Needed
Parameters	IdPet	UInt32	Unique request Id	Mandatory
	IdRpt	String	Requested Report Id ("Sxx")	Mandatory
	tfStart	String	Start of requested timeframe (Timestamp format "YYYYMMDDHHMNSSFFFX")	Optional (may be empty string). If not specified, no bottom limitation for data timestamp.
	tfEnd	String	End of requested timeframe (Timestamp format "YYYYMMDDHHMNSSFFFX")	Optional (maybe empty string). If not specified, no up limitation for data timestamp.
	IdMeters	String	Meters for which the report has to be produced (MeterIDs format) Comma-separated. Example : "00000,00000,00000"	Optional (maybe null string). If null applies to all meters
	Priority	UInt32	Indicates the report priority : • 0 : ultra high • 1 : very high • 2 : high • 3 : normal high • 4 : normal • 5: normal low	Mandatory

			• 6: low • 7: very low • 8: super low • 9: ultra low	
	STGSource	UInt32	Indicates to which HES the DTC should reply: • 1 • 2 • 3	Optional If not specified, the reply should go to HES 1.
	IdDC	String	Id of the DTC for which the request is addressed	Mandatory
Return Value		String	Payload –Report XML content.	

Note that synchronous requests will only be used in S01, S21, S27 and S44. In these cases, attributes tfStart and tfEnd don't apply, they should be ignored by the DTC. However, we are keeping these attributes in case we need them in a future release.

The HES will send the request and will keep the link until it receives the information requested by the DTC. If in a first try the DTC can't communicate with all meters, the DTC should not manage the retry logic based on the parameters "TimeRetryInterval" and "RetryDisconMeter". Therefore, the DTC will not try consecutively until the timeout meter retry is over. The DTC will send the report to the HES with all possible data collected in the first access to the meter. For such requests is important to get a quick response.

Additionally, in synchronous requests, the "TimeSendReq" and "NumMeters" parameters handle defined in "Request to the DTC" paragraph doesn´t apply.

- Order Request

Orders are considered as those messages which imply a change (parameter, command execution..) either a meter or the DTC.

Name	**Order**			**Needed**
Parameters	IdPet	UInt32	Unique request Id	Mandatory
	Format	Integer	Encoding format of the order: • 0 – No compression • 1 – Compressed (gzip)	Mandatory
	Order	String	XML Content of the Bxx order to execute	Mandatory
	Priority	UInt32	Indicates the report priority : • 0 : ultra high • 1 : very high • 2 : high • 3 : normal high	Mandatory

			• 4 : normal • 5: normal low • 6: low • 7: very low • 8: super low • 9: ultra low	
	STGSource	UInt32	Indicates to which HES the DTC should reply: • 1 • 2 • 3	Optional If not specified, the reply should go to HES 1.
	IdDC	String	Id of the DTC for which the request is addressed	Mandatory
Return Value		Boolean	Indicates the requested order has been registered.	

7.2.4 Services send to the HES (from the DTC)

HES offered services present following methods:

- Report

This service allows the DTC to send to the HES a report content, regarding: • Unsolicited report: DTC Event, Meter event, DTC Restart, Meter Registering… • Solicited report : Reports generated after a given request				
Name	**Report**			**needed**
Parameters	IdPet	UInt32	Unique request Id	Mandatory (might be 0)
	IdDC	String	Id of the DTC	Mandatory
	ReqStatus	Integer	Status of the request after this sending (see UpdateRequestStatus method)	Mandatory
	Format	Integer	Encoding format of the payload: • 0 – No compression • 1 – Compressed (gzip)	Mandatory
	Payload	String	Report XML Content	Mandatory
Return Value		Boolean	Indicates that the HES has taken the message in account.	

- UpdateRequestStatus

This WebService is intended to inform the HES about a request status.
It has to be called by the DTC after an asynchronous request from the HES has been ended in the DTC, in order to inform the HES of the reason why the request has been terminated (normal termination, timeout…) if the information has not been yet passed to the HES (e.g. if the report was sent using Report WS).
In the case of periodic reports (scheduled tasks) delivered by the DTC (eg, S05 daily billing), the DTC should use this web service for notify the upload of the report and set IdPet with value 0.

Name	UpdateRequestStatus			**Needed**
Parameters	IdPet	UInt32	Unique request Id	Mandatory
	IdDC	String	Id of the DTC	Mandatory
	ReqStatus	Integer	Status of the request after this sending (complete, or still on progress) Possible values : • 0 : ended with success • 1 : in progress • 2 : cancelled due to a timeout (used when the number of retries to meters has been reached) refers to link DTC-Meters • 3 : Outdated order (rejected) • 4 : Partially applied (success in some meters, failure in others). • 5: Malformed request (invalid date, unknown request, unfeasible request –write in read parameters, request unfeasible actions..-,etc). • 6 : cancelled due to a timeout (used when the number of retries has been reached) refers to link DTC-HES (ftp problems..). Includes communication problems, wrong passwords, wrong HES ftp ip, file not exists, …: in all these cases it is assumed the time out is reached. • 7: Meter does not exist in DTC database. • 8: Incompatible or inconsistent protocol version (eg: DTC is in protocol version 3.1. and receives an order request with version tag 2.1) • 9: Cancelled by the HES • 10: Maximum queue number of requests has been reached • 255 : other reason. The request didn't succeed for any other reason.	Mandatory

			"Ended with success" applies when all requested actions and reports have been done. "In progress" applies when a report has been generated as a part of a request (case of a report sent in multiple parts). When "Other reason" is emitted, an event should be registered in the event list defined of the DTC to indicate the reason of the failure.	
	Reference	String	In case of FTP sent report, indicates the name of the file containing the message.	Only mandatory in case of a FTP sent report
Return Value		Boolean	Indicates that the HES has taken the message in account.	

- UpdateMetersStatus

This WebService is intended to inform the HES about the status of a given meter regarding a given request.
It has to be called by the DTC after a meter has been processed during an asynchronous request from the HES (AsynchRequest, ReportQuery to meters, Order are considered asynchronous request) in order to inform the HES of the status of this particular meter regarding the request.
The notification through this web server **doesn't substitute** the UpdateRequestStatus WS that must be additionally sent by the DTC for reporting about the successfully finishing of a request.
This notification can include several idMeters to notify with a single message a confirmation update for several meters.

Name	UpdateMetersStatus			**needed**
Parameters	IdPet	UInt32	Unique request Id	Mandatory
	idDC	String	Id of the DTC	Mandatory
	idMeter	String	Id of the meter	Mandatory
	MeterStatus	Integer	Status of the meter Possible values : • 0: ended with success • 1: ended with error • 2: Order has been executed but any report after is missing. • 3: Order partially applied (part of the data sent in the order were not correctly applied in the meter)(*)	Mandatory
	ErrCat	Integer	Error category, as defined in § "Failed meters"	Optional (may be null)
	ErrCode	Integer	Error code, as defined in § "Failed meters"	Optional (may be null)

Return Value		Boolean	Indicates that the HES has taken the message in account.	

(*) Covers the case of sending several parameters change the meter, when some parameter are changed but for different reasons another not.

8 REQUESTS TO THE DISTRIBUTION TRANSFORMER CONTROLLER

8.1 Energy registers

8.1.1 Basic Instant data values in a meter [S01]

To answer this request, the DTC will require the meter data reflecting also the timestamp (time and hour of readings).
When receiving this request, the DTC should attempt to collect all the attributes included in the list. **However**, if any attribute fails to be collected, the DTC should include the others and send back the request to the HES. The fact of having missing information or errors in collecting some of the objects from the meter should not prevent the response with the information available to the HES.
This request will be synchronous. The HES will send the request and will keep the link until it receives the information requested by the DTC. If in a first try the DTC can't communicate with all meters, the DTC should not manage the retry logic based on the DTC parameters "TimeRetryInterval" and "RetryDisconMeter". Therefore, the DTC will not try consecutively until the *timeout meter retry* is over. The DTC will send the report to the HES with all possible data collected in the first access to the meter. For such requests is important to get a quick response. This behavior should only be done in the case of requests made through the SynchReportRequest (WS Request). In the case of having to generate a S01 as a result of a DTC-order, the retry logic should be conducted as any other request.

The structure for S01 and S21 should be sent with all attributes defined in the specification. The values receive from the meters should be mapped to the corresponding attribute. If DTC does not succeed collecting the OBIS code from the meter, the tag should be included with a null value.

S01	FIELD	DESCRIPTION	VALUE	Object	Class	Logical Name	Attr
1	IdRpt	Identifier of the request	S01				
2	IdPet	Unique request identifier					
3	Version	Version Identifier	3.4_EDP_2.0				
4	Cnc	Concentrator identifier		Device ID5	1	0.0.96.1.4.255	2
5	Cnt	Unique meter identifier					
	S01	Basic Instant Values tag name					
6	Fh	Meter Date as date_time format "YYYYMMDDHHmmssfffX"	Timestamp	Clock	8	0.0.1.0.0.255	2
7	L1v	Voltage L1	V Number (3,1)	Instantaneous voltage L1	3	1.0.32.7.0.255	2
8	L1i	Current L1	A	Instantaneous current L1	3	1.0.31.7.0.255	2
9	Pimp	Active power (import)	W	Instantaneous active power + (Sum of all phases)	3	1.0.1.7.0.255	2
10	Pexp	Active power (export)	W	Instantaneous active power - (Sum of all phases)	3	1.0.2.7.0.255	2
11	PF	Power factor	Number(1,3)	Instantaneous power factor (PF)	3	1.0.13.7.0.255	2
12	Ca	Active quadrant (0 means no load connected).	Integer (0, 1,2,3,4)	Active Quadrant	1	1.1.94.35.100.255	2
13	PP	Phase presence (2)	String	Phase presence	1	1.1.94.35.104.255	2
14	Fc	Meter phase. 4= all, 5= unknown, 6=none. (1)	Integer (1,2,3, 4, 5, 6)				
15	Eacti	Current switch state	Integer (0,1,2) Will be null if the meter hasn´t swtch (e.g.- Supervisory meters)	Disconnect Control	70	0.0.96.3.10.255	3
16	Eanti	Previous switch state	Integer (0,1,2) Will be null if the meter hasn´t swtch (e.g.- Supervisory meters)	Previous Disconnect Control	70	0.1.94.35.20.255	3

17	AIa	Active Import	kWh - Absolute	Active energy import (+A)	3	1.0.1.8.0.255	2
18	AEa	Active Export	kWh - Absolute	Active energy export (−A)	3	1.0.2.8.0.255	2
19	R1a	Reactive quadrant I	kvarh – Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2
20	R2a	Reactive quadrant II	kvarh – Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2
21	R3a	Reactive quadrant III	kvarh – Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2
22	R4a	Reactive quadrant IV	kvarh – Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2
23	Freq	Frequency	Hz Number (2,1)	Frequency	3	1.0.14.7.0.255	2

(1) This parameter is detected by PLC. This means the phase is connected to the meter. Today meters do not have this feature enabled because they don't have a DLMS parameter for it. If meters do not have this feature enabled (eg there is not a parameter DLMS for it) the value should be "5" or null.

(2) OBIS 1-1:94.35.104.255. Phase presence indicator. In the S01 report this attribute will be a String with the format "1,2,3". If is detected the phase 1 "1,0,0", if is detected the phase 2 "0,2,0", if is detected the all three phases "1,2,3".

The DTC should always retrieve the data from the meter in the most efficient way. In this case, instead of reading the all the objects listed on the table above one by one, it could read the buffer of the object Instantaneous (7-0.0.21.0.5.255-2). If for some reason the DTC is not able to parse the answer, it should read the capture_objets (7-0.0.21.0.5.255-3).

8.1.2 Advanced Instant data values in a meter [S21]

This request is similar to S01 but with additional data, typically available in polyphase and supervision meters.
To answer this request, the DTC will require the meter data reflecting also the timestamp (time and hour of readings).
The behaviour when missing attributes mentioned in S01 applies in this report as well.
This request will be synchronous. The HES will send the request and will keep the link until it receives the information requested by the DTC. If in a first try the DTC can't communicate with all meters, the DTC should not manage the retry logic based on the DTC parameters "TimeRetryInterval" and "RetryDisconMeter". Therefore, the DTC will not try consecutively until the *timeout meter retry* is over. The DTC will send the report to the HES with all possible data collected in the first access to the meter. For such requests is important to get a quick response. This behavior should only be done in the case of requests made through the SynchReportRequest (WS Request). In the case of having to generate a S21 as a result of a DTC-order, the retry logic should be conducted as any other request.

S21	FIELD	DESCRIPTION	VALUE	Object	Class	Logical Name	Attr	Comments
1	IdRpt	Identifier of the request	S21					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	S21	Advanced Instant Values tag name						
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	Clock	8	0.0.1.0.0.255	2	

7	Ca	Active quadrant (for single phase meters and for 3 phase as total)	Integer (1,2,3,4)	Active Quadrant	1	1.1.94.35.100.255	2	
8	I3	Current sum 3 phases	A	Instantaneous current (sum over all phases)	3	1.0.90.7.0.255	2	
9	L1v	Voltage L1 phase 1	V	Instantaneous voltage L1	3	1.0.32.7.0.255	2	
10	L1i	Current L1 phase 1	A	Instantaneous current L1	3	1.0.31.7.0.255	2	
11	Pimp1	Active power (import) phase 1	W	Instantaneous active power + (L1)	3	1.0.21.7.0.255	2	
12	Pexp1	Active power (export) phase 1	W	Instantaneous active power - (L1)	3	1.0.22.7.0.255	2	
13	QR1phase1	Reactive power QI phase 1	VAr	Reactive power QI				Only for supervison meter
14	QR2phase1	Reactive power QII phase 1	VAr	Reactive power QII				Only for supervison meter
15	Qr3phase1	Reactive power QIII phase 1	VAr	Reactive power QIII				Only for supervison meter
16	QR4phase1	Reactive power QIV phase 1	VAr	Reactive power QIV				Only for supervison meter
17	PF1	Power factor phase 1	Number(1,3)	Instantaneous power factor (PF) L1	3	1.0.33.7.0.255	2	
18	Ca1	Active quadrant phase 1	Integer (1,2,3,4)	Active Quadrant L1	1	1.1.94.35.101.255	2	
19	L2v	Voltage L2 phase 2	V	Instantaneous voltage L2	3	1.0.52.7.0.255	2	
20	L2i	Current L2 phase 2	A	Instantaneous current L2	3	1.0.51.7.0.255	2	
21	Pimp2	Active power (import) phase 2	W	Instantaneous active power + (L2)	3	1.0.41.7.0.255	2	
22	Pexp2	Active power (export) phase 2	W	Instantaneous active power - (L2)	3	1.0.42.7.0.255	2	
23	QR1phase2	Reactive power QI phase 2	VAr	Reactive power QI				Only for supervison meter
24	QR2phase2	Reactive power QII phase 2	VAr	Reactive power QII				Only for supervison meter
25	Qr3phase2	Reactive power QIII phase 2	VAr	Reactive power QIII				Only for supervison meter
26	QR4phase2	Reactive power QIV phase 2	VAr	Reactive power QIV				Only for supervison meter
27	PF2	Power factor phase 2	Number(1,3)	Instantaneous power factor (PF) L2	3	1.0.53.7.0.255	2	
28	Ca2	Active quadrant phase 2	Integer (1,2,3,4)	Active Quadrant L2	1	1.1.94.35.102.255	2	
29	L3v	Voltage L3 phase 3	V	Instantaneous voltage L3	3	1.0.72.7.0.255	2	
30	L3i	Current L3 phase 3	A	Instantaneous current L3	3	1.0.71.7.0.255	2	

31	Pimp3	Active power (import) phase 3	W	Instantaneous active power + (L3)	3	1.0.61.7.0.255	2	
32	Pexp3	Active power (export) phase 3	W	Instantaneous active power - (L3)	3	1.0.62.7.0.255	2	
33	QR1phase3	Reactive power QI phase 3	VAr	Reactive power QI				Only for supervison meter
34	QR2phase3	Reactive power QII phase 3	VAr	Reactive power QII				Only for supervison meter
35	Qr3phase3	Reactive power QIII phase 3	VAr	Reactive power QIII				Only for supervison meter
36	QR4phase3	Reactive power QIV phase 3	Var	Reactive power QIV				Only for supervison meter
37	PF3	Power factor phase 3	Number(1,3)	Instantaneous power factor (PF) L3	3	1.0.73.7.0.255	2	
38	Ca3	Active quadrant phase 3	Integer (1,2,3,4)	Active Quadrant L3	1	1.1.94.35.103.255	2	
39	PP	Phase presence (2)	String	Phase presence	1	1.1.94.35.104.255	2	
40	Fc	Meter phase. 4= all, 5= unknown, 6=none. (1)	Integer (1,2,3, 4, 5, 6)					
41	Eacti	Current switch state	Integer (0,1,2) Will be null if the meter hasn´t swtch (e.g.- Supervisory meters)	Disconnect Control	70	0.0.96.3.10.255	3	
42	Eanti	Previous switch state	Integer (0,1,2) Will be null if the meter hasn´t swtch (e.g.- Supervisory meters)	Previous Disconnect Control	70	0.1.94.35.20.255	3	
43	Aia	Active Import	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.0.255	2	
44	Aea	Active Export	kWh-Absolute	Active energy export (–A)	3	1.0.2.8.0.255	2	
45	R1a	Reactive quadrant I	kVARh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
46	R2a	Reactive quadrant II	kVARh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
47	R3a	Reactive quadrant III	kVARh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
48	R4a	Reactive quadrant IV	kVARh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
49	Pimp	Active power (import) sum 3 phases	W	Instantaneous active power + (Sum of all phases)	3	1.0.1.7.0.255	2	
50	Pexp	Active power (export) sum 3 phases	W	Instantaneous active power - (Sum of all phases)	3	1.0.2.7.0.255	2	
51	Qimp	Reactive power (import)	VAR					Only for supervision meter
52	Qexp	Reactive power (export)	VAR					

53	PF	Power factor	Number(1,3)	Instantaneous power factor (PF)	3	1.0.13.7.0.255	2	
54	Freq	Fequency	Hz Number (2,1)	Frequency	3	1.0.14.7.0.255	2	
55	AIa1	Active Import phase 1	kWh-Absolute	Active energy import (+A) L1	3	1.0.21.8.0.255	2	Only for supervision meter
56	AIa2	Active Import phase 2	kWh-Absolute	Active energy import (+A) L2	3	1.0.41.8.0.255	2	
57	AIa3	Active Import phase 3	kWh-Absolute	Active energy import (+A) L3	3	1.0.61.8.0.255	2	
58	AEa1	Active Export phase 1	kWh-Absolute	Active energy export (−A) L1	3	1.0.22.8.0.255	2	
59	AEa2	Active Export phase 2	kWh-Absolute	Active energy export (−A) L2	3	1.0.42.8.0.255	2	
60	AEa3	Active Export phase 3	kWh-Absolute	Active energy export (−A) L3	3	1.0.62.8.0.255	2	
61	R1a1	Reactive energy QI (+Ri) L1	kVARh-Absolute	Reactive energy QI (+Ri) L1	3	1.0.25.8.0.255	2	
62	R1a2	Reactive energy QI (+Ri) L2	kVARh-Absolute	Reactive energy QI (+Ri) L2	3	1.0.45.8.0.255	2	
63	R1a3	Reactive energy QI (+Ri) L3	kVARh-Absolute	Reactive energy QI (+Ri) L3	3	1.0.65.8.0.255	2	
64	R2a1	Reactive energy QII (+Rc) L1	kVARh-Absolute	Reactive energy QII (+Rc) L1	3	1.0.26.8.0.255	2	
65	R2a2	Reactive energy QII (+Rc) L2	kVARh-Absolute	Reactive energy QII (+Rc) L2	3	1.0.46.8.0.255	2	
66	R2a3	Reactive energy QII (+Rc) L3	kVARh-Absolute	Reactive energy QII (+Rc) L3	3	1.0.66.8.0.255	2	
67	R3a1	Reactive energy QIII (-Ri) L1	kVARh-Absolute	Reactive energy QIII (-Ri) L1	3	1.0.27.8.0.255	2	
68	R3a2	Reactive energy QIII (-Ri) L2	kVARh-Absolute	Reactive energy QIII (-Ri) L2	3	1.0.47.8.0.255	2	
69	R3a3	Reactive energy QIII (-Ri) L3	kVARh-Absolute	Reactive energy QIII (-Ri) L3	3	1.0.67.8.0.255	2	
70	R4a1	Reactive energy QIV (-Rc) L1	kVARh-Absolute	Reactive energy QIV (-Rc) L1	3	1.0.28.8.0.255	2	
71	R4a2	Reactive energy QIV (-Rc) L2	kVARh-Absolute	Reactive energy QIV (-Rc) L2	3	1.0.48.8.0.255	2	
72	R4a3	Reactive energy QIV (-Rc) L3	kVARh-Absolute	Reactive energy QIV (-Rc) L3	3	1.0.68.8.0.255	2	

*The supervision meter of the DTC is also a Poly-phase meter.
(1) This parameter is detected by PLC. This means the phase is connected to the meter. Today meters do not have this feature enabled because they don't have a DLMS parameter for it. Code 4 is used for three-phase meters. In previous versions this parameter was sent with value 5 or null.
(2) OBIS 1-1:94.35.104.255. Phase presence indicator. In the S21 report this attribute will be a String with the format "1,2,3". If is detected the phase 1 "1,0,0", if is detected the phase 2 "0,2,0", if is detected only two phases "0,2,3", if is detected the all three phases "1,2,3".

The DTC should include on the S21 response only the tags applicable for the type of meter requested. For example, if the is meter is single phase, the DTC should not include three phase meter tags.

8.1.3 Current billing values on demand [S27]

This request will be synchronous. The HES will send the request and will keep the link until it receives the information requested by the DTC. If in a first try the DTC can't communicate with all meters, the DTC should not manage the retry logic based on the DTC parameters "TimeRetryInterval" and "RetryDisconMeter". Therefore, the DTC will not try consecutively until the *timeout meter retry* is over. The DTC will send the report to the HES with all possible data collected in the first access to the meter. For such requests is important to get a quick response. This behavior should only be done in the case of requests made through the SynchReportRequest (WS Request). In the case of having to generate a S27 as a result of a DTC-order, the retry logic should be conducted as any other request.
It takes the Current register absolute values per contract and tariff period **only for contract 1**.
It is composed up to 6 tariff periods + total.
To answer this request, the DTC will require the meter data reflecting also the timestamp (time and hour of readings).

The execution of S27 report is a **two step operation** where the 1st step is the execution of an end of billing reset (manual monthly billing reset) and the 2nd step is used to read the monthly billing data from the meter.
Using this report "execution workflow" is a must to ensure that the meter has the "current" billing values available.

(1) The 1st step is to execute a monthly billing reset to all contracts, similarly as it's done in B28 order through tag "MBRst" = 7. At DLMS level, this operation is done through method #1 execute (7) of the DLMS object "0.0.10.0.1.255".
(2) The 2nd step is to read the monthly billing data through attribute #2 (buffer) of the DLMS object "0.0.98.1.1.255". Only data related to contract 1.

Regarding the data collection, and in order to properly execute the S27 report, DTC shall always take into consideration the parameter "DataCollectMode" (S12/B07 report). Considering this parameter's value and the existance of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the monthly profile configuration is needed before the collection of the monthly billing data.
Please see section 9.1.5 for further details.

S27	FIELD	DESCRIPTION	VALUE	Object	Class	Logical Name	Attr	Comments
1	IdRpt	Identifier of the request	S27					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier						
	S27	Current billing values on demand tag name						
6	Fh	Meter Date as date_time format	Timestamp	Clock		0.0.1.0.0.255		Clock
7	Ctr	Nº contract	Integer(1-3)					
8	Pt	Tariff period	Integer(0-6)					
<Value>	Ctr=1, Pt=0							
9	Mx	Max Ali. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	Ctr=1 x=10

10	Fx	Date/Time Mx Date (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
11	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10
12	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
13	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10
14	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
15	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
16	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
17	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
18	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
19	AItot	Active Energy Import Total	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.0.255	2	Refers to absolute values (all contracts and all tariffs). Ctr=c, Pt=0
20	AEtot	Active Energy Export Total	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.0.255	2	
21	R1tot	Reactive Energy QI Total	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
22	R2tot	Reactive Energy QII Total	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
23	R3tot	Reactive Energy QIII Total	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
24	R4tot	Reactive Energy QIV Total	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
25	AIa1	Import Active phase L1	kWh-Absolute	Active energy import (+A) phase L1	3	1.0.21.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
26	AEa1	Export Active phase L1	kWh-Absolute	Active energy export (−A) phase L1	3	1.0.22.8.x.255	2	
27	R1a1	Reactive quadrant I phase L1	kvarh-Absolute	Reactive energy QI (+Ri) phase L1	3	1.0.25.8.x.255	2	
28	R2a1	Reactive quadrant II phase L1	kvarh-Absolute	Reactive energy QII (+Rc) phase L1	3	1.0.26.8.x.255	2	
29	R3a1	Reactive quadrant III phase L1	kvarh-Absolute	Reactive energy QIII (-Ri) phase L1	3	1.0.27.8.x.255	2	
30	R4a1	Reactive quadrant IV phase L1	kvarh-Absolute	Reactive energy QIV (-Rc) phase L1	3	1.0.28.8.x.255	2	

31	AIa2	Import Active phase L2	kWh-Absolute	Active energy import (+A) phase L2	3	1.0.41.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
32	AEa2	Export Active phase L2	kWh-Absolute	Active energy export (−A) phase L2	3	1.0.42.8.x.255	2	
33	R1a2	Reactive quadrant I phase L2	kvarh-Absolute	Reactive energy QI (+Ri) phase L2	3	1.0.45.8.x.255	2	
34	R2a2	Reactive quadrant II phase L2	kvarh-Absolute	Reactive energy QII (+Rc) phase L2	3	1.0.46.8.x.255	2	
35	R3a2	Reactive quadrant III phase L2	kvarh-Absolute	Reactive energy QIII (-Ri) phase L2	3	1.0.47.8.x.255	2	
36	R4a2	Reactive quadrant IV phase L2	kvarh-Absolute	Reactive energy QIV (-Rc) phase L2	3	1.0.48.8.x.255	2	
37	AIa3	Import Active phase L3	kWh-Absolute	Active energy import (+A) phase L3	3	1.0.61.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
38	AEa3	Export Active phase L3	kWh-Absolute	Active energy export (−A) phase L3	3	1.0.62.8.x.255	2	
39	R1a3	Reactive quadrant I phase L3	kvarh-Absolute	Reactive energy QI (+Ri) phase L3	3	1.0.65.8.x.255	2	
40	R2a3	Reactive quadrant II phase L3	kvarh-Absolute	Reactive energy QII (+Rc) phase L3	3	1.0.66.8.x.255	2	
41	R3a3	Reactive quadrant III phase L3	kvarh-Absolute	Reactive energy QIII (-Ri) phase L3	3	1.0.67.8.x.255	2	
42	R4a3	Reactive quadrant IV phase L3	kvarh-Absolute	Reactive energy QIV (-Rc) phase L3	3	1.0.68.8.x.255	2	
43	DMCpd	Duration of Critical Demand Management Periods	seconds	Duration of Critical Demand Management Periods	3	0.1.94.35.62.255	2	
44	DMnCpd	Duration of Non-Critical Demand Management Periods	seconds	Duration of Non-Critical Demand Management Periods	3	0.1.94.35.63.255	2	
<Value>	Ctr=1, Pt=1							
45	Mx	Max Ali. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.1.255		
46	Fx	Date/Time Mx Date (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.1.255		
47	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they

48	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	may always be configured to be captured. Ctr=1 x=1
49	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=1
50	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1
51	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
52	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
53	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
54	R4a	Reactive quadrant IV	kvarh-Absolute					
<Value>	Ctr=1, Pt=2							
55	Mx	Max AIi. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
56	Fx	Date/Time Mx Date (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
57	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2
58	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
59	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=2
60	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2
61	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
62	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
63	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
64	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=3							
65	Mx	Max AIi. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
66	Fx	Date/Time Mx Date	Timestamp	Maximum Demand		1.0.1.6.2.255		

		(Y/M/D H:M:S)		Register Active power+ (QI+QIV)				
67	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3
68	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
69	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=3
70	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3
71	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
72	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
73	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
74	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=4							
75	Mx	Max AIi. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
76	Fx	Date/Time Mx Date (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
77	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4
78	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
79	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4
80	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
81	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
82	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
83	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	

84	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=5							
85	Mx	Max Ali. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
86	Fx	Date/Time Mx Date (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
87	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5
88	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
89	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5
90	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
91	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
92	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
93	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
94	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=6							
95	Mx	Max Ali. The max value incurs since last monthly billing closure.	W	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
96	Fx	Date/Time Mx Date (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)		1.0.1.6.2.255		
97	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6
98	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
99	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not

100	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6
101	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
102	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
103	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
104	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>								

8.1.4 Instant data values on demand [S26]

Similarly to other reports delivered by the DTC, this report will be sent to the HES through ftp and a WS notification. The DTC will collect the MeterID, the specified variable value as scheduled and the timestamp (reading date and time).
The variables included in the S26 report will be configured in the DTC parameter “S26Content”.
The variables which can be collected are those from the following list:
L1v, L1i, L2v, L2i, L3v, L3i, I3, P, Q, FP, Ca, Pf, Fc, Eacti, Eanti, AIa, AEa, R1a, R2a, R3a, R4a

S26	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S26
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
5	Cnt	Unique meter identifier	
	S26	Instant data values on demand tag name	
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp
7	DataId	Data Identificator	L1v, L1i, L2v, L2i, L3v, L3i, I3, Pimp, Pexp, Qimp, Qexp, PF, Ca, PP, Fc, Eacti, Eanti, AIa, AEa, R1a, R2a, R3a, R4a
8	DataValue	Value of the data	String (although it will store numerical values).

Bellow it is possible to see an example for this S26 Report:

```
<Report IdRpt="S26" IdPet="647466" Version="3.4_EDP_2.0">
    <Cnc Id="AAA57C4730016">
        <Cnt Id="BBB0115108646">
            <S26 Fh="20120223152600000W">
                    <DataId>Pimp</DataId>
                    <DataValue>0</DataValue>
                    <DataId>AIa</DataId>
                    <DataValue>3</DataValue>
                    <DataId>L1v</DataId>
                    <DataValue>224</DataValue>
            </S26>
        </Cnt>
    </Cnc>
</Report>
```

8.1.5 Daily [S05] & [S5B] and Monthly billings [S04] & [S4B]

8.1.5.1. Monthly Billing [S04]

The monthly billing profile configuration of meters is not fixed (it's configurable).

In order to properly execute the S04 report, DTC shall always take into consideration the parameter "DataCollectMode" (S12/B07 report). Considering this parameter's value and the existence of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the monthly profile configuration is needed before the collection of the monthly billing data.
Please see section 9.1.5 for further details.

Monthly billing data is always collected through attribute #2 (buffer) of the DLMS object "0.0.98.1.c.255", with c=1,2 (contracts 1 and 2).

Only existing tags should be returned in the report. More details in tab "Annex.S04"

S04	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At	Comments
1	IdRpt	Identifier of the request	S04					
2	IdPet	Unique request identifier						
3	Versio n	Version Identifier	3.4_EDP_2. 0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier						
	S04	Report tag name identifier						
6	Fhi	Start Date (Y/M/D H:M:S:ms)	Timestamp	Time stamp of billing period 1 last reset	1	0.0.94.35.x.255	2	x=11,12,13 (contract 1,2 ,3). By default, this object is not being captured in monthly billing profile.
7	Fhf	Finish Date (Y/M/D H:M:S:ms)	Timestamp	Clock	8	0.0.1.0.0.255	2	
8	Ctr	Nº contract	Integer(1-3)					Only values 1,2 apply for EDP
9	Pt	Tariff period	Integer(0-6)					
<Value>	Ctr=1, Pt=0							
10	Mx	Max AIi	W Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 & Ctr=2 x=20
11	Fx	Date/Time Mx (Y/M/D H:M:S:ms)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
12	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile.

13	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	Nevertheless, they may always be configured to be captured. Ctr=1 x=10 & Ctr=2 x=20
14	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
15	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
16	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
17	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
18	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
19	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
20	AItot	Active Energy Import Total	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.0.255	2	Refers to absolute values (all contracts and all tariffs). May be configured in both contracts. Ctr=c, Pt=0
21	AEtot	Active Energy Export Total	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.0.255	2	
22	R1tot	Reactive Energy QI Total	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
23	R2tot	Reactive Energy QII Total	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
24	R3tot	Reactive Energy QIII Total	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
25	R4tot	Reactive Energy QIV Total	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
26	AIa1	Import Active phase L1	kWh-Absolute	Active energy import (+A) phase L1	3	1.0.21.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
27	AEa1	Export Active phase L1	kWh-Absolute	Active energy export (−A) phase L1	3	1.0.22.8.x.255	2	
28	R1a1	Reactive quadrant I phase L1	kvarh-Absolute	Reactive energy QI (+Ri) phase L1	3	1.0.25.8.x.255	2	
29	R2a1	Reactive quadrant II phase L1	kvarh-Absolute	Reactive energy QII (+Rc) phase L1	3	1.0.26.8.x.255	2	
30	R3a1	Reactive quadrant III phase L1	kvarh-Absolute	Reactive energy QIII (-Ri) phase L1	3	1.0.27.8.x.255	2	
31	R4a1	Reactive quadrant IV phase L1	kvarh-Absolute	Reactive energy QIV (-Rc) phase L1	3	1.0.28.8.x.255	2	
32	AIa2	Import Active phase L2	kWh-Absolute	Active energy import (+A) phase L2	3	1.0.41.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
33	AEa2	Export Active phase L2	kWh-Absolute	Active energy export (−A) phase L2	3	1.0.42.8.x.255	2	
34	R1a2	Reactive quadrant I phase L2	kvarh-Absolute	Reactive energy QI (+Ri) phase L2	3	1.0.45.8.x.255	2	
35	R2a2	Reactive quadrant II phase L2	kvarh-Absolute	Reactive energy QII (+Rc) phase L2	3	1.0.46.8.x.255	2	
36	R3a2	Reactive quadrant III phase L2	kvarh-Absolute	Reactive energy QIII (-Ri) phase L2	3	1.0.47.8.x.255	2	
37	R4a2	Reactive quadrant IV phase L2	kvarh-Absolute	Reactive energy QIV (-Rc) phase L2	3	1.0.48.8.x.255	2	
38	AIa3	Import Active phase L3	kWh-Absolute	Active energy import (+A) phase L3	3	1.0.61.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
39	AEa3	Export Active phase L3	kWh-Absolute	Active energy export (−A) phase L3	3	1.0.62.8.x.255	2	
40	R1a3	Reactive quadrant I phase L3	kvarh-Absolute	Reactive energy QI (+Ri) phase L3	3	1.0.65.8.x.255	2	
41	R2a3	Reactive quadrant II phase L3	kvarh-Absolute	Reactive energy QII (+Rc) phase L3	3	1.0.66.8.x.255	2	
42	R3a3	Reactive quadrant III phase L3	kvarh-Absolute	Reactive energy QIII (-Ri) phase L3	3	1.0.67.8.x.255	2	
43	R4a3	Reactive quadrant IV phase L3	kvarh-Absolute	Reactive energy QIV (-Rc) phase L3	3	1.0.68.8.x.255	2	

44	DMCpd	Duration of Critical Demand Management Periods	seconds	Duration of Critical Demand Management Periods	3	0.1.94.35.62.255	2	
45	DMnCpd	Duration of Non-Critical Demand Management Periods	seconds	Duration of Non-Critical Demand Management Periods	3	0.1.94.35.63.255	2	
<Value>	Ctr=1, Pt=1							
46	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1 & Ctr=2 x=11
47	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
48	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1 & Ctr=2 x=11
49	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
50	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=1 & Ctr=2 x=11
51	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1 & Ctr=2 x=11
52	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
53	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
54	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
55	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=2							Ctr=1 x=2 Ctr=2 x=12
56	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2 & Ctr=2 x=12
57	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
58	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2 & Ctr=2 x=12
59	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
60	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=2 Ctr=2 x=12
61	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2 Ctr=2 x=12
62	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
63	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
64	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
65	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=3							
66	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile.

67	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	Nevertheless, they may always be configured to be captured. Ctr=1 x=3 & Ctr=2 x=13
68	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3 & Ctr=2 x=13
69	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
70	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=3 Ctr=2 x=13
71	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3 Ctr=2 x=13
72	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
73	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
74	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
75	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=4							
76	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4 & Ctr=2 x=14
77	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
78	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4 & Ctr=2 x=14
79	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
80	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4 Ctr=2 x=14
81	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
82	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
83	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
84	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
85	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=5							
86	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5 & Ctr=2 x=15
87	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
88	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5 & Ctr=2 x=15
89	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
90	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may
91	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	

92	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	always be configured to be captured. Ctr=1 x=5 Ctr=2 x=15
93	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
94	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
95	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=6							
96	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6 & Ctr=2 x=16
97	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
98	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6 & Ctr=2 x=16
99	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
100	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6 Ctr=2 x=16
101	AEa	Export Active	kWh-Absolute	Active energy export (–A)	3	1.0.2.8.x.255	2	
102	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
103	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
104	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
105	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>								

Note: The implementation of this B30 is not mandatory for the SVM. In case B30 is not supported for SVM, the DTC should reply with error to B30 order request. It is acceptable if the daily and monthly billing configuration is fixed for the SVM, with all absolute registers excluding registers per rate (only C=1 Pt=0).
Note: For the SVM, the DTC should reply with those absolute values on the S05, S04, S5B and S4B reports.

8.1.5.2. Daily Billing [S05]

The daily billing profile configuration of meters is not fixed (it's configurable).

In order to properly execute the S05 report, DTC shall always take into consideration the parameter "DataCollectMode" (S12/B07 report). Considering this parameter's value and the existance of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the daily profile configuration is needed before the collection of the daily billing data.

Please see section 9.1.5 for further details.

Daily billing data is always collected through attribute #2 (buffer) of the DLMS object "0.0.98.2.c.255", with c=1,2 (contracts 1 and 2).

Only existing tags should be returned in the report. More details in 16 16.1.4

S05	FIELD	DESCRIPTION	VALUE	Object	Class	Logical Name	At	Comments
1	IdRpt	Identifier of the request	S05					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier						
	S05	Report tag name identifier						
6	Fhi	Start Date (Y/M/D H:M:S:ms)	Timestamp	Time stamp of billing period 1 last reset	1	0.0.94.35.x.255	2	x=11,12,13 (contract 1,2 ,3). By default, this object is not being captured in monthly billing profile.
7	Fhf	Finish Date (Y/M/D H:M:S:ms)	Timestamp	Clock	8	0.0.1.0.0.255	2	
8	Ctr	Nº contract	Integer(1-3)					Only values 1,2 apply for EDP
9	Pt	Tariff period	Integer(0-6)					
<Value>	Ctr=1, Pt=0							
10	Mx	Max Ali	W Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 & Ctr=2 x=20
11	Fx	Date/Time Mx (Y/M/D H:M:S:ms)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
12	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 & Ctr=2 x=20
13	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
14	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
15	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	

16	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
17	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
18	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
19	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
20	AItot	Active Energy Import Total	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.0.255	2	Refers to absolute values (all contracts and all tariffs). May be configured in both contracts. Ctr=c, Pt=0
21	AEtot	Active Energy Export Total	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.0.255	2	
22	R1tot	Reactive Energy QI Total	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
23	R2tot	Reactive Energy QII Total	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
24	R3tot	Reactive Energy QIII Total	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
25	R4tot	Reactive Energy QIV Total	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
26	AIa1	Import Active phase L1	kWh-Absolute	Active energy import (+A) phase L1	3	1.0.21.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
27	AEa1	Export Active phase L1	kWh-Absolute	Active energy export (−A) phase L1	3	1.0.22.8.x.255	2	
28	R1a1	Reactive quadrant I phase L1	kvarh-Absolute	Reactive energy QI (+Ri) phase L1	3	1.0.25.8.x.255	2	
29	R2a1	Reactive quadrant II phase L1	kvarh-Absolute	Reactive energy QII (+Rc) phase L1	3	1.0.26.8.x.255	2	
30	R3a1	Reactive quadrant III phase L1	kvarh-Absolute	Reactive energy QIII (-Ri) phase L1	3	1.0.27.8.x.255	2	
31	R4a1	Reactive quadrant IV phase L1	kvarh-Absolute	Reactive energy QIV (-Rc) phase L1	3	1.0.28.8.x.255	2	
32	AIa2	Import Active phase L2	kWh-Absolute	Active energy import (+A) phase L2	3	1.0.41.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20
33	AEa2	Export Active phase L2	kWh-Absolute	Active energy export (−A) phase L2	3	1.0.42.8.x.255	2	
34	R1a2	Reactive quadrant I phase L2	kvarh-Absolute	Reactive energy QI (+Ri) phase L2	3	1.0.45.8.x.255	2	
35	R2a2	Reactive quadrant II phase L2	kvarh-Absolute	Reactive energy QII (+Rc) phase L2	3	1.0.46.8.x.255	2	
36	R3a2	Reactive quadrant III phase L2	kvarh-Absolute	Reactive energy QIII (-Ri) phase L2	3	1.0.47.8.x.255	2	
37	R4a2	Reactive quadrant IV phase L2	kvarh-Absolute	Reactive energy QIV (-Rc) phase L2	3	1.0.48.8.x.255	2	
38	AIa3	Import Active phase L3	kWh-Absolute	Active energy import (+A) phase L3	3	1.0.61.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=10 Ctr=2 x=20

39	AEa3	Export Active phase L3	kWh-Absolute	Active energy export (−A) phase L3	3	1.0.62.8.x.255	2	
40	R1a3	Reactive quadrant I phase L3	kvarh-Absolute	Reactive energy QI (+Ri) phase L3	3	1.0.65.8.x.255	2	
41	R2a3	Reactive quadrant II phase L3	kvarh-Absolute	Reactive energy QII (+Rc) phase L3	3	1.0.66.8.x.255	2	
42	R3a3	Reactive quadrant III phase L3	kvarh-Absolute	Reactive energy QIII (-Ri) phase L3	3	1.0.67.8.x.255	2	
43	R4a3	Reactive quadrant IV phase L3	kvarh-Absolute	Reactive energy QIV (-Rc) phase L3	3	1.0.68.8.x.255	2	
44	DMCpd	Duration of Critical Demand Management Periods	seconds	Duration of Critical Demand Management Periods	3	0.1.94.35.62.255	2	
45	DMnCpd	Duration of Non-Critical Demand Management Periods	seconds	Duration of Non-Critical Demand Management Periods	3	0.1.94.35.63.255	2	
<Value>	Ctr=1, Pt=1							
46	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1 & Ctr=2 x=11
47	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
48	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1 & Ctr=2 x=11
49	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
50	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=1 & Ctr=2 x=11
51	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=1 & Ctr=2 x=11
52	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
53	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
54	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
55	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=2							Ctr=1 x=2 Ctr=2 x=12
56	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2 & Ctr=2 x=12
57	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	

58	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2 & Ctr=2 x=12
59	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
60	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=2 Ctr=2 x=12
61	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=2 Ctr=2 x=12
62	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
63	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
64	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
65	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=3							
66	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3 & Ctr=2 x=13
67	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
68	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3 & Ctr=2 x=13
69	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
70	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	Ctr=1 x=3 Ctr=2 x=13
71	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=3 Ctr=2 x=13
72	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
73	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
74	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
75	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=4							

76	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4 & Ctr=2 x=14
77	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
78	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4 & Ctr=2 x=14
79	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
80	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=4 Ctr=2 x=14
81	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
82	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
83	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
84	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
85	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=5							
86	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5 & Ctr=2 x=15
87	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
88	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5 & Ctr=2 x=15
89	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
90	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=5 Ctr=2 x=15
91	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	

92	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
93	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
94	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
95	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>	Ctr=1, Pt=6							
96	Mx	Max AIi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6 & Ctr=2 x=16
97	Fx	Date/Time Mx (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
98	MxAE	Max AEi	W-Incremental	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6 & Ctr=2 x=16
99	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
100	AIa	Import Active	kWh-Absolute	Active energy import (+A)	3	1.0.1.8.x.255	2	By default, these objects are not being captured in monthly billing profile. Nevertheless, they may always be configured to be captured. Ctr=1 x=6 Ctr=2 x=16
101	AEa	Export Active	kWh-Absolute	Active energy export (−A)	3	1.0.2.8.x.255	2	
102	R1a	Reactive quadrant I	kvarh-Absolute	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	
103	R2a	Reactive quadrant II	kvarh-Absolute	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	
104	R3a	Reactive quadrant III	kvarh-Absolute	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	
105	R4a	Reactive quadrant IV	kvarh-Absolute	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	
<Value>								

Note: The implementation of this B30 is not mandatory for the SVM. In case B30 is not supported for SVM,the DTC should reply with error to B30 order request. It is acceptable if the daily and monthly billing configuration is fixed for the SVM, with all absolute registers excluding registers per rate (only C=1 Pt=0).
Note: For the SVM, DTC should reply with those absolute values on the S05, S04, S5B and S4B reports.

8.1.5.3. Daily Billing [S5B]

It is a simplified version of S05. It takes a daily register with absolute values per **contract 1** and tariff period.
The DTC should collect the information configured on the meter, in the same way has it is done or S05, the only difference is that the DTC must request to the meter only the information stored billing values profile for the tariff **contract 1**, reading the corresponding entries of the buffer {7, 0-0:98.2.1.255, 2}.

Report example:

```
<Report IdRpt="S5B" IdPet="711488741" Version="3.4_EDP_2.0">
    <Cnc Id="AAA0004365162">
```

```
        <Cnt Id="AAA0041894738">
                <S5B Fh="20150428000000000S" Ctr="1" Pt="0">
                        <Value AIa="730" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="1">
                        <Value AIa="324" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="2">
                        <Value AIa="405" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="3">
                        <Value AIa="0" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="4">
                        <Value AIa="0" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="5">
                        <Value AIa="0" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="6">
                        <Value AIa="0" AEa="0"/>
                </S5B>
        </Cnt>
        <Cnt Id="BBB0041895434">
                <S5B Fh="20150428000000000S" Ctr="1" Pt="0">
                        <Value AIa="451" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="1">
                        <Value AIa="269" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="2">
                        <Value AIa="182" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="3">
                        <Value AIa="0" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="4">
                        <Value AIa="0" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="5">
                        <Value AIa="0" AEa="0"/>
                </S5B>
                <S5B Fh="20150428000000000S" Ctr="1" Pt="6">
                        <Value AIa="0" AEa="0"/>
                </S5B>
        </Cnt>
    </Cnc>
</Report>
```

8.1.5.4. Monthly Billing [S4B]

It is a simplified version of S04. It takes a monthly register with absolute values per **contract 1** and tariff period. The DTC should collect the information configured on the meter, in the same way has it is done or S04, the only difference is that the DTC must request to the meter only the information stored billing values profile for the tariff **contract 1**, reading the corresponding entries of the buffer {7, 0-0:98.1.1.255, 2}.

8.2 Meter parameters and modification [S06]/[B09]

It contents static and dynamic information from the meter and from the service point.

A “Nature” column has been added to the table below, which indicates:

- "R" if the information can only be read from the meter. In this case the field will only appear in S06 report.
- "R/W" if the information can be both read from and written to the meter. In this case the field will appear in both S06 report and B09 order.
- "W" if the information can only be written to the meter (typically, security keys).

When B09 is sent to the DTC by HES, same as in the case of DTC parameters update, only the fields to be updated are required in the message. If the B09 contain any attributes that it´s not possible to change on the meter, the DTC should generate an "UpdateMetersStatus" method with MeterStatus=3 and ErrCat=3, ErrCode=4 in case the DTC is not able to write the attribute and ErrCat=3, ErrCode=5 if the written is successful but the value read after is not the expected one. On another hand, during S06 reading execution, if some get request is replied with an error on the get response, then the DTC should continue reading all other objects and the failed tags should be marked with NULL vales. In this case the S06 should terminate successfully, with MeterStatus=0 and RequestStatus=0.
For a description of the Meter Parameter Modification refer to the Annex C section 16.1.15 , which show sequence diagrams with all messages and information exchanged between HES and DTC.
The completion of the request has to be notified through the UpdateMetersStatus and UpdateRequestStatus web services, as described in Annex C.
The structure for S06 should be sent with all attributes defined in the specification. The values receive from the meters should be mapped to the corresponding attribute. If DTC does not succeed collecting all OBIS codes from the meter, the retry mechanism will apply. If eventually the OBIS code is not available in the meter, the tag should be included with a null value. This retry mechanism does not apply if the meter reply with access-denied or object unavailable. In these cases the DTC should continue with the reading of the other objects.

S06	FIELD	DESCRIPTION	VALUE	NAT	Object	Clas	Logical Name	At	Comments
1	IdRpt/IdReq	Identifier of the Report/Request	S06/B09						
2	IdPet	Unique request identifier							
3	Version	Version Identifier	3.4_EDP_2.0						
4	Cnc	Concentrator identifier							
5	Cnt	Unique meter identifier							
	S06/B09	Report/Request identifier tag name							
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	R					
7	NS	Serial number	String (ARV)	R	Device ID1	1	0.0.96.1.0.255	2	
8	Te	Type of equipment (3)	'contador' or 'supervisor'	R	Device ID3	1	0.0.96.1.2.255	2	
9	JUMPCode	Utility serial JUMP code		R	Device ID8	1	0.0.96.1.7.255	2	
10	Vf	Firmware version	String	R	Active core firmware identifier	1	1.0.0.2.0.255	2	
11	VPrime	Prime Firmware version	String	R	PRIME PLC Application identification	86	0.0.28.7.0.255	2	
12	Vfapp	Application Firmware version	String	R	Active application firmware identifier	1	1.1.0.2.0.255	2	Application firmware version = "1.1.0.2.0.255"
13	CommFW	Communication Firmware	String	R	Communication module active firmware identifier	1	1.2.0.2.0.255	2	Applies to all meters (any kind of communication technology): PLC PRIME, GPRS, RF Mesh, etc…

14	Pro	Protocol (name, version and date of issue for dlms protocol) (4)(7)	String	R	Device ID3	1	0.0.96.1.2.255	2	
15	Idm	Id. Comunic. Multicast (1)	String	R/W	Device ID6	1	0.0.96.1.5.255	2	
16	Mac	MAC address, modem PLC	MAC	R	PRIME MAC address	43	0.0.28.6.0.255	2	
17	Tp	Primary voltage (supervision or T4 meters)	Integer	R/W	Transformer ratio – voltage (numerator)	1	1.0. 0.4.3.255	2	Applies to supervision meters
18	Ts	Secondary voltage (supervision or T4 meters)	Integer	R/W	Transformer ratio – voltage (denominator)	1	1.0.0.4.6.255	2	Applies to supervision meters
19	Ip	Primary current (supervision or T4 meters)	Integer	R/W	Transformer ratio – current (numerator)	1	1.0.0.4.2.255	2	Applies to supervision meters
20	Is	Secondary current (supervision or T4 meters)	Integer	R/W	Transformer ratio – current (denominator)	1	1.0.0.4.5.255	2	Applies to supervision meters
21	Clec	Reading key (10)		W	Association LN (Reading)	15	0.0.40.0.2.255	7	
22	Cges	Parameterization key (11)		W	Association LN (Management)	15	0.0.40.0.3.255	7	
23	Cact	Updating (firmware) key (12)		W	Association LN (Firmware)	15	0.0.40.0.4.255	7	
24	Usag	Time threshold for Voltage sags	seconds	R/W	Time Threshold for undervoltage	3	1.0.12.43.0.255	2	
25	Uswell	Time threshold for Voltage swells	seconds	R/W	Time Threshold for overvoltage	3	1.0.12.44.0.255	2	
26	Ut	Time threshold for long power failure	Seconds	R/W	Time threshold for long power failure	3	0.0.96.7.20.255	2	
27	Per	Load profile Period (as DLMS capture period sect 6.3.)(6)	seconds	R/W	Load profile with period 1	7	1.0.99.1.0.255	4	
28	Vr	Reference voltage	Volts	R/W	Reference Voltage for power quality measurement	3	1.0.0.6.4.255	2	
29	UsubT	Voltage sag threshold	% V nominal, Number(2,2)	R/W	Threshold for undervoltage	3	1.0.12.31.0.255	2	
30	UsobT	Voltage swell threshold	% V nominal	R/W	Threshold for overvoltage	3	1.0.12.35.0.255	2	
31	UcorteT	Voltage long power failure threshold (5)	% V nominal	R/W	Threshold for long power failure	3	0.0.94.35.60.255	2	
32	AutMothBill	Enable/Disable automatic monthly billing	Y/N	R/W	Time for Scroll Display	3	0.0.94.35.110.255	2	
33	ScrollDispTime	Time for Scroll Display. (9) Default value: 3	seconds	R/W	Timeout for return to auto scroll mode	3	0.0.94.35.110.255	2	
34	AutoScrollTimeOut	Timeout to return to AutoScroll Mode	seconds	R/W	“Measurement Period - Demand Settings”	3	0.0.94.35.111.255	2	
35	DemandIntP	Demand Integration Period	seconds	R/W	Device ID 2	1	1.0.0.8.0.255	2	Also applies to supervision meters (default value 900 seconds)
36	DevID2	Device ID2	octet-string	R	Device ID 10	1	0.0.96.1.1.255	2	
37	DevID10	DeviceID10	octet-string	R	GPS Coordinates	1	0.0.96.1.9.255	2	
38	GPSCoordLat	GPS Coordinates Latitude	float64	R/W	GPS Coordinates	1	0.65.0.30.4.255	2	
39	GPSCoordLong	GPS Coordinates Longitude	float64	R/W	HAN interface – Modbus address	1	0.65.0.30.4.255	2	
40	HanAdd	HAN interface - Modbus address	unsigned	R/W	HAN interface – access profile	1	0.65.0.30.5.255	2	
41	HanAcs	HAN interface - Access profile	bit-string	R/W	HAN interface – communication speed	1	0.65.0.30.7.255	2	
42	HanSpd	HAN interface - Communication speed	Integer	R/W	Alarm Filter	1	0.65.0.30.6.255	2	

43	SerialSpd	IEC HDLC setup - Serial port speed	Integer	R/W	IEC HDLC setup - Serial port speed	23	0.1.22.0.0.255	2	
44	SerialAdd	IEC HDLC setup – Serial port HDLC address	Long-unsigned	R/W	IEC HDLC setup – Serial port HDLC address	23	0.1.22.0.0.255	9	
45	AlmFltr	Alarm Filter	double-long-unsigned	R/W	Alarm object	3	0.0.97.98.10.255	2	
46	AlmObj	Alarm Object	double-long-unsigned	R	Metering point ID	1	0.0.97.98.0.255	2	
47	ErrorObj	Error Object	double-long-unsigned	R	Error Object	3	0.0.97.97.0.255	2	
48	CPE	Metering Point ID	octet-string	R/W	Utility Defined register 4	1	0.0.96.1.10.255	2	
49	CNEorVIP	Client with special needs or prioritary client	octet-string	R/W	Utility Defined register 5	1	0.65.0.30.8.255	2	
50	Utilitydef5	Utility Defined register 5	octet-string	R/W	Timeout for return to auto scroll mode	3	0.65.0.30.9.255	2	
51	RemOpMode	Remote Communication operation mode	Enum (0,1,2,3)	R/W	Remote Communication operation mode	1	0.65.0.30.10.255	2	
52	Bat	Battery voltage	Volts resolution: 00.00 V	R	RTC Battery Voltage	4	0.0.96.6.3.255	2	
53	BatTime	Battery Voltage last measure timestamp	Timestamp	R	Battery Voltage last measure timestamp	4	0.0.96.6.3.255	5	

(1): It is not clear how many multicasts ID a meter can have. This is a dynamic information for a meter. DLMS considers 3 multicast addresses for a meter, they are composed of 8bytes alphanumeric data. This parameter will retrieve the 24 bytes full multicast information.
(2) Ip and Is are used to set the current transformer ratio (eg 1200/5). Ip, Is, Tp, Ts apply only to supervision meters. These paramenters can also be changed through B07.
(3) The meter knows if it is a normal meter or a supervision meter. This value is in the deviceID 3, equipment type.
(4) This value is included in deviceID 3, protocol identifier. As an example, 'meterDLMS0200' is the value in our meters currently. The DTC should we this information to know what new services are available on the meter.
(5) UcorteT refers to OBIS 0.0.94.35.60.255 (Threshold for long power failure).
(6) The Per parameter refers to LoadProfile integration period.
(7) Pro refers to the OBIS 0.0.96.1.2.255
(9) ScrollDispTime refers to the OBIS 0-0:94.35.110.255
(10) Clec is the Reading Client LLS_secret. This parameter only applies to non-secure meters. For secured meters the DTC has other specific orders to manage the LLS_secret from all clients.
(11) Cges is the Management Client LLS_secret. This parameter only applies to non-secure meters. For secured meters the DTC has other specific orders to manage the LLS_secret from all clients.

Note: If the meter reply with error or doesn't answer to the "HanSpd" tag, the DTC should consider it as a meter with flexibility functionality implemented and report NULL in this tag. This should not be consider an error (i.e. should not trigger any UMS or URS different than zero and DTC should not retry).

Note: The "RemOpMode" tag defines the operating mode of the remote communication:

(0): DLMS communication active on the 2 remote communication interfaces (PLC PRIME and RS-485);

(1): DLMS communication only active on PLC PRIME interface;

(2): DLMS communication only active on the RS-485 interface, maintaining the PLC PRIME interface active in the lower layers (MAC and PHY). In this mode the device continues to function as a service node on the PLC PRIME network.

(3): (Preferential) DLMS communication only active on the RS-485 interface, and communication on the PLC PRIME interface is totally disabled.

Note: This object was already defined on the previous data model (companion) as "Utility Defined register 6". If the meter answer with a not expected format for "RemOpMode", the DTC should consider the meter a non-flexible meter (i.e. flexibility functionality not implemented), so the tag should have NULL value, RemOpMode="".

8.3 Meter event handling and modification paramenters [S9B]/[B9B]

These reports are used to manage (read and change) event handling configuration in the meters.
Definition includes meter event static and dynamic information for each subgroup event log defined in the current EDP specification (DEF-C44-507N). Currently meters have defined one abstract object (obis) per each subgroup event log.
A "Nature" column has been added to the table below, which indicates:

- "R" if the information can only be read from the meter. In this case the field will only appear in S9B report.
- "R/W" if the information can be both read from and written to the meter. In this case the field will appear in both S9B report and B9B order.
- "W" if the information can only be written to the meter (typically, security keys).

When B9B is sent to the DTC by HES, same as in the case of DTC parameters update, only the fields to be updated are required in the message. If the B9B contain any attributes that it´s not possible to update in the meter, the DTC should generate an "UpdateMetersStatus" method with MeterStatus=3 and ErrCat=3, ErrCode=4 o 5.
For a description of the Meter Parameter Modification refer to the Annex C section 16.1.15 , which shows sequence diagrams with all messages and information exchanged between HES and DTC.
The completion of the request has to be notified through the UpdateMetersStatus and UpdateRequestStatus web services, as described in Annex C.
The structure for S9B should be sent with all attributes defined in the specification. The values receive from the meters should be mapped to the corresponding attribute. If DTC does not succeed collecting the OBIS code from the meter, the tag should be included with a null value.

S9B	FIELD	DESCRIPTION	VALUE	NAT	Object	Clas	Logical Name	At
1	IdRpt/IdReq	Identifier of the Report/Request	S9B/B9B					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier						
	S9B/B9B	Report/Request identifier tag name						
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	R				
7	SponEventMask10	Hex Mask Standard Event Log Filter	Octet-String	R/W	Standard Event Log Filter Array[1]	1	0.1.94.35.105.255	2
8	SponEventMask11	Hex Mask Import Power Contract Event Log Filter	Octet-String	R/W	"Potência contratada"Event Log Filter Array[1]	1	0.1.94.35.111.255	2
9	SponEventMask12	Hex Mask Firmware Event Log Filter	Octet-String	R/W	Firmware Event Log Filter Array[1]	1	0.1.94.35.112.255	2

10	SponEventMask13	Hex Mask Synchronization Event Log Filter	Octet-String	R/W	"Sincronização" Event Log Filter Array[1]	1	0.1.94.35.113.255	2
11	SponEventMask14	Hex Mask Configuration Event Log Filter	Octet-String	R/W	"Configuração" Event Log Filter Array[1]	1	0.1.94.35.115.255	2
12	SponEventMask20	Hex Mask Disconnect Control log Filter	Octet-String	R/W	"ICP" log Filter Array[1]	1	0.1.94.35.114.255	2
13	SponEventMask31	Hex Mask Power Quality Non-finished Event Log Filter	Octet-String	R/W	"Qualidade de serviço" Event Log Filter Array[1]	1	0.1.94.35.107.255	2
14	SponEventMask32	Hex Mask Power Quality finished Event Log Filter	Octet-String	R/W	"Falha de Energia" Event Log Filter Array[1]	1	0.1.94.35.108.255	2
15	SponEventMask40	Hex Mask Fraud Detection Log Filter	Octet-String	R/W	"Antifraude" Event Log Filter Array[1]	1	0.1.94.35.106.255	2
16	SponEventMask50	Hex Mask Demand Management Event Log Filter	Octet-String	R/W	"Gestão da Procura" Event Log Filter Array[1]	1	0.1.94.35.109.255	2
17	SponEventMask60	Hex Mask Common Event Log Filter	Octet-String	R/W	"Alta Ocorrência" Event Log Filter Array [1]	1	0.1.94.35.110.255	2
29	SponEventMask70	Hex Mask public lightning Log Filter	Octet-String	R/W	"Iluminação Pública" Event log filter Array[1]	1	0.1.94.35.116.255	2
30	SponEventMask81	Hex Mask Failed Security Operations Event Log Filter	Octet-String	R/W	Failed security Log Filter Array[1]	1	0.1.94.35.118.255	2
31	SponEventMask82	Hex Mask Incorrect Security Operations Event Log Filter	Octet-String	R/W	Correct security Log Filter Array[1]	1	0.1.94.35.117.255	2
18	EventLogMask10	Hex Mask Standard Event Log Filter	Octet-String	R/W	Standard Event Log Filter Array[0]	1	0.1.94.35.105.255	2
19	EventLogMask11	Hex Mask Import Power Contract Event Log Filter	Octet-String	R/W	"Potência contratada"Event Log Filter Array[0]	1	0.1.94.35.111.255	2
20	EventLogMask12	Hex Mask Firmware Event Log Filter	Octet-String	R/W	Firmware Event Log Filter Array[0]	1	0.1.94.35.112.255	2
21	EventLogMask13	Hex Mask Synchronization Event Log Filter	Octet-String	R/W	"Sincronização" Event Log Filter Array[0]	1	0.1.94.35.113.255	2
22	EventLogMask14	Hex Mask Configuration Event Log Filter	Octet-String	R/W	"Configuração" Event Log Filter Array[0]	1	0.1.94.35.115.255	2
23	EventLogMask20	Hex Mask Disconnect Control log Filter	Octet-String	R/W	"ICP" log Filter Array[0]	1	0.1.94.35.114.255	2
24	EventLogMask31	Hex Mask Power Quality Non-finished Event Log Filter	Octet-String	R/W	"Qualidade de serviço" Event Log Filter Array[0]	1	0.1.94.35.107.255	2
25	EventLogMask32	Hex Mask Power Quality finished Event Log Filter	Octet-String	R/W	"Falha de Energia" Event Log Filter Array[0]	1	0.1.94.35.108.255	2
26	EventLogMask40	Hex Mask Fraud Detection Log Filter	Octet-String	R/W	"Antifraude" Event Log Filter Array[0]	1	0.1.94.35.106.255	2
27	EventLogMask50	Hex Mask Demand Management Event Log Filter	Octet-String	R/W	"Gestão da Procura" Event Log Filter Array[0]	1	0.1.94.35.109.255	2
28	EventLogMask60	Hex Mask Common Event Log Filter	Octet-String	R/W	"Alta Ocorrência" Event Log Filter Array [0]	1	0.1.94.35.110.255	2
32	EventLogMask70	Hex Mask public lightning Log Filter	Octet-String	R/W	"Iluminação Pública" Event log filter Array[0]	1	0.1.94.35.116.255	2
33	SponEventMask81	Hex Mask Failed Security Operations Event Log Filter	Octet-String	R/W	Failed security Log Filter Array[0]	1	0.1.94.35.118.255	2
34	SponEventMask82	Hex Mask Incorrect Security Operations Event Log Filter	Octet-String	R/W	Correct security Log Filter Array[0]	1	0.1.94.35.117.255	2

The SponEventMaskXX are parameters defined for each subgroup that indicate the event codes that should be considered spontaneous by the meter. In this case they should be sent to DTC building an EVENT-NOTIFICATION-Request APDU. When the DTC receives the spontaneous event from the meter, it should send it to the HES with a S13 report. (Bit = 0 (not sent), bit = 1 (sent)).

In the next example:
SponEventMask13="0x1880000000000000000000000000000000000000000000000000000000000000" indicates the events 3, 4 and 8 for the synchronization subgroup must be spontaneous.

The EventLogMaskXX are parameters defined for each subgroup that indicate the events codes that the meter must log into the subgroup buffer.
(Bit = 0 (not sent), bit = 1 (sent)).

In the next example:
EventLogMask20="0x6f7fffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff" indicates the meter must send to Disconnect Control log buffer all events except the codes 3 and 8.

The bit 0 of the array has no meaning, because there is no Event with value 0. In the octet strings event filters, the left-most byte contains the low order indexes and the right-most byte the high order indexes. The size of these octet strings filters is fixed and equal to 32 bytes (256 positions).

8.4 Contact definition [S23]

Report about the contracted power in the meter.

S23	FIELD	DESCRIPTION		VALUE	Object	Clas	Logical Name	At	Comments
1	IdRpt	Identifier of the request		S23					
2	IdPet	Unique request identifier							
3	Version	Version Identifier		3.4_EDP_2.0					
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	S23	Report identifier tag name							
6	Fh	Meter date at which the information is collected it is given in format date (Y/M/D H:M:S:ms)		Timestamp	Clock	8	0.0.1.0.0.255	2	
	PCact	Present contracted power							
7		ActDat - Activation date (		Timestamp Ej: "20110207171407000W"	Time stamp for new calendar activation	1	1.0.94.35.130.255	2	
		Contrato1							
8		TR1	Tariff rate 1	VA (integer)	Active Demand Control Threshold T1	3	0.1.94.35.1.255	2	unit = VA
9		TR2	Tariff rate 2	VA (integer)	Active Demand Control Threshold T2	3	0.1.94.35.2.255	2	
10		TR3	Tariff rate 3	VA (integer)	Active Demand Control Threshold T3	3	0.1.94.35.3.255	2	
11		TR4	Tariff rate 4	VA (integer)	Active Demand Control Threshold T4	3	0.1.94.35.4.255	2	
12		TR5	Tariff rate 5	VA (integer)	Active Demand Control Threshold T5	3	0.1.94.35.5.255	2	
13		TR6	Tariff rate 6	VA (integer)	Active Demand Control Threshold T6	3	0.1.94.35.6.255	2	
	PCLatent								

14		ActDate - Activation date		Octet-string hexadecimal Ej: "FFFFFFFFFFFFFFFFFF800009"	Activity Calendar	20	0.0.13.0.**c**.255	10	Only values 1,2 apply for EDP. c=1,2 for contracts 1 and 2 respectively
		Contrato1							
15		TR1	Tariff rate 1	VA (integer)	Passive Demand Control Threshold T1	3	0.1.94.35.11.255	2	unit = VA
16		TR2	Tariff rate 2	VA (integer)	Passive Demand Control Threshold T2	3	0.1.94.35.12.255	2	
17		TR3	Tariff rate 3	VA (integer)	Passive Demand Control Threshold T3	3	0.1.94.35.13.255	2	
18		TR4	Tariff rate 4	VA (integer)	Passive Demand Control Threshold T4	3	0.1.94.35.14.255	2	
19		TR5	Tariff rate 5	VA (integer)	Passive Demand Control Threshold T5	3	0.1.94.35.15.255	2	
20		TR6	Tariff rate 6	VA (integer)	Passive Demand Control Threshold T6	3	0.1.94.35.16.255	2	
	ActiveCalendars								
	Contract								
21		C - contract number		Integer(1,2,3) ej. “1”	Activity Calendar		0.0.13.0.**c**.255		Only values 1,2 apply for EDP. c=1,2 for contracts 1 and 2 respectively
22		CalendarType season or summer/winter		Octet-string hexadecimal Ej:"01", "0A"					
23		CalendarName		Octet-string hexadecimal Ej: "202020202020", ""444F424C455F"	Activity Calendar	20	0.0.13.0.**c**.255	2	
24		ActDate (2) Activation date		Timestamp Ej:"20110325122346000W"	Time stamp for new calendar activation	1	1.0.94.35.130.255	2	
63		BDate		Octet-string hexadecimal(4) (YYYYMMDD) Eg:"FFFFFF08"-> 8th day of every month	Active end of billing period 1	22	0.0.15.1.**c**.255	4	Attribute #4 "execution_time", only "date". c=1,2 for contracts 1 and 2 respectively
		<Season>							
25			Name	Octet-string hexadecimal. Name of defined season Ej:"01"	Activity Calendar	20	0.0.13.0.**c**.255	3	
26			Start	Octet-string hexadecimal (only considered year, month, day, hour) Ej: "FFFF0101FF00000000800000"	Activity Calendar	20	0.0.13.0.**c**.255	3	
27			week	This is the associated week. Octet-string hexadecimal. Link with week info.	Activity Calendar	20	0.0.13.0.**c**.255	3	

				Ej:"01"						
		</Season>								
		<Week>								
28			Name	Octet-string hexadecimal. Name week for later definition. Up to 12 can be defined. Ej:"01", "0A"		Activity Calendar	20	0.0.13.0.**c**.255	4	
29			Week	Octet-string hexadecimal Ej:"01010101010101"		Activity Calendar	20	0.0.13.0.**c**.255	4	
		</Week>								
		<Day>								
30			id	Octet-string (1) hexadecimal. Day definition, a number identifies each day. Up to 24 can be defined. Ej:"01", "0A"		Activity Calendar	20	0.0.13.0.**c**.255	5	
			<Change>							
31				Hour	Octet-string hexadecimal (4): 12000000. Currently only the hour is used. Ej: "0C000000"	Activity Calendar	20	0.0.13.0.**c**.255	5	start_time (Hour), script_logical_name (dummy script) e script_selector (Tariff rate).
32				TariffRate	long-unsigned hexadecimal (2 bytes). Ej: "0001"	Activity Calendar	20	0.0.13.0.**c**.255	5	start_time (Hour), script_logical_name (dummy script) e script_selector (Tariff rate).
			</Change>							
		</Day>								
		<SpecialDays>		This tag might exist only when special Days apply for that contract						
33			DT	Date of the special day. Timestamp Ej: "20111225000000000W"		Special Days Table	11	0.0.11.0.c.255	2	Only values c=1,2 apply for EDP
34			DTCard	Y= If year is ignored (applies to all year, the DTC will consider year as wildcard when updating meter). N= Year is not ignored		-		-		
35			DayID	This is the ID defined previously. DH to be applied for this day. Octet-string (1) hexadecimal Ej:"01", "0A"		Special Days Table	11	0.0.11.0.c.255	2	Only values c=1,2 apply for EDP
		<SpecialDays>								
	Contract									
	ActiveCalendars									
	Latent calendars									
	Contract									
36		c (contract number)		Integer(1,2,3) Ej. "1"		Activity Calendar	20	0.0.13.0.**c**.255		
37		Calendar Type (season or summer/winter)		Octet-string hexadecimal Ej:"01", "0A"						
38		CalendarName		Octet-string hexadecimal		Activity Calendar	20	0.0.13.0.**c**.255	6	

				Ej: "202020202020", ""444F424C455F"						
39		ActDate (Activation date)		Octet-string hexadecimal Ej:"FFFFFFFFFFFFFFFFFF800009"		Activity Calendar	20	0.0.13.0.c.255	10	
		<Season>								
40			Name	Octet-string hexadecimal. Name of defined season Ej:"01"		Activity Calendar	20	0.0.13.0.c.255	7	
41			Start	Octet-string hexadecimal (only considered year, month, day, hour) Ej: "FFFF0101FF00000000800000"		Activity Calendar	20	0.0.13.0.c.255	7	
42			week	This is the associated week. Octet-string hexadecimal. Link with week info. Ej:"01"		Activity Calendar	20	0.0.13.0.c.255	7	
		</Season>								
		<Week>								
43			Name	Octet-string hexadecimal. Name week for later definition. Up to 12 can be defined. Ej:"01", "0A"		Activity Calendar	20	0.0.13.0.c.255	8	
44			Week	Octet-string hexadecimal Ej:"01010101010101"		Activity Calendar	20	0.0.13.0.c.255	8	
		</Week>								
		<Day>								
45			Id	Octet-string (1) hexadecimal. Day definition, a number identifies each day. Up to 24 can be defined. Ej:"01", "0A"		Activity Calendar	20	0.0.13.0.c.255	9	
			<Change>							
46				Hour	Octet-string hexadecimal (4): 12000000. Currently only the hour is used. Ej: "0C000000"	Activity Calendar	20	0.0.13.0.c.255	9	start_time (Hour), script_logical_name (dummy script) e script_selector (Tariff rate).
47				Tariff rate	long-unsigned hexadecimal (2 bytes). Ej: "0001"	Activity Calendar	20	0.0.13.0.c.255	9	start_time (Hour), script_logical_name (dummy script) e script_selector (Tariff rate).
			</Change>							
		</Day>								
		<SpecialDays>		This tag might exist only when special Days apply for that contract						
48			DT	Date of the special day. Timestamp Ej: "20111225000000000W"		Passive Special Days Table	11	0.0.11.0.c.255	2	Only values c=1,2 apply for EDP
49			DTCard	Y= If year is ignored (applies to all year, the DTC will consider year as wildcard when updating meter). N= Year is not ignored		-		-		

50		DayID	This is the ID defined previously. DH to be applied for this day. Octet-string (1) hexadecimal. Ej:"01", "0A"	Passive Special Days Table	11	0.0.11.0.c.255	2	Only values c=1,2 apply for EDP
	<SpecialDays >							
	Contract							
	Latent calendars							

(2) Refers to OBIS 1-0:94.35.130.255 (Time stamp for new calendar activation).

The structure for S23 report should be sent including only the information (tags) required for the definition of the contract's configuration (Eg: if no special days are defined, this tag can be skipped).

8.5 Voltage failure reports [S07]

Historical register with the information about the long power failures registered by the meter.

S07	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At	Comments
1	IdRpt	Identifier of the request	S07					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDp_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	S07	Report tag name identifier						
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	Clock	8	0.0.1.0.0.255	2	
7	Dc	Time threshold for long power failures	Seconds	Time threshold for long power failure	3	0.0.96.7.20.255	2	
8	Nc	Number of long power failures in all phases		Number of long power failures in any phase	1	0.0.96.7.9.255 0.0.96.7.5.255	2	For single phase meters the 0.0.96.7.9.255 object should be used. For poly phase meters the OBIS is the 0.0.96.7.5.255
9	Df	Duration of long power failures in all phase	Seconds	Duration of long power failures in any phases	3	0.0.96.7.19.255 0.0.96.7.15.255	2	For single phase meters the 0.0.96.7.19.255 object should be used. For poly phase meters the OBIS is the 0.0.96.7.15.255
10	Hc	Time of the last long power failures open.	Timestamp	QoS event start - Timestamp (undervoltage, overvoltage and long power failure)	1	0.0.94.35.80.255	2	

A long power failure starts when there is an interruption in all of the phases and ends when the interruption is finished in all phases.

Therefore, the meaningful registers to monitor are the "Number of long power failures in all phase" and "Duration of long power failures in all phases" along with the specifc registers for each phase (scope of S08 report).

8.6 Quality power reports [S08]

Takes the historical register with the information about undervoltages, overvoltages and long power failure registered by the meter.

S08	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At	Comments
1	IdRpt	Identifier of the request	S08					
2	IdPet	Unique request identifier						

3	Version		Version Identifier	3.4_EDP_2.0					
4	Cnc		Concentrator identifier						
5	Cnt		Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	S08		Report tag name identifier						
6	Fh		Date (Y/M/D H:M:S:ms)	Timestamp	Clock	8	0.0.1.0.0.255	2	
	Sub		Undervoltages information						
7		NsubTt	Number of undervoltages in any phase	Integer	Number of undervoltages in any phase	1	1.0.12.32.0.255	2	
8		TsubTt	Duration of undervoltages in any phase	minutes	Duration of undervoltages in any phase	3	1.0.12.33.0.255	2	
9		NsubTf1	Number of undervoltages in phase L1	Integer	Number of undervoltages in phase L1	1	1.0.32.32.0.255	2	
10		TsubTf1	Duration of undervoltages in phase L1	minutes	Duration of undervoltages in phase L1	3	1.0.32.33.0.255	2	
12		NsubTf2	Number of undervoltages in phase L2	Integer	Number of undervoltages in phase L2	1	1.0.52.32.0.255	2	
13		TsubTf2	Duration of undervoltages in phase L2	minutes	Duration of undervoltages in phase L2	3	1.0.52.33.0.255	2	
14		NsubTf3	Number of undervoltages in phase L3	Integer	Number of undervoltages in phase L3	1	1.0.72.32.0.255	2	
15		TsubTf3	Duration of undervoltages in phase L3	minutes	Duration of undervoltages in phase L3	3	1.0.72.33.0.255	2	
16		NsubTtall	Number of undervoltages for average voltage in all 3 phases	Integer	Number of undervoltages for average voltage in all 3 phases	1	1.0.94.35.90.255	2	
17		TsubTtall	Duration of undervoltages for average voltage in all 3 phases	minutes	Duration of undervoltages for average voltage in all 3 phases	3	1.0.94.35.91.255	2	
	Sob		Overvoltages information						
18		NsobTt	Number of overvoltages in any phase	Integer	Number of overvoltages in any phase	1	1.0.12.36.0.255	2	
19		TsobTt	Duration of overvoltages in any phase	minutes	Duration of overvoltagess in any phase	3	1.0.12.37.0.255	2	
20		NsobTf1	Number of overvoltages in phase L1	Integer	Number of overvoltages in phase L1	1	1.0.32.36.0.255	2	
21		TsobTf1	Duration of overvoltages in phase L1	minutes	Duration of overvoltages in phase L1	3	1.0.32.37.0.255	2	
22		NsobTf2	Number of overvoltages in phase L2	Integer	Number of overvoltages in phase L2	1	1.0.52.36.0.255	2	
23		TsobTf2	Duration of overvoltages in phase L2	minutes	Duration of overvoltages in phase L2	3	1.0.52.37.0.255	2	
24		NsobTf3	Number of overvoltages in phase L3	Integer	Number of overvoltages in phase L3	1	1.0.72.36.0.255	2	
25		TsobTf3	Duration of overvoltages in phase L3	minutes	Duration of overvoltages in phase L3	3	1.0.72.37.0.255	2	
26		NsobTtall	Number of overvoltages for average voltage in all 3 phases	Integer	Number of overvoltages for average voltage in all 3 phases	1	1.0.94.35.92.255	2	

27		TsobTtall	Duration of overvoltages for average voltage in all 3 phases	minutes	Duration of overvoltages for average voltage in all 3 phases	3	1.0.94.35.93.255	2	
	Corte		Long power failures information						
28		NcorteTt	Number of long power failures in all phases	Integer	Number of long power failures in any phase	1	0.0.96.7.9.255 0.0.96.7.5.255	2	For single phase the OBIS is 0.0.96.7.9.255. For poly phase meters OBIS is 0.0.96.7.5.255
29		TcorteTt	Duration of long power failures in all phases.	Seconds	Duration of long power failures in any phases	3	0.0.96.7.19.255 0.0.96.7.15.255	2	For single phase the OBIS is 0.0.96.7.19.255. For poly phase meters OBIS is 0.0.96.7.15.255 unit = seconds, maintaining coherence with report S07
30		NcorteTf1	Number of long power failures in phase L1	Integer	Number of long power failures in phase L1	1	0.0.96.7.6.255	2	
31		TcorteTf1	Duration of long power failures in phase L1	Seconds	Duration of long power failures in phase L1	3	0.0.96.7.16.255	2	unit = seconds, maintaining coherence with report S07
32		NcorteTf2	Number of long power failures in phase L2	Integer	Number of long power failures in phase L2	1	0.0.96.7.7.255	2	
33		TcorteTf2	Duration of long power failures in phase L2	Seconds	Duration of long power failures in phase L2	3	0.0.96.7.17.255	2	unit = seconds, maintaining coherence with report S07
34		NcorteTf3	Number of long power failures in phase L3	Integer	Number of long power failures in phase L3	1	0.0.96.7.8.255	2	
35		TcorteTf3	Duration of long power failures in phase L3	Seconds	Duration of long power failures in phase L3	3	0.0.96.7.18.255	2	unit = seconds, maintaining coherence with report S07

A long power failure starts when there is an interruption in all the phases and ends when the interruption is finished in all phases.

Therefore, the meaningful registers to monitor are the "Number of long power failures in all phase" and "Duration of long power failures in all phases" along with the specifc registers for each phase.

Duration of long power failures in any phases": unit = seconds, maintaining coherence with report S07

8.7 Meter Events [S09]

Takes the event register of the meter depending on the time interval requested by the HES.

Meter events are defined in the document “DEF-C44-507” from EDP specification.
There are 8 types of events. Inside each type the event is defined by a code and a timestamp:

- Standard events (Group 1)

Events not included in a specific section, such as Firmware updates, end of billings periods, clock changes, configuration changes and a few others.

- Switch Control (Group 2)

All the events related to the Switch operations.

- Quality and Power Failures (Group 3)

All the events related to the voltage variations, Undervoltages, Overvoltages or Power Failures.

- Fraud detection (anti tampering) (Group 4)

All the events related to tampering detection, attempts to access with a wrong passwords, cover opening, etc.

- Demand management (Group 5)

Events related to the demand management such as modifications in the power limit parameterization.

- Communication (Group 6)

All the events related to the meter communications.

- Public Lightning events (Group 7)

Events related to public lightning monitor and control.

- Security events (Group 8)

All events related to security activation and key management, failed and successful operations.

S09	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At	Comments
1	IdRpt	Identifier of the request	S09					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	Device ID5
	S09	Report tag name identifier						
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	Clock	8	0.0.1.0.0.255	2	Clock
7	Et	Event Group	Integer	"Standard" Event Log	7	0.0.99.98.0.255	2	Group 1: 5 subgroups, each one has its own obiscode
				"Potência contratada" Event Log	7	0.0.99.98.3.255	2	
				Firmware Event Log	7	0.0.99.98.4.255	2	
				"Sincronização" Event Log	7	0.0.99.98.8.255	2	
				"Configuração" Event Log	7	0.0.99.98.10.255	2	
				"ICP" log	7	0.0.99.98.2.255	2	
				"Falha de Energia" Event Log	7	0.0.99.98.5.255	2	Group 3: 2 subgroups, each one has its own obiscode
				"Qualidade de Serviço" Event Log	7	0.0.99.98.9.255	2	
				"Antifraude" Event Log	7	0.0.99.98.1.255	2	
				"Gestão da Procura " Event Log	7	0.0.99.98.6.255	2	
				"Alta Ocorrência" Event Log	7	0.0.99.98.7.255	2	
				"Iluminação Pública " Event Log	7	0.0.99.98.11.255	2	Only applies to Public lightning meters

				Correct Security Operations Event Log	7	0.0.99.98.12.255	2	Group 8: 2 subgroups each one has its own obiscode
				Failed Security Operations Event Log	7	0.0.99.98.13.255	2	
8	C	Event code Number	Integer					Event codes stored in the logs mentioned above.
9	D1	If needed, Event data (e.g. Switch states)	String					
10	D2	If needed, Event data (e.g. Switch states)	String					

D1 and D2 values are to be read from the corresponding event logbook. The requirements for these values are specified in ANNEX G.
The meter event list received on request should be ordered by Event Group (ascending), Event code number (ascending) and date (ascending latest first)

D1 - former values

- "FW Event log": D1 - Data related with former FW versions, considering the following order: former application fw version
- "Potência contratada Event Log": D1 - Data related with former power contract

D2 - current values

- "FW Event log": D2 - Data related with former FW versions, considering the following order: active core fw version, active application fw version, communication module fw version.
- "Potência contratada Event Log": D2 - Data related with new power contract (passive)

8.8 Spontaneous Meter Events [S13]

This message is sent by the DTC when it receives a spontaneous event message from a meter.
Once these messages arrive the DTC, they are always reported to the HES number 1. These events are processed with high priority (code 2).
Any event can be configured to be sent spontaneously, using the B9B order.

S13	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S13
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
5	Cnt	Unique meter identifier	
	S13	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S:ms)	Timestamp
7	Et	Event Group	Integer
8	C	Event code	Integer
9	D1	If needed, Event data (e.g. Switch states)	String
10	D2	If needed, Event data (e.g. Switch states)	String

D1 and D2 values are to be read from the corresponding event logbook.

8.9 DTC Events [S17]

Takes the event register of the DTC depending on the time interval requested by the HES.
DTC events are specified in the latest version of the DTC Specification document, specifically in Annex A:" DEF-C98-405". This list has been included in Annex E – List of DTC EVENT CODES**Error! Reference source not found.**
The following Event groups will exist:

- Standard Events (group 1)

This group includes events related to internal processes within the DTC (memory problems, hardware problems, firmware update…).

- Access events (group 2)

This group includes events related to access to the DTC.

- Demand Side Management events (group 3)

This group includes events related to power changes and definition.

- High Ocurrence – Common events (group 4)

This group includes events related to communications, PLC base node problems, etc.

- Meter Registering events (group 5)

This group includes events related to variations of the registered meters in the PRIME network.

- Grid monitoring events (group 6)

This group includes events related to the internal supervision meter of the DTC, QoS functionalities, phase fault detection, digital input and output, etc.

- Load profile events (group 7)

This group includes events related to the load profile of the supervision meter do the DTC. Events like the load profile configuration and reset are stored on this log.

Event reports will have the following format:

S17	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S17
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	S17	Report tag name identifier	
5	Fh	Date (Y/M/D H:M:S:ms)	timestamp
6	Et	Event Group	Integer
7	C	Event Code	Integer
8	D1	If needed, Event data (e.g. MeterID,..)	String
9	D2	If needed, Event data (e.g. Switch states)	String

D1 and D2 values specified in Annex G together with corresponding values for the case of meter events.

8.10 Spontaneous DTC Events [S15]

In some circumstances the DTC itself will send information to the HES with no previous request.
Typically, this is the case for reports calculated by scheduled tasks (as described in DTC configuration parameters).

In the case of spontaneous events, it is possible through the B36 order, to configure any DTC event to be sent spontaneously. By default, several events should be sent spontaneously, for example:

- Acknowledge message after restart (This message will inform to the STG when a DTC starts up, this option can be enabled/disabled in the DTC with the parameter ResetMsg) (Group 1, code 1);
- Power down event (Group 1, code 5). This event is sent as a last-dying gasp event to the HES.
- Meter failed clock synchronization event (Group 5, code 9). This event is sent when the DTC can not synchronize the clock of the meter because the deviation is higher than TimeDevOver. The D1 should come with the meter ID and D2 with the deviation in seconds.
- Meter registering (Group 5, code 1). For clarifications about meter registering refer the section **Error! R eference source not found.**. Report S15 Meter registering.

The list with the B36 default configuration with the DTC events that should be sent through S15, will be shared by EDP Distribuição on the "Eventos-Alarmes-DTC_Omissão.xls" document.

The message format will be as follows:

S15	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S15
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	S15	Report tag name identifier	
5	Fh	Event Date, date at which the meter was registered (1)	timestamp
6	Et	Event Group	Integer
7	C	Event Code	Integer
8	D1	If needed, Event data (e.g. MeterID,..)	String
9	D2	If needed, Event data (e.g. Switch states)	String

(1) **Fh** must indicate the date on which the event actually occurred. In the case of the events meter discovery (5, 1), S15 must reflect the date that the meter was registered the first time.

For each event group and event code the event data should be the same.
In case of an event related to a restart there is no event data. Otherwise D1 and D2 values are to be read from the corresponding event logbook.

In case of an event related to a meter registering the event data will be:

- D1: Meter ID;
- D2: may exist in multiple occurrences, depending on the DTC parameters.

The "D2" tag will have a supplementary attribute "cosemId" filled with the COSEM identification used to retrieve data in the meter, as defined in DTC parameters. E.g.:

<D1>MMM0037592013</D1> <!—Always the meter ID -->
<D2 cosemID="0100006001 00FF02">3030333735393230 3132</D2> <!— Device ID 1 as defined in parameters -->
<D2 cosemID="0100006001 01FF02">2043594B3331</D2> <!— **Device ID 2** as defined in parameters -->

Note that one of the parameters that will also be requested is the Device ID 3. This parameter is used in the HES to identify meter type.
For a generic domestic meter compliant with the previous version we would have:

<D2 cosemID="010000600102FF02">"meterDLMS0200"</D2> <!— **Device ID 3** as defined in parameters -->

For a generic domestic meter compliant with this new version we would have:

<D2 cosemID="010000600102FF02">" meterDLMS0200"</D2> <!-**Device ID 3** as defined in parameters -->

If any of the data to be included through this mechanism cannot be retrieved from the meter, the tag should be included with value “ERROR”.eg:

<D2 cosemID=”010000600102FF02”>”ERROR”</D2> <!— **Device ID 3** as defined in parameters -->

D1 and/or D2 parameters inside S15 and S20 reports are recovered in case of an ERROR during the reading.

- The first time a node is detected by the DTC (was not included in the Data Base). D1 and/or D2 parameters are read.
- In case this information is not correctly recovered because of a disconnection of the node during the DLMS data requests, D1 and/or D2 will be stored as ERROR. If this occurs, when the node recovers the connection with the DTC, it will retry the request. The request is done just if D1 and/or D2 were stored as ERROR.

D2 data should be sent in hexadecimal format, instead of ASCII. It was decided because since it can include any obis code which might not be converted to ASCII, in this way we keep it standard.
As an example if the DTC wants to send:

```
<D2 cosemID="010000600100FF02">0034664990</D2>
<D2 cosemID="010000600101FF02"> ABC10</D2>
<D2 cosemID="010000600102FF02">contador DLMS01.30</D2>
```

It must send :

```
<D2 cosemID="010000600100ff02">30303334363634393930</D2>
<D2 cosemID="010000600101ff02">4142433130</D2>
<D2 cosemID="010000600102ff02">636f6e7461646f7220444c4d5330312e3330</D2>
```

Note that the DTC must be at least configured as above so that the information read from the meter and given to the HES through the S15 report contains the meter manufacturer and type.
This is a complete example format for S15 with an event related to a meter registering.

```
<Report IdRpt="S15" IdPet="0" Version="3.4_EDP_2.0">
    <Cnc Id="MMM7940190606">
            <S15 Fh="20130710083343000S" Et="5" C="1">
                    <D1>MMM0037592013</D1>
                    <D2 cosemID="010000600100FF02">30303337353932303132</D2>
                    <D2 cosemID="010000600101FF02">205A4D593133</D2>
                    <D2 cosemID="010000600102FF02">636F6E7461646F722020444C4D5330313035</D2>
            </S15>
    </Cnc>
</Report>
```

8.11 Intruder equipment in PLC [S10]

To prevent that intruder equipment connected to the PLC could interfere in the system operation, there will be a list with the MAC address of that equipment which the Base Node of the DTC would not permit the registering or which have a high keep alive time for them not to saturate the communications.
This list will have the possibility to be managed from the DTC and it will have also the possibility to be consulted from the HES through the following request:

S10	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S10
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	S10	Report tag name identifier	
5	Fh	Date (Y/M/D H:M:S:ms)	Timestamp
6	Mac	Intrude MAC address	MAC

8.12 Base Node PLC Information [S11]

This report gets instant information from the PLC base node in the DTC and registers PLC event from a determined date
The objective of this report is to store periodically in the HES, information about the DTC PLC to be used in case of failure.
The standard operation will be to consult this information in real time and directly in the DTC's web page (DTC Web UI).
Parameters in **bold** have been extracted from DEF-C44-507 companion specifciation for communication interfaces, Anexo B.

S11	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S11
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	S11	Report tag name identifier	
5	Fh	Date and time of data acquisition "YYYYMMDDHHmmssfffX"	
6	MacSNA		
		macSNA	MAC
7		macBeaconsPerFrame	Integer
8		macState Node state	BaseNode, Switch, Terminal o Disconnected
9		macSCPLength	Integer
10		macNodeHierarchyLevel Hierarchy level	Integer
11		macBeaconSlotCount	Integer
12		macBeaconTxSlot	Integer
13		macBeaconTxFrequency	Integer
14		macCSMAChBusyCount	Integer
	macListRegDevices		
15		regEntryID	MAC
16		regEntryLNID	Integer
17		regEntryState	TERMINAL=1, SWITCH=2
18		RegEntryLSID	Integer
19		RegEntrySID	Integer
20		regEntryLevel	Integer
	macListActiveConn		
21		connEntrySID	Integer
22		connEntryLNID	Integer
23		connEntryLCID	Integer
24		connEntryID	MAC
	macListMcastEntries		
25		mcastEntryLCID	Integer
26		mcasteEntryMembers	Integer
	macListSwitchTable		
27		stblEntryLSID	Integer
	macListDirectConn		
28		dconnEntrySrcSID	Integer
29		dconnEntrySrcLNID	Integer
30		dconnEntrySrcLCID	Integer
31		dconnEntrySrcID	Integer
32		dconnEntryDstSID	Integer
33		dconnEntryDstLNID	Integer
34		dconnEntryDstLCID	Integer
35		dconnEntryDstID	MAC
36		dconnEntryDSID	Integer
37		dconnEntryDID	MAC
	macListDirectTable		
38		dconnEntrySrcSID	Integer
39		dconnEntrySrcLNID	Integer
40		dconnEntrySrcLCID	Integer

41		dconnEntryDstSID	Integer
42		dconnEntryDstLNID	Integer
43		dconnEntryDstLCID	Integer
44		dconnEntryDID	MAC
	macListAvailablesSwitches		
45		slistEntrySNA	MAC
46		slistEntryLSID	Integer
47		slistEntryLevel	Integer
48		slistEntryRSSI	Integer

8.13 Table of existing meters in PLC network [S24]

It contains the most important information for each of the meters that have been detected by the Base Node and are managed by the DTC. This information will indicate the Management System not only the existence of a specific meter in the network, but also the main data about its status and its availability.

S24	FIELD	DESCRIPTION	VALUE	Comments
1	IdRpt	Identifier of the request	S24	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	S24	Report identifier tag name		
5	Fh	Date (Y/M/D H:M:S:ms) of data retrieval	Timestamp	
	Meter	Tag for each meter in the list		
6	MeterId	Identifier of the meter	Meter Identifier	
7	ComStatus	This informs of the communication status of the meter	0,1,2 (PF, TF, Registered)	This status has the best of the ComStatusTCP and ComStatusPRIME states. If one of the remote interfaces is Active, this tag reports Active; If both remote interfaces have an equal state, this tag has also that state. If one of the remote interfaces is TF and the other PF, this tag is TF
8	ComStatusTCP	This informs of the communication status of TCP connection of the meter	0,1,2 (PF, TF, Registered)	Used for the meter with flexible remote communications or any other TCP communication (GPRS or public lightning HDLC/TCP)
9	ComStatusPRIME	This informs of the communication status of PRIME connection of the meter	0,1,2 (PF, TF, Registered)	Used for the meter with PLC PRIME remotecommunications
10	SecGenCltStatus	This informs of the security activation status of the Secure General Client	0,1,2 (AKP, AKW, Activated)	Null value for Non- secure meters
11	SecBroadCltStatus	This informs of the security activation status of the Secure Broadcast Client	0,1,2 (AKP, AKW, Activated)	Null value for Non- secure meters
12	Date	Date and time of last access to the meter	Timestamp (1)	
13	Active	Indicates if the DTC will manage the meter, that is, meters with ComStatus with values 1, 2 or 3.	YES/NO	
14	MeterComTech		0=PRIME 1=GPRS 2=RF MESH 3=HDLC 4=PRIME+HDLC/TPC	Used to identify the communication technology of each meter registered in the DTC During meter registration, if the meter reply with error or a different data type (should be an Enum), then the meter does not support flexible communications.
15	MainComTech	Definition of the preferential remote interface	Enum (0,1,2,3) 0 – Preferential is HDLC/TCP, PRIME is backup	If the meter does not support flexibility communications, then the MainComTEch should come with NULL value. Example: MainComTech=""

				1 – Preferential is PRIME HDLC/TCP is backup 2 – Only HDLC/TCP 3 – Only PRIME NULL – Default configuration	
	Meter		Tag for each meter in the list		

(1) The Timestamp format can be set as undefined in situations where the DTC is able to communicate with the meter at fisical communication level, but it is not able to do it at the application level. This can happen in some extreme poor communications scenario. In this case, the timestamp format should be: "00000000000000000W".

Note: All tags should be sent by the DTC on the S24 report. If some tag is not applicable to the meter, this tag should have the NULL value. For example, if the meter is not secure the SecGenCltStatus="" and SecBroadCltStatus="". For meters without flexibility functionality MainComTech="".

Note: During meter registration the DTC needs to read the attribute 2 of the 0.65.0.30.10.255 object to understand if the meter support flexible communications.The value should be an ENUM ={0,1,2,3}. In case of error or a different data type, the DTC should assume that the meter does not support this feature. With this information the DTC should set the proper value on the MeterComTech.

For meters with remote communication flexibillty, the DTC should monitor the two remote interfaces in parallel and report that on S24.

8.14 DTC parameters [S12]/[B07]

It contents static and dynamic information about the DTC.

For the case of the B07, the message definition is made in such a way that only the parameters that are required to be changed are included in a message (there is no need to include the full parameter list each time this message is sent). If the B07 contain any attributes that it´s not possible to update to the DTC, the DTC should generate an "UpdateRequestStatus" method with RequestStatus=4.

For a description of the Modification of the DTC configuration procedure refer to the Annex C section 16.1.16 16.1.17 , which show sequence diagrams with all messages and information exchanged between HES and DTC.The DTC once executes order B07 should send to the HES (using the request IdPet) a S12 report with the current (after modification) configuration. The completion of the request has to be notified through UpdateRequestStatus web services, as described in Annex C.
A "Nature" column has been added to the table below, which indicates:

- "R" if the information can only be read from the DTC (e.g. the Battery monitoring). In this case the field will only appear in S12 report
- "R/W" if the information can be both read from and written to the DTC. In this case the field will appear in both S12 report and B07 order.

S12	FIELD	DESCRIPTION	VALUE	NATURE	Comments
1	IdRpt/IdReq	Identifier of the Report/Request	S12/B07		
2	IdPet	Unique request identifier			
3	Version	Version Identifier	3.4_EDP_2.0		
4	Cnc	Concentrator identifier			
	S12/B07	Report/Request identifier tag name			
5	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	R	
6	Mod	Type		R	

7	Af	Manufacturing year		R	
8	Te	Type of equipment	"DTC"	R	
9	ModelCode	Identifier of the DTC Model. Every hardware version should have it's unique model code	Octet-strig[2] e.g. "0000", "1100" or "FFFF"	R	This code is managed by EDPD.
10	DCPwdAdm	Password of the admin user.		W	
11	DCPwdRead	Password of the read user		W	
12	Vf	Firmware version This is used to read the current firmware version of the DTC. It should be consistent with the naming convention of the firmware file so that they can be visually related to each other.		R	
13	VfComm	Communication module (PRIME) firmware version. This is used to read the current firmware version of the communication module. Eg 1.3.e		R	
14	Pro	Protocol content is the same except "DLMS Protocol" has to be replaced by the Iberdrola DTC Protocol : name ("ISDIP"), version and date of issue. "ISDIP" standing for "Iberdrola STG-DC Interface Protocol" ; version and date of issue being the one of the implemented protocol specifications	3.4_EDP_2.0-2019	R	
15	Com	Communications	(PLC/GPRS.)	R	
16	Bat	% Battery monitoring		R	If the battery is not demaged or the value of the battery monitoring should be 0%
17	ipCom	IP of the DTC		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
18	PortWS	IP Port on which WS requests have to be done to the DTC	number (e.g. 8080)	R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
19	ipMask	IP Mask (To be used if DHCP is not activated)		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
20	ipGtw	IP Gateway (To be used if DHCP is not activated)			This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
21	ipDhcp	Indicates if DHCP has to be used	Y/N	R/W	This parameter is duplicated on report/order

					S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
22	Slave1	Data definition for other equipment hanging from DTC (pending to clarify)	String	R/W	
23	Slave2	Data definition for other equipment hanging from DTC (pending to clarify)	String	R/W	
24	Slave3	Data definition for other equipment hanging from DTC (pending to clarify)	String	R/W	
25	ipLoc	When specified, the DTC should additionally configure this IP over the eth interface used for dialog with STG so that a local PC can be connected and communicate with the DTC through this IP.	E.g.: 100.0.0.1	R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
26	ipMaskLoc	IP Mask used when ipLoc was configured.	E.g.:255.255.255.0	R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
27	Macplc	MAC port PLC	MAC	R	
28	Pse	Serial port speed		R	
29	Priority	Enabled/disabled	Y/N	R/W	
30	IPstg	IP of the HES To be used to access HES WS	IP address	R/W	
31	stgPwd	Password for accessing HES WS (if any)		W	
32	IPNTP	IP for NTP synchronisation	IP address	R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
33	IPftp	IP of FTP server where reports have to be delivered	IP address	R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
34	FTPUserReport	Username for accessing the ftp server for delivering reports		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
35	FTPPwdReport	Password for accessing the ftp server for delivering reports		W	This parameter is duplicated on

					report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
36	IPftpDCUpg	IP of the ftp server for DTC firmware upgrade		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
37	UserftpDCUpg	User of the ftp server for DTC firmware upgrade		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
38	PwdftpDCUpg	Password of the ftp server for DTC firmware upgrade		W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
39	IPftpMeterUpg	IP of the ftp server for meters firmware upgrade		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
40	UserftpMeterUpg	User of the ftp server for meters firmware upgrade		R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
41	PwdftpMeterUpg	Password of the ftp server for meters firmware upgrade		W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
42	RetryFtp	Number of attempts for accessing an ftp server for fulfilling a task (report delivery, firmware update, etc) also applies for HES WS	integer	R/W	This parameter is duplicated on report/order S12/B07 and may

					be accessed or changed using both reports/orders (S12/B07 or B41/S41).
43	TimeBetwFtp	Time between retries when accessing an ftp server. Also applies for HES WS	Secs.	R/W	This parameter is duplicated on report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
44	IPftpCycles	IP of ftp server for uploading cycle test reports	IP address	R/W	
45	UserftpCycles	Username for ftp uploading cycles.		R/W	
46	PwdftpCycles	Password for ftp uplading cycles		W	
47	DestDirCycles	Directory for uplading cycles	string	R/W	
48	SyncMeter	This parameter defines if the DTC synchronizes time every time it access the meter (as originally stated) or not (in that case, there will be a periodic task for performing it).	Y/N	R/W	
49	TimeOutMeterFwU	Time out for cancelling FW upgrade in a meters	Secs.	R/W	
50	TimeDevOver	Allowed Max time deviation between meter and DTC for discarding time synchronisation and sending an event (if deviation exceeds this time, no sync is made). If set to 0 this limit is not considered. This doesn't apply for a NEW METERS registered the first time in the DTC.	Secs.	R/W	Default value: 300 Parameter and algorithm also apply for NEW METERS registered the first time in the DTC
51	TimeDev	Allowed Min time deviation between meter and DTC. Syn is only made if meter time is between TimeDev and TimeDevOver. This doesn't apply for a NEW METERS registered the first time in the DTC.	Secs.	R/W	Default value: 60 Parameter and algorithm also apply for NEW METERS registered the first time in the DTC
52	ResetMsg	Used to configure if the DTC will send a message to STG after restart/reset	Y/N	R/W	
53	NumMeters	When reports/answers to HES involve several meters, it defines the number of meters information to be included in a response	Integer (0 means no limit)	R/W	
54	TimeSendReq	For reports/answers to HES (for one or several meters), it defines the maximum time without sending collected information. If this time is reached, DTC will send what is collected to that time and continue with its process.	Integer(secs)	R/W	
55	TimeDisconMeter	This is the time P as defined in DTC specification (time between considering a meter as TF to PF)	Integer (secs)	R/W	
56	RetryDisconMeter	This is the parameter U as defined in DTC specification (number of retries) – for services and schedule tasks	Integer	R/W	
57	TimeRetryInterval	This is the time between retries in the DTC to access meters - – for services and schedule tasks	Integer	R/W	
58	RetryDisconMeterOrder	This is the parameter U as defined in DTC specification (number of retries) – for orders	Integer	R/W	
59	TimeRetryIntervalOrder	This is the time between retries in the DTC to access meters - – for orders	Integer	R/W	
60	RetryDisconMeterFirm	This is the parameter U as defined in DTC specification (number of retries) – for meter firmware upgrade	Integer	R/W	Only applicable to B05 order and the corresponding S19
61	TimeRetryIntervalFirm	This is the time between retries in the DTC to access meters - – for meter firmware upgrade	Integer	R/W	Only applicable to B05 order and the corresponding S19
62	MeterRegData	This represent the list of information the DTC must retrieve from the meter once it just has been registered, in order to send these information to the HES inside the "Registering"	String	R/W	Default value: Device ID1 Device ID2 Device ID3

		message. If the value is null there is no information added in D2. This list is a list of obis codes and attributes to read, in the following format : • 2 hexadecimal digits for the COSEM class • 12 hexadecimal digits for the OBIS code • 2 hexadecimal digits for the attribute number Example for the Device ID 1, Device ID 2 and Device ID 3: "010000600100FF02010000600101FF02010000600102FF02"			Device ID10 Remote communication operation mode
63	ReportFormat	Global parameter indicating the format under which the report has to be produced. This parameter applies to both FTP and WS payloads.	format as defined for payload formats	R/W	
64	S26Content	Configuration field for S26	String e.g." Pimp;Ala;L1v"	R/W	
65	ValuesCheckDelay	Number of seconds to wait before reading values after an order has been proceeded to.	Seconds	R/W	
66	MaxOrderOutdate	Time window for validation of orders. If an order/task has a larger time deviation than this value the order not executed (explained in **Error! Reference source not found.**)	Integer (seconds)	R/W	
67	TimeDelayRestart	Time to wait after a reboot (expected or unexpected) for resuming tasks which were running at the time of reboot (this allows meter reconnection and prime convergence to take place). This time to wait don´t apply communications between HES_DTC.	Integer (secs)	R/W	
68	NTPMaxDeviation	DTC generates an event when the difference between the current time and new time is larger than this parameter. Default value will be 30 secs. DTC event code (1,9)	Integer (secs)	R/W	
69	AccInacTimeout	Inactivity time in minutes to close the session opened for all type of access (WEB, local, Command line, etc.).	Integer (min)	R/W	
70	AccSimulMax	Maximum number of sessions simultaneously opened for all type of access (WEB, local, Command line, etc.).	Integer	R/W	
71	AuthIP	IP address Authentication Server (LDAP, TACACS, etc.)	IP address	R/W	
72	AuthRetry	Number of attempts for access to the Authentication Server.	integer	R/W	
73	AuthRetryInterval	Time between retries for access to the Authentication Server.	Secs.	R/W	
74	TacacsPlusKey	Secret Shared Key (note 9)	String	W	
75	BNodeStatus	Enable/Disable the PLC PRIME base node. Y=Base Node enabled; N=Base Node disabled (emulating electric disconnection)	Y/N	R/W	Default value: Y
76	TimetoInactivePRIME	Minutes to consider a PRIME meter as Inactive (Permanent failure)	long (minutes)	R/W	default value: 2880 minutes
77	TimetoInactiveTCP	Minutes to consider a TCP meter as Inactive (Permanent failure)	long (minutes)	R/W	default value: 2880 minutes
78	TimetoInactiveRS485	Minutes to consider a HDLC/RS485 meter as Inactive (Permanent failure)	long (minutes)	R/W	default value: 1440 minutes
79	NoPowerUpperTh	Upper threshold (%) of registered and online meters, to be applied in the advanced algorithm: "Identification of clients without power"	% integer	R/W	default value: 80% Not mandatory (only if algorithm is implemented)
80	NoPowerLowerTh	Lower threshold (%) of registered and online meters, to be applied in the advanced algorithm: "Identification of clients without power"	% integer	R/W	default value: 60% Not mandatory (only if algorithm is implemented)
81	MinMetersNoPower	Minimum number of registered meters in DTC to apply the advanced algorithm: "Identification of clients without power"	Integer	R/W	default value: 30 Not mandatory (only if algorithm is implemented)
82	PhUnbVTm	Phase Unbalance algorithm - threshold for average instantaneous voltage calculation	% V nominal	R/W	Default value, Tm = 15%
83	PhUnbVTv	Phase Unbalance algorithm - threshold for instantaneous voltage deviation	% V	R/W	Default value, Tv = 10%

84	PhUnbVTd	Phase Unbalance algorithm - sampling period used for voltage and current unbalance calculation	minutes	R/W	Default value, Td = 10 minutes
85	PhUnbITi	Phase Unbalance algorithm - threshold for current deviation	% I	R/W	Default value, Ti = 50%
86	PhUnbVmin	Voltage threshold for power failure. Applies to all phases.	V	R/W	Default value, Umin=115V
87	DataCollectMode	Identify the mode used to collect data with flexible configuration from meters	Integer	R/W	Possible values: 0,1; default value=0 See annex "**Annex.CollectFlexData**" for details
88	TPId	Transformer ID	String	R/W	
89	PTDId	Secondary Substation ID	String	R/W	
90	Latitude	GPS coordinate - Latitude	Float64	R/W	
91	Longitude	GPS coordinate - Longitude	Float64	R/W	
93	TPMaxPower	Transformer's maximum power (nominal value)	Integer KVA	R/W	Default value: 1000
94	OverloadAlarmTh	Power % to generate a fault (overload alarm threshold)	Float	R/W	
96	CurrentRatio	Transformer current ratio (TI)	Float	R/W	Default value: 200
	Pwdsdlms	(Note 10)			
97	PwdID	1 … 30	unsigned (1, … , 30)	W	up to 30 different dlms passwords
98	PwdLv	DLMS password level: Management, Read, Firmware	unsigned (1,2,3)	W	Where: **0= Used to remove the array entry; 1= management client password; 2= Reading client password; 3= Firmware client password**
99	Pwd	DLMS password	octect-string [8]	W	
98	ManufID	Meter manufacturer	octect-string [3]	W	If Null, the dlms password applies to all Meters manufacturers According to meter's FLAG_ID
	Pwdsdlms				
100	NTPRefreshPer	NTP Refresh Period - This parameter is used to define how often the DTC (acting as a NTP client) should check his clock against the NTP server. This periodicity parameter is defined in seconds.	Integer (seconds)	R/W	Default value: 43200 seconds
101	RemoteTimeoutF	Time open session for firmware update access through Secure PLC channel. Note 4.	Integer (secs)	R/W	
102	HESKeyMngTimeout	Time to wait before re-sending Meters Key Management Requests not answered by HES	long (minutes)	R/W	
103	MaxQueueNum	Maximum number of requests and/or orders that can be on the queue list of pending to execute requests.	Integer	R/W	Default value is 20
104	FTPRandomDelay	Maximum ramdom delay before sending a file into the FTP	long (seconds)	R/W	Default value is 60 seconds. This means that the DTC will wait a ramdom time between 0 and 60seconds to send the FTP report
105	TimeActRetryTCP	Time to retry the TCP/IP connection of the meter when the meter is online	Integer (secs)	R/W	Default value: 3600s
106	TimeTFRetryTCP	Time to retry the TCP/IP connection of the meter when the meter is TF	Integer (secs)	R/W	Default value: 3600s
107	TimePFRetryTCP	Time to retry the TCP/IP connection of the meter when the meter is PF	Integer (min)	R/W	Default value: 1440min
	TP	Programmed tasks in the concentrator	R/W		
108	TPReset	Allows the HES to clear all the tasks configured on the DTC	Y/N. This tag will not appear on S12, it can only be used on B07.		On B07, if the values is "Y" or "", the DTC will clear all the tasks

					previously configured and apply the ones mentioned on the current B07 (if configured).
109		TpTar	Task identifier	1,2,3...	
110		TpPrio	Priority	0 to 9	
111		TpHi	Initial starting timestamp	YYYYMMDDHHmmssfffX (absolute value). E.g.” 201001010010000000W”	
112		TpPer	Periodicity. (Note 5)	Timestamp (relative value). Note: If periodicity is null the task should be removed. Periodicity can also be set to zero (0), then it means it should be only run once, in this case the timeframe is fixed by type of Report (S02, S03, S05 daily, S04 monthly, S09 weekly) e.g.” 00000001000000”	
113		TpCompl	Identifies if the collected data considers periodicity or collects complement data till today according to pointer identifying what is sent so far to HES	Y/N. If empty means N	
114		TpMet	List of meters included in the task. (Note 7)	If empty, it applies to ALL.	
115		TpPro	TaskNameList. Defines the information to be retrieved. This list includes all functionality to be done at a time.		
116		TpReq	Defines the information to be retrieved based in existing reports, if it doesn’t exist in the DTC, it is collected from meters. (Note 1)	S04, S05, S5B,S4B,S06,S07,S08,S09,S21,S29, G03, G04, G05, G06 Txx	Please note that Txx are the DTC tasks mention on B11
117		TpSend	Defines if the collected report is sent to the HES. This attribute is per task in the task list	Y/N	. Reports resulting from programmed tasks shall only be sent to FTP1.
118		TpHESDest	Indicates to which HES the report should be send	String Note: This string lists the HES to where the scheduled tasks data should be sent. (e.g. Send to HES1 “1”; send to HES1 and 2 “1,2”or send to all HES “1,2,3”) Null value means that it should be sent to the HES1	. If TpSend=”N”, this tag does not have any meaning. . This is not a mandatory tag. If not present/defined, the destination is the HES1.
119		TpStore	Defines if the information retrieved is stored in the DTC. This will apply when a trending for instant values of a meter is requested. This attribute is per task in the task list	Y/N	
120		TpAttr	Parameters for the task (included only when needed, e.g. S09, S17)	String e.g. (Note 3)	
		TpPro			
	TP				
	cycles		Cycles definition Structure	(Note 6)	
121	CycleReset		Allows the HES to clear all the tasks configured on the DTC	Y/N. This tag will not appear on S12, it can only be used on B07 to reset cycles.	
122		cycle	Each cycle tag build one cycle		
123		name	Cycle name	String	
124		period	Time period between two consecutive cycles	Integer (minutes)	
125		inmediate	If true it starts immediately without waiting for start	String	
126		repeat	Number of repetitions polling cycle to meters	Integer	
127		start	Date to start the cycle	Timestamp (YYYY/MM/DD hh:mm)	
128		stop	Date to finish the cycle	Timestamp (YYYY/MM/DD hh:mm)	
129		priority	Cycle priority. Default value 9.	0 to 9	
130		device	Each device tag adds a meter in the cycle. In case doesn´t exist device tag, the cycle must be executed on all meter registered in the DC.		
131		sn	Meter identifier	String	

132		<get> <set> <action>	Tags get, set, action add operation to execute in the cycle. This operation will be executed for each meter included in the cycle definition			
133		obis	Obis Identifier (e.g. : "1-0:32.7.0.255")	String		
134		class	Obis class Identifier (e.g. : "3")	String		
135		element	Attribute_id (get o set) or method_id (action) (e.g. : "2")	String		
136		selective_access	Selective access if necessary	String		
137		data	Data for set or action services	String		
138		<get> <set> <action>	Tags get, set, action add operation to execute in the cycle. This operation will be executed for each meter included in the cycle definition			
139		cycle				
	cycles					
140	DataCollectDepth		Number of past days in which the meter data is accessed on the schedule tasks	Integer (days) Default value: 5 days	R/W	By default this is set to 7 days
141	G03Capture		Load profile Integration period for Average values	Integer (seconds) Default value: 0	R/W	If G03Capture is set to "0", the DTC should disable this curve
142	G04Capture		Load profile Integration period for maximum values	Integer (seconds) Default value: 0	R/W	If G04Capture is set to "0", the DTC should disable this curve
143	G05Capture		Load profile Integration period for minimum values	Integer (seconds) Default value: 0	R/W	If G05Capture is set to "0", the DTC should disable this curve
144	G06Capture		Load profile Integration period for momentaneous values	Integer (seconds) Default value: 0	R/W	If G06Capture is set to "0", the DTC should disable this curve
145	MeasureCST		Ativation or inhibition of the measures to the technical system	Boolean 0 – Inhibited 1 - Active	R/W	By default this is inhibited.
146	DstConfW		Daylight saving time winter to summer transition configuration	Timestamp e.g.: 20200329010000000W	R/W	The DTC should execute the DST change every year at the same month and day of the week according to what is configured in this tag. If this tag has the undefined value of: 00000000000000000W, this means that the DST will not occur.
147	DstConfS		Daylight saving time summer to winter transition configuration	Timestamp e.g.: 20201025020000000S	R/W	The DTC should execute the DST change every year at the same month and day of the week according to what is configured in this tag. If this tag has the undefined value of:

					00000000000000 000W, this means that the DST will not occur.

Note 1: Any report defined in the specification can be configured here. Also, all list of possible orders included in field “order” in DTC Order Request (B11) should be added as available for being scheduled with the same behaviour defined there. T01, T02, T03, T04, etc.
Note 2: The attribute MeterRegData can be limited to 5 OBIS codes of les 1k. So far we will only use ID 1, 2 and 3. Additionally, if the DTC fails to retrieve any of this information, the string “ERROR” should be included instead. Example:

```
<Report IdRpt="S20" IdPet="1268" Version="3.4_EDP_2.0">
  <Cnc Id="CURDUMMY00000">
    <S20 Fh="20110101000000000W" Et="5" C="1">
      <D1>ZIV00000000</D1>
      <D2 cosemID="010000600101FF02">ERROR</D2>
      <D2 cosemID="010000600102FF02">ERROR</D2>
    </S20>
  </Cnc>
</Report>
```

Note 3: For a scheduled task to collect S09 or S17 specifying EvGroup and EvCodes, the attributes to be included in TpAttr are those similar to ReportQuery method in the web service:

```
<TpAttr>
    <QueryID>Q1</QueryID>
    <Parameters>EvGroup:1;EvCode:98</Parameters>
</TpAttr>
```

In the case of similar report without event group and event code filter, TpAttr should have the following value:

```
<TpAttr>
    <QueryID>Q1</QueryID>
    <Parameters>EvGroup:;EvCode: </Parameters>
</TpAttr>
```

In the case of similar report with event group and event code multiple filter, TpAttr should have the following value:

```
<TpAttr>
    <QueryID>Q1</QueryID>
    <Parameters> EvGroup:1,2,3,4,5;EvCode:+EvGroup:6;EvCode:3,4,5,6 </Parameters>
</TpAttr>
```

In the case of similar report with event group and event code exclusion filter, TpAttr should have the following value:

```
<TpAttr>
    <QueryID>Q1</QueryID>
    <Parameters> EvGroup:1,2,3,4,5,6;EvCode:-EvGroup:6;EvCode:1,2,3,4 </Parameters>
</TpAttr>
```

Note 4: RemoteTimeoutF parameters is used to configure the Current Association PLC timeout in the DTC when it have to establish a new association for fw update access and to configure the Current Session PLC timeout value in the new OBIS defined in secure meters.
When starting the session, In the meter, the Current Session PLC timeout value is the same as PLC general Timeout (for secure client, only). This way to start the session, the current session timeout would be same the general.
If DTC has to perform a firmware upgrade process, or continue with the upgrade process in a started earlier association, this timeout should be set to the appropriate value for the update indicated in the parameter “RemoteTimeoutF”.

Note 5: If periodicity is null the task should be removed. When the DTC receives a B07 order with TpPer=””, the DTC must identifier the TpTar (task identifier) and delete all programed task definition for this TpTar. Example for delete a programed task:

```
<B07>
    <TP TpTar="1" TpHi="20140421000000000S" TpPer="" TpMet="" TpPrio=""/>
</B07>
```

Periodicity can also be set to zero (0) and then it means it should be only run once, in this case the timeframe is fixed by type of Report (S05 daily, S04 monthly, S09 weekly)

Note 6: A basic example of a cycle configuration is as follows:

```
<cycles>
<cycle name="TEST_123456789_AAAAAAAAA_1" period="1" immediate="true" stop="2015/02/25 14:59">
<get obis="1-0:1.8.10.255" class="3" element="2"/>
<get obis="0-0:21.0.6.255" class="7" element="2"/>
</cycle>
</cycles>
```

Another example could be as follows:

```
<cycles>
    <cycle name="TEST_12345676890_BBBBBBBBBBBB_2" period="1" immediate="true" stop="2012/12/01  9:46">
        <get obis="0-0:1.0.0.255" class="8" element="2" />
        <get obis="1-0:99.1.0.255" class="7" element="2"
        selective_access="structure{structure{long_unsigned{8}octet_string{00 00 01 00 00
        ff}integer{2}long_unsigned{0}}date_time{2012/11/28 00:00:00}date_time{2012/11/28 12:00:00}array{}}"/>
    </cycle>
</cycles>
```

Note 7: When the DTC receives a B07 order from HES with TpMet="" in a task programmed, the configuration stored in DTC side must be TpMet="", therefore when the HES requests a S12 report the TpMet for that task scheduled must be ""

Note 8: The parameter TacacsPlusKey is only used to Tacacs authentication. If Tacacs is not used like method authentication this paremeters must be ""

Note 9: The Pwdsdlms password configuration, only apply to Non-secure meters. For secure meters the keys and LLS are managed differently, please check the DTC ciber security specification.

Note 10: It is possible to configure the S21 (advanced instantaneous values) has a schedule task. This way the DTC will be able to report periodically this information to the HES.

8.15.1. Examples of task scheduling messages

For clarification purposes, following there are 3 examples of task scheduling according to the above format:

- Example 1: One task with one programmed report, of Dailly execution of S05 for all meters with priority 2

```
<TP TpTar="1" TpHi="20190415001000000S" TpPer="00000001000000" TpMet="" TpPrio="2">
    <TpPro TpReq="S05" TpSend="Y" TpHESDest="1" TpStore="Y" >
        <TpAttr/>
    </TpPro>
</TP>
```

- Example 2: One task with two programmed reports sent to different HES

```
<TP TpTar="1" TpHi="20110415001000000S" TpPer="00000001000000" TpMet="" TpPrio="2">
    <TpPro TpReq="S05" TpSend="Y" TpStore="Y" TpHESDest="1" >
        <TpAttr/>
    </TpPro>
    <TpPro TpReq="S09" TpSend="Y" TpStore="Y" TpHESDest="1,2" >
        <TpAttr/>
    </TpPro>
</TP>
```

- Example 3: Remove specific task: PtPer is set to null

```
<TP TpTar="1" TpHi="20110415001000000S" TpPer="" TpMet="" TpPrio="2">
            <TpPro TpReq="S05" TpSend="Y" TpStore="Y" >
                <TpAttr/>
            </TpPro>
</TP>
```

- Example 4: Remove all task: TPReset is set to "Y"

```
<TP TPReset="Y">
</TP>
```

- Example 5: Remove all preivous task and sent a new one

```
<TP TPReset="Y" TpTar="1" TpHi="20190415001000000S" TpPer="00000001000000" TpMet="" TpPrio="2">
    <TpPro TpReq="S05" TpSend="Y" TpHESDest="1" TpStore="Y" >
        <TpAttr/>
    </TpPro>
</TP>
```

- Example 6: Multi-request programmed task that uses the TpAttr and TpCompl attributes.

```
<TP TpTar="2" TpPrio="2" TpHi="20100101011000000W" TpPer="00000100000000" TpMet="" TpCompl="N">
     <TpPro TpReq="S09" TpSend="Y" TpStore="Y">
                    <TpAttr>
                        <QueryID>Q1</QueryID>
                        <Parameters>EvGroup:;EvCode: </Parameters>
              </TpAttr>
     </TpPro>
</TP>
<TP TpTar="3" TpPrio="2" TpHi="20100101040000000W" TpPer="00000007000000" TpMet="" TpCompl="N">
             <TpPro TpReq="S08" TpSend="Y" TpStore="Y">
                    <TpAttr/>
      </TpPro>
      <TpPro TpReq="S07" TpSend="Y" TpStore="Y">
                    <TpAttr/>
      </TpPro>
</TP>
```

Note that when a TpTar definition is received by the DTC, it overrides previous definition which might exist.

8.15 DTC communication parameters [S41]/[B41]

This service contains the information about the communication configurarion of the DTC. Some parameters also exist on B07/S12 and for those, every change made through B41, should be reflected on S12 and the other way around.
It is possible to send B41 with only the parameters that are required to be changed included in a message (there is no need to include the full parameter list each time this message is sent). If the B41 contain any attributes that it´s not possible to update to the DTC, the DTC should generate an "UpdateRequestStatus" method with RequestStatus=4.
The DTC once executes order B41 should send to the HES (using the request IdPet) a S41 report with the current (after modification) configuration.
A "Nature" column has been added to the table below, which indicates:

- "R" if the information can only be read from the DTC. In this case the field will only appear in S41 report.
- "R/W" if the information can be both read from and written to the DTC. In this case the field will appear in both S41 report and B41 order.

S41	FIELD	DESCRIPTION	VALUE	NATURE	COMMENTS
1	IdRpt/IdReq	Identifier of the request	B41/S41		
2	IdPet	Unique request identifier			
3	Version	Version Identifier	3.4_EDP_2.0		
4	Cnc	Concentrator identifier			
	B41/S41	Report tag name identifier			
5	Fh	Date at which the meter was registered (Y/M/D H:M:S:ms)	timestamp		
6	ipCom	IP of the DTC	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
7	PortWS	IP Port on which WS requests have to be done to the DTC	number (e.g. 8080)	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
8	ipMask	IP Mask (To be used if DHCP is not activated)	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
9	ipGtw	IP Gateway (To be used if DHCP is not activated)	IP address		This parameter is duplicated from report/order S12/B07 and may be

					accessed or changed using both reports/orders (S12/B07 or B41/S41).
10	ipDhcp	Indicates if DHCP has to be used	Y/N	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
11	ipLoc	When specified, the DTC should additionally configure this IP over the eth interface used for dialog with HES so that a local PC can be connected and communicate with the DTC through this IP.	E.g.: 100.0.0.1	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
12	ipMaskLoc	IP Mask used when ipLoc was configured	E.g.:255.255.255.0	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
13	IPNTP	IP for NTP synchronisation	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
14	IPNTP2	A second IP for NTP synchronisation	IP address	R/W	This parameter can be used to configure a secondary NTP server.
15	IPstg	IP of the HES1 To be used to access HES1 WS	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41). If this parameter is set through order B07/B41 and "URLstg" is not, then"URLstg" shall be automatically updated with the information of the present parameter. If both parameters (IPstg and URLstg) are set through order B41, parameter "URLstg" shall prevail in case of inconsistency between them.
16	URLstg	Url of the HES1 Ex: http://127.0.0.1:8080/Webservices/namespace	String	R/W	This parameter is complementary to tag "IPstg" and does not replace it. If this parameter is set through order B41 and "IPstg" is not, then"IPstg" shall be automatically updated with the information of the present parameter. If both parameters (IPstg and URLstg) are set through order B41, parameter "URLstg" shall prevail in case of inconsistency between them.
17	stgPwd	Password for accessing HES1 WS (if any)	String	W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
18	IPftp	IP of ftp1 server where reports have to be delivered	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41). If this parameter is set through order B07/B41 and "URLftp" is not, then"URLftp" shall be automatically updated with the information of the present parameter. If both parameters (IPftp and URLftp) are set through order B41, parameter "URLftp" shall prevail in case of inconsistency between them.
19	URLftp	Path to ftp1 report server Ex: ftp://127.0.0.1/reports	String	R/W	This parameter is complementary to tag "IPftp" and does not replace it. If this parameter is set through order B41 and "IPftp" is not, then"IPftp" shall be automatically updated with the information of the present parameter. If both parameters (IPftp and URLftp) are set through order B41, parameter "URLftp" shall prevail in case of inconsistency between them.

20	FTPUserReport	Username for accessing the ftp1 server for delivering reports	String	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
21	FTPPwdReport	Password for accessing the ftp1 server for delivering reports	String	W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
22	IPftpDCUpg	IP of the ftp1 server for DTC firmware upgrade	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41). If this parameter is set through order B07/B41 and "URLftpDCUpg" is not, then"URLftpDCUpg" shall be automatically updated with the information of the present parameter. If both parameters (IPftpDCUpg and URLftpDCUpg) are set through order B41, parameter "URLftpDCUpg" shall prevail in case of inconsistency between them.
23	URLftpDCUpg	Path to ftp1 DTC Upgrade server Ex: ftp://127.0.0.1/DTCUpgrade	String	R/W	This parameter is complementary to tag "IPftpDCUpg" and does not replace it. If this parameter is set through order B41 and "IPftpDCUpg" is not, then"IPftpDCUpg" shall be automatically updated with the information of the present parameter. If both parameters (IPftpDCUpg and URLftpDCUpg) are set through order B41, parameter "URLftpDCUpg" shall prevail in case of inconsistency between them.
24	UserftpDCUpg	User of the ftp1 server for DTC firmware upgrade	String	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
25	PwdftpDCUpg	Password of the ftp1 server for DTC firmware upgrade	String	W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
26	IPftpMeterUpg	IP of the ftp1 server for meters firmware upgrade	IP address	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41). If this parameter is set through order B07/B41 and "URLftpMeterUpg" is not, then"URLftpMeterUpg" shall be automatically updated with the information of the present parameter. 26If both parameters (IPftpMeterUpg and URLftpMeterUpg) are set through order B41, parameter "URLftpMeterUpg" shall prevail in case of inconsistency between them.
27	URLftpMeterUpg	Path to ftp1 Meter Upgrade server Ex: ftp://127.0.0.1/MeterUpgrade	String	R/W	This parameter is complementary to tag "IPftpMeterUpg" and does not replace it. If this parameter is set through order B41 and "IPftpMeterUpg" is not, then"IPftpMeterUpg" shall be automatically updated with the information of the present parameter. If both parameters (IPftpMeterUpg and URLftpMeterUpg) are set through order B41, parameter "URLftpMeterUpg" shall prevail in case of inconsistency between them.
28	UserftpMeterUpg	User of the ftp1 server for meters firmware upgrade	String	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
29	PwdftpMeterUpg	Password of the ftp1 server for meters firmware upgrade	String	W	This parameter is duplicated from report/order S12/B07 and may be

					accessed or changed using both reports/orders (S12/B07 or B41/S41).
30	RetryFtp	Number of attempts for accessing ftp1 server for fulfilling a task (report delivery, firware update, etc) also applies for HES1 WS	Integer	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
31	TimeBetwFtp	Time between retries when accessing an ftp1 server. Also applies for HES1 WS	Integer	R/W	This parameter is duplicated from report/order S12/B07 and may be accessed or changed using both reports/orders (S12/B07 or B41/S41).
32	IPstg_2	IP of the HES2 To be used to access HES2 WS	IP address	R/W	If this parameter is set through order B41 and "URLstg_2" is not, then"URLstg_2" shall be automatically updated with the information of the present parameter. If both parameters (IPstg_2 and URLstg_2) are set through order B41, parameter "URLstg_2" shall prevail in case of inconsistency between them.
33	URLstg_2	Url of the HES2 Ex: http://127.0.0.1:8080/Webservices/namespace	String	R/W	This parameter is complementary to tag "Ipstg_2" and does not replace it. If this parameter is set through order B41 and "IPstg_2" is not, then"IPstg_2" shall be automatically updated with the information of the present parameter. If both parameters (IPstg_2 and URLstg_2) are set through order B41, parameter "URLstg_2" shall prevail in case of inconsistency between them.
34	stgPwd_2	Password for accessing HES2 WS (if any)	String	W	
35	IPftp_2	IP of ftp2 server where reports have to be delivered	IP address	R/W	If this parameter is set through order B41 and "URLftp_2" is not, then"URLftp_2" shall be automatically updated with the information of the present parameter. If both parameters (IPftp_2 and URLftp_2) are set through order B41, parameter "URLftp_2" shall prevail in case of inconsistency between them.
36	URLftp_2	Path to ftp2 report server Ex: ftp://127.0.0.1/reports	String	R/W	This parameter is complementary to tag "Ipftp_2" and does not replace it. If this parameter is set through order B41 and "IPftp_2" is not, then"IPftp_2" shall be automatically updated with the information of the present parameter. If both parameters (IPftp_2 and URLftp_2) are set through order B41, parameter "URLftp_2" shall prevail in case of inconsistency between them.
37	FTPUserReport_2	Username for accessing the ftp2 server for delivering reports	String	R/W	
38	FTPPwdReport_2	Password for accessing the ftp2 server for delivering reports	String	W	
39	IPftpDCUpg_2	IP of the ftp2 server for DTC firmware upgrade	IP address	R/W	If this parameter is set through order B41 and "URLftpDCUpg_2" is not, then"URLftpDCUpg_2" shall be automatically updated with the information of the present parameter. If both parameters (IPftpDCUpg_2 and URLftpDCUpg_2) are set through order B41, parameter "URLftpDCUpg_2" shall prevail in case of inconsistency between them.
40	URLftpDCUpg_2	Path to ftp2 DTC Upgrade server Ex: ftp://127.0.0.1/DTCUpgrade	String	R/W	This parameter is complementary to tag "IPftpDCUpg_2" and does not replace it. If this parameter is set through order B41 and "IPftpDCUpg_2" is not, then"IPftpDCUpg_2" shall be automatically updated with the information of the present parameter. If both parameters (IPftpDCUpg_2 and URLftpDCUpg_2) are set through order B41, parameter "URLftpDCUpg_2" shall

					prevail in case of inconsistency between them.
41	UserftpDCUpg_2	User of the ftp2 server for DTC firmware upgrade	String	R/W	
42	PwdftpDCUpg_2	Password of the ftp2 server for DTC firmware upgrade	String	W	
43	IPftpMeterUpg_2	IP of the ftp2 server for meters firmware upgrade	IP address	R/W	If this parameter is set through order B41 and "URLftpMeterUpg_2" is not, then"URLftpMeterUpg_2" shall be automatically updated with the information of the present parameter. If both parameters (IPftpMeterUpg_2 and URLftpMeterUpg_2) are set through order B41, parameter "URLftpMeterUpg_2" shall prevail in case of inconsistency between them.
44	URLftpMeterUpg_2	Path to ftp2 Meter Upgrade server Ex: ftp://127.0.0.1/MeterUpgrade	String	R/W	This parameter is complementary to tag "IPftpMeterUpg_2" and does not replace it. If this parameter is set through order B41 and "IPftpMeterUpg_2" is not, then"IPftpMeterUpg_2" shall be automatically updated with the information of the present parameter. If both parameters (IPftpMeterUpg_2 and URLftpMeterUpg_2) are set through order B41, parameter "URLftpMeterUpg_2" shall prevail in case of inconsistency between them.
45	UserftpMeterUpg_2	User of the ftp2 server for meters firmware upgrade	String	R/W	
46	PwdftpMeterUpg_2	Password of the ftp2 server for meters firmware upgrade	String	W	
47	RetryFtp_2	Number of attempts for accessing ftp2 server for fulfilling a task (report delivery, firware update, etc) also applies for HES2 WS	Integer	R/W	
48	TimeBetwFtp_2	Time between retries when accessing an ftp2 server. Also applies for HES2 WS	Integer	R/W	
49	IPstg_3	IP of the HES3 To be used to access HES3 WS	IP address	R/W	If this parameter is set through order B41 and "URLstg_3" is not, then"URLstg_3" shall be automatically updated with the information of the present parameter. If both parameters (IPstg_3 and URLstg_3) are set through order B41, parameter "URLstg_3" shall prevail in case of inconsistency between them.
50	URLstg_3	Url of the HES3 Ex: http://127.0.0.1:8080/Webservices/namespace	String	R/W	This parameter is complementary to tag "Ipstg_3" and does not replace it. If this parameter is set through order B41 and "IPstg_3" is not, then"IPstg_3" shall be automatically updated with the information of the present parameter. If both parameters (IPstg_3 and URLstg_3) are set through order B41, parameter "URLstg_3" shall prevail in case of inconsistency between them.
51	stgPwd_3	Password for accessing HES3 WS (if any)	String	W	
52	IPftp_3	IP of ftp3 server where reports have to be delivered	IP address	R/W	If this parameter is set through order B41 and "URLftp_3" is not, then"URLftp_3" shall be automatically updated with the information of the present parameter. If both parameters (IPftp_3 and URLftp_3) are set through order B41, parameter "URLftp_3" shall prevail in case of inconsistency between them.
53	URLftp_3	Path to ftp3 report server Ex: ftp://127.0.0.1/reports	String	R/W	This parameter is complementary to tag "Ipftp_3" and does not replace it. If this parameter is set through order B41 and "IPftp_3" is not, then"IPftp_3" shall be automatically updated with the information of the present parameter.

					If both parameters (IPftp_3 and URLftp_3) are set through order B41, parameter "URLftp_3" shall prevail in case of inconsistency between them.
54	FTPUserReport_3	Username for accessing the ftp3 server for delivering reports	String	R/W	
55	FTPPwdReport_3	Password for accessing the ftp3 server for delivering reports	String	W	
56	IPftpDCUpg_3	IP of the ftp3 server for DTC firmware upgrade	IP address	R/W	If this parameter is set through order B41 and "URLftpDCUpg_3" is not, then"URLftpDCUpg_3" shall be automatically updated with the information of the present parameter. If both parameters (IPftpDCUpg_3 and URLftpDCUpg_3) are set through order B41, parameter "URLftpDCUpg_3" shall prevail in case of inconsistency between them.
57	URLftpDCUpg_3	Path to ftp3 DTC Upgrade server Ex: ftp://127.0.0.1/DTCUpgrade	String	R/W	This parameter is complementary to tag "IPftpDCUpg_3" and does not replace it. If this parameter is set through order B41 and "IPftpDCUpg_3" is not, then"IPftpDCUpg_3" shall be automatically updated with the information of the present parameter. If both parameters (IPftpDCUpg_3 and URLftpDCUpg_3) are set through order B41, parameter "URLftpDCUpg_3" shall prevail in case of inconsistency between them.
58	UserftpDCUpg	User of the ftp3 server for DTC firmware upgrade	String	R/W	
59	PwdftpDCUpg_3	Password of the ftp3 server for DTC firmware upgrade	String	W	
60	IPftpMeterUpg_3	IP of the ftp3 server for meters firmware upgrade	IP address	R/W	If this parameter is set through order B41 and "URLftpMeterUpg_3" is not, then"URLftpMeterUpg_3" shall be automatically updated with the information of the present parameter. If both parameters (IPftpMeterUpg_3 and URLftpMeterUpg_3) are set through order B41, parameter "URLftpMeterUpg_3" shall prevail in case of inconsistency between them.
61	URLftpMeterUpg_3	Path to ftp3 Meter Upgrade server Ex: ftp://127.0.0.1/MeterUpgrade	String	R/W	This parameter is complementary to tag "IPftpMeterUpg_3" and does not replace it. If this parameter is set through order B41 and "IPftpMeterUpg_3" is not, then"IPftpMeterUpg_3" shall be automatically updated with the information of the present parameter. If both parameters (IPftpMeterUpg_3 and URLftpMeterUpg_3) are set through order B41, parameter "URLftpMeterUpg_3" shall prevail in case of inconsistency between them.
62	UserftpMeterUpg_3	User of the ftp3 server for meters firmware upgrade	String	R/W	
63	PwdftpMeterUpg_3	Password of the ftp3 server for meters firmware upgrade	String	W	
64	RetryFtp_3	Number of attempts for accessing ftp3 server for fulfilling a task (report delivery, firware update, etc) also applies for HES3 WS	Integer	R/W	
65	TimeBetwFtp_3	Time between retries when accessing an ftp3 server. Also applies for HES3 WS	Integer	R/W	
66	IPTechSys	IP of the Technical System (SCADA) To be used to access Technical System, via IEC 60870-5-104	IP address	R/W	IP address from the primary front end for the SCADA System
67	IPTechSys_2	IP of the Technical System 2 (SCADA) To be used to access Technical System, via IEC 60870-5-104	IP address	R/W	IP address from the secondary front end for the SCADA System

68	IPComMngtSys	IP of the Communication Management System	IP address	R/W	IP address from the SNMP server that the DTC should use to send the SNMP traps
69	IProuter	IP address of the external router used by DTC to communicate with serial meters (RS485 and RS232) through HDLC.	IP address (default 0.0.0.0)	R/W	IP address of the external router used by DTC to communicate with serial meters (RS485 and RS232) through HDLC. This parameters shall always be taken into account to access serial meters over IP (IProuter; TCPportRSxxx; MeterHDLCAddress); default value: 0.0.0.0
70	TCPportRS485	TCP Port of the external router to communicate with RS485 meters	number (e.g. 8080)	R/W	default value= 0
71	UDPtrapPort	UDP port used by the DTC to send the SNMP traps	number (e.g. 161)	R/W	default value= 161
72	UDPSNMPPort	UDP port used by the DTC to receive SNMP requests	number (e.g. 160)	R/W	default value= 160
73	MIBRst	Comand option to reset all the MIB counters. Similar to factory reset.	Integer 1=reset MIB info	W	If this value is 1 the DTC should reset the MIB counters

8.16 List of managed meters [S20]

This report request can be made from the HES to receive meters which are active or in temporary failure.
The format of this report is similar to that of S15 for the case of new meter message (as shown in the table below).
Additionally in this case, the HES should receive a single file with all the meters included.

- Meter registering (Group 5, code 1)

The message format will be as follows:

S20	FIELD	DESCRIPTION	VALUE
10	IdRpt	Identifier of the request	S20
11	IdPet	Unique request identifier	
12	Version	Version Identifier	3.4_EDP_2.0
13	Cnc	Concentrator identifier	
	S20	Report tag name identifier	
14	Fh	Date at which the meter was registered (Y/M/D H:M:S:ms)	timestamp
15	Et	Event Group	5
16	C	Event Code	1
17	D1	MeterID	String
18	D2	Parameters included in the new meter message (it is assumed that the DTC has this data available and it doesn't need to retrieve it from all meters)	String

(1) **Fh** must indicate the date that the meter was registered the first time.

Only meters in status Active or Temporary Failure are included in this list. Please note that this state refers to the tag ComStatus of the S24, which is the best of the ComStatusTCP and ComStatusPRIME states.
If one of the remote interfaces is Active, the ComStatus reports Active, in this case the meter should be included on the S20.

8.17 DTC maximum demand values [S39]

Ths services allows the HES to collect the DTC maximum demand values. This service is sent with the Cnt tag with the supervison meter Id, this way the DTC knows that the HES wants the maximum demand values from the DTC.

S39	FIELD	DESCRIPTION	VALUE	Comments
1	IdRpt	Identifier of the report	S39	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		To address/identify the DTC's internal supervision meter, the following algorithm shall be used: "MMM**S**NNNNNNNNN", where -> MMM - stands for the manufacturer identifier as defined in the DLMS/COSEM Specification; -> S - identifies the meter as supervision meter; -> NNNNNNNNN - 9 right-hand digits of the DTC serial number;
	S39	DTC maximum demand values tag name identifier		DTC maximum demand values (DTC internal supervison meter)
6	MxAI	Max AI	W	
7	FxAI	Date/Time MxAI (Y/M/D H:M:S)	Timestamp	
8	MxAIa1	Max Aia1	W	
9	FxAIa1	Date/Time MxAIa1 (Y/M/D H:M:S)	Timestamp	
10	MxAIa2	Max Aia2	W	
11	FxAIa2	Date/Time MxAIa2 (Y/M/D H:M:S)	Timestamp	
12	MxAIa3	Max Aia3	W	
13	FxAIa3	Date/Time MxAIa3 (Y/M/D H:M:S)	Timestamp	
14	MxAE	Max AE	W	
15	FxAE	Date/Time MxAE (Y/M/D H:M:S)	Timestamp	
16	MxAEa1	Max AEa1	W	
17	FxAEa1	Date/Time MxAEa1 (Y/M/D H:M:S)	Timestamp	
18	MxAEa2	Max AEa2	W	
19	FxAEa2	Date/Time MxAEa2 (Y/M/D H:M:S)	Timestamp	
20	MxAEa3	Max AEa3	W	
21	FxAEa3	Date/Time MxAEa3 (Y/M/D H:M:S)	Timestamp	
22	MxR1	Max R1	W	
23	FxR1	Date/Time MxR1 (Y/M/D H:M:S)	Timestamp	
24	MxR1a1	Max R1a1	W	
25	FxR1a1	Date/Time MxR1a1 (Y/M/D H:M:S)	Timestamp	
26	MxR1a2	Max R1a2	W	
27	FxR1a2	Date/Time MxR1a2 (Y/M/D H:M:S)	Timestamp	
28	MxR1a3	Max R1a3	W	
29	FxR1a3	Date/Time MxR1a3 (Y/M/D H:M:S)	Timestamp	
30	MxR2	Max R2	W	

31	FxR2	Date/Time MxR2 (Y/M/D H:M:S)	Timestamp	
32	MxR2a1	Max R2a1	W	
33	FxR2a1	Date/Time MxR2a1 (Y/M/D H:M:S)	Timestamp	
34	MxR2a2	Max R2a2	W	
35	FxR2a2	Date/Time MxR2a2 (Y/M/D H:M:S)	Timestamp	
36	MxR2a3	Max R2a3	W	
37	FxR2a3	Date/Time MxR2a3 (Y/M/D H:M:S)	Timestamp	
38	MxR3	Max R3	W	
39	FxR3	Date/Time MxR3 (Y/M/D H:M:S)	Timestamp	
40	MxR3a1	Max R3a1	W	
41	FxR3a1	Date/Time MxR3a1 (Y/M/D H:M:S)	Timestamp	
42	MxR3a2	Max R3a2	W	
43	FxR3a2	Date/Time MxR3a2 (Y/M/D H:M:S)	Timestamp	
44	MxR3a3	Max R3a3	W	
45	FxR3a3	Date/Time MxR3a3 (Y/M/D H:M:S)	Timestamp	
46	MxR4	Max R4	W	
47	FxR4	Date/Time MxR4 (Y/M/D H:M:S)	Timestamp	
48	MxR4a1	Max R4a1	W	
49	FxR4a1	Date/Time MxR4a1 (Y/M/D H:M:S)	Timestamp	
50	MxR4a2	Max R4a2	W	
51	FxR4a2	Date/Time MxR4a2 (Y/M/D H:M:S)	Timestamp	
52	MxR4a3	Max R4a3	W	
53	FxR4a3	Date/Time MxR4a3 (Y/M/D H:M:S)	Timestamp	

8.18 Public Lighting status information [S44]

The S44 service report has the information about the public lighting meter configuration and status, for each one of the output relays. In case of meters with only 1 output relay, the DTC should generate the report with all tags but those related to output 2 should have null values.

S44	FIELD	DESCRIPTION	VALUE	NAT	Object	Clas	Logical name	Att	Comments
1	IdRpt	Identifier of the report	S44						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	S44	Public Lighting status information tag name identifier							
6	Fh	Meter Clock	Timestamp (date_time)		Clock	8	0.0.1.0.0.255	2	
7	OpModeO1	Public Lighting operation mode - Output relay 1	Integer (0,1,2,3,4)	R	IP control – Output relay 1 operating mode configuration	1	0.1.94.35.40.255	2	"0": IP switch off - permanent state "1": IP switch on - permanent state "2": Astronomical clock "3": Time switching table "4": Clock+Table combined (default mode)
8	OpModeO2	Public Lighting operation mode - Output relay 2	Integer (0,1,2,3,4)	R	IP control – Output relay 1 operating mode configuration	1	0.1.94.35.140.255	2	"0": IP switch off - permanent state "1": IP switch on - permanent state "2": Astronomical clock "3": Time switching table "4": Clock+Table combined (default mode)
9	StatusO1	Current status of Public lighting output relay 1	Integer (0,1)	R	Output Relay Control 1	70	0.1.96.3.10.255	3	"0": Disconnected "1": Connected
10	StatusO2	Current status of Public lighting output relay 2	Integer (0,1)	R	Output Relay Control 2	70	0.2.96.3.10.255	3	"0": Disconnected "1": Connected
11	PLfaultPTh	Power threshold for over consumption verification - IP circuit disconnected state	W	R	Power threshold for over consumption verification - IP circuit disconnected state	3	0.1.94.35.44.255	2	
12	PLVminPTh	Demand variation on public lighting circuit - minimum power threshold	W	R	Overall minimum power threshold for IP circuit	3	0.1.94.35.45.255	2	
13	PLVmaxPTh	Demand variation on public lighting circuit - maximum power threshold	W	R	Overall maximum power threshold for IP circuit	3	0.1.94.35.46.255	2	
14	PLfaultSt	Public lighting circuit fault status	Integer (0,1,2,3,4)	R	Public lighting circuit fault status	1	0.1.94.35.43.255	2	"0": No fault; "1": No consumption in Public Lighting circuit with "IP control - current status" **connected.** "2": Consumption higher then the configured threshold with"IP control - current status" **disconnected**. "3": Consumption in Public Lighting

									circuit under the configured minimum threshold with "IP control - current status" **connected**. "4": Consumption in Public Lighting circuit over the configured maximum threshold with "IP control - current status" **connected**.

8.19 Schedule tasks exclusion list order [P08]/[D08]

P08 and D08 allow the HES to manage meters with remote communication flexibilliy that appear in more than one DTC or virtual DTC. With the exclusion list, the DTC can remove one or more meters from the schedule tasks.

P08 – Schedule task exclusion list service that provide the list of meters on the exclusion list;
D08 – Schedule task exclusion list order used to configure the meter that should be included or removed from the exclusion list.

D08	FIELD	DESCRIPTION	VALUE	Comments
1	IdReq	Identifier of the Request	D08	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	D08	Meter insert and configuration tag name		
5	Cnt	Unique meter identifier		
6	ExcList	Operations to be done: It is possible to include or exclude each meter individually from the exclusion list. It is also possible to reset this list using this parameter.	0=Reset (i.e. remove) all meters included in the exclusion list 1=Include a meter in the exclusion list 2=Remove a meter from exclusion list	If Cnt Id="" and ExcList=0, the DTC should clear the exclusion list configuration for all the meters. A valid Cnt Id with ExcList=0 should be considered as a malformed request, ExcList=0 should only be used with Cnt Id="".
7	ExcTasks	List of tasks to which the meter is excluded. It should be used the TpTar Id of the tasks	String: e.g."S04,S05,S06,S09,S29"	The values should be separated by comma. If the string has the NULL value of if the tag is not present, the exclusion should be applicable to all tasks.

P08	FIELD	DESCRIPTION	VALUE	Comments
1	IdRpt	Identifier of the report	P08	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	P08	Report tag name identifier		
5	Fh	Date (Y/M/D H:M:S) of data retrieval	Timestamp	
	Meter	Tag for each meter in the list		
6	MeterId	Identifier of the meter	Meter Identifier	For each meter on the exclusion list
7	ExcTasks	List of tasks to which the meter is excluded. It should be used the TpTar Id of the tasks	String: e.g."S04,S05,S06,S09,S29"	NULL value means that the exclusion is for all tasks
11	Date	Date and time of the inclusion on the "exclusion List"	Timestamp	
	Meter			

This service P08 report structure is similar to that of the S24.

8.20 General clarifications

8.20.1 Clarification of MaxOrderOutdate, Maximum Execution Date and Execution Date

These parameters are used to control time attributes in order requests coming from HES.

Note that the explanation described in this section, has nothing to do with previous section related to scheduled tasks.

MaxOrderOutdate is a DTC parameter that allows control DTC time deviations in its internal clock when validating the window of time in which an order is accepted for execution.

Execution date (Fini, ActDate order attributes) is expected to be in the past. MaxOrderOutdate allows a deviation of it in the future.

Maximum Execution Date (Ffin order attribute) is expected to be in the future. MaxOrderOutdate allows a deviation of it in the past.

The DTC never keeps order requests received from HES scheduled considering these time information. It just validates the time window as described above and sends the order requests to meters with no time constraints to assure they are executed immediately. This way, the DTC can manage the collection of any report after the execution if required (after the ValuesCheckDelay parameter).

Note that when order retries occur, the time window should be validated on every retry.

If Figure 1 and Figure 2 conditions are matched, the order is executed immediately, with the priority management criteria as stated in the order request. The DTC does not schedule tasks.

Additionally, the activation/execution time included in the message sent from the DTC to the meter must be the Execution date (Fini, ActDate) included in the HES-DTC order.

If Figure 3 condition is not matched, the order is rejected immediately by the DTC and an error must be sent back to the HES: The condition for Execution date is not fulfilled (outside the allowed timeframe). Both, Execution date and Maximum Execution Date conditions must be fulfilled if these dates are included in the request.

Figure 1 Execution Date (Fini, ActDate) must be < than (DTCTime + MaxOrderOutdate)

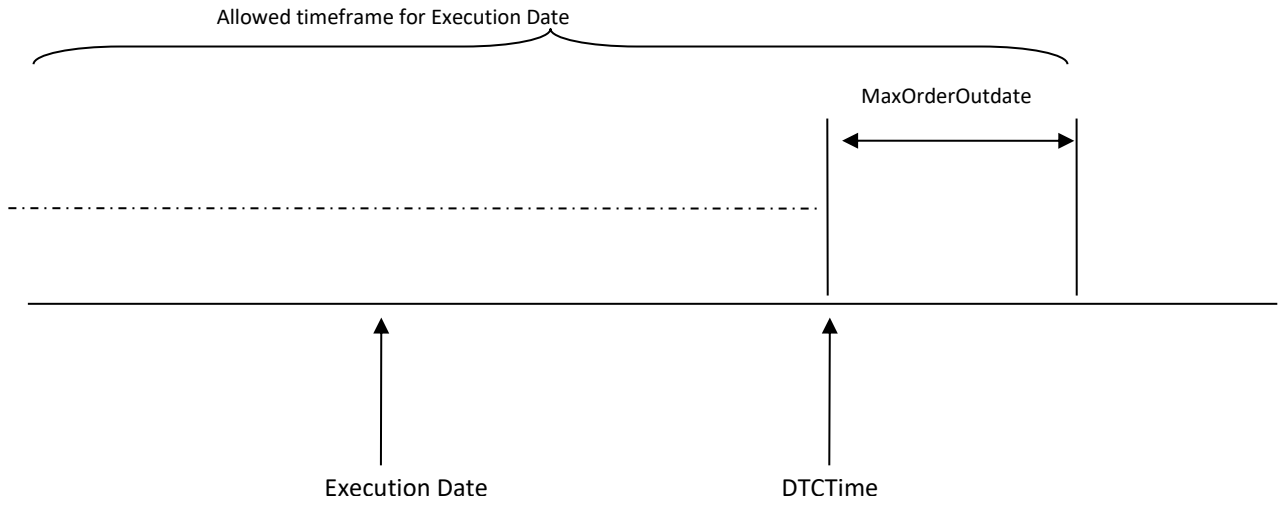


Figure 2. Maximum Execution Date (Ffin) date must be > than (DTCTime-MaxOrderOutdate)

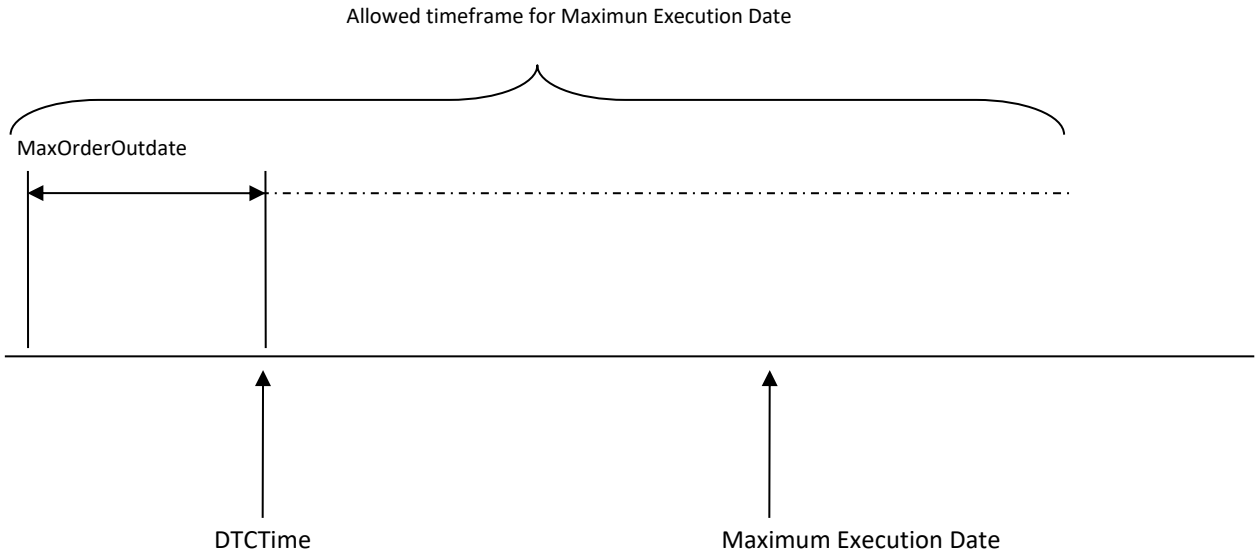
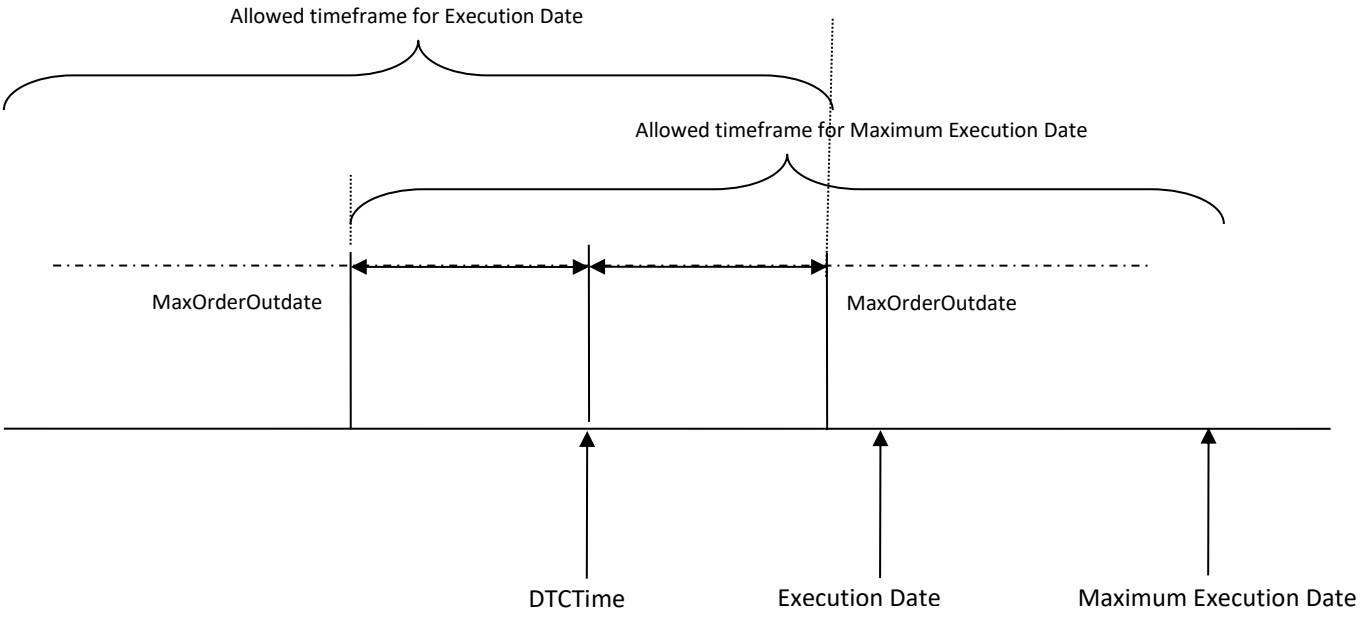


Figure 3. Execution Date (Fini, ActDate) which raises an error

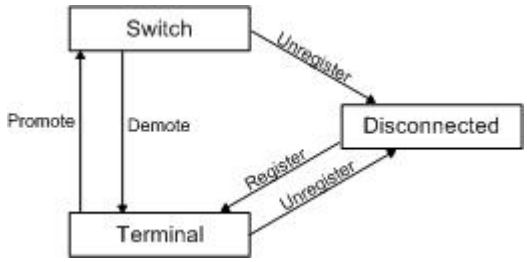


8.20.2 Clarification of meters managed by DTC

This section clarifies the differences between the reports used for collecting meters under DTC.
Note that a as mentioned in section 11 11.1 , a meter included in a B06 message would automatically be removed from the DTC. If the meter is discovered after this action, it would be treated as a completely new meter (this is the case when a S15 is sent to the HES).

8.20.2.1 Status of a meter (PRIME status)

A meter from PRIME point of view can be in the following three functional states



- **Disconnected**: Service Nodes start in a disconnected state. In this state a node is not capable of communicating or switching the traffic of another node. The primary function of a Service Node in this state is to search for an operational network in its proximity and try to register itself on it.
- **Terminal**: In this state a Service Node is capable of communicating its traffic by establishing connections, but it is not capable of switching the traffic of any other node.
- **Switch**: In this state a Service Node is capable of performing all Terminal functions. Additionally, it is capable of forwarding data to and from other devices on the subnetwork. It is a branch point on the tree.

Here is important clarify the next PRIME concepts.

- **Register**: The process by which a Service Node includes itself in the Base Node's list of attached devices. This process is a confirmation that a Service Node is part of a subnetwork. Thus, it is between the *Disconnected* state and the *Terminal* state.
- **Unregister**: The process by which a Service Node unlists itself from the Base Node. Unregister may be carried out for the sake of changing the point of connectivity or for other reasons. Following this process, a Node is no longer part of any subnetwork and this process thus results in transition to a *Disconnected* state.
- **Keep-alive:** The process used to detect when a Service Node has left the subnetwork. The time to assume the Service Node has been unregistered is a PRIME parameter.

Name	Length	Description
ALV.TIME	3 bits	Time to wait for an ALV_B messages before assuming the Service Node has been unregistered by the Base Node. ALV.TIME = 0 => 32 seconds ALV.TIME = 1 => 64 seconds ALV.TIME = 2 => 128 seconds ~ 2.1 minutes ALV.TIME = 3 => 256 seconds ~ 4.2 minutes ALV.TIME = 4 => 512 seconds ~ 8.5 minutes ALV.TIME = 5 => 1024 seconds ~ 17.1 minutes ALV.TIME = 6 => 2048 seconds ~ 34.1 minutes ALV.TIME = 7 => 4096 seconds ~ 68.3 minutes

For details, please refer to the latest version of the PRIME specification.

8.20.2.2 Status of a meter as of DTC-HES

A meter can be in the following PRIME connectivity status from DTC point of view:

- **Active (A):** This means it is connected to the PRIME network (either in terminal or in switch mode), and if the DTC would send it any request received from the HES, they will probably succeed.
- **Temporary Failure (TF)**: The meter is disconnected from the PRIME network during less than TimeDisconMeter. (PRIME status is disconnected: the meter didn't respond to the PRIME keep alive mechanism).
- **Permanente Failure (PF):** The meter has been disconnected from the network more than TimeDisconMeter.

A meter in TF or PF, can become active if it is again connected to the PRIME network and therefore starts responding to keep alive messages.

A meter can also be in the following DLMS security status, for each one of the secured clients (only for secure meters):

- **Active Key Pending (AKP)**: For secure meters. This means it is connected to the PRIME network but the DTC doesn´t have the access keys. A meter is in AKP status in the DTC when the S31 status is 0 (AKP0) or 1 (AKP1).
- **Active Key Wrong (AKW)**: For secure meters. This means it is connected to the PRIME network but the DTC access keys are wrong. A meter is in AKW status in the DTC when the S31 status is 2 (AKW2), 3 (AKW3) or 4 (AKW4).
- **Activated (AE)**: For secure meters. This means that the DLMS client is properly activated.

8.20.2.3 Meters to be considered in DTC scheduled tasks

Meters which are **Active or in TF** are those that should be included in DTC scheduled tasks which do not specify MeterIds (collection or readings, etc.) and in requests to DTC which affect to several meters (eg: MeterID explicitly included).
For the case of TF meters, they are included in the sense that the retry mechanism should be used. This means that if in the first attempt, the meter is in TF, the DTC will wait TimeRetryInterval for checking if it becomes active (and the task can be applied on it). If at the end of the retries the DTC does not succeed collecting data, it has to be included in the report to the DTC with the corresponding error codes.
The access to meters in PF state for a request with:

- IdMeters="" (null): The DTC shall NOT access to the PF meters, thus NO UMS for those meters is expected.
- IdMeter="XXXxxxxxxx, YYYyyyyyyy, …" (specified list of meters): The DTC shall NOT access to the PF meters, but reception of UMS for those meters is expected (MeterStatus=1, ErrCat=2, ErrCode=2) for HES transaction information.

The access to meters in PF state for a scheduled task is the same like request with IdMeters="" (null).

Only secure meters with the **Secure General Client Activated** are considered for the scheduled tasks. If the meter is on AKP or AKW states, the DTC should trigger again the S31 to request keys for this meter. Moreover, secure meters with the Secure General Client Activated shall be considered for the schedule talsks regardless of the activation state of the Secure Broadcast Client.

8.20.2.4. Report S20

This report includes all the meters which are attached to the DTC and available in the PRIME network (A, A(AE) – non-secure and secured meters), including those in temporary failure (TF).
This means, meters in permanent failure (PF), and secure meters with the Secure Broadcast Client status in Active Key Pending (AKP) or Active Key Wrong (AKW) are not included.

8.20.2.5. Report S24

This report includes all the meters that have been detected by the Base Node and are in the DTC database. This means active, TF, PF, AE (active with security), and AKP, AKW for both secure clients meters are included.
Regarding the Active attribute included, it refers to the meters included in the activity of the DTC, basically those with ComStatus 1, 2 or 3 (TF, A or AE).

8.20.2.6. Report S11

This report refers to all PRIME nodes that are included in the DTC. This includes therefore the base node and nodes in Terminal/Switch mode connected to it. These nodes can be meters, auxiliary nodes, etc…
Meters which are disconnected (TF and PF) are not included in this report because the base node does not have information of them.

8.20.2.7. Report S10

This lists a number of MAC addresses which belong to PRIME nodes that are not allowed to be connected to the network by the base node (the DTC). They could be meter MAC addresses or any other PRIME devices MACs.

Note that if a meter that has been detected by the Base Node (exists in the DTC database) is added to the intruder list, all information from the DTC database for that meter must be removed: Same as B06 but adding this meter to S10 list.

8.20.2.8. Report S15 Meter registering (Group 5 ,code 1)

This report is sent to the HES the first time a meter is registered in the DTC database. In the case of secured meters, the sequence of steps for sending this message is described in section **Error! Reference source not found.**8.16 (Meter key request [S31] description)
A change from PF or TF to active in a meter does not imply sending this report. Neither a reboot of the DTC or restart due to a power failure.
If a meter was removed through B06 and is registered again, this report is sent.
If a meter was added in the intruder list and is removed from it, this report is also sent.

8.20.3 Collect Flexible Data

This section Details the specification to collect flexible data from reports S04, S4B, S05, S5B, S27 and S29.

The goal of this specification is to clearly define how the DTC should manage the collection of meter data with flexible configuration, namely monthly billing values, daily billing values and load profile values through reports S04, S4B, S05, S5B, S27 and S29.
To avoid collecting the profiles configurations (capture_objects) from meters in each communication (which are not supposed to change very often and would result in an over traffic in PRIME network) and yet assure coherence between data and configuration, the DTC should manage an updated "configuration database" for each one of the registered meters (in addition to the data database).

For each meter, the DTC should manage the following configuration structures:

- ➔ Monthly billing configuration, retrieved from attribute #3 of dlms objects “0.0.98.1.c.255” - to be used in reports S04, S4B and S27;
- ➔ Daily billing configuration, retrieved from attribute #3 of dlms objects “0.0.98.2.c.255” - to be used in report S05 and S5B;
- ➔ Load profile configuration, retrieved from attribute #3 of dlms object “1.0.99.1.0.255” - to be used in report S29;

where “c=1 or 2”, depending on contract number.

The "configuration database" shall be created and updated according to the following algorithm.

8.20.3.1. Data collection mode

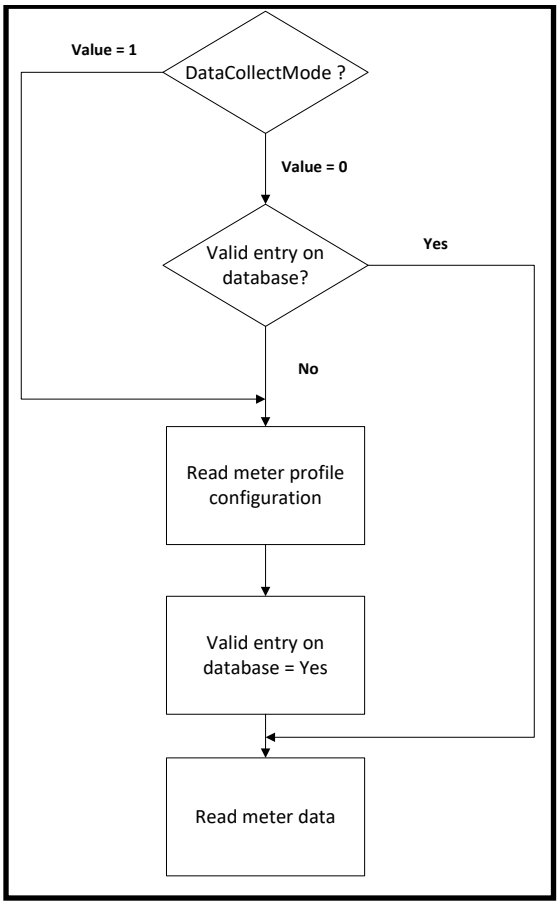
A new DTC parameter was created (DataCollectMode) to define the mode used to collect data with flexible configuration (monthly billing values, daily billing values and load profile values) from meters. This parameter is part of S12/B07 report. The DTC should always mind the “DataCollectMode” value to decide how to collect data with flexible configuration from meters.

With “DataCollectMode=0” the DTC should use its internal "configuration database" to identify the collected data. For a given meter:

- ➔ if valid information is already available in the "configuration database", the data should be collected from the meter without retrieving the corresponding profile configuration (this profile configuration already exists in the database);
- ➔ otherwise, DTC should read the profile configuration directly from meter before data collection.

With “DataCollectMode=1” the DTC should always read the profile configuration directly from the meter before every data collection, regardless of valid information is already available in the "configuration database".

See the following fluxogram:



8.20.3.2. “Configuration database” manage and update

With “DataCollectMode=0” the DTC should use its internal "configuration database" to decide if there is a need to read profile configuration before collect data. This decision shall be made for each meter and for each type of flexible data: monthly billing, daily billing and load profile. This means that DTC shall handle independent configuration structures for each registered meter.

Each new meter registered in DTC will have unknown profiles configuration, i.e. will not have valid information in DTC’s "configuration database". This means that the DTC does not know the measurements configured in the meter to be capture in monthly billing, daily billing and load profile.
For each meter, the update of the “configuration database” should be done only as result of request to collect data (reports S04, S4B, S05, S5B, S27 and S29). Whenever there is no entry (or valid entry) for a particular type of data, the DTC should collect the corresponding profile configuration and update the database. This update should be done separately for each type of data and only following the corresponding report requests.

This database shall be kept (for each meter and type of data) by DTC and records shall only be deleted according to the following use cases:

8.20.3.2.1 - Remote change of meter configuration (through HES or HMI)

Following an order to change meter’s monthly or daily billing configuration (through B30 order) or load profile configuration (through B29 order) the DTC should delete the corresponding entry from its internal “configuration database” and all the data stored with the old configuration. This operation should only take place after the end of the order, enabling the correct execution of the order (execution of related reports) and avoiding the loss of meaningful data.

The next data collection request will trigger a new read of meter's profile configuration and corresponding update of "configuration database".

8.20.3.2.2 - Local change of meter configuration

Specific spontaneous events should be generated from the meter to the DTC following a local configuration of meter's monthly billing, daily billing or load profile configuration.
The DTC should monitor this events to delete the corresponding entry from its internal "configuration database" and all the data stored with the old configuration.
The next data collection request will trigger a new read of meter's profile configuration and corresponding update of "configuration database".

Meter events to monitor:

- ➔ Event Group: 1; Event Code Number: 122 – Load profile configuration changed. This event should trigger the deletion of load profile configuration of meter "x" in "configuration database";
- ➔ Event Group: 1; Event Code Number: 131 – Monthly billing configuration of contract 1 changed. This event should trigger the deletion of monthly billing configuration of meter "x" in "configuration database";
- ➔ Event Group: 1; Event Code Number: 132 – Monthly billing configuration of contract 2 changed. This event should trigger the deletion of monthly billing configuration of meter "x" in "configuration database";
- ➔ Event Group: 1; Event Code Number: 133 – Daily billing configuration of contract 1 changed. This event should trigger the deletion of daily billing configuration of meter "x" in "configuration database";
- ➔ Event Group: 1; Event Code Number: 134 – Daily billing configuration of contract 2 changed. This event should trigger the deletion of daily billing configuration of meter "x" in "configuration database";

8.20.3.2.3 - Explicit order to delete entries from “configuration database” (through HES or HMI)

Following an explicit order to delete entries from “configuration database” for one, multiple or all registered meters. This operation can be performed using the order B28 (Meter Actions), namely through tag "CfgDBRst". The corresponding data stored with the old configuration should also be deleted from DTC.
The next data collection request will trigger a new read of meter’s profile configuration and corresponding update of “configuration database”.

8.20.3.2.4 - Incoherent data retrieved from the meter

If the size and/or type of collected data is not coherent with the configuration stored in the “configuration database”, the corresponding entry should be deleted along with all the data stored with the old configuration.
The next data collection request will trigger a new read of meters profile configuration and corresponding update of “configuration database”.

9 ORDERS FROM THE HES TO THE METER

9.1 General Clarifications

9.1.1 Execution date

Execution date is expected to be in the past, so DTC does not keep orders latent before sending them to meters.
The rules for control of dates in orders are clarified in section 7
Execution date and activation date can be considered as synonyms. Depending on the order, one or the other is included.

9.1.2 Order confirmation

DTC must explicitly verify all orders or configuration changes on meters triggered by a request from HES.
The DTC will send the order required to the meter (write) and will receive from the meter the DLMS write confirmation. Later, after the “ValuesCheckDelay”, in order to verify the correct execution of the order, the DTC will get a reading of the OBIS codes required to validate that changes took place in the meter.
This will conclude the execution phase of the order.
In order relating to meters synchronization such as B11-T03, B11-T07 will not be necessary to verify the correct execution of the order by reading the OBIS object to meter clock: {8,0-0:1.0.0.255,2} from the meters.

9.1.3 Order Sequence

Sending an Order Request from the HES to a meter can lead to the execution of different phases or steps (download file update, previous reports generation, execution phase, generation of subsequent reports, etc.). These phases will run on the DTC sequentially so that one phase cannot be started until full completion of the previous one.
In case of a failure in the execution of one step, the sequence of execution should be stopped and the status of the order should be notified to the HES through UMS and URS with the appropriate error category and code.
To more details and clarification examine user cases shown in Annex C.

9.1.4 Order execution for more than one meter

All orders (and services) implemented on the DTC can be sent, by the HES, for more than 1 meter. To do it, the content of the message should have duplicated “cnt” structure, one for each meter.
The DTC should try to execute the order for each one of the meters mentioned. If an error occur, the DTC should proceed to the next meter and report that error with proper UMS error codes.
If applicable (some orders do not generate reports), the DTC can send all the content of the information in one file or message or in multiple files, one for each meter. If the report is a file, the DTC should also send only one URS=1 (with the name of that file), for each file sent, a UMS for all the meters or one for each meter and an URS=0 in the end. Please note that only one URS=0 (or with an error code) can be sent, at the end of the order.

9.1.5 Sending Orders (Bxx) to multiple meters

The purpose of this section is to clearly define how to send Orders (Bxx) to multiple meters at the same time.
To send an order request to the DTC to be applied to multiple meters, the HES shall send, in the same xml, the content of the order to execute to the "n" meters. Apart from the order's header, all tags shall be repeated for each meter. Please mind the examples below:

```
<Order IdPet="1" IdReq="B03" Version="3.4_EDP_2.0">
  <Cnc Id="MMMNNNNNNNNNN">
    <Cnt Id="MMMNNNNNNNNN1">
      <B03 Fini="20140300000000000W" Ffin="20140310000000000W" Order="0"/>
    </Cnt>
```

```
      <Cnt Id="MMMNNNNNNNNN2">
        <B03 Fini="20140300000000000W" Ffin="20140310000000000W" Order="0"/>
      </Cnt>
      <Cnt Id="MMMNNNNNNNNN3">
        <B03 Fini="20140300000000000W" Ffin="20140310000000000W" Order="0"/>
      </Cnt>
      <Cnt Id="MMMNNNNNNNNN4">
        <B03 Fini="20140300000000000W" Ffin="20140310000000000W" Order="0"/>
      </Cnt>
    </Cnc>
  </Order>
```

9.2 Power Modification [B02]

The HES sends a request detailing the meters where to apply the power limit change. These values only apply to one contract (contract 1) and can specify up to 6 tariff periods (should be defined consistently with the contract definition).
This configuration is activated at the activation time. This activation time is independent from that of the contract.

B02	FIELD		DESCRIPTION	VALUE	Object	Clas	Logical Name	At
1	IdReq		Identifier of the request	B02				
2	IdPet		Unique request identifier					
3	Version		Version Identifier	3.4_EDP_2.0				
4	Cnc		Concentrator identifier					
5	Cnt		Unique meter identifier					
	B02		Power modification tag name					
6	ActDate		Activation date (e.g. : “20100101000000000W”)	Timestamp				
	Contrato1							
7		TR1	Tariff rate 1	VA (integer)	Passive Demand Control Threshold T1	3	0.1.94.35.11.255	2
8		TR2	Tariff rate 2	VA (integer)	Passive Demand Control Threshold T2	3	0.1.94.35.12.255	2
9		TR3	Tariff rate 3	VA (integer)	Passive Demand Control Threshold T3	3	0.1.94.35.13.255	2
10		TR4	Tariff rate 4	VA (integer)	Passive Demand Control Threshold T4	3	0.1.94.35.14.255	2
11		TR5	Tariff rate 5	VA (integer)	Passive Demand Control Threshold T5	3	0.1.94.35.15.255	2
12		TR6	Tariff rate 6	VA (integer)	Passive Demand Control Threshold T6	3	0.1.94.35.16.255	2

Reports to produce when proceeding to B02: same as reports for tariff change (B04).
For a description of the power modification procedure refer to the Annex C section 16.1.13 and 16.1.14 , which show sequence diagrams with all messages and information exchanged between HES and DTC.

9.3 Disconnection / Reconnection [B03], [S18]

When the DTC receives a disconnection or reconnection order for one or more meters, DTC shall validate that its date is between execution date and max execution date. If so, it will send the request to the Meter. There is no scheduling of tasks in the DTC. In addition, scheduling requests in meters will not be used. The procedure will be as follows:

1. Obtain a current billing values report [S27] to be sent to the HES.
2. Operate the meter contactor.
3. The DTC should confirm the order execution reading the meter disconnector status. To check the status, the DTC should apply the “ValuesCheckDelay” parameter in order to sure the final status.

Necessary information in the request:

B03	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At	Comments
1	IdReq	Identifier of the request	B03					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					

4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	B03	Power modification tag name						
6	Fini	Execution date (e.g. : "20100101000000000W")	Timestamp					
7	Ffin	Maximum Execution Date (e.g. : "20100101000000000W")	Timestamp					To be managed by DTC
8	Order	Type of order to execute	0=OPEN, 1=CLOSE 2=CLOSE RECONNECT	Disconnect Control	70	0.0.96.3.10.255	2	

The value 2 (close reconnect) in field order is used to reconnect remotely the meter and when the internal state of the disconnect control object of the meter is in state Ready_for_reconnection (2). When the HES send a B03 with Order field to 2, the DTC should check previously the internal control_state of the meter. If the previous state is Disconnected (0) or Connected (1), the DTC should abort the order execution notifying to the HES the final execution with MS=1 (ErrCat=3, ErrCode=6). If the previous state is Ready_for_reconnection (2), the DTC should send a disconnect order to the meter, wait "ValuesCheckDelay" and verify the current control_state. The meter must pass to disconnected (0) state. In this moment, the DTC should send a reconnect order to the meter and the meter will be to connected (1) state finally.
For more information about the Disconnect control interface class management see the Anexo A of the DEF-C44-507.
Attempts to modify the contactor state must be done between execution date and maximum execution date.
Annex C depicts a sequence diagram with all messages and information exchange between HES and DTC.
The S18 report is not included in the disconnection/reconnection process, but the HES can request it through an asynchReportRequest to the DTC in order to get the status of the last order executed and the execution date, at which it was executed, it includes with the following information:

S18	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S18
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
5	Cnt	Unique meter identifier	
	S18	Basic Instant Values tag name	
6	Fh	Order execution date/time (e.g. : "20100101000000000W")	Timestamp
7	Orden	Executed order	0=OPEN, 1=CLOSE

9.4 Contract Modifications [B04]

The contract information is changed in the latent tariff with a date of activation. In this date, the meter will activate the latent tariff.
B04 can configure up to 2 contracts in a single message. Meters have always 2 ative contracts that could be differently configured and two passive contracts.

For a description of the contract modification procedure refer to the annex C section 16.1.13 and 16.1.14 which show sequence diagrams with all messages and information exchanged between HES and DTC.
A S04 is registered automatically in the meter when the contract change is done.
Reports that should to be sent to the HES (using the request idPet):

- S04 (requested to meter at contract change date + ValuesCheckDelay, the one created in the meter at contract change).

The completion of the request has to be notified through the UpdateMetersStatus and UpdateRequestStatus web services, as described in Annex C.

All reports have to be tagged with the same IdPet as the original request.
Additionally, the S04 that corresponds to the tariff change has not to be pushed again during next monthly push.

B04	FIELD	DESCRIPTION		VALUE	Object	Clas	Logical Name	At	Comment
1	IdReq	Identifier of the request		B04					
2	IdPet	Unique request identifier							
3	Version	Version Identifier		3.4_EDP_2.0					
4	Cnc	Concentrator identifier							
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	B04	Contract modification tag name							
	Contract								
6		c	contract number	Integer(1,2) ej. “1”	Activity Calendar		0.0.13.0.**c**.255		Only values 1,2 apply for EDP. c=1,2 for contracts 1 and 2 respectively
7		CalendarType	season or summer/winter	Octet-string hexadecimal Ej:”01”, “0A”					
8		CalendarName		Octet-string hexadecimal Ej: “202020202020”, “”444F424C455F”	Activity Calendar	20	0.0.13.0.**c**.255	6	
9		ActDate	Activation date	Timestamp Ej:”20110325122346000W”	Activity Calendar	20	0.0.13.0.**c**.255	10	
21		BDate		Octet-string hexadecimal. Billing Date Eg: "FFFFFF08FF00000000800000" -> end of billing to be performed every 8th day of the month at 00:00.	Passive end of billing period 1	1	0.0.94.35.**x**.255	2	For c=1, x=41 Forc=2, >x=42
		<Season>							
10			Name	Octet-string hexadecimal. Name of defined season Ej:”01”	Activity Calendar	20	0.0.13.0.**c**.255	7	
11			Start(2)	Octet-string hexadecimal (only considered year, month, day, hour) Ej: “FFFF0101FF00000000800000”	Activity Calendar	20	0.0.13.0.**c**.255	7	
12			Week	This is the associated week. Octet-string hexadecimal. Link with week info. Ej:”01”	Activity Calendar	20	0.0.13.0.**c**.255	7	
		</Season>							
		<Week>							
13			Name	Octet-string hexadecimal. Name week for later definition. Up to 12 can be defined. Ej:”01”, “0A”	Activity Calendar	20	0.0.13.0.**c**.255		
14			Week	Octet-string hexadecimal Ej:”01010101010101”	Activity Calendar	20	0.0.13.0.**c**.255		
		</Week>							
		<Day>							
15			id	Octet-string (1) hexadecimal. Day definition, a number identifies each day. Up to 24 can be defined. Ej:”01”, “0A”	Activity Calendar	20	0.0.13.0.**c**.255	9	
			<Change>						
16			Hour(2)	octet string hexadecimal (4): 12000000. Currently only the hour is used. Ej: “0C000000”	Activity Calendar	20	0.0.13.0.**c**.255	9	start_time (Hour), script_logical_name (dummy script) e script_selector (Tariff rate).

										Minutes included in time of rate changes (tag "Hour") shall not be ignored by the DTC. 15 minutes resolution is needed for Portuguese tariff schemes.
17				TariffRate	long-unsigned hexadecimal (2 bytes). Ej: "0001"	Activity Calendar	20	0.0.13.0.**c**.255	9	start_time (Hour), script_logical_name (dummy script) e script_selector (Tariff rate).
			</Change>							
		</Day>								
		<SpecialDays>			This tag might exist only when special Days apply for that contract					
18			DT		Date of the special day. Timestamp Ej: "20111225000000000W"	Passive Special Days Table	11	0.0.11.0.c.255	2	Only values c=1,2 apply
19			DTCard		Y= If year is ignored (applies to all year, the DTC will consider year as wildcard when updating meter). N= Year is not ignored	-		-		
20			DayID		This is the ID defined previously. DH to be applied for this day. Octet-string (1) hexadecimal Ej:"01", "0A"	Passive Special Days Table	11	0.0.11.0.c.255	2	Only values c=1,2 apply
		<SpecialDays>								
	Contract									

(1)CalendarType: In case of 2, there is a definition of seasons (always 2 seasons, winter and summer), the DTC will only consider the MONTH definition included in the start timestamp attribute.
(2) All data format in start time and hour attributes should be used considering as a reference the Blue Book.

NOTE: Minutes included in time of rate changes (tag "Hour") shall not be ignored by the DTC. 15 minutes resolution is needed for Portuguese tariff schemes.

General comments: minutes and seconds included in time of rate changes are ignored by the DTC.

The indexes encoded as OCTET-STRINGS are composed of 6 chars. They must be alphanumeric characters. When shorter than 6 the DTC will fill it with blanks automatically.

Note on special days: They are latent together with the contract.

The DT attribute for defining the date of special days

Note additionally following considerations:

- ActDate in latent contract can have wildcards, then 'F' should be used needed (eg: consider FFFF instead of the year when it is not defined).

- TariffRate: in the blue book it is mentioned that this value can be long unsigned. Although we will never have more than 6, values will be from '0001' to '0006'.

- In special days definition, wildcards are not considered with FFFF, the DTCard flag is used (see example below).

Similarly to S23, the structure for B04 order should include only the information (tags) required for the definition of the contracts configuration (Eg1: It is possible to set only contract 1 and do not change contract 2. Eg2: if no special days are defined, this tag can be skipped).
The following examples illustrate the above described message definition.

9.4.1 Example S23 contract definition.

```
<Report IdRpt=”S23” IdPet=”0” Version=”3.4_EDP_2.0”>
  <Cnc Id=”DTC1234567890”>
    <Cnt Id=”KFM1723000008”>
      <S23 Fh=”20190321082305000W”>
        <Pcact ActDate=”20190309103539000W”>
          <Contrato1 TR1=”10000” TR2=”10000” TR3=”10000” TR4=”10000” TR5=”10000” TR6=”10000”/>
        </Pcact>
        <PCLatent ActDate=”FFFFFFFFFFFFFFFFFF8000FF”>
          <Contrato1 TR1=”10000” TR2=”10000” TR3=”10000” TR4=”10000” TR5=”10000” TR6=”10000”/>
        </PCLatent>
         <ActiveCalendars>
           <Contract c=”1” CalendarType=”01” CalendarName=”464646312020” ActDate=”20190309103539000W”
BDate="FFFFFF16">
               <Season Name=”01” Start=”FFFF03FE0701000000800000” Week=”01” />
               <Season Name=”02” Start=”FFFF0AFE0702000000800080” Week=”01” />
               <Week Name=”01” Week=”01010606070809” />
               <Week Name=”02” Week=”01010606020304” />
               <Day id="01">
                      <Change Hour="00000000" TariffRate="0001"/>
                      <Change Hour="08000000" TariffRate="0003"/>
                      <Change Hour="0A1E0000" TariffRate="0002"/>
                      <Change Hour="0D000000" TariffRate="0003"/>
                      <Change Hour="131E0000" TariffRate="0002"/>
                      <Change Hour="15000000" TariffRate="0003"/>
                      <Change Hour="16000000" TariffRate="0001"/>
               </Day>
               <Day id="02">
                      <Change Hour="00000000" TariffRate="0001"/>
                      <Change Hour="08000000" TariffRate="0003"/>
                      <Change Hour="09000000" TariffRate="0002"/>
                      <Change Hour="0A1E0000" TariffRate="0003"/>
                      <Change Hour="12000000" TariffRate="0002"/>
                      <Change Hour="141E0000" TariffRate="0003"/>
                      <Change Hour="16000000" TariffRate="0001"/>
               </Day>
           </Contract>
                <Contract c="2" CalendarType="01" CalendarName="444444542020" ActDate="20171107155419000W"
       BDate="FFFFFF0E">
                      <Season Name="01" Start="FFFF03FE0701000000800000" Week="01"/>
                      <Season Name="02" Start="FFFF0AFE0702000000800080" Week="02"/>
                      <Week Name="01" Week="01010101010101"/>
                      <Week Name="02" Week="02020202020203"/>
                      <Day id="01">
                             <Change Hour="00000000" TariffRate="0001"/>
                             <Change Hour="08000000" TariffRate="0003"/>
                             <Change Hour="0A1E0000" TariffRate="0002"/>
                             <Change Hour="0D000000" TariffRate="0003"/>
                             <Change Hour="131E0000" TariffRate="0002"/>
                             <Change Hour="15000000" TariffRate="0003"/>
                             <Change Hour="16000000" TariffRate="0001"/>
                      </Day>
                      <Day id="02">
                             <Change Hour="00000000" TariffRate="0001"/>
                             <Change Hour="08000000" TariffRate="0003"/>
                             <Change Hour="09000000" TariffRate="0002"/>
                             <Change Hour="0A1E0000" TariffRate="0003"/>
                             <Change Hour="12000000" TariffRate="0002"/>
                             <Change Hour="141E0000" TariffRate="0003"/>
```

```
                        <Change Hour="16000000" TariffRate="0001"/>
                    </Day>
                    <Day id="03">
                        <Change Hour="00000000" TariffRate="0001"/>
                        <Change Hour="08000000" TariffRate="0001"/>
                        <Change Hour="09000000" TariffRate="0002"/>
                        <Change Hour="0A1E0000" TariffRate="0003"/>
                        <Change Hour="12000000" TariffRate="0001"/>
                        <Change Hour="141E0000" TariffRate="0002"/>
                        <Change Hour="16000000" TariffRate="0003"/>
                    </Day>
                    <SpecialDays DT="ffff01010000000000W" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff04250000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff05010000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff06100000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff08150000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff12080000000000W" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff12250000000000W" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="20130329000000000W" DTCard="N" DayID="03"/>
                    <SpecialDays DT="20130331000000000W" DTCard="N" DayID="03"/>
                </Contract>
            </ActiveCalendars>

            <LatentCalendars>
                <Contract c="1" CalendarType="01" CalendarName="434343542020"
ActDate="FFFFFFFFFFFFFFFFFF8000FF">
                    <Season Name="01" Start="FFFF03FE0701000000800000" Week="01"/>
                    <Season Name="02" Start="FFFF0AFE0702000000800080" Week="02"/>
                    <Week Name="01" Week="01010101010101"/>
                    <Week Name="02" Week="02020202020202"/>
                    <Day id="01">
                        <Change Hour="00000000" TariffRate="0001"/>
                        <Change Hour="08000000" TariffRate="0003"/>
                        <Change Hour="0A1E0000" TariffRate="0002"/>
                        <Change Hour="0D000000" TariffRate="0003"/>
                        <Change Hour="131E0000" TariffRate="0002"/>
                        <Change Hour="15000000" TariffRate="0003"/>
                        <Change Hour="16000000" TariffRate="0001"/>
                    </Day>
                    <Day id="02">
                        <Change Hour="00000000" TariffRate="0001"/>
                        <Change Hour="08000000" TariffRate="0003"/>
                        <Change Hour="09000000" TariffRate="0002"/>
                        <Change Hour="0A1E0000" TariffRate="0003"/>
                        <Change Hour="12000000" TariffRate="0002"/>
                        <Change Hour="141E0000" TariffRate="0003"/>
                        <Change Hour="16000000" TariffRate="0001"/>
                    </Day>
                </Contract>
                <Contract c="2" CalendarType="01" CalendarName="444444542020"
ActDate="FFFFFFFFFFFFFFFFFF8000FF">
                    <Season Name="01" Start="FFFF03FE0701000000800000" Week="01"/>
                    <Season Name="02" Start="FFFF0AFE0702000000800080" Week="02"/>
                    <Week Name="01" Week="01010101010101"/>
                    <Week Name="02" Week="02020202020203"/>
                    <Day id="01">
                        <Change Hour="00000000" TariffRate="0001"/>
                        <Change Hour="08000000" TariffRate="0003"/>
                        <Change Hour="0A1E0000" TariffRate="0002"/>
                        <Change Hour="0D000000" TariffRate="0003"/>
                        <Change Hour="131E0000" TariffRate="0002"/>
                        <Change Hour="15000000" TariffRate="0003"/>
                        <Change Hour="16000000" TariffRate="0001"/>
                    </Day>
                    <Day id="02">
                        <Change Hour="00000000" TariffRate="0001"/>
                        <Change Hour="08000000" TariffRate="0003"/>
                        <Change Hour="09000000" TariffRate="0002"/>
                        <Change Hour="0A1E0000" TariffRate="0003"/>
                        <Change Hour="12000000" TariffRate="0002"/>
                        <Change Hour="141E0000" TariffRate="0003"/>
                        <Change Hour="16000000" TariffRate="0001"/>
                    </Day>
                    <Day id="03">
                        <Change Hour="00000000" TariffRate="0001"/>
                        <Change Hour="08000000" TariffRate="0001"/>
                        <Change Hour="09000000" TariffRate="0002"/>
                        <Change Hour="0A1E0000" TariffRate="0003"/>
                        <Change Hour="12000000" TariffRate="0001"/>
```

```
                        <Change Hour="141E0000" TariffRate="0002"/>
                        <Change Hour="16000000" TariffRate="0003"/>
                    </Day>
                    <SpecialDays DT="ffff01010000000000W" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff04250000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff05010000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff06100000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff08150000000000S" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff12080000000000W" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="ffff12250000000000W" DTCard="Y" DayID="03"/>
                    <SpecialDays DT="20130329000000000W" DTCard="N" DayID="03"/>
                    <SpecialDays DT="20130331000000000W" DTCard="N" DayID="03"/>
                </Contract>
            </LatentCalendars>
            </S23>
            </Cnt>
            </Cnc>
            </Report>
```

9.4.2 Example B04 contract modification (only contract 1)

```
            <Order>
               <IdPet>0406</IdPet>
               <Format>0</Format>
               <Order> <Order IdPet="406" IdReq="B04" Version="3.4_EDP_2.0">
                <Cnc Id="XYZ1404355247">
                <Cnt Id="ABC1723000028">
                   <B04><Contract ActDate="20151019183023110S" BDate="FFFFFF1EFF00000000800000"
CalendarName="434433542020" CalendarType="01" c="1">
                   <Season Name="01" Start="FFFF03FE0701000000800000" Week="01"/>
                   <Season Name="02" Start="FFFF0AFE0702000000800080" Week="02"/>
                   <Week Name="01" Week="01010101010101"/>
                   <Week Name="02" Week="02020202020202"/>
                   <Day id="01">
                          <Change Hour="00000000" TariffRate="0001"/>
                          <Change Hour="08000000" TariffRate="0003"/>
                          <Change Hour="0A1E0000" TariffRate="0002"/>
                          <Change Hour="0D000000" TariffRate="0003"/>
                          <Change Hour="131E0000" TariffRate="0002"/>
                          <Change Hour="15000000" TariffRate="0003"/>
                          <Change Hour="16000000" TariffRate="0001"/>
                   </Day>
                          <Day id="02">
                                 <Change Hour="00000000" TariffRate="0001"/>
                                 <Change Hour="08000000" TariffRate="0003"/>
                                 <Change Hour="09000000" TariffRate="0002"/>
                                 <Change Hour="0A1E0000" TariffRate="0003"/>
                                 <Change Hour="12000000" TariffRate="0002"/>
                                 <Change Hour="141E0000" TariffRate="0003"/>
                                 <Change Hour="16000000" TariffRate="0001"/>
                      </Day>
                   <SpecialDays DT="20180101000000000W" DTCard="Y" DayID="02"/>
                   <SpecialDays DT="20180501000000000W" DTCard="Y" DayID="02"/>
                   <SpecialDays DT="20181225000000000W" DTCard="Y" DayID="02"/>
                   <SpecialDays DT="20180610000000000W" DTCard="Y" DayID="02"/>
                   <SpecialDays DT="20180709000000000W" DTCard="N" DayID="02"/>
                   <SpecialDays DT="20180710000000000W" DTCard="N" DayID="02"/>
               </Contract></B04></Cnt>
               </Cnc></Order>
            </Order>
```

9.5 Meter firmware update [B05], [S19]

The firmware updating in one or more meters will be done in two phases. First the HES will send a WS order to the DTC notifying the need for firmware update [B05]. Then the DTC will start the update process by downloading the firmware from a ftp server. Once the previous step is concluded, the firmware is sent to meters and the update takes place. As meters are updated, the DTC will report it to the HES through S19 messages.
The integrity of the image will be guaranteed before activating it.
Annex C, section 16.5.3describes the sequence of messages exchange between HES and DTC in meter firmware update.

B05	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdReq	Identifier of the request	B05	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	B05	Meter firmware update tag name		
6	ActDate	Activation date at which the process update should start in the DC	Timestamp (e.g. : "20100101000000000W")	
7	Firmware	Firmware location and filename (full path and name)	String	
8	ActProt	Activation protocol to be used: Either PRIME or DLMS	String	The ActProt tag selects the firmware upgrade method. The PRIME method can be used to upgrade the application or communciation firmware.
9	Mult	Identifier to specify the method to update groups of meters: UN=Unicast, MU=Multicast, BO=Both.(1)	String UN,MU,BO	

(1) Select Update Method by choosing Unicast, Multicast or Both.

- "Unicast" will update meters one at a time, even if multiple meters are configured to be updated.
- "Multicast" will update multiple meters at the same time.
- "Both" will first attempt to upgrade all configured meters at the same time, if a meter reaches its configured retries limit ("RetryDisconMeter" parameter) then that meter will be added to the Unicast List. When the Broadcast method is complete, then the meters that were added to the Unicast List will be updated one at a time. This method helps when meters are in a dynamic environment.

Note: typically in PLC prime network, the firmware file is split into pieces and sent to the meters through multicast messaging. Meter update process will probably finish at similar times in the updated meters.
Once the updating has been executed, the DTC will send a confirmation report to the HES:

Note: It is also possible to request an assynchronous S19 from the HES. In this case the DTC should read the firmware information from the meter and then reply with the S19 report to the FTP and .

S19	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At
1	IdRpt	Identifier of the request	S19				
2	IdPet	Unique request identifier					
3	Version	Version Identifier	3.4_EDP_2.0				
4	Cnc	Concentrator identifier					
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2
	S19	Report tag name identifier					
6	Fh	Order execution date/time (e.g. : "20100101000000000W")	Timestamp				
7	Vf	Firmware version	String	Active core firmware identifier	1	1.0.0.2.0.255	2
8	Vprime	Prime Firmware version	String	PRIME PLC Application identification	86	0.0.28.7.0.255	2
13	Vfapp	Application Firmware version	String	Active application firmware identifier	1	1.1.0.2.0.255	2
12	CommFW	Communication Firmware	String	Communication module active firmware identifier	1	1.2.0.2.0.255	2
9	ErrCat	Error category if request failed (otherwise null)					
10	ErrCode	Error code if request failed (otherwise null)					
11	FwType	Firmware type. Indicates the type of the last Firmware update.	String "DLMS" or "PRIME"				

The DTC will handle an owner retry logic in FW update meters to ensure the success of any updates. This logic should not be based on the parameters "TimeRetryIntervalFirm" and "RetryDisconMeterFirm". For example, in case of a communication failure or non response during the image transfer, the DTC should retry to send the last data block in order to avoid restart the all transfer process (in this case this last block retries should be done within the firmware client session timeout).
Any alternative implementation, diffent to what is mentioned on section 9.5.1 , should be accepted and validated by EDP Distribuição

In order to minimize the effort and time of the upgrade process and to avoid collateral negative impact in the upgrade process itself, the values to include in the tags "Vf", "Vprime", "Vfapp" and "CommFW" of the report to be sent following an upgrade may be managed in an alternative way rather than to be collected at the end of the upgrade process from the meters through DLMS.

In this sense, the following may be considered as an alternative:

1. The values of fields "Vf", "Vprime", "Vfapp" and "CommFW" may be collected from the meters right at the registering process and stored in the DTC database. This values have to be updated following specific reports where these values are collected and following an upgrade process. A periodical specific task may also be considered as a complement of the latter.
2. Based on the value of tag "ActProt" (PRIME or DLMS), on the content of the new firmware filename ("MMM_modelcode_PRIME_Vxxxx" or "MMM_modelcode_DLMS_Vxxxx") and on the success of the upgrade operation (with or without success), the DTC may upgrade the values of tags "Vprime", "Vfapp" and "CommFW" without reading the data directly from the meters.

It is also possible to send an assynchornous request from the HES to collect the S19. In this case the DTC should collect the information directly from the meter send a web service with the S19 report.

9.5.1 Meter Broadcast firmware upgrade

If that “Mult” is set to “MU”, then the DTC should efectute a broadcast firmware upgrade for the meters included on the B05 order.

The following steps should be done by the DTC:

1. Establish a unicast DLMS session with everyone of the meters:
    a. For non secure meters the DTC should establish a DLMS session with client 3 (firmware client)
    b. For secure meters the DTC should use the DLMS client 5 ($GUEK_{bro}$ and GAK_{bro} keys)
2. Activate the firmware upgrade image transfer in each meter “image_transfer_enabled” in unicast: SET {18,0.0.44.0.0.255,5}
3. Check the “image_block_size” in unicast: GET {18,0.0.44.0.0.255,2}. The DTC can assume that the block size is the same for all meters (same vendor/model), so it can read only the block size from one equipment;
4. Activate the “image_transfer_initiate” in unicast: ACTION {18,0.0.44.0.0.255,1}. The “image_identifier” needed on this method should be following:
    a. "FLAG_ID[3]"_"model_code[2]"_"fw_type"_"version[5]"
    In which:
    FLAG_ID[3] : flag ID from the manufacturer
    model_code[2]: hexadecimal representation from the meter type and communciation. This is defined by EDP;
    fw_type: firmware type
    (DLMS[4], PRIME[5] or GPRS[4]);
    version[5]: firmware version with the following format vXXXX.
5. Send the image through “image_block_transfer” in broadcast: ACTION {18,0.0.44.0.0.255,2}
    a. Use the broadcast LNID (0x3FFF) at the PRIME level;
    b. At DLMS level execute “action-request” with the bit 6 (service-class) of the “Invoke-Id-And-Priority” set to “0” to indicate that it is a not confirmed service (no answer from the meter). For secure meters it should be used the GBEK and GAK_{bro} keys.
6. At the end of all block transfer, check the missing blocks in unicast, for each meter. Preferencially it should read the “image_transferred_block_status”: GET {18,0.0.44.0.0.255,3};
7. Repeat step 5 for the missing blocks;
8. Repeat steps 6 and 7 until the image is completed on all meters listed on the B05
    a. Maximum number of retries to send the blocks should be “RetryDisconMeterFirm"
    Any other alternative implementation should be accepted and validated by EDP Distribuição
    b. Steps 6 should not be executed to meters with a completed image
9. Execute the “image_verify” in unicsast for the meters with the firmware transfer already finished: ACTION {18,0.0.44.0.0.255,3};
10. Check the “image_transfer_status” in unicast: GET {18,0.0.44.0.0.255,6}
    a. Please note that the image verification may take a while, depending on the meter implementation
    b. While the meter reply with status (2), the DTC should keep the meter pending and try with another one and wait “TimeRetryIntervalFirm” between retries and try “RetryDisconMeterFirm” times.
    Any other alternative implementation should be accepted and validated by EDP Distribuição
    c. If the meter reply with status (3), then the meter should be removed from the list and keep the retry mechanism for the remaining meters
    d. This step is concluded when the “TimeRetryIntervalFirm” time is expired or “RetryDisconMeterFirm” retries reached, or when the status (3) or (4) is obtained for all the meters.
    Any other alternative implementation should be accepted and validated by EDP Distribuição
11. Activate the image with “image_Activate” in unicast: ACTION {18,0.0.44.0.0.255,4};
    a. The DTC should activate the image only from meters with “image_transfer_status” = (3) obtained on the previous step
12. Check that the meter finished the activation with success “image_trasnfer_Status” in unicast: GET {18,0.0.44.0.0.255,6}

a. Please note that the image activation may take a while, depending on the meter implementation. After that the meter will reboot and get online again and that may take a while (new PRIME registration)
b. While a meter reply with status (5), the DTC should keep the meter pending and try with another one and wait "TimeRetryIntervalFirm" between retries and try "RetryDisconMeterFirm" times.
c. When a meter reply with status (6), it should be removed from the pending meter.

Any other alternative implementation should be accepted and validated by EDP Distribuição

d. This step is finished when the "TimeRetryIntervalFirm" time is expired or "RetryDisconMeterFirm" retries reached, or when the status (6) or (7) is obtained for all the meters.

Any other alternative implementation should be accepted and validated by EDP Distribuição

9.6 Meter DLMS request [B12], [S42]

This order is used to facilitate DLMS requests directly to meter through DTC that provides great versatility access to all defined and accessible on meter obiscodes. As a result of the different actions defined in the order B12, the DTC will generate a S42 report with the data reported by the meter itself using the same format as that used in the methodology of cycles.

Annex C, section 16.1.18 describes the sequence of messages exchange between HES and DTC in meter DLMS request.

B12	FIELD		DESCRIPTION	VALUE
1	IdReq		Identifier of the request	B12
2	IdPet		Unique request identifier	
3	Version		Version Identifier	3.4_EDP_2.0
4	Cnc		Concentrator identifier	
5	Cnt		Unique meter identifier	
	B12		DLMS order	
6	Fini		Execution date (e.g. : "20100101000000000W")	Timestamp
7	Ffin		Maximum Execution Date (e.g. : "20100101000000000W")	Timestamp
	<get><set><action>		(1)	
8		obis	Obis Identifier (e.g. : "1-0:32.7.0.255")	String
9		class	Obis class Identifier (e.g. : "3")	String
10		element	Attribute_id (get o set) or method_id (action) (e.g. : "2")	String
11		selective_access	Selective access if necessary	String
12		data	Data for set or action services	String
	<get><set><action>			

(1) In a B12 order is possible send more than one operation adding <get><set><action> structure to the order. Below you can see examples.

The DTC should be able to use the proper DLMS client for each operation, depending if the meter is secured or non-secure.

Review the next examples to see different possibilities in B12 order format.

```
<Order IdPet="11006811" IdReq="B12" Version="3.4_EDP_2.0">
      <Cnc Id="AAA57C4730016">
            <Cnt Id="BBB0115108646">
                  <B12 Fini="20130101000000000W" Ffin="20130101000500000W">
                        <get obis="1-0:32.7.0.255" class="3" element="2"/>
                  </B12>
```

```
            </Cnt>
      </Cnc>
</Order>

<Order IdPet="11006811" IdReq="B12" Version="3.4_EDP_2.0">
      <Cnc Id="AAA57C4730016">
            <Cnt Id="BBB0115108646">
                  <B12 Fini="20130101000000000W" Ffin="20130101000500000W">
                        <get obis="1-0:32.7.0.255" class="3" element="2"/>
                  </B12>
            </Cnt>
            <Cnt Id="CCC0115108646">
                  <B12 Fini="20130101000000000W" Ffin="20130101000500000W">
                        <get obis="1-0:32.7.0.255" class="3" element="2"/>
                  </B12>
            </Cnt>
            <Cnt Id="DDD0115108646">
                  <B12 Fini="20130101000000000W" Ffin="20130101000500000W">
                        <get obis="1-0:32.7.0.255" class="3" element="2"/>
                  </B12>
            </Cnt>
</Cnc>
</Order>
```

```
<Order IdPet="11006811" IdReq="B12" Version="3.4_EDP_2.0">
      <Cnc Id="AAA57C4730016">
            <Cnt Id="BBB0115108646">
                  <B12 Fini="20130101000000000W" Ffin="20130101000500000W">
                        <get obis="1-0:32.7.0.255" class="3" element="2"/>
                        <get obis="1-0:31.7.0.255" class="3" element="2"/>
                        <get obis="0-1:94.34.1.255" class="3" element="2"/>
                        <get obis="1-0:99.1.0.255" class="7" element="2"
selective_access="structure{structure{long_unsigned{8}octet_string{00 00 01 00 00
ff}integer{2}long_unsigned{0}}date_time{2010/11/29 01:00:00}date_time{2010/11/30 00:00:00}array{}}"/>
                  </B12>
            </Cnt>
      </Cnc>
</Order>
```

Once the operation is finished, the DTC will send the S42 report with the meter data response. (FTP Transfer)

S42	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S42
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
5	Cnt	Unique meter identifier	
	S42	Report tag name identifier	
6	Fh	Order execution date/time (e.g. : "20100101000000000W")	Timestamp
7	Operation	Operation executed (e.g. : "set" or "get" or "action")	String
8	obis	Obiscode Identifier (e.g. : "1-0:32.7.0.255")	String
9	class	Obiscode class Identifier (e.g. : "3")	String
10	element	Attribute_id (get o set) or method_id (action) (e.g. : "2")	String
11	data	Data for set or action services	String
12	result	Meter operation response	String

The DTC will handle owner retry logic to ensure the success of any operations. This logic should be based on the parameters "TimeRetryInterval" and "RetryDisconMeter".

Review the next examples to see different possibilities in S42 order format.

```
<Report IdRpt="S42" IdPet="685740881" Version="3.4_EDP_2.0">
      <Cnc Id="AAA0004330375">
            <Cnt Id="BBB0019892564">
                  <S42 Fh="20150407201140000S" Operation="get" obis="1-0:32.7.0.255"
            class="3" element="2" data="  " result="double_long_unsigned{16203}" />
            </Cnt>
      </Cnc>
</Report>

<Report IdRpt="S42" IdPet="685740881" Version="3.4_EDP_2.0">
      <Cnc Id="AAA0004330375">
            <Cnt Id="BBB0115108646">
                  <S42 Fh="20150407201140000S" Operation="get" obis="1-0:32.7.0.255" class="3"
            element="2" data="" result="double_long_unsigned{16203}" />
            </Cnt>
            <Cnt Id="CCC0115108646">
                  <S42 Fh="20150407201140000S" Operation="get" obis="1-0:32.7.0.255" class="3"
element="2" data="" result="double_long_unsigned{16203}" />
            </Cnt>
            <Cnt Id="DDD0115108646">
                  <S42 Fh="20150407201140000S" Operation="get" obis="1-0:32.7.0.255" class="3"
element="2" data="" result="double_long_unsigned{16203}" />
            </Cnt>
      </Cnc>
</Report>
```

```
        <Report IdRpt="S42" IdPet="685740881" Version="3.4_EDP_2.0">
              <Cnc Id="AAA0004330375">
                    <Cnt Id="BBB0115108646">
                          <S42 Fh="20150407201140000S" Operation="get" obis="1-0:32.7.0.255" class="3"
element="2" data="" result="double_long_unsigned{16203}" />
                          <S42 Fh="20150407201140000S" Operation="get" obis="1-0:31.7.0.255" class="3"
element="2" data="" result="double_long_unsigned{165603}" />
                          <S42 Fh="20150407201140000S" Operation="get" obis="0-1:94.34.1.255"
class="3" element="2" data="" result="double_long_unsigned{145703}" />
                          <S42 Fh="20150407201140000S" Operation="get" obis="0-0:21.0.6.255" class="7"
element="2" data="" result="array{structure{octet_string{2011/04/08
10:10:47}double_long_unsigned{16203}double_long_unsigned{0}double_long_unsigned{10154}double_long_unsigned
{0}double_long_unsigned{0}double_long_unsigned{5554}}}" />
                          <S42 Fh="20150407201140000S" Operation="get" obis="1-0:99.1.0.255" class="7"
element="2" data="" result="array{structure{octet_string{2011/04/06
00:00:00}unsigned{0}double_long_unsigned{357}double_long_unsigned{0}double_long_unsigned{23}double_long_un
signed{0}double_long_unsigned{0}double_long_unsigned{156}}
                    structure{octet_string{2011/04/06 01:00:00}
unsigned{0}double_long_unsigned{304}double_long_unsigned
{0}double_long_unsigned{0}double_long_unsigned{0}double_long_unsigned{0}double_long_unsigned{156}}
                    structure{octet_string{2011/04/06 02:00:00}unsigned{0} double_long_unsigned{312}
double_long_unsigned{0}double_long_unsigned{1}double_long_unsigned{0}double_long_unsigned{0}double_long_un
signed{133}}
                    structure{octet_string{2011/04/06
03:00:00}unsigned{0}double_long_unsigned{159}double_long_unsigned{0}double_long_unsigned{0}double_long_uns
igned{0}double_long_unsigned{0}double_long_unsigned{164}}
                    structure{octet_string{2011/04/06
08:00:00}unsigned{0}double_long_unsigned{57}double_long_unsigned{0}double_long_unsigned{0}double_long_unsi
gned{0}double_long_unsigned{0}double_long_unsigned{160}}
                    structure{octet_string{2011/04/06 09:00:00}unsigned{0}
double_long_unsigned{302}double_long_unsigned{0}double_long_unsigned{3}double_long_unsigned{0}double_long_
unsigned{0}double_long_unsigned{124}}
                    structure{octet_string{2011/04/06
10:00:00}unsigned{0}double_long_unsigned{57}double_long_unsigned{0}double_long_unsigned{0}double_long_unsi
gned{0}double_long_unsigned{0}double_long_unsigned{160}}
                    structure{octet_string{2011/04/06
11:00:00}unsigned{0}double_long_unsigned{57}double_long_unsigned{0}double_long_unsigned{0}double_long_unsi
gned{0}double_long_unsigned{0}double_long_unsigned{159}}

       structure{octet_string{2011/04/0612:00:00}unsigned{0}double_long_unsigned{475}double_long_unsigned
{0}double_long_unsigned{1}double_long_unsigned{0}double_long_unsigned{0}double_long_unsigned{156}}}" />
                    </Cnt>
              </Cnc>
        </Report>
```

9.7 Manage intruder equipment in PLC [B10]

It is possible to manage the intruder equipment on the DTC PLC network with the B10 order. This order allows the HES to place some PRIME MAC addresses on a black list and after that those devises will not connect to the DTC base node.

This order allow the HES to perform diferent operations:

- Include a MAC address on the intruder list;
- Exclude a MAC address from the intruder list
- Reset the intruder list, meaning that all devices previous included will be excluded and the list will be empty

B10	FIELD	DESCRIPTION	VALUE
1	IdReq	Identifier of the request	B10
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	B10	Report tag name identifier	
5	Mac	Intrude MAC address	MAC Value="0" used only for Operation="0" (reset purposes) E.g.: 40:40:22:00:6a:48
6	Operation	Operation to be done. If a meter that has been detected by the Base Node (exists in the DTC database) is added to the intruder list, all information from the DTC database for that meter should be removed: Same as B06 but adding this meter to S10 list	0=Reset (i.e. remove) all MAC addresses included in the intruder list 1=Include MAC address in the intruder list 2=Exclude MAC address from intruder list

It should be possible to add MAC addresses from devices not registered on the DTC.

9.8 Meter Actions [B28]

The HES can execute action on the meter with the B28 order. The B28 order allow the HES to perform the following operations:

- Montly billing reset – It is possible to reset only 1 contract or both;
- Alarm reset;
- Event reset – DTC clears all the event logs from the meter. Please note that the DTC should be able to reset only the event logs applicable to the meter, for example if the meter is non-secure those event logs should not be accessed;
- Error reset;
- Global meter reset;
- Quality of Service related registers reset;
- Reset the maximum demand registers of the DTC internal supervision meter or other meters;
- Delete meter data from the DTC database – It is possible to clear all data related to a certain meter (billings, events, load profile, etc.);
- Operate each of of the public lightning output relays;
- Sinchronize the meter clock individually, using DTC clock as a reference.

B28	FIELD	DESCRIPTION	VALUE	Object	Class	Logical name	Att	Comments
1	IdReq	Identifier of the request	B28					Not related with DLMS
2	IdPet	Unique request identifier						Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0					Not related with DLMS
4	Cnc	Concentrator identifier						Not related with DLMS
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	To address/identify the DTC's internal supervision meter, the following algorithm shall be used: "MMM**S**NNNNNNNNN", where -> MMM - stands for the manufacturer identifier as defined in the DLMS/COSEM Specification; -> S - identifies the meter as supervision meter; -> NNNNNNNNN - 9 right-hand digits of the DTC serial number;
	B28	Meter Actions tag name						Only the tags of the actions to be performed shall be sent in the order. **See order workflow and other details in tab "Annex.B28"**
6	MBRst	Montly Billing Reset	Integer(1,2,7)	Predefined Scripts - MDI reset / end of billing period	9	0.0.10.0.1.255	execute method 1	Execute method 1 with the following available arguments: 1,2 = contracts, 7= All contracts
7	AlRst	Alarms Reset	Integer(0)	Alarm Object	3	0.0.97.98.0.255	execute method 1	Execute method 1 = Reset
8	EvRst	Events Reset	Integer(0)	"Standard" Event Log	7	0.0.99.98.0.255	execute method 1	Execute method 1 = Reset Note: "Iluminação Pública " Event Log only applies to Public lightning meters Note: "Correc Security Operation" and Failed Security Operation" only applies to secure meters.
				"Potência contratada" Event Log	7	0.0.99.98.3.255		
				Firmware Event Log	7	0.0.99.98.4.255		
				"Sincronização" Event Log	7	0.0.99.98.8.255		
				"Configuração" Event Log	7	0.0.99.98.10.255		
				"ICP" log	7	0.0.99.98.2.255		
				"Falha de Energia" Event Log	7	0.0.99.98.5.255		
				"Qualidade de Serviço" Event Log	7	0.0.99.98.9.255		
				"Antifraude" Event Log	7	0.0.99.98.1.255		
				"Gestão da Procura " Event Log	7	0.0.99.98.6.255		
				"Alta Ocorrência" Event Log	7	0.0.99.98.7.255		
				"Iluminação Pública " Event Log	7	0.0.99.98.11.255		
				Correct Security Operations Event Log	7	0.0.99.98.12.255		
				Failed Security Operations Event Log	7	0.0.99.98.13.255		
9	ErrRst	Errors Reset	Integer(0)	Error Object	3	0.0.97.97.0.255	execute method 1	Execute method 1 = Reset
10	DRst	Data Reset (1)	Integer (1)	Global Meter Reset	9	0.0.10.0.0.255	execute method 1	Execute method 1 with argument 1 to perform the Data Reset.

11	MaxPowRst	Maximum Demand Register reset	Integer (0)	Maximum Demand Registers		1.0.x.6.y.255	execute method 1	Execute method 1 = Reset Also used to reset maximum power registers of DTC's internal supervision meter. In this case, this operation is not DLMS related.
12	CfgDBRst	Delete entries from DC's internal "configuration database"	Integer(0)	-	-	-	-	To be managed by DC. Not related with DLMS, since no action is to be done in the meter itself. This action is meant to delete all entries from DC's internal "configuration database" for the meters reffered in tag "Cnt" (i.e. monthly, daily and load profile configuration).
13	PLOut1	Public Lighting Output relay 1 status	Integer (1,2)	Output Relay Control 1	70	0.1.96.3.10.255	execute method x	The "execution method" to be used depends on the selected value for this field (1 or 2), where: execute method 1 (x=1): disconnect (i.e. switch OFF Public lighting) execute method 2 (x=2): connect (i.e. switch ON Public lighting) **Only apply to PL Meter (Public Lighting Meter)**
14	PLOut2	Public Lighting Output relay 2 status	Integer (1,2)	Output Relay Control 2	70	0.2.96.3.10.255	execute method x	The "execution method" to be used depends on the selected value for this field (1 or 2), where: execute method 1 (x=1): disconnect (i.e. switch OFF Public lighting) execute method 2 (x=2): connect (i.e. switch ON Public lighting) **Only apply to PL (Public Lighting Meter)**
15	ClkSync	Clock synchronization action	Integer(0)	Clock	8	0.0.1.0.0.255	2	After the opening association the DTC will set the clock of the meter using its internal clock. Even if the retry mechanism apply, the DTC needs to make sure that the clock is set with the minimum deviation possible.
16	QoSRst	QoS register reset	Integer(0)	Global Meter Reset	9	0.0.10.0.0.255	execute method 1	The DTC should execute the global meter reset with argument 3 to reset the QoS registers.

1) The meter data reset tag (DRst) can only assume one values, “1” and with that the DTC should execute the global meter reset of the meter, OBIS 0.0.10.0.0.255 method 1 and use argument 1. Note that theDLMS argument used on method 1 (“Method Invocation Paramenters”) is a long-unsigned value.

2) For the QoS register reset tag, (QoSRst), the OBIS is also the Global Meter Reset with method 1, but the argument or the “Method Invocation Paramenter” has the value “3”.

9.9 Load Profile configuration [B29] [S29]

The meters load profile can be configured with the B29 and collected with a S29 assynchronous service.

When the DTC receives a B29 for a meter configuration, the DTC will access the meter to perform that modification and after the ValuesCheckDelay, it should read again the load profile configuration to validate the operation. In case of any error, the DTC should report with error.

The configuration of the measurements to be captured in the load profile is performed using the DLMS object "1.0.99.1.0.255" (attribute #3, capture_objects).

Only the tags of the measurements to be configured shall be sent in the order (up to 10 tags, including "clock"and "AMR profile status" for single phase meters and 14 for three phase). For supervision meters up to 23 tags could be configured (up to 14 tags "mandatory" or up to 23 tags "preferentially", including "clock"and "AMR profile status"). Whenever there is a load profile configuration, the previous load profile data and configuration should be cleared.

Check the use case on Annex C.

B29	FIELD	DESCRIPTION	VALUE	Object	Class	Logical name	Att	Comments
1	IdReq	Identifier of the request	B29					Not related with DLMS
2	IdPet	Unique request identifier						Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0					Not related with DLMS
4	Cnc	Concentrator identifier						Not related with DLMS
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	To address/identify the DTC's internal supervision meter, the following algorithm shall be used: "MMM**S**NNNNNNNNN", where -> MMM - stands for the manufacturer identifier as defined in the DLMS/COSEM Specification; -> S - identifies the meter as supervision meter; -> NNNNNNNNN - 9 right-hand digits of the DTC serial number;
	B29	Load Profile Configuration tag name						**See order workflow and other details in tab "Annex C B29"**
6	Fh	Clock	Boolean ("Y")	Clock	8	0.0.1.0.0.255	2	
7	Bc	AMR Profile Status	Boolean ("Y")	AMR profile status for Load profile with period 1	1	0.0.96.10.7.255	2	
8	AItot	Active Energy Import Total	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.0.255	2	
9	AEtot	Active Energy Export Total	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.0.255	2	
10	R1tot	Reactive Energy QI Total	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
11	R2tot	Reactive Energy QII Total	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
12	R3tot	Reactive Energy QIII Total	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
13	R4tot	Reactive Energy QIV Total	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
14	AIi	Active Energy Import Incremental	Boolean ("Y")	Active energy import (+A) incremental	3	1.0.1.29.0.255	2	
15	AEi	Active Energy Export Incremental	Boolean ("Y")	Active energy export (−A) incremental	3	1.0.2.29.0.255	2	
16	R1i	Reactive Energy QI Incremental	Boolean ("Y")	Reactive energy QI (+Ri) incremental	3	1.0.5.29.0.255	2	
17	R2i	Reactive Energy QII Incremental	Boolean ("Y")	Reactive energy QII (+Rc) incremental	3	1.0.6.29.0.255	2	
18	R3i	Reactive Energy QIII Incremental	Boolean ("Y")	Reactive energy QIII (-Ri) incremental	3	1.0.7.29.0.255	2	

19	R4i	Reactive Energy QIV Incremental	Boolean ("Y")	Reactive energy QIV (-Rc) incremental	3	1.0.8.29.0.255	2	
20	LAvgPF	Last Average Power Factor	Boolean ("Y")	Last Average power factor (PF) register	5	1.0.13.5.0.255	3	
21	LAvgVL 1	Last Average Voltage L1	Boolean ("Y")	Last Average Voltage L1 register	5	1.0.32.5.0.255	3	
22	LAvgVL 2	Last Average Voltage L2	Boolean ("Y")	Last Average Voltage L2 register	5	1.0.52.5.0.255	3	
23	LAvgVL 3	Last Average Voltage L3	Boolean ("Y")	Last Average Voltage L3 register	5	1.0.72.5.0.255	3	
24	LAvgV	Last Average Any Phase Voltage	Boolean ("Y")	Last Average any phase voltage register	5	1.0.12.5.0.255	3	
25	AItotL1	Active Energy Import L1	Boolean ("Y")	Active Energy Import L1	3	1.0.21.8.0.255	2	Only applies to supervision meter
26	AItotL2	Active Energy Import L2	Boolean ("Y")	Active Energy Import L2	3	1.0.41.8.0.255	2	Only applies to supervision meter
27	AItotL3	Active Energy Import L3	Boolean ("Y")	Active Energy Import L3	3	1.0.61.8.0.255	2	Only applies to supervision meter
28	AEtotL 1	Active Energy Export L1	Boolean ("Y")	Active Energy Export L1	3	1.0.22.8.0.255	2	Only applies to supervision meter
29	AEtotL 2	Active Energy Export L2	Boolean ("Y")	Active Energy Export L2	3	1.0.42.8.0.255	2	Only applies to supervision meter
30	AEtotL 3	Active Energy Export L3	Boolean ("Y")	Active Energy Export L3	3	1.0.62.8.0.255	2	Only applies to supervision meter
31	R1totL 1	Reactive Energy QI L1	Boolean ("Y")	Reactive Energy QI L1	3	1.0.25.8.0.255	2	Only applies to supervision meter
32	R1totL 2	Reactive Energy QI L2	Boolean ("Y")	Reactive Energy QI L2	3	1.0.45.8.0.255	2	Only applies to supervision meter
33	R1totL 3	Reactive Energy QI L3	Boolean ("Y")	Reactive Energy QI L3	3	1.0.65.8.0.255	2	Only applies to supervision meter
34	R2totL 1	Reactive Energy QII L1	Boolean ("Y")	Reactive Energy QII L1	3	1.0.26.8.0.255	2	Only applies to supervision meter
35	R2totL 2	Reactive Energy QII L2	Boolean ("Y")	Reactive Energy QII L2	3	1.0.46.8.0.255	2	Only applies to supervision meter
36	R2totL 3	Reactive Energy QII L3	Boolean ("Y")	Reactive Energy QII L3	3	1.0.66.8.0.255	2	Only applies to supervision meter
37	R3totL 1	Reactive Energy QIII L1	Boolean ("Y")	Reactive Energy QIII L1	3	1.0.27.8.0.255	2	Only applies to supervision meter
38	R3totL 2	Reactive Energy QIII L2	Boolean ("Y")	Reactive Energy QIII L2	3	1.0.47.8.0.255	2	Only applies to supervision meter
39	R3totL 3	Reactive Energy QIII L3	Boolean ("Y")	Reactive Energy QIII L3	3	1.0.67.8.0.255	2	Only applies to supervision meter
40	R4totL 1	Reactive Energy QIV L1	Boolean ("Y")	Reactive Energy QIV L1	3	1.0.28.8.0.255	2	Only applies to supervision meter
41	R4totL 2	Reactive Energy QIV L2	Boolean ("Y")	Reactive Energy QIV L2	3	1.0.48.8.0.255	2	Only applies to supervision meter
42	R4totL 3	Reactive Energy QIV L3	Boolean ("Y")	Reactive Energy QIV L3	3	1.0.68.8.0.255	2	Only applies to supervision meter
43	AIiL1	Active Energy Import Incremental L1	Boolean ("Y")					Only applies to supervision meter
44	AIiL2	Active Energy Import Incremental L2	Boolean ("Y")					Only applies to supervision meter
45	AIiL3	Active Energy Import Incremental L3	Boolean ("Y")					Only applies to supervision meter
46	AEiL1	Active Energy Export Incremental L1	Boolean ("Y")					Only applies to supervision meter
47	AEiL2	Active Energy Export Incremental L2	Boolean ("Y")					Only applies to supervision meter
48	AEiL3	Active Energy Export Incremental L3	Boolean ("Y")					Only applies to supervision meter
49	R1iL1	Reactive Energy QI Incremental L1	Boolean ("Y")					Only applies to supervision meter
50	R1iL2	Reactive Energy QI Incremental L2	Boolean ("Y")					Only applies to supervision meter

51	R1iL3	Reactive Energy QI Incremental L3	Boolean ("Y")					Only applies to supervision meter
52	R2iL1	Reactive Energy QII Incremental L1	Boolean ("Y")					Only applies to supervision meter
53	R2iL2	Reactive Energy QII Incremental L2	Boolean ("Y")					Only applies to supervision meter
54	R2iL3	Reactive Energy QII Incremental L3	Boolean ("Y")					Only applies to supervision meter
55	R3iL1	Reactive Energy QIII Incremental L1	Boolean ("Y")					Only applies to supervision meter
56	R3iL2	Reactive Energy QIII Incremental L2	Boolean ("Y")					Only applies to supervision meter
57	R3iL3	Reactive Energy QIII Incremental L3	Boolean ("Y")					Only applies to supervision meter
58	R4iL1	Reactive Energy QIV Incremental L1	Boolean ("Y")					Only applies to supervision meter
59	R4iL2	Reactive Energy QIV Incremental L2	Boolean ("Y")					Only applies to supervision meter
60	R4iL3	Reactive Energy QIV Incremental L3	Boolean ("Y")					Only applies to supervision meter
61	LAvgIto t	Last Average Current Total	Boolean ("Y")					Only applies to supervision meter Not mandatory
62	LAvgIL 1	Last Average Current L1	Boolean ("Y")					Only applies to supervision meter Not mandatory
63	LAvgIL 2	Last Average Current L2	Boolean ("Y")					Only applies to supervision meter Not mandatory
64	LAvgIL 3	Last Average Current L3	Boolean ("Y")					Only applies to supervision meter Not mandatory
65	LAvgIN	Last Average Current Neutral	Boolean ("Y")					Only applies to supervision meter Not mandatory
66	sAIi	Short size Active Energy Import Incremental	Boolean ("Y")	Active energy import (+A) incremental	3	1.1.1.29.0.255	2	
67	sAEi	Short size Active Energy Export Incremental	Boolean ("Y")	Active energy export (−A) incremental	3	1.1.2.29.0.255	2	
68	sR1i	Short size Reactive Energy QI Incremental	Boolean ("Y")	Reactive energy QI (+Ri) incremental	3	1.1.5.29.0.255	2	
69	sR2i	Short size Reactive Energy QII Incremental	Boolean ("Y")	Reactive energy QII (+Rc) incremental	3	1.1.6.29.0.255	2	
70	sR3i	Short size Reactive Energy QIII Incremental	Boolean ("Y")	Reactive energy QIII (-Ri) incremental	3	1.1.7.29.0.255	2	
71	sR4i	Short size Reactive Energy QIV Incremental	Boolean ("Y")	Reactive energy QIV (-Rc) incremental	3	1.1.8.29.0.255	2	
72	sLAvgP F	Short size Last Average Power Factor	Boolean ("Y")	Last Average power factor (PF) register	5	1.0.13.5.0.255	3	
73	sLAvgV	Short size Last Average Any Phase Voltage	Boolean ("Y")	Last Average any phase voltage register	5	1.0.12.5.0.255	3	
74	sAIiL1	Active energy import (+A) L1 incremental (short)	Boolean ("Y")	Active energy import (+A) L1 incremental (short)	3	1.1.21.29.0.255	2	Only applies to three phase meters
75	sAIiL2	Active energy import (+A) L2 incremental (short)	Boolean ("Y")	Active energy import (+A) L2 incremental (short)	3	1.1.41.29.0.255	2	Only applies to three phase meters
76	sAIiL3	Active energy import (+A) L3 incremental (short)	Boolean ("Y")	Active energy import (+A) L3 incremental (short)	3	1.1.61.29.0.255	2	Only applies to three phase meters

77	sAEiL1	Active energy export (+A) L1 incremental (short)	Boolean ("Y")	Active energy export (+A) L1 incremental (short)	3	1.1.22.29.0.255	2	Only applies to three phase meters
78	sAEiL2	Active energy export (+A) L2 incremental (short)	Boolean ("Y")	Active energy export (+A) L2 incremental (short)	3	1.1.42.29.0.255	2	Only applies to three phase meters
79	sAEiL3	Active energy export (+A) L3 incremental (short)	Boolean ("Y")	Active energy export (+A) L3 incremental (short)	3	1.1.62.29.0.255	2	Only applies to three phase meters
80	sR1iL1	Reactive energy QI (+Ri) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (+Ri) L1 incremental (short)	3	1.1.25.29.0.255	2	Only applies to three phase meters
81	sR1iL2	Reactive energy QI (+Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Ri) L3 incremental (short)	3	1.1.45.29.0.255	2	Only applies to three phase meters
82	sR1iL3	Reactive energy QI (+Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Ri) L3 incremental (short)	3	1.1.65.29.0.255	2	Only applies to three phase meters
83	sR2iL1	Reactive energy QI (+Rc) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (+Rc) L1 incremental (short)	3	1.1.26.29.0.255	2	Only applies to three phase meters
84	sR2iL2	Reactive energy QI (+Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Rc) L3 incremental (short)	3	1.1.46.29.0.255	2	Only applies to three phase meters
85	sR2iL3	Reactive energy QI (+Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Rc) L3 incremental (short)	3	1.1.66.29.0.255	2	Only applies to three phase meters
86	sR3iL1	Reactive energy QI (-Ri) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (-Ri) L1 incremental (short)	3	1.1.25.29.0.255	2	Only applies to three phase meters
87	sR3iL2	Reactive energy QI (-Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Ri) L3 incremental (short)	3	1.1.45.29.0.255	2	Only applies to three phase meters
88	sR3iL3	Reactive energy QI (-Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Ri) L3 incremental (short)	3	1.1.65.29.0.255	2	Only applies to three phase meters
89	sR4iL1	Reactive energy QI (-Rc) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (-Rc) L1 incremental (short)	3	1.1.25.29.0.255	2	Only applies to three phase meters
90	sR4iL2	Reactive energy QI (-Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Rc) L3 incremental (short)	3	1.1.45.29.0.255	2	Only applies to three phase meters
91	sR4iL3	Reactive energy QI (-Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Rc) L3 incremental (short)	3	1.1.65.29.0.255	2	Only applies to three phase meters
92	sLAvgV L1	Short size Last Average Voltage L1	Boolean ("Y")	Last Average Voltage L1 register	5	1.1.32.5.0.255	3	Only applies to three phase meters
93	sLAvgV L2	Short size Last Average Voltage L2	Boolean ("Y")	Last Average Voltage L2 register	5	1.1.52.5.0.255	3	Only applies to three phase meters
94	sLAvgV L3	Short size Last Average Voltage L3	Boolean ("Y")	Last Average Voltage L3 register	5	1.1.72.5.0.255	3	Only applies to three phase meters
95	Magn	Used to define the magnitude of the data, since supervision meters	Integer Number (1 for Wh and					Not DLMS related and only applies for SVM

8	Bc	AMR Profile Status	octet-string	AMR profile status for Load profile with period 1	1	0.0.96.10.7.255	2	
9	AItot	Active Energy Import Total	Wh	Active energy import (+A)	3	1.0.1.8.0.255	2	
10	AEtot	Active Energy Export Total	Wh	Active energy export (−A)	3	1.0.2.8.0.255	2	
11	R1tot	Reactive Energy QI Total	varh	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
12	R2tot	Reactive Energy QII Total	varh	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
13	R3tot	Reactive Energy QIII Total	varh	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
14	R4tot	Reactive Energy QIV Total	varh	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
15	AIi	Active Energy Import Incremental	Wh	Active energy import (+A) incremental	3	1.0.1.29.0.255	2	
16	AEi	Active Energy Export Incremental	Wh	Active energy export (−A) incremental	3	1.0.2.29.0.255	2	
17	R1i	Reactive Energy QI Incremental	varh	Reactive energy QI (+Ri) incremental	3	1.0.5.29.0.255	2	
18	R2i	Reactive Energy QII Incremental	varh	Reactive energy QII (+Rc) incremental	3	1.0.6.29.0.255	2	
19	R3i	Reactive Energy QIII Incremental	varh	Reactive energy QIII (-Ri) incremental	3	1.0.7.29.0.255	2	
20	R4i	Reactive Energy QIV Incremental	varh	Reactive energy QIV (-Rc) incremental	3	1.0.8.29.0.255	2	
21	LAvgPF	Last Average Power Factor	Number (1,3)	Last Average power factor (PF) register	5	1.0.13.5.0.255	3	
22	LAvgVL1	Last Average Voltage L1	V Number (3,1)	Last Average Voltage L1 register	5	1.0.32.5.0.255	3	
23	LAvgVL2	Last Average Voltage L2	V Number (3,1)	Last Average Voltage L2 register	5	1.0.52.5.0.255	3	
24	LAvgVL3	Last Average Voltage L3	V Number (3,1)	Last Average Voltage L3 register	5	1.0.72.5.0.255	3	
25	LAvgV	Last Average Any Phase Voltage	V Number (3,1)	Last Average any phase voltage register	5	1.0.12.5.0.255	3	
26	AItotL1	Active Energy Import L1	Boolean ("Y")	Active Energy Import L1	3	1.0.21.8.0.255	2	Only applies to supervision meters
27	AItotL2	Active Energy Import L2	Boolean ("Y")	Active Energy Import L2	3	1.0.41.8.0.255	2	Only applies to supervision meters
28	AItotL3	Active Energy Import L3	Boolean ("Y")	Active Energy Import L3	3	1.0.61.8.0.255	2	Only applies to supervision meters
29	AEtotL1	Active Energy Export L1	Boolean ("Y")	Active Energy Export L1	3	1.0.22.8.0.255	2	Only applies to supervision meters
30	AEtotL2	Active Energy Export L2	Boolean ("Y")	Active Energy Export L2	3	1.0.42.8.0.255	2	Only applies to supervision meters
31	AEtotL3	Active Energy Export L3	Boolean ("Y")	Active Energy Export L3	3	1.0.62.8.0.255	2	Only applies to supervision meters
32	R1totL1	Reactive Energy QI L1	Boolean ("Y")	Reactive Energy QI L1	3	1.0.25.8.0.255	2	Only applies to supervision meters
33	R1totL2	Reactive Energy QI L2	Boolean ("Y")	Reactive Energy QI L2	3	1.0.45.8.0.255	2	Only applies to supervision meters
34	R1totL3	Reactive Energy QI L3	Boolean ("Y")	Reactive Energy QI L3	3	1.0.65.8.0.255	2	Only applies to supervision meters
35	R2totL1	Reactive Energy QII L1	Boolean ("Y")	Reactive Energy QII L1	3	1.0.26.8.0.255	2	Only applies to supervision meters
36	R2totL2	Reactive Energy QII L2	Boolean ("Y")	Reactive Energy QII L2	3	1.0.46.8.0.255	2	Only applies to supervision meters

37	R2totL3	Reactive Energy QII L3	Boolean ("Y")	Reactive Energy QII L3	3	1.0.66.8.0.255	2	Only applies to supervision meters
38	R3totL1	Reactive Energy QIII L1	Boolean ("Y")	Reactive Energy QIII L1	3	1.0.27.8.0.255	2	Only applies to supervision meters
39	R3totL2	Reactive Energy QIII L2	Boolean ("Y")	Reactive Energy QIII L2	3	1.0.47.8.0.255	2	Only applies to supervision meters
40	R3totL3	Reactive Energy QIII L3	Boolean ("Y")	Reactive Energy QIII L3	3	1.0.67.8.0.255	2	Only applies to supervision meters
41	R4totL1	Reactive Energy QIV L1	Boolean ("Y")	Reactive Energy QIV L1	3	1.0.28.8.0.255	2	Only applies to supervision meters
42	R4totL2	Reactive Energy QIV L2	Boolean ("Y")	Reactive Energy QIV L2	3	1.0.48.8.0.255	2	Only applies to supervision meters
43	R4totL3	Reactive Energy QIV L3	Boolean ("Y")	Reactive Energy QIV L3	3	1.0.68.8.0.255	2	Only applies to supervision meters
44	AIiL1	Active Energy Import Incremental L1	Wh					Only applies to supervision meters
45	AIiL2	Active Energy Import Incremental L2	Wh					Only applies to supervision meters
46	AIiL3	Active Energy Import Incremental L3	Wh					Only applies to supervision meters
47	AEiL1	Active Energy Export Incremental L1	Wh					Only applies to supervision meters
48	AEiL2	Active Energy Export Incremental L2	Wh					Only applies to supervision meters
49	AEiL3	Active Energy Export Incremental L3	Wh					Only applies to supervision meters
50	R1iL1	Reactive Energy QI Incremental L1	varh					Only applies to supervision meters
51	R1iL2	Reactive Energy QI Incremental L2	varh					Only applies to supervision meters
52	R1iL3	Reactive Energy QI Incremental L3	varh					Only applies to supervision meters
53	R2iL1	Reactive Energy QII Incremental L1	varh					Only applies to supervision meters
54	R2iL2	Reactive Energy QII Incremental L2	varh					Only applies to supervision meters
55	R2iL3	Reactive Energy QII Incremental L3	varh					Only applies to supervision meters
56	R3iL1	Reactive Energy QIII Incremental L1	varh					Only applies to supervision meters
57	R3iL2	Reactive Energy QIII Incremental L2	varh					Only applies to supervision meters
58	R3iL3	Reactive Energy QIII Incremental L3	varh					Only applies to supervision meters
59	R4iL1	Reactive Energy QIV Incremental L1	varh					Only applies to supervision meters
60	R4iL2	Reactive Energy QIV Incremental L2	varh					Only applies to supervision meters
61	R4iL3	Reactive Energy QIV Incremental L3	varh					Only applies to supervision meters
62	LAvgItot	Last Average Current Total	Boolean ("Y")					Only applies to supervision meter Not mandatory
63	LAvgIL1	Last Average Current L1	Boolean ("Y")					Only applies to supervision meter Not mandatory
64	LAvgIL2	Last Average Current L2	Boolean ("Y")					Only applies to supervision meter Not mandatory
65	LAvgIL3	Last Average Current L3	Boolean ("Y")					Only applies to supervision meter Not mandatory
66	LAvgIN	Last Average Current Neutral	Boolean ("Y")					Only applies to supervision meter Not mandatory
67	sAIi	Short size Active Energy Import Incremental	Boolean ("Y")	Active energy import (+A) incremental	3	1.1.1.29.0.255	2	
68	sAEi	Short size Active Energy Export Incremental	Boolean ("Y")	Active energy export (−A) incremental	3	1.1.2.29.0.255	2	

69	sR1i	Short size Reactive Energy QI Incremental	Boolean ("Y")	Reactive energy QI (+Ri) incremental	3	1.1.5.29.0.255	2	
70	sR2i	Short size Reactive Energy QII Incremental	Boolean ("Y")	Reactive energy QII (+Rc) incremental	3	1.1.6.29.0.255	2	
71	sR3i	Short size Reactive Energy QIII Incremental	Boolean ("Y")	Reactive energy QIII (-Ri) incremental	3	1.1.7.29.0.255	2	
72	sR4i	Short size Reactive Energy QIV Incremental	Boolean ("Y")	Reactive energy QIV (-Rc) incremental	3	1.1.8.29.0.255	2	
73	sLAvgPF	Short size Last Average Power Factor	Boolean ("Y")	Last Average power factor (PF) register	5	1.1.13.5.0.255	3	
74	sLAvgV	Short size Last Average Any Phase Voltage	Boolean ("Y")	Last Average any phase voltage register	5	1.1.12.5.0.255	3	
75	sAIiL1	Active energy import (+A) L1 incremental (short)	Boolean ("Y")	Active energy import (+A) L1 incremental (short)	3	1.1.21.29.0.255	2	
76	sAIiL2	Active energy import (+A) L2 incremental (short)	Boolean ("Y")	Active energy import (+A) L2 incremental (short)	3	1.1.41.29.0.255	2	
77	sAIiL3	Active energy import (+A) L3 incremental (short)	Boolean ("Y")	Active energy import (+A) L3 incremental (short)	3	1.1.61.29.0.255	2	
78	sAEiL1	Active energy export (+A) L1 incremental (short)	Boolean ("Y")	Active energy export (+A) L1 incremental (short)	3	1.1.22.29.0.255	2	
79	sAEiL2	Active energy export (+A) L2 incremental (short)	Boolean ("Y")	Active energy export (+A) L2 incremental (short)	3	1.1.42.29.0.255	2	
80	sAEiL3	Active energy export (+A) L3 incremental (short)	Boolean ("Y")	Active energy export (+A) L3 incremental (short)	3	1.1.62.29.0.255	2	
81	sR1iL1	Reactive energy QI (+Ri) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (+Ri) L1 incremental (short)	3	1.1.25.29.0.255	2	
82	sR1iL2	Reactive energy QI (+Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Ri) L3 incremental (short)	3	1.1.45.29.0.255	2	
83	sR1iL3	Reactive energy QI (+Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Ri) L3 incremental (short)	3	1.1.65.29.0.255	2	Only applies to three phase meters
84	sR2iL1	Reactive energy QI (+Rc) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (+Rc) L1 incremental (short)	3	1.1.26.29.0.255	2	Only applies to three phase meters
85	sR2iL2	Reactive energy QI (+Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Rc) L3 incremental (short)	3	1.1.46.29.0.255	2	Only applies to three phase meters
86	sR2iL3	Reactive energy QI (+Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (+Rc) L3 incremental (short)	3	1.1.66.29.0.255	2	Only applies to three phase meters
87	sR3iL1	Reactive energy QI (-Ri) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (-Ri) L1 incremental (short)	3	1.1.25.29.0.255	2	Only applies to three phase meters

88	sR3iL2	Reactive energy QI (-Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Ri) L3 incremental (short)	3	1.1.45.29.0.255	2	Only applies to three phase meters
89	sR3iL3	Reactive energy QI (-Ri) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Ri) L3 incremental (short)	3	1.1.65.29.0.255	2	Only applies to three phase meters
90	sR4iL1	Reactive energy QI (-Rc) L1 incremental (short)	Boolean ("Y")	Reactive energy QI (-Rc) L1 incremental (short)	3	1.1.25.29.0.255	2	Only applies to three phase meters
91	sR4iL2	Reactive energy QI (-Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Rc) L3 incremental (short)	3	1.1.45.29.0.255	2	Only applies to three phase meters
92	sR4iL3	Reactive energy QI (-Rc) L3 incremental (short)	Boolean ("Y")	Reactive energy QI (-Rc) L3 incremental (short)	3	1.1.65.29.0.255	2	Only applies to three phase meters
93	sLAvgVL1	Short size Last Average Voltage L1	Boolean ("Y")	Last Average Voltage L1 register	5	1.1.32.5.0.255	3	Only applies to three phase meters
94	sLAvgVL2	Short size Last Average Voltage L2	Boolean ("Y")	Last Average Voltage L2 register	5	1.1.52.5.0.255	3	Only applies to three phase meters
95	sLAvgVL3	Short size Last Average Voltage L3	Boolean ("Y")	Last Average Voltage L3 register	5	1.1.72.5.0.255	3	Only applies to three phase meters

9.10 Monthly and Daily Billing configuration [B30]

The B30 is used to change the configuration of the Monthly and/or billing billing profiles of one or more meter. It is possible with one order to change the configuration of several meters and for each meter change that differently.

The configuration of the measurements to be captured in the monthly and daily billing profiles is performed using the DLMS objects "0.0.98.1.c.255" (monthly) and "0.0.98.2.c.255" (daily) with c=1,2 (contracts 1 and 2). Only the tags of the measurements to be configured shall be sent in the order (up to 60 tags). See order workflow and other details in "Annex C – Use cases" B30.

B30	FIELD	DESCRIPTION		VALUE	Object	Cl a	Logical name	Att	Comments
1	IdReq	Identifier of the request		B30					Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier		3.4_EDP_2.0					Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5		0.0.96.1.4.255		
	B30	Monthly and Daily Billing Configuration tag name							
6	Bt	BillingType		Integer(1,2) 1=Monthly , 2= Daily	Data of billing period 1 Data of billing period 2	7	0.0.98.1.c.255 0.0.98.2.c.255	3	Bt=1 Monthly Billing Configuration "0.0.98.1.c.255", c=1,2 (contracts 1 and 2) Bt=2 Daily Billing Configuration

									"0.0.98.2.c.255", c=1,2 (contracts 1 and 2)
	Contract								
7		c	contract number	Integer(1,2)					
8		Clock	Clock	Boolean ("Y")	Clock	8	0.0.1.0.0.255	2	
9		AItot	Active Energy Import Total	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.0.255	2	
10		AIaC	Active Energy Import Total Contract	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=10, c=2 x=20
11		AIaT1	Active Energy Import T1	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=1, c=2 x=11
12		AIaT2	Active Energy Import T2	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=2, c=2 x=12
13		AIaT3	Active Energy Import T3	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=3, c=2 x=13
14		AIaT4	Active Energy Import T4	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=4, c=2 x=14
15		AIaT5	Active Energy Import T5	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=5, c=2 x=15
16		AIaT6	Active Energy Import T6	Boolean ("Y")	Active energy import (+A)	3	1.0.1.8.x.255	2	c=1 x=6, c=2 x=16
17		AItotL1	Active Energy Import Total L1	Boolean ("Y")	Active energy import (+A)	3	1.0.21.8.0.255	2	
18		AItotL2	Active Energy Import Total L2	Boolean ("Y")	Active energy import (+A)	3	1.0.41.8.0.255	2	
19		AItotL3	Active Energy Import Total L3	Boolean ("Y")	Active energy import (+A)	3	1.0.61.8.0.255	2	
20		AEtot	Active Energy Export Total	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.0.255	2	
21		AEaC	Active Energy Export Total Contract	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=10, c=2 x=20
22		AEaT1	Active Energy Export T1	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=1, c=2 x=11
23		AEaT2	Active Energy Export T2	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=2, c=2 x=12
24		AEaT3	Active Energy Export T3	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=3, c=2 x=13
25		AEaT4	Active Energy Export T4	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=4, c=2 x=14
26		AEaT5	Active Energy Export T5	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=5, c=2 x=15
27		AEaT6	Active Energy Export T6	Boolean ("Y")	Active energy export (−A)	3	1.0.2.8.x.255	2	c=1 x=6, c=2 x=16
28		AEtotL1	Active Energy Export Total L1	Boolean ("Y")	Active energy export (−A)	3	1.0.22.8.0.255	2	
29		AEtotL2	Active Energy Export Total L2	Boolean ("Y")	Active energy export (−A)	3	1.0.42.8.0.255	2	
30		AEtotL3	Active Energy Export Total L3	Boolean ("Y")	Active energy export (−A)	3	1.0.62.8.0.255	2	
31		R1tot	Reactive Energy QI Total	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2	
32		R1aC	Reactive Energy QI Total Contract	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=10, c=2 x=20
33		R1aT1	Reactive Energy QI T1	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=1, c=2 x=11
34		R1aT2	Reactive Energy QI T2	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=2, c=2 x=12
35		R1aT3	Reactive Energy QI T3	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=3, c=2 x=13
36		R1aT4	Reactive Energy QI T4	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=4, c=2 x=14
37		R1aT5	Reactive Energy QI T5	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=5, c=2 x=15
38		R1aT6	Reactive Energy QI T6	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.5.8.x.255	2	c=1 x=6, c=2 x=16
39		R1totL1	Reactive Energy QI Total L1	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.25.8.0.255	2	

40		R1totL2	Reactive Energy QI Total L2	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.45.8.0.255	2	
41		R1totL3	Reactive Energy QI Total L3	Boolean ("Y")	Reactive energy QI (+Ri)	3	1.0.65.8.0.255	2	
42		R2tot	Reactive Energy QII Total	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2	
43		R2aC	Reactive Energy QII Total Contract	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=10, c=2 x=20
44		R2aT1	Reactive Energy QII T1	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=1, c=2 x=11
45		R2aT2	Reactive Energy QII T2	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=2, c=2 x=12
46		R2aT3	Reactive Energy QII T3	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=3, c=2 x=13
47		R2aT4	Reactive Energy QII T4	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=4, c=2 x=14
48		R2aT5	Reactive Energy QII T5	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=5, c=2 x=15
49		R2aT6	Reactive Energy QII T6	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.6.8.x.255	2	c=1 x=6, c=2 x=16
50		R2totL1	Reactive Energy QII Total L1	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.26.8.0.255	2	
51		R2totL2	Reactive Energy QII Total L2	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.46.8.0.255	2	
52		R2totL3	Reactive Energy QII Total L3	Boolean ("Y")	Reactive energy QII (+Rc)	3	1.0.66.8.0.255	2	
53		R3tot	Reactive Energy QIII Total	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2	
54		R3aC	Reactive Energy QIII Total Contract	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=10, c=2 x=20
55		R3aT1	Reactive Energy QIII T1	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=1, c=2 x=11
56		R3aT2	Reactive Energy QIII T2	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=2, c=2 x=12
57		R3aT3	Reactive Energy QIII T3	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=3, c=2 x=13
58		R3aT4	Reactive Energy QIII T4	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=4, c=2 x=14
59		R3aT5	Reactive Energy QIII T5	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=5, c=2 x=15
60		R3aT6	Reactive Energy QIII T6	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.7.8.x.255	2	c=1 x=6, c=2 x=16
61		R3totL1	Reactive Energy QIII Total L1	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.27.8.0.255	2	
62		R3totL2	Reactive Energy QIII Total L2	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.47.8.0.255	2	
63		R3totL3	Reactive Energy QIII Total L3	Boolean ("Y")	Reactive energy QIII (-Ri)	3	1.0.67.8.0.255	2	
64		R4tot	Reactive Energy QIV Total	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2	
65		R4aC	Reactive Energy QIV Total Contract	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=10, c=2 x=20
66		R4aT1	Reactive Energy QIV T1	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=1, c=2 x=11
67		R4aT2	Reactive Energy QIV T2	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=2, c=2 x=12
68		R4aT3	Reactive Energy QIV T3	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=3, c=2 x=13
69		R4aT4	Reactive Energy QIV T4	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=4, c=2 x=14
70		R4aT5	Reactive Energy QIV T5	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=5, c=2 x=15
71		R4aT6	Reactive Energy QIV T6	Boolean ("Y")	Reactive energy QIV (-Rc)	3	1.0.8.8.x.255	2	c=1 x=6, c=2 x=16
72		R4totL1	Reactive Energy QIV TotalL1	Boolean ("Y")	Reactive energy QIV (-Rc) L1	3	1.0.28.8.0.255	2	
73		R4totL2	Reactive Energy QIV TotalL2	Boolean ("Y")	Reactive energy QIV (-Rc) L2	3	1.0.48.8.0.255	2	
74		R4totL3	Reactive Energy QIV TotalL3	Boolean ("Y")	Reactive energy QIV (-Rc) L3	3	1.0.68.8.0.255	2	

75		MxAIaC	Maximum Demand Active Power Import Total Contract	Boolean ("Y")	Maximum Demand Register Active power+ total contract	4	1.0.1.6.x.255	2	c=1 x=10 c=2 x=20
76		FxAIaC	Maximum Demand Active Power Import Total Contract DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV total contract)	4	1.0.1.6.x.255	5	c=1 x=10 c=2 x=20
77		MxAIaCL1	Maximum Demand Active Power Import Total Contract L1	Boolean ("Y")	Maximum Demand Register Active power+ total contract L1	4	1.0.21.6.x.255	2	C=1 x=10 Only for C1 Only for poly phase meters
78		FxAIaCL1	Maximum Demand Active Power Import Total Contract DateTime L1	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV total contract) L1	4	1.0.21.6.x.255	5	C=1 x=10 Only for C1 Only for poly phase meters
79		MxAIaCL2	Maximum Demand Active Power Import Total Contract L2	Boolean ("Y")	Maximum Demand Register Active power+ total contract L2	4	1.0.41.6.x.255	2	C=1 x=10 Only for C1 Only for poly phase meters
80		FxAIaCL2	Maximum Demand Active Power Import Total Contract DateTime L2	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV total contract) L2	4	1.0.41.6.x.255	5	C=1 x=10 Only for C1 Only for poly phase meters
81		MxAIaCL3	Maximum Demand Active Power Import Total Contract L3	Boolean ("Y")	Maximum Demand Register Active power+ total contract L3	4	1.0.61.6.x.255	2	C=1 x=10 Only for C1 Only for poly phase meters
82		FxAIaCL3	Maximum Demand Active Power Import Total Contract DateTime L3	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV total contract) L3	4	1.0.61.6.x.255	5	C=1 x=10 Only for C1 Only for poly phase meters
83		MxAIaT1	Maximum Demand Active Power Import T1	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	c=1 x=1 c=2 x=11
84		FxAIaT1	Maximum Demand Active Power Import T1 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
85		MxAIaT2	Maximum Demand Active Power Import T2	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	c=1 x=2 c=2 x=12
86		FxAIaT2	Maximum Demand Active Power Import T2 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
87		MxAIaT3	Maximum Demand Active Power Import T3	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	c=1 x=3 c=2 x=13
88		FxAIaT3	Maximum Demand Active Power Import T3 DateTime	Boolean ("Y")	Maximum Demand Register Active	4	1.0.1.6.x.255	5	

					power+ (QI+QIV)				
89		MxAIaT4	Maximum Demand Active Power Import T4	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	c=1 x=4 c=2 x=14
90		FxAIaT4	Maximum Demand Active Power Import T4 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
91		MxAIaT5	Maximum Demand Active Power Import T5	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	c=1 x=5 c=2 x=15
92		FxAIaT5	Maximum Demand Active Power Import T5 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
93		MxAIaT6	Maximum Demand Active Power Import T6	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	2	c=1 x=6 c=2 x=16
94		FxAIaT6	Maximum Demand Active Power Import T6 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.x.255	5	
95		MxAEaC	Maximum Demand Active Power Export Total Contract	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=10 c=2 x=20
96		FxAEaC	Maximum Demand Active Power Export Total Contract DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
97		MxAEaCL1	Maximum Demand Active Power Export Total Contract L1	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV) L1	4	1.0.22.6.x.255	2	C=1 x=10 Only for C1 Only for poly phase meters
98		FxAEaCL1	Maximum Demand Active Power Export Total Contract DateTime L1	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV) L1	4	1.0.22.6.x.255	5	C=1 x=10 Only for C1 Only for poly phase meters
99		MxAEaCL2	Maximum Demand Active Power Export Total Contract L2	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV) L2		1.0.42.6.x.255	2	C=1 x=10 Only for C1 Only for poly phase meters
100		FxAEaCL2	Maximum Demand Active Power Export Total Contract DateTime L2	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV) L2		1.0.42.6.x.255	5	C=1 x=10 Only for C1 Only for poly phase meters
101		MxAEaCL3	Maximum Demand Active Power Export Total Contract L3	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV) L3		1.0.62.6.x.255	2	C=1 x=10 Only for C1 Only for poly phase meters
102		FxAEaCL3	Maximum Demand Active Power Export Total Contract DateTime L3	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV) L3		1.0.62.6.x.255	5	C=1 x=10 Only for C1 Only for poly phase meters

103		MxAEaT1	Maximum Demand Active Power Export T1	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=1 c=2 x=11
104		FxAEaT1	Maximum Demand Active Power Export T1 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
105		MxAEaT2	Maximum Demand Active Power Export T2	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=2 c=2 x=12
106		FxAEaT2	Maximum Demand Active Power Export T2 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
107		MxAEaT3	Maximum Demand Active Power Export T3	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=3 c=2 x=13
108		FxAEaT3	Maximum Demand Active Power Export T3 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
109		MxAEaT4	Maximum Demand Active Power Export T4	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=4 c=2 x=14
110		FxAEaT4	Maximum Demand Active Power Export T4 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
111		MxAEaT5	Maximum Demand Active Power Export T5	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=5 c=2 x=15
112		FxAEaT5	Maximum Demand Active Power Export T5 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
113		MxAEaT6	Maximum Demand Active Power Export T6	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	2	c=1 x=6 c=2 x=16
114		FxAEaT6	Maximum Demand Active Power Export T6 DateTime	Boolean ("Y")	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.x.255	5	
115		DMCpd	Duration of Critical Demand Management Periods	Boolean ("Y")	Duration of Critical Demand Management Periods	3	0.1.94.35.62.255	2	
116		DMnCpd	Duration of Non-Critical Demand Management Periods	Boolean ("Y")	Duration of Non-Critical Demand Management Periods	3	0.1.94.35.63.255	2	
117		Fhi	Time stamp of billing period 1 last reset	Boolean ("Y")	Time stamp of billing period 1 last reset	1	0.0.94.35.x.255	2	c=1 x=11 c=2 x=12

Note: The implementation of this B30 is not mandatory for the SVM, in that case the DTC should reply with error to B30 order request. It is acceptable if the daily and monthly billing configuration is fixed for the SVM, with all absolute registers excluding registers per rate (only C=1 Pt=0).

9.11 Meter Display configuration [B33] [S33]

The configuration of the information to be presented in Auto scroll and Manual scroll is performed using the DLMS objects "0.0.21.0.1.255" and "0.0.21.0.2.255" accordingly (attribute #3, capture_objects). Only the tags of the objects to be configured shall be sent in the order (up to 20 tags for Autoscroll and 30 tags for Manualscroll).

The value sent in B33 order for each one of the tags corresponds to its position/order in the display sequence. The display sequence is related to the order of the objects in the "capture_objects" attribute.

See order workflow and other details in tab "Annex C – Use cases", B33.

B33/ S33	FIELD	DESCRIPTION		VALUE	Object	Clas	Logical name	Att	Comments
1	IdRpt/IdReq	Identifier of the Report/Request		B33/S33					Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier		3.4_EDP_2.0					Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5		0.0.96.1.4.255		
	B33/S33	Request/Report identifier tag name							
	ScrollMode								
6		ScrollMode	Display Scroll Mode	Integer(1,2) 1=Auto Scroll 2= Manual Scroll	General Display Readout (Auto scroll sequence) Alternative Display Readout (Manual scroll sequence)	7	0.0.21.0.1.255 0.0.21.0.2.255	3	ScrollMode=1 Auto scroll Configuration "0.0.21.0.1.255" ScrollMode=2 Manual scroll Configuration "0.0.21.0.2.255"
7		NS	Serial Number	Integer	Device ID1	1	0.0.96.1.0.255	2	Integer with the following valid values: Autoscroll: 1 to 20 Manualscroll: 1 to 30 The value sent in B33 order for each one of the tags corresponds to its position/order in the display sequence. The
8		DId2	Device ID2	Integer	Device ID2	1	0.0.96.1.1.255	2	
9		DId5	Device ID5	Integer	Device ID5	1	0.0.96.1.4.255	2	
10		DId7	Device ID7	Integer	Device ID7	1	0.0.96.1.6.255	2	
11		LT	Local Time	Integer	Local Time	1	1.0.0.9.1.255	2	
12		LD	Local Date	Integer	Local Date	1	1.0.0.9.2.255	2	
13		CalendarName	Calendar Name	Integer	Activity Calendar	20	0.0.13.0.x.255	2	
14		TR1	Active Demand Control Threshold T1	Integer	Active Demand Control Threshold T1	3	0.1.94.35.1.255	2	

15		TR2	Active Demand Control Threshold T2	Integer	Active Demand Control Threshold T2	3	0.1.94.35.2.255	2	display sequence is related to the order of the objects in the "capture_objects" attribute. Tag "CalendarName": x=1,2 for contracts 1 and 2 respectively
16		TR3	Active Demand Control Threshold T3	Integer	Active Demand Control Threshold T3	3	0.1.94.35.3.255	2	
17		TR4	Active Demand Control Threshold T4	Integer	Active Demand Control Threshold T4	3	0.1.94.35.4.255	2	
18		TR5	Active Demand Control Threshold T5	Integer	Active Demand Control Threshold T5	3	0.1.94.35.5.255	2	
19		TR6	Active Demand Control Threshold T6	Integer	Active Demand Control Threshold T6	3	0.1.94.35.6.255	2	
20		Plim	Currently Aparent Power Threshold	Integer	Currently Aparent Power Threshold	3	0.1.94.35.31.255	2	
21		ICPPCtrInh	ICP Power Control Inhibition	Integer	ICP power control Inhibition	1	0.1.94.35.21.255	2	
22		Presidual	Residual Power Threshold	Integer	Residual Power Threshold Object	3	0.1.94.35.61.255	2	
23		CPE	Metering Point ID	Integer	Metering point ID	1	0.0.96.1.10.255	2	
24		CoreFW	Core Firmware	Integer	Active core firmware identifier	1	1.0.0.2.0.255	2	
25		AppFW	Application Firmware	Integer	Active application firmware identifier	1	1.1.0.2.0.255	2	
26		CommFW	Communication Firmware	Integer	Communication module active firmware identifier	1	1.2.0.2.0.255	2	
27		UReg4	Utility Defined Register 4	Integer	Utility Defined Register 4	1	0.65.0.30.8.255	2	
28		UReg5	Utility Defined Register 5	Integer	Utility Defined Register 5	1	0.65.0.30.9.255	2	
29		UReg6	Utility Defined Register 6	Integer	Utility Defined Register 6	1	0.65.0.30.10.255	2	
30		UReg7	Utility Defined Register 7	Integer	Utility Defined Register 7	1	0.65.0.30.11.255	2	
31		UReg8	Utility Defined Register 8	Integer	Utility Defined Register 8	1	0.65.0.30.12.255	2	
32		UReg9	Utility Defined Register 9	Integer	Utility Defined Register 9	1	0.65.0.30.13.255	2	
33		AItot	Active Energy Import Total	Integer	Active energy import (+A)	3	1.0.1.8.0.255	2	
34		AIaC	Active Energy Import Total Contract1	Integer	Active energy import (+A)	3	1.0.1.8.10.255	2	

35		AIaT1	Active Energy Import Contract1 T1	Integer	Active energy import (+A)	3	1.0.1.8.1.255	2
36		AIaT2	Active Energy Import Contract1 T2	Integer	Active energy import (+A)	3	1.0.1.8.2.255	2
37		AIaT3	Active Energy Import Contract1 T3	Integer	Active energy import (+A)	3	1.0.1.8.3.255	2
38		AIaT4	Active Energy Import Contract1 T4	Integer	Active energy import (+A)	3	1.0.1.8.4.255	2
39		AIaT5	Active Energy Import Contract1 T5	Integer	Active energy import (+A)	3	1.0.1.8.5.255	2
40		AIaT6	Active Energy Import Contract1 T6	Integer	Active energy import (+A)	3	1.0.1.8.6.255	2
41		AEtot	Active Energy Export Total	Integer	Active energy export (−A)	3	1.0.2.8.0.255	2
42		AEaC	Active Energy Export Total Contract1	Integer	Active energy export (−A)	3	1.0.2.8.10.255	2
43		AEaT1	Active Energy Export Contract1 T1	Integer	Active energy export (−A)	3	1.0.2.8.1.255	2
44		AEaT2	Active Energy Export Contract1 T2	Integer	Active energy export (−A)	3	1.0.2.8.2.255	2
45		AEaT3	Active Energy Export Contract1 T3	Integer	Active energy export (−A)	3	1.0.2.8.3.255	2
46		AEaT4	Active Energy Export Contract1 T4	Integer	Active energy export (−A)	3	1.0.2.8.4.255	2
47		AEaT5	Active Energy Export Contract1 T5	Integer	Active energy export (−A)	3	1.0.2.8.5.255	2
48		AEaT6	Active Energy Export Contract1 T6	Integer	Active energy export (−A)	3	1.0.2.8.6.255	2
49		R1tot	Reactive Energy QI Total	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.0.255	2

50		R1aC	Reactive Energy QI Total Contract1	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.10.255	2
51		R1aT1	Reactive Energy QI Contract1 T1	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.1.255	2
52		R1aT2	Reactive Energy QI Contract1 T2	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.2.255	2
53		R1aT3	Reactive Energy QI Contract1 T3	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.3.255	2
54		R1aT4	Reactive Energy QI Contract1 T4	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.4.255	2
55		R1aT5	Reactive Energy QI Contract1 T5	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.5.255	2
56		R1aT6	Reactive Energy QI Contract1 T6	Integer	Reactive energy QI (+Ri)	3	1.0.5.8.6.255	2
57		R2tot	Reactive Energy QII Total	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.0.255	2
58		R2aC	Reactive Energy QII Total Contract1	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.10.255	2
59		R2aT1	Reactive Energy QII Contract1 T1	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.1.255	2
60		R2aT2	Reactive Energy QII Contract1 T2	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.2.255	2
61		R2aT3	Reactive Energy QII Contract1 T3	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.3.255	2
62		R2aT4	Reactive Energy QII Contract1 T4	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.4.255	2
63		R2aT5	Reactive Energy QII Contract1 T5	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.5.255	2
64		R2aT6	Reactive Energy QII Contract1 T6	Integer	Reactive energy QII (+Rc)	3	1.0.6.8.6.255	2
65		R3tot	Reactive Energy QIII Total	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.0.255	2
66		R3aC	Reactive Energy QIII Total Contract1	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.10.255	2
67		R3aT1	Reactive Energy QIII Contract1 T1	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.1.255	2
68		R3aT2	Reactive Energy QIII	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.2.255	2

			Contract1 T2					
69		R3aT3	Reactive Energy QIII Contract1 T3	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.3.255	2
70		R3aT4	Reactive Energy QIII Contract1 T4	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.4.255	2
71		R3aT5	Reactive Energy QIII Contract1 T5	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.5.255	2
72		R3aT6	Reactive Energy QIII Contract1 T6	Integer	Reactive energy QIII (-Ri)	3	1.0.7.8.6.255	2
73		R4tot	Reactive Energy QIV Total	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.0.255	2
74		R4aC	Reactive Energy QIV Total Contract1	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.10.255	2
75		R4aT1	Reactive Energy QIV Contact1 T1	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.1.255	2
76		R4aT2	Reactive Energy QIV Contact1 T2	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.2.255	2
77		R4aT3	Reactive Energy QIV Contact1 T3	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.3.255	2
78		R4aT4	Reactive Energy QIV Contact1 T4	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.4.255	2
79		R4aT5	Reactive Energy QIV Contact1 T5	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.5.255	2
80		R4aT6	Reactive Energy QIV Contact1 T6	Integer	Reactive energy QIV (-Rc)	3	1.0.8.8.6.255	2
81		MxAIaC	Maximum Demand Active Power Import Total Contract1	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.10.255	2
82		FxAIaC	Maximum Demand Active Power Import Total Contract1 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.10.255	5
83		MxAIaT1	Maximum Demand Active Power Import Contract1 T1	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.1.255	2

84		FxAIaT1	Maximum Demand Active Power Import Contract1 T1 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.1.255	5
85		MxAIaT2	Maximum Demand Active Power Import Contract1 T2	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.2.255	2
86		FxAIaT2	Maximum Demand Active Power Import Contract1 T2 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.2.255	5
87		MxAIaT3	Maximum Demand Active Power Import Contract1 T3	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.3.255	2
88		FxAIaT3	Maximum Demand Active Power Import Contract1 T3 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.3.255	5
89		MxAIaT4	Maximum Demand Active Power Import Contract1 T4	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.4.255	2
90		FxAIaT4	Maximum Demand Active Power Import Contract1 T4 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.4.255	5
91		MxAIaT5	Maximum Demand Active Power Import Contract1 T5	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.5.255	2
92		FxAIaT5	Maximum Demand Active Power Import Contract1 T5 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.5.255	5
93		MxAIaT6	Maximum Demand Active Power	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.6.255	2

			Import Contract1 T6					
94		FxAIaT6	Maximum Demand Active Power Import Contract1 T6 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.1.6.6.255	5
95		MxAEaC	Maximum Demand Active Power Export Total Contract1	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.10.255	2
96		FxAEaC	Maximum Demand Active Power Export Total Contract1 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.10.255	5
97		MxAEaT1	Maximum Demand Active Power Export Contract1 T1	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.1.255	2
98		FxAEaT1	Maximum Demand Active Power Export Contract1 T1 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.1.255	5
99		MxAEaT2	Maximum Demand Active Power Export Contract1 T2	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.2.255	2
100		FxAEaT2	Maximum Demand Active Power Export Contract1 T2 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.2.255	5
101		MxAEaT3	Maximum Demand Active Power Export Contract1 T3	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.3.255	2
102		FxAEaT3	Maximum Demand Active Power Export Contract1 T3 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.3.255	5

103		MxAEaT4	Maximum Demand Active Power Export Contract1 T4	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.4.255	2	
104		FxAEaT4	Maximum Demand Active Power Export Contract1 T4 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.4.255	5	
105		MxAEaT5	Maximum Demand Active Power Export Contract1 T5	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.5.255	2	
106		FxAEaT5	Maximum Demand Active Power Export Contract1 T5 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.5.255	5	
107		MxAEaT6	Maximum Demand Active Power Export Contract1 T6	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.6.255	2	
108		FxAEaT6	Maximum Demand Active Power Export Contract1 T6 DateTime	Integer	Maximum Demand Register Active power+ (QI+QIV)	4	1.0.2.6.6.255	5	
	ScrollMode								

9.12 Disconnector configuration and state [B34] [S34]

Only the tags of the parameters to be changed shall be sent in the order, there is no need to send all the tags (same approach for all orders).
All tags changed by within the order should be check by the DTC after the ValuesCheckDelay.
See order workflow and other details in "Annex C- Use case", B34. Note that on the B34 workflow there is no S34 report before the parameter modification and validation.

B34/ S34	FIELD	DESCRIPTION	VALUE	NATURE	Object	ClassID	Logical name	Att	Comments
1	IdRpt/Id Req	Identifier of the Report/Request	B34/S34						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5		0.0.96.1.4.255		

	B34/S34	Request/Report identifier tag name							
6	ICPCtrM	Disconnect Control Mode	Integer (0-6)	R/W	Disconnect Control	70	0.0.96.3.10.255	4	
7	ICPPCtrlnh	ICP Power Control Inhibition	Integer(0,1)	R/W	ICP power control Inhibition	1	0.1.94.35.21.255	2	
8	ICPtcQ	ICP Tripping Curve - Parameter Q	double long unsigned	R/W	parameter Q - ICP	1	0.0.128.30.1.255	2	
9	ICPtcK	ICP Tripping Curve - Parameter K	% (double long unsigned)	R/W	parameter k - ICP	3	0.0.128.30.2.255	2	
10	Plim	Currently Aparent Power Threshold	VA (integer)	R	Currently Aparent Power Threshold	3	0.1.94.35.31.255	2	
11	Eacti	Actual switch control state	Integer (0,1,2)	R	Disconnect Control	70	0.0.96.3.10.255	3	
12	ICPact	Actual switch output state	Integer (0,1)	R	Disconnect Control	70	0.0.96.3.10.255	2	
13	Eanti	Previous switch control state	Integer (0,1,2)	R	Previous Disconnect Control	70	0.1.94.35.20.255	3	
14	ICPprev	Previous switch output state	Integer (0,1)	R	Previous Disconnect Control	70	0.1.94.35.20.255	2	
15	ICPctrThresh	S_{PMF} – Certified installation power (maximum power per phase)	VA (integer)	R/W	Certified installation power (maximum power per phase)	3	0.1.94.35.32.255	2	Only applicable for poly phase meters Default values is 0
16	ICPExpCtrl	ICP export power control Activation	Integer(0,1)	R/W	ICP export power control Activation	1	0.1.94.35.22.255	2	Default values is 0

Note 1: The ICPctrThresh tag is only applicable to poly phase meter. The DTC should not collect this information for single phase meters and it should reply ICPctrThresh="" on the S34. The DTC should reject the B34 order if an request from the HES to change this tag on a single phase meter is sent.

Note 2: If a meter does not have the OBIS codes related to the new tags ICPctrThresh and ICPExpCtrl, the DTC should not report a failure on the UMS and URS and on the S34 and the content of these tags should be NULL (e.g.: ICPctrThresh="" and ICPExpCtrl="").

9.13 Demand Management configuration [B35] [S35]

Only the tags of the parameters to be changed shall be sent in the order.
See order workflow and other details in "Annex - Use cases", B35.

B35	FIELD	DESCRIPTION	VALUE	NATURE	Object	Class	Logical name	Att	Comments
1	IdReq	Identifier of the request	B35						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	B35	Demand Management Configuration tag name							
6	DMtype	Type of period	Integer (1,2)	W	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"type_of_period" = enum - 1st element of structure[5]
7	DMstart	Start period	Timestamp	W	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"start_date_time" = octet-string[12] - 2nd element of structure[5]
8	DMend	End period	Timestamp	W	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"end_date_time" = octet-string[12] - 3rd element of structure[5]
9	DMdecr	Decrease percentage	% (integer)	W	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"decrease_percentage" = integer - 4th element of structure[5]
10	DMabs	Absolute power value	VA (double long unsigned)	W	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"absolute_power_value" = double-long-unsigned - 5th element of structure[5]
11	Presidual	Residual Power Threshold	VA (double long unsigned)	W	Residual Power Threshold Object	3	0.1.94.35.61.255	2	

Note1: It should be possible to send a B35 with only the Presidual tag or a B35 with all tags exclude the Presidual. Please note that the Presidual has a different OBIS than all others.

Note2: If a B35 is sent with Cnt="", the DTC should open the DLMS association (and use client 5 for secure meters) with all meters and then send the message in broadcast to all meters. After that the DTC needs to read in unicast the meter configuration and reply to the HES with the proper UMS for each meter.

S35	FIELD	DESCRIPTION	VALUE	NATURE	Object	Cla	Logical name	Att	Comments
1	IdRpt	Identifier of the report	S35						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	S35	Demand Management Status tag name identifier							
6	DMstatus	Demand management status	Integer (0,1,2)	R	Demand Management Status	1	0.1.94.35.64.255	2	
7	DMtype	Type of period	Integer (1,2)	R	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"type_of_period" = enum - 1st element of structure[5]
8	DMstart	Start period	Timestamp	R	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"start_date_time" = octet-string[12] - 2nd element of structure[5]
9	DMend	End period	Timestamp	R	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"end_date_time" = octet-string[12] - 3rd element of structure[5]
10	DMdecr	Decrease percentage	% (integer)	R	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"decrease_percentage" = integer - 4th element of structure[5]
11	DMabs	Absolute power value	VA (double long unsigned)	R	Demand Management Period Definition Object	1	0.1.94.35.60.255	2	"absolute_power_value" = double-long-unsigned - 5th element of structure[5]
12	Presidual	Residual Power Threshold	VA (double long unsigned)	R	Residual Power Threshold Object	3	0.1.94.35.61.255	2	
13	DMCpd	Duration of Critical Demand Management Periods	seconds (double long unsigned)	R	Duration of Critical Demand Management Periods Object	3	0.1.94.35.62.255	2	
14	DMnCpd	Duration of Non-Critical Demand Management Periods	seconds (double long unsigned)	R	Duration of Non-Critical Demand Management Periods Object	3	0.1.94.35.63.255	2	

9.14 Meter insert and configuration [B38]

The B38 is used to insert a meter on the DTC. It is possible to insert serveral different meters with this order:

- 1=GPRS
- 2=RF Mesh
- 3=RS485/HDLC – Meters connected directly on the RS485 port of the DTC
- 4=RS485/HDLC over IP
- 5=RS232/HDLC over IP

B38	FIELD	DESCRIPTION	VALUE	Comments
1	IdReq	Identifier of the Request	B38	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	B38	Meter insert and configuration tag name		
5	Cnt	Unique meter identifier		
	ComTech			
6	MeterComTech	Communication technology of the meter to be inserted in DTC	Integer(1,2,3,4,5) 1=GPRS 2=RF Mesh 3=RS485/HDLC 4=RS485/HDLC over IP 5=RS232/HDLC over IP	Type of serial communication architecture: **3** = means the RS485/HDLC meter is directly connected to the DTC. **4 =** means the RS485/HDLC meter is connected to the DTC through an external communication module (router or modem). The connection between DTC and the external communication module can be done using ethernet. In this case, if MeterIP =”0” the DTC should consider the parameter "IProuter" - see S12/B07) and the meter accessed through TCP port defined in parameter "TCPportRS485" (see S12/B07). Otherwise it can be connected to a different external communication module whose IPaddress is defined in the tag “MeterIP”. (1) **5** = means the RS232/HDLC meter is connected to the DTC through an external router. The connection between DTC and the router is done using ethernet (considering parameter "IProuter" - see S12/B07) and the meter accessed through TCP port defined in parameter "TCPportRS232" (see S12/B07).
7	MeterIP	IP address of the meter.	IP address	With MeterComTech=1 or 2, this tag is used to configure the IP address of the meter (GPRS or RF Mesh). With MeterComTech=3, 4 or 5, this tag can be zero (0) - not used.
8	MeterHDLCAdd	HDLC address of the meter. If MeterComTech=1 or 2, the value should be MeterAdd="0" or ignored by the DTC otherwise.	Integer	This tag is used to manually configure the HDLC address of the meter.
9	MeterTCPPort	TCP port used to establish the connection	Integer	By default, the value of this port is 4059. If this tag is not present of NULL, the value should be the one configured on the TCPportRS485 or TCPportRS232 on B41/S41.
10	MainComTech	Definition of the preferential remote interface	Integer(0,1,2,3) 0 – HDLC/TCP is preferential , and PRIME is backup 1 – PRIME is preferential, amd HDLC/TCP is backup 2 – Only HDLC/TCP 3- Only PRIME NULL – default configuration	Not a mandatory tag. If not present or NULL, the DTC should assume that the HDLC/TCP interface is the preferential.
	ComTech			

(1) If the MeterComTech=4 or 5 and the MeterIP is set with a value different than zero (0), the DTC should accept the order and use the MeterIP address to communicate with the meter instead of the IProuter (from the S12/B07).

Note: Upon receiving a B38 for a meter that was already registered as a meter with remote communication flexibility, changing only the “MainComTech” parameter value, the DTC should keep all the meter database, do not collect the registration data and change only the preferential remote interface configuration.

Note: Upon receiving a B38 for a meter that was already registered, with any change besides the “MainComTech”, the DTC should keep all the meter database, collect the registration data and change the preferential remote interface configuration accordingly.

9.15 Public Lighting configuration [B43] [S43]

The B43 allows the HES to configure the public lightning control for public lightning meters. Likewise, the S43 allows the HES to read the public lightning control configuration..

Only the tags of the parameters to be changed shall be sent in the order.
See order workflow and other details in tab "Annex C – Use Cases", B43.

B43	FIELD	DESCRIPTION	VALUE	NATURE	Object	Class	Logical name	Att	Comments
1	IdReq	Identifier of the request	B43						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	B43	Public Lighting configuration tag name							
6	OpModeO1	Public Lighting operation mode - Output relay 1	Integer (0,1,2,3,4)	W	IP control – Output relay 1 operating mode configuration	1	0.1.94.35.40.255	2	"0": IP switch off - permanent state "1": IP switch on - permanent state "2": Astronomical clock "3": Time switching table "4": Clock+Table combined (default mode)
7	OpModeO2	Public Lighting operation mode - Output relay 2	Integer (0,1,2,3,4)	W	IP control – Output relay 1 operating mode configuration	1	0.1.94.35.140.255	2	"0": IP switch off - permanent state "1": IP switch on - permanent state "2": Astronomical clock "3": Time switching table "4": Clock+Table combined (default mode)
8	PLfaultPTh	Power threshold for over consumption verification - IP circuit disconnected state	W	W	Power threshold for over consumption verification - IP circuit disconnected state	3	0.1.94.35.44.255	2	
9	PLVminPTh	Demand variation on public lighting circuit - minimum power threshold	W	W	Overall minimum power threshold for IP circuit	3	0.1.94.35.45.255	2	
10	PLVmaxPTh	Demand variation on public lighting circuit - maximum power threshold	W	W	Overall maximum power threshold for IP circuit	3	0.1.94.35.46.255	2	
	PublicLightingControl	IP control - Time switching table for output relay 1 and 2							
11	OutputId	IP control - Output relay identifier	integer (1,2)						"1": IP control - Time switching table for output relay 1 "2": IP control - Time

									switching table for output relay 2
	<TimeSwitch>	Time switching table, with up to 366 entries			IP control - Time switching table for output relay x				Table with up to 366 entries (array[366])
12	Bdate	Begin date	Date octet string(5)	W	IP control - Time switching table for output relay x	1	0.1.94.35.x.255	2	"begin_date": date - 1st element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
13	Edate	End date	Date octet string(5)	W	IP control - Time switching table for output relay x	1	0.1.94.35.x.255	2	"end_date": date - 2nd element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
14	SwOFF	Switch OFF time	Time	W	IP control - Time switching table for output relay x	1	0.1.94.35.x.255	2	"switch_OFF_time": time - 3rd element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
15	SwON	Switch ON time	Time	W	IP control - Time switching table for output relay x	1	0.1.94.35.x.255	2	"switch_ON_time": time - 4th element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
	<TimeSwitch/>								
	<Offset>	Time offsets table, with up to 12 entries			IP control – Output relay x time offsets table				Table with up to 12 entries (array[12])
16	Bdate	Begin date	Date octet string(5)	W	IP control – Output relay x time offsets table	1	0.1.94.35.x.255	2	"begin_date": date - 1st element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
17	Edate	End date	Date octet string(5)	W	IP control – Output relay x time offsets table	1	0.1.94.35.x.255	2	"end_date": date - 2nd element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
18	OffsetOFF	Offset OFF	Long	W	IP control – Output relay x time offsets table	1	0.1.94.35.x.255	2	"offset_OFF": long - 3rd element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control -

									Output relay 2 time offsets table
19	OffsetON	Offset ON	Long	W	IP control – Output relay x time offsets table	1	0.1.94.35.x.255	2	"offset_ON": long - 4th element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
	<Offset/>								
	PublicLightingControl								

S43	FIELD	DESCRIPTION	VALUE	NAT	Object	Clas	Logical name	Att	Comments
1	IdRpt	Identifier of the report	S43						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	S43	Public Lighting extended information tag name identifier							
6	Fh	Meter Clock	Timestamp (date_time)		Clock	8	0.0.1.0.0.255	2	
7	OpModeO1	Public Lighting operation mode - Output relay 1	Integer (0,1,2,3,4)	R	IP control – Output relay 1 operating mode configuration	1	0.1.94.35.40.255	2	"0": IP switch off - permanent state "1": IP switch on - permanent state "2": Astronomical clock "3": Time switching table "4": Clock+Table combined (default mode)
8	OpModeO2	Public Lighting operation mode - Output relay 2	Integer (0,1,2,3,4)	R	IP control – Output relay 1 operating mode configuration	1	0.1.94.35.140.255	2	"0": IP switch off - permanent state "1": IP switch on - permanent state "2": Astronomical clock "3": Time switching table "4": Clock+Table combined (default mode)
9	StatusO1	Current status of Public lighting output relay 1	Integer (0,1)	R	Output Relay Control 1	70	0.1.96.3.10.255	3	"0": Disconnected "1": Connected
10	StatusO2	Current status of Public lighting output relay 2	Integer (0,1)	R	Output Relay Control 2	70	0.2.96.3.10.255	3	"0": Disconnected "1": Connected
11	PLfaultPTh	Power threshold for over consumption verification - IP circuit disconnected state	W	R	Power threshold for over consumption verification - IP circuit disconnected state	3	0.1.94.35.44.255	2	
12	PLVminPTh	Demand variation on public lighting circuit - minimum power threshold	W	R	Overall minimum power threshold for IP circuit	3	0.1.94.35.45.255	2	
13	PLVmaxPTh	Demand variation on public lighting circuit - maximum power threshold	W	R	Overall maximum power threshold for IP circuit	3	0.1.94.35.46.255	2	

14	PLfaultSt	Public lighting circuit fault status	Integer (0,1,2,3,4)	R	Public lighting circuit fault status	1	0.1.94.35. 43.255	2	"0": No fault; "1": No consumption in Public Lighting circuit with "IP control - current status" **connected.** "2": Consumption higher then the configured threshold with"IP control - current status" **disconnected**. "3": Consumption in Public Lighting circuit under the configured minimum threshold with "IP control - current status" **connected**. "4": Consumption in Public Lighting circuit over the configured maximum threshold with "IP control - current status" **connected**.
	Aclockinfo	Astronomical clock - information about the next 31 days							Table with 31 entries (array[31])
15	Cdate	Calendar date	Date	R	IP control - Astronomical clock information	1	0.1.94.35. 42.255	2	calendar_date: date - 1st element of structure[3]
16	ASunrise	Astro Sunrise time	Time	R	IP control - Astronomical clock information	1	0.1.94.35. 42.255	2	astro_sunrise_time: time - 2nd element of structure[3]
17	ASunset	Astro Sunset time	Time	R	IP control - Astronomical clock information	1	0.1.94.35. 42.255	2	astro_sunset_time: time - 3rd element of structure[3]
	Aclockinfo								
	PublicLightinginfo	IP control - Time switching table for output relay 1 and 2							
18	OutputId	IP control - Output relay identifier	integer (1,2)						"1": IP control - Time switching table for output relay 1 "2": IP control - Time switching table for output relay 2
	<TimeSwitch>	Time switching table, with up to 366 entries			IP control - Time switching table for output relay x				Table with up to 366 entries (array[366])
19	Bdate	Begin date	Date octet string(5)	R	IP control - Time switching table for output relay x	1	0.1.94.35. x.255	2	"begin_date": date - 1st element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
20	Edate	End date	Date Octet string (5)	R	IP control - Time switching table for output relay x	1	0.1.94.35. x.255	2	"end_date": date - 2nd element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
21	SwOFF	Switch OFF time	Time	R	IP control - Time switching table for output relay x	1	0.1.94.35. x.255	2	"switch_OFF_time": time - 3rd element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2

22	SwON	Switch ON time	Time	R	IP control - Time switching table for output relay x	1	0.1.94.35. x.255	2	"switch_ON_time": time - 4th element of structure[4] x=41: IP control - Time switching table for output relay 1 x=141: IP control - Time switching table for output relay 2
	<TimeSwitch/>								
	<Offset>	Time offsets table, with up to 12 entries			IP control – Output relay x time offsets table				Table with up to 12 entries (array[12])
23	Bdate	Begin date	Date Octet string (5)	R	IP control – Output relay x time offsets table	1	0.1.94.35. x.255	2	"begin_date": date - 1st element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
24	Edate	End date	Date Octet string (5)	R	IP control – Output relay x time offsets table	1	0.1.94.35. x.255	2	"end_date": date - 2nd element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
25	OffsetOFF	Offset OFF	Long	R	IP control – Output relay x time offsets table	1	0.1.94.35. x.255	2	"offset_OFF": long - 3rd element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
26	OffsetON	Offset ON	Long	R	IP control – Output relay x time offsets table	1	0.1.94.35. x.255	2	"offset_ON": long - 4th element of structure[4] x=48: IP control - Output relay 1 time offsets table x=148: IP control - Output relay 2 time offsets table
	<Offset/>								
	<StatusInfo>	General information status of output relays							
27	StatusOutput	Current status of Public lighting output relay	Integer (0,1)	R	IP control - general information status of output relay x	1	0.1.94.35. x.255	2	"current_IP_output_state": boolean - 1st element of structure[4] x=49: IP control - general information status of output relay 1 x=149: IP control - general information status of output relay 2
28	OpMode	Public Lighting operation mode	Integer (0,1,2,3,4)	R	IP control - general information status of output relay x	1	0.1.94.35. x.255	2	"current_operating_mode" : enum - 2nd element of structure[4] x=49: IP control - general information status of output relay 1 x=149: IP control - general information status of output relay 2
29	NextSwOFF	Next switch OFF transition	Timestamp (date_time)	R	IP control - general information status of output relay x	1	0.1.94.35. x.255	2	"next_switch_OFF_transition": date_time - 3rd element of structure[4] x=49: IP control - general information status of output relay 1 x=149: IP control - general information status of output relay 2
30	NextSwON	Next switch ON transition	Timestamp (date_time)	R	IP control - general information status of output relay x	1	0.1.94.35. x.255	2	"next_switch_ON_transition": date_time - 4th element of structure[4] x=49: IP control - general

									information status of output relay 1 x=149: IP control - general information status of output relay 2
	<StatusInfo />								
	<LastTransition>	Information related to the last transitions, with up to 6 entries							Buffer with up to 6 entries (array[6])
31	FhT	Timestamp of the last transition	Timestamp (date_time)	R	IP control status - Output relay x last transition	7	0.1.94.35.x.255	2	"clock": date_time - 1st element of structure[3] x=47: IP control status - Output relay 1 last transition x=147: IP control status - Output relay 2 last transition
32	StatusOutput	Status of the output relay after the last transition	Integer (0,1)	R	IP control status - Output relay x last transition	7	0.1.94.35.x.255	2	"output_state": boolean - 2nd element of structure[3] x=47: IP control status - Output relay 1 last transition x=147: IP control status - Output relay 2 last transition
33	Trigger	Last public lighting output status transition trigger	Integer (0,1,2,3,4,255)	R	IP control status - Output relay x last transition	7	0.1.94.35.x.255	2	"last_transition_trigger": enum - 3rd element of structure[3] x=47: IP control status - Output relay 1 last transition x=147: IP control status - Output relay 2 last transition
	<LastTransition/>								
	PublicLightinginfo								

9.16 Autonomous firmware upgrade [D09] [P09]

The autonomous firmware upgrade process allows the DTC to manage the meter firmware upgrade campaigns automatically, based on some pre-established requirements.
This process is intended to run continually (time interval of execution is defined on D09) on the DTC to guarantee, for example, that new meters that appear on the network without the latest firmware are upgraded in some specific periods of the day.

This mechanism is similar to the schedule tasks, where the D09/P09 is used just to send/read the the rules for these autonomous firmware upgrades and the process itself will run on the DTC. It can be reconfigured,canceled and after configured the DTC will send periodic G14 reports with the status of the meters.

D09	FIELD	DESCRIPTION	VALUE	COMMENTS
10	IdReq	Identifier of the request	D09	
11	IdPet	Unique request identifier		
12	Version	Version Identifier	3.4_EDP_2.0	
13	Cnc	Concentrator identifier		
	D09	Meter autonomous firmware update tag name		
5	ActDate	Activation date at which the process update should start in the DTC	Timestamp (e.g. : “20100101000000000W”)	Same tag has B05
6	MaxDate	Maximum execution date of the order	Timestamp (e.g. : “20100101000000000W”)	
	Cntrg			
7	CntRngId	1…200		
8	CntIni	Initial Meter identifier of the range		Device ID5
9	CntFin	Final Meter identifier of the range		Device ID5
10	VfList	List of firmware versions from the meters that should be upgraded	String E.g.: VfList="V0001,V0002,V0003"	The DTC should upgrade only the meters with one of the firmware versions listed. E.g.: VfList="V0001,V0002,V0003"
11	Firmware	Firmware location and filename (full path and name)	String	Same tag has B05
12	ActProt	Activation protocol to be used: Either PRIME or DLMS	String	Same tag has B05
13	Mult	Identifier to specify the method to update groups of meters: UN=Unicast, MU=Multicast, BO=Both.(1)	String UN,MU,BO	Same tag has B05
14	RemoveR	Remove a certain range ID of meters	Boolean (Y or N) If RemoveR=”Y” the CntRngID will be removed from the configuration	
	Cntrg			
	ExPer	Exclusion periods structure configuration		Periods of time in which the DTC should not perform meter upgrades.

15	PerID	1…10		
16	DateIni	Starting date of the exclusion period	Hour Octect-string hexadecimal (4) E.g.: 0A000000 -> Start at 10:00	
17	DateFin	Finishing date of the exclusion period	Hour Octect-string hexadecimal (4) E.g.: 12000000 -> End at 18h00	
18	Period	Periodicity	Bitstring (7) Each bit is a day of the week [Mon;Tue;Wed;Thur;Frid;Sat;Sund] E.g.: 1111100 Configuration to repeat the exclusion period each working day (except Saturday and Sunday)	
19	RemoveE	Remove a certain exclusion List	Boolean (Y or N) If RemoveE="Y" the ExPer will be removed from the configuration	
	ExPer			
20	Per	Periodicity to send periodic reports	Integer (seconds) Default value is 1440 minutes	The DTC should send a G14 periodically according to the Per configured.
21	Priority	Priority given to the firmware upgrades	Integer (0 to 9)	This task should have a low priority.

The first operation should be the download of the firmware file. During this stage the meters are all in Pending state. Afterwards the DTC should collect the firmware version from the meters that it does not know.to be able to define which meters "Comply" and which "Not Comply". After this, the DTC will start the upgrade to one (unicast) or more (broadcast) meters. If the upgrade is unicast, then one of the meters will be in "Upgrading" and the others in "Waiting time slot" states. If the upgrade fails for connectivity reasons the state should change to "Waiting retry".
If an exclusion period appears during the process, the meter should pass to "Paused" state.
If the process is cancelled by the HES, then the meters should be in "Canceled" state.
In case of success the state should be "Upgraded". Conversely, if fails for some connectivity reason it should be "Failed". It can also happen that the meter rejects the firmware, in this case the state is "Rejected".

P09	FIELD	DESCRIPTION	VALUE	Comments
12	IdRpt	Identifier of the request	P10	
13	IdPet	Unique request identifier		
14	Version	Version Identifier	3.4_EDP_2.0	
15	Cnc	Concentrator identifier		
5	ActDate	Activation date at which the process update should start in the DTC	Timestamp (e.g. : "20100101000000000W")	
6	MaxDate	Maximum execution date of the order	Timestamp (e.g. : "20100101000000000W")	
	Cntrg			
7	CntrngId	1…30		
8	CntIni	Initial Meter identifier of the range		
9	CntFin	Final Meter identifier of the range		
10	Firmware	New firmware name	String	
11	FwType	Firmware type. Indicates the type of the last Firmware update.	String "DLMS" or "PRIME"	
12	Mult	Identifier to specify the method to update groups of meters: UN=Unicast, MU=Multicast, BO=Both.(1)	String UN,MU,BO	
13	RemoveR	Remove a certain range ID of meters	Boolean (Y or N) If RemoveR="Y" the CntRngID will be removed from the configuration	
	Cntrg			
14	ExPer	Exclusion periods structure configuration		
15	PerID	1…10		
16	DateIni	Starting date of the exclusion period	Timestamp	
17	DateFin	Finishing date of the exclusion period	Timestamp	
18	Period	Periodicity	Timestamp (relative value). Note: If periodicity is null the exclusion period should be removed. Periodicity can also be set to zero (0), then it means it should be only run once, in this case the timeframe is fixed by type of Report (S02, S03, S05 daily, S04 monthly, S09 weekly) e.g. ‖ 00000001000000 ‖	
19	RemoveE	Remove a certain exclusion List	Boolean (Y or N) If RemoveE="Y" the ExPer will be removed from the configuration	
	ExPer			
20	Per	Periodicity to send periodic reports	Integer (seconds) Default value is 1440 minutes	The DTC should send a G14 periodically according to the Per configured.
21	Priority	Priority given to the firmware upgrades	Integer (0 to 9)	This task should have a low priority.

P09 can be requested from the HES has an asynchronous request. This report has the information from the configured upgrade processes. If more than 1 is launched by the HES through several D09, then the P09 report should have the final configuration (same has S12 from several B07 with task configurations).

9.17 Overvoltage monitoring [D12] [P12]

The meters have a feature in which the disconnector relay can open upon the detection of a overvoltage. In order to change some paramenters of this features, the HES can send a D12 to the DTC and change those parameters on the meter. Upon receiving a D12, the DTC shall execute the corresponding modifications on the meter, wait the ValueCheckDelay time and then read again the same objects to check if the modifications were properly done.

P12 is an asynchronous service that enables reading some of these feature's parameters. The report will be sent to the FTP server.

D12/P12	FIELD	DESCRIPTION	VALUE	NAT	Object	Class	Logical name	Att	Comments
1	IdRpt	Identifier of the report	D12/P12						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	D12	Overvoltage Monitoring							
6	Fh	Meter Clock	Timestamp (date_time)	R	Clock	8	0.0.1.0.0.255	2	
7	Vc	Threshold for neutral loss or overvoltage with	% Voltage reference (2,2)	R/W	Threshold for neutral loss or overvoltage with	3	1.0.94.35.94.255	2	Default value is 40,00 % of increment over Vref Meter will reply "4000"
8	Vp	Threshold for overvoltage with production detection	% Voltage reference (2,2)	R/W	Threshold for overvoltage with production detection	3	1.0.94.35.95.255	2	Default value is 20,00 % of increment over Vref Meter will reply "2000"
9	T1	Time Threshold for neutral loss/overvoltage detection	Seconds	R/W	Time Threshold for neutral loss/overvoltage detection	3	1.0.94.35.96.255	2	Default value is 60 seconds
10	T2	Time Threshold for neutral recovery	Seconds	R/W	Time Threshold for neutral recovery	3	1.0.94.35.97.255	2	
11	T3	Time Threshold for monitoring of overvoltage recovery	Seconds	R/W	Time Threshold for monitoring of overvoltage recovery	3	1.0.94.35.98.255	2	
	T4	Time Threshold for timed manual connection	Seconds	R/W	Time Threshold for timed manual connection	3	1.0.94.35.99.255	2	
12	OvMode	Overvoltage monitoring mode	Enum 0. Disabled 1. Enabled without triggering (only event generation 2. Enabled	R/W	Overvoltage monitoring mode	1	1.0.94.35.100.255	2	Default value on the meter is "0"

9.18 Meter Communication information [D13] [P13]

Through the service P13 the HES is able to collect information about the number of requests made to the meter through each one of its communication interfaces. P13 is an asynchronous service that enables reading these parameters. The report will be sent to the FTP server.

The D13 is used to reset this communication interfaces counter on the meter.

When the DTC receives the D13, it will execute the modifications on the meter, wait the ValueCheckDelay and then read again the same objects to check if the modification was properly done. Please note that the D13 will reset the counters so after the ValueCheckDelay the counter shoud be “0”.

D13	FIELD	DESCRIPTION	VALUE	Object	Class	Logical Name	Mth	COMMENTS
14	IdReq	Identifier of the request	D13					
15	IdPet	Unique request identifier						
16	Version	Version Identifier	3.4_EDP_2.0					
17	Cnc	Concentrator identifier						
	D13	Meter Communication information						
5	HAN	HAN request’s counter	Integer “0”	HAN request’s counter	3	0.0.94.35.72.255	2	Execute a method to reset this value on the meter
6	HDLC	DLMS association’s counter - established through RS485 interface	Integer “0”	DLMS association’s counter - established through RS485 interface	3	0.0.94.35.71.255	2	Execute a method to reset this value on the meter
	PRIME	DLMS association’s counter - established through PLC	Integer “0”	DLMS association’s counter - established through PLC	3	0.0.94.35.70.255	2	Execute a method to reset this value on the meter.

P13	FIELD	DESCRIPTION	VALUE	NAT	Object	Clas	Logical name	Att	Comments
1	IdRpt	Identifier of the report	P13						Not related with DLMS
2	IdPet	Unique request identifier							Not related with DLMS
3	Version	Version Identifier	3.4_EDP_2.0						Not related with DLMS
4	Cnc	Concentrator identifier							Not related with DLMS
5	Cnt	Unique meter identifier			Device ID5	1	0.0.96.1.4.255	2	
	P13	Meter Communication Information							
6	Fh	Meter Clock	Timestamp (date_time)	R	Clock	8	0.0.1.0.0.255	2	
7	HAN	DLMS association's counter - established through RS485 interface	Long-unsigned	R	DLMS association's counter - established through RS485 interface	3	1.1.94.35.122.255	2	
8	HDLC	DLMS association's counter - established through RS485 interface	Long-unsigned	R	DLMS association's counter - established through RS485 interface	3	1.1.94.35.121.255	2	
9	PRIME	DLMS association's counter - established through PLC	Long-unsigned	R	DLMS association's counter - established through PLC	3	1.1.94.35.120.255	2	

10 SECURITY RELATED ORDERS FROM THE HES TO THE METER

In this section are listed the web service messages, related to the EDP security implementation, sent by the HES to the DTC, which target some meter configuration or key management.
Please check the DTC security specification “EDP - WP2.1 DTC Security Functional Specification” and the Use Case document “HES-DTC Interface Specification_Use_cases ”, for more detailed information.

10.1 Meter Keys Update [B32], [S32]

With this message, it will be possible to send to the meter the Master Key, the Keys for each client or both at the same time.
The B32 message structure is prepared to allow programming in the same order several meters with different keys each, depending on the needs of the system.
For the case of client keys, this message includes the wrapped keys and the keys in clear. This way, the DTC will send the wrapped ones to the meter and keep the ones in clear to be used for accessing that meter. The use case of B32 includes the request of some meter data with new keys to validate the correct update before the final confirmation (UMS/URS) to the HES.
Reports that should be sent to the HES (using the request IdPet):

- S32 (requested to meter at Key Update date + ValuesCheckDelay)

If the B32 contains any attributes that are not possible to be updated in the meter, the DTC should generate a “UpdateMetersStatus” method with MeterStatus=3 and ErrCat=3, ErrCode=7 or 12 to 19.
The completion of the request has to be notified through the updatemetersstatus and updaterequeststatus web services.

The Execution Date (Fini) and Maximum Execution Date (Ffin) must follow the behavior defined in the “Clarification of use of MaxOrderOutdate, Maximum Execution Date and Execution Date” paragraph in this technical specification. Similarly, “Ffin” defines the maximum date where that DTC will attempt to execute the order at the counter, taking into account the number of retries defined in the parameters of the DTC. So, once the date “Ffin” has been reached, the DTC will not retry any more the order, notifying with UMS and error codes conveniently, the final state of the order.

When the HES needs to change only the MK meter, it is mandatory to include in B32 order also a new GunKey because the DTC transfers a new GunKey to check the correct MK update in the meter.

If the DTC receives a B32 order with MK information only, without GunKey information, the DTC must reject the order.

If the DTC has to initialize the meter (security policy 0), the B32 order received from the HES must include new information for Global unicast encryption key and Global authentication key, otherwise, the DTC must reject the order.

In both cases, the DTC rejects the order sending to the HES an Update Meter Status with MS=1 and ErrCat=3, ErrCode=2 (Data error (malformed, partially received…)) and mustn´t try to change any Key to the meter.

If the DTC receives a B32 order for a meter and this meter is registered internally for any reason like a non-secured meter, the DTC will try to establish an association with the public client (16) to read the attribute 2 in the security setup OBIS 0-0:43.0.5.255, from the Secure General Client. If the DTC reads the attribute successfully, it is understood that the new meter registered will be secure.

If the DTC reads the security setup attribute 2 with value 0 or 3, the B32 order received will be executed with the Keys included by the HES checking all validations above described.

In the case the meter is not secure (does not have the security policy OBIS), an UMS error with ErrCat=3 and ErrCode=0 will be sent indicating this situation. More details in use case section 16.6.

B32	FIELD	DESCRIPTION	VALUE	Object	Clas	Logical Name	At	Comments
1	IdReq	Identifier of the request	B32					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	B32	Meter Keys Update						
6	Fini	Execution date (e.g. : "20100101000000000W")	Timestamp					
7	Ffin	Maximum Execution Date (e.g. : "20100101000000000W")	Timestamp					
	MasterKey							
8	KeyId	Key Identifier	Uint32					
9	KeyWrap	Key Wrapped	Hexadecimal					
	MasterKey							
	DASec	Data Access Security						
10	ClientId	Client Id Security Association	Integer					Posible Client Values ◦ 4: SGC ◦ 5: SBC
11	Secret	Secret password LLS	String	Assicuation LN	15	0.0.40.0.5.255	7	For SGC
					15	0.0.40.0.6.255	7	For SBC
	CDTSec	Data Transport Security Key						
12	KeyId	Key Identifier	Uint32					KMF Internal Unique identifier
13	KeyType	Key Type "GUnKey", "GBrKey" or "GAuKey"	String	Security Setup	64	0.0.43.0.5.255		For Secure General Client
					64	0.0.43.0.6.255		For Secure Broadcast Client
14	KeyWrap	Key Wrapped	Hexadecimal					
	KeyVal	key Value. Keys must be in clear so that DTC can know and use them.	Hexadecimal					
	CDTSec							
	DASec							

The DASec structure will be repeated for every Client that the HES wants to update to the meter. The clientId and Secret are mandatory attributes. The Secret attribute can be null "". It means that the LLS_secret mustn't be changed in the meter.

The CDTSec structure will be repeated for every Key that the HES wants to update to the Meter.

In the next example, the HES sends an order to the DTC "AAA57C4730016". In this order, the HES Updates the secret password, the global unicast encryption key and the global authentication key for the Client 4 to the meters "BBB0115108646" and "CCC0115108646".

```
<Order IdPet="11006811" IdReq="B32" Version="3.4_EDP_2.0">
      <Cnc Id="AAA57C4730016">
       <Cnt Id="BBB0115108646">
           <B32 Fini="20130101000000000W" Ffin="20130101000500000W">
                 <DASec ClientId="4" Secret="ABCDEF">
                          <CDTSec KeyId="5647378" KeyType="GunKey">
                                KeyWrap="805398099580948550" KeyVal="85575445575837537">
                          </CDTSec>
                            <CDTSec KeyId="64838374" KeyType="GauKey">
                                KeyWrap="648763278468726487" KeyVal="75757875375875353">
                            </CDTSec>
                       </DASec>
              </B32>
       </Cnt>
       <Cnt Id="CCC0115108646">
           <B32 Fini="20130101000000000W" Ffin="20130101000500000W">
                   <DASec ClientId="4" Secret="ABCDEF">
                            <CDTSec KeyId="6478387" KeyType="GunKey">
                                    KeyWrap="805398099580948550" KeyVal="9898327327877739">
                            </CDTSec>
                            <CDTSec KeyId="84368438" KeyType="GauKey">
                                    KeyWrap="648763278468726487" KeyVal="3576536247457577">
                            </CDTSec>
                  </DASec>
```

```
            </B32>
          </Cnt>
      </Cnc>
</Order>
```

In the next example, the HES sends an order to the DTC “AAA57C4730016”. In this order, the HES Update the Master key to the meter “BBB0115108646”. The order must include the new GunKey information to verify the correct MK upgrade.

```
<Order IdPet=”11006811” IdReq=”B32” Version=”3.4_EDP_2.0”>
    <Cnc Id=”AAA57C4730016”>
         <Cnt Id=”BBB0115108646”>
             <B32 Fini=”20130101000000000W” Ffin=”20130101000500000W”>
                  <MasterKey KeyId=”35372772”>
                                  KeyWrap=”805398099580948550”>
                  </MasterKey>
                   <DASec ClientId=”4” Secret=””>
                            <CDTSec KeyId=”6478387” KeyType=”GunKey”>
                                  KeyWrap=”805398099580948550” KeyVal=”9898327327877739”>
                            </CDTSec>
                 </DASec>
             </B32>
         </Cnt>
     </Cnc>
</Order>
```

The S32 report is included in the meter keys update process to verify that the DTC can establish a DLMS association with the meter after changing the Keys in the meter, to confirm that the Keys have been updated correctly.
The format of this report is similar to that of S15 for the case of new meter message (as shown in the table below).

- Meter registering (Group 5 ,code 1)

The message format will be as follows:

S32	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S32
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	S32	Report tag name identifier	
5	Fh	Date at which the DTC generate the Report (Y/M/D H:M:S:ms)	timestamp
6	Et	Event Group	5
7	C	Event Code	1
8	D1	MeterID	String
9	D2	Parameters included in the new meter message (it is assumed that the DTC has this data available and it doesn’t need to retrieve it from all meters)	String

This is an example format for S32 with an event related to a meter registering.

```
<Report IdRpt=”S32” IdPet=”34524” Version=”3.4_EDP_2.0”>
   <Cnc Id=”MMM7940190606”>
      <S32 Fh=”20130710083343000S” Et=”5” C=”1”>
         <D1>MMM0037592013</D1>
         <D2 cosemID=”0100006001OOFF02”>3030333735392303132</D2>
         <D2 cosemID=”0100006001O1FF02”>205A4D593133</D2>
         <D2 cosemID=”0100006001O2FF02”>636F6E7461646F722020444C4D5330313035</D2>
      </S32>
   </Cnc>
</Report>
```

The DTC collects D1 and D2 during the meter iniciatilization and reports that to the HES with the S15 message. The S32 has the same data so it does not make sense to collect that same data again from the meter. Both messages should be sent to the HES, but only once the DTC should collect the information.

10.2 Deliver Optical port LSSs to the Meter [D01]

D01 is the web service sent by the HES with the new LLS to be written on a secure meter. The DTC should establish a secure general client association and write the new LLS according to what is mention on the D01 order.

D01	FIELD	DESCRIPTION	VALUE	OBJECT	CLASS	LOGICAL NAME	ATT	COMMENTS
1	IdReq	Identifier of the request	D03					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	D01	Timeout for connections						
6	Fini	Execution date	TimeStamp					
7	Ffin	Maximum Execution Date	TimeStamp					
	DASec							
8	LLSRead	Optical Port LLS for Reading Client Value	String	Association LN (Reading)	15	0.0.40.0.2.255	7	Length 8 characters. Field omitted if LLS_{OPT-R} was not requested
10	LLSMng	Opitcal Port LLS for Management Client Value	String	Association LN (Management)	15	0.0.40.0.3.255	7	Length 8 characters. Field omitted if LLS_{OPT-M} was not requested
	LLSFw	Optical Port LLS for Firmware Client Value	String	Association LN (Firmware)	15	0.0.40.0.4.255	7	Length 8 characters. Field omitted if LLS_{OPT-FW} was not requested
	DASec							

10.3 Deliver encrypted FW Upfrade Public key to the Meter [D02]

D02 is the web service sent by the HES to change the firmware public key of the meter. In this web service are sent the IV, ephemeral key wrapped with the corresponding meter marterkey, the encrypted firmware update public key (encrypted with the ephemeral key), the autehentication tag and the firmware updade key ID that the DTC uses to validate that the operation was properly done.

D02	FIELD	DESCRIPTION	VALUE	OBJECT	CLASS	LOGICAL NAME	ATT	COMMENTS
1	IdReq	Identifier of the request	D03					
2	IdPet	Unique request identifier						
3	Version	Version Identifier	3.4_EDP_2.0					
4	Cnc	Concentrator identifier						
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2	
	D02	Timeout for connections						
6	Fini	Execution date e.g. : “20100101000000000W”	TimeStamp					
7	Ffin	Maximum Execution Date e.g. : “20100101000000000W”	TimeStamp					
	DASec							
8	IV	KMF generated 96 bits IV	Hex	FW Update Public Key	1	0.1.94.35.74.255	2	Length 12 hex characters.
10	WrapEphKey	KMF generated AES-128 Ephemeral Key Wrapped with the meter MK	Hex					Length 24 hex characters.
	EncrPubKey	Encrypted FW Update Public Key	Hex					Length 65 hex characters.
	AuthTag	AES-GCM Authentication Tag of the ecrypted FW Update Public Key	Hex					Length 12 hex characters.
	FWUpdKeyId	32 bits containing the FW Update Public key Unique ID	Hex					Length 4 hex characters. Note that this field is not referring to an ineternal KMF Unique ID, but to a special Index allowing to verify that the Public Key was correctly loaded in the meter
	DASec							

10.4 Deliver Timeout for Connection (secure client) [D03]

D03 is the web service that is sent by the HES when there is the need to change the timeouts for the DLMS session of the secure general and broadcast clients.

D03	FIELD	DESCRIPTION	VALUE	OBJECT	CLASS	LOGICAL NAME	ATT
1	IdReq	Identifier of the request	D03				
2	IdPet	Unique request identifier					
3	Version	Version Identifier	3.4_EDP_2.0				
4	Cnc	Concentrator identifier					
5	Cnt	Unique meter identifier		Device ID5	1	0.0.96.1.4.255	2
	D03	Timeout for connections					
6	Fini	Execution date	TimeStamp				
7	Ffin	Maximum Execution Date	TimeStamp				
	DASec						
8	TimeOutSGCDef	Timeout open session for Secure General Client through Secure Channel	Seconds	Timeout open sesion for Secure General Client through Secure Channel	1	0.0.94.35.54.255	2
10	TimeOutSBCDef	Timeout open session for Secure Broadcast Client through Secure Channel	Seconds	Timeout open sesion for Secure Broadcast Client through Secure Channel	1	0.0.94.35.56.255	2
	DASec						

11 ORDERS FROM THE HES TO THE DTC

11.1 Meter Removal [B06]

This message is used to remove a meter in a DTC.
When this message is received, the DTC will remove the meter in its database including all depending information (readings, events, passwords, DLMS Keys, unregister it and remove information at the PRIME node base, etc). B06 provides the means to keep the DTC database under control. This means that if in the future, that DTC registers that meter, a message will be sent to the HES (new meter message).
Note that this operation is independent of the fact of having a meter unreachable.

B06	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdReq	Identifier of the request	B06	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	B06	Meter activation control		
6	Operation	Operation to be done. When a meter is removed, if it is discovered again it wouldreport it to the HES (S15).	1 = Remove meter	Applies to all meters except the SVM.

11.2 Modification of the DTC configuration [B07]

This order will allow changing the tasks programmed in the DTC as also its priority.
The message definition is made in such a way that only the parameters that are required to be changed are included in a message (there is no need to include the full parameter list each time this message is sent).
The structure of the message is defined in “S12 report” section.

Notes for the first implementation of the protocol:

- Security issues will not be considered for encrypting usernames and passwords sent in messages.

11.3 Modification of the DTC communication configuration [B41]

The message definition is made in such a way that only the parameters that are required to be changed are included in a message (there is no need to include the full parameter list each time this message is sent).
The structure of the message is defined in “S41 report” section.

11.4 DTC Firmware update [B08], [S22]

Updating the firmware of the DTC is done in two phases, first the HES will send a WS request to the DTC notifying the need for firmware update [B08]. Then the DTC will start the update process by downloading the firmware from an ftp server. Once this is done, the DTC will start its update process. When the update is finished, the DTC will send a notification to the HES through S22 messages.
The integrity of the image will be guaranteed before activating it.

B08	FIELD	DESCRIPTION	VALUE
1	IdReq	Identifier of the request	B08
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	B08	Concentrator Firmware update tag name	
5	ActDate	Activation date at which the process update should start in the DTC	Timestamp

			(e.g. : “20100101000000000W”)
6	Firmware	Firmware location and filename (full path and name)	String

Once the updating has been executed, the DTC will send to the HES a confirmation report through WS:

S22	FIELD	DESCRIPTION	VALUE
1	IdRpt	Identifier of the request	S22
2	IdPet	Unique request identifier	
3	Version	Version Identifier	3.4_EDP_2.0
4	Cnc	Concentrator identifier	
	S22	Report tag name identifier	
5	Fh	Order execution date/time “YYYYMMDDHHmmssfffX”	
6	Vf	Firmware version This is used to read the current firmware version of the DTC. It should be consistent with the naming convention of the firmware file so that they can be visually related to each other.	
7	VfComm	Communication module (PRIME) firmware version. This is used to read the current firmware version of the communication module. Eg 1.3.e	

Also the DTC will send to the HES the DTC parameters report [S12].
Annex C, section 16.5.5describes the sequence of interaction and message exchange between HES and DTC when receiving a B08.

It is also possible to send an assynchornous request from the HES to collect the S22. In this case the DTC should send a web service with the S22.

11.5 DTC Order Request [B11]

This message is used to execute a command in the DTC. The message is executed through the DTC order request message.
The response to this task is given by the web service acknowledgement (success or failure).

B11	FIELD	DESCRIPTION	VALUE	Version
1	IdReq	Identifier of the request	B11	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	B11	DTC order request tag name		
5	Order	Type of order to execute	String (see list below)	
6	Args	String with additional arguments when needed	string	
7	Fini	Execution date (e.g. : “20100101000000000W”)	Timestamp	
8	Ffin	Maximum Execution Date (e.g. : “20100101000000000W”)	Timestamp	

Minimum list of orders to be included

Order	DESCRIPTION
T01	Reboot of the DTC. When the DTC reboot by a T01 order execution, the all running reports (due to scheduled tasks or HES report requests) are stopped

	and cancelled. In this case the DTC should send all the data available from the meters before the reboot and then report the HES with the proper URS
T02	This implies that all running reports (due to scheduled tasks or HES report requests) are stopped and cancelled and the DTC informs the HES through UMS and URS, sending all the information it was gattered from the meters.
T03	Synchronize meter time according to parameter TimeDev and TimeDevOver defined above.
T04	Perform a Clear of meters database in DTC that are in Permanent Failure “PF” state (Clear= remove them fully, together with their dependencies from the DTC database)
T05	Force time synchronisation in DTC.
T06	Clean meters passwords/keys in DTC database. Apply to all meters secured and non-secured meters.
T07	Force meter synchronisation ignoring parameters TimeDev and TimeDevOver. In this case all meters should be synchronized not only the ones with deviations higher than TimeDevOver.
T08	Perform a Clear for all meters in the DTC database (Clear= remove them fully, together with their dependencies from the DTC database)
T09	Perform a Clear of secure meters in the DTC database that are pending to receive the keys from HES. This means that the HES key request process will be triggered again on association request (Clear= remove them fully, together with their dependencies from the DTC database)
T11	DTC must generate a S31 message for each meter in AKP or AKW status.
T12	Refresh the PRIME network but do not delete the meter database. Same operation as disable and enable the base node.
T13	Clear and cancel the automatic firmware upgrade process (configured through D09 orders)

Additional order codes will be included based on the needs.

11.6 DTC alarms configuration and status [B36] [S36]

The B36 order can be used to configure any DTC event as an alarm and configure a second event to disable that alarm. This alarm can be sent to different systems depending on the configuration.
When reading alarm register and configuration (report S36), only meaningful data should be returned. See below details for each tag.

B36/S36	FIELD	DESCRIPTION	VALUE	NATURE	Comments
1	IdRpt/IdReq	Identifier of the Report/Request	B36/S36		
2	IdPet	Unique request identifier			
3	Version	Version Identifier	3.4_EDP_2.0		
4	Cnc	Concentrator identifier			
	B36/S36	Request/Report identifier tag name			
5	AlRst	Alarm register reset	Boolean "Y" - Execute alarm reset "N" - Do not execute alarm reset	W	Full reset of alarm register array
6	AlConfigRst	Alarm configuration reset	Boolean "Y" - Execute alarm configuration reset "N" - Do not execute alarm configuration reset	W	Full reset of the alarm configuration, namely arrays: "Alarm filter", "Alarm clearing event group&code", "Alarm destination" and "Alarm timer".
	Alarm	Tag for each alarm in the list			
7	Evgroup	DTC Event group	unsigned (1,2,3,..., n)		n= number of event groups
8	Evcode	DTC Event code	unsigned (1,2,3,..., 256)		
9	AlReg	Alarm register	bit-string[1] Value "0" means the alarm is not present Value "1" means the alarm is present	R/W	"W" permission should be used to reset alarms individually, setting alarm register with value "0"(zero) Active alarms (alarm register with value "1") should be returned in the report S36"
10	AlFilter	Alarm filter	bit-string[1] Value "0" means the alarm is disabled (should not be generated) Value "1" means the alarm is enabled (should be generated)	R/W	Only enabled alarms (alarm filter with value "1") should be returned in the report S36"
11	AlClearEvgroup	Alarm clearing event (event group)	unsigned (0,1,2,3,..., n)	R/W	n= number of event groups Value "AlClearEvgroup = 0; AlClearEvcode = 0" (default value for each alarm register) means there isn't any associated clearing event. Only "clearing events" with values different from "0" (zero) should be returned in the report S36" (only non-default values)
12	AlClearEvcode	Alarm clearing event (event code)	unsigned (0,1,2,3,..., 256)	R/W	
13	ALDestin (1)	Alarm destination	unsigned, with the following meaning: bit0 - Commercial System (STG1) bit1 - Commercial System (STG2) bit2 - Commercial System (STG3) bit3 - Technical System 1 bit4 - Technical System 2 bit5 - Communication management System Value "0" means the alarm is not sent to the respective	R/W	Only "Alarm destination" (ALDestin) with values different from "0" (zero) should be returned in the report S36"

			system Value "1" means the alarm shall be sent to the respective system		
14	AlTimer	Alarm timer	unsigned Values in seconds. Value "0" means the alarm is sent immediately after being generated	R/W	Only "Alarm timer" (ALTimer) with values different from "0" (zero) should be returned in the report S36"
	Alarm	Tag for each alarm in the list			

(1) If the ALDestin tag is set to send the alarm to:
   a. STG1, STG2 or STG3, a S15 message will be generated to the corresponding destination
   b. Technical System 1 or Techical System 2, them the alarm should be sent through IEC 60870-5-104
   c. Communication management System, them the alarm is sent through a SNMP trap. This is valid for events that generate trap (check annex E).

11.7 Digital I/O configuration and status [B37] [S37]

The B37 is used to configure the digital input and output of the DTC.
It is possible to configure an event to be generated when the input is activated and deactivated and the same for the output, it is possible to change the output state of the digital output after the generation of events.

B37/S37	FIELD	DESCRIPTION	VALUE	NATURE	Comments
1	IdRpt/IdReq	Identifier of the Report/Request	B37/S37		
2	IdPet	Unique request identifier			
3	Version	Version Identifier	3.4_EDP_2.0		
4	Cnc	Concentrator identifier			
	B37/S37	Request/Report identifier tag name			
5	OutputRst	Digital outputs reset	Boolean "Y" - Execute digital outputs reset "N" - Do not execute digital outputs reset	W	Full reset of digital outputs status (set to "OFF")
6	IOConfigRst	Digital I/O configuration reset	Boolean "Y" - Execute digital I/O configuration reset "N" - Do not execute digital I/O configuration reset	W	Full reset of the digital I/O configuration
	Input	Tag for each input in the list			
7	Input	Digital input	unsigned (1, … , n)		n = number of digital inputs
8	InputOnEvgroup	Input activation event configuration (event group)	unsigned (0,1,2,3,…, n)	R/W	n= number of event groups Value "InputOnEvgroup = 0; InputOnEvcode = 0" (default value for each digital input) means there isn't any associated event.
9	InputOnEvcode	Input activation event configuration (event code)	unsigned (0,1,2,3,…, 256)	R/W	
10	InputOffEvgroup	Input deactivation event configuration (event group)	unsigned (0,1,2,3,…, n)	R/W	n= number of event groups Value "InputOffEvgroup = 0; InputOffEvcode = 0" (default value for each digital input)
11	InputOffEvcode	Input deactivation event configuration (event code)	unsigned (0,1,2,3,…, 256)	R/W	

					means there isn't any associated event.
12	InputStatus	Digital inputs status	bit-string [1] Value "0" means the input is OFF Value "1" means the input is ON	R	
	Input	Tag for each input in the list			
	Output	Tag for each output in the list			
13	Output	Digital Output	unsigned (1, … , n)		n = number of digital outputs
14	OutputOnEvgroup	Output activation event configuration (event group)	unsigned (0,1,2,3,…, n)	R/W	n= number of event groups Value "OutputOnEvgroup = 0; OutputOnEvcode = 0" (default value for each digital output) means output is not configured.
15	OutputOnEvcode	Output activation event configuration (event code)	unsigned (0,1,2,3,…, 256)	R/W	
16	OutputOffEvgroup	Output deactivation event configuration (event group)	unsigned (0,1,2,3,…, n)	R/W	n= number of event groups Value "OutputOffEvgroup = 0; OutputOffEvcode = 0" (default value for each digital output) means output is not configured.
17	OutputOffEvcode	Output deactivation event configuration (event code)	unsigned (0,1,2,3,…, 256)	R/W	
18	OutputStatus	Digital outputs status	bit-string [1] Value "0" means the output is OFF Value "1" means the output is ON	R/W	"W" permission should be used to individually activate or deactivate the output
	Output	Tag for each output in the list			

11.8 Hourly communication statistic with meters [G01]

It contains hourly information about statistics of communications. In case of study, it is possible to know the evolution of communications throughout the day (for example, hours with highest number of failures).

The report will show:

- Average number of active meters at last hour (to do this, we define Amed parameter).
- Maximum number of active meters at this hour (to do this, we define Amax parameter).
- Total number of active/failure meters at the closure instant (to do this, we define Tot parameter).
- Percentage of active meters detected at the closure instant with accuracy of two decimal places (to do this, we define Aperc parameter).

The variables involved in this report are:

G01	FIELD	DESCRIPTION	VALUE
1	Cnc Id	Concentrator identifier	
2	IdRpt	Unique report identifier	
3	IdPet	Unique request identifier	
4	Version	HES-DTC Interface specification version	“3.4_EDP_2.0”
	G01	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S)	Timestamp
7	Amed	Average number of active meters	Integer
8	Amax	Maximum number of active meters	Integer
9	Tot	Total number of active/failure meters at the closure	Integer
10	Aperc	Percent of active meters	%

This report can be programmed in the task scheduler and will send hourly stored information about a specific period of time.

Following is an example of a daily request of G01 report with 24 values stored.

```
<Report IdRpt="G01" IdPet="4969990" Version="3.4_EDP_2.0">
<Cnc Id="xxx0000035098">
        <G01 Fh="20110715010000S" Amed=”120” Amax=”124” Tot=”125” Aperc=”82.33” />
        <G01 Fh="20110715020000S" Amed=”120” Amax=”124” Tot=”125” Aperc=”82.33” />
        <G01 Fh="20110715030000S" Amed=”120” Amax=”124” Tot=”125” Aperc=”82.33” />
                .
                .
                .
        <G01 Fh="20110715230000S" Amed=”120” Amax=”124” Tot=”125” Aperc=”82.33” />
        <G01 Fh="20110716000000S" Amed=”120” Amax=”124” Tot=”125” Aperc=”82.33” />
</Cnc>
</Report>
```

11.9 Daily communication statistic with meters [G02]

G02 report stores the information about the statistic of daily communication, the report will show one line for each meter with the following parameters:

- Time which the meter has been active (Atime).
- Number of state changes Active/Failure (to do this, we define Nchanges parameter).
- Time which the DTC has been active (Aconc).
- Final percentage of time which the meter has been active (to do this, we define Atimeperc parameter).

There is no distinction between temporary failure (TF) and permanent failure (PF) because they are equivalent at communication level.

Atimeperc will set to zero daily.

The following table shows the variables involved in this report.

G02	FIELD	DESCRIPTION	VALUE
1	Cnc Id	Concentrator identifier	
2	IdRpt	Unique report identifier	
3	IdPet	Unique request identifier	
4	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
5	Cnt Id	Unique meter identifier	
	G02	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S)	Timestamp
7	Atime	Time that the meter has been up	Integer (Minutes)
8	Nchanges	Number of changes Active-Fail	Integer
9	Aconc	Time that the DTC has been up	Integer (Minutes)
10	Atimeperc	Percent of active time daily	%

This is an example of G02 report:

```
<Report IdRpt="G02" IdPet="4969990" Version="3.4_EDP_2.0">
<Cnc Id="XXX0000035098">
<Cnt Id="XXX0034668898">
<G02 Fh="20110715000000S" Atime="1400" Nchanges="6"  Aconc ="1440" Atimeperc="97.22" />
</Cnt>
</Cnc>
</Report>
```

Note: The number of state changes may be greater at convergence grid phases or if a repeater node is failed. At this moment, the node tries to register and it may be failed several times until it finds the most stable route to base node.

11.10 Report of average values curve (MED) of voltages and currents [G03]

This report allows storing average values of voltages, currents and powers over a defined period of time.

The variables involved in this report are included in the following tables.

This service is only aplicable to the DTC SVM.

G03	FIELD	DESCRIPTION	VALUE
1	Cnc Id	Concentrator identifier	
2	IdRpt	Unique report identifier	
3	IdPet	Unique request identifier	
4	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
5	Cnt Id	Unique meter identifier	
	G03	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S)	Timestamp
7	AvVph1_lv	Average Voltage phase 1 – low voltage	V
8	AvVph2_ lv	Average Voltage phase 2– low voltage	V
9	AvVph3_ lv	Average Voltage phase 3– low voltage	V
10	AvIph1_ lv	Average Current phase 1– low voltage	A
11	AvIph2_ lv	Average Current phase 2– low voltage	A
12	AvIph3_ lv	Average Current phase 3– low voltage	A
17	Bc	Bit of register quality	Octetstring

Note: If this curve is disabled (in B07 G03Capture="0") then the DTC should reply to this G03 request with URS=255.

An example of G03 report is shown below:

```
<Report IdRpt="G03" IdPet="4969990" Version="3.4_EDP_2.0">
<Cnc Id="XXX0000035098">
        <Cnt Id="XXX0000035098">
                <G03 Fh="20110715010000S"
                        AvVph1_lv="" AvVph2_lv="" AvVph3_lv="" AvIph1_lv="" AvIph2_lv=""
                        AvIph3_lv="" Bc=""
                        />
                <G03 Fh="20110716010000S"
                        AvVph1_lv="" AvVph2_lv="" AvVph3_lv="" AvIph1_lv="" AvIph2_lv=""
                        AvIph3_lv="" Bc=""
                        />
                <G03 Fh="20110717010000S"
                        ... />
                <G03 Fh="20110718010000S"
                        ... />
        </Cnt>
</Cnc>
</Report>
```

11.11 Report of maximum values curve (MAX) of voltages and currents [G04]

This report is similar to G03 report and it contains information about maximum values of voltage, current and power.

This service is only aplicable to the DTC SVM.

G04	FIELD	DESCRIPTION	VALUE
1	Cnc Id	Concentrator identifier	
2	IdRpt	Unique report identifier	
3	IdPet	Unique request identifier	
4	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
5	Cnt Id	Unique meter identifier	
	G04	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S)	Timestamp
7	MaxVph1_lv	Max.Voltage phase 1 – low voltage	V
8	MaxVph2_ lv	Max.Voltage phase 2– low voltage	V
9	MaxVph3_ lv	Max.Voltage phase 3– low voltage	V
10	MaxIph1_ lv	Max.Current phase 1– low voltage	A
11	MaxIph2_ lv	Max.Current phase 2– low voltage	A
12	MaxIph3_ lv	Max.Current phase 3– low voltage	A
25	Bc	Bit of register quality	Octetstring

Note: If this curve is disabled (in B07 G04Capture="0") then the DTC should reply to this G04 request with URS=255.

11.12 Report of minimum values curve (MIN) of voltages and currents [G05]

This report is similar to G03 report and it contains information about minimum values of voltage, current and power.

This service is only aplicable to the DTC SVM.

G05	FIELD	DESCRIPTION	VALUE
1	Cnc Id	Concentrator identifier	
2	IdRpt	Unique report identifier	
3	IdPet	Unique request identifier	
4	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
5	Cnt Id	Unique meter identifier	
	G05	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S)	Timestamp
7	MinVph1_lv	Min.Voltage phase 1 – low voltage	V
8	MinVph2_ lv	Min.Voltage phase 2– low voltage	V
9	MinVph3_ lv	Min.Voltage phase 3– low voltage	V
10	MinIph1_ lv	Min.Current phase 1– low voltage	A
11	MinIph2_ lv	Min.Current phase 2– low voltage	A
12	MinIph3_ lv	Min.Current phase 3– low voltage	A
25	Bc	Bit of register quality	Octetstring

Note: If this curve is disabled (in B07 G05Capture="0") then the DTC should reply to this G05 request with URS=255.

11.13 Report of momentaneous values curve (MOM) of voltages and currents [G06]

This report is similar to G03 report and it contains information about mmomentaneous values of voltage and current.

This service is only aplicable to the DTC SVM.

G06	FIELD	DESCRIPTION	VALUE
1	Cnc Id	Concentrator identifier	
2	IdRpt	Unique report identifier	
3	IdPet	Unique request identifier	
4	Version	HES-DTC Interface specification version	"3.2"
5	Cnt Id	Unique meter identifier	
	G06	Report tag name identifier	
6	Fh	Date (Y/M/D H:M:S)	Timestamp
7	MomVph1_lv	Mom.Voltage phase 1 – low voltage	V
8	MomVph2_ lv	Mom.Voltage phase 2– low voltage	V
9	MomVph3_ lv	Mom.Voltage phase 3– low voltage	V
10	MomIph1_ lv	Mom.Current phase 1– low voltage	A
11	MomIph2_ lv	Mom.Current phase 2– low voltage	A
12	MomIph3_ lv	Mom.Current phase 3– low voltage	A
13	Bc	Bit of register quality	Octetstring

The DTC should capture the instantaneous values of voltage and current per phase with the periodicity defined in the G06Capture parameter (B07) and report that information on the G06.

By befault G06Capture is disabled.

Note: If this curve is disabled (in B07 G06Capture="0") then the DTC should reply to this G06 request with URS=255.

11.14 Work in progress [G10] [D11]

This G10 report contains statistics related to tasks, request and orders that are being processed by the DTC.

The D11 allows the HES to cancel one or several tasks, services or orders, not yet finished by the DTC.

G10	FIELD	DESCRIPTION	VALUE
1	IdRpt	Unique report identifier	G10
2	IdPet	Unique request identifier	
3	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
4	Cnc	Concentrator identifier	DTC Identifier
	G10	Report tag name identifier	
5	Fh	Date (Y/M/D H:M:S)	Timestamp
	TP	For every scheduled Task in the queue	
6	TpTar	Task identifier	1,2,3,…
7	TpHi	Initial starting timestamp	Timestamp
8	TpPer	Periodicity	Timestamp (relative value)
9	TpPrio	Priority code	1: very high 2: high 3: normal
10	Status	Present task status	"Idle" "Working" "Sending" "Canceling"
11	LastReport	Date/Time of last report sent to HES	
	TpPro	TaskNameList	
12	TpReq	Information to be retrieved (Report)	String: S01,S02,…
13	Status	Present subtask (Report) status	"Idle" "Working" "Sending"
	Meter	For every meter in the Task	
14	Id	Meter identifier	Meter Identifier
15	Status	Meter status	"Working" "Failed" "Success" "Canceling"
16	LastSend	Date/Time of last information sent to HES (1)	Timestamp
17	NextRetry	Date/Time for next scheduled retry	Timestamp
18	Retries	Number of retries performed	Integer: 0,1,2,…
19	ErrCat	In case of failure when reading meter	Integer: 0,1,2,…
20	ErrCode	In case of failure when reading meter	Integer: 0,1,2,…
	Request	For every Request from HESin the queue	
21	IdPet	Request identifier	Integer
22	IdRpt	Report identifier	String: S01, S02, …
23	Priority	Priority code	1: very high 2: high 3: normal
24	Status	Present request status	"Idle" "Working" "Sending" "Canceling"
25	StartTime	Date/Time of Request's reception	Timestamp
	Meter	For every meter in the Request	

G10	FIELD	DESCRIPTION	VALUE
26	Id	Meter identifier	Meter Identifier
27	Status	Meter status	"Working" "Failed" "Success" "Canceling"
28	LastSend	Date/Time of last information sent to HES	Timestamp
29	NextRetry	Date/Time for next scheduled retry	Timestamp
30	Retries	Number of retries performed	Integer: 0,1,2,…
31	ErrCat	In case of failure when reading meter	Integer: 0,1,2,…
32	ErrCode	In case of failure when reading meter	Integer: 0,1,2,…
	Order	For every Order from STG in the queue	
33	IdPet	Request identifier	Integer
34	IdOrd	Order identifier	String: B02, B03, …
35	Priority	Priority code	1: very high 2: high 3: normal
36	Status	Present request status	"Idle" "Working" "Sending" "Canceling"
37	StartTime	Date/Time of Request's reception	Timestamp
	Meter	For every meter in the Request	
38	Id	Meter identifier	Meter Identifier
39	Status	Meter status	• "Reading previous" • "Sending previous" • "Executing" • "Reading parameters" • "Reading after" • "Sending after"
40	LastSend	Date/Time of last information sent to STG	Timestamp
41	NextRetry	Date/Time for next scheduled retry	Timestamp
42	Retries	Number of retries performed	Integer: 0,1,2,…
43	ErrCat	In case of failure when reading meter	Integer: 0,1,2,…
44	ErrCode	In case of failure when reading meter	Integer: 0,1,2,…

(1) This attribute, LastSend, contains a timestamp extracted from the related pointer that keeps track of data sent to the HES, as described in "7.2.3.4 Management of contingencies".

Note: The “Canceling” state should be report when the DTC is finishing the data collection of one meter before canceling the task, request or order. This occurs after a D11 order to cancel a task, request or order already sent to the DTC and not finished.

The following is an example of G10 report:

```
<Report IdRpt="G10" IdPet="0" Version="3.4_EDP_2.0">
   <Cnc Id="FAB0123456789">
      <G10 Fh="20130607125711000S">
         <TP      TpTar="1"      TpHi="20130701002000000S"      TpPer="00000100000000"      TpPrio="2"      Status="Idle"
LastReport="20130607102800000S">
            <TpPro TpReq="S04" Status="Idle">
            </TpPro>
         </TP>
         <TP      TpTar="2"      TpHi="20130608003000000S"      TpPer="00000001000000"      TpPrio="2"      Status="Idle"
LastReport="20130607102800000S">
            <TpPro TpReq="S05" Status="Idle">
```

```
            </TpPro>
         </TP>
         <TP      TpTar="3"      TpHi="20130612020000000S"      TpPer="00000007000000"      TpPrio="3"      Status="Idle"
LastReport="20130607102800000S">
            <TpPro TpReq="S06" Status="Idle">
            </TpPro>
         </TP>
         <TP      TpTar="11"      TpHi="20130608001700000S"      TpPer="00000001000000"      TpPrio="1"      Status="Idle"
LastReport="20130607115233000S">
            <TpPro TpReq="G03" Status="Idle">
                  <Meter Id="FAB0150001234" Status="Success"></Meter>
                  <Meter Id="FAB0501217083" Status="Failed" ErrCat="2" ErrCode="2"></Meter>
            </TpPro>
            <TpPro TpReq="G04" Status="Idle">
                  <Meter Id="FAB0150001234" Status="Success"></Meter>
                  <Meter Id="FAB0501217083" Status="Failed" ErrCat="0" ErrCode="0"></Meter>
            </TpPro>
         </TP>
         <TP      TpTar="12"      TpHi="20130607000000000S"      TpPer="00000001000000"      TpPrio="2"      Status="Working"
LastReport="20130607115234000S">
            <TpPro TpReq="S02" Status="Working">
                  <Meter Id="FAB0141129601" Status="Failed" ErrCat="2" ErrCode="2"></Meter>
                  <Meter Id="FAB0141129604" Status="Success"></Meter>
                  <Meter Id="FAB0141129606" Status="Success"></Meter>
                  <Meter Id="FAB0141129607" Status="Success"></Meter>
                  <Meter Id="FAB0141129608" Status="Failed" ErrCat="2" ErrCode="2"></Meter>
                  <Meter Id="FAB0141129609" Status="Failed" ErrCat="2" ErrCode="2"></Meter>
                  <Meter Id="FAB0141129610" Status="Success"></Meter>
                  <Meter Id="FAB0141129644" Status="Success"></Meter>
                  <Meter Id="FAB0141129645" Status="Working" NextRetry="20130607125527000S" Retries="1"></Meter>
                  <Meter Id="FAB0141129649" Status="Success"></Meter>
                  <Meter Id="FAB0150001234" Status="Success"></Meter>
                  <Meter Id="FAB0501217083" Status="Failed" ErrCat="2" ErrCode="2"></Meter>
                  <Meter Id="FAB0032005593" Status="Success"></Meter>
                  <Meter Id="FAB0131401024" Status="Success"></Meter>
                  <Meter Id="FAB0098178527" Status="Working" NextRetry="20130607130018000S" Retries="1"></Meter>
                  <Meter Id="FAB0098178528" Status="Success"></Meter>
                  <Meter Id="FAB0098178529" Status="Success"></Meter>
                  <Meter Id="FAB0098178530" Status="Success"></Meter>
                  <Meter Id="FAB0098178531" Status="Success"></Meter>
                  <Meter Id="FAB0098178533" Status="Success"></Meter>
                  <Meter Id="FAB0098178534" Status="Success"></Meter>
            </TpPro>
         </TP>
         <Request IdPet="270481" IdRpt="S12" Priority="3" Status="Working" StartTime="20130607125529000S">
         </Request>
      </G10>
   </Cnc>
</Report>
```

D11	FIELD	DESCRIPTION	VALUE	Comments
1	IdRpt	Unique report identifier	G10	
2	IdPet	Unique request identifier		
3	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"	
4	Cnc	Concentrator identifier	DTC Identifier	
	D11	Report tag name identifier		
5	Fh	Date (Y/M/D H:M:S)	Timestamp	
	TP	For scheduled Tasks		
6	TpTar	Task identifier	1,2,3,…	It is possible to filter for a specific TpTar and TpReq. Is also possible to select only the TpTar and in this case the action is applied to all TpReq within the TpTar. It is also possible to filter all TpReq from all Tptar, in this case the tag TpTar is iqual to "" or inexistant
7	TpReq	Information to be filtered (Report)	Timestamp	String: S01,S02,… It is also possible to filter for TpReq and in this case the action will be applied to all TpTar with the specific TpReq If this tag is null or inexistent, the filter is only made by TpTar

				If TpTar="" and TpReq is inexistent or "", the DTC should cancel all schedule tasks running on the DTC
8	Action	Action to be executed	0= Cancel task 1=Restart tasks 2= Force report	0 – This operation cancels all tasks and the DTC should send a final report with the remaining information 1 – This operation changes the TpHi to the current date/time and the DTC will operate imidiately the selected task. In this case the tasks queue will be maintained, the data already collected from the meter will not be lost and the DTC will have more time to finish all tasks. 2 – This operation only applies to the schedule tasks and asynchronous requests. In this case the DTC send the report with the available data imidiately, and do not need to wait until the NumMeters or TimeSendReq is achieved. If an asynchronous request for one meter is forced to send resport, then the report should have the available data and all other tags should have "" value, URS=4.
	TP			
	Requests			
10	IdPet	Request identifier	Integer	If this tag is present on the order the IdRpt is not necessary or can be IdRpt=""
11	IdRpt	Report identifier	String: S01, S02, …	If IdRpt is explicit on the order and IdPet is "" or inexistent, then the DTC should cancell all requests with the same IdRpt
12	Action	Action to be executed	0= Cancel request	This operation will cancel the request metioned. The DTC should report an error to the HES in response to the cancelled request – URS=9 (Cancelled by HES)
	Requests			
	Orders			
13	IdPet	Request identifier	Integer	If this tag is present on the order the IdOrd is not necessary or can be IdRpt=""
14	IdOrd	Order identifier	String: B02, B03, …	If IdOrd is explicit on the order and IdPet is "" or inexistent, then the DTC should cancell all orders with the same IdOrd
15	Action	Action to be executed	0= Cancel order	
	Orders			

If the D11 is sent to the DTC with a task, request or order identification invalid, inexistent or already finished, then the DTC should report URS=5 (Marlformed reques) to the HES. If the D11 is sent to cancel several tasks, requests or orders and some are canceled but some others are invalid, inexistent or already finished, then the DTC should report URS=4 (Partilaly applied).

11.15 DTC's performance log [G12]

This report contains statistics related to DTC's performance.

G12	FIELD	DESCRIPTION	VALUE
1	IdRpt	Unique report identifier	G12
2	IdPet	Unique request identifier	
3	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
4	Cnc	Concentrator identifier	DTC Identifier
	G12	Report tag name identifier (repeated for every record)	

5	Fh	Date (Y/M/D H:M:S) of record	Timestamp
6	Cpu	Processor usage (%)	Integer Ex. “51”
7	Ram	RAM memory usage (%)	Integer Ex. “51”
8	Flash	Flash memory usage (%)	Integer Ex. “51”
9	PerStor	Permanent storage (databases, etc) capacity used (%)	Integer Ex. “51”
10	TmpStor	Temporal storage (reports, etc) capacity used (%)	Integer Ex. “51”
11	EthRx	Ethernet received bytes per second	Integer Ex. “51”
12	EthTx	Ethernet transmitted bytes per second	Integer Ex. “51”
13	Plc	PRIME average bandwith usage (%)	Integer Ex. “51”
14	SerRx	Serial interface received bytes per second	Integer Ex. “51”
15	SerTx	Serial interface transmitted bytes per second	Integer Ex. “51”
16	Temp	Temperature (Celsius degrees)	Integer Ex. “51”

The following is an example of G12 report:

```
<Report IdRpt="G12" IdPet="0" Version="3.4_EDP_2.0">
   <Cnc Id="FAB0123456789">
      <G12 Fh="20130607090000000S" Ram="54" Cpu="22" PerStor="12" TmpStor="17" Flash="53" EthRx="28" EthTx="76" Plc="0"
SerRx="0" SerTx="0" Temp="42" />
      <G12 Fh="20130607100000000S" Ram="56" Cpu="25" PerStor="12" TmpStor="19" Flash="53" EthRx="108" EthTx="73" Plc="0"
SerRx="0" SerTx="0" Temp="42" />
      <G12 Fh="20130607110000000S" Ram="55" Cpu="35" PerStor="12" TmpStor="2" Flash="53" EthRx="116" EthTx="125" Plc="3"
SerRx="0" SerTx="0" Temp="42" />
      <G12 Fh="20130607120000000S" Ram="62" Cpu="26" PerStor="12" TmpStor="3" Flash="53" EthRx="84" EthTx="50" Plc="2"
SerRx="0" SerTx="0" Temp="42" />
      <G12 Fh="20130607130000000S" Ram="72" Cpu="42" PerStor="12" TmpStor="4" Flash="53" EthRx="105" EthTx="66" Plc="83"
SerRx="0" SerTx="0" Temp="42" />
   </Cnc>
</Report>
```

11.16 FTP transferred file log [G13]

This report contains historical info related to files transferred to and from the DTC through the FTP protocol.

G13	FIELD	DESCRIPTION	VALUE
1	IdRpt	Unique report identifier	G13
2	IdPet	Unique request identifier	
3	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
4	Cnc	Concentrator identifier	DTC Identifier
	G13	Report tag name identifier (repeated for every record)	
5	Fhi	Date/Time of first attempt	Timestamp

6	Fhf	Date/Time of last attempt	Timestamp
7	Action	Start time	"Put" or "Get"
8	File	Full path of transferred file	String
9	Size	Size of the file in bytes	Integer
10	Address	FTP server's IP address	String. Ex." 10.25.200.43"
11	User	FTP account's user name	String
12	Result	Operation result	"Success" or "Failed"

The following is an example of G13 report:

```
<Report IdRpt="G13" IdPet="0" Version="3.4_EDP_2.0">
   <Cnc Id="FAB0123456789">
      <G13                Fhi="20130603102510000S"                Fhf="20130603102514000S"                Action="Put"
File="/upload/FAB0123456789_41B7D_0_20130603102510" Address="10.25.200.43" User="Prime" Result="Success"/>
      <G13  Fhi="20130603111916000S"  Fhf="20130603111922000S"  Action="Get"  File="/fw/dc/ACME_Brand/ACME_DC_v6.6.6.tar"
Address="10.25.200.43" User="DCupgrade" Result="Success"/>
      <G13                Fhi="20130603120343000S"                Fhf="20130603120346000S"                Action="Put"
File="/upload/FAB0123456789_41BAF_0_20130603120343" Address="10.25.200.43" User="Prime" Result="Success"/>
      <G13 Fhi="20130604001001000S" Fhf="20130604032249000S" Action="Put" File="/upload/FAB0123456789_6_0_20130604001000"
Address="10.25.200.43" User="Prime" Result="Failed"/>
      <G13 Fhi="20130604001501000S" Fhf="20130604032801000S" Action="Put" File="/upload/FAB0123456789_7_0_20130604001501"
Address="10.25.200.43" User="Prime" Result="Failed"/>
      <G13 Fhi="20130605110853000S" Fhf="20130605110900000S" Action="Put" File="/upload/FAB0123456789_B_0_20130605110849"
Address="10.25.200.43" User="Prime" Result="Success"/>
      <G13 Fhi="20130605111031000S" Fhf="20130605111037000S" Action="Put" File="/upload/FAB0123456789_B_0_20130605111028"
Address="10.25.200.43" User="Prime" Result="Success"/>
      <G13 Fhi="20130606001002000S" Fhf="20130606001008000S" Action="Put" File="/upload/FAB0123456789_6_0_20130606001000"
Address="10.25.200.43" User="Prime" Result="Success"/>
   </Cnc>
</Report>
```

11.17 Meter's firmware update log [G14]

This report contains historical info related to meter's firmware updates performed from the DTC. This applies to all meter firmware upgrades, triggered by a B05 or D09 orders sent by the HES system or autonomous managed by the DTC.

G14	FIELD	DESCRIPTION	VALUE
1	IdRpt	Unique report identifier	G14
2	IdPet	Unique request identifier	
3	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"
4	Cnc	Concentrator identifier	DTC Identifier
	G14	Report tag name identifier (repeated for every record)	
5	Fh	Date/Time of first attempt	Timestamp
6	Id	Meter Identifier	Meter Identifier
7	Vf	Current DLMS firmware version	String
8	VPrime	Current PRIME firmware version	String
9	VfPre	Previous DLMS firmware version	String
10	VPrimePre	Previous PRIME firmware version	String
11	ActProt	Protocol used to transfer firmware image	"PRIME" "DLMS"
12	Mult	Communications mode used	"UN" (unicast) "MU" (multicast) "BO" (both)

13	Firmware	Firmware image's file name	String
14	ErrCat	In case of failure while updating (otherwise null)	Integer
15	ErrCode	In case of failure while updating (otherwise null)	Integer
16	Retries	Number of retries already used to try to upgrade de meter. This will increase for each retry attempt to upgrade the meter	Integer
17	Result	Operation result	String ○ Comply ○ Not Comply ○ Pending ○ Waiting time slot ○ Upgrading ○ Waiting retry ○ Paused ○ Canceled ○ Upgraded ○ Rejected

The following is an example of G14 report:

```
<Report IdRpt="G14" IdPet="0" Version="3.4_EDP_2.0">
   <Cnc Id="FAB0123456789">
      <G14 Fh="20130610082512000S" Id="FAB0112233445" Vf="V0666" VPrime="1.20.30" VfPre="V0650" VPrimePre="1.20.30"
ActProt="DLMS" Mult="MU" Firmware="FAB_MD_DLMS_V0666.bin" ErrCat="" ErrCode="" Retries="0" Result="Success"/>
      <G14 Fh="20130615102410000S" Id="FAB0221144339" Vf="V0650" VPrime="1.20.30" VfPre="V0650" VPrimePre="1.20.30"
ActProt="PRIME" Mult="UN" Firmware="FAB_MD_PRIME_1.20.40.bin" ErrCat="2" ErrCode="2" Retries="10" Result="Waiting retry"/>
   </Cnc>
</Report>
```

11.18 DTC - Gateway communication parameters interface [D10] [P10]

Through D10 the HES can send to the DTC the configuration to establish a communication with one or more PRIME Gateways.

The PRIME Gateway can be configured as a Service Node or as a Base Node and depending of that the DTC will need to manage several Base Nodes including its own and/or several remote Service Nodes. For the Service Nodes the DTC needs to send the PRIME traffic over UDP to the GW.

D10/P10	FIELD	DESCRIPTION	VALUE	NATURE	COMMENTS
1	IdRpt	Unique report identifier	D10/P10		
2	IdPet	Unique request identifier			
3	Version	HES-DTC Interface specification version	"3.4_EDP_2.0"		
4	Cnc	Concentrator identifier	DTC Identifier		
5	GWClear	Remove all GW configured	Boolean 0. Do not clear the GW configuration 1. Clear all GWs		This is an optional tag. If GWClear is set to "1" all GW configuration will be removed from the DTC. e.g. GWClear=1
	D10	Report tag name identifier (repeated for every record)			
6	GWId	Gateway identifier	String [20]	R/W	e.g. GWId="GW1700000000123"
7	IPGW	IP address from the Gateway	IP address e.g. "10.10.10.1"	R/W	If IPGW is set to "" or "0.0.0.0", then the specific GW configuration will be removed
8	Port	Port Number to Access the GW	Integer E.g.: "4059"	R/W	If Port is set to "" or "0", then the specific GW configuration will be removed
9	Mode	Gateway operation mode	String SN or BN E.g.: Mode="BN"	R/W	
	D10				

10	ListenUDPPort	UDP port used by the GWs to send data to the DTC (Gateway in Service Node)	Integer E.g.: “7919”		Default value: 7919

Note: To remove one specific GW the D10 should have the IPGW or Port tag with NULL or zero value. If one of these tags is set to NULL or zero, then the Gateway will be removed.

12 SECURITY RELATED ORDERS FROM THE HES TO THE DTC

12.1 Deliver DLMS Keys to the DTC [B31]

Message to deliver to the DTC the current Keys existing in the meters.
The B31 message structure is prepared to allow programming in the same order, different meters and different keys depending on the needs of the system.
The completion of the request has to be notified through the UpdateRequestStatus web services.
The Activation Date (ActDate) must follow the behavior defined in the "Clarification of use of MaxOrderOutdate, Maximum Execution Date and Execution Date" paragraph in this technical specification.

B31	FIELD	DESCRIPTION	VALUE	COMMENTS
	IdReq	Identifier of the request	B31	
1	IdPet	Unique request identifier		
2	Version	Version Identifier	3.4_EDP_2.0	
3	Cnc	Concentrator identifier		
	B31	Meter Keys Delivery		
4	ActDate	Activation date	Timestamp (e.g. : "20100101000000000W")	
5	CntId	Unique meter identifier		
	DASec	Data Access Security		
6	ClientId	Client Id Security Association	Integer	Posible Client Values ◦ 4: Secure General Client ◦ 5: Secure Broadcast Client
7	Secret	Secret password LLS	String	
	CDTSec	Data Transport Security Key		
8	KeyId	Key Identifier	Uint32	
9	KeyType	Key Type "GUnKey", "GBrKey" or "GAuKey"	String	
10	KeyVal	Key Value. Keys must be in clear so that DTC can know and use them.	hexadecimal	
	CDTSec			
	DASec			

The DASec structure will be repeated for every Client that the HES wants to deliver to the DTC per each meter.
The CDTSec structure will be repeated for every Key that the HES wants to deliver to the DTC per each meter.
In the next example, the HES sends an order to the DTC "AAA57C4730016". In this order, the HES Deliver the secret password, the global unicast encryption key and the global authentication key for the Client 4 to the meters "BBB0115108646" and "CCC0115108646".

```
<Order IdPet="11006811" IdReq="B31" Version="3.4_EDP_2.0">
    <Cnc Id="AAA57C4730016">
          <B31 ActDate="20130101000000000W" CntId="BBB0115108646">
               <DASec ClientId="4" Secret="ABCDEF">
                     <CDTSec KeyId="66365377" KeyType="GunKey">
                           KeyVal="805398099580948550">
                     </CDTSec>
                     <CDTSec KeyId="8373663" KeyType="GauKey">
                           KeyVal="648242389442428979">
                     </CDTSec>
               </DASec>
          </B31>
          <B31 ActDate="20130101000000000W" CntId="CCC0115108646">
               <DASec ClientId="4" Secret="ABCDEF">
                     <CDTSec KeyId="88747433" KeyType="GunKey">
                           KeyVal="805398099580948550">
                     </CDTSec>
                     <CDTSec KeyId="8474437" KeyType="GauKey">
                           KeyVal="648242389442428979">
                     </CDTSec>
```

```
                    </DASec>
                </B31>
            </Cnc>
        </Order>
```

13 SECURITY RELATED MESSAGES FROM THE DTC TO THE HES

In this section are listed the web service messages, related to the EDP security implementation, sent by the DTC to the HE.
Please check the DTC security specification “EDP - WP2.1 DTC Security Functional Specification” and the Use Case document “HES-DTC Interface Specification_Use_cases ”, for more detailed information.

13.1 Meter Keys Request [S31]

This message is used to send a meter key request from DTC to HES, and the state of a DTC regarding secure communication with a meter.

The S31 structure is prepared to request different key types to many different meters in 1 message.

The normal use, currently, for this message is to request the Global Unicast Encryption key and the Global Authentication Key for each meter and secure client.

The DTC Installed should be able to communicate with both secure and non-secure meters.

This report is critical to have access to the meter, so if sending the report to the HES fails, it must be continually retried every “TimeBetwFtp” parameter.The parameter “RetryFtp”, which sets the number of retries, does not apply in this case.

When a DTC discovers a meter for the first time, the first association attempt with the meter will be done with the public client (16) to read the attribute 2 in the security setup (class_id:64, version: 0) OBIS 0-0:43.0.5.255 and 0-0:43-0-6-255 (included in the DEF-C44-507 EDP specification). If these OBIS doesn´t exist in the meter, it means that the meter is non-secure and the DTC must try to generate the corresponding S15 with the non-secure clients known at the moment. If DTC gets access to read the attribute 2 in the security setup, it means that this meter is secure and the DTC can know the security policy of the meter to be reported to the HES.

If this attribute has a value of 0 (zero), the DTC assumes that the meter is secure and reset without Keys, and that only has the “Master Key” and the LLS_secret. The DTC will send to the HES a S31 report with Status value set to 0. The HES must update all their keys with a B32 order.

If this attribute has a value of 3 (all messages to be authenticated and encrypted), the DTC assumes that the meter is secure and correctly updated with all Keys. If the DTC doesn´t know the Keys, the DTC must send to the HES a S31 report with Status value set to 1. The HES must update to the DTC the current Keys to access to this meter, with a B31 order.

Once the DTC can access to the meter for the first time, the DTC must send to the HES the corresponding S15 report (same behaviour as with non-secure meters). If the DTC sent to the HES the S31 and for any reason the DTC never received the B3X needed to access/secure the meter, the S15 report can´t be generated by the DTC. Therefore, every time the meter is registered again in the DTC, the DTC must try to access the meter for generating the S15 report. Since the DTC can´t access the meter without keys, the DTC must generate a new S31 to notify to the HES that the meter keys are needed and start the process over again.

The message format will be as follows:

S31	FIELD	DESCRIPTION	VALUE	Comments
1	IdRpt	Identifier of the request	S31	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	S31	Report tag name identifier		
7	Fh	Date (Y/M/D H:M:S:ms)	Timestamp	
8	Status	DTC status regarding connection to meter	Integer (0,..,6)	This field indicates the status of the meter. Regarding the connection to the DTC. The possible status defined are: ◦ 0: MeterReset Keys (Uninitialized Secure New Meter installed or Secure Meter after Reset Keys). ◦ 1: Meter never registered with keys updated, DTC Keys Unknown ◦ 2: Secret Password fails for LLS data access security. ◦ 3: Shared Secret fails for HLS data access security. ◦ 4: Encryption key or authentication key fails for data transport security. ◦ 5: DTC/Meter need keys update for Frame Counter ◦ 6: Meter need Broadcast Keys
	DASec			
10	ClientId	Client Id Secureity Association	integer	Posible Client Values ◦ 4: Secure General Client ◦ 5: Secure Broadcast Client
11	KeyRequest	Mask Keys Requested	Binary Mask (8-bits). Ej.”00011100”	
	CDTSecCur	Current Data Transport Security Key		
12	KeyId	Key Identifier(1)	Uint32	The KeyId must be 32-bits unsigned integer. This KeyId will be unique per system. The KeyId is only known by KMF, HES & DTCs
13	KeyType	Key Type	String	Posible Values: ◦ "GUnKey" ◦ "GBrKey" ◦ "GAuKey"
	CDTSecCur			
	DASec			

(1) The KeyId must be 32-bits unsigned integer. This KeyId will be unique per system. The KeyId only Knows the HES and DTCs.

S31 Requested Keys Bit Field

Bit	7	6	5	4	3	2	1	0
Key	Not	Not	Not	GBEK	GAK	GUEK	Not	Not

When the DTC has internally stored the Keys for a meter, but for any reason has to send a S31 report to the HES, the DTC must send to the HES the CDTSecCur structure for each key stored for this meter/client, so the HES knows the keys for that meter.

In the next example, the DTC requests to the HES the global unicast encryption key and the global authentication key for the meters “BBB0135084421” and “CCC0135084421”:

```
<Report IdRpt=”S31” IdPet=”0” Version=”3.4_EDP_2.0”>
        <Cnc Id=”AAA79DE402219”>
            <Cnt Id=”BBB0135084421”>
                <S31 Fh=”20130712130000000S” Status=”1” >
                  <DASec ClientId=”4” KeyRequest =”00001100”>
                  </DASec>
                  <DASec ClientId=”5” KeyRequest =”00011100”>
                  </DASec>

            </Cnt>
            <Cnt Id=”CCC0135084421”>
                <S31 Fh=”20130712130000000S” Status=”1” >
                  <DASec ClientId=”4” KeyRequest =”00001100”>
                  </DASec>
                  <DASec ClientId=”5” KeyRequest =”00011100”>
                  </DASec>

            </Cnt>
        </Cnc>
</Report>
```

13.2 DTC DLMS Broadcast New Keys Request [P01]

This P01 web service is sent by the DTC when it boots without its owned broadcast keys, GBEK and GAK_{bro}. If the P01 is not acknowledge by the HES, then the DTC should resend every RetryFTP, without a limit of retries and if the P01 is acknowledge but no B31 is received with the DTC broadcast keys, then it should re-send the P01 every HESKeyMngTimeout, also without a number of retry limit.

P01	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	P01	DTC DLMS Broadcast New Keys		
5	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	Timestamp	
6	DTCBroBitField	DTC Broadcast Keys Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00011000”

DTC Broadcast Keys Bit Field *(DTCBroBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	$GBEK_{BRO}$	GAK_{BRO}	Not Used	Not Used	Not Used

13.3 Meter Optical Port New LLSs Request [P02]

The P02 message is sent after a successful meter security activation. This message will the trigger to change the meter optical LLSs. Is up to the HES to decide when the D01 order should be sent, so the DTC does not need to wait for that.

P02	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	P02	Meter Optical Port New LLSs request		
6	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	Timestamp	
7	MeterOptBitField	Meter Optical Port LLSs Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00000111”

Meter Optical Port LLSs Bit Field *(MeterOptBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	Not Used	Not Used	LLS_{OPT-FW}	LLS_{OPT-M}	LLS_{OPT-R}

13.4 FW Update Public Key Request [P03]

P03 message is sent by the DTC to request the FW public key update. This can only be triggered through the web interface of the DTC.

P03	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	P03	FW Update Public Key request		
6	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	Timestamp	

13.5 Confirm Meter DLMS Keys Update [P04]

The P04 message is sent by the DTC to confirm which keys were set and confirmed on the meter. This message is triggered after a B32 order.

P04	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	P04	Confirm Meter DLMS Keys Update		
6	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	Timestamp	
7	MeterGenBitField	Meter Secure General PLC Client Keys Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00001101”
8	MeterBroBitField	Meter Secure Broadcast PLC Client Keys Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00011100”

Meter Secure General PLC Client Keys Bit Field *(MeterGenBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	Not Used	GAK_{GEN}	$GUEK_{GEN}$	LLS_{GEN}	MK

Meter Secure Broadcast PLC Client Keys Bit Field *(MeterBroBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	$GBEK_{BRO}$	GAK_{BRO}	$GUEK_{BRO}$	LLS_{BRO}	Not Used

13.6 Confirm DTC DLMS Keys Update [P05]

P05 is a confirmation web service sent by the DTC when the broadcast keys are sent on the B31 order.

P05	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
	P05	Confirm DTC DLMS Keys Update		
5	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	Timestamp	
6	DTCBroBitField	DTC Broadcast Keys Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00011000”

DTC Broadcast Keys Bit Field *(DTCBroBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	$GBEK_{BRO}$	GAK_{BRO}	Not Used	Not Used	Not Used

13.7 Confirm Meter Optical Port LLSs Update [P06]

The P06 web service is sent by the DTC to confirm a meter optical port LLSs upgrade. Upon receiving a D01, the DTC should execute the D01 and then send a P06 to confirm which LLS was change on the meter.

P06	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	P06	Confirm Meter Optical Port LLSs Update		
6	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	Ttimestamp	
7	MeterOptBitField	Meter Optical Port LLSs Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00000111”

Meter Optical Port LLSs Bit Field *(MeterOptBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	Not Used	Not Used	LLS_{OPT-FW}	LLS_{OPT-M}	LLS_{OPT-R}

13.7. Confirm TimeOut Update [P07]

The P07 web service is sent by the DTC to confirm a meter timeout upgrade. Upon receiving a D03, the DTC should execute the D03 and then send a P07 to confirm which timeout was change on the meter.

P07	FIELD	DESCRIPTION	VALUE	COMMENTS
1	IdRpt	Identifier of the request	P01	
2	IdPet	Unique request identifier		
3	Version	Version Identifier	3.4_EDP_2.0	
4	Cnc	Concentrator identifier		
5	Cnt	Unique meter identifier		
	P07	Confirm TimeOut Update		
6	Fh	Date at with the DTC generates the report (Y/M/D H:M:S:ms)	timestamp	
7	TimeOutBitField	TimeOut Bit Field	Bit Field (8)*	Binary Mask (8-bits) ex: ”00000011”

TimeOuts Bit Field *(TimeOutBitField)*

Bit Position	7	6	5	4	3	2	1	0
Key	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	TimeOutSBCDef	TimeOutSGCDef

14 ANNEX A – MESSAGES SAMPLES

Message samples are provided along with the Specification Document, but in this section are listed some other examples.

14.1 Assynchronous requests examples

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
  <soap:Body>
    <AsynchRequest>
      <IdPet>04</IdPet>
      <IdRpt>Sxx</IdRpt>
      <tfStart>20181101000000000S</tfStart>
      <tfEnd>20181210000000000S</tfEnd>
      <IdMeters>EMI1762004222</IdMeters>
      <Priority>1</Priority>
      <Source>MET</Source>
      <STGSource>3</STGSource>
      <IdDC>DTC1704438751</IdDC>
    </AsynchRequest>
  </soap:Body>
</soap:Envelope>
```

14.2 Report Query examples

```
<?xml version='1.0' encoding='UTF-8'?>
<soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"xmlns:xsd="http://www.w3.org/2001/XMLSchema"xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
 <soap:Body>
    <ReportQuery>
      <IdPet>98</IdPet>
      <IdRpt>S09</IdRpt>
      <tfStart>20181209000000000W</tfStart>
      <tfEnd>20181213000000000W</tfEnd>
      <IdMeters>EMI1723000029,ZIV1538301105,LGZ1630000620</IdMeters>
      <Priority>1</Priority>
      <QueryID>Q1</QueryID>
      <Parameters>EvGroup:1,2;EvCode:+ EvGroup:3;EvCode:1,2,3,4</Parameters>
      <STGSource>3</STGSource>
      <IdDC>DTC1404355247</IdDC>
    </ReportQuery>
  </soap:Body>
</soap:Envelope>
```

```
<?xml version='1.0' encoding='UTF-8'?>
<soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
 <soap:Body>
    <ReportQuery>
      <IdPet>17</IdPet>
      <IdRpt>S17</IdRpt>
      <tfStart>20190701000000000S</tfStart>
      <tfEnd>20190710000000000S</tfEnd>
      <IdMeters></IdMeters>
      <Priority>1</Priority>
      <QueryID>Q1</QueryID>
     <Parameters>EvGroup:1,2,3,6,7;EvCode:+EvGroup:4;EvCode:9,10,11,12,13,14,14,16,17,18,19,20+EvGroup:5;EvCode:1,2,6,7,8,9,10,11,12,13,14,15,16</
     Parameters>
      <STGSource>2</STGSource>
      <IdDC>DTC1144860873</IdDC>
    </ReportQuery>
  </soap:Body>
</soap:Envelope>


<?xml version='1.0' encoding='UTF-8'?>
<soap:Envelope
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
 <soap:Body>
    <ReportQuery>
      <IdPet>17</IdPet>
      <IdRpt>S17</IdRpt>
      <tfStart>20190701000000000S</tfStart>
      <tfEnd>20190710000000000S</tfEnd>
      <IdMeters></IdMeters>
      <Priority>1</Priority>
      <QueryID>Q1</QueryID>
     <Parameters>EvGroup:1,2,3,6,7;EvCode:-EvGroup:7;EvCode:9,10,11</Parameters>
      <STGSource>2</STGSource>
      <IdDC>DTC1144860873</IdDC>
    </ReportQuery>
  </soap:Body>
</soap:Envelope>
```

14.3 Orders for only one meter examples

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order>

<IdPet>200</IdPet>

<Format>0</Format>

<Order><Order IdPet="200" IdReq="B02" Version="3.4_EDP_2.0"

><Cnc Id="DTC1404355247">

<Cnt Id="EMI1723000028">

<B02 ActDate="20140101000000000W">

<Contrato1 TR2="2200" TR3="3300" TR4="4400" TR5="5500" TR6="6600"/>

</B02></Cnt>

</Order></Order>

<Priority>1</Priority>

<IdDC>DTC1404355247</IdDC>

<STGSource>3</STGSource>

</Order>

</soap:Body>

</soap:Envelope>

<?xml version="1.0" encoding="utf-8"?><soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
<soap:Body>
<Order><IdPet>0334</IdPet><Format>0</Format>
<Order><Order IdPet="0335" IdReq="B03" Version="3.4_EDP_2.0" >
<Cnc Id="DTC1404355247">
<Cnt Id="EMI1538301105">
<B03 Fini="20171118130133829W" Order="1" Ffin="20191028130133829W" />
</Cnt>
</Cnc></Order>
</Order>
<Priority>1</Priority>
<STGSource>3</STGSource>
<IdDC>DTC1404355247</IdDC>
</Order>
</soap:Body></soap:Envelope>

14.4 Orders for multiple meters examples

<?xml version="1.0" encoding="utf-8"?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order>

<IdPet>200</IdPet>

<Format>0</Format>

<Order><Order IdPet="200" IdReq="B02" Version="3.4_EDP_2.0"

><Cnc Id="DTC1404355247">

<Cnt Id="EMI1723000028">

<B02 ActDate="20140101000000000W">
<Contrato1 TR2="2200" TR3="3300" TR4="4400" TR5="5500" TR6="6600"/>
</B02></Cnt>
<Cnt Id="EMI1338300048">
<B02 ActDate="20140101000000000W">
<Contrato1 TR2="2200" TR3="3300" TR6="6600"/>
</B02></Cnt>
</Cnc>
</Order></Order>
<Priority>1</Priority>
<IdDC>DTC1404355247</IdDC>
<STGSource>3</STGSource>
</Order>
</soap:Body>
</soap:Envelope>

```
<?xml version="1.0" encoding="utf-8"?><soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
        <soap:Body>
                <Order><IdPet>0334</IdPet><Format>0</Format>
                        <Order>&lt;Order  IdPet="0335" IdReq="B03"  Version="3.4_EDP_2.0" &gt;
                                &lt;Cnc Id="DTC1404355247"&gt;
                                        &lt;Cnt Id="EMI1538301105"&gt;
                                                &lt;B03 Fini="20171118130133829W" Order="1" Ffin="20191028130133829W" /&gt;
                                        &lt;/Cnt&gt;
                                        &lt;Cnt Id="EMI1630000620"&gt;
                                                &lt;B03 Fini="20171118130133829W" Order="1" Ffin="20191028130133829W" /&gt;
                                        &lt;/Cnt&gt;
                                        &lt;Cnt Id="EMI1723000029"&gt;
                                                &lt;B03 Fini="20171118130133829W" Order="1" Ffin="20191028130133829W" /&gt;
                                        &lt;/Cnt&gt;
                                &lt;/Cnc&gt;&lt;/Order&gt;
                        </Order>
                        <Priority>1</Priority>
                        <STGSource>3</STGSource>
                        <IdDC>DTC1404355247</IdDC>
                </Order>
        </soap:Body></soap:Envelope>


<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
    <soap:Body>
        <Order>
            <IdPet>0507</IdPet>
            <Format>0</Format>
            <Order>&lt;Order IdPet="0507" IdReq="B05" Version="3.4_EDP_2.0"&gt;
                    &lt;Cnc Id="DTC1404343244"&gt;
                &lt;Cnt Id="EMI0123456789"&gt;
                &lt;B05 ActDate="20170207145700000W" Firmware="/EMI_0000_DLMS_V0001.dat" ActProt="DLMS" Mult="MU"/&gt;&lt;/Cnt&gt;
                &lt;Cnt Id="EMI1821859763"&gt;
                &lt;B05 ActDate="20170207145700000W" Firmware="/EMI_0000_DLMS_V0001.dat" ActProt="DLMS" Mult="MU"/&gt;&lt;/Cnt&gt
                    &lt;/Cnc&gt;&lt;/Order&gt;
            </Order>
            <Priority>1</Priority>
            <IdDC>DTC1404343244</IdDC>
            <STGSource>1</STGSource>
        </Order>
    </soap:Body>
</soap:Envelope>
```

<?xml version='1.0' encoding='UTF-8'?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order>

<IdPet>491</IdPet><Format>0</Format>

<Order>

<Order IdReq="B29" IdPet="491" Version="3.4_EDP_2.0" >

<Cnc Id="DTC1404355247">

<Cnt Id="EMI1538301105">

<B29 Fh="Y" Bc="Y" AItot="Y" AIi="Y" AEi="Y" R1i="Y" R2i="Y" R3i="Y"/>

</Cnt>

<Cnt Id="EMI1630000620">

<B29 Fh="Y" Bc="Y" AItot="Y" AIi="Y" AEi="Y" R1i="Y" R2i="Y" R3i="Y"/>

</Cnt>

<Cnt Id="EMI1723000029">

<B29 Fh="Y" Bc="Y" AItot="Y" AIi="Y" AEi="Y" R1i="Y" R2i="Y" R3i="Y"/>

</Cnt>

</Cnc>

</Order>

</Order><Priority>1</Priority>

<IdDC>DTC1404355247</IdDC>

<STGSource>1</STGSource>

</Order>

</soap:Body></soap:Envelope>

<?xml version='1.0' encoding='UTF-8'?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order>

<IdPet>3031</IdPet><Format>0</Format>

<Order>

<Order IdReq="B30" IdPet="3031" Version="3.4_EDP_2.0">

<Cnc Id="DTC1404355247">

<Cnt Id="EMI1723000029">

<B30 Bt="1">

<Contract c="1" Clock="Y" AItot="Y" AIaT1="Y" />

<Contract c="2" Clock="Y" AItot="Y" AIaT1="Y" />

</B30>

<B30 Bt="2">

<Contract c="1" Clock="Y" AItot="Y" AIaT1="Y" />

<Contract c="2" Clock="Y" AItot="Y" AIaT1="Y" />

</B30>
</Cnt>
<Cnt Id="EMI1630000620">
<B30 Bt="2">
<Contract c="2" Clock="Y" AItot="Y" AIaT1="Y" />
<Contract c="1" Clock="Y" AItot="Y" AIaT1="Y" />
</B30>
<B30 Bt="1">
<Contract c="1" Clock="Y" AItot="Y" AIaT1="Y" />
<Contract c="2" Clock="Y" AItot="Y" AIaT1="Y" />
</B30>
</Cnt>

</Cnc>
</Order>
</Order>
<Priority>1</Priority>
<IdDC>DTC1404355247</IdDC>
<STGSource>1</STGSource>
</Order>
</soap:Body></soap:Envelope>

14.5 B07 order examples

- Schedule tasks configuration

<?xml version="1.0" encoding="utf-8"?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<IdPet>0707</IdPet>

<Format>0</Format>

<Order><Order IdPet="0707" IdReq="B07" Version="3.4_EDP_2.0" >

<Cnc Id="DTC1504378011">

<B07 RetryDisconMeter="11" TimeRetryInterval="7200" >

<TP TpTar="5" TpHi="20170215010000000W" TpPer="00000001000000" TpMet="" TpPrio="3" TpCompl="Y" >

<TpPro TpReq="S05" TpSend="Y" TpStore="Y" >

<TpAttr/>

</TpPro>

</TP>

<TP TpTar="29" TpHi="20170217060000000W" TpPer="00000001000000" TpMet="" TpPrio="3" TpCompl="Y" >

<TpPro TpReq="S29" TpSend="Y" TpStore="Y" >

<TpAttr/>

</TpPro>

</TP>

<TP TpTar="9" TpHi="20170215130000000W" TpPer="00000001000000" TpMet="" TpPrio="3" TpCompl="Y" >

<TpPro TpReq="S09" TpSend="Y" TpStore="Y" >

<TpAttr>

<QueryID>Q1</QueryID>

<Parameters>EvGroup:;EvCode:</Parameters>

</TpAttr>

</TpPro>

</TP>

<TP TpTar="3" TpHi="20180618100000000S" TpPer="00000007000000" TpMet="" TpPrio="3" TpCompl="N" >

<TpPro TpReq="T03" TpSend="Y" TpStore="N" >

<TpAttr/>

</TpPro>

</TP>

<TP TpTar="2" TpHi="20180618233000000S" TpPer="00000001000000" TpMet="" TpPrio="2" TpCompl="N" >

<TpPro TpReq="T02" TpSend="Y" TpStore="N" >

<TpAttr/>

</TpPro>

</TP>

<TP TpTar="1" TpHi="20180618234500000S" TpPer="00000007000000" TpMet="" TpPrio="1" TpCompl="N" >

<TpPro TpReq="T01" TpSend="Y" TpStore="N" >

<TpAttr/>

</TpPro>

</TP>

</B07>

</Cnc>

</Order>

</Order>

<Priority>2</Priority>

<IdDC>DTC1504378011</IdDC>

<STGSource>1</STGSource>

</Order>

</soap:Body>

</soap:Envelope>

- Non-secure meters password configuration:

<?xml version="1.0" encoding="utf-8"?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<IdPet>7288</IdPet>

<Format>0</Format>

<Order><Order IdPet="7288" IdReq="B07" Version="3.4_EDP_2.0" >

<Cnc Id="DTC1900931970">

<B07>

<Pwdsdlms PwdID="1" PwdLv="1" Pwd="n5pM2hyF" ManufID="" />

<Pwdsdlms PwdID="2" PwdLv="2" Pwd="8GKfBUeC" ManufID="" />

<Pwdsdlms PwdID="3" PwdLv="3" Pwd="ZEdWgOlB" ManufID="" />

<Pwdsdlms PwdID="4" PwdLv="1" Pwd="N5pM2hyF" ManufID="JCE" />

</B07>

</Cnc>

</Order>

</Order>

<Priority>2</Priority>

<IdDC>DTC1900931970</IdDC>

<STGSource>1</STGSource>

</Order>

</soap:Body>

</soap:Envelope>

- DTC parameter configuration:

<?xml version="1.0" encoding="utf-8"?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<IdPet>7288</IdPet>

<Format>0</Format>

<Order><Order IdPet="7288" IdReq="B07" Version="3.4_EDP_2.0" >

<Cnc Id="DTC1900931970">

<B07 TimeBetwFtp="400" />

</Cnc></Order>

</Order>

<Priority>2</Priority>

<IdDC>DTC1900931970</IdDC>

<STGSource>1</STGSource>

</Order>

</soap:Body>

</soap:Envelope>

14.6 B36 DTC Alarm configuration examples

<?xml version="1.0" encoding="utf-8"?>

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"

xmlns="http://www.asais.fr/ns/Saturne/DC/ws">

<soap:Body>

<Order>

<IdPet>137</IdPet>

<Format>0</Format>

<Order>

<Order IdPet="137" IdReq="B36" Version="3.4_EDP_2.0" >

<Cnc Id="DTC1143690156">

<B36 AlRst="N" AlConfigRst="N">

<Alarm Evgroup="1" Evcode="1" AlReg="1" AlFilter="1" AlClearEvgroup="0" AlClearEvcode="0" ALDestin="1" AlTimer="0" />

<Alarm Evgroup="1" Evcode="2" AlReg="1" AlFilter="1" AlClearEvgroup="0" AlClearEvcode="0" ALDestin="3" AlTimer="0" />

<Alarm Evgroup="1" Evcode="3" AlReg="1" AlFilter="0" AlClearEvgroup="0" AlClearEvcode="0" ALDestin="1" AlTimer="0" />

<Alarm Evgroup="2" Evcode="1" AlReg="1" AlFilter="1" AlClearEvgroup="0" AlClearEvcode="0" ALDestin="3" AlTimer="0" />

<Alarm Evgroup="2" Evcode="2" AlReg="1" AlFilter="1" AlClearEvgroup="0" AlClearEvcode="0" ALDestin="3" AlTimer="0" />

</B36>

</Cnc>

</Order>

</Order>

<Priority>1</Priority>

<STGSource>1</STGSource>

<IdDC>DTC1143690156</IdDC>

</Order>

</soap:Body>

</soap:Envelope>

14.7 B37 DTC IO configuration examples

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
    <soap:Body>
        <Order>
            <IdPet>137</IdPet>
            <Format>0</Format>
            <Order>
            &lt;Order IdPet="137" IdReq="B37" Version="3.4_EDP_2.0" &gt;
             &lt;Cnc Id="DTC1143690156"&gt;
                    &lt;B37 OutputRst="N" IOConfigRst="N"&gt;
                    &lt;Input Input="5" InputOnEvgroup="6" InputOnEvcode="26" InputOffEvgroup="6" InputOffEvcode="29" InputStatus=""/&gt;
                    &lt;Input Input="6" InputOnEvgroup="6" InputOnEvcode="28" InputOffEvgroup="6" InputOffEvcode="31" InputStatus=""/&gt;
                    &lt;Input Input="3" InputOnEvgroup="6" InputOnEvcode="27" InputOffEvgroup="6" InputOffEvcode="30" InputStatus=""/&gt;
                    &lt;Input Input="1" InputOnEvgroup="6" InputOnEvcode="29" InputOffEvgroup="6" InputOffEvcode="32" InputStatus=""/&gt;
                    &lt;Output Output="6" OutputOnEvgroup="6" OutputOnEvcode="70" OutputOffEvgroup="6" OutputOffEvcode="71" /&gt;
                    &lt;Output Output="1" OutputOnEvgroup="6" OutputOnEvcode="72" OutputOffEvgroup="6" OutputOffEvcode="73" /&gt;
              &lt;/B37&gt;
           &lt;/Cnc&gt;
           &lt;/Order&gt;
           </Order>
           <Priority>1</Priority>
           <STGSource>3</STGSource>
           <IdDC>DTC1143690156</IdDC>
        </Order>
    </soap:Body></soap:Envelope>
```

14.8 B38 Meter insert and configuration examples

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"xmlns="http://www.asais.fr/ns/Saturne/DC/ws">
  <soap:Body>
    <Order>
    <IdPet>138</IdPet>
    <Format>0</Format>
      <Order>
       &lt;Order IdPet="138" IdReq="B38" Version="3.4_EDP_2.0" &gt;
        &lt;Cnc Id="DTC1990000001"&gt;
          &lt;B38&gt;
                    &lt;Cnt Id="EMI1499005111"&gt;&lt;ComTech MeterComTech="1" MeterIP="1.2.3.4" MeterHDLCAdd="0"/&gt;&lt;/Cnt&gt;
                    &lt;Cnt Id="EMI1630000620"&gt;&lt;ComTech MeterComTech="4" MeterIP="2.3.4.5" MeterHDLCAdd="16"/&gt;&lt;/Cnt&gt;
          &lt;/B38&gt;
           &lt;/Cnc&gt;
       &lt;/Order&gt;
      </Order>
      <Priority>1</Priority>
      <STGSource>1</STGSource>
<IdDC>DTC1990000001</IdDC>
    </Order>
  </soap:Body></soap:Envelope>
```

15 ANNEX B – DATA REPRESENTATION

15.1 COSEM Data format coditication

Following table specifies which codification has to be applied in order to represent COSEM Data formats:

Type name	Id	Codification
null-data	[0]	"null"
array	[1]	N/A
structure	[2]	N/A
boolean	[3]	TRUE : "Y" FALSE : "N"
Bcd	[13]	Decimal display of the current value. e.g. : • Bcd value 25h ; Display : "25" • Enum value 08h ; Display "8"
enum	[22]	
integer	[15]	Signed decimal display of the current value. e.g. : • long value { E8h, 03h } (bytes order in A-XDR COSEM Data representation) displays as "1000" • long value { 18h, FCh } (bytes order in A-XDR COSEM Data representation) displays as "-1000"
Long	[16]	
double-long	[5]	
long64	[20]	
unsigned	[17]	Decimal display of the current value. e.g. : • long value { E8h, 03h } (bytes order in A-XDR COSEM Data representation) displays as "1000"
long-unsigned	[18]	
double-long-unsigned	[6]	
long64-unsigned	[21]	
bit-string	[4]	Hexadecimal display of the sequence of bits, padded with 0s (zeros) in order to obtain a multiple of 8 bits. e.g. : • Bit-string(10) : { 1 0 1 0 0 0 0 0 1 0 } • Padding "10100000 10000000" • Bytes : ○ "10100000" i.e. A0h ○ "10000000" i.e. 80h • Display : "A080"
octet-string	[9]	Hexadecimal display of the sequence of bytes in initial order. e.g. : • Octet-string(256) : { 0, 1, 2… 255 } • Display : "00010203…FDFEFF"
visible-string	[10]	Ascii display . e.g. : • Visible-string : { 31h, 32h, 33h } • Display : "123"
float32	[23]	Decimal display of the value using "." (dot) as decimal separator. e.g. "12345.678"
float64	[24]	
date_time	[25]	Decimal "YYYYMMDDHHmmssfffX" ordered display. e.g. : "20100101000000000W"
Date	[26]	Decimal "YYYYMMDD" ordered display. e.g. : "20100101"
Time	[27]	Decimal "hhmmssfffX" ordered display. e.g. "233000000W"
compact-array	[19]	N/A
don't-care	[255]	N/A

15.2 Specific data format specification

Following specific data format are defined as follows:
For engineering units on data received, unless otherwise specified all data should be received in the same format as that specified in the DLMS Companion.

W	This stands for Watts, integer (no decimals). The DTC is responsible for converting data received from the meter into this units where needed (eg kW with two decimals DLMS data into W)

VA	This stands for volts amperes, integer.
V	This stands for volts, integer.
A	This stands for Amps, **1 decimal**.
Energy data: kWh absolute or incremental.	These are always integer values.
Power Factor	Number with 3 decimal values
Timestamp	Timestamp is to be displayed in the XML fields in the next format: • "YYYYMMDDHHMNSSFFFX" Where: • "YYYY" stands for the year (2010) • "MM" stands for the month (01-12) • "DD" stands for the day (01-31) • "HH" stands for the hour in 24hrs format (00-24) • "MN" stands for the minutes (00-60) • "SS" stands for the seconds (00-60) • "FFF" stands for the milliseconds (000-999) • "X" stands for the Summer/Winter flag: o "S" for summer time o "W" for winter time Note that clock status as defined in DLMS is not included in the timestamp structure today.
Timestamp (relative value)	Timestamp relative value is used to define the periodicity used in programmed tasks. The value has the same format as a timestamp **excluding X flag**, but its relative. It includes the details on the periodicity (up to seconds). As an example: Periodicity= Every month Value= 00000100000000 Periodicity= Every day Value= 00000001000000 This means that we only specify day information. Periodicity= Every hour Value= 00000000010000 Periodicity= Every week (7 days) Value= 00000007000000
DTC Identifier Meter Identifier	The device identifiers (both for DTCs and meters) rely upon the same identifier structure: "MMMNNNNNNNNNN" where : • "MMM" stands for the manufacturer identifier as defined in the DLMS/COSEM Specification • "NNNNNNNNNN" stands for the device serial number Length of this identifier: 13 digits (3 digits for the manufacturer, 10 digits for the device serial number)

16 ANNEX C – USE CASES

16.1 Reports and orders requests (asynchronous)

16.1.1 Asynchronous Report Request (WS)

Report request corresponds to the following sequence:

- The HES issues a “Report Request” to the DTC for a given report
- The result of the service invocation indicates the report request has been taken in account
- Once the report has been generated, an answer is sent to the HES through the “Report” service including information depending on the original request

The type of service to use for each message is specified in the “Report Index” **Annex D**.

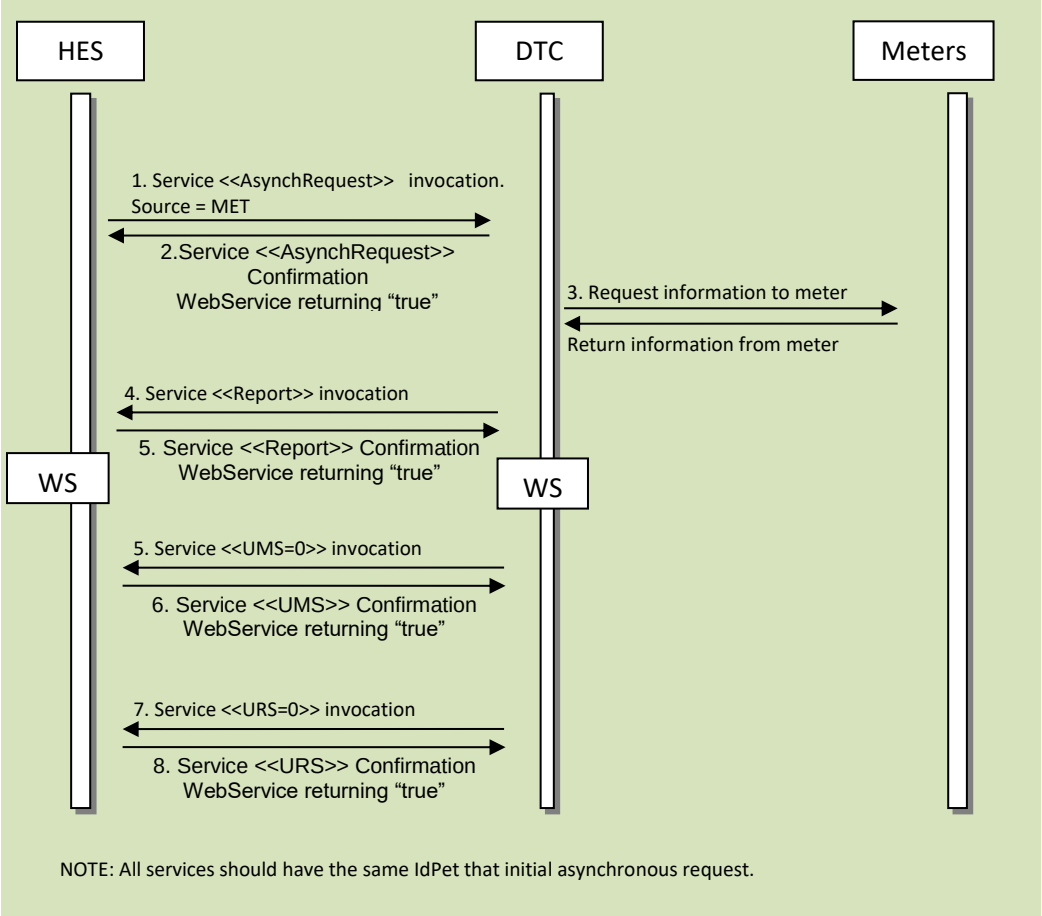


Figure1. Asyncronous WS

16.1.2 Asynchronous Report Request (FTP)

Report request corresponds to the following sequence:

- The HES issues a “Report Request” to the DTC for a given report
- The result of the service invocation indicates the report request has been taken in account
- Once the report has been generated, a file is sent to the HES through FTP including information depending on the original request.

The type of service to use for each message is specified in the “Report Index” **Annex D**.

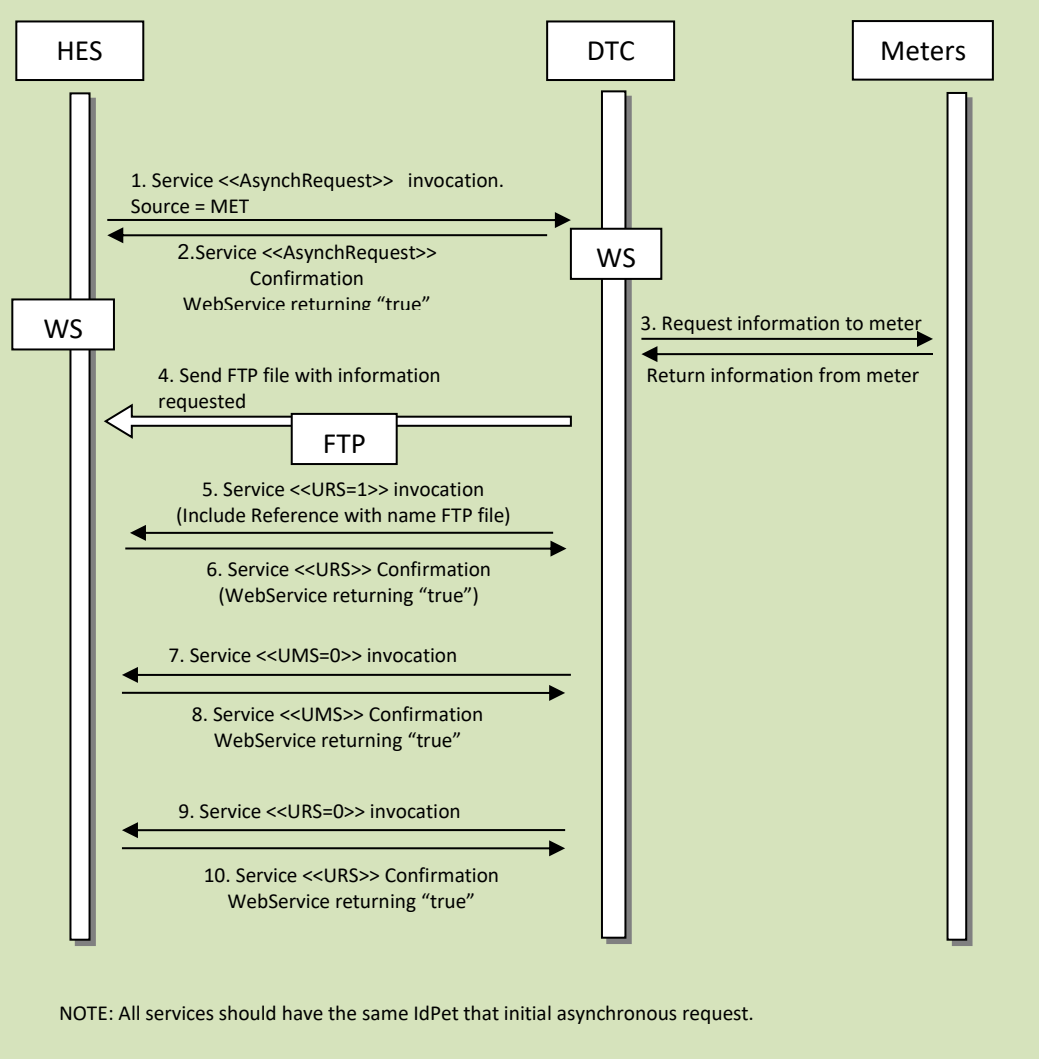


Figure 2. Asyncronous FTP

16.1.3 Asynchronous Report Request (FTP) Multiple Meters

The following figure shows an example of an asynchronous report request at **4 meters with the NumMeters DTC parameter set to 2**. It's very interesting to see the message sequences especially UpdateMetersStatus and UpdateRequestStatus.

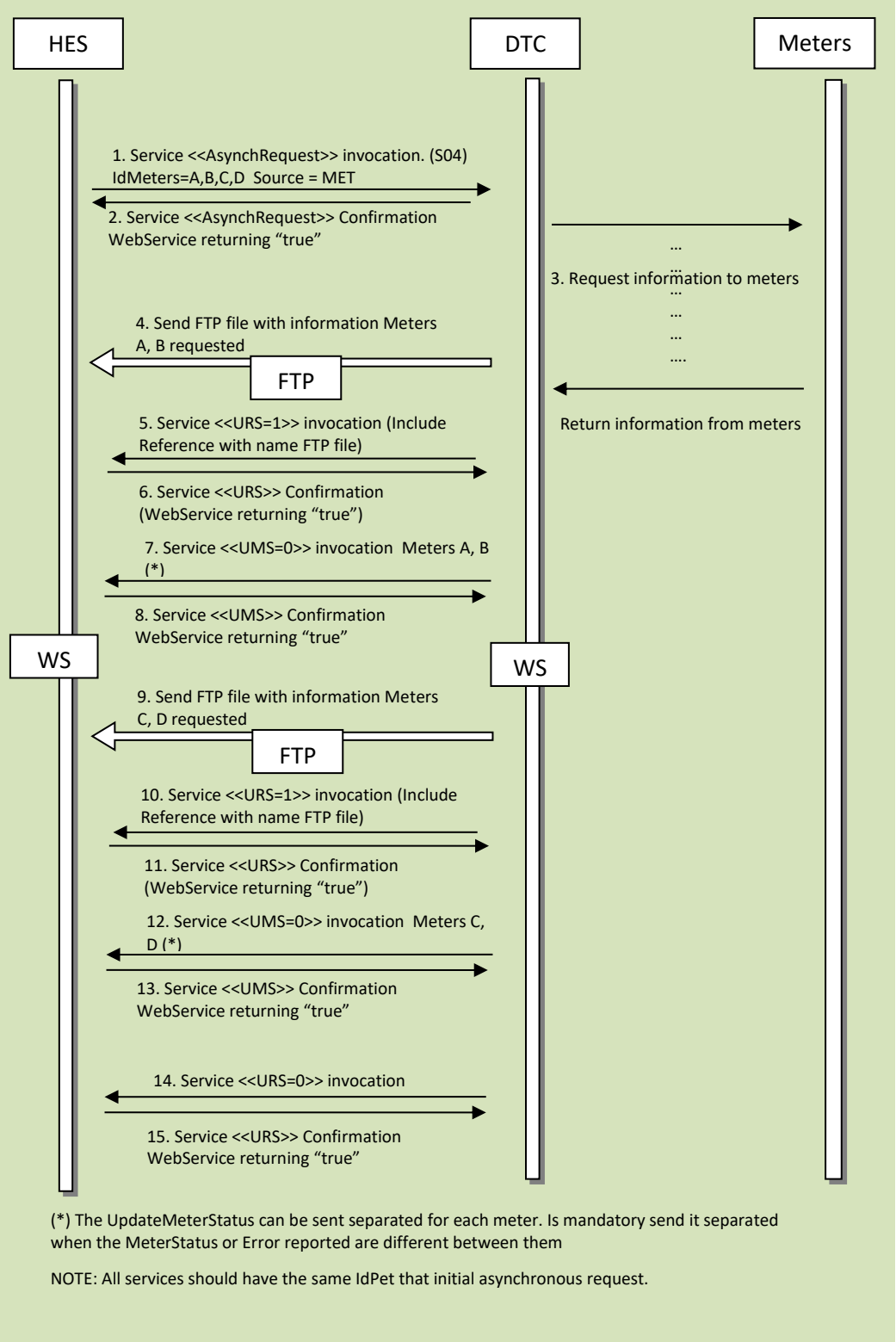


Figure 3. Asyncronous FTP, Multiple Meters.

16.1.4 Asynchronous Report Monthly billing – S04

The S04 report may be executed due to an asynchronous report request or a scheduled task, exactly as stated in section 8.1.5.1 of this document.

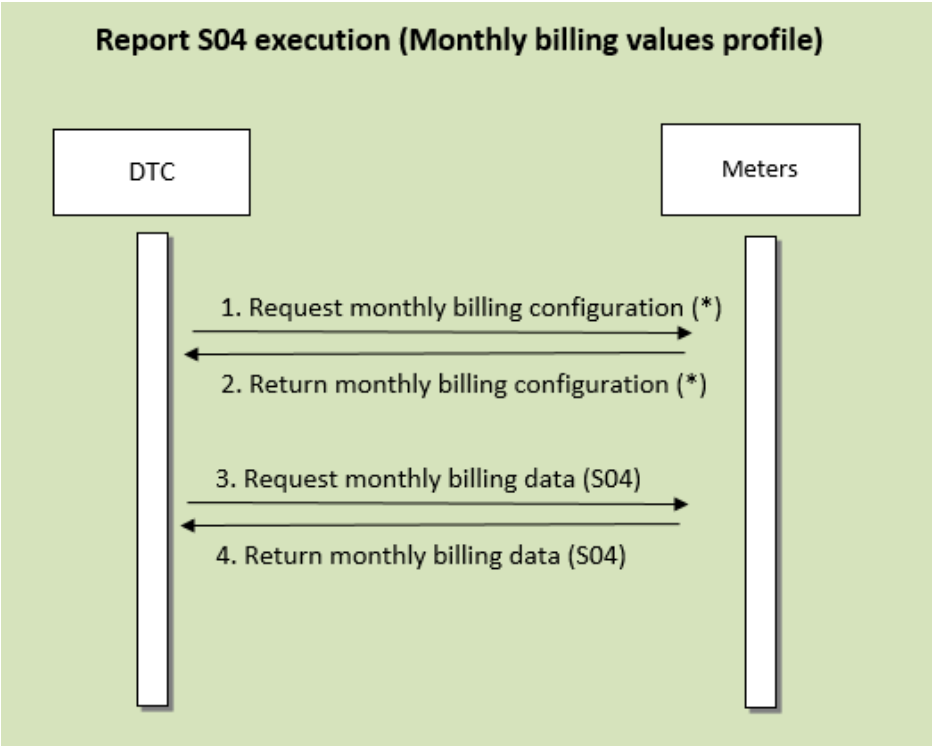


Figure 4. S04 execution

The monthly billing profile configuration of meters is not fixed (it's configurable).
In order to properly execute the S04 report, DTC shall always take into consideration the parameter "DataCollectMode" (S12/B07 report). Considering this parameter's value and the existance of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the monthly profile configuration is needed before the collection of the monthly billing data.

Please see section 8.20.3 for further details.
Monthly billing data is always collected through attribute #2 (buffer) of the DLMS object "0.0.98.1.c.255", with c=1,2 (contracts 1 and 2).
NOTE: Only existing tags should be returned in the report.

16.1.5 Asynchronous Report Dailly billing – S05

The S05 report may be executed due to an asynchronous report request or a scheduled task, exactly as stated in section 8.1.5.1 of this document.

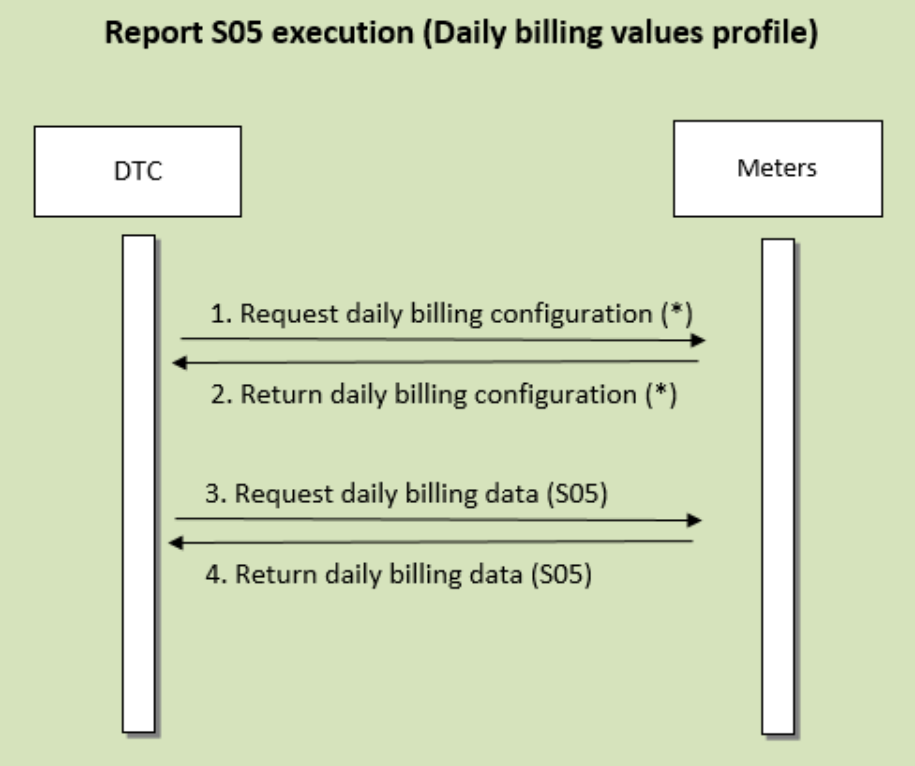


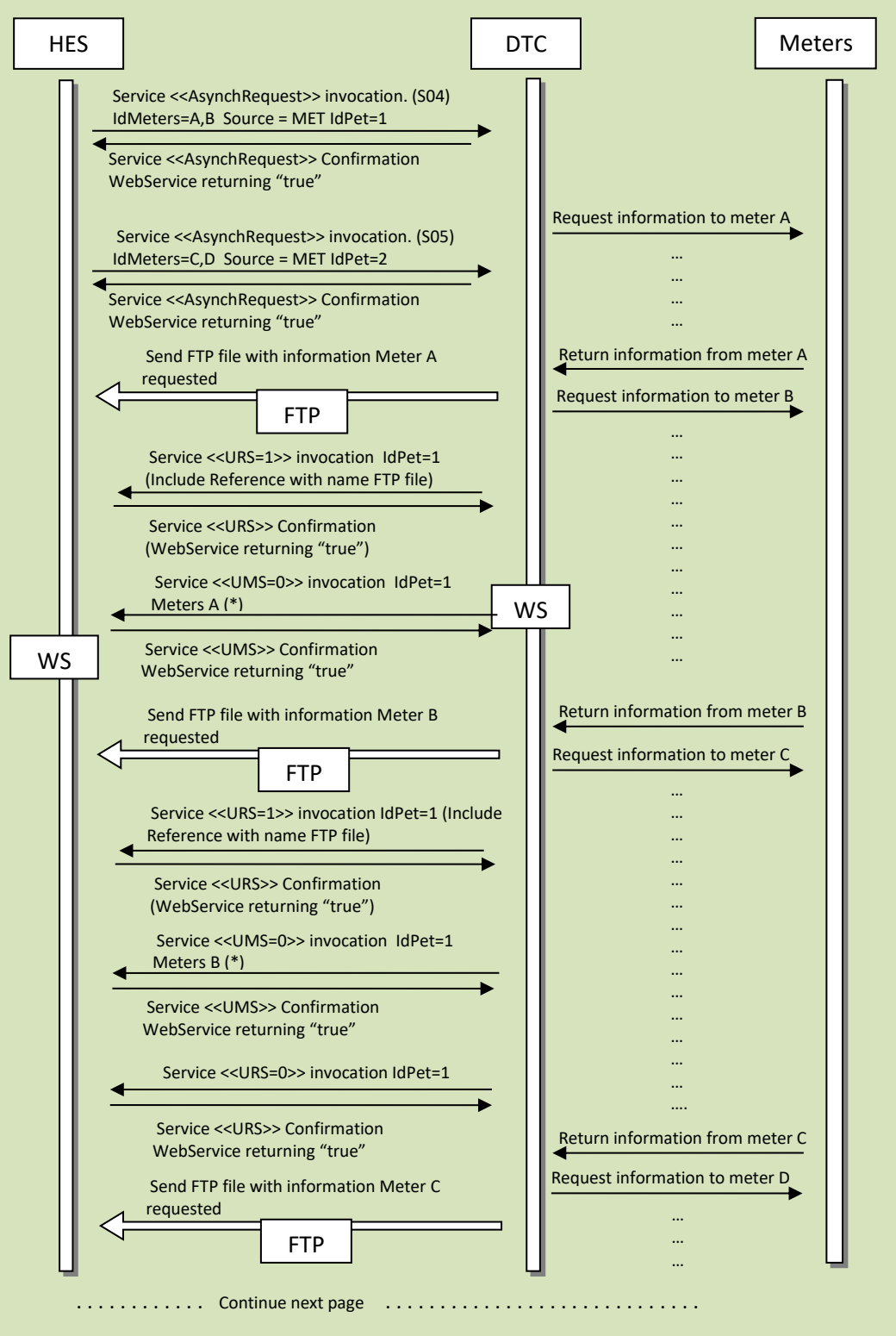
Figure 5. S05 execution

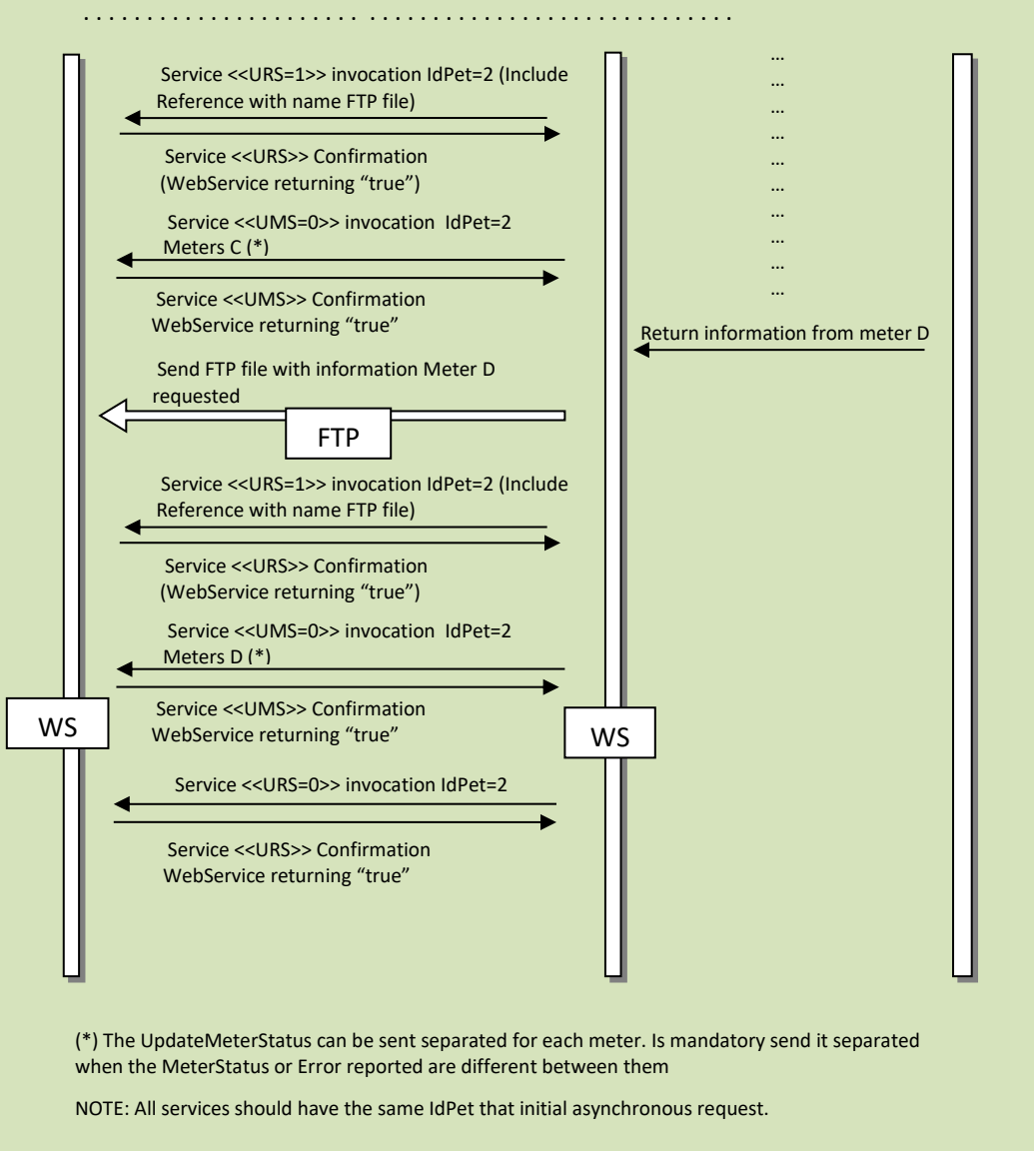
The daily billing profile configuration of meters is not fixed (it's configurable).
In order to properly execute the S05 report, DTC shall always take into consideration the parameter "DataCollectMode" (S12/B07 report). Considering this parameter's value and the existance of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the daily profile configuration is needed before the collection of the daily billing data.

Please see section 8.20.3 for further details.
Daily billing data is always collected through attribute #2 (buffer) of the DLMS object "0.0.98.2.c.255", with c=1,2 (contracts 1 and 2).
NOTE: Only existing tags should be returned in the report.

16.1.6 Muliple Asynchronous Report Request (FTP), same priority on Multiple Meters

The following figure shows an example of two asynchronous report request with the same priority at **2 meters with the NumMeters DTC parameter set to 1**. It's very interesting to see the message sequences especially UpdateMetersStatus and UpdateRequestStatus and priority access meter.





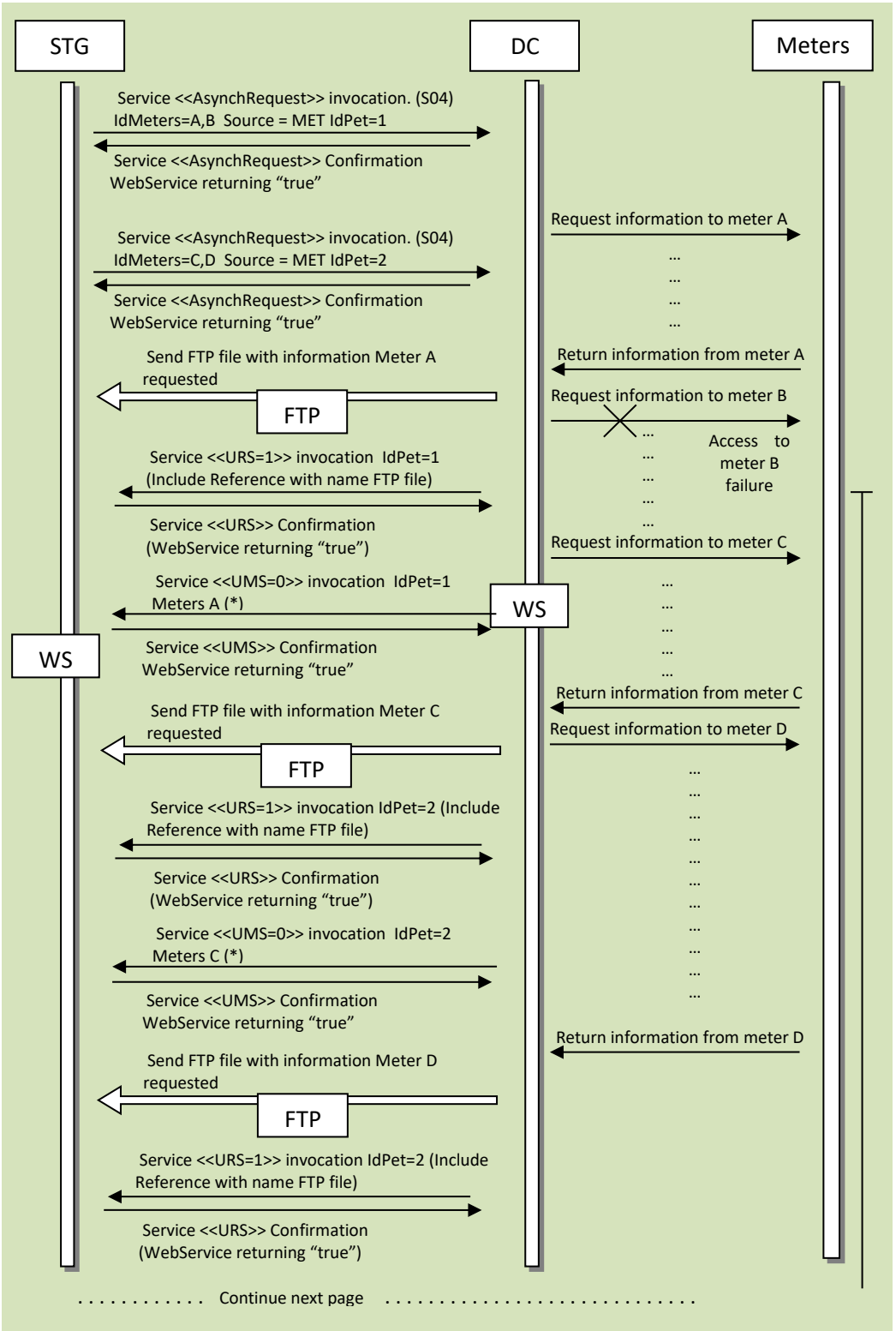
(*) The UpdateMeterStatus can be sent separated for each meter. Is mandatory send it separated when the MeterStatus or Error reported are different between them

NOTE: All services should have the same IdPet that initial asynchronous request.

Figure 6. Multiple Asynchronous Report Request (FTP), same priority on Multiple Meters.

16.1.7 Muliple Asynchronous Report Request (FTP), same priority on Multiple Meters, one meter fails

The following figure shows an example of two asynchronous report request with the same priority at **2 meters with the NumMeters DTC parameter set to 1, where the first access to the meter B fail**. It's very interesting to see the message sequences especially UpdateMetersStatus and UpdateRequestStatus and priority access meter.



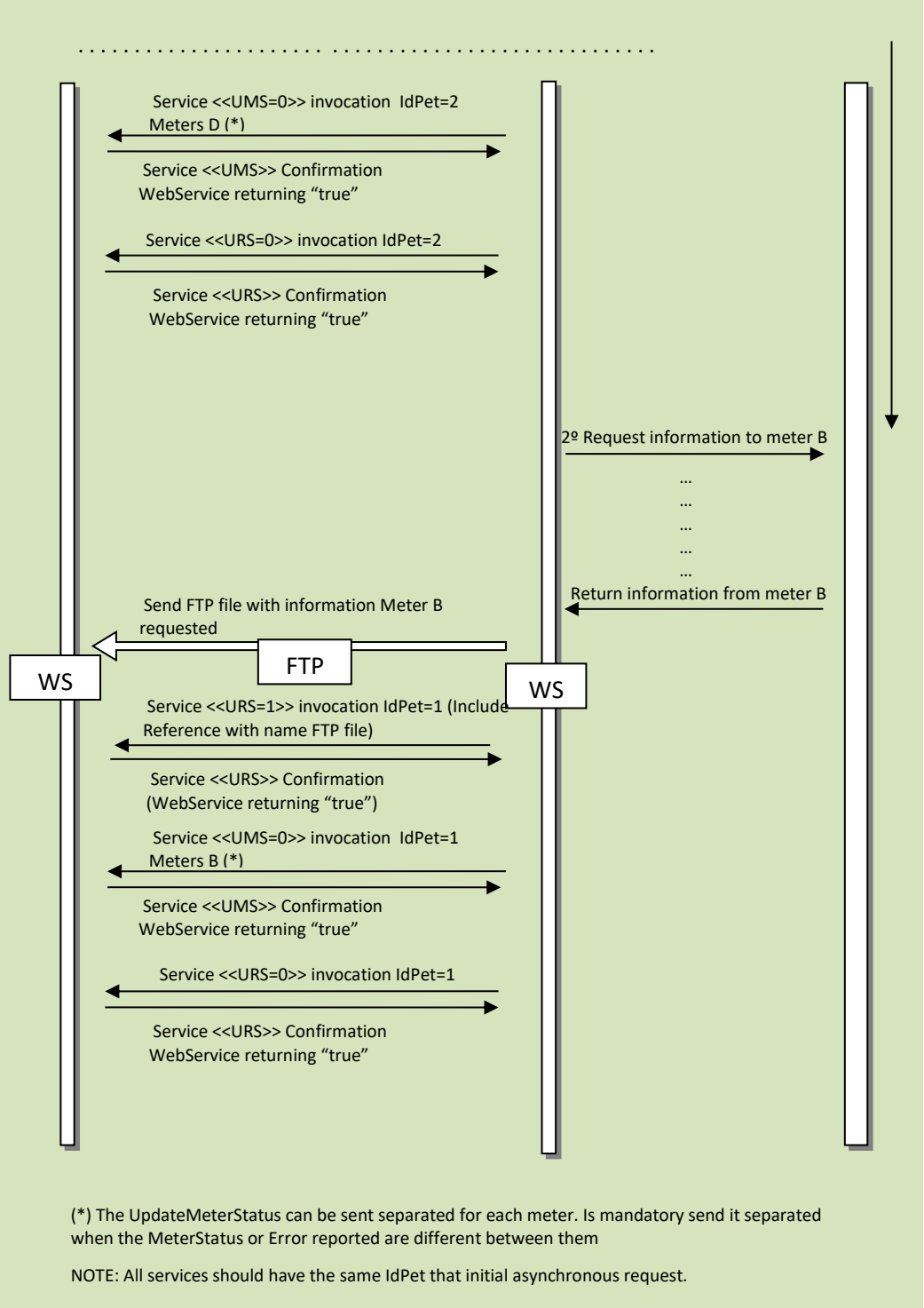


Figure 7. Multiple Asynchronous Report Request (FTP), same priority on Multiple Meters, first access to meter B failure.

Please note that this example is for NumMeters=1. If NumMeters>1, then the DTC should collect the data from more than one meter and only send the FTP report once that data from all those meters is collected. If the NumMeters is hgher than the number of meters mentioned on the request, than the DTC will only send 1 FTP file. (If the TimeSendReq is not reached).

16.1.8 Order Request, DTC Modifications with an associated report (using FTP)

Orders request with the purpose of DTC modifications correspond to the following sequence:

- The HES issues an "OrderRequest" to the DTC for a given order (step 1).
- The service result indicates the order has been taken in account (step 2).
- The order execution should be confirmed by the DTC (steps 3 and 4).
- The DTC validates if it matches with the new values (step 4).
- The appropriate messages (depending on the order) are sent through FTP (steps 5 and 6).
- Once the order is complete, the DTC issues an "UpdateRequestStatus" in order to inform the HES of the completeness of the complete order (step 7).

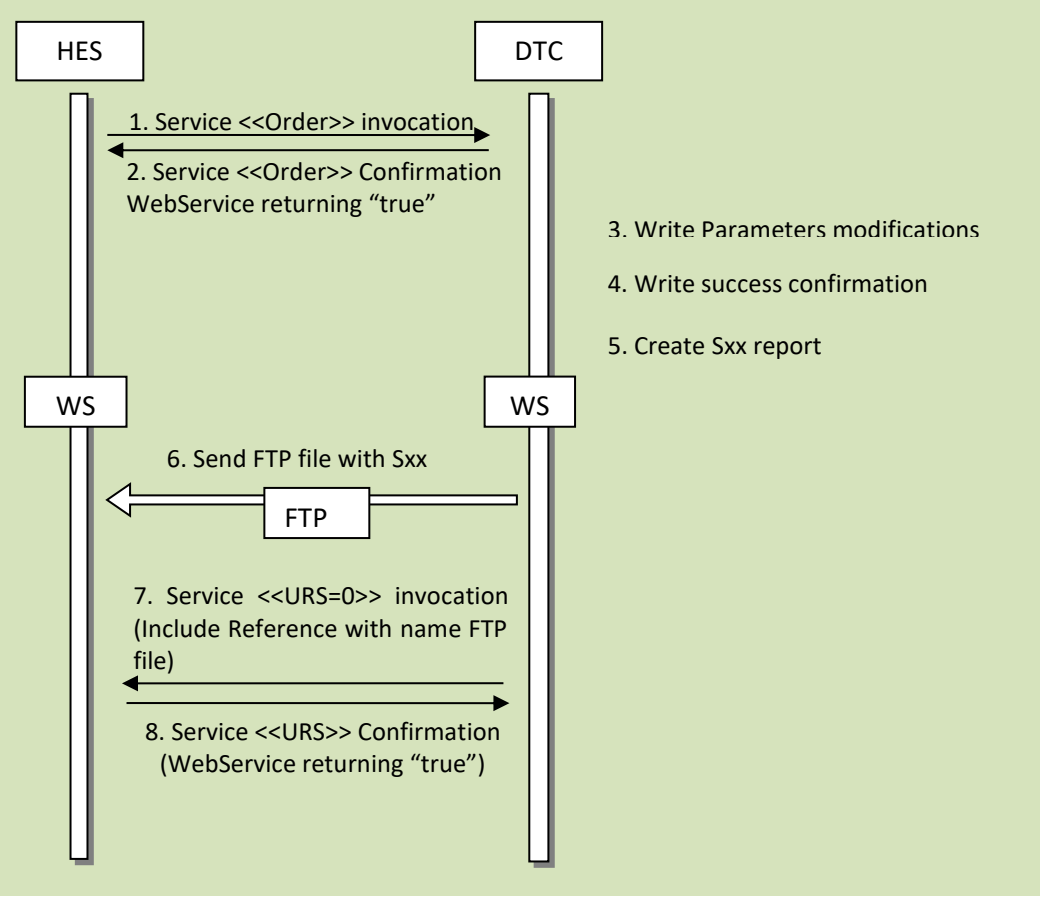


Figure 8. Order Request, DTC Modifications with an associated report (using FTP).

The report to be sent within the scope of this workflow depend on the executed order. The following table show the proper correspondence between the order and the report for this workflow.

Order (Bxx)	Report (Sxx)
B07	S12
B10	S10
B36	S36
B37	S37
B40	S40
B41	S41

16.1.9 Order Request, DTC Modifications or action execution without an associated report

Orders request with the purpose of DTC modifications correspond to the following sequence:

- The HES issues an "OrderRequest" to the DTC for a given order (step 1).
- The service result indicates the order has been taken in account (step 2).
- The order execution should be confirmed by the DTC (steps 3 and 4).
- Once the order is complete for a meter, the DTC issues an "UpdateMeterStatus" in order to inform the HES of the completeness of this meter (step 5).
- Once the order is complete, the DTC issues an "Update Request Status" in order to inform the HES of the completeness of the complete order (step 7).

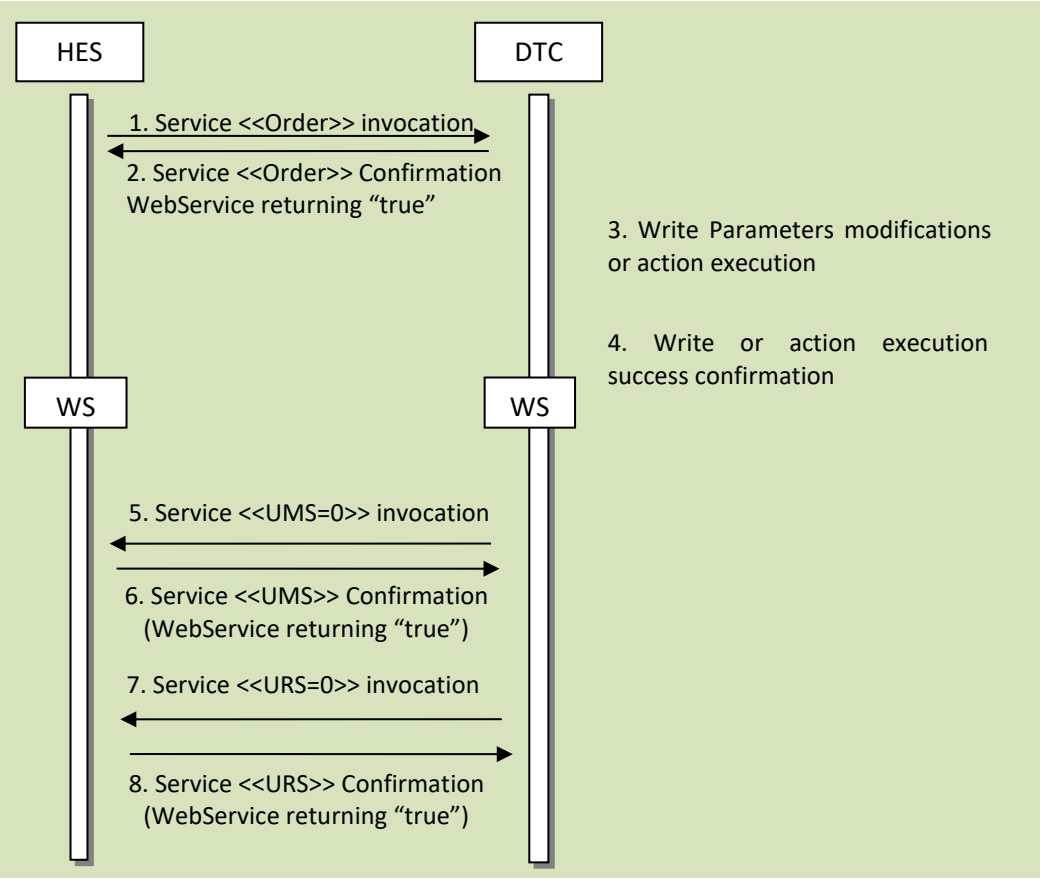


Figure 9. Order Request, DTC Modifications or action execution without an associated report

List of orders that shall be implemented according to this use case: B06.

16.1.10 Order Request. Example of interaction for a B03

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports).
    - The order execution should be confirmed by the DTC reading the necessaries OBIS to the meters. Apply “ValuesCheckDelay”.
    - Once the order is complete for a meter, the DTC issues an “UpdateMeterStatus” in order to inform the HES of the completeness of this meter.
    - Once the order is complete, the DTC issues an “UpdateRequestStatus” in order to inform the HES of the completeness of the complete order.

The type of service to use for each message is specified in the “Report Index” **Annex D**.

The schematic below represents data flow for an asynchronous order:

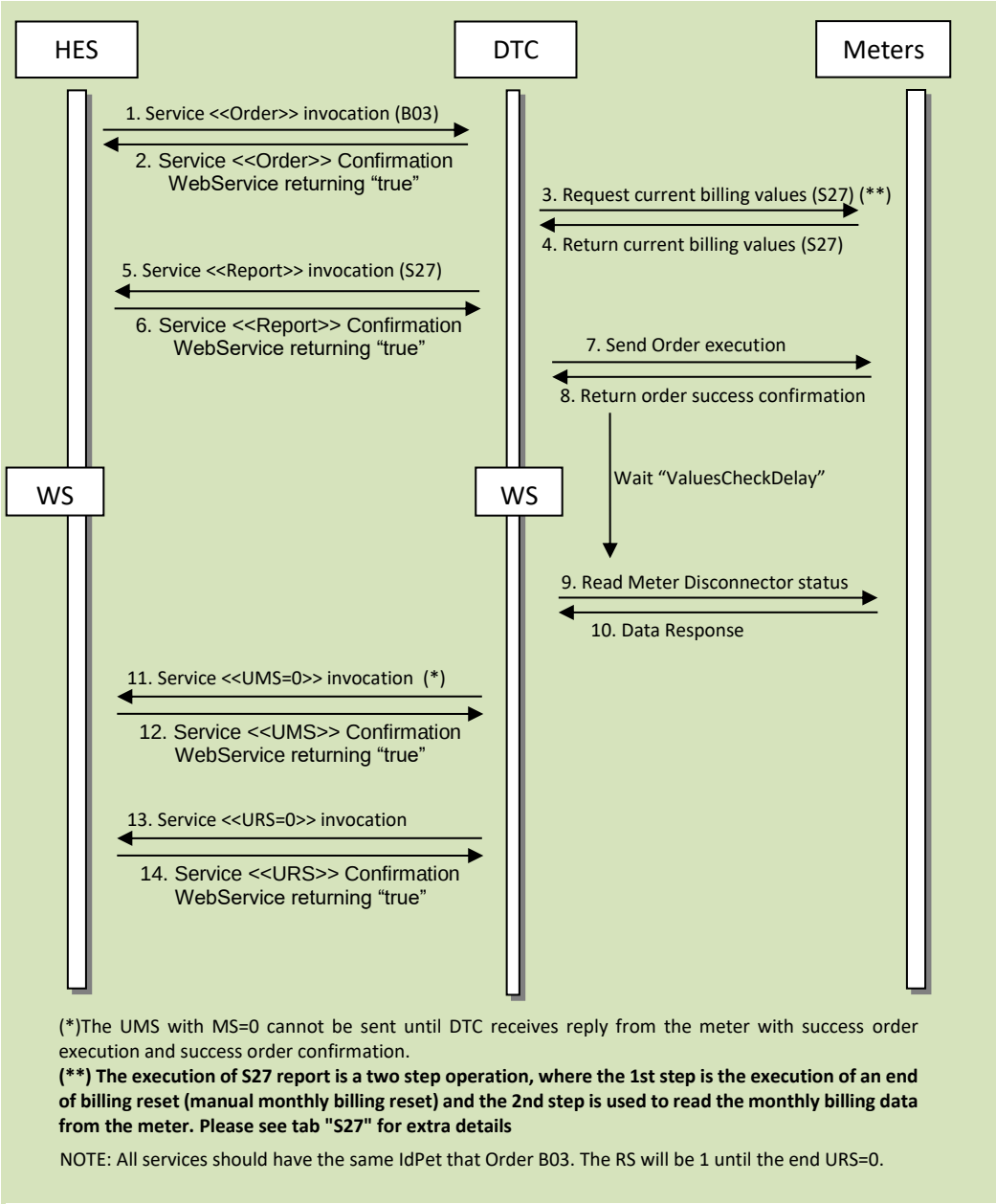


Figure 10. Order Request B03 WS

Before the action execution over the meter's circuit breaker, the DTC should perform a monthly billing reset for contract 1 and then collect that new billing from the meter and send it through S27. The DTC should be able to collect this last billing even if the DTC has some colock deviation. Implementations like collection in a time window of [-1h; +1h] are accepted.

16.1.11 Order Request. Example of interaction for a B03 (Order=2 and initial control_state=Ready_for_reconnection)

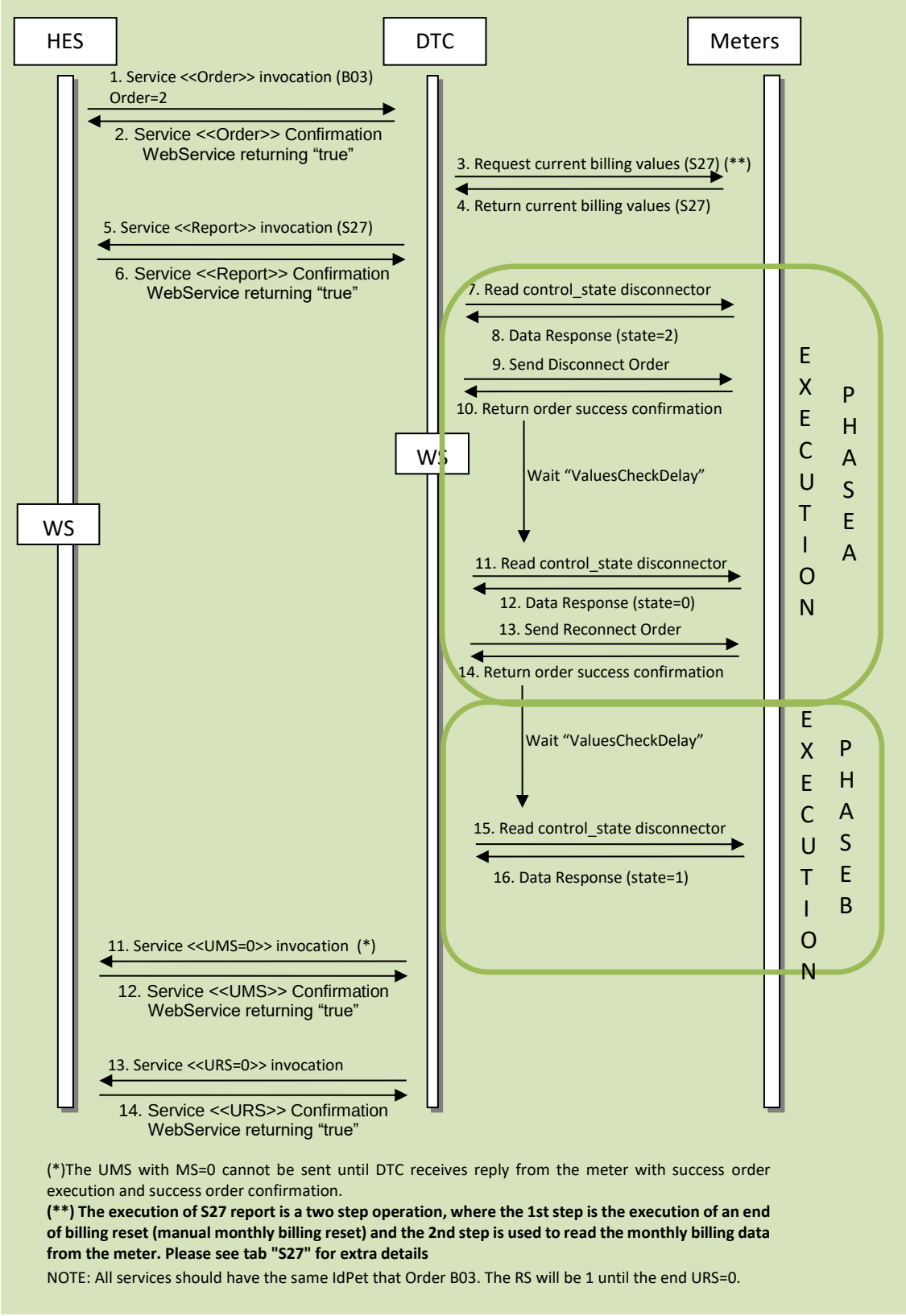
Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports).
    - The execution phase A, the DTC check the internal control_state of the meter. The state is Ready_for_reconnection (2), the DTC send a disconnect order and the meter will be in state disconnected (0). Any failure in execution phase A must be reported to the HES with MeterStatus=1, ErrCat=3 ErrCode=4 (Order execution rejected from the meter (write)).
    - The next steps are the same like B03 order 1 (CLOSE)
    - The order execution should be confirmed by the DTC reading the necessaries OBIS to the meters. Apply “ValuesCheckDelay”.
    - Once the order is complete for a meter, the DTC issues a “UpdateMeterStatus” in order to inform the HES of the completeness of this meter.
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the completeness of the complete order.

The type of service to use for each message is specified in the “Report Index” **Annex D**.

Before the action execution over the meter’s circuit breaker, the DTC should perform a monthly billing reset for contract 1 and then collect that new billing from the meter and send it through S27. The DTC should be able to collect this last billing even if the DTC has some colock deviation. Implementations like collection in a time window of [-1h; +1h] are accepted.

The schematic below represents data flow for an asynchronous order:



(*)The UMS with MS=0 cannot be sent until DTC receives reply from the meter with success order execution and success order confirmation.

(**) The execution of S27 report is a two step operation, where the 1st step is the execution of an end of billing reset (manual monthly billing reset) and the 2nd step is used to read the monthly billing data from the meter. Please see tab "S27" for extra details

NOTE: All services should have the same IdPet that Order B03. The RS will be 1 until the end URS=0.

Figure 11. Order Request B03 WS (Order=2)

16.1.12 Order Request. Example of interaction for a B03 with Order Execution Failed

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports).
    - The order is rejected or not confirmed for a meter, the DTC issues a “UpdateMeterStatus” in order to inform the HES of the end with error of this meter.
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the end with error of the complete order.

The schematic below represents data flow for an asynchronous order:

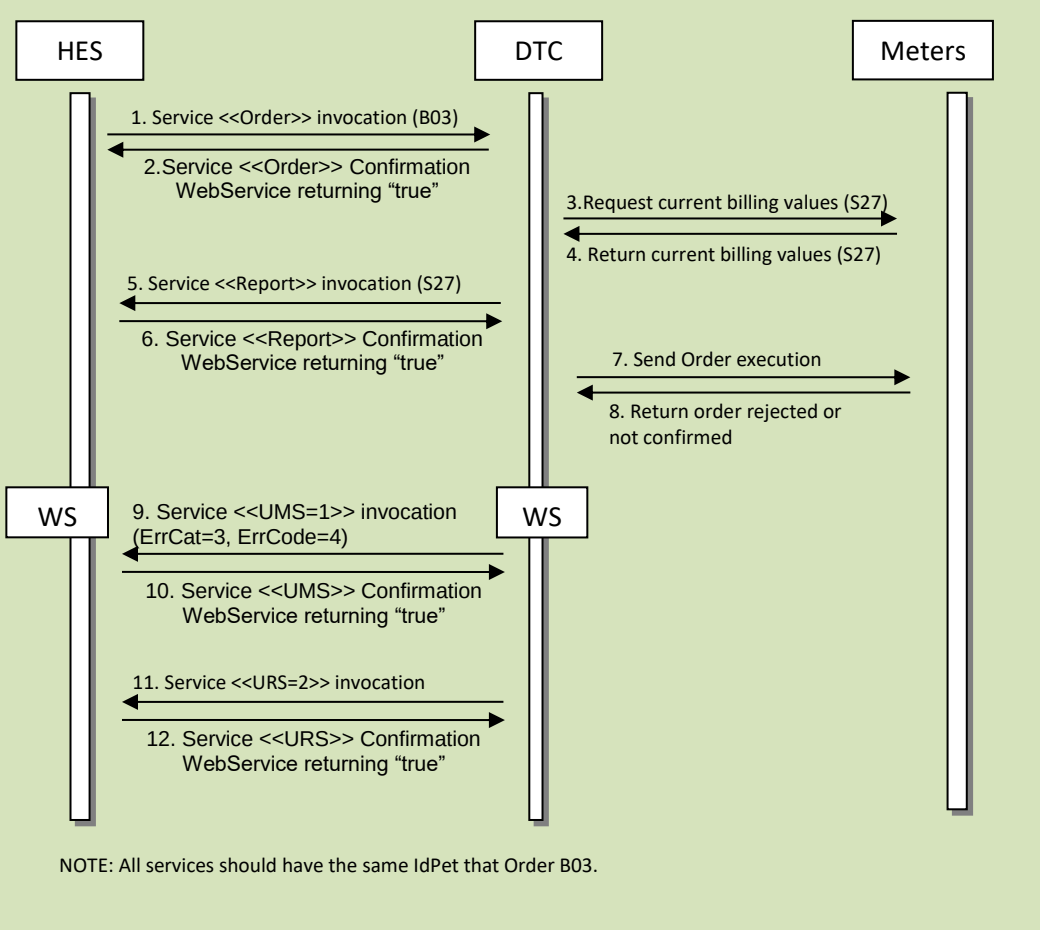


Figure 12. Order Request B03 Failed WS

The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description.
1	3	4	Order execution rejected from the meter (write).
1	3	5	Order execution accepted (write) but not confirmed (read).
1	3	6	Order execution rejected from DTC (e.g. because previous reports are not executed correctly, state initial incorrect for order execution…).
2	Null	Null	Order has been executed but any after report is missing.
3	3	4 o 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

16.1.13 Order Request. Example of interaction for a B02 and B04

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account (step 2 below).
    - The order execution should be confirmed by the DTC reading the necessaries OBIS to the meters. Apply “ValuesCheckDelay”. This is shown in steps 5 and 6 below. On receiving this information, the DTC validates it matches with the new values.
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports). This is represented with steps 7, 8 and 9 below.
    - Once the order is complete for a meter, the DTC issues a “UpdateMeterStatus” in order to inform the HES of the completeness of this meter (Step 12 below).
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the completeness of the complete order (step 14 below).

The type of service to use for each message is specified in the “Report Index” **Annex D**.

After the changes on the meter, the DTC should collect the last monthly billing from the meter and send it through S04. The DTC should be able to collect this last billing even if the DTC has some colock deviation. Implementations like collection in a time window of [-1h; +1h] are accepted.

The schematic below represents data flow for an asynchronous order:

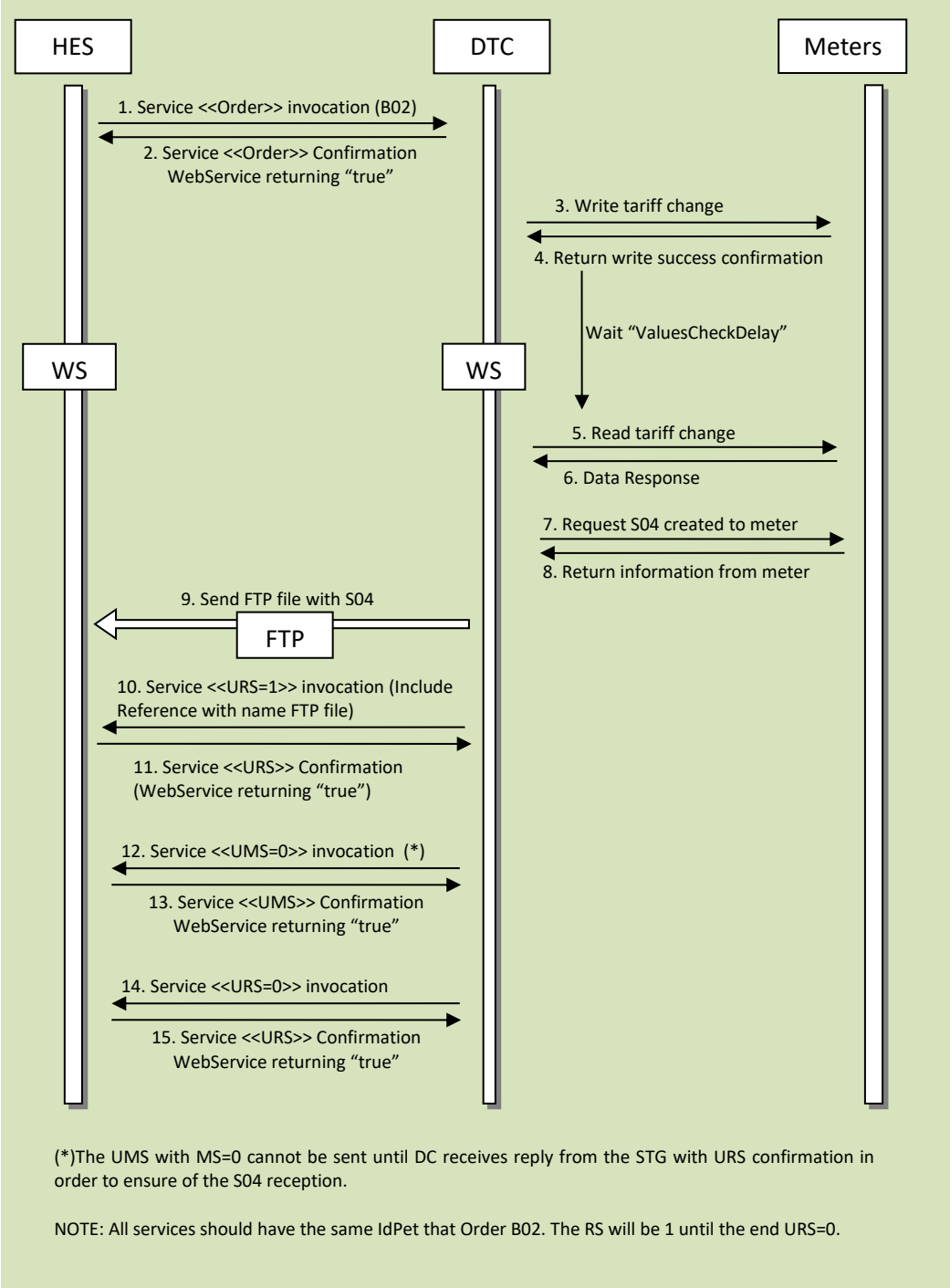


Figure 13. Order Request B02-B04 WS

16.1.14 Order Request. Example of interaction for a B02 and B04 with Oder Execution Failed

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports).
    - The order is executed and confirmed for a meter.
    - When DTC try to retrieve the S04 created with the tariff change, the communication with the meter fails.
    - The DTC issues a “UpdateMeterStatus” in order to inform the HES of the end with error of this meter.
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the end with error of the complete order.

After the changes on the meter, the DTC should collect the last monthly billing from the meter and send it through S04. The DTC should be able to collect this last billing even if the DTC has some colock deviation. Implementations like collection in a time window of [-1h; +1h] are accepted.

The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description.
1	3	4	Order execution rejected from the meter (write).
1	3	5	Order execution accepted (write) but not confirmed (read).
2	Null	Null	Order has been executed but any after report is missing.
3	3	4 o 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

The schematic below represents data flow for an asynchronous order:

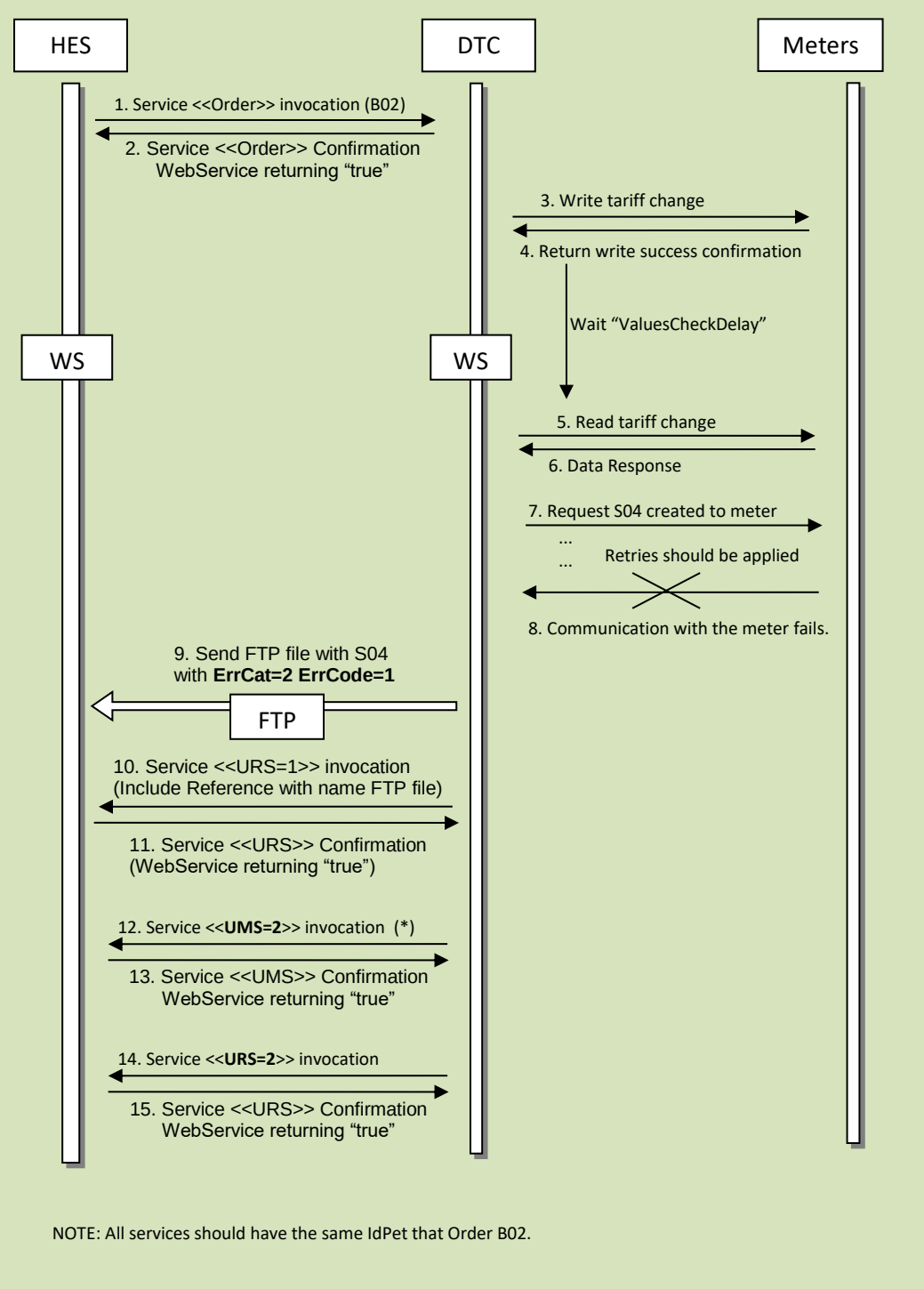


Figure 14. Order Request B02-B04 Failed WS

16.1.15 Order Request. Example of interaction for a B09

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account (step 2 below).
    - The order execution should be confirmed by the DTC reading the necessaries OBIS to the meters. Apply “ValuesCheckDelay”. This is shown in steps 5 and 6 below. On receiving this information, the DTC validates it matches with the new values.
    - Once the order is complete for a meter, the DTC issues a “UpdateMeterStatus” in order to inform the HES of the completeness of this meter (Step 7 below).
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the completeness of the complete order (step 9 below).

The type of service to use for each message is specified in the “Report Index” **Annex D**.

The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description.
1	3	4	Order execution rejected from the meter (write).
1	3	5	Order execution accepted (write) but not confirmed (read).
2	Null	Null	Order has been executed but any after report is missing.
3	3	4 o 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

The schematic below represents data flow for an asynchronous order:

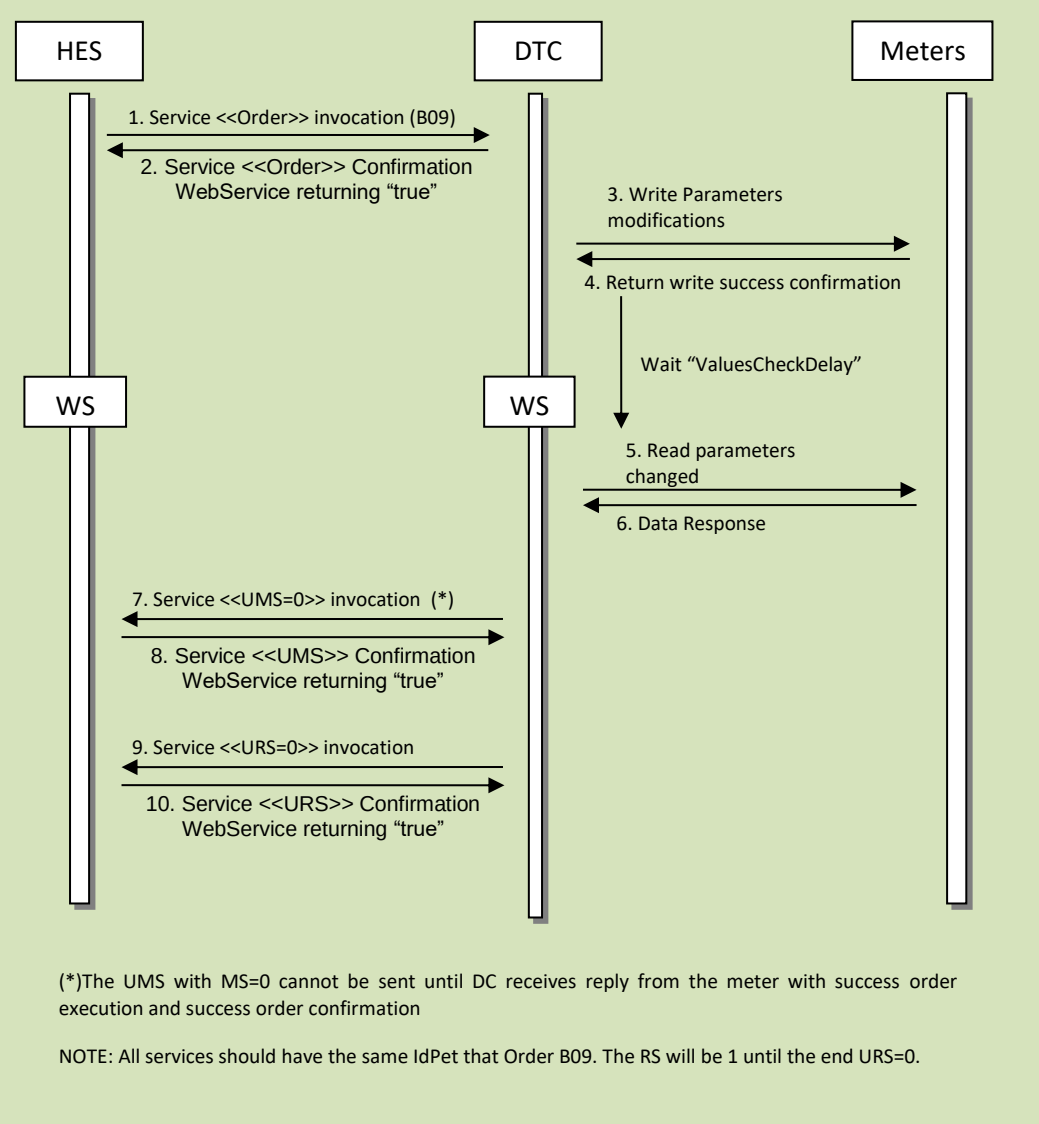


Figure 15. Order Request B09 WS

16.1.16 Order Request. Example of interaction for a B07

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account (step 2 below).
    - The order execution should be confirmed by the DTC. This is shown in steps 3 and 4 below. The DTC validates it matches with the new values.
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports). This is represented with steps 5 and 6 below.
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the completeness of the complete order (step 7 below).

The type of service to use for each message is specified in the “Report Index” **Annex D**.

The schematic below represents data flow for an asynchronous order:

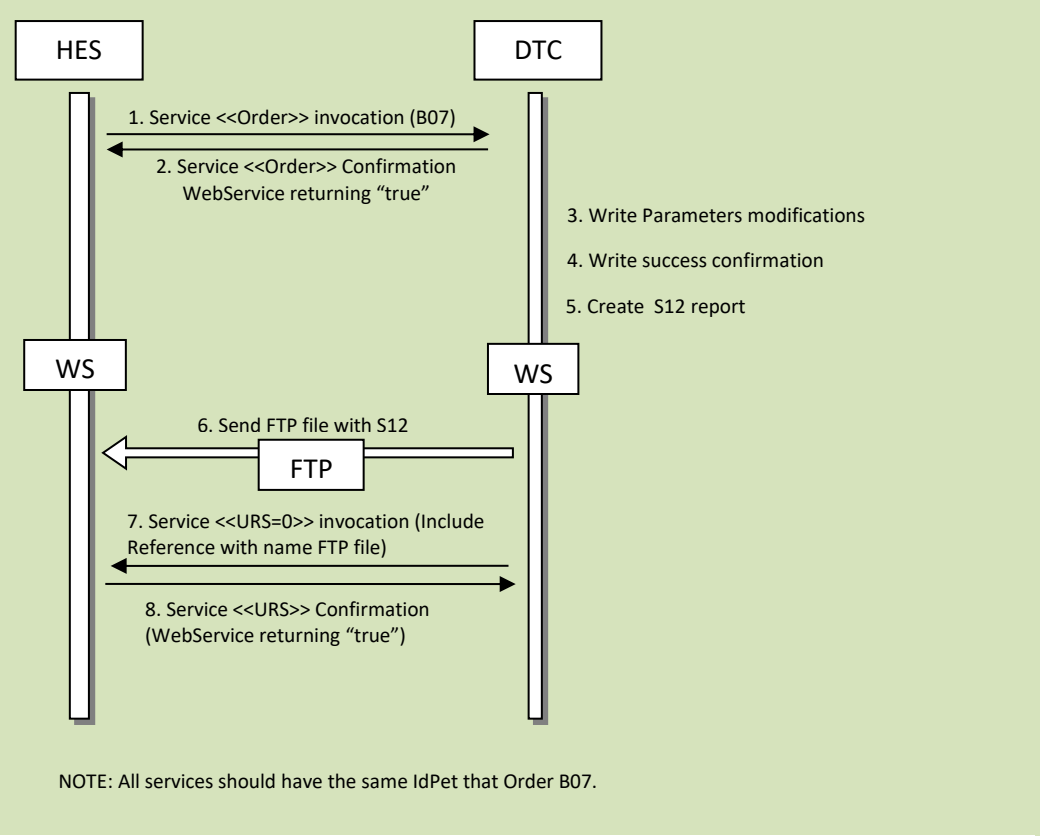


Figure 16. Order Request B07 WS

16.1.17 Order Request. Example of interaction for a partially applied B07

Orders request corresponds to the following sequence:

- The HES issues a “OrderRequest” to the DTC for a given order. In B07 order the HES request the modifications for 2 different parameters. One an “R” parameter and the other “R/W” parameter.
    - The Service result indicates the order has been taken in account (step 2 below).
    - The order execution should be confirmed by the DTC. This is shown in steps 3 and 4 below. The DTC validates one parameter is changed correctly, the other is not possible to change.
    - The appropriate messages (depending on the order) are sent through WebServices Report or FTP (SynchReport is not used for Orders reports). This is represented with steps 5 and 6 below.
    - Once the order is complete, the DTC issues a “UpdateRequestStatus” in order to inform the HES of the partially applied order (step 7 below).

The type of service to use for each message is specified in the “Report Index” **Annex D**.
The schematic below represents data flow for an asynchronous order:

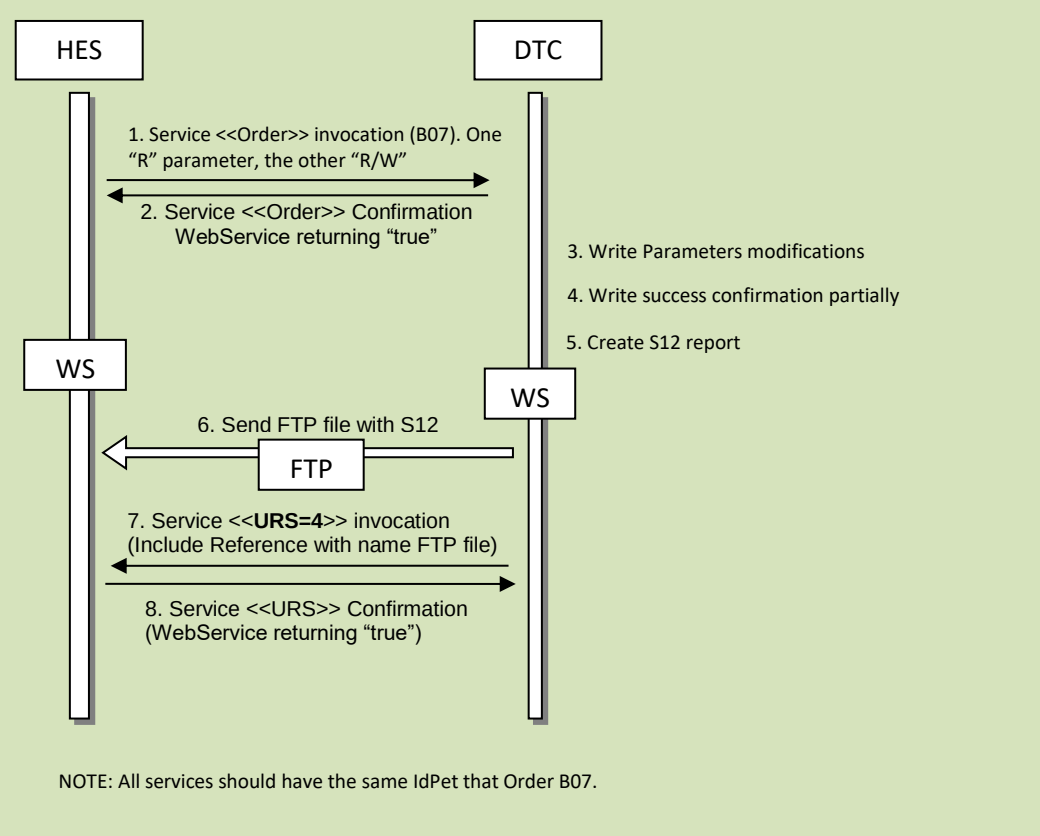


Figure 17. Order Request B07 WS partially applied.

16.1.18 Order Request. Example of interaction for a B12

Orders request corresponds to the following sequence (**NumMeters > m**):

- The HES issues a “OrderRequest” to the DTC for a given order
    - The Service result indicates the order has been taken in account (step 2 below).
    - The order execution should be confirmed by the DTC. The DTC has to open a DLMS association per meter included in the order and send the diferents operations included in the same association. DTC receives the meter responses. On receiving this information, the DTC builds the S42 report and sent it to the HES
    - The appropriate messages are sent through WebServices Report and FTP. This is represented with steps 19, 20 and 21 below.
    - Once the order is complete for a meter, the DTC issues an “UpdateMeterStatus” in order to inform the HES of the completeness of this meter (Step 22, 24 below).
    - Once the order is complete, the DTC issues a “Update RequestStatus” in order to inform the HES of the completeness of the complete order (step 26 below).

The type of service to use for each message is specified in the “Report Index” **Annex D**.

The schematic below represents data flow for an asynchronous order:

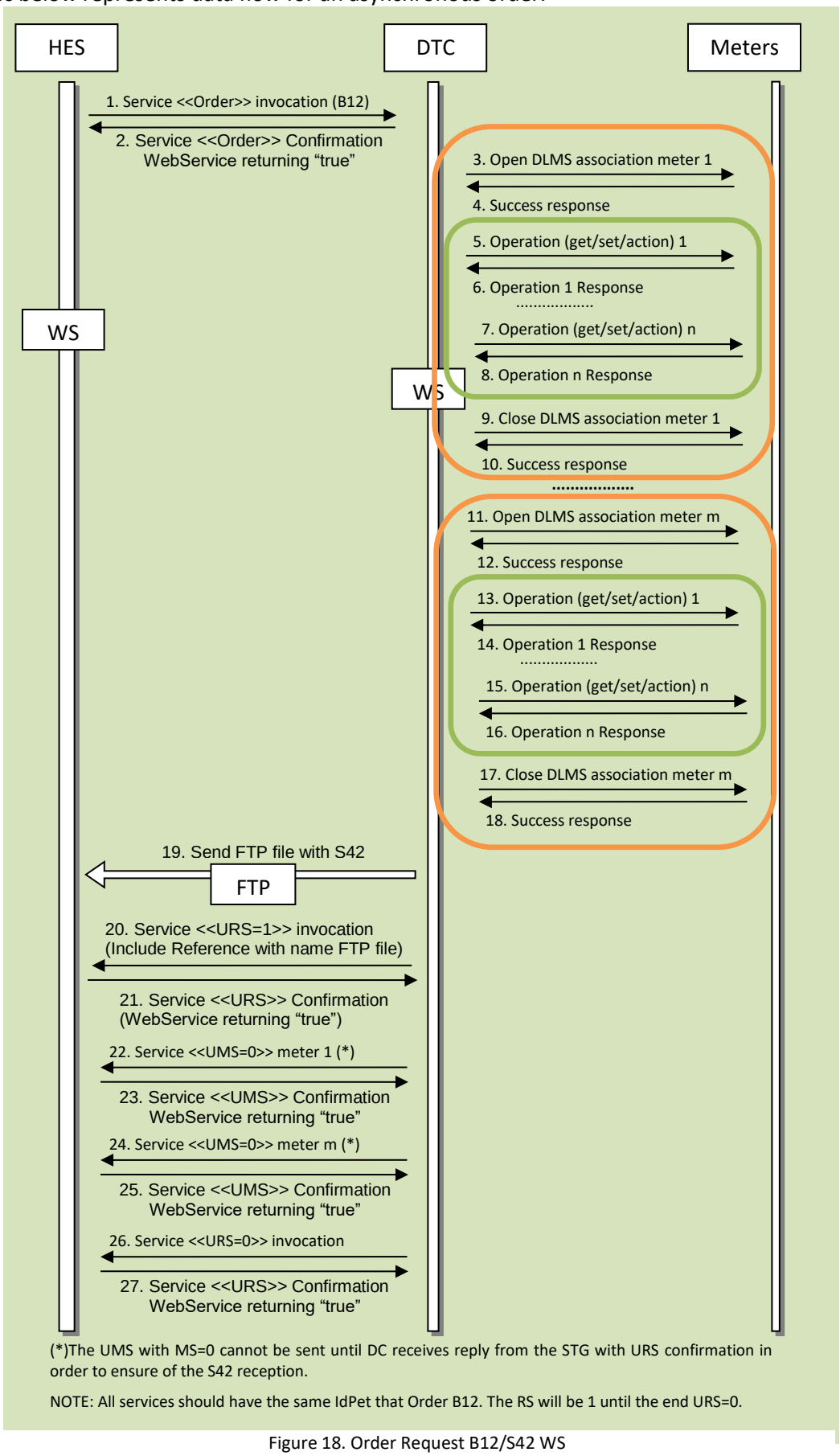


Figure 18. Order Request B12/S42 WS

16.1.19 Order Request. Example of interaction for a B28

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)
2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

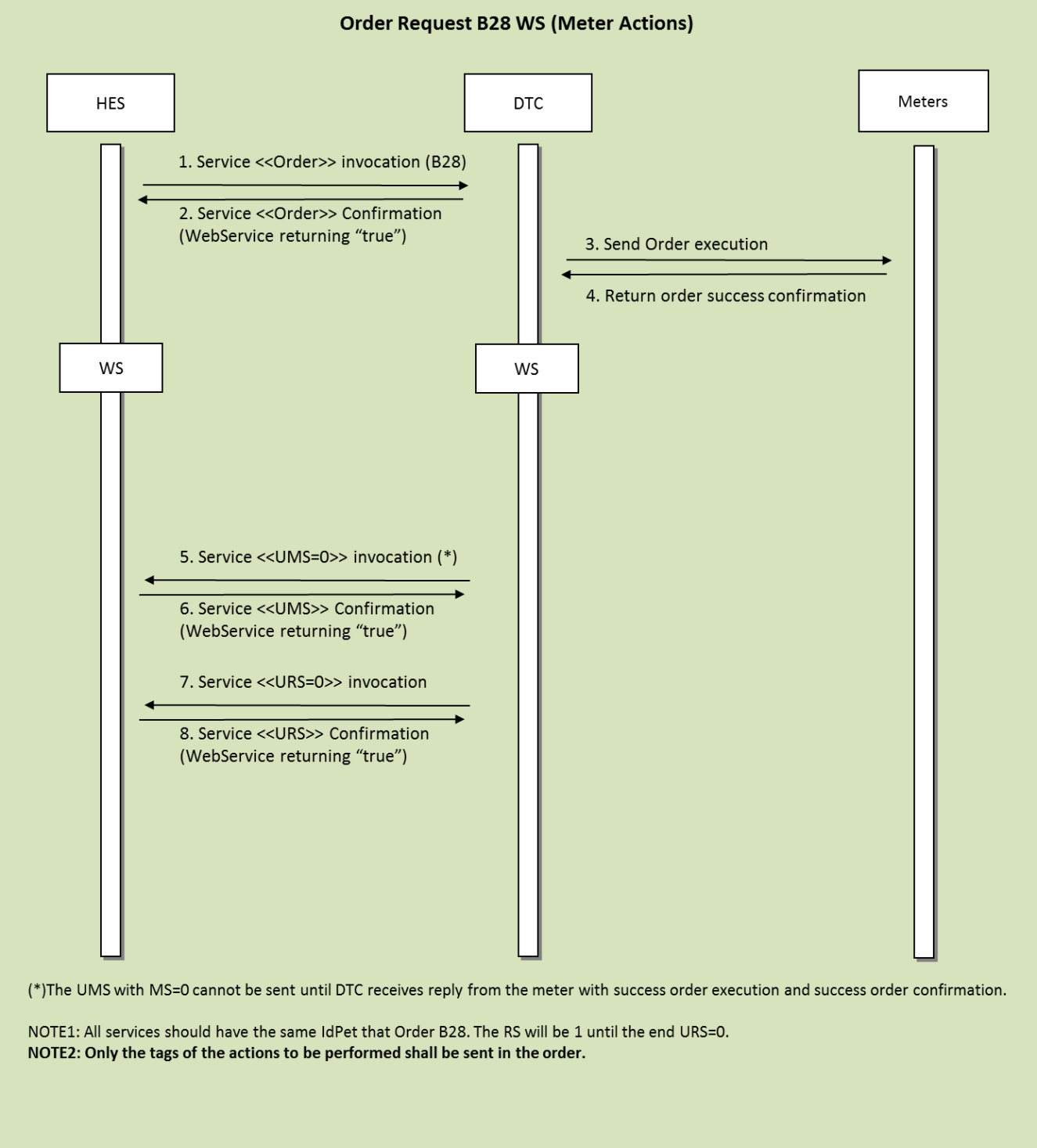
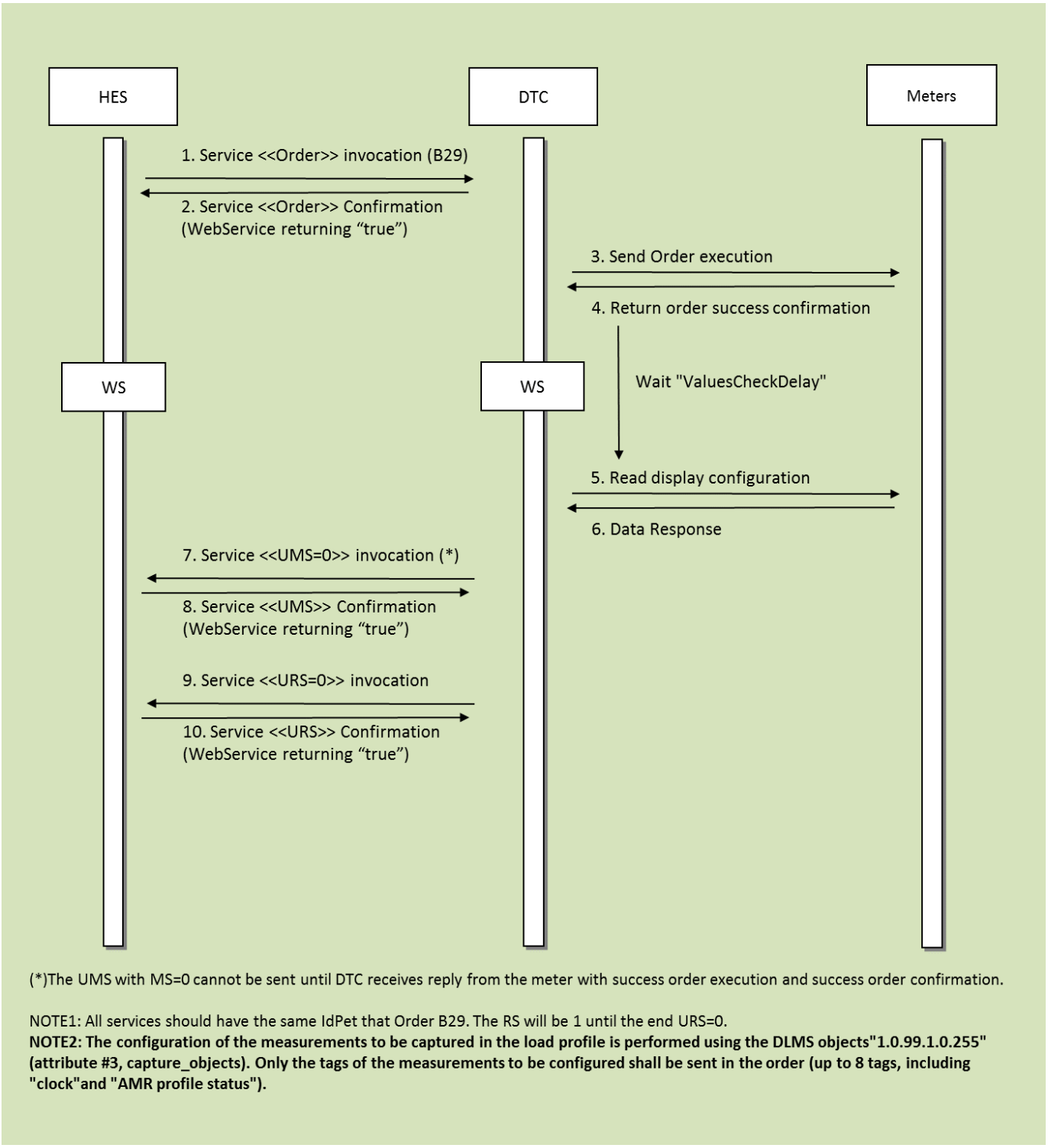


Figure 19. Order Request. Example of interaction for a B28

16.1.20 Order Request. Example of interaction for a B29

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)

2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)



(*)The UMS with MS=0 cannot be sent until DTC receives reply from the meter with success order execution and success order confirmation.

NOTE1: All services should have the same IdPet that Order B29. The RS will be 1 until the end URS=0.
NOTE2: The configuration of the measurements to be captured in the load profile is performed using the DLMS objects"1.0.99.1.0.255" (attribute #3, capture_objects). Only the tags of the measurements to be configured shall be sent in the order (up to 8 tags, including "clock"and "AMR profile status").

Figure 20. Order Request. Example of interaction for a B29

16.1.21 Order Request. Example of interaction for a B30

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)
1	3	6	Order execution rejected from DTC (e.g. because previous reports are not executed correctly)
2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

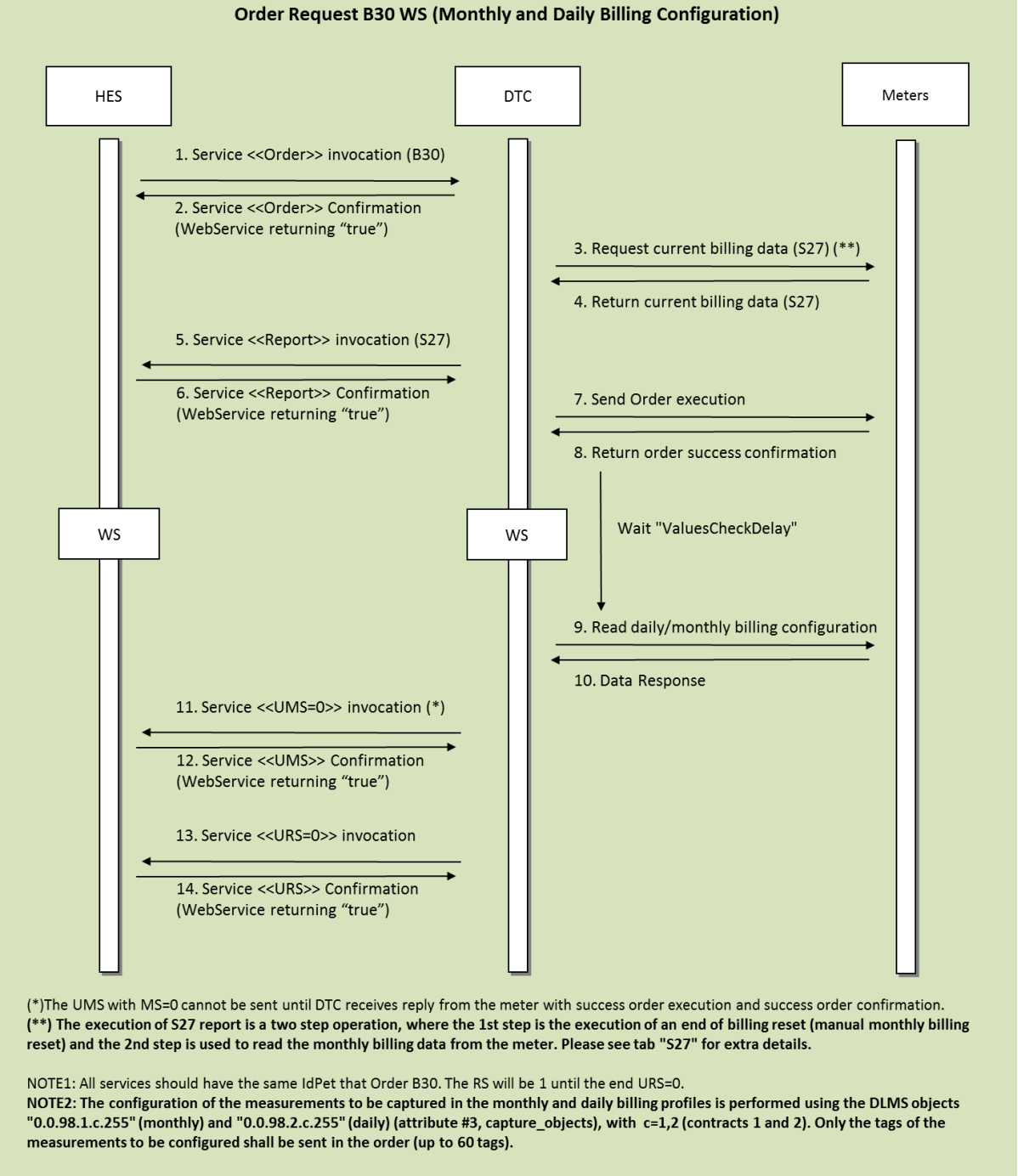


Figure 21. Order Request. Example of interaction for a B30

16.1.22 Order Request. Example of interaction for a B33

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)
2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

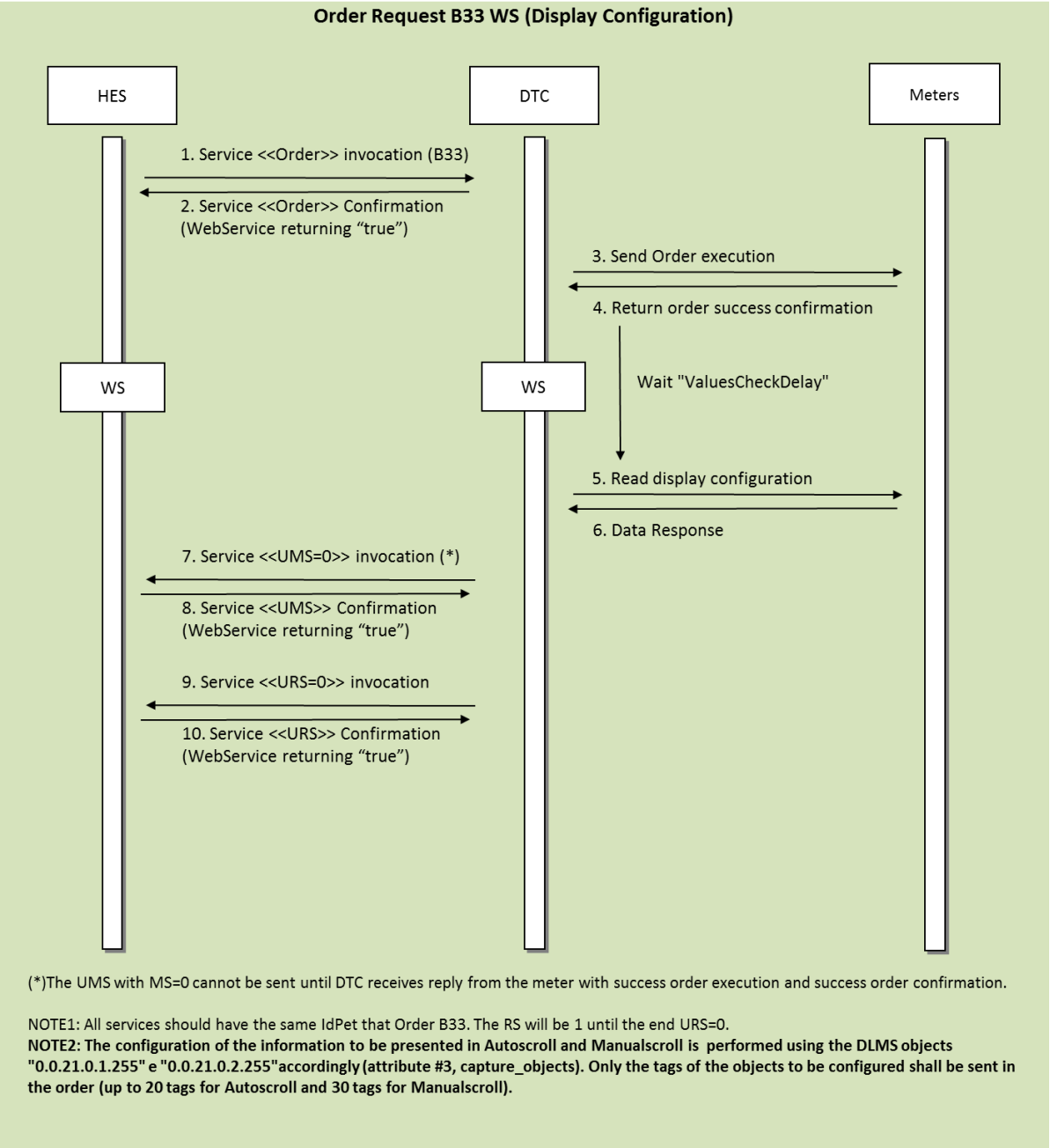


Figure 22. Order Request. Example of interaction for a B33

16.1.23 Order Request. Example of interaction for a B34

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)
2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

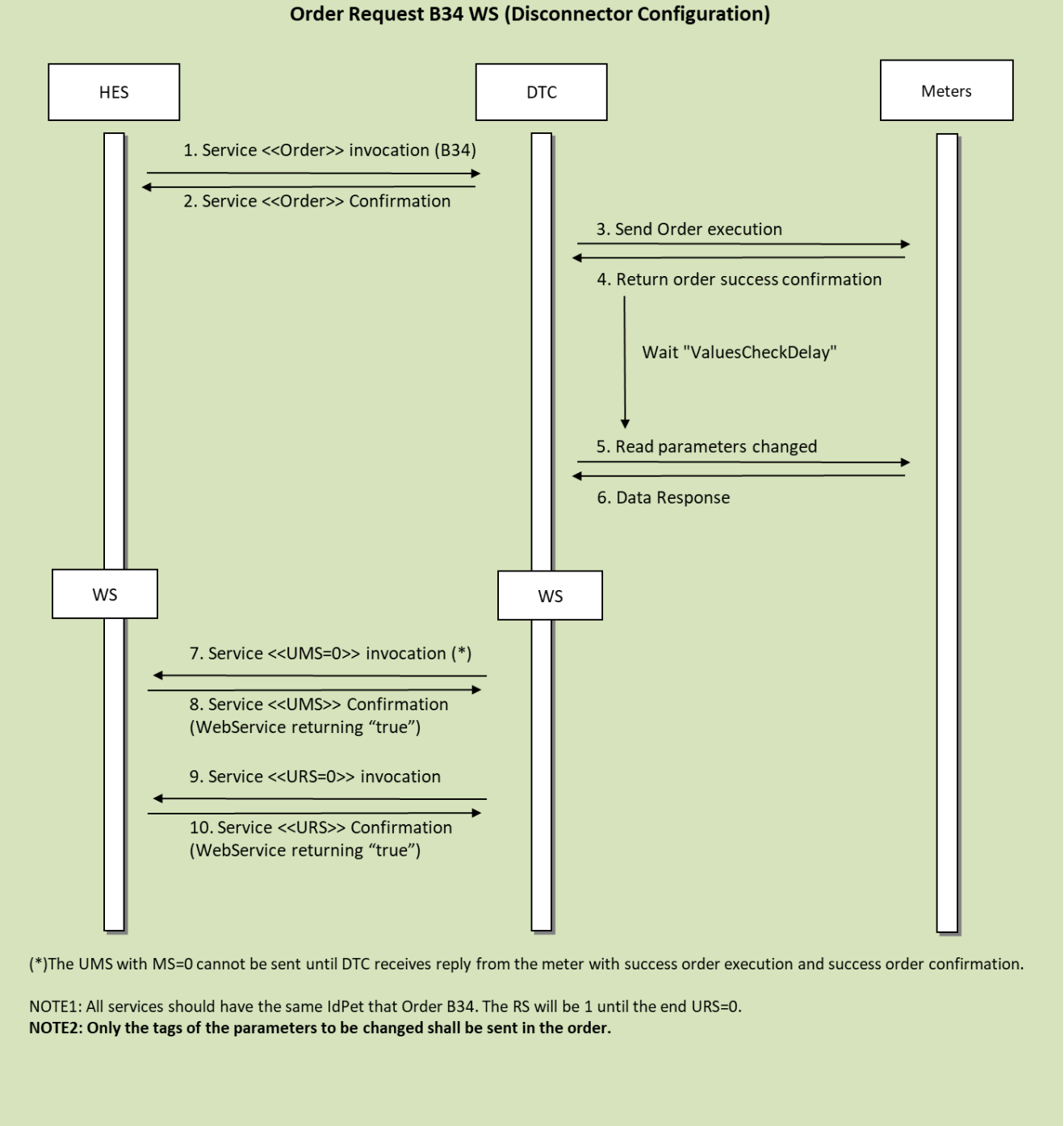


Figure 23. Order Request. Example of interaction for a B34

16.1.24 Order Request. Example of interaction for a B35

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)
2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

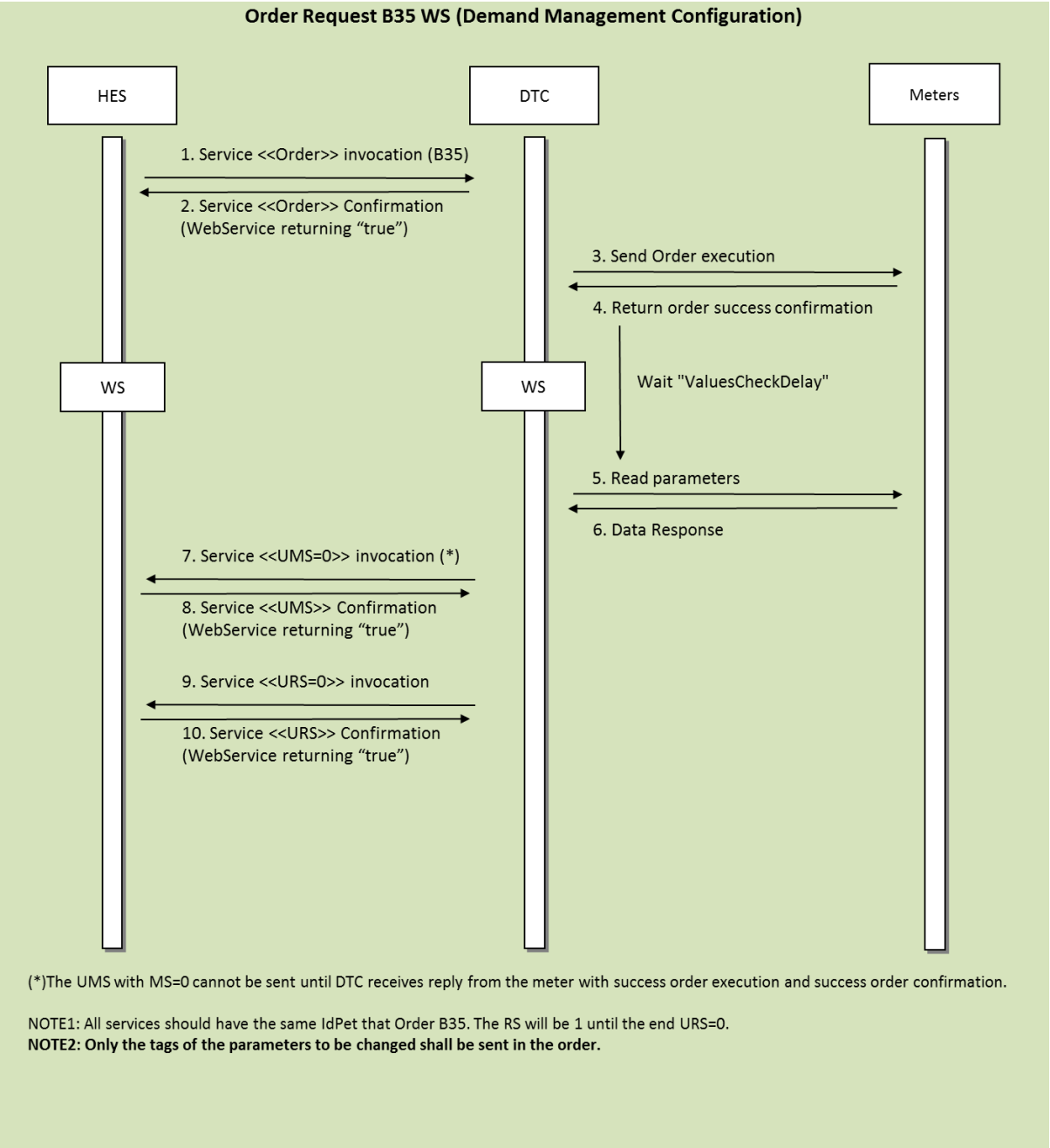


Figure 24. Order Request. Example of interaction for a B35

16.1.25 Order Request. Example of interaction for a B38

Order request with the purpose of adding new meters to the DTC database.

- The HES issues an “OrderRequest” to the DTC (step 1).
- The service result indicates the order has been taken in account (step 2).
- The DTC tries to communicate with the new meter(s) in order to validate the communication and the meter’s Id (3 and 4)
- New meters are only included in the DTC database following a successful validation (step 5)
- Once the order is complete for a meter, the DTC issues an “UpdateMeterStatus” in order to inform the HES of the completeness of this meter (step 6).
- Once the order is complete, the DTC issues an “UpdateRequestStatus” in order to inform the HES of the completeness of the complete order (step 8).

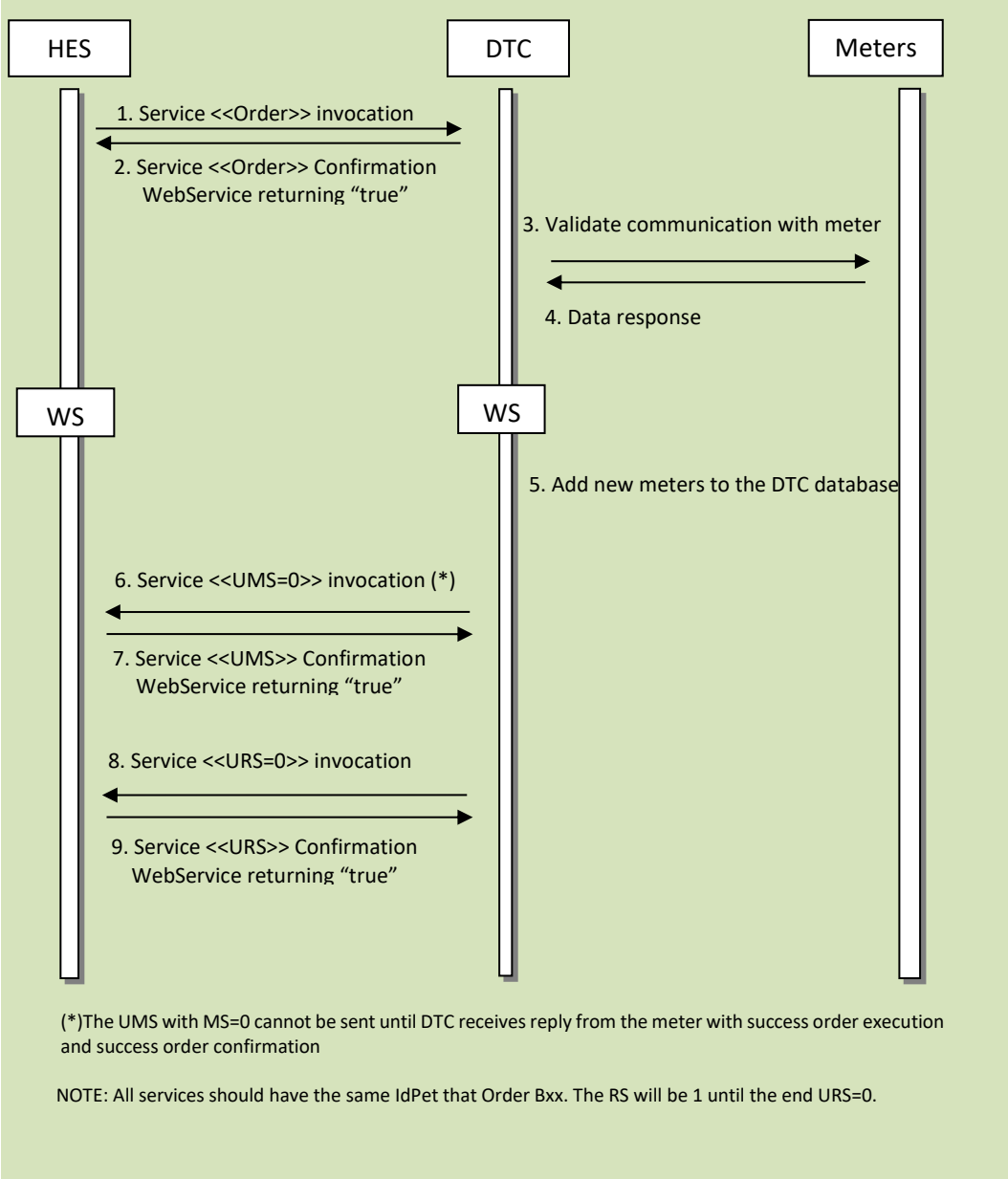


Figure 25. Order Request. Example of interaction for a B38

List of orders that shall be implemented according to this use case: B38

16.1.26 Order Request. Example of interaction for a B43

UMS Errors	ErrCat	ErrCode	Description
1	3	4	Order execution rejected from the meter (write)
1	3	5	Order execution accepted (write) but not confirmed (read)
2	Null	Null	Order has been executed but any after report is missing
3	3	4 or 5	Order partially applied (part of the data sent in the order were not correctly applied in the meter)

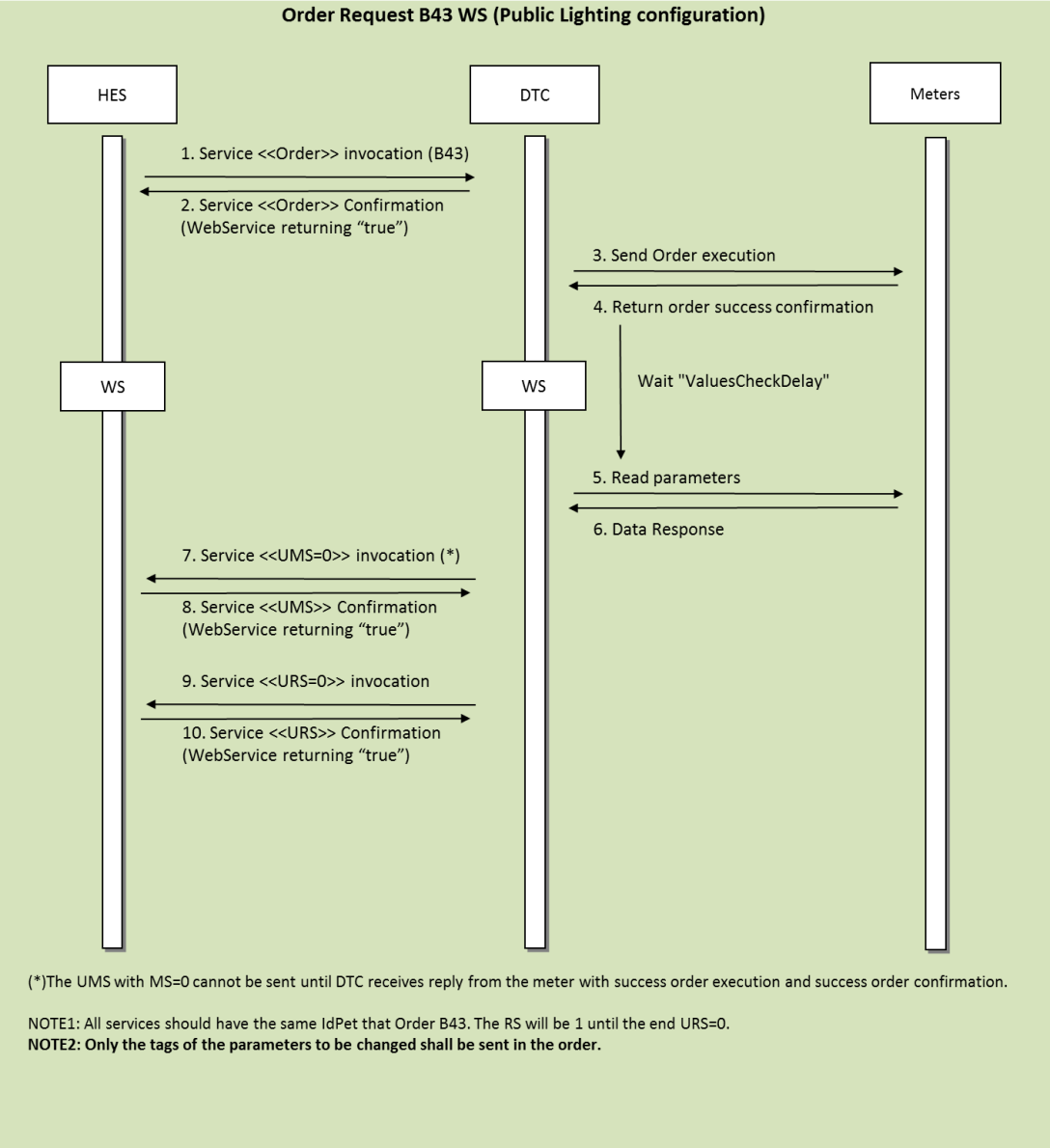


Figure 26. Order Request. Example of interaction for a B43

16.1.27 Synchronous Request. Example of interaction for a S27

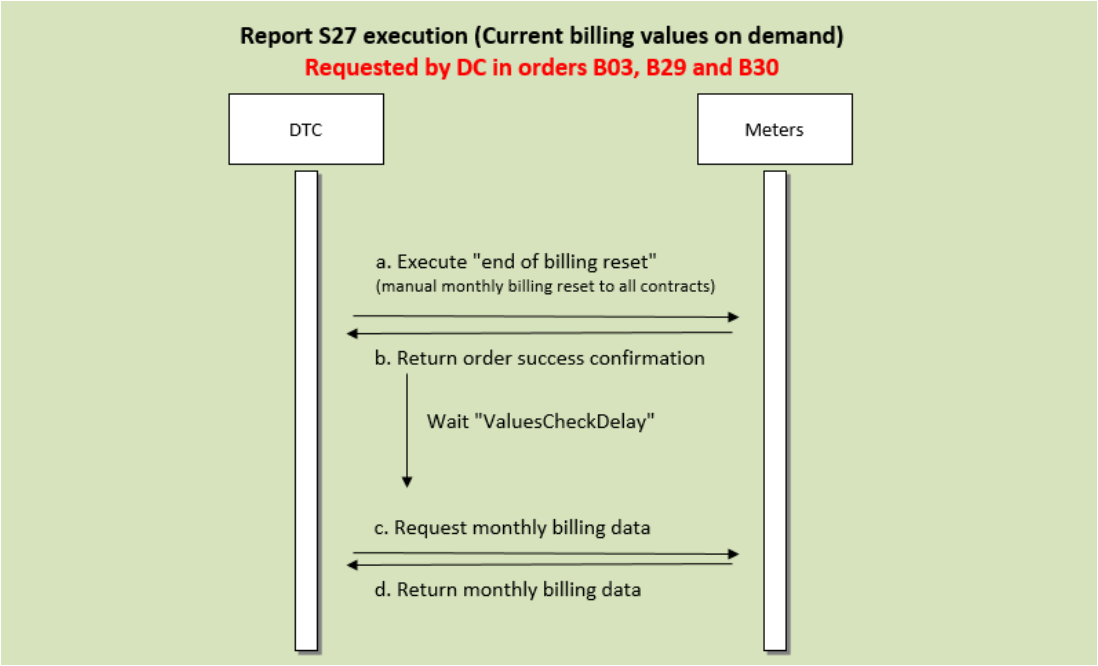


Figure 27. Synchronous Request. Example of interaction for a S27

The S27 report may be executed due to a synchronous report request from HES or through the workflow of orders B03, B29 and B30. When this report is part of an order request answer from the DTC (B03, B29 or B30), it will be uploaded asynchronous with WS-Report.

EDP Use case:
Current billing values objects (0.0.21.0.z.255, with z=11,12,13 (contracs 1,2,3)) are not available in EDP's companion, so for this purpose monthly billing data will be collected and interpreted as current billing data.
The execution of S27 report is a two step operation where the 1st step is the execution of an end of billing reset (manual monthly billing reset) and the 2nd step is used to read the monthly billing data from the meter.
Using this report "execution workflow" is a must to ensure that the meter has the "current" billing values available.

(1) The 1st step is to execute a monthly billing reset to all contracts, similarly as it's done in B28 order through tag "MBRst" = 7. At dlms level, this operation is done through **method #1 execute (7) of the DLMS object "0.0.10.0.1.255".**

(2) The 2nd step is to read the monthly billing data through **attribute #2 (buffer) of the DLMS object "0.0.98.1.1.255".** Only data related to **contract 1.**
Regarding the data collection, and in order to properly execute the S27 report, DTC shall always take into consideration the parameter "**DataCollectMode**" (S12/B07 report). Considering this parameter's value and the existance of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the monthly profile configuration is needed before the collection of the monthly billing data.
Please see section 8.20.3 for further details.

NOTE: Only existing tags should be returned in the report.

16.1.28 Asynchronous Request. Example of interaction for a S29

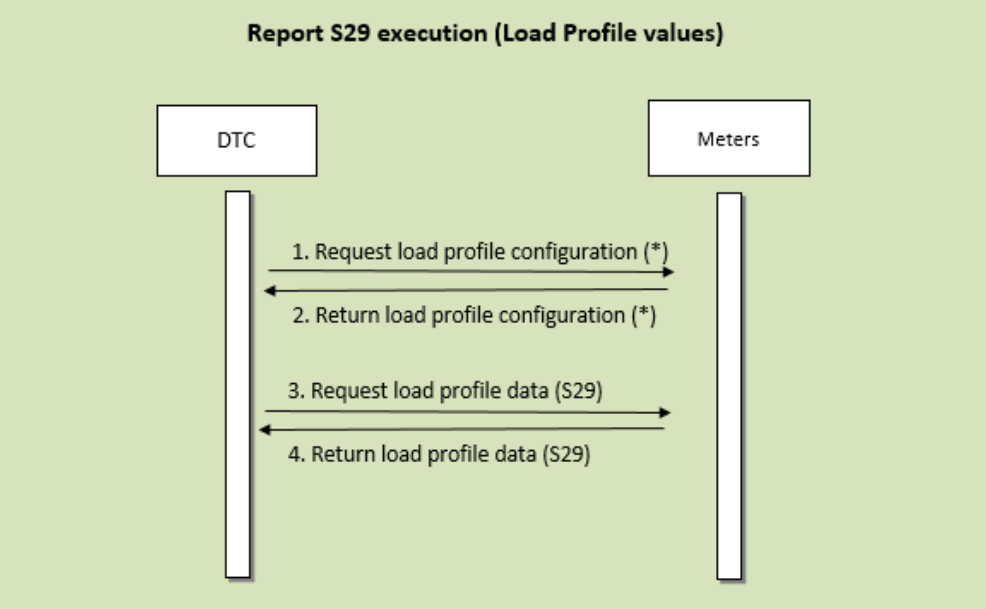


Figure 28. Asynchronous Request. Example of interaction for a S29

The S29 report may be executed due to an asynchronous report request or a scheduled task.
(*) This 1st step is only to be executed if needed. See below EDP Use Case.

EDP Use case
The load profile configuration of meters is not fixed (it's configurable).
In order to properly execute the S29 report, DTC shall always take into consideration the parameter "DataCollectMode" (S12/B07 report). Considering this parameter's value and the existance of valid information in its "configuration database" for the given meter(s), DTC will decide if reading the load profile configuration is needed before the collection of the load profile data.
Please see section 8.20.3 for further details.
Load profile data is always collected through attribute #2 (buffer) of the DLMS object "1.0.99.1.0.255".

NOTE: Only existing tags should be returned in the report.

16.1.29 Order Request. Example of interaction for a B31

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	7	Meter MK Update Fail
3	3	12	Meter Security activate method fails.
3	3	13	Meter LLS_{GEN} Update Fail
3	3	14	Meter $GUEK_{GEN}$ Update Fail
3	3	15	Meter GAK_{GEN} Update Fail
3	3	16	Meter LLS_{BRO} Update Fail
3	3	17	Meter $GUEK_{BRO}$ Update Fail
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.

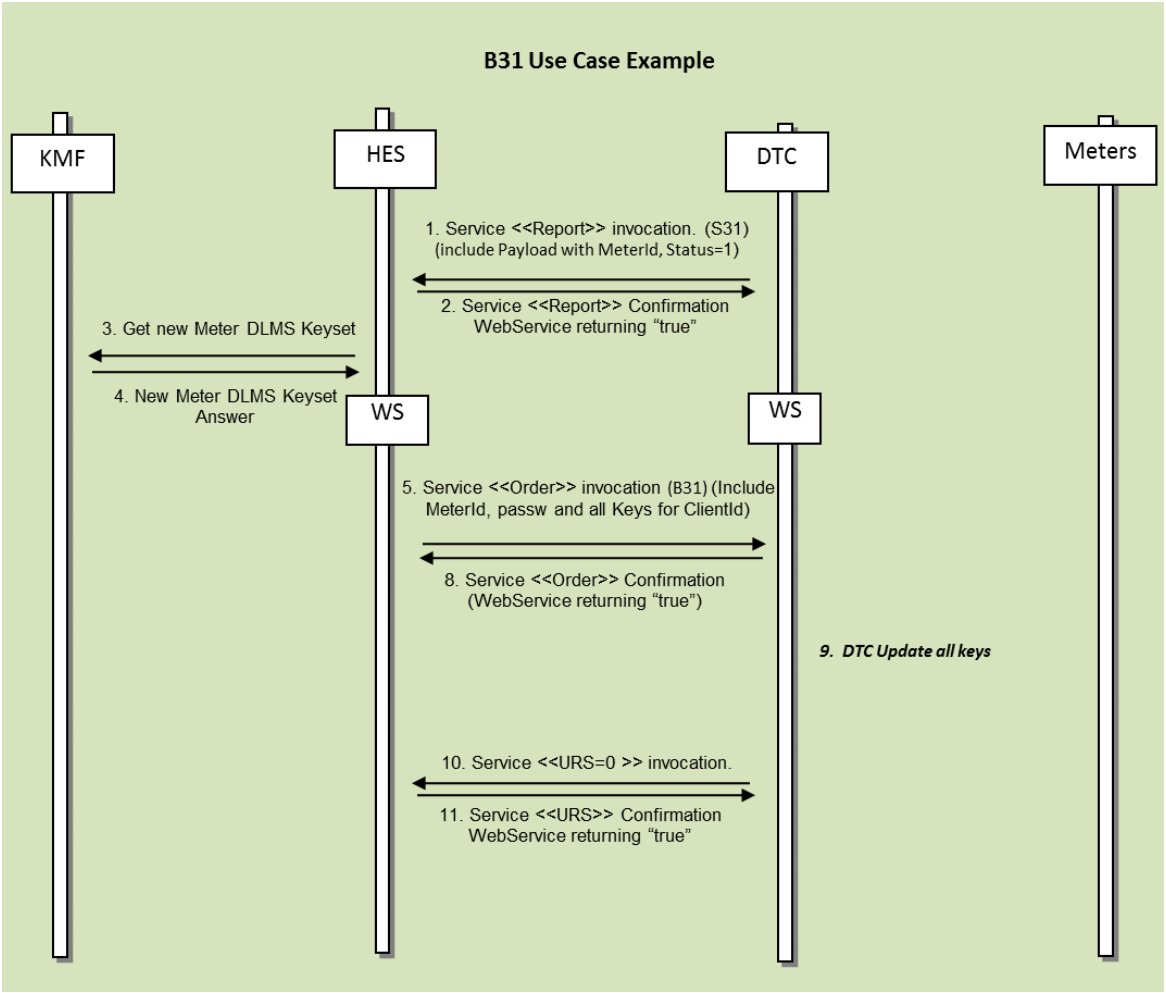


Figure 29. Order Request. Example of interaction for a B31

16.1.30 Order Request. Example of interaction for a B32

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	7	Meter MK Update Fail
3	3	12	Meter Security activate method fails.
3	3	13	Meter LLS_{GEN} Update Fail
3	3	14	Meter $GUEK_{GEN}$ Update Fail
3	3	15	Meter GAK_{GEN} Update Fail
3	3	16	Meter LLS_{BRO} Update Fail
3	3	17	Meter $GUEK_{BRO}$ Update Fail
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.

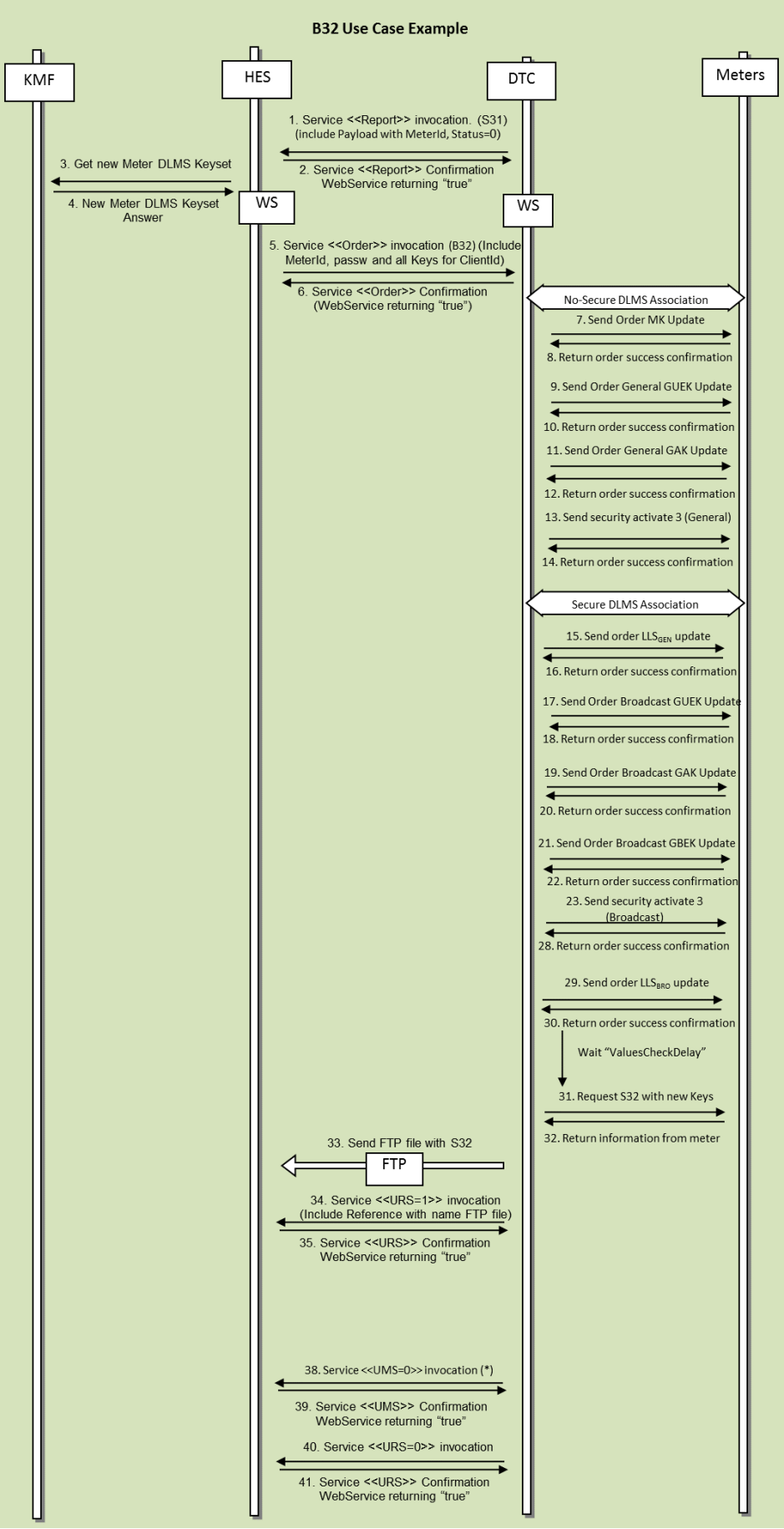


Figure 30. Order Request. Example of interaction for a B32

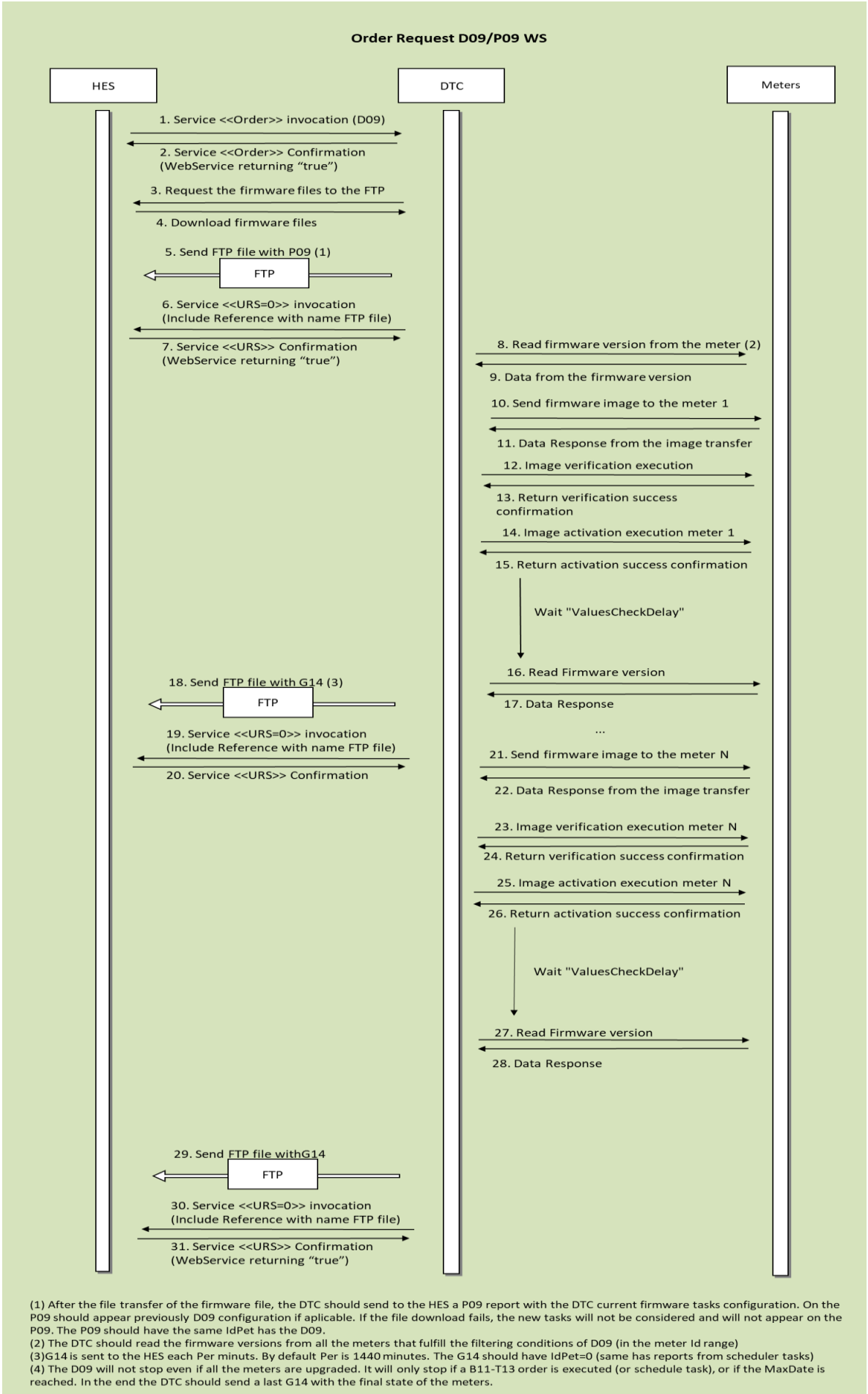
16.1.31 Order Request. Example of interaction for a D09

Upon receiving a D09 order the DTC will try to collect the firmware files from the FTP server. The new rules for the firmware upgrades are created and the P09 is sent to the HES with the current configuration. Please note that P09 should have all the information stored on DTC database, not only related to the last D09.

If a D09 is sent with the “CntRngId” parameter value equal to one previously sent, then the DTC should overwrite the previous “CntRngId” value with the new configuration. The same apply to the PerID from the exclusion period configuration. Please note that the exclusion periods and meter ranges can be deleted through D09, using RemoveR.

All P09 configuration can be deleted through B11-T13 or schedule task T13.

Periodicaly, every “Per” minutes (configured through D09), the DTC should send G14 to the HES with the status of the meter upgrades.



(1) After the file transfer of the firmware file, the DTC should send to the HES a P09 report with the DTC current firmware tasks configuration. On the P09 should appear previously D09 configuration if aplicable. If the file download fails, the new tasks will not be considered and will not appear on the P09. The P09 should have the same IdPet has the D09.
(2) The DTC should read the firmware versions from all the meters that fulfill the filtering conditions of D09 (in the meter Id range)
(3)G14 is sent to the HES each Per minuts. By default Per is 1440 minutes. The G14 should have IdPet=0 (same has reports from scheduler tasks)
(4) The D09 will not stop even if all the meters are upgraded. It will only stop if a B11-T13 order is executed (or schedule task), or if the MaxDate is reached. In the end the DTC should send a last G14 with the final state of the meters.

Figure 31. Order Request. Example of interaction for a D09

16.1.32 Order Request. Example of interaction for a D10

D10 is an order to configure gateways communication interfaces on the DTC. It is possible to configure up to 10 gateways on the same DTC using this order. After the D10 execution the DTC will return a P10 with the current configuration. P10 can also be requested has an asynchronous request from the HES.

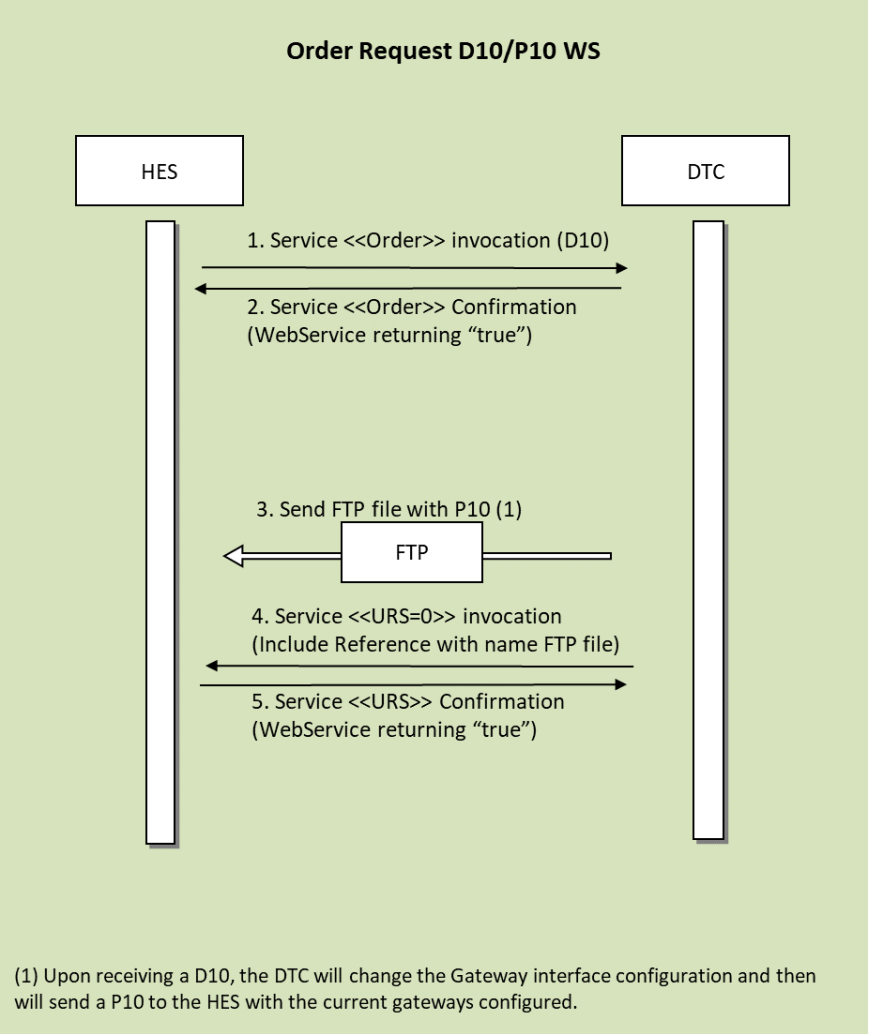


Figure 32. Order Request. Example of interaction for a D10

16.2. Reports request (Synchronous)

Report request corresponds to the following sequence:
The HES sends a SynchReportRequest sending to the DTC a “Request” method, and the report content is sent back to the DTC within the result of the service invocation.
This request can be sent to several meters in a single request as specified in the method. The priority is given in the priority parameter at the invocation.
The DTC should be able to handle simultaneously different synchronous and asynchronous requests, each of them being managed with its given priority.

The type of service to use for each message is specified in the “Report Index” **Annex D**.

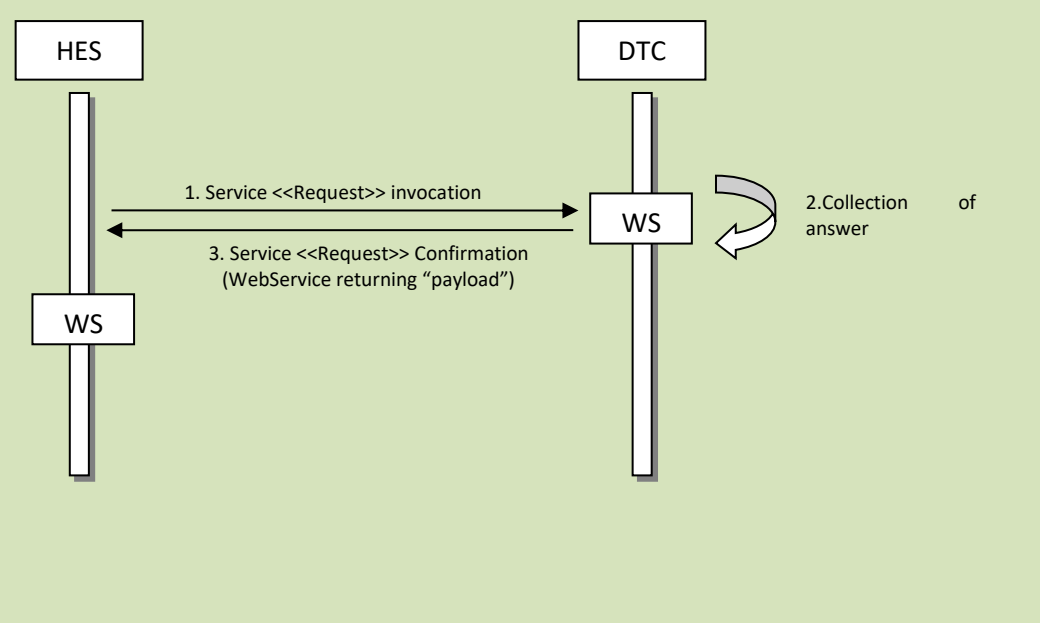


Figure 33. Syncronous WS

16.3. Schedule Tasks data collection

16.3.1. Use case

Heavy data collection consists in the transmission to the HES of data collected in meters by the DTC, according to its planned tasks or according to non-immediate requests as defined in “Report Index” **Annex D**.

16.3.2. General Workflow

The collected data will be sent by the DTC to the HES using the FTP protocol, and the request status will be updated accordingly.
If the report is only a part of the data, the request status will be updated as “in progress”, otherwise if it is the last – or only – part of the data the request status will be updated to “Complete”.

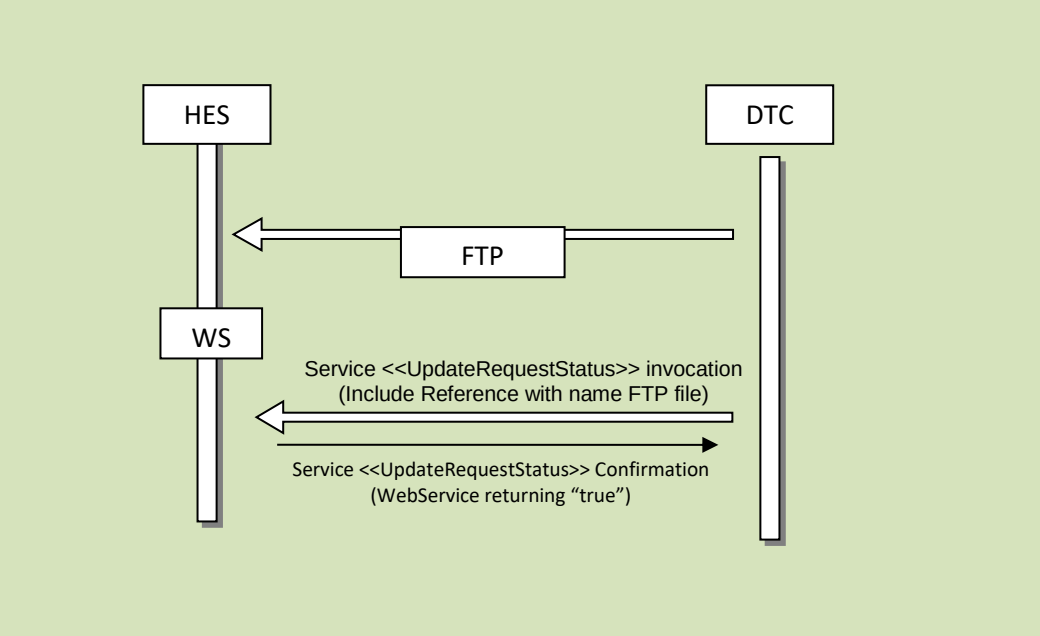


Figure 34. FTP Report delivery by DTC

16.3.3. Example Sending Scheduled task S05

In the next example we can see the messages exchange between DTC and HES for sending scheduled task S05 programmed in the DTC for all meters. The collected data will be sent by the DTC to the HES using the FTP protocol according to Annex D.
This example show the case all information have to be sent in 3 different FTP files because NumMeters or TimeSendReq is reached.

```
<TP TpTar=”1” TpPrio=”2” TpHi=”20190101001000000W” TpPer=”00000001000000” TpMet=”” TpCompl=”N”>
<TpPro TpReq=”S05” TpSend=”Y” TpStore=”Y”>
        <TpAttr/>
</TpPro>
</TP>
```

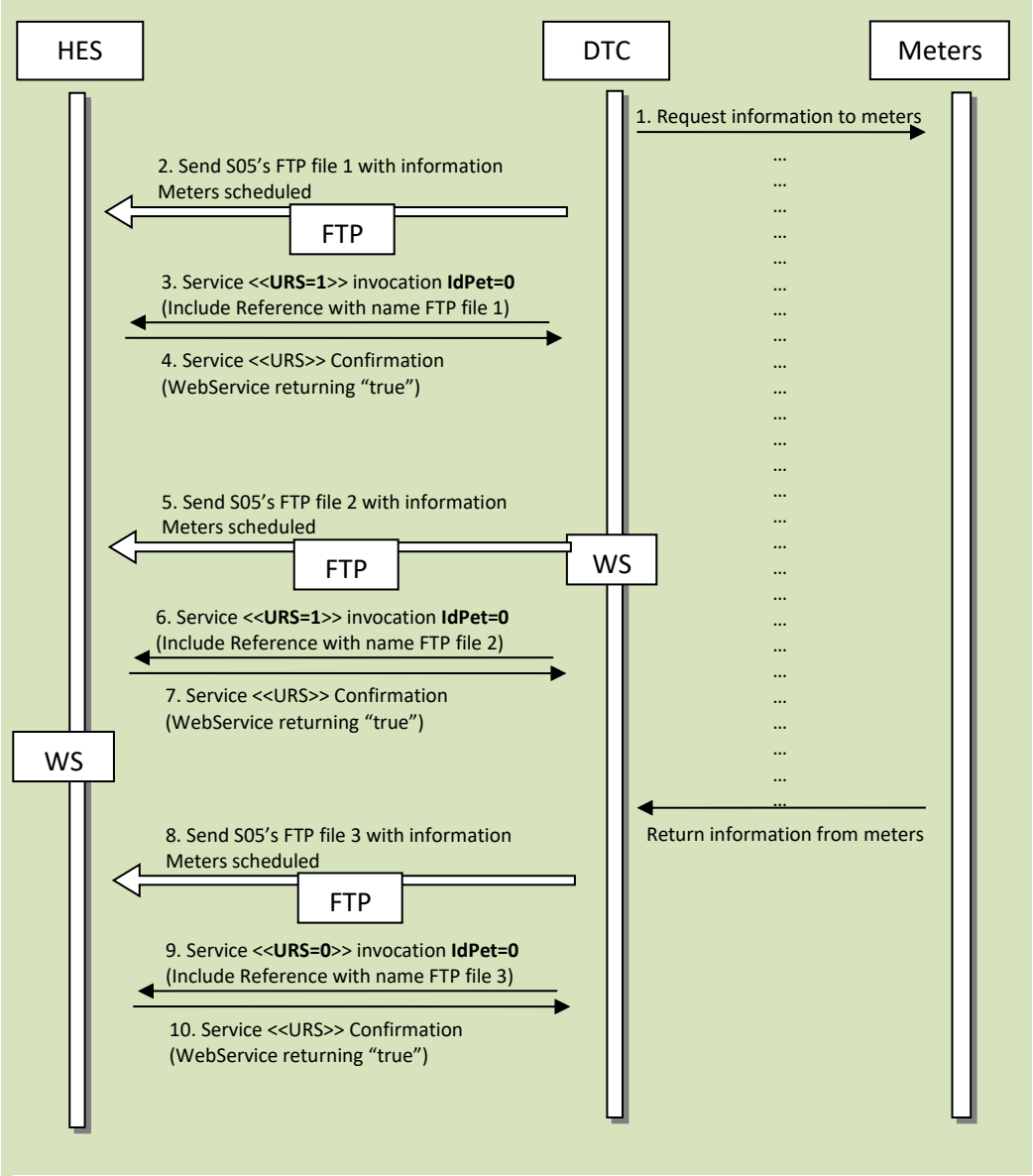


Figure 35. FTP Report delivery by DTC in Scheduled Task.

If for some reason the DTC is not able to finish a task execution, for example it a B11-T02 is lauched from the HES, the DTC should send the available information from the meters to the FTP and report to the HES that the task has been stoped. Basicaly, it should send a URS=1 with the file name of the missing information and them a URS=9.

16.3.4. File name

FTP file name for a message has to be a combination of:

- DTC Identification (13 digits)
- Request Identification (Hexadecimal form) or 0 (zero) if the report does not correspond to a request (Daily push)
- The report code, when applies, otherwise XXX (3 digits)
- The format as defined for payload formats
- Timestamp (in order to prevent name collision when a DTC pushes several messages for the same request or in case the DTC pushes a message multiple times (in case of problems)

E.g. 9990101010101_4B3_S01_0_20100302015533 stands for:

- DTC identifier “9990101010101”
- Request ID #4B3h
- Report included S01
- Uncompressed XML content
- Timestamped 02/03/2010 01:55:33

E.g. for a programmed S05 report : “9990101010101_0_S05_0_20100302015533” ((no request ID).

The message content has to be conforming to XML Sxx Report message definition.

16.4. Events

16.4.1. Use case

Events consist in messages payload generated and sent by the DTC when an event occurs internally int the DTC or is sent by a meter to the DTC.

All DTC events are listed on ANNEX E.

16.4.2. General workflow

Events are sent by the DTC using the Report HES WebService:

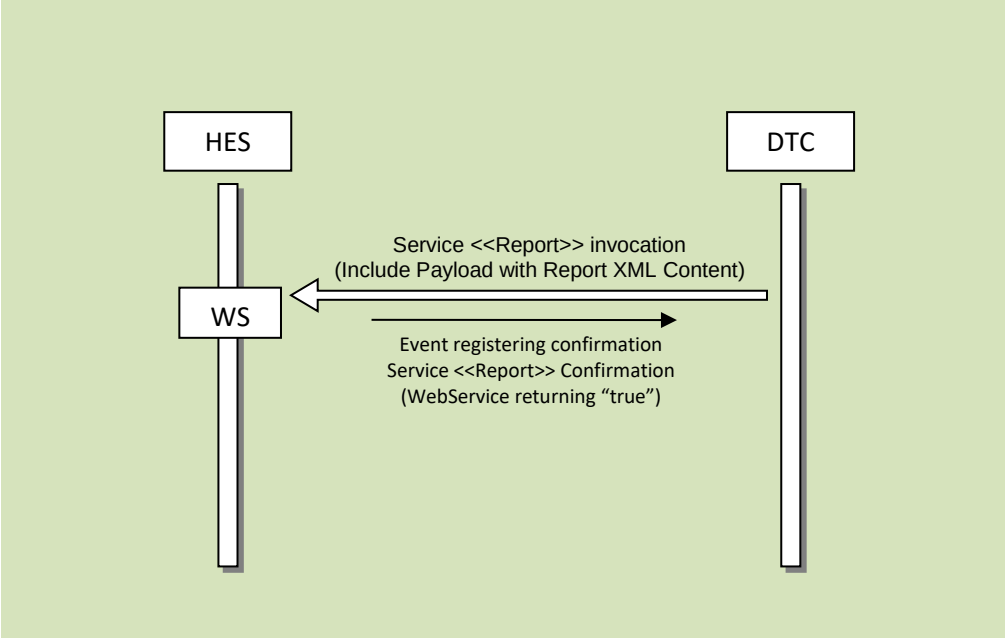


Figure 36. Spontaneous WS from DC

16.4.3. Protocol specification

The event use the "Report" method of HES exposed services, with:

- Idpet set to "0" to indicate the report is unsolicited (thus corresponds to an event)
- ReqStatus has no meaning
- Payload consists in one of following report :
    - Meter events
        - S13 – Meter spontaneous event
    - DTC events
        - S15 – DTC spontaneous event

The service Boolean return value indicates:

- "true" if the report was correctly registered by the HES, so that the DTC has no need to keep track of it
- "false" if the event was not correctly registered by the HES.

In case of event registration failure, or in case in failure in the invocation of the WebService, the DTC will try to resend the event until it is successfully registered by the HES or the maximum number of retries is reached.
The retry frequency and the maximum number of retries to do are part of DTC parameters.

16.5. Firmware upgrades

16.5.1. Use case

The firmware upgrade is basically the same as any other order.

16.5.2. General Workflow

Firmware upgrade is made after the DTC is instructed by the HES to proceed to the update, as an order:

16.5.3. Meter Firmware update [B05] [S19]

The firmware upgrade process use the "Order" method of DTC. First the HES will send a WS order to the DTC notifying the need for meter firmware update with:

- Idpet set to the appropriate value
- MeterStatus sent with UMS is to be set to "Done" for each meter included in the request to be upgraded for the DTC.
- ReqStatus is to be set to "Done" the request, before the last meter to be upgraded for the DTC.
- DTC must send following reports to deliver the necessary information to the HES :
  - S19 – Meter Firmware applied

The schematic below represents data flow for a Meter Firmware Update order:

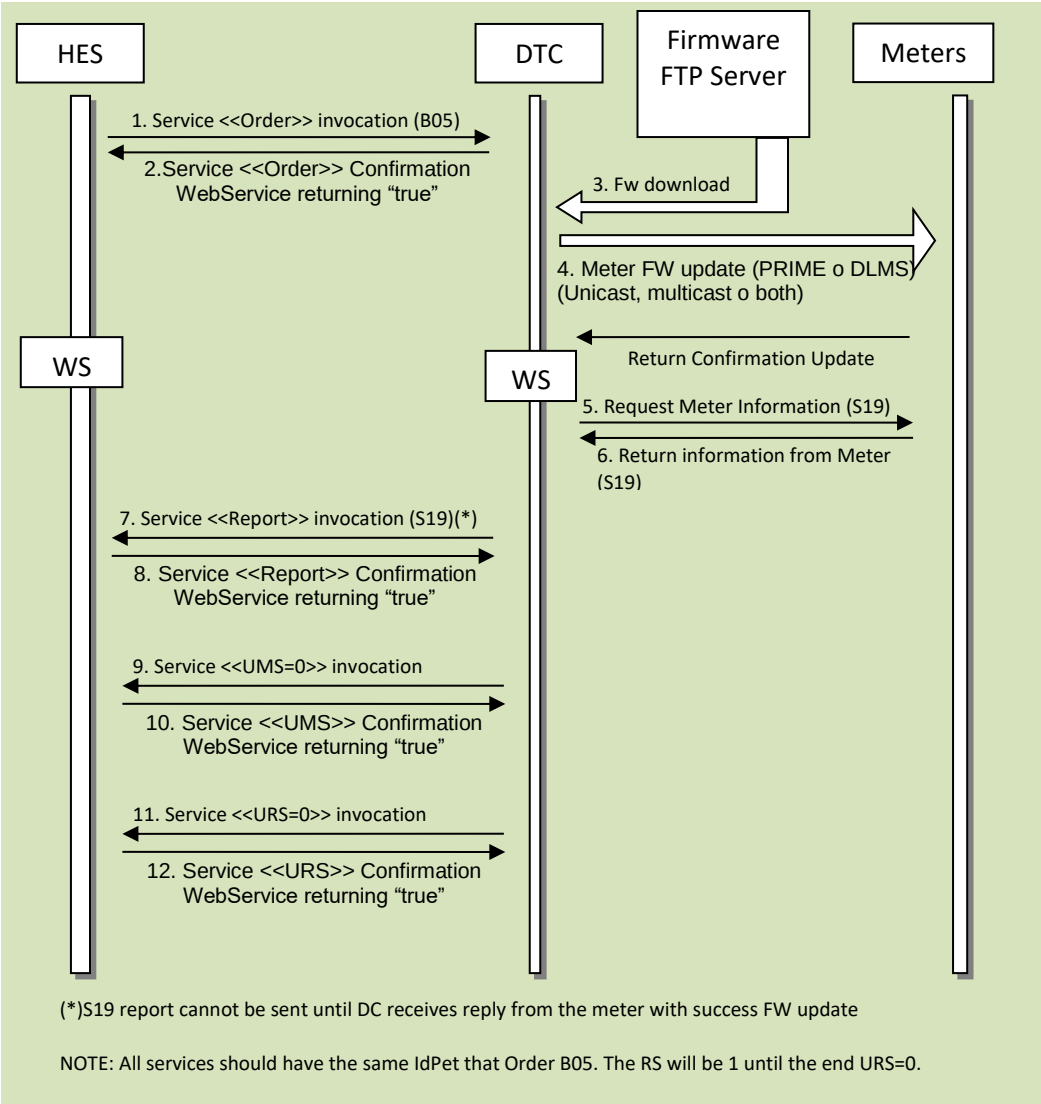


Figure 37. Meter Firmware Update

In case of problem to access the Firmware ftp server the DTC has to make retries accordingly to its configuration parameters.

16.5.4. Meter Firmware update task

One alternative to the B05 order, which is triggered by the HES with immediate execution, is the firmware upgrade task, in which the HES sets the rules to perform the meter upgrades. Please check section 9 9.16 and the functional specification (DEF-C98-405) for more detail.

16.5.5. DTC Firmware Update [B08] [S22]

The firmware upgrade process use the "Order" method of DTC. First the HES will send a WS order to the DTC notifying the need for DTC firmware update, DTC download de FW and start the upgrade process. Remarks:

- Idpet set to the appropriate value
- ReqStatus is to be set to "Done" the DTC to be upgraded in the request..
- DTC must send following reports to deliver the necessary information to the HES :
    - S22 – DTC Firmware Update confirmation.
    - S12 – DTC Parameters.

In case of problem to access the Firmware ftp server the DTC has to make retries accordingly to its configuration parameters.
The schematic below represents data flow for a Meter Firmware Update order:

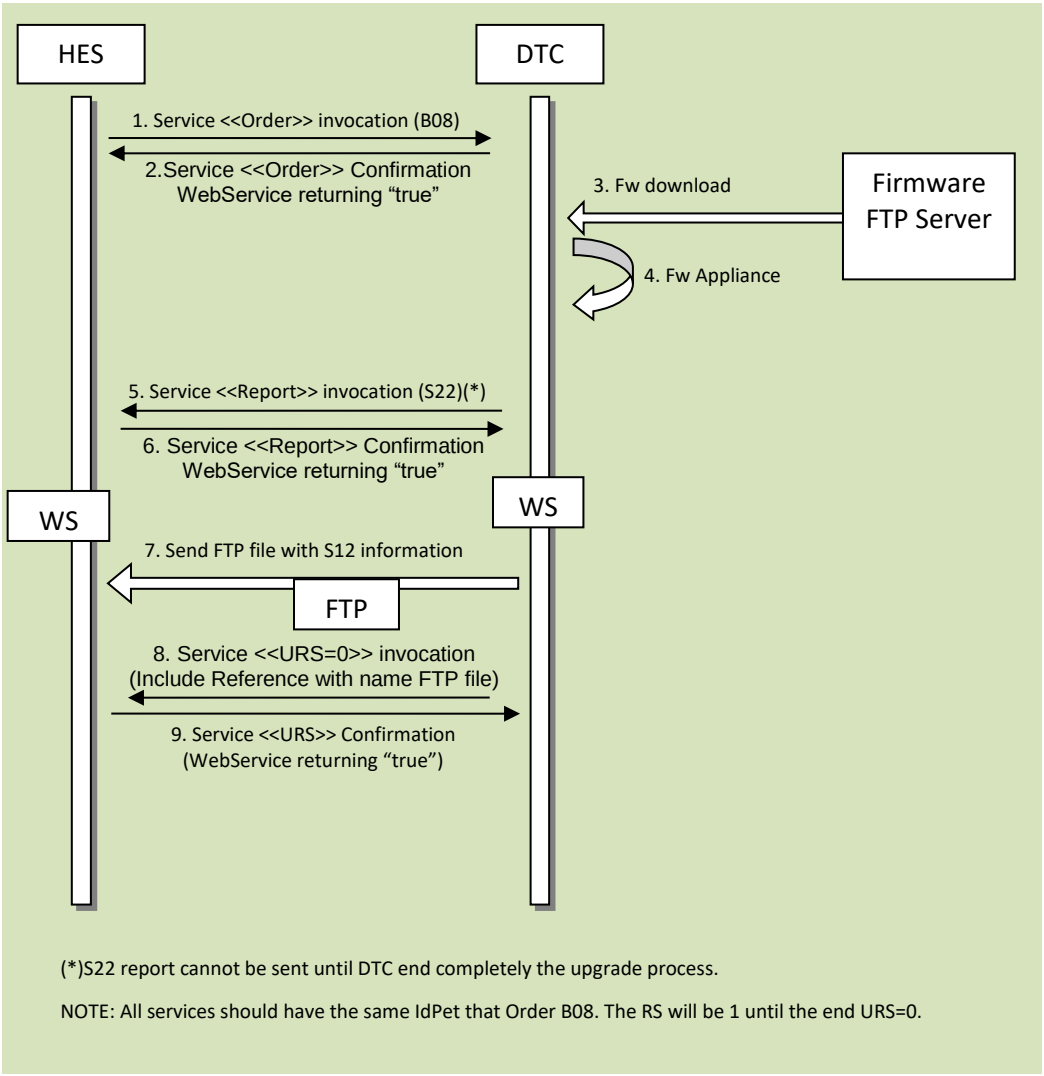


Figure 38. DTC Firmware Update

16.6. Security

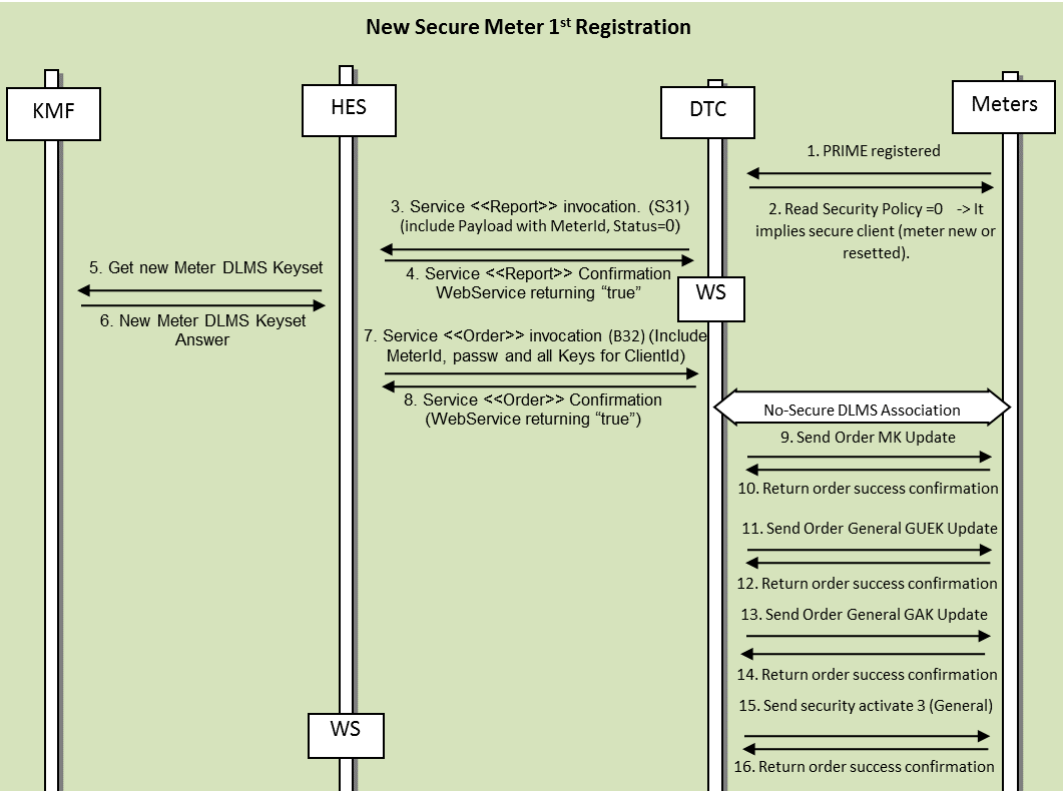
This chapter intended to reflect diverse casuistic concerning secure access to meters.

16.6.1. New Secure Meter registers in DTC the first time

In this section is described the workflow for the new secure meter registration on the DTC. Please find all detailed information about this on EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	4	Order execution rejected from the meter (write).
3	3	5	Order execution accepted (write) but not confirmed (read).
3	3	12	Meter Security activate method fails.
3	3	13	Meter LLS_{GEN} Update Fail
3	3	14	Meter $GUEK_{GEN}$ Update Fail
3	3	15	Meter GAK_{GEN} Update Fail
3	3	16	Meter LLS_{BRO} Update Fail
3	3	17	Meter $GUEK_{BRO}$ Update Fail
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.



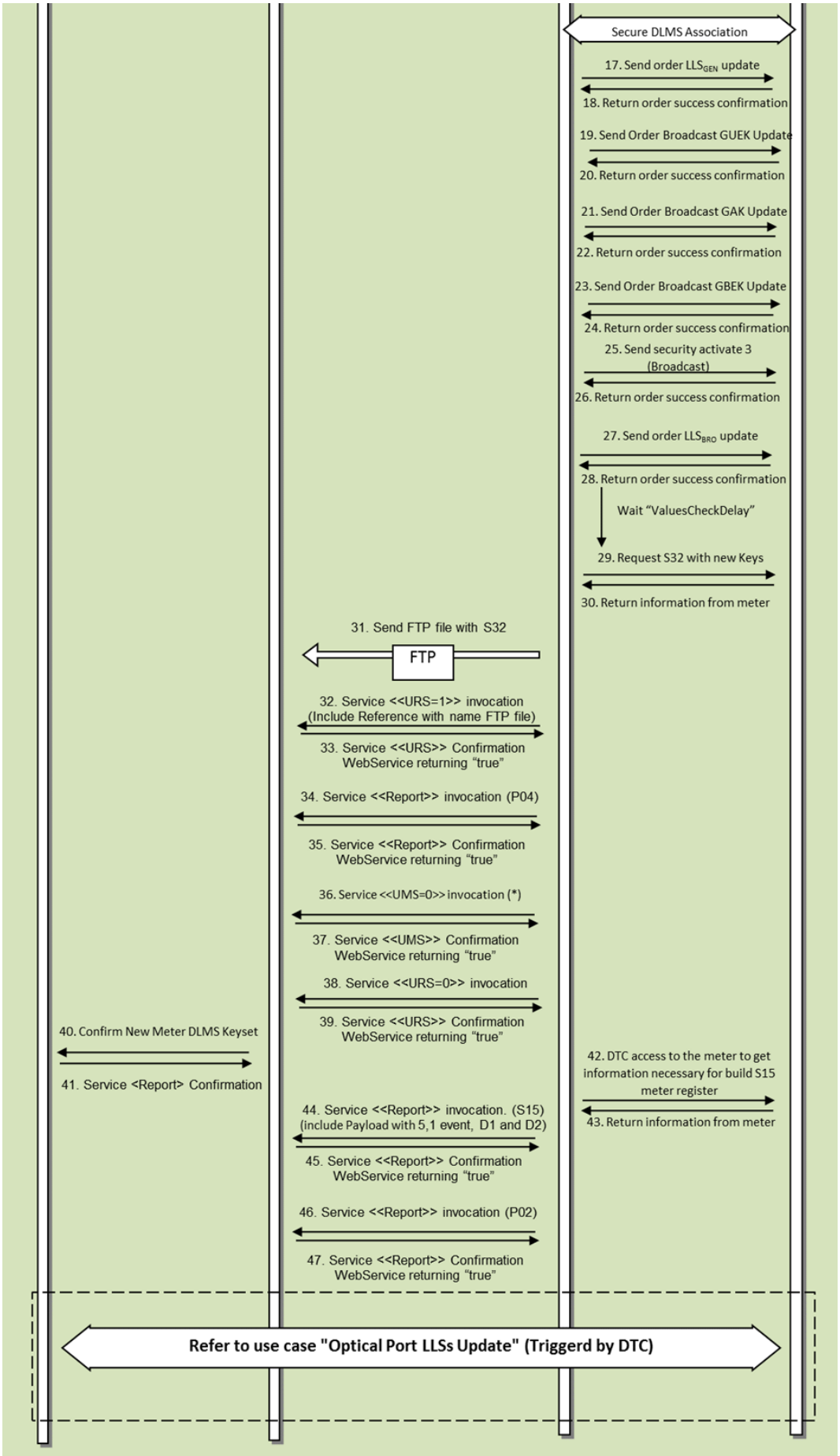


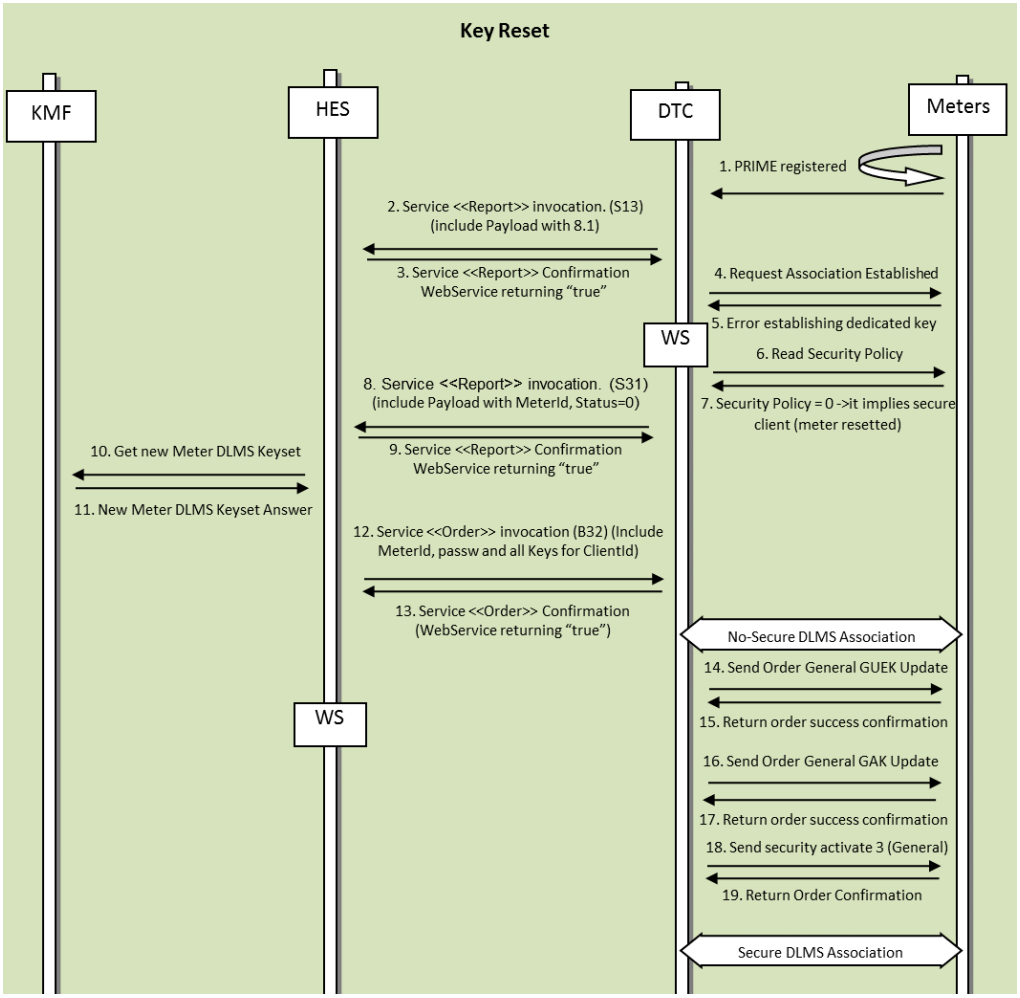
Figure 39. Registering Secure Meter Security Policy 0.

16.6.2. New Secure Meter registers in DTC after key reset

After the key reset the meter will generate a spontaneous evento that will allow the DTC to detect that the meter has been reseted. In this case the DTC should perform the meter initialization. Please find all detailed information about this on EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	4	Order execution rejected from the meter (write).
3	3	5	Order execution accepted (write) but not confirmed (read).
3	3	12	Meter Security activate method fails.
3	3	13	Meter LLS_{GEN} Update Fail
3	3	14	Meter $GUEK_{GEN}$ Update Fail
3	3	15	Meter GAK_{GEN} Update Fail
3	3	16	Meter LLS_{BRO} Update Fail
3	3	17	Meter $GUEK_{BRO}$ Update Fail
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	null	Null	Order has been executed but any after report is missing.



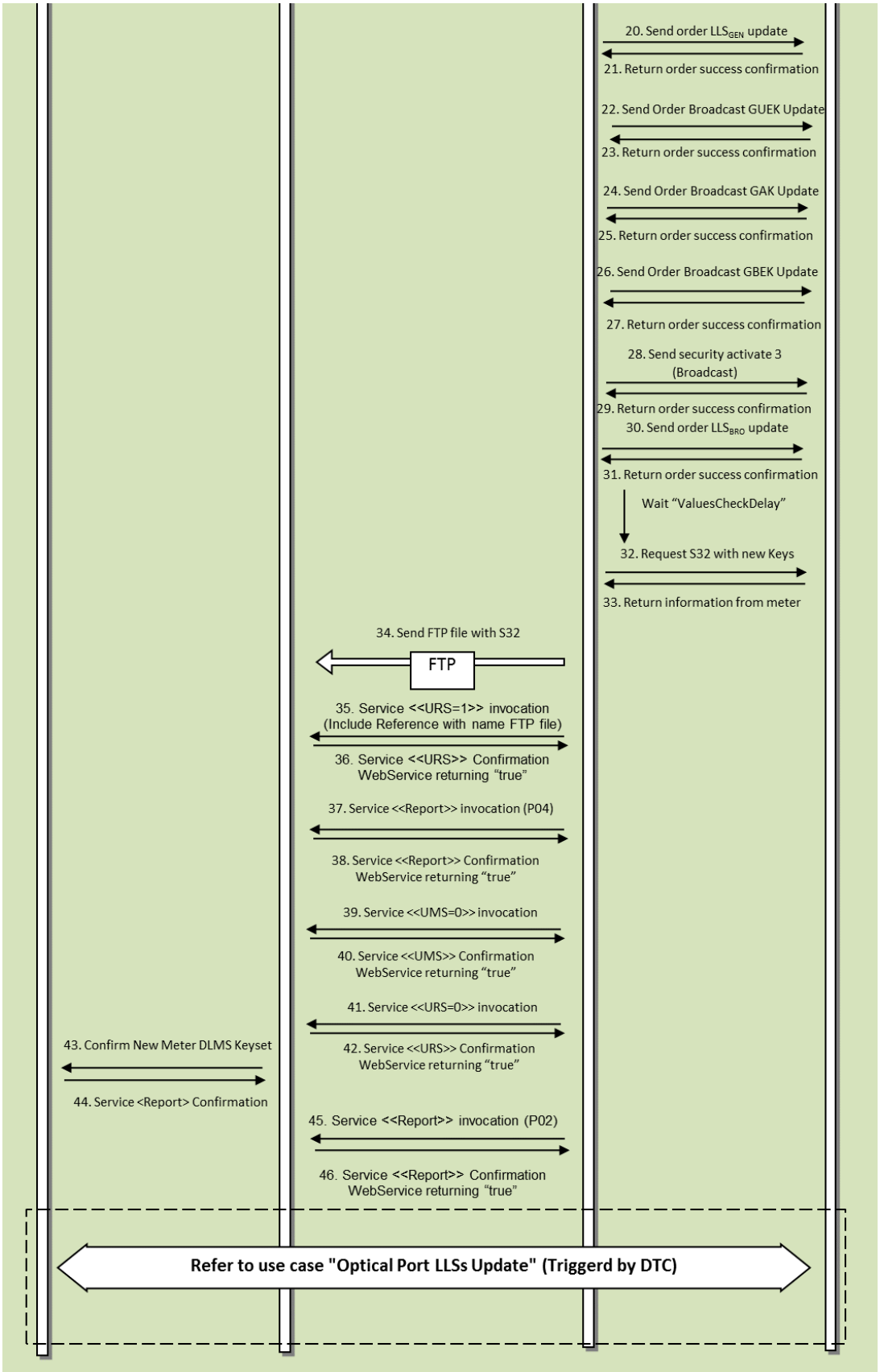


Figure 40. Reset Keys in a initialized meter.

16.6.3. Initialized secure meter registration in a different DTC

This is the use case where a meter already initialized is registered on another DTC for the first time. In this case the HES needs to informthe DTC about the keys of the meter and it is necessary to change the GAK_{BRO} and $GBEK_{BRO}$ to match the DTC keys. Please find all detailed information about this on EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.

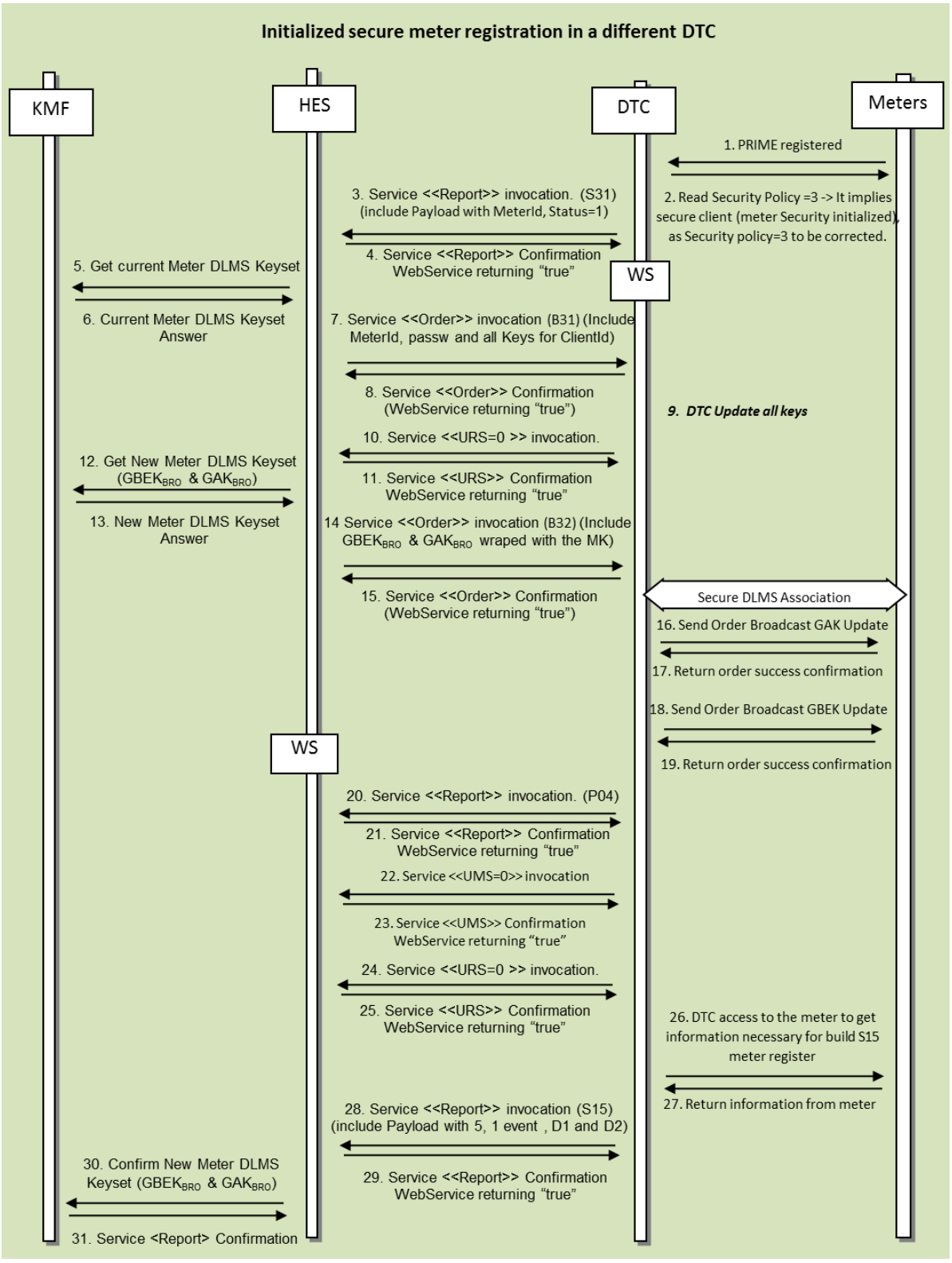


Figure 41. Registering Secure Meter Security Policy 3.

16.6.4. Global Key Updated with success (Unicast Keys)

The B32 order is used by the HES for key management. Uppon receiving the B32, the DTC should change the keys mentioned on the order and report the successful of failure of the operation to the HES. A P04 should be generated at the end of the process with the usual UMS and URS. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	7	Meter MK Update Fail
3	3	13	Meter LLS_{GEN} Update Fail
3	3	14	Meter $GUEK_{GEN}$ Update Fail
3	3	15	Meter GAK_{GEN} Update Fail
2	Null	Null	Order has been executed but any after report is missing.

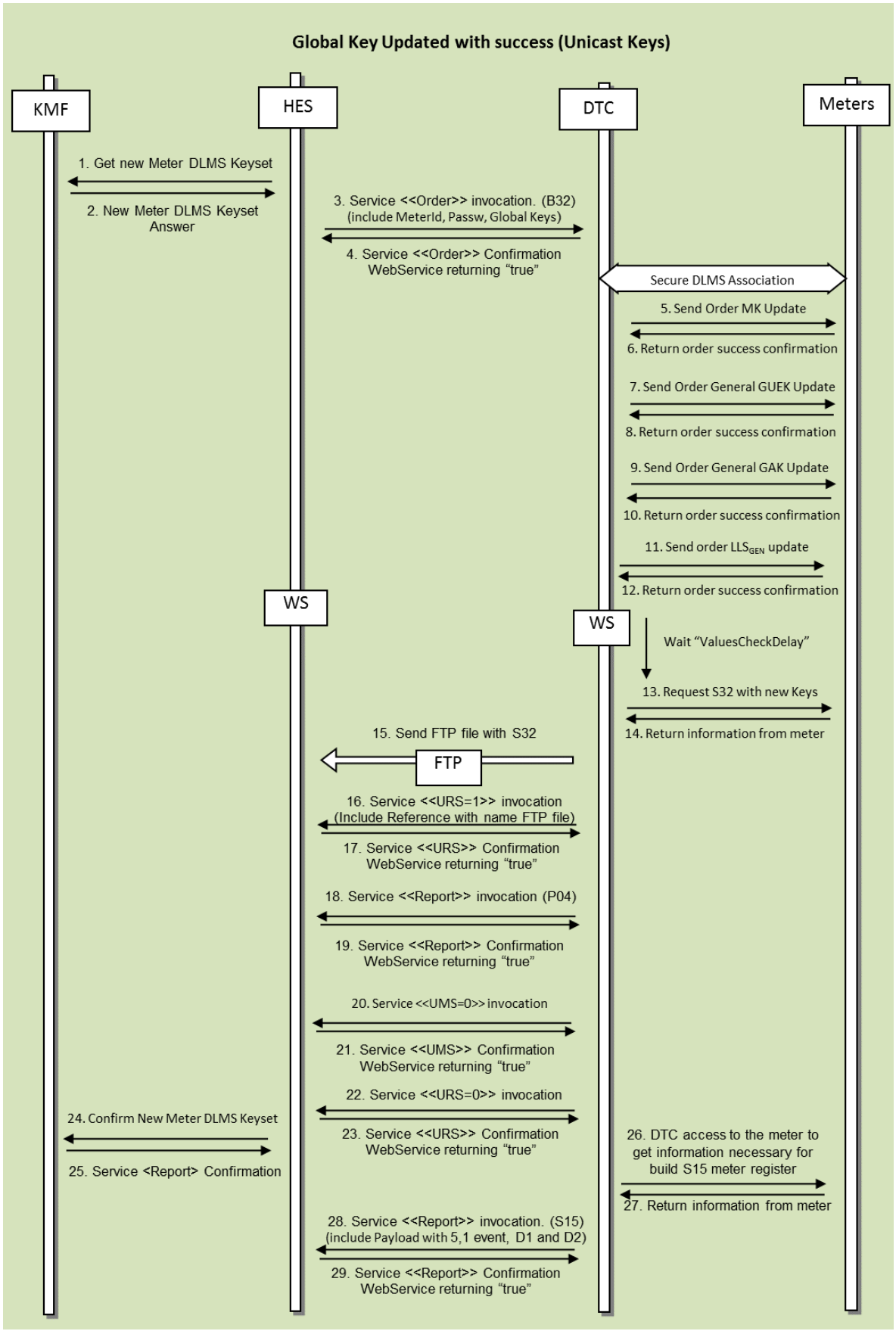


Figure 42. Global Key Updated with success (Unicast Keys)

16.6.5. Global Key Updated without success

During key management, faillures can occur and in this case the DTC should be able to report the proper error to inform the HES. If an error occur durng B32 execution, the DTC should stop the order and report imidiately with the proper error code (on the UMS web service). In the end a P04 should be generated reporting exactly what keys were changed and UMS will contain the error code stating in which key the failure occur. At the end a URS should be generated as well. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	7	Meter MK Update Fail
3	3	13	Meter LLS_{GEN} Update Fail
3	3	14	Meter $GUEK_{GEN}$ Update Fail
3	3	15	Meter GAK_{GEN} Update Fail
3	3	16	Meter LLS_{BRO} Update Fail
3	3	17	Meter $GUEK_{BRO}$ Update Fail
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.

EDP Box Secure General PLC Client Keys Bit Field (*EDPBGenBitField*) Example

Bit Position	7	6	5	4	3(GAK_{GEN})	2($GUEK_{GEN}$)	1 (LLS_{GEN})	0 (MK)
Key	Not Used	Not Used	Not Used	Not Used	1	1	0	1

EDP Box Secure Broadcast PLC Client Keys Bit Field (*EDPBBroBitField*) Example

Bit Position	7	6	5	4($GBEK_{BRO}$)	3(GAK_{BRO})	2($GUEK_{BRO}$)	1(LLS_{BRO})	0
Key	Not Used	Not Used	Not Used	0	1	1	0	Not Used

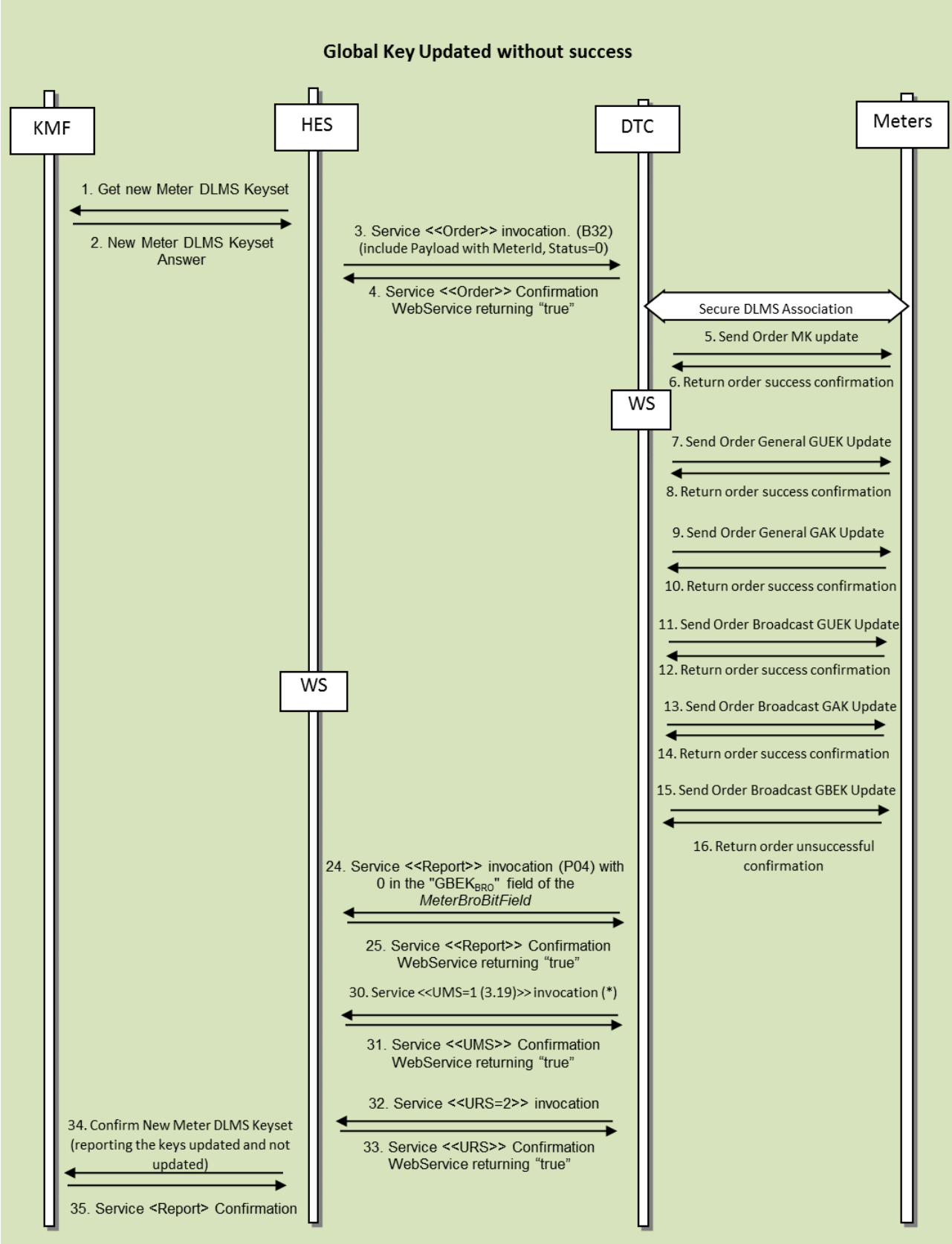


Figure 43. Global Key Updated without success

16.6.6. Optical Port LLSs Update (Triggered by KMF)

At any moment the HES can trigger the Optical Port LLSs Update with a D01 order. The DTC should perform the set of the new LLSs of the meters and report with the P06. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	4	Order execution rejected from the meter (write).
3	3	5	Order execution accepted (write) but not confirmed (read).
2	Null	Null	Order has been executed but any after report is missing.

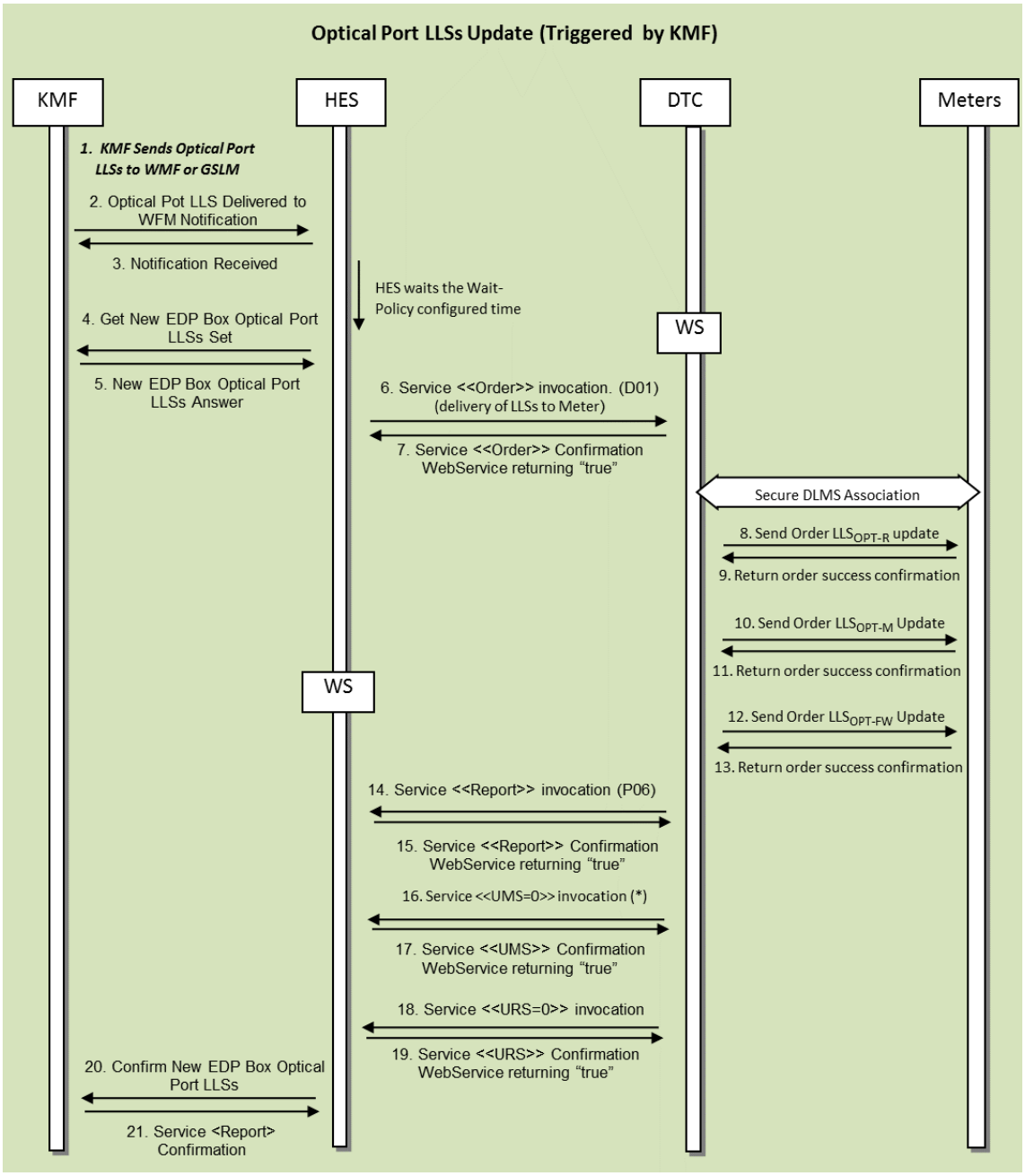


Figure 44. Optical Port LLSs Update (Triggered by KMF)

16.6.7. Optical Port LLSs Update (Triggered by DTC)

After a meter initialization, the DTC triggers the P02 to change the LLSs of the Optical port. This order can be ignored by the HES or executed through the D01 order. The DTC should reply with the P06 to the D02 order. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	4	Order execution rejected from the meter (write).
3	3	5	Order execution accepted (write) but not confirmed (read).
2	Null	Null	Order has been executed but any after report is missing.

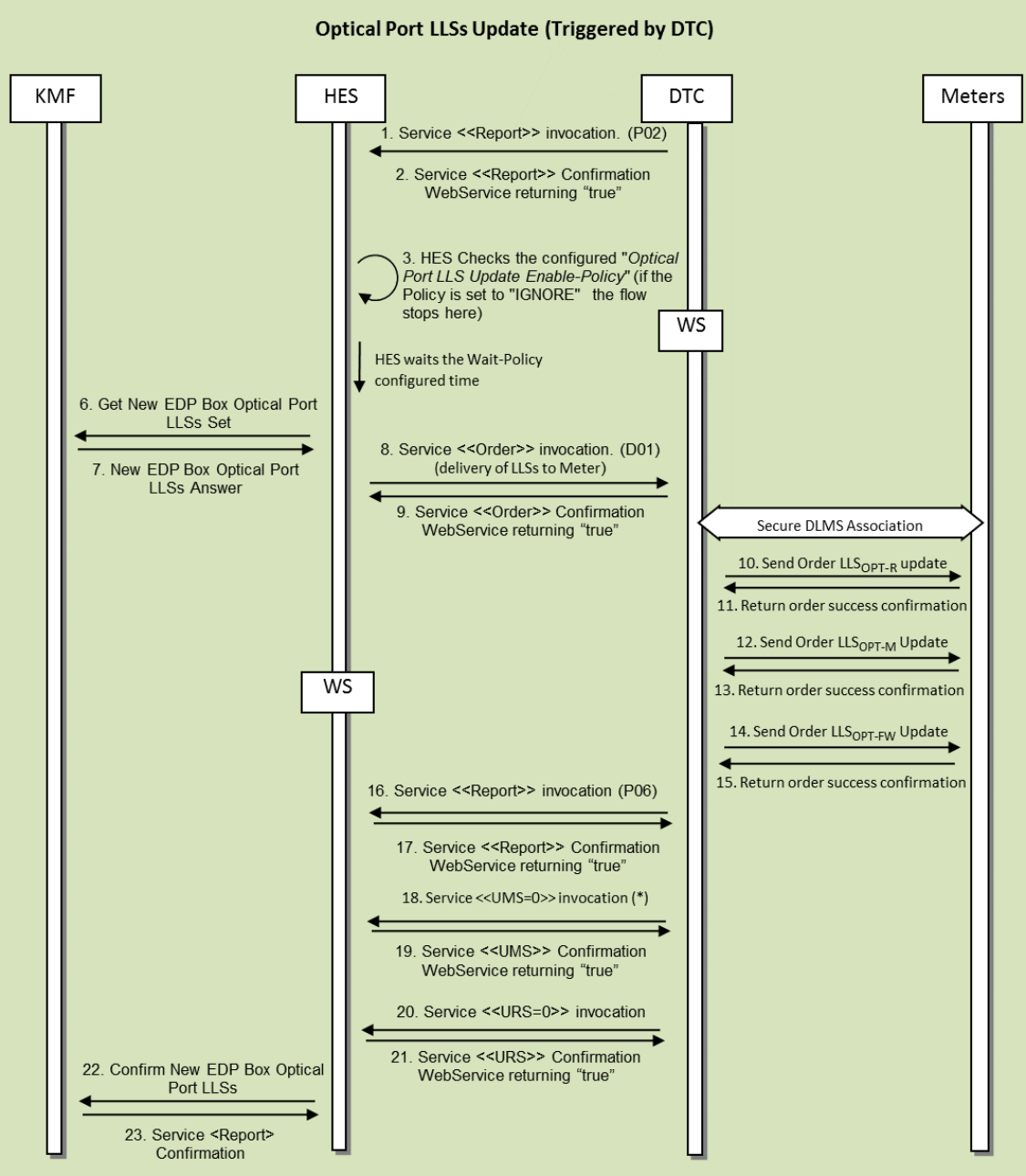


Figure 45. Optical Port LLSs Update (Triggered by DTC)

16.6.8. "FW Update Public Key" Update

With D02 order, the HES can change the “FW Update Public Key” on the meter. Uppon receiving this order the DTC needs to set that information on 0.1.94.34.74.255 DLMS object on the meter. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	4	Order execution rejected from the meter (write).
3	3	5	Order execution accepted (write) but not confirmed (read).
2	Null	Null	Order has been executed but any after report is missing.

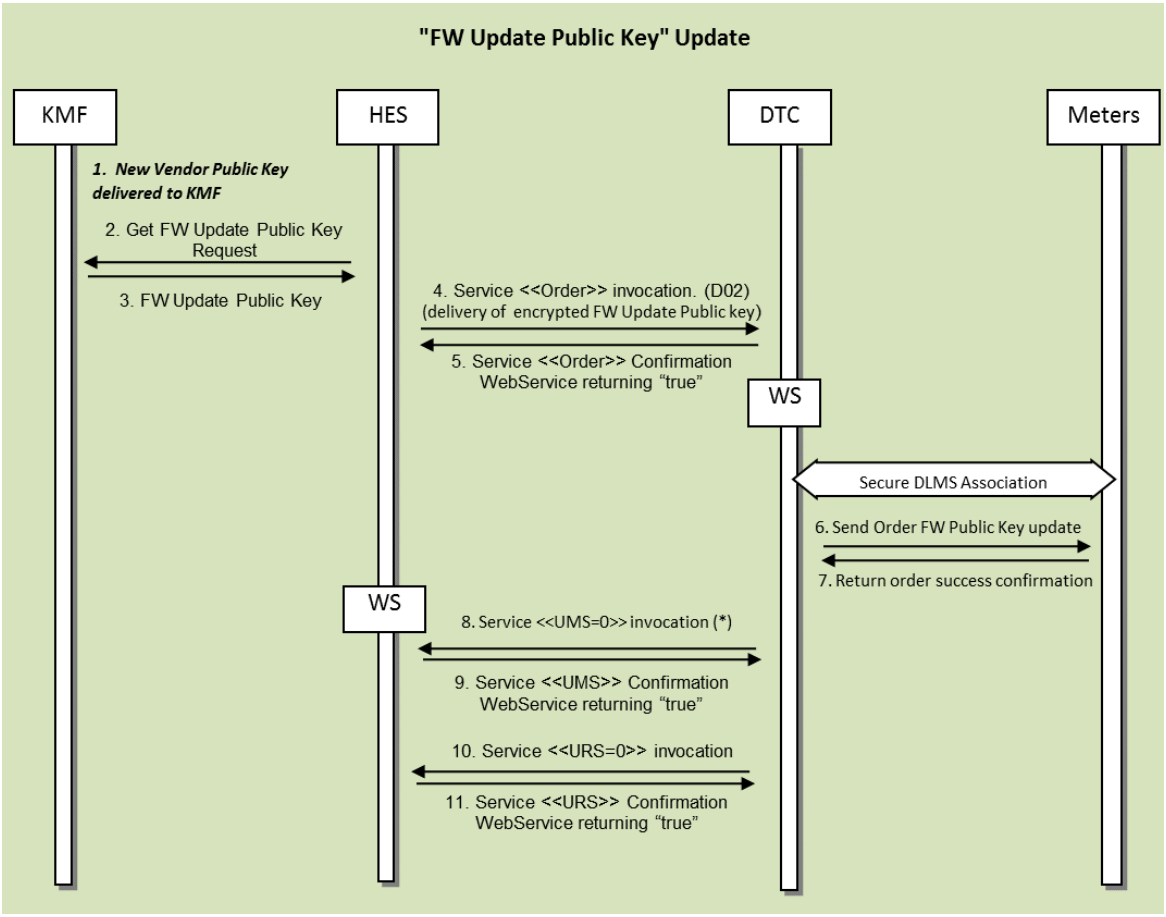


Figure 46. "FW Update Public Key" Update

16.6.9. DTC DLMS Broadcast Keys Update

When necessary the HES can send a B31 order to change the broadcast keys of the meters. This order triggers this use case in which the DTC needs to request and change the broadcast keys for all the meters on its network. The DTC should reply with the P05 to the B31 and then send one S31 per meter with the status=6. The HES will reply with a B32, execute this order and change the keys on the meter and send a P04 in response to the HES.
For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.

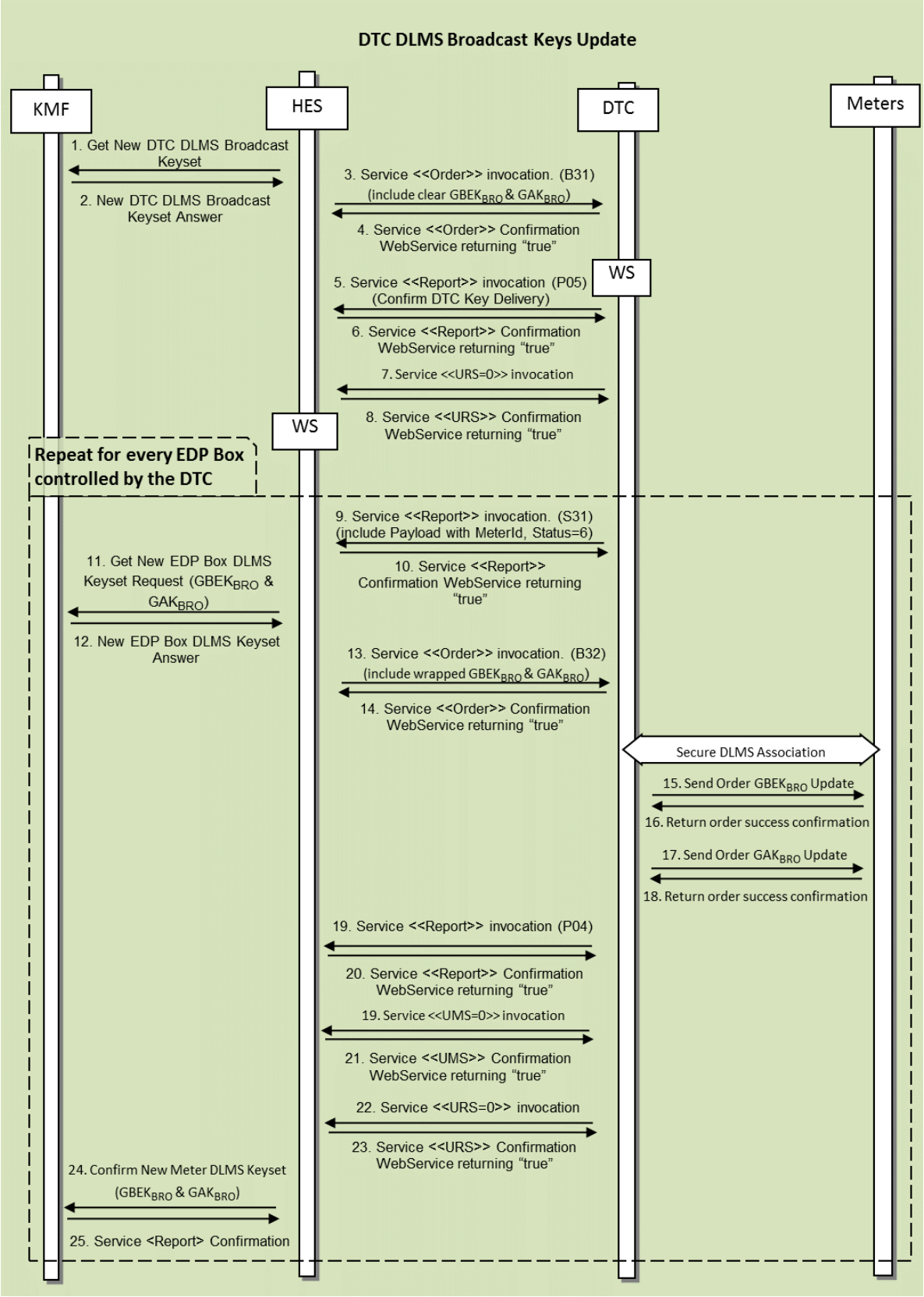


Figure 47. DTC DLMS Broadcast Keys Update

16.6.10. Timeouts Update

Apon receiving the D03 request from the HES to change the meter Timeouts, the DTC should execute the order and reply with the P07 WS. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	4	Order execution rejected from the meter (write).
3	3	5	Order execution accepted (write) but not confirmed (read).
2	Null	Null	Order has been executed but any after report is missing.

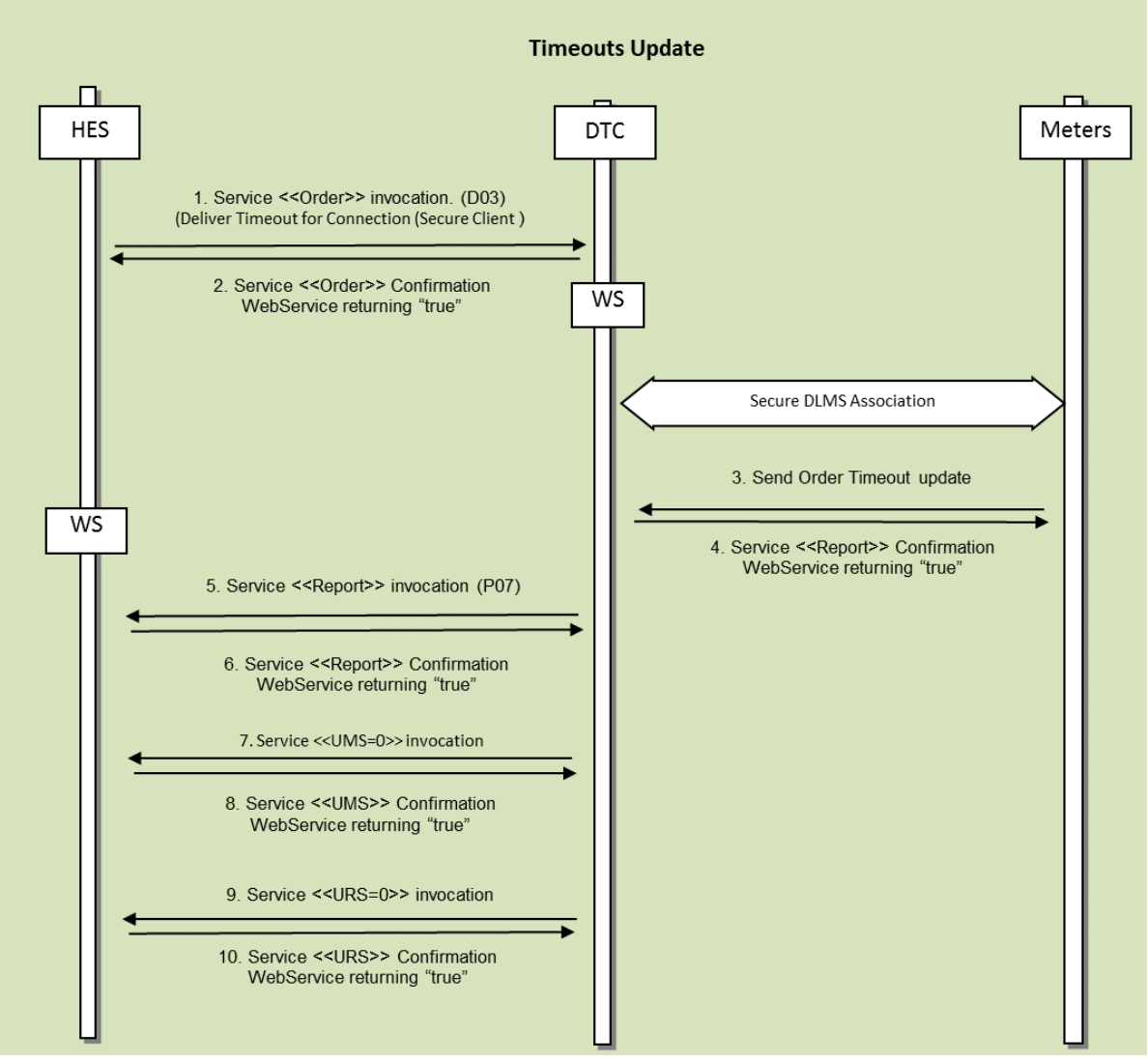


Figure 48. Timeouts Update

16.6.11. New DTC Deployment

When a new is installed (powered on), the DTC send the P01 to the HES to request the broadcast keys necessary to initialize the meters. Note that the DTC should retry to collect this information from the HES, because without it, is not possible to initialize the secure broadcast client of the meters. For more details check EDP - WP2.1 DTC Security Functional Specification.

- The table below is a list of possible errors.

UMS Errors	ErrCat	ErrCode	Description
3	3	1	Authentication failure.
3	3	18	Meter GAK_{BRO} Update Fail
3	3	19	Meter $GBEK_{BRO}$ Update Fail
2	Null	Null	Order has been executed but any after report is missing.

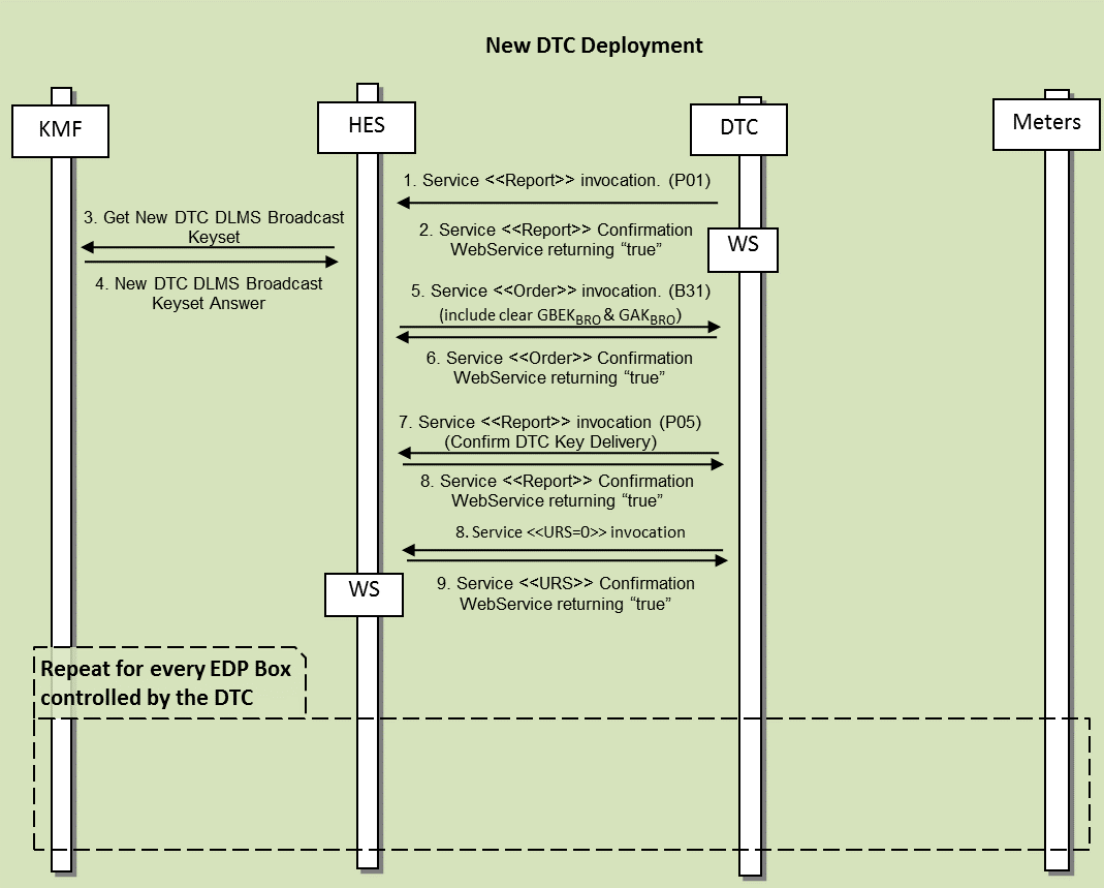


Figure 49. New DTC Deployment

17. ANNEX D – REPORT INDEX

Following table represent for each order and report:

- The Data flow model:
    - “Asynch” for the asynchronous data flow
    - “Synch” for the synchronous data flow
- The underlying protocol to be used:
    - “WS” for WebServices
    - “FTP” for FTP

Report	Content	Synchronous	FTP/WS	WS server & name (1)
B02	Power modification	Async	WS	DC-Order
B03	Disconnection / Reconnection	Async	WS	DC-Order
B04	Contract modifications	Async	WS	DC-Order
B05	Meter firmware update	Async	WS	DC-Order
B06	Meter removal	Async	WS	DC-Order
B07	Modification of the DTC configuration	Async	WS	DC-Order
B08	DTC Firmware update	Async	WS	DC-Order
B09	Meter parameters modification	Async	WS	DC-Order
B10	Manage intruder equipment in PLC	Async	WS	DC-Order
B11	DTC Order Requests	Async	WS	DC-Order
B12	Meter DLMS Request	Async	WS	DC-Order
B28	Meter Actions	Async	WS	DC-Order
B29	Load Profile configuration	Async	WS	DC-Order
B30	Monthly and Daily Billing configuration	Async	WS	DC-Order
B31	Deliver DLMS Keys to the DTC	Async	WS	DC-Order
B32	Deliver DLMS Keys to the DTC and to the Meter	Async	WS	DC-Order
B33	Meter Display configuration	Async	WS	DC-Order
B34	Disconnector configuration	Async	WS	DC-Order
B35	Demand Management configuration	Async	WS	DC-Order
B36	DTC alarms configuration	Async	WS	DC-Order
B37	Digital I/O configuration	Async	WS	DC-Order
B38	Meter insert and configuration	Async	WS	DC-Order
B41	DTC communication parameters configuration	Async	WS	DC-Order
B43	Public Lighting configuration	Async	WS	DC-Order
G01	Hourly Communication statistic with meters	Async	FTP	STG- UpdateRequestStatus
G02	Daily Communication statistic with meters	Async	FTP	STG- UpdateRequestStatus
G03	Report of average values curve (MED) of voltage and curents	Async	FTP	STG- UpdateRequestStatus
G04	Report of maximum values curve (MAX) of voltage and curents	Async	FTP	STG- UpdateRequestStatus
G05	Report of minimum values curve (MIN) of voltage and curents	Async	FTP	STG- UpdateRequestStatus
G06	Report of momentaneous values curve (MOM) of voltages and currents [G06]	Async	FTP	STG- UpdateRequestStatus
G10	Work in progress	Async	FTP	STG- UpdateRequestStatus
G12	DTC's performance log	Async	FTP	STG- UpdateRequestStatus
G13	FTP transferred file log	Async	FTP	STG- UpdateRequestStatus
G14	Meter's Firmware update log	Async	FTP	STG- UpdateRequestStatus
D01	Deliver optical port LLSs to the Meter	Async	WS	DC-Order
D02	Deliver encrypted FW Update Public key to the Meter	Async	WS	DC-Order
D03	Deliver Timeout for Connection (Secure Client / optical port)	Async	WS	DC-Order
D08	Schedule tasks exclusion list order	Async	WS	DC-Order
D09	Autonomous Firmware upgrade	Async	FTP	DC-Order
D10	Gateway communication parameters interface	Async	FTP	DC-Order
D11	Work in progress	Async	FTP	DC-Order

D12	Maximum voltage protection parameter modification	Async	WS	DC-Order
D13	Meter communication information reset	Async	WS	DC-Order
S01	Instant data values (1 or several meters)	Sync	WS	DC-Request/STG-Report (4)
S04	Monthly billing profile	Async	FTP	STG- UpdateRequestStatus
S05	Daily billing values profile	Async	FTP	STG- UpdateRequestStatus
S5B	Daily billing values profile only contract 1	Async	FTP	STG- UpdateRequestStatus
S4B	Monthly billing profile only contract 1	Async	FTP	STG- UpdateRequestStatus
S06	Meter Parameters	Async	FTP	STG- UpdateRequestStatus
S07	Voltage Failure report	Async	FTP	STG- UpdateRequestStatus
S08	Quality Power report	Async	FTP	STG- UpdateRequestStatus
S09	Meter Events	Async	FTP	STG- UpdateRequestStatus
S10	Intruder Equipment in PLC	Async	FTP	STG- UpdateRequestStatus
S11	Base Node PLC Information	Async	FTP	STG- UpdateRequestStatus
S12	DTC Parameters	Async	FTP	STG- UpdateRequestStatus
S13	Meter spontaneous event	Async	WS	STG- Report
S14	Voltage and current profile	Async	FTP	STG- Report
S15	DTC spontaneous event	Async	WS	STG- Report
S17	DTC events	Async	FTP	STG- UpdateRequestStatus
S18	Disconnection/Reconnection confirmation	Async	WS	STG- Report
S19	Meter Firmware Update Confirmation	Async	WS	STG-UpdateRequestStatus(3)
S20	List of managed meters	Async	FTP	STG- UpdateRequestStatus
S21	Advanced instant data values	Sync	WS	DC-Request
S22	DTC Firmware Update confirmation	Async	WS	STG- UpdateRequestStatus
S23	Contract definition	Async	FTP	STG- UpdateRequestStatus
S24	Table of meters present in the PLC network	Async	FTP	STG- UpdateRequestStatus
S26	Instant data values on demand	Async	FTP	STG- UpdateRequestStatus
S27	Current billing values on demand	Sync	WS	STG- Report (4)
S29	Load Profile Values	Async	FTP	STG- UpdateRequestStatus
S31	Meter DLMS Keys request	Async	WS	STG-Report
S32	Confirm correct updating of the keys	Async	FTP	STG- UpdateRequestStatus
S33	Meter Display	Async	FTP	STG- UpdateRequestStatus
S34	Disconnector state	Async	FTP	STG- UpdateRequestStatus
S35	Demand Management status	Async	FTP	STG- UpdateRequestStatus
S36	DTC alarms status	Async	FTP	STG- UpdateRequestStatus
S37	Digital I/O configuration and status	Async	FTP	STG- UpdateRequestStatus
S39	DTC maximum demand values	Async	FTP	STG- UpdateRequestStatus
S41	DTC communication parameters	Async	FTP	STG- UpdateRequestStatus
S42	Meter DLMS response	Async	FTP	STG- UpdateRequestStatus
S43	Public Lighting extended information	Async	FTP	STG- UpdateRequestStatus
S44	Public Lighting status information	Sync	WS	DC-Request
P01	DTC DLMS Broadcast New Keys request	Async	WS	STG-Report
P02	Meter Optical Port New LLSs request	Async	WS	STG-Report
P03	FW Update Public Key request	Async	WS	STG-Report
P04	Confirm Meter DLMS Keys Update	Async	WS	STG-Report
P05	Confirm DTC DLMS Keys Update	Async	WS	STG-Report
P06	Confirm Meter Optical Port LLSs Update	Async	WS	STG-Report

P07	Confirm TimeOut Update	Async	WS	STG-Report
P08	Schedule tasks exclusion list	Async	FTP	STG- UpdateRequestStatus
P09	Autonomous Firmware upgrade configuration	Async	FTP	STG- UpdateRequestStatus
P10	Gateway communication parameters interface	Async	FTP	STG- UpdateRequestStatus
P12	Maximum voltage protection	Async	FTP	STG- UpdateRequestStatus
P13	Meter Communication information	Async	FTP	STG- UpdateRequestStatus

(1): In the case of messages through ftp, the name of the Web Service refers to the WS which is invoked for notifying that the ftp file has been uploaded.
(2): This WS applies either if the report is sent as a result of a request or if the report is sent as a result of a scheduled task in the DTC.
(3): UpdateMeterStatus can be called for meter during request for processing by the DTC. This WS admits several meters included (for the same status reporting).
(4): When this report S01 or S27 is part of an order request answer from the DTC, it will be uploaded asynchronous with WS-Report.

Tab legend
No fill: Report/Order without change (tags and workflow point of view)
Green: New Report/Order
Purple: Security Report/Order
Blue: Workflow changed

18. ANNEX E – LIST OF DTC EVENT CODES

Grupo	Subgrupo	Número	Descrição do Evento	Parâmetros associados	Nome do Evento	Requisito Associado em DEF-C98-405	Valor D1 associado ao evento	Valor D2 associado ao evento	SNMP TRAP
Todos	Reset de evento	255	Indicação de que o evento foi limpo		RESET				Não
1 - Standard	Arranques e Falhas de Alimentação	1	Arranque do equipamento (power up)		POWER_UP	AD_04			SIM
		2	Not used						Não
		3	Reserved						Não
		4	Reserved						Não
		5	Falha de alimentação no equipamento (power down)		POWER_DOWN	AD_04			SIM
		6	Not used						Não
		7	Falha de bateria interna ao DTC - carga abaixo de 10% (se aplicável)		BAT_FAIL	AD_05			SIM
	Sincronização	8	Sincronização do relógio de valor menor ou igual ao limite definido em NTPMaxDeviation	NTPMaxDeviation	NTP_MIN_SYNC	GRC_04	Data/Hora anterior	Nova data/hora programada	Não
		9	Sincronização do relógio de valor maior que o limite definido em NTPMaxDeviation	NTPMaxDeviation	NTP_MAX_SYNC	GRC_04	Data/Hora anterior	Nova data/hora programada	Não
	Erros Internos críticos de fabricante	10	Erro de memória na aplicação		APPL_MEM_ERROR	EVT_03			Não
		11	Erro na memória RAM		RAM_ERROR	EVT_03			Não
		12	Erro na memória não volátil		NV_MEM_ERROR	EVT_03			Não
		13	Erro de Watchdog		WDOG_ERROR	AD_01	Identificação do processo causador do erro		SIM

		14	Erro interno no sistema de arquivo		FILE_SYS_ERROR	EVT_03			Não
	Outros erros não críticos de fabricante	15	Espaço livre de memória não volátil inferior a 10%		DISK_USAGE	MNV_04			Não
		16	DTC not available because of a Security Alarm		SECURITY_ALARM				Não
		17	Not used		DISPLAY_ERROR				Não
	Reserva para usos futuros	18	Reserved						Não
	Alteração de Parâmetros	19	Alteração da configuração do equipamento, em quaisquer dos parâmetros da ordem B07		RECONFIG				Não
		20	Alteração da configuração do equipamento, em quaisquer dos parâmetros da ordem B41	IProuter TCPportRS485	RECONFIG_COM	TE_07			Não
		21	Alteração da password de consulta, indicar user e método de acesso	DCPwdRead	READ_PWD	SEG_01	user	"WS" ou "HMI"	Não
		22	Alteração da password de escrita, indicar user e método de acesso	DCPwdAdm	WRITE_PWD	SEG_01	user	"WS" ou "HMI"	Não
		23	Not used						Não
		24	Not used						Não
		25	Limpeza manual dos dados de medida		DATA _RESET				Não
		26	Not used						Não
		27	Atualização de versão de firmware do DTC	Vf	DTC_FIRM	FIRM_05	nova versão de FW	antiga versão de FW	SIM
		28	Atualização de firmware ao modem PLC PRIME	VfComm	PLC_FIRM	FIRM_05	nova versão de FW	antiga versão de FW	SIM
		29	Not used		GPRS_FIRM				Não
		30	Not used						Não
		31	Not used						Não

	outros	32	Falha no download do ficheiro update da EB com o SI FTP		EB_FILE_FIRM_FAIL		nome do ficheiro		Não
		33	Falha no download do ficheiro update do DTC com o SI FTP após tentativas		DTC_FILE_FIRM_FAIL		nome do ficheiro		Não
		34	Falha update de firmware à EB		EB_FIRM_FAIL		Identificador EB	versão de FW (cujo update falhou)	Não
		35	Falha update de firmware ao DTC		DTC_FIRM_FAIL		versão de FW (cujo update falhou)		Não
		36	Pedido errado do SI (mensagem mal formatada, datas insconsistentes, desconhecido)		DTC_MSG				Não
		37	Detecção de falha nas comunicações com servidor NTP		DTC_NTP_FAIL				Não
		38	Detecção de falha nas comunicações SCADA		DTC_SCADA_FAIL				Não
		39	Detecção de falha nas comunicações TAN (HDLC)		DTC_HDLC_FAIL				Não
		40	Detecção de falha nas comunicações TAN (MODBUS)		DTC_MODBUS_FAIL				Não
		41	Detecção de falha nas comunicações LAN		DTC_LAN_FAIL				Não
		42	Ultrapassagem do valor limite de registo totalizador		OVERFLOW	DC_05			Não
		43	Alteração do período de integração da potência	DemandIntP	POWER_IP_CHANGED	METP_03			Não
	Alteração da hora	44	Alteração da configuração da mudança automática da hora legal (DST - Daylight Saving Time)		DST_CHANGED	GRC_02	Data/Hora anterior	Nova data/hora programada	Não
		45	Mudança da hora legal (inverno -> verão)		HOUR_CHANGED_W_S	GRC_02	Data/Hora anterior	Nova data/hora programada	Não
		46	Mudança da hora legal (verão -> inverno)		HOUR_CHANGED_S_W	GRC_02	Data/Hora anterior	Nova data/hora programada	Não
		47	Acerto do relógio ou calendário		TIME_CHANGED	GRC_03 GRC_06	Data/Hora anterior	Nova data/hora programada	Não
		48	Inibição do Daylight Saving Time		DST_DISABLE	GRC_02	DST Inativo		Não
		49	Ativação do Daylight Saving Time		DST_ENABLE	GRC_02	DST Ativo		Não

	Gestão tarefas	50	Alteração do número máximo da lista de tarefas pendentes		MaxQueueNum	GT_12	Valor anterior	Valor atual	Não
	Parâmetros SVM	51	Alteração da relação de transformação de corrente do DTC	CurrentRatio	CUR_RATIO_CHANGED	CTM_01	Valor anterior	Valor atual	Não
	Reserva para usos futuros	52-254	Reserved						Não
2 - Acesso	Acesso Remoto	1	Login remoto no DTC		LOGIN	SEG_01	user	IP Origem e Tipo de acesso: "read", "write","HMI_read", "HMI_write"	Não
		2	Logout remoto no DTC		LOGOUT	SEG_01	user	IP Origem e Tipo de acesso: "read", "write","HMI_read", "HMI_write"	Não
		3	Tentativa falhada de login remoto no DTC		LOGIN_FAILED	SEG_01	user	IP Origem e Tipo de acesso: "read", "write","HMI_read", "HMI_write"	Não
	Acesso de consola	4	Login local no DTC		CONS_LOGIN	SEG_01	user	Tipo de acesso: "read", "write"	Não
		5	Logout local no DTC		CONS_LOGOUT	SEG_01	user	Tipo de acesso: "read", "write"	Não
		6	Tentativa falhada de login local no DTC		CONS_LOGIN_FAILED	SEG_01	user	Tipo de acesso: "read", "write"	Não
	Abertura/Fecho de cobertura física	7	Deteção de abertura imprevista da cobertura física do equipamento.		DTC_COVER_OPEN	AD_06			SIM
		8	Deteção do fecho da cobertura física do equipamento.		DTC_COVER_CLOSED	AD_06			SIM
		9	Not used						Não
		10	Not used						Não
	Reserva para usos futuros	11-254	Reserved						Não
3 - Gestão da Procura	Reserva para usos futuros	1-254	Reserved						Não

4 - Ocorrência elevada	Ocorrência elevada - Comuns	1	Inicio estabelecimento de comunicações porto PLC		COM_PLC_ON	GC_01	Identificador porto PLC		Não
		2	Fim de comunicações porto PLC		COM_PLC_OFF	GC_01	Identificador porto PLC		Não
		3	Inicio estabelecimento de comunicações porto ETHERNET		COM_ETHERN_ON	GC_01	Identificador porto Ethernet		Não
		4	Fim de comunicações porto ETHERNET		COM_ETHERN_OFF	GC_01	Identificador porto Ethernet		Não
		5	Inicio estabelecimento de comunicações porto GPRS		COM_GPRS_ON	GC_01			Não
		6	Fim de comunicações porto GPRS		COM_GPRS_OFF	GC_01			Não
		7	Inicio estabelecimento de comunicações porta série RS-485		COM_RS485_ON	GC_01	Identificador porta RS-485		Não
		8	Fim de comunicações porta série RS-485		COM_RS485_OFF	GC_01	Identificador porta RS-486		Não
		9	Sinal GPRS fraco		GPRS_SIG_LOW	GEB_23			SIM
		10	Ligação GPRS em baixo (caso exista)		GPRS_CON_OFF				Não
		11	Sem cartão SIM instalado		SIM_OUT				Não
		12	O cartão SIM solicita um código PIN		SIM_PIN				Não
		13	Ligação ETHERNET em baixo		ETHERN_CON_OFF		Identificador porto Ethernet		Não
		14	Falha na comunicação com o Base Node PRIME		PRIME_ERROR		Código do erro		Não
		15	Não existe MAC do modem PRIME definido		PRIME_NO_MAC				Não
		16	Falha no envio de WS ao SI após tentativas		DTC_SI_FAIL				Não
		17	Falha no envio de ficheiro FTP ao SI após tentativas. Link lost while transfer		DTC_SI_REPORT_FAIL				Não
		18	Falha no envio de ficheiro FTP ao SI após tentativas. Wrong FTP username or password		DTC_SI_REPORT_FAIL				Não
		19	Falha no envio do ficheiro FTP ao SI após tentativas. Serviço FTP indisponível.		DTC_SI_REPORT_FAIL				Não

		20	Falha no equipamento de medida do DTC.		DTC_METERING_HW_FAIL				Não
	Reserva para usos futuros	21-254	Reserved						Não
5 - Gestão de EBs	Gestão de EBs	1	Registo de nova EB na lista de EB geridas pelo DTC		EB_NEW	GEB_14 GEB_25	Identificador EB	Valores dos objectos configurados em MeterRegData (B07)	SIM
		2	Remoção de EB da lista de EB geridas pelo DTC		EB_REMOVED	GEB_14 GEB_25	Identificador EB		Não
		3	Passagem de EB para estado online		EB_ONLINE	GEB_15 GEB_16			Não
		4	Passagem de EB para estado offline		EB_OFFLINE	GEB_15 GEB_16			Não
		5	Passagem de EB para estado inactiva	TimetoInactivePRIME TimetoInactiveGPRS TimetoInactiveRS485	EB_INACT	GEB_15 GEB_18			SIM
		6	Alteração da password de leitura da EB		EB_READ_PWD	GEB_28	Identificador EB	Descritivo do método de acesso	Não
		7	Alteração da password de escrita da EB		EB_WRITE_PWD	GEB_28	Identificador EB	Descritivo do método de acesso	Não
		8	Alteração da password de firmware da EB		EB_FIRM_PWD	GEB_28	Identificador EB	Descritivo do método de acesso	Não
		9	Falha de Sincronização de relogio à EB* (EB ID e desvio)	TimeDev =60 s TimeDevOver =300 s	EB_SYNC_FAIL	SET_04	Identificador EB	desvio	Não
		10	Percentagem de EBs Online desce abaixo do limite	NoPowerLowerTh MinMetersNoPower	EB_ONLINE_LOW	FA_02			Não
		11	Percentagem de EBs Online sobe acima do limite	NoPowerUpperTh MinMetersNoPower	EB_ONLINE_HIGH	FA_02			Não
		12	Update de firmware aplicacional à EB	Vfapp	EB_FIRM	AF_03	Identificador EB		Não
		13	Update de firmware ao modem PLC da EB	CommFW	EB_PLC_FIRM	AF_03	Identificador EB	MAC address Modem	Não
		14	Inibição do "Base Node" PLC Prime do DTC	BNodeStatus	BASE_NODE_OFF	GEB_26			Não
		15	Activação do "Base Node" PLC Prime do DTC	BNodeStatus	BASE_NODE_ON	GEB_26			Não

		16	Alteração do modo de gestão de dados com configuração flexível	DataCollectMode	DATA_COLLECT_MODE_CHANGED	GT_10	Identificador EB	Valor do DataCollectMode	Não
		17	Passagem de EB do estado inactivo para o estado Online		Back_to_Active		Identificador EB	MAC address	SIM
		18	Alteração parâmetros de comunicação EMI RS485	TCPportRS485IProuterMeterTCPPortMeterIP	RECONFIG_IP_PORT_EB	TE_08	Identificador EB	Parâmetro: Novo_Valor	Não
		19	Alteração do parâmetro de profundidade temporal máxima para recolha de dados	DataCollectDepth	DATA_DEPTH_CHANGED	GT_11	Identificador EB	Valor do DataCollectDepth	Não
		20	Alteração do parâmetro de ativação/Inativação da comunicação remota das EMI (ambito flexibildiade)	RemOpMode	EB_INIB_TCP	FLX_16	Identificador EB	Valor do RemOpMode	Não
		21	Falha de comunicação aplicacional (ambito flexibilidade)		FALHA_TCP_EB	FLX_19	Identificador EB		Não
		22	Falha de comunicação TCP/IP entre DTC e EMI (Passa do estado Activo para TF)		EB_TCP_OFFLINE	FLX_20	Identificador EB		Não
		23	Sucesso na comunicação TCP/IP entre DTC e EMI (recuperação após falha)		EB_TCP_ONLINE	FLX_20	Identificador EB		Não
		24	Interface TCP/IP da EMI passa para o estado PF	TimetoInactiveTCP	EB_TCP_INACT	FLX_20	Identificador EB		Não

		25	Indisponibilidade de acesso DLMS		EB_DLMS_IN_USE	FLX_21	Identificador EB		Não
		26	EMI colocada na lista de exclusão de tarefas		EB_EXC_LIST	FLX_22	Identificador EB		Não
		27	EMI removida da lista de exclusão de tarefas		EB_EXC_LIST_REMOVED	FLX_22	Identificador EB		Não
		28	Configuração de uma Gateway em modo Service Node		GW_SERVICE_NODE_ON	GEB_07	IP da Gateway configurada	MAC da GW	Não
		29	Remoção de uma Gateway em modo Service Node		GW_SERVICE_NODE_OFF	GEB_07	IP da Gateway configurada	MAC da GW	Não
		30	Configuração de uma Gateway em modo Base Node		GW_BASE_NODE_ON	GEB_08	IP da Gateway configurada	MAC da GW	Não
		31	Remoção de uma Gateway em modo Base Node		GW_BASE_NODE_OFF	GEB_08	IP da Gateway configurada	MAC da GW	Não
	Reserva para usos futuros	32-254	Reserved						Não
6 - Monitorização da Rede	Limites e Desequilíbrios	1	Subtensão por fase - L1	UnLowerTh	UNDERVOLTAGE_L1	QS_05			Não
		2	Subtensão por fase - L2	UnLowerTh	UNDERVOLTAGE_L2	QS_05			Não
		3	Subtensão por fase - L3	UnLowerTh	UNDERVOLTAGE_L3	QS_05			Não

		4	Configuração de limite de subtensão por fase	UnLowerTh	UNDERVOLTAGE_CHANGED	QS_05			Não
		5	Sobretensão por fase - L1	UnUpperTh	OVERVOLTAGE_L1	QS_04			Não
		6	Sobretensão por fase - L2	UnUpperTh	OVERVOLTAGE_L2	QS_04			Não
		7	Sobretensão por fase - L3	UnUpperTh	OVERVOLTAGE_L3	QS_04			Não
		8	Alteração de limite de sobretensão por fase	UnUpperTh	OVERVOLTAGE_CHANGED	QS_04			Não
		9	Normalização do valor de tensão por fase - L1	UnUpperTh UnLowerTh	VOLTAGE_OK_L1	QS_04 QS_05			Não
		10	Normalização do valor de tensão por fase - L2	UnUpperTh UnLowerTh	VOLTAGE_OK_L2	QS_04 QS_05			Não
		11	Normalização do valor de tensão por fase - L3	UnUpperTh UnLowerTh	VOLTAGE_OK_L3	QS_04 QS_05			Não
		12	Corrente por fase abaixo do valor mínimo - L1	CurULTh	CURRENT_UNDERLOAD_L1	QS_07			Não
		13	Corrente por fase abaixo do valor mínimo - L2	CurULTh	CURRENT_UNDERLOAD_L2	QS_07			Não
		14	Corrente por fase abaixo do valor mínimo - L3	CurULTh	CURRENT_UNDERLOAD_L3	QS_07			Não
		15	Configuração de limite de corrente mínima por fase	CurULTh	CURRENT_UNDERLOAD_CHANGED	QS_07			Não
		16	Corrente por fase acima do valor máximo - L1	CurOLTh	CURRENT_OVERLOAD_L1	QS_06			Não
		17	Corrente por fase acima do valor máximo - L2	CurOLTh	CURRENT_OVERLOAD_L2	QS_06			Não
		18	Corrente por fase acima do valor máximo - L3	CurOLTh	CURRENT_OVERLOAD_L3	QS_06			Não
		19	Configuração de limite de corrente máxima por fase	CurOLTh	CURRENT_OVERLOAD_CHANGED	QS_06			Não
		20	Normalização do valor da corrente por fase - L1	CurOLTh	CURRENT_OK_L1	QS_06 QS_07			Não
		21	Normalização do valor da corrente por fase - L2	CurOLTh	CURRENT_OK_L2	QS_06 QS_07			Não
		22	Normalização do valor da corrente por fase - L3	CurOLTh	CURRENT_OK_L3	QS_06 QS_07			Não

		23	Configuração da Tensão de referência	Vref	REF_VOLTAGE_CHANGED	QS_03			Não
		24	Sobrecarga no transformador	OverloadAlarmTh	TP_OVERLOAD	QS_01			Não
		25	Normalização da potência aparente do transformador	OverloadAlarmTh	TP_LOAD_OK	QS_01			Não
		26	Configuração de limite de sobrecarga no transformador	OverloadAlarmTh	TP_OVERLOAD_CHANGED	QS_01			Não
		27	Falha de tensão no QGBT - L1	PhUnbVmin	PHASE_DOWN_L1	QS_02			Não
		28	Falha de tensão no QGBT - L2	PhUnbVmin	PHASE_DOWN_L2	QS_02			Não
		29	Falha de tensão no QGBT - L3	PhUnbVmin	PHASE_DOWN_L3	QS_02			Não
		30	Recuperação da tensão no QGBT - L1	PhUnbVmin	PHASE_UP_L1	QS_02			Não
		31	Recuperação da tensão no QGBT - L2	PhUnbVmin	PHASE_UP_L2	QS_02			Não
		32	Recuperação da tensão no QGBT - L3	PhUnbVmin	PHASE_UP_L3	QS_02			Não
		33	Configuração de limite de falha de tensão no QGBT	PhUnbVmin	PHASE_DOWN_CHANGED	QS_02			Não
		34	Reset do registo de potência máxima	MaxPowRst	MAX_POWER_RESET	RT_04			Não
		35	Desequilíbrio de tensões no TP - L1		VOLT_UNBALANCED_L1	DDF_01	% de desequilíbrio		Não
		36	Desequilíbrio de tensões no TP - L2		VOLT_UNBALANCED_L2	DDF_01	% de desequilíbrio		Não
		37	Desequilíbrio de tensões no TP - L3		VOLT_UNBALANCED_L3	DDF_01	% de desequilíbrio		Não
		38	Desequilíbrio de tensões no TP normalizado - L1		VOLT_BALANCED_L1	DDF_01			Não
		39	Desequilíbrio de tensões no TP normalizado - L2		VOLT_BALANCED_L2	DDF_01			Não
		40	Desequilíbrio de tensões no TP normalizado - L3		VOLT_BALANCED_L3	DDF_01			Não
		41	Configuração do threshold para cálculo da média da tensão instantânea do TP	PhUnbVTmn	AVER_VOLTAGE_THRES_CHANGED	DDF_02			Não

		42	Configuração do threshold para desequilíbrio de tensões	PhUnbVTv	VOLT_UNBALANCED_THRES_CHANGED	DDF_03			Não
		43	Configuração do período de amostragem para desequilíbrio de tensões	PhUnbVTd	TIME_UNBALANCED_THRES_CHANGED	DDF_04 DDF_07			Não
		44	Desequilíbrio de correntes no TP - L1	PhUnbVTd	CUR_UNBALANCED_L1	DDF_05	% de desequilíbrio		Não
		45	Desequilíbrio de correntes no TP - L2		CUR_UNBALANCED_L2	DDF_05	% de desequilíbrio		Não
		46	Desequilíbrio de correntes no TP - L3		CUR_UNBALANCED_L3	DDF_05	% de desequilíbrio		Não
		47	Desequilíbrio de correntes no TP normalizado - L1		CUR_BALANCED_L1	DDF_05			Não
		48	Desequilíbrio de correntes no TP normalizado - L2		CUR_BALANCED_L2	DDF_05			Não
		49	Desequilíbrio de correntes no TP normalizado - L3		CUR_BALANCED_L3	DDF_05			Não
		50	Configuração do threshold para desequilíbrio de correntes	PhUnbITi	CURR_UNBALANCED_THRES_CHANGED	DDF_06			Não
		51-69	Reserved						Não
	Entradas e Saídas	70	Entrada digital 1 ativada		INPUT1_ON	IO_01			Não
		71	Entrada digital 1 desativada		INPUT1_OFF	IO_01			Não
		72	Entrada digital 2 ativada		INPUT2_ON	IO_01			Não
		73	Entrada digital 2 desativada		INPUT2_OFF	IO_01			Não
		74	Entrada digital 3 ativada		INPUT3_ON	IO_01			Não
		75	Entrada digital 3 desativada		INPUT3_OFF	IO_01			Não
		76	Entrada digital 4 ativada		INPUT4_ON	IO_01			Não
		77	Entrada digital 4 desativada		INPUT4_OFF	IO_01			Não
		78	Saída digital 1 ativada		OUTPUT1_ON	IO_03			Não

		79	Saída digital 1 desativada		OUTPUT1_OFF	IO_03			Não
		80	Saída digital 2 ativada		OUTPUT2_ON	IO_03			Não
		81	Saída digital 2 desativada		OUTPUT2_OFF	IO_03			Não
		82	Saída digital 3 ativada		OUTPUT3_ON	IO_03			Não
		83	Saída digital 3 desativada		OUTPUT3_OFF	IO_03			Não
		84	Saída digital 4 ativada		OUTPUT4_ON	IO_03			Não
		85	Saída digital 4 desativada		OUTPUT4_OFF	IO_03			Não
		86	Inundação detetada		FLOOD_ON				Não
		87	Inundação regularizada		FLOOD_OFF				Não
		88	Porta Aberta do Posto de Transformação		DOOR_OPEN				Não
		89	Porta Fechada do Posto de Transformação		DOOR_CLOSED				Não
		90	Bomba de água com problema		PUMP_NOK				Não
		91	Bomba de água sem problema		PUMP_OK				Não
		92	Temperatura alta		TEMPERATURE_HIGH				Não
		93	Temperatura regularizada		TEMPERATURE_OK				Não
	Reserva para usos futuros	94-254	Reserved						Não
7 - Diagrama de Cargas	Configuração DC	1	Alteração do período de integração do diagrama de cargas	Per	LOAD_PROFILE_IP_CHANGED	DC_04			Não
		2	Alteração da configuração dos canais do diagrama de cargas		LOAD_PROFILE_CONFIG	DC_02 DC_03			Não
		3	Reset dos dados do diagrama de cargas		LOAD_PROFILE_RESET	DC_02 DC_03			Não

	Reserva para usos futuros	4-254	Reserved						Não
8- Monitorização do DTC	Gestão interna	1	Aviso caso o DTC executar mais do que "K" *reboots* por dia.		Reboot_Limit		Número de reboots efetuados		Sim
		2	Falha num ficheiro essencial ao correto funcionamento do sistema		File_System_ERROR				SIm
		3	Excedido o limite de utilização de CPU em System Time.		CPU_Alert		System time	Interrupt time	Sim
		4	Excedido o limite de load average de 15 minutos.		load_average_alert		Load average		Sim
		5	Memória RAM real é utilizada acima de limite definido, ou seja, a memória disponível (/proc/meminfo) é inferior ao limite.		Real_memory_utilization_alert		Memória RAM real a ser utilizada		Sim
		6	Memória RAM virtual (virtual swap memory) é utilizada acima do limite definido.		swap_memory_utilization_alert		Memória RAM virtual que está a ser utilizada		Sim
		7	Excedido o limite mínimo de espaço físico.		low_disk_space_alert		Valor de espaço físico livre existente		Sim
		8	Mudança de estado do watchdog.		Mudança_estado_Watchdog		Estado atual do Watchdog		Sim
	Interfaces Físicos	9	Detetada uma quebra do link de ligação ethernet.		Link_down		Data e hora de ocorrência.		Sim
		10	Detetada restabelecimento do link de ligação ethernet.		Link_up		Data e hora de ocorrência.		Sim
		11	Mudança de estado da interface PRIME		PRIME_State_Change		Estado atual do interface		Sim
		12	Aviso de o DTC não tiver contadores ativos durante "N" minutos seguidos.		No_Meters		Número de contadores no estado "Ativo"		Sim
		13	Aviso se o DTC tiver mais que "M "contadores ativos durante "B" minutos seguidos.		Recovered_Meters		Número de contadores no estado "Ativo"		SIM
	Agente SNMP	14	Agente SNMP recebe uma mensagem que não está devidamente autenticada.		Authentication_failure		User	Mensagem que não foi devidamente autenticada.	Sim
		15	Iniciado o agente SNMP, ou reinicializado com alteração de configuração.		Boot/Cold_start		Número de vezes que o agente foi		Sim

							reinicializado.		
		16	Reinicializado o agente SNMP sem alteração de configuração.		Warm_start		Número de vezes que o agente foi reinicializado.		Sim
	Interface DTC-HES	17	Excedido o limite de tempo médio de execução definido por cada tarefa.		Threshold_avg_time		Serviço associado	Tempo associado	Sim
		18	Excedido o valor de serviços em espera.		Treshold_waiting_services		Listagem de tarefas em string separado por ","		Sim
		19	Número de sessões provenientes do DTC do tipo Webservice bem-sucedidas, sobre o total de sessões (x100) é inferior ao valor definido de threshold.		Web_Percentual		valor de configuração do threshold		Sim
		20	Número de sessões provenientes do DTC do tipo FTP bem-sucedidas, sobre o total de sessões (x100) é inferior ao valor definido de threshold.		FTP_percentual		valor de configuração do threshold.		Sim
	Interface Scada	21	Número de sessões provenientes do *DTC* do tipo Scada bem-sucedidas, sobre o total de sessões (x100) é inferior ao valor definido de *threshold*.		Scada_Percentual_Success		valor de configuração do threshold.		Sim

19. ANNEX F – WEBSERVICES WSDL

19.1 HES WebServices

WSDL Reference document are provided along with the Specifications document.

19.2 DTC WebServices

WSDL Reference document are provided along with the Specifications document.

20. ANNEX G DETAILED DESCRIPTION OF METER/DTC EVENT CODES

Meter event codes include D1 and D2 attributes which have to be filled in with data depending on each event received. Details for each event group/code are defined in the DEF-C44-507 (Section 5.3.3 Eventos, Alarmes e Tratamento de Erros). Most relevant event details are described below.
For the case of DTC event codes, it should only be considered those cases that apply (firmware update, clock synchronisation and order errors).The following list shows examples of these D1 and D2 attributes defined for all the cases which are required.

20.1. Power contract event logs.

```
<Report IdRpt="S09" IdPet="0" Version="3.4_EDP_2.0">
   <Cnc Id="ABC0000000003">
         <Cnt Id="XYZ0034616943">
               <S09 Fh="20100727112320000S" Et="1" C="96">
                     <D1>1200,1500,15000,15000,15000,15000</D1>
                     <D2>1500,1500,15000,15000,15000,15000</D2>
               </S09>
         </Cnt>
   </Cnc>
</Report>
```

*D1= Former Power contract
*D2= New Power contract

20.2. Switch control event logs.

```
<Report IdRpt="S09" IdPet="0" Version="3.4_EDP_2.0">
   <Cnc Id="ABC0000000003">
         <Cnt Id="XYZ0034616943">
               <S09 Fh="20100727112233000S" Et="2" C="4">
                     <D1>0,1</D1>
                     <D2>6900,0</D2>
</S09>
         </Cnt>
   </Cnc>
</Report>
```

*D1

- First position: Previous disconnector control status (1- Connected; 0-Disconnected; 2-Ready_for_reconnection)
- Second position: Current disconnector control status (1- Connected; 0-Disconnected; 2-Ready_for_reconnection)

*D2

- First position: Current apparent power threshold
- Second position: ICP power control inhibition value

20.3. Firmware event logs.

```
<Report IdRpt="S09" IdPet="0" Version="3.4_EDP_2.0">
    <Cnc Id="ABC0000000003">
        <Cnt Id="XYZ0034616943">
            <S09 Fh="20100727112233000S" Et="1" C="97">
                <D1>V0200</D1>
                <D2>V0001,V0204,V2020</D2>
</S09>
        </Cnt>
    </Cnc>
</Report>
```

*D1= Former application firmware version
*D2

- First position: Active core firmware version
- Second position: Active application firmware version
- Third position: Active communication module firmware version

For the case of DTC firmware event:

```
<Report IdRpt="S17" IdPet="0" Version="3.4_EDP_2.0">
.<Cnc Id="ABC57C4730016">
..<S17 Fh="20110606073726000S" Et="1" C="27">
...<D1>Old_FW</D1>
...<D2>New_FW</D2>
..</S17>
.</Cnc>
</Report>
```

20.4. Synchronization event logs.

```
<Report IdRpt="S09" IdPet="0" Version="3.4_EDP_2.0">
    <Cnc Id="ABC0000000003">
        <Cnt Id="XYZ0034616943">
            <S09 Fh="20101116150930000W " Et="1" C="98">
                <D1>20101116151022000W </D1>
</S09>
        </Cnt>
    </Cnc>
</Report>
```

*D1= Former clock time

20.5. Finished Quality event logs (Qualidade de Serviço).

```
<Report IdRpt="S09" IdPet="0" Version="3.4_EDP_2.0">
    <Cnc Id="ABC0000000003">
        <Cnt Id="XYZ0034616943">
            <S09 Fh="20101116150930000W " Et="3" C="13">
                <D1>20101116101022000W </D1>
</S09>
        </Cnt>
    </Cnc>
</Report>
```

*D1= QoS Event start – Timestamp

20.6. Demand side management event log

```
<Report IdRpt="S09" IdPet="0" Version="3.4_EDP_2.0">
    <Cnc Id="ABC0000000003">
        <Cnt Id="XYZ0034616943">
            <S09 Fh="20101116150930000W " Et="5" C="13">
                <D1>6900 </D1>
            </S09>
        </Cnt>
    </Cnc>
</Report>
```

*D1= Current Aparent Power Threshold

20.7. DTC order errors

```
<Report IdRpt="S17" IdPet="0" Version="3.4_EDP_2.0">
.<Cnc Id="ABC57C4730016">
..<S17 Fh="20110606073726000S" Et="1" C="27">
...<D1>Old_FW</D1>
...<D2>New_FW</D2>
..</S17>
.</Cnc>
</Report>
```