Release Notes DSMR V4.0.6

Dutch Smart Meter Requirements

By order of:	**Netbeheer Nederland**
Date:	**September 01st, 2013**
Version:	**4.0.6**
Status:	**Final**

Change summary

Version	Change
4.0	Initial version of the release notes for the DSMR 4.0
4.0.1	First update of the release notes for the DSMR 4.0
4.0.2	Second update of the release notes for the DSMR 4.0
4.0.3	Third update of the release notes for the DSMR 4.0
4.0.4	Forth update of the release notes for the DSMR 4.0
4.0.5	Fifth update of the release notes for the DSMR 4.0
4.0.6	Sixth update of the release notes for the DSMR 4.0

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1 INTRODUCTION

This document describes the changes incorporated in the Dutch Smart Meter Requirements version v4.0.6 compared to the previous version of the DSMR (v4.0.5). The intention of this document is to make the changes in the various DSMR documents more transparent for the readers.

1.1 Normative references

The following standards are referred to in document. For undated references the latest edition applies.

Ref No	Document	Description
1.	NTA 8130 NL:2007	Netherlands Technical Agreement -"Minimum set of functions for metering of electricity, gas and thermal energy for domestic customers"
2.	Dutch Smart Meter Requirements v4.0.6 final Main	The main document of the Dutch Smart Meter Requirements, containing all definitions and most of the use cases and requirements
3.	Dutch Smart Meter Requirements v4.0.6 final P1	Companion standard P1
4.	Dutch Smart Meter Requirements v4.0.6 final P2	Companion standard P2
5.	Dutch Smart Meter Requirements v4.0.6 final P3	Companion standard P3
6.	Dutch Smart Meter Requirements v4.0.6 final GPRS	Additional document describing the requirements for the GPRS infrastructure as part of the Dutch Smart Meter Specification.

2 DSMR V4.0.6 MAIN CHANGES

This section lists all the changes incorporated in the Dutch Smart Meter Requirements v4.0.6 Final Main document. Minor editorial corrections are not listed.

1. In section 2.1 updated the definition of Installation mode

Installation mode	When in installation mode, the ~~wired~~ E-meter scans for physically wired connected M-Bus devices, the ~~wireless~~ E-meter accepts and processes installation mode requests from wireless M-Bus devices.

2. In section 2.3.1 updated the definition of Register value

Register value	In case of a periodic meter read or an actual meter read: - The register value is the value of the (periodic or actual) meter reading. In case of an interval meter read: - The register value contains 960 values of the 15 minutes interval data.

3. In section 2.3.2 updated the definition of Register value

Register value	In case of a periodic meter read or an actual meter read: - The register value is the last available ~~value of the (periodic or actual~~ meter reading. In case of an interval meter read: - The register value contains 240 values of the hourly interval data.

4. In section 2.4 added a new definition:

Installation mode	Installation mode is the state of the E and G-meter where it is possible to bind a G-meter to an E-meter.	

5. In section 2.5.1.1 updated the value “Changeable by GO” for the following items

Duration of voltage swells	Definition of voltage swell in terms of duration, cf. use case “Provide power quality information”.	Yes	~~No~~Yes
Threshold for voltage swells	Definition of voltage swell in terms of threshold, cf. use case “Provide power quality information”.	Yes	~~No~~Yes
Duration of voltage sags	Definition of voltage sag in terms of duration, cf. use case “Provide power quality information”.	Yes	~~No~~Yes
Threshold for voltage sags	Definition of voltage sag in terms of threshold, cf. use case “Provide power quality information”.	Yes	~~No~~Yes
Discover on open cover	Indicates whether the M-Bus discovery process is automatically started when the cover is opened	Yes	~~No~~Yes
Discover on power	Indicates whether the M-Bus discovery pro-	Yes	~~No~~Yes

on	cess is automatically started when the power of the E meter is switched on		
Dynamic M-Bus address	Indicates whether M-Bus devices that are installed have their address initially configured as 0 or as a predefined value	Yes	~~No~~Yes
Send commissioning notification	Indicates whether an alarm should be raised when a new M-Bus device is discovers	Yes	~~No~~Yes
Allow local disconnect	Indicates whether the electricity meter can be switched off locally.	Yes	~~No~~Yes
HLS 3 and 4 enabled on P3	Indicates which security levels are enabled on the P3 port	Yes	~~No~~Yes
IP message content	A configurable attribute that contains contents of the IP message send when a PDP context is established.	Yes	~~No~~Yes
IP message target address	A configurable attribute that defines the address of the receiver of the IP message, which is send after establishing PDP context	Yes	~~No~~Yes
GPRS operation mode	Defines the GPRS operation mode: always on, external trigger or internal trigger	Yes	~~No~~Yes
PPP set up	Defines username and password for GPRS connectivity	Yes	~~No~~Yes
Encryption key	The key used to encrypt / decrypt messages	~~No~~Yes	~~Yes~~

6. In section 2.5.1. update the definition of duration of short power outage

Duration ~~short~~long power outage	Definition of ~~short~~long power outage (upper bound for duration), cf. use case “Provide power information”.	Yes	No

7. In section 2.5.1.1 updated the definition of maximum time adjustment:

Maximum time adjustment	Definition of time adjustment allowed without ~~raising~~generating an ~~alarm~~ event, cf. use case “Synchronise time E-equipment”.	Yes	No

8. In section 2.5.1.1 updated the definition of Administrative in/out on P3

Administrative in/out on P3	Indicates whether the meter ~~can~~will be read out via P3	No	Yes

9. In section 2.5.1.2 removed the definition for Daylight savings

Daylight savings	Indication if the clock in the meter has applied daylight savings time (DST) or standard time.	Yes	Yes

10. In section 2.5.1.2 updated the value for “Initially filled by manufacturer” of the following

Encryption key	The key used to encrypt / decrypt messages	~~No~~Depending on GO	Yes

11. In section 2.6 updated the definition for Interval values G

Interval values G	The interval values (register readings) for G shall contain the following information: ▪ Time stamp of the interval values; ▪ G status ▪ Interval values specified in m^3 (two or three decimals); ~~▪ Indication if interval value is converted for temperature (yes/no)~~ The interval has been chosen to be 60 minutes. In Annex A of the P3 document the minimal numbers of digits used throughout the whole metering chain are shown.

12. Updated requirement DSMR-M 4.3.4

Description	The vendor of equipment has to meet the requirements for life time expectancy.						
Rationale	The minimum life time expectancy must be 20 years						
Fit criterion	Suppliers should clearly show the expected life time of their products. The minimum technical lifetime for all the components of E and G meters is 20 years without maintenance or replacement of the battery. Life time expectancy of the battery of the G meter is calculated using the following conditions: ▪ ~~Continuously visible display information~~The use of the display ▪ Hourly communication between G meter and E meter ▪ Valve operation 10 times a year. ▪ Yearly update of software (if applicable) ▪ Normal operation of the meter under normal operating conditions Reliability predictions must be done as described in IEC 62059-41. Estimation of the product life time must be done as described in IEC 62059-31-1. For FMEA calculations MIL-HDBK-217 (Electronic Reliability Design handbook) must be used. The results shall be clearly documented and must be available for the grid operator or an external party representing the grid operator.						
History	Dec. 2008	**Origin**	TST	**Port**	n.a.	**Applicable**	E meter, G meter, Comm. unit

13. Updated requirement DSMR-M 4.3.14:

Description	The design of the devices must take in account that the security functionality is future proof.
Rationale	In the design of devices (i.e. processing power, memory) consideration must be given to the following possible changes. ○ Asymmetric security algorithms ○ Key size ○ Key generation in the meter ○ Authentication on P2 ○ Firmware upgrade of M-Bus devices ○ Signed measurements ○ Up to 16 energy registers for E meters, 2 register for G meters (including storage) ○ Extend the number of M-Bus devices
Fit criterion	The design of the device allows the mentioned future changes.

History	Jan. 2011	Origin	P&S 1.5	Port	~~P2~~, P3	Applicable	E meter~~, G meter~~

14. Updated requirement DSMR-M 4.3.22:

Description	Service mode of the display is activated when the terminal cover is removed.						
Rationale	During installation (while the terminal cover is removed) most detailed information is needed for a quick installation, trouble shooting and testing.						
Fit criterion	Service mode of the display is activated when the terminal cover is removed. In service mode the next information should be visible: ▪ Actual date and time ▪ The register values for all tariffs in both energy directions in Wh resolution ▪ ID's of connected M-Bus devices ▪ Version of Legally Relevant and Non Legally Relevant Software ▪ Active instantaneous power per phase for both energy directions. During installation of M-Bus devices, if there are more than 10 devices available to choose from, at least 10 device ID's must be shown. Every time a button is pressed, a new item is shown. When the terminal cover is installed the display changes to auto scroll mode. The values are displayed simultaneously with the relevant reduced OBIS codes (value group C,D,E i.e.1.8.1) whenever the second display row is not occupied for other specified information..						
History	Apr. 2011	**Origin**	TST	**Port**	n.a.	**Applicable**	E meter

15. From requirement DSMR-M 4.3.40 removed incorrect reference to standard:

Description	The E breaker shall be able to perform a sufficient number of (dis)connections during its lifecycle without any maintenance and failures.
Rationale	As maintenance on equipment is expensive, planned maintenance has to be reduced to nil under circumstances of normal usage. In normal usage also short circuit currents can occur, therefore the equipment must: ▪ Withstand minimal conditions without being damaged ▪ Withstand minimal conditions without causing damage or danger to its direct environment ▪ Endurance 1: the meter shall be capable of at least 3000 operation cycles at 80 Ampère at PF1 ▪ Endurance 2: In addition to "Endurance 1" , the meter shall be capable of at least 2000 operation cycles at 80 Ampère at PF0.5
Fit criterion	The Circuit Breaker in the E meter must comply with the following criteria from IEC 62055-31 Annex C ▪ C5: Fault Current making capacity at UC2 level (2,5 kA) ▪ C6: Short-circuit current carrying capacity at UC2 level (2,5 kA) ○ Test 2 : at UC2 level (2,5 kA) ○ Test 1 : at UC3 level (6 kA) ▪ C8: Dielectric strength The Circuit Breaker in the E meter must meet the following endurance requirements, derived from IEC 62055-31 Annex C/C3:

	- 3000 operation cycles at 80 Ampère, PF1. - 2000 operation cycles at 80 Ampère, PF 0,5 inductive In domestic installations the circuit-breaker will be protected by a protection device. In combination with a protection device the circuit-breaker must be able to withstand short circuits of 10 kA according the following conditions: ▪ Prospected Short-circuit current: 10 kA; U= 230VAC: PF0,5 ~~(acc. IEC 61008-1, table 16)~~ ▪ Meter circuit protected by an electromechanical protection relay 80 A ▪ A short circuit connection: 2 * 0,5 m; 16 mm^2 ▪ 5 tests short-circuit carrying and 5 tests short circuit making capacity						
History	Nov. 2007	**Origin**	NTA	**Port**	n.a.	**Applicable**	E meter

16. Updated requirement 4.3.52

Description	G meters ~~that also convert the volume to m_n^3~~ shall comply with the latest release of EN 12405						
Rationale	In the standards for measuring volume conversion is not included. G-meters that convert the volume to m_n^3 shall comply with the latest release of EN 12405						
Fit criterion	The vendor shall supply a certificate from a notified body for the metering instrument stating that it complies with the latest release of EN 12405						
History	Sep. 2009	**Origin**	TST	**Port**	n.a.	**Applicable**	G meter

17. Updated requirement DSMR-M 4.3.65

Description	Gas meters shall comply with Nederlandse Praktijk Richtlijn (NPR) 7028.						
Rationale	NPR 7028 contains the Dutch standards for diaphragm meters but is also considered applicable for ultrasonic gas meters. This standard contains some requirements (mainly about dimensions and connections) which are not described in EN 1359.						
Fit criterion	G meters shall comply with the requirements for connections and dimensions in NPR 7028. In contradiction to NPR 7028; for G25 gasmeter the maximim width of the gasmeter is 540 mm						
History	Nov. 2007	**Origin**	TST	**Port**	n.a.	**Applicable**	G meter

18. From requirement DSMR-M 4.4.6 removed the term password:

Description	The equipment shall provide functionality for authentication on the communication ports P0 and P3.						
Rationale	For security reasons it is important that equipment is able to determine authenticity of communication partners to ensure that data is not modified or compromised by any unauthorized entity.						
Fit criterion	No port can be accessed without correct authentication~~, either by using a unique log-in/password-combination or~~ by applying an encryption algorithm that includes authentication mechanisms.						
History	Nov. 2007	**Origin**	P&S 1.5	**Port**	P0, P3	**Applicable**	E meter

19. Updated requirement DSMR-M 4.4.11:

Description	All communications interfaces shall only support DSMR specified functionality. All other functionality on the communication interfaces shall be disabled. This also is applicable for the developer interface (e.g. JTAG).						
Rationale	It is important that the equipment does not respond to and is not adversely affected by communications using protocols and functionality other than those required for communications with other metering infrastructure equipment.						
Fit criterion	All communications interfaces shall only support DSMR specified functionality. All other functionality on the communication interfaces shall be disabled (read and write). This also is applicable for the developer interface (e.g. JTAG).						
History	July. 2009	**Origin**	P&S 1.5	**Port**	P0, P2 P3	**Applicable**	E meter, G meter

20. Updated requirement DSMR-M 4.4.12

Description	Interfaces shall not accept unauthorized or erroneous communications and are capable of handling (dropping) such communication (including TCP) without adverse effects on the operation of the equipment or the interface.						
Rationale	It is important that the interfaces do not accept unauthorized or erroneous communications and are capable of handling (dropping) such communication (including TCP) without adverse effects on the operation of the equipment or the interface.						
Fit criterion	Interfaces shall not accept unauthorized or erroneous communication and unauthorised communications will not adversely affect the operation of the remainder of the equipment.						
History	July. 2009	**Origin**	P&S 1.5	**Port**	P0, P2 P3	**Applicable**	E meter, G meter

21. From requirement DSMR-M 4.4.24 removed the term password:

Description	All communication pertaining to privacy sensitive data shall be secured so that integrity, authenticity, confidentiality and uniqueness are guaranteed.
Rationale	Privacy sensitive data shall be protected at all times
Fit criterion	○ No common secrets (including cryptographic keys ~~and passwords~~) shall be present in smart meters. Thus, each smart meter shall have its own unique meter master key. ○ The meter master ~~secret~~ and encryption keys shall be stored on meters in a secure manner which resists attempts to discover them. ~~○ The administrative password(s) on meters shall be stored in a secure manner which resists unauthorized attempts to access them.~~ ○ The message encryption key and message authentication key shall be updated using the meter master key with a secure key wrapping function. ○ The message encryption key and authentication key shall be unique per meter and shall be stored in a secure manner that resists attempts to discover them. ○ All cryptographic keys and random data involved in any cryptographic operation shall be cryptographically random. ○ Software which implements the security functions (e.g., authentication handshake protocol, message encryption/decryption, access control, etc) shall be protected from unauthorized access and modification. ○ Smart meter software for the E meter shall be renewable/updatable in case

	that a security compromise or a security vulnerability is found or there is a need to update meter functionality including cryptographic algorithm update. ○ Smart meter software for the E meter (as a whole or only a module) shall be updated in a secure manner that only authorized software can be loaded into the meter.						
History	Dec. 2010	**Origin**	P&S 1.5	**Port**	n.a.	**Applicable**	E meter, G meter

22. Updated requirement DSMR-M 4.5.24

Description	G meters ~~with a clock~~ shall register the last hourly meter reading.						
Rationale	Interval values are useful for both grid operator and supplier. The grid operator can use the interval values for fraud detection; the supplier can use the interval values for energy advises to customers or for analysis of consumption patterns. The G meter interval values will be stored in the E meter.						
Fit criterion	The G meter shall register a meter reading (as defined in Chapter 2) each whole hour (xx:00) ~~when the G meter has an internal clock. For clock-less G meters the E meter is responsible to register the G meter reading at the whole hour (xx:00).~~						
History	Nov. 2007	**Origin**	NTA 8130 ((§5.2.6)	**Port**	n.a.	**Applicable**	G meter, E meter

23. In section 5.9 updated the sentence:
    The metering installation must be able to register at least the last ~~1~~30 fraud attempts.

24. In section 5.11 updated the Post-conditions for Apply Treshold:
    P*ost-conditions for Apply Threshold*
    - The E meter disconnects if the threshold is exceeded;
    - Disconnect information is logged and an ~~alarm~~ event is ~~raised~~generated (if configured).

25. In section 5.11.2 updated the Post-conditions for Activate Code red
    Post-conditions for Activate Code red
    - The E meter uses the Code Red Threshold register in the defined time period, for monitoring the power.
    - The E meter uses the normal operational Threshold register outside the defined time period, for monitoring the power.
    - The E meter disconnects when the code red threshold is exceeded.
    - Disconnect information is logged and an ~~alarm~~ event is ~~raised~~ generated (if configured).

26. Updated requirement DSMR-M 4.5.68:

Description	The G equipment shall provide functionality to remotely (dis)connect the supply of gas automatically after such a command has been received.
Rationale	The market dynamics require a means to (dis)connect a customer. Market dynamics include: non-payment, change of supplier, removal, etc.
Fit criterion	The customer does not receive any gas after a disconnect. The supply of gas is started

	after a connect in case the connect can be handled safely. ~~A disconnect is always preceded by a meter read from the CS.~~						
History	Nov. 2007	**Origin**	NTA 8130 ((§5.3.1.2.1)	**Port**	P2	**Applicable**	G meter

27. Updated requirement DSMR-M 4.5.73:

Description	The E meter shall issue a logical error in case the date of the requested connect or (dis)connect cannot be applied at the designated date~~., or the timestamp is more then 24 hours in the past.~~						
Rationale	In the function call to connect or disconnect the meter, one parameter is given to identify the date of (dis)connect. If the equipment could not apply the (dis)connect (e.g. because the date was in the past~~, or the command was given more then 24 hours in the past~~) a logical error is issued. Note that in case of power down, the (dis)connect is applied at power up.						
Fit criterion	The E meter shall issue a logical error in case the date of the requested connect or (dis)connect cannot be applied at the designated date.~~, or the timestamp is more then 24 hours in the past..~~						
History	Nov. 2007	**Origin**	TST	**Port**	n.a.	**Applicable**	E meter

28. Removed requirement DSMR-M 4.5.84

Description	The E meter shall log all Set Tariff Shift Time requests.						
Rationale	It is important to have the means to verify when and which tariff is used and what the meter register values were.						
Fit criterion	The E meter shall log if a change of Tariff Shift Times has occurred.						
History	Sep. 2009	**Origin**	TST	**Port**	P3	**Applicable**	E meter

29. Update requirement DSMR-M 4.5.85

Description	The E meter shall log info when the new Tariff Shift Time is applied.						
Rationale	It is important to have the means to verify when and which tariff is used and what the meter register values were.						
Fit criterion	The E meter shall log info when the new Tariff Shift Time is applied. The following info is logged: ▪ Activation date and time ▪ Event 9 and/or 19 will be used						
History	Sep. 2009	**Origin**	TST	**Port**	P3	**Applicable**	E meter

30. From requirement DSMR-M 4.6.24 removed G-meter from Applicable field:

Description	The vendor of the M&S equipment shall deliver an integrated software package that supports adjusting the pre-configuration of the M&S equipment **and** setting the operational parameters for all the M&S equipment.
Rationale	Although the vendor will pre-configure the meters according to the specifications of the GO, the GO needs a facility to modify the pre-configuration. The configuration process by the GO does not apply to the communication facilities used during the operational phase of the equipment (i.e. P3), but utilizes a local tool and port (i.e.

	P0).						
Fit criterion	The tool provided by the M&S equipment vendor shall support the adjustment of pre-configuration functionality and setting operational parameters for all M&S equipment as described in 'Use case: Adjust equipment'						
History	Nov. 2007	**Origin**	TST	**Port**	P0	**Applicable**	E meter~~, G meter~~

31. Removed requirement DSMR-M 4.6.41

Description	A metering instrument shall provide functionality to set the 'function location' using a correct EAN code before the instrument is deployed.						
Rationale	GO's will specify the function location by means of the EAN code of the connection. The EAN code shall comply with the rules for EAN codes.						
Fit criterion	The meter will provide facilities to record a correct 18 digit EAN code.						
History	Nov. 2007	**Origin**	I&M	**Port**	P0, P3	**Applicable**	E meter

32. From requirement DSMR-M 4.6.51 removed the term password and add clarification about restoring the original key

Description	The M&S equipment shall provide functionality to overwrite user meter data (only the data that is allowed according to the MID*)*, keys~~, passwords~~ and personal details (including interval values) with zero's (0) after the equipment is physically un-installed. Overwriting this data shall not affect the metrological part of the instruments in any way. Keys should be reset to their original value (as listed in the original shipmentfile)						
Rationale	The GO can decide that equipment shall be re-used after it is un-installed. For this purpose the equipment shall provide functionality to overwrite user meter data (only the data that is allowed according to the MID), keys~~, passwords~~ and personal details (including interval values) with zero's (0). According to European law and legislation it is not allowed to change the metrological characteristics or functionality in metering instruments. By following Welmec 7.2 Issue 4 (Software Guide – measuring Instruments Directive 2004/22/EC –) a compliancy with the software-related requirements contained in the MID can be assumed.						
Fit criterion	Functionality to overwrite user meter data (only the data that is allowed according to the MID), keys~~, passwords~~ and personal details (including interval values) with zero's (0) is provided using the defined security mechanism. Keys should be reset to their original value (as listed in the original shipmentfile)						
History	Nov. 2007	**Origin**	I&M	**Port**	n.a.	**Applicable**	E meter, G meter

3 DSMR V4.0.6 P1 CHANGES

This section lists all the changes incorporated in the Dutch Smart Meter Requirements v4.0.6 Final P1 document. Minor editorial corrections are not listed.

1. In section 5.12, table 5-3 corrected value format for Power Failure Event Log:

Power Failure Event Log (long power failures)	1-0:99.97.0.255	2 Buffer	7 Profile Generic	TST, F10(0,0) - tag 6 Format applicable for the value within the log (OBIS code ~~1~~ 0-0:96.7.19.255)	Timestamp (end of failure) –duration in seconds

2. In section 5.13 corrected OBIS code:

1-0:99.97.0(2)(~~1~~0-0:96.7.19)(101208152415W)(0000000240*s)(101208151004W)(0000000301*s)

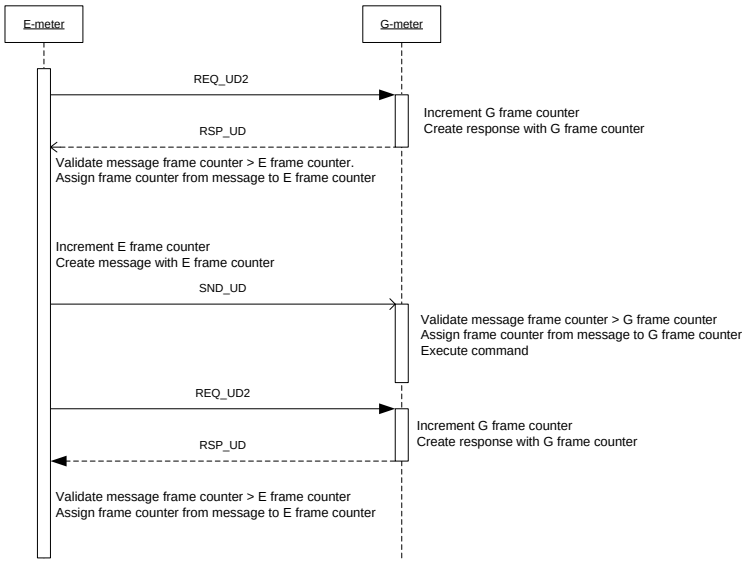
4 DSMR V4.0.6 P2 CHANGES

This section lists all the changes incorporated in the Dutch Smart Meter Requirements v4.0.6 Final P1 document. Minor editorial corrections are not listed.

1. In section 5.2 updated part of text:
   The receiver of a message, either the E-meter or the M-Bus device, shall check the validity of the frame counter.
   The encrypted message is validated as follows:
   1. the received frame counter must be higher than the previously validated frame counter;
   2. the received message is encrypted and received correctly, i.e. checksum and other M-Bus fields are correct;
   3. the message is decrypted correctly, i.e. the integrity field (two filler bytes) is present.

   Only encrypted messages that conform to this validation rule shall be accepted by the receiving device. Unencrypted messages and messages that use encryption code 0 will not contain frame counters.
   After this validation of an encrypted message, the received frame counter is stored as validated frame counter and is ready for the next usage, either sending or receiving a new message.
   When the device sends a new message, the frame counter is incremented by the sender exactly 1 (one).

2. In section 5.2 updated figure 4



3. In section 6 added the following text:
   Filler bytes (DIF=2Fh) may be used in unencrypted variable datablocks and must be used in encrypted variable datablocks.

4. In section 6.1 updated the first sentence:
   M-Bus devices can transfer either actual~~, "real-time",~~ values or hourly values. ~~Real Time values are sent on request only.~~

5. Update section 6.2.1
   If the M-Bus device has an internal clock it should be synchronised by the master system. Synchronisation is done:
   - At every time change of the Bus Master
   - Every day to ensure a maximum deviation below 60 seconds.

   The maximum allowed clock deviation between E-meter and M-Bus device is 60 seconds. If the M-Bus device receives a new system time through the Set Date and Time mechanism then it verifies the difference between the new time and the old M-Bus Device system time. If the difference is more than 60 seconds then a "Clock synchronization error" is set The M-Bus device will always set its system time to the time received in the synchronisation message. The time used in the P2 messages is UTC. Format Type I specified in prEN 13757-3 is intended for local time but in this companion standard it shall be used for UTC[5]

   The time is set using the following message with the special CI-code:

Field	Hex	Remark
	2Fh, 2Fh	Filler bytes
TC	00h	Set time
	xxh, xxh, xxh, xxh, xxh, xxh	New time in Format I (but used for UTC; see remark)
	00h,00h,00h	Reserved
	2Fh, 2Fh, 2Fh, 2Fh	Filler bytes

   When the User key is set (non zero value), this command can only be send encrypted. If the User key is not set, this command can be send unencrypted.

[5] The fields "Second", "Minute", "Hour", "Day", "Month", "Year", "Day of Week", "Week", "Leap year" shall contain the UTC time. The fields "Time during daylight saving" and "Daylight saving deviation" shall not be used and coded as "0". Example: UTC time 16 July 2013; 13:00 shall be coded as "Second=0", "Minute=0", "Hour=13", "Day=16", "Month=7", "Year=13", "Day of Week=2", "Week=0", "Leap year=0", "Time during daylight saving=0" and "Daylight saving deviation=0". M-Bus devices shall ignore the fields "Time during daylight saving" and "Daylight saving deviation".

6. In section 6.3 updated the following section:
   All M-Bus devices ~~with a clock~~ transfer the last known hourly value (Storage Number bit in DIF field is set) and a time stamp indicating the time of the meter reading value.
   - 6.4.3 Time stamp

   ~~M-Bus devices without a clock shall transfer the actual value and may omit the time stamp.~~

7. In section 6.3.1 added a specification for retries:
   When changing the readout list does not succeed the first time, a maximum of 2 retries should be performed.

8. In section 6.4 added the following sentence:
   Variable data blocks containing measurement data shall be handled by the E-meter (even when unencrypted) to be able to provide data for the P1 port.

9. In section 6.4.3 updated the text:
   M-Bus devices ~~can~~ transfer either actual~~, "real time",~~ values or hourly values. ~~If a clock is present~~, either value will be accompanied with a time stamp of the moment the value is determined. The Storage Number bit in the DIF block of the time stamp signifies the hourly value. The time stamp is UTC and sent in Format I.

   ~~M-Bus devices without a clock shall transfer the actual value and may omit the time stamp.~~

10. In section 6.4.4 updated the text:
    ~~Actual~~ Gas Meter specific data blocks contain the Meter Reading temperature converted Volume~~,~~. The storage bit should be set for hourly values ~~("real time" values shall clear the storage bit).~~ For Gas Meters G10-G25 the display is in 10 Litre resolution, therefore separate VIFs are necessary.
    For G4-G6:

Field	Hex	Remark
DIF	4Ch	8 digit BCD (Storage bit is set for hourly values)
VIF	13h	Multiplier 0,001; unit m³
	43h	~~Actual t~~Temperature converted reading, e.g. 31412,743 m³
	27h	
	41h	
	31h	

    For G10-G25:

Field	Hex	Remark
DIF	4Ch	8 digit BCD (Storage bit is set for hourly values)
VIF	14h	Multiplier 0,01; unit m³
	43h	~~Actual t~~Temperature converted reading, e.g. 314127,43 m³
	27h	

	41h	
	31h	

11. In section 6.4.6 updated the text:

To differentiate between Heat and Cooling values the Device Unit in the DIFE field is used. For Cooling values the Device bit is set to TRUE. For Heat values the DIFE field is omitted or the Device bit in the DIFE is set to FALSE.

~~Actual m~~Meter reading energy Heat ~~("real time" values shown)~~

~~Note 1:~~ ~~Storage bit should be set for hourly values.~~

Field	Hex	Remark
DIF	04Ch	8 digit BCD (Storage bit is set for hourly values)
VIF	0Fh	Multiplier 0,01 ; unit GJ
	27h	~~Actual~~ Meter reading, e.g. 03141,27 GJ
	41h	
	31h	
	00h	

~~Actual m~~Meter reading energy Cold

~~Note 2:~~ ~~Storage bit should be set for hourly values~~

Field	Hex	Remark
DIF	~~8~~CCh	8 digit BCD (Storage bit is set for hourly values)
DIFE	40h	Cooling unit
VIF	0Fh	Multiplier 0,01 ; unit GJ
	27h	~~Actual~~ Meter reading, e.g. 03141,27 GJ
	41h	
	31h	
	00h	

~~Actual~~ Meter Reading Volume

~~Note 3:~~ ~~Storage bit should be set for hourly values~~

Field	Hex	Remark
DIF	04Ch	8 digit BCD (Storage bit is set for hourly values)
VIF	13h	Multiplier 0,001; unit m³
	74h	~~Actual~~ Meter reading, e.g. 02440,474m³
	04h	
	44h	
	02h	

12. In section 6.4.7 updated the text:

~~Actual~~ Meter Reading Volume~~("real time" values shown)~~

~~Note 4:~~ ~~Storage bit should be set for hourly values.~~

Field	Hex	Remark
DIF	04Ch	8 digit BCD (Storage bit is set for hourly values)
VIF	134~~4~~h	Multiplier 0,001; unit m³

	74h	~~Actual~~ Meter reading, e.g. 03141,274 m³
	12h	
	14h	
	03h	

13. In section 6.4.8 updated the text:

~~Actual~~ Meter Reading ~~("real time" values shown)~~

~~Note 5:~~ ~~Storage bit should be set for hourly values.~~

Field	Hex	Remark
DIF	04Ch	8 digit BCD (Storage bit is set for hourly values)
VIF	03h	Multiplier 1; unit Wh
	74h	~~Actual~~ Meter reading, e.g. 03141274 Wh
	12h	
	14h	
	03h	

14. Reworked section 8:

8. Installation procedures

8.1 General installation procedures

During installation the M-Bus devices will be registered by the E-meter.

Removal of the M-Bus cover at the E-meter or a power-up of the E-meter are possible triggers to set the E-meter in Installation mode.
When in installation mode the E-meter:

- the E-meter scans for physically connected wired M-Bus devices and accepts and processes installation mode requests (SND_IR) from wireless M-Bus devices.
- at least the last 7 digits of the meter number (equipment identifier) of all wireless M-Bus devices found will be shown on the display of the E-meter.
- If a new device is detected it must be added to the list of detected device ID's
- By pressing the button at least 2 seconds a selection is made and the binding process is started.

When the M-Bus cover at the E-meter is replaced, the E-meter exits Installation mode.

After the M-Bus devices are registered in the E-meter and M-Bus devices are in Customer mode, several administrative tasks shall be executed. The User keys need to be transferred before the readout list is changed. The readout list is changed to read out the firmware and hardware versions and the meter configuration data during the installation procedure. The standard readout list is activated by sending a SND_NKE.

For identification of the M-Bus devices in the E-meter as well as in the back office, the Short ID shall be used. The back office maps the Short ID to other identifiers like the Equipment Identifier, if needed.

8.2 M-Bus Device State

M-Bus devices can be in one of four states:

- Storage mode: the wireless M-Bus interface is inactive.
- Installation mode: In installation mode, wired M-Bus devices accept settings from the E-meter; wireless M-Bus devices will broadcast requests so that an E-meter can register it.
- Customer mode: after a wired M-Bus device receives an M-Bus address and after a wireless M-Bus device receives its CNF_IR, it will start normal operation in Customer mode as described elsewhere in this document.
- Test mode: a vendor specific mode; not in the scope of this document.

8.3 Wired configurations

8.3.1 Scan for new M-Bus devices

The E-Meter will maintain a list of device addresses, in the range 1 to 250, of all devices it is connected to, through a wired connection. Note that only four M-Bus devices can be connected, either wired or wireless. While in installation mode, the E-meter will continuously scan for devices on the wired M-Bus. All responding devices will be registered in the list. This scan will be suspended for any other data transfer. The scan and the installation mode will be terminated if four devices are registered, after the M-Bus cover is replaced or 1 hour after the scan was triggered by a power-up of the E-meter or removal of the M-bus cover. The E-meter will support two types of addresses to discover newly installed M-Bus devices:

- Devices with address 0

  Address 0 is reserved for unconfigured M-Bus devices. Each unconfigured M-Bus device shall accept and answer all communication to this address (ref EN 13757-2 section 5.7.5 and this companion standard section 4.3.1).
  The E-meter will select an unused device address and set the new M-Bus device's address to that using the procedure in 6.3.2.

- Devices with unregistered address

  The E-meter will scan all unused addresses once per minute following the procedure outlined in EN 13757-3 section 11.5. Note that there is only one baud rate allowed and that secondary addresses are not used.

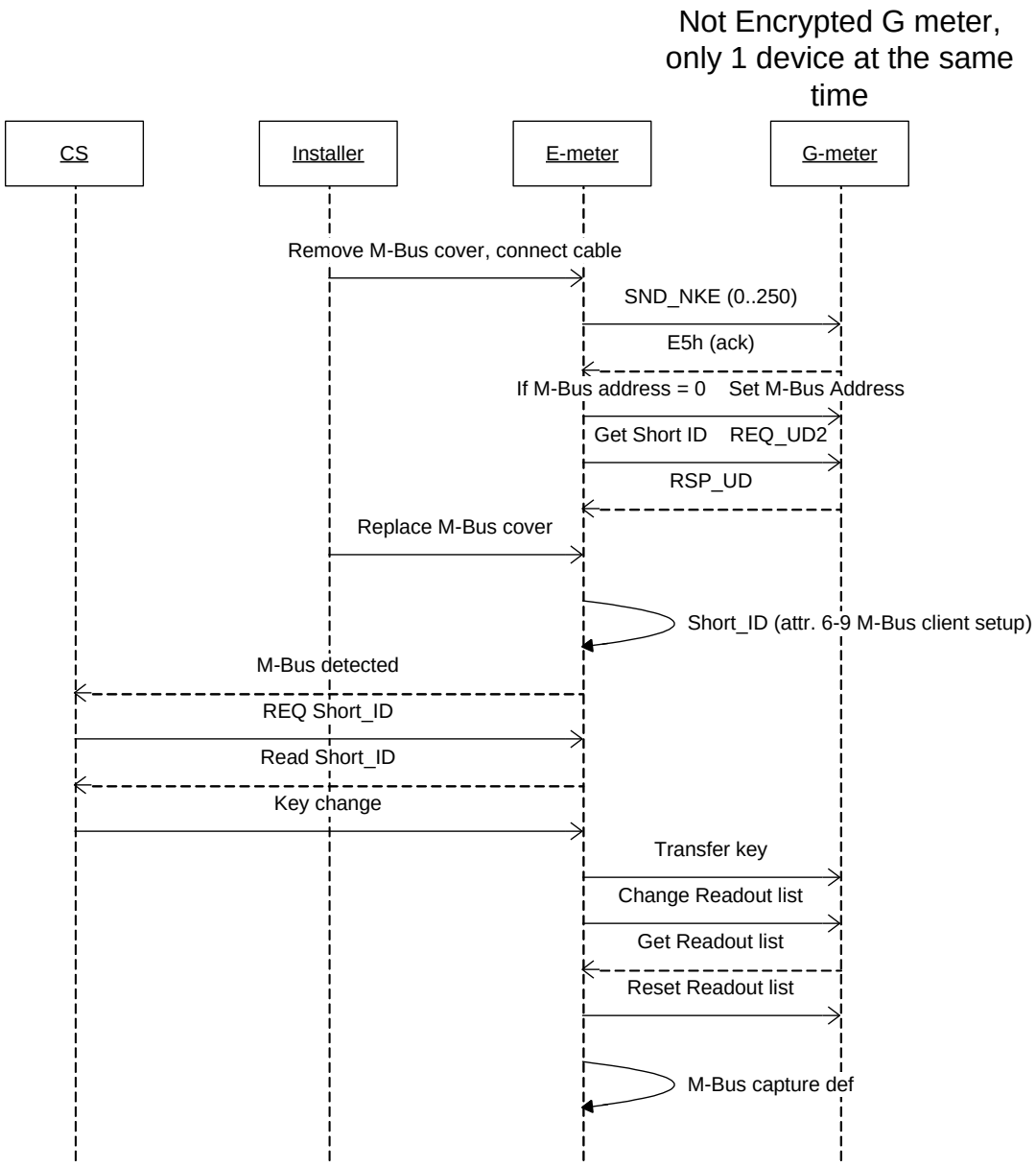


Figure 6: Example wired installation with unencrypted gasmeter.

Figure 6 describes how an installer manually starts the M-bus installation process by removing the M-bus cover on the E-meter to start the installation mode on the E-meter. The gasmeter is delivered without an User-key. In this example actions like time-synchronisation and exchange of unencrypted data is not included.

8.3.1.1 Remote wired M-Bus binding via CS by writing attributes of the M-Bus Client Setup Object

This scenario handles the process of binding a preconfigured wired G-meter (in general a M-Bus device) to an E-meter which is not bound yet to this M-Bus device and has not automatically scanned (or not successfully scanned) for these M-Bus devices.

Trigger	Description
Exchange M&S equipment	During installation of the M&S equipment, the normal (wired) M-Bus scan process is not executed, e.g. power off during installation and "discover_on_power_on" is disabled. The wired M-Bus device has already a non-zero primary address, for instance from a previous installation. This situation may occur for an existing installation where the E-meter is replaced, or where a preconfigured G-meter is installed.
Corrective action by Operations	For refreshing settings in the CS or M&S equipment, Operations remotely de-installs and reinstalls the M-Bus device.

Figure 7 shows the scenario in high-level steps. Either the E-meter or the G-meter is placed or exchanged and the local binding was, purposely or accidentally, not executed.

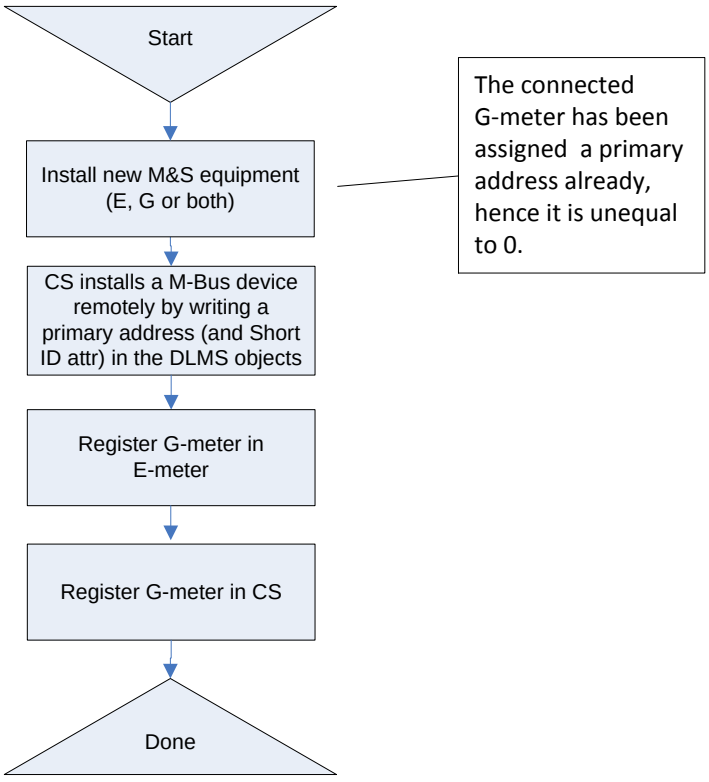


Figure 7: Wired: Configuring DLMS M-Bus attributes in E-meter

Pre-conditions

- The E-meter is not bound to the physically connected M-Bus device;
- The M-Bus device is preconfigured with a non-zero primary address.

Parameters

- DLMS M-Bus Client Setup (Class ID: 72) in the E-meter, specifically primary_address and Short ID attributes;
- Primary address of M-Bus device itself, already assigned and known in the CS.

Post-conditions

- Binding of E-meter and wired M-Bus device;
- Logging of the event ‘M-Bus device detected’.

Assumptions

- After transferring the keys by the CS, the E-meter shall autonomically set the capture definition, change and get the read-out list and set the clock.

Reference

- DLMS Blue Book
  This scenario is an implementation (of which variations are possible, see also text in the figure) of the requirement for attribute 5, primary_address, at section 4.7.2.

The sequence diagram is shown in Figure 8:

Scenario 2.1: Binding of wired M-Bus with M-Bus attributes

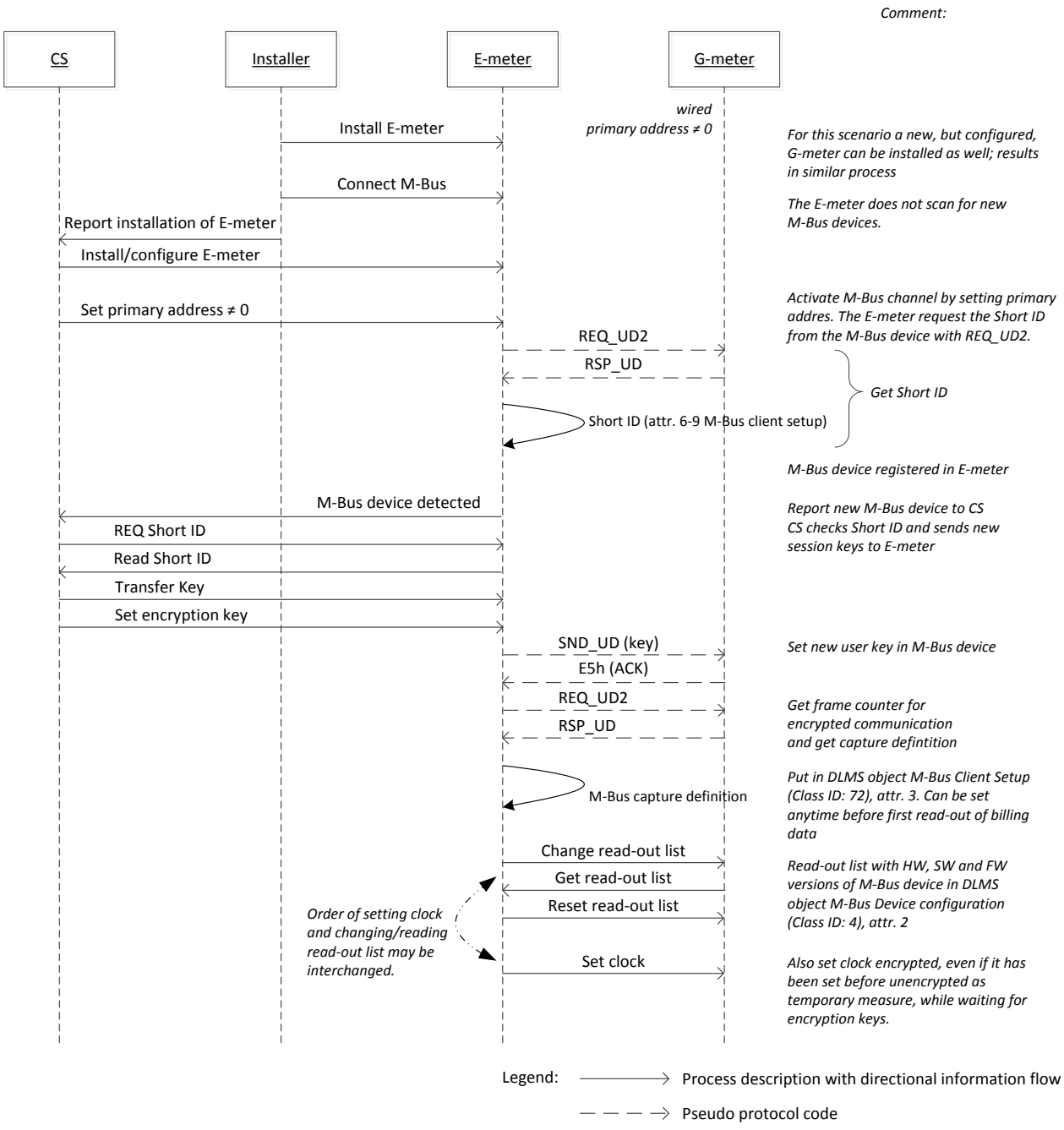


Figure 8: Sequence diagram of binding a wired M-Bus device with M-Bus attributes.

8.3.1.2 Remote wired M-Bus binding via CS by using the slave_install() method

This scenario handles the process of binding a wired G-meter (in general a M-Bus device) to an E-meter which is not bound yet to this M-Bus device and has not automatically (or successfully) scanned for these M-Bus devices.

Trigger	Description
Exchange M&S equipment	During installation of the M&S equipment, the normal (wired) M-Bus scan process is not executed, e.g. powered E-meter has "discover_on_open_cover" disabled. This is a typical situation when an installation process via the CS is configured.
Corrective action by Operations	For refreshing settings in the CS or M&S equipment, Operations remotely de-installs and reinstalls the M-Bus device.

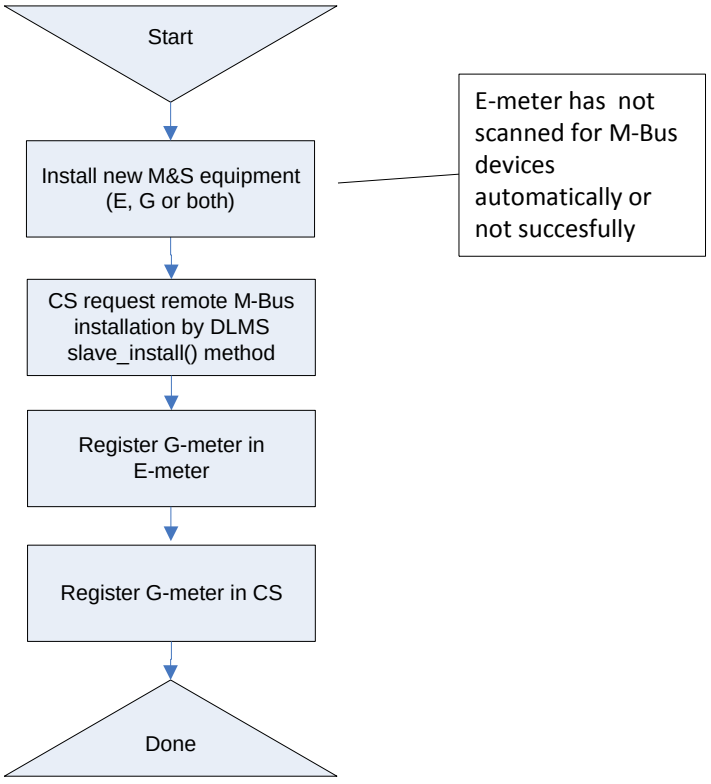


Figure 9: Wired: Configuring DLMS M-Bus attributes in E-meter

Figure 9 shows the scenario in high-level steps. Either the E-meter or the G-meter is placed or exchanged and the local binding was, purposely or accidentally, not executed.

Pre-conditions

- The E-meter is not bound to the physically connected M-Bus device;
- The M-Bus device is in one of the following states:
  - Unconfigured (primary address is 0) and unencrypted;
  - Preconfigured with a non-zero primary address and either encrypted or unencrypted.

Parameters

- *None*

Post-conditions

- Binding of E-meter and wired M-Bus device.

Assumptions

- The DLMS slave_install() method in the DLMS specification is adapted to scan on both primary address 0 as well as 1-250 (when not already in use).
- Triggered by the slave_install(), the regular installation procedures shall be performed (change M-Bus address if needed, set key, set capture definition, get read-out list, synchronize clock).
- Scanning for new devices shall be done in one scan-cycle and not during 1 hour.

Reference

- *None*

The sequence diagram is shown in Figure 10.

Scenario 2.2: Wired binding of M-Bus using slave_install()

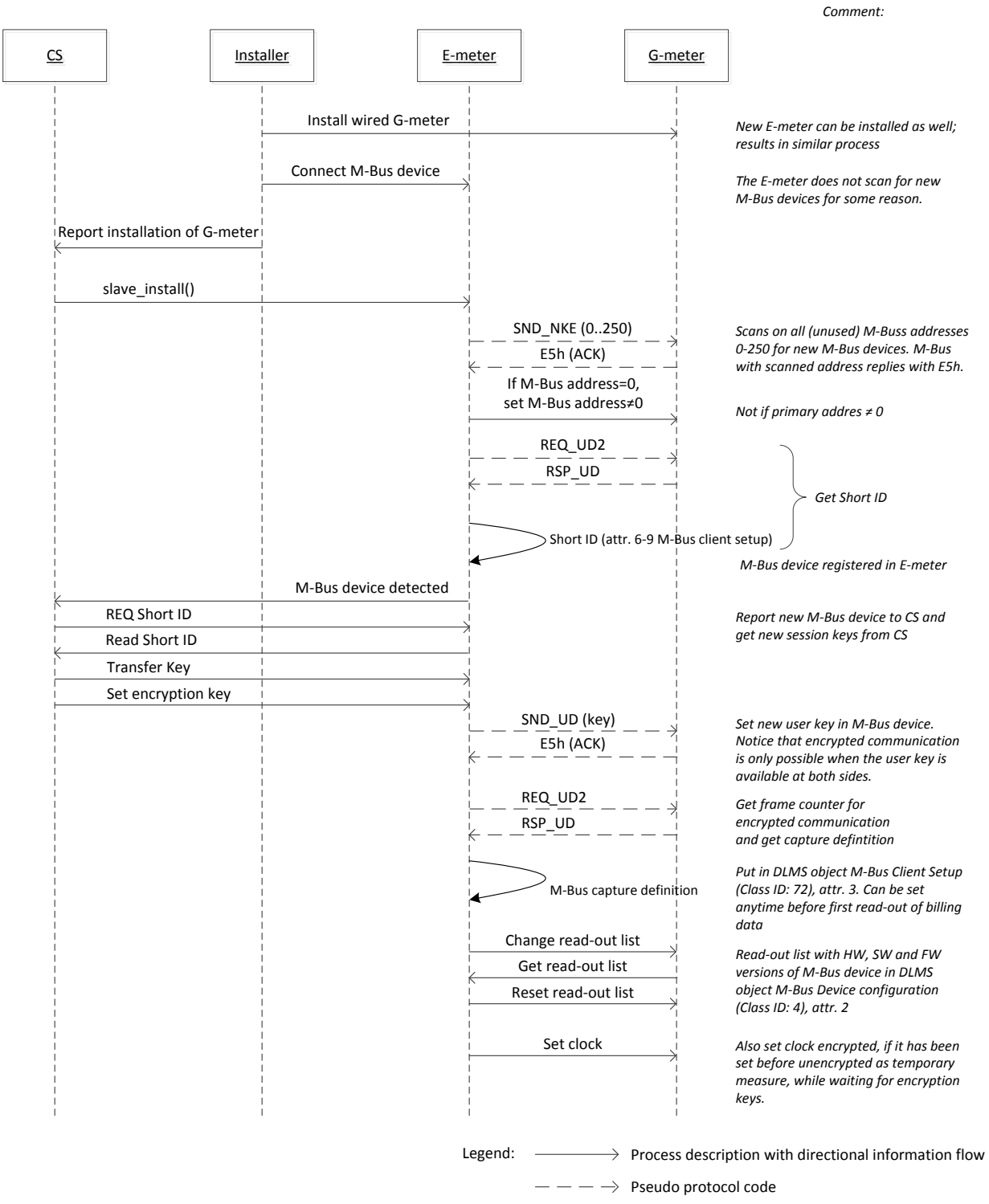


Figure 10: Sequence diagram of binding a wired M-Bus device with the slave_install() method.

8.4 Wireless configurations

8.4.1 Wireless device address

Wireless M-Bus devices must have a unique device address in the range of the M-Bus transmission. The definition of the address is provided in section 4.2.2 When the M-Bus device is installation mode, it will start periodic transmissions of installation messages (SND_IR) with the Short ID as sender address, see section 4.4.6 The selected E-meter shall respond with a confirmation message (CNF_IR) to the specific M-Bus device.

8.4.2 M-Bus Device Binding

The E-meter needs to bind the M-Bus device to the DLMS/COSEM objects. Interaction between the back office (central system) and the E-meter is through the DLMS protocol. In the following, the interaction of the application in the E-meter and the various protocols is described, followed by an installation procedure (M-Bus binding procedure; there may be more scenario's possible).

8.4.2.1 E-Meter interaction

1) The E-meter always sends a CNF_IR to a *registered* M-Bus device, after reception of a SND_IR of that *registered* M-Bus device. No further action follows, the E-meter just responds with the appropriate message;
2) An M-Bus device is called *registered* in the E-meter when the Short ID (see section 4.2.2) values are written in respective DLMS/COSEM M-Bus objects;
3) An M-Bus device is registered in the E-meter through:
    a. Manual selection from a display at the E-meter of a (unregistered) M-Bus device that sends an SND_IR message. The E-meter shall be in Installation mode to display the received serial number. The E-meter will load the M-Bus Short ID found in the SND_IR message after manual selection;
    b. Loading M-Bus device Short ID through the P0 port by means of a PDA;
    c. Loading M-Bus device Short ID through the P3 port by the CS.

8.4.2.2 Local M-Bus Binding Procedure

The binding procedure, based on manual selection on the display of the E-meter, is shown in figure 11. In this case it is assumed that the initial user key is set by the manufacturer and unknown by the system or E-meter. An alternative option is to configure the M-Bus device without the key set (null key).

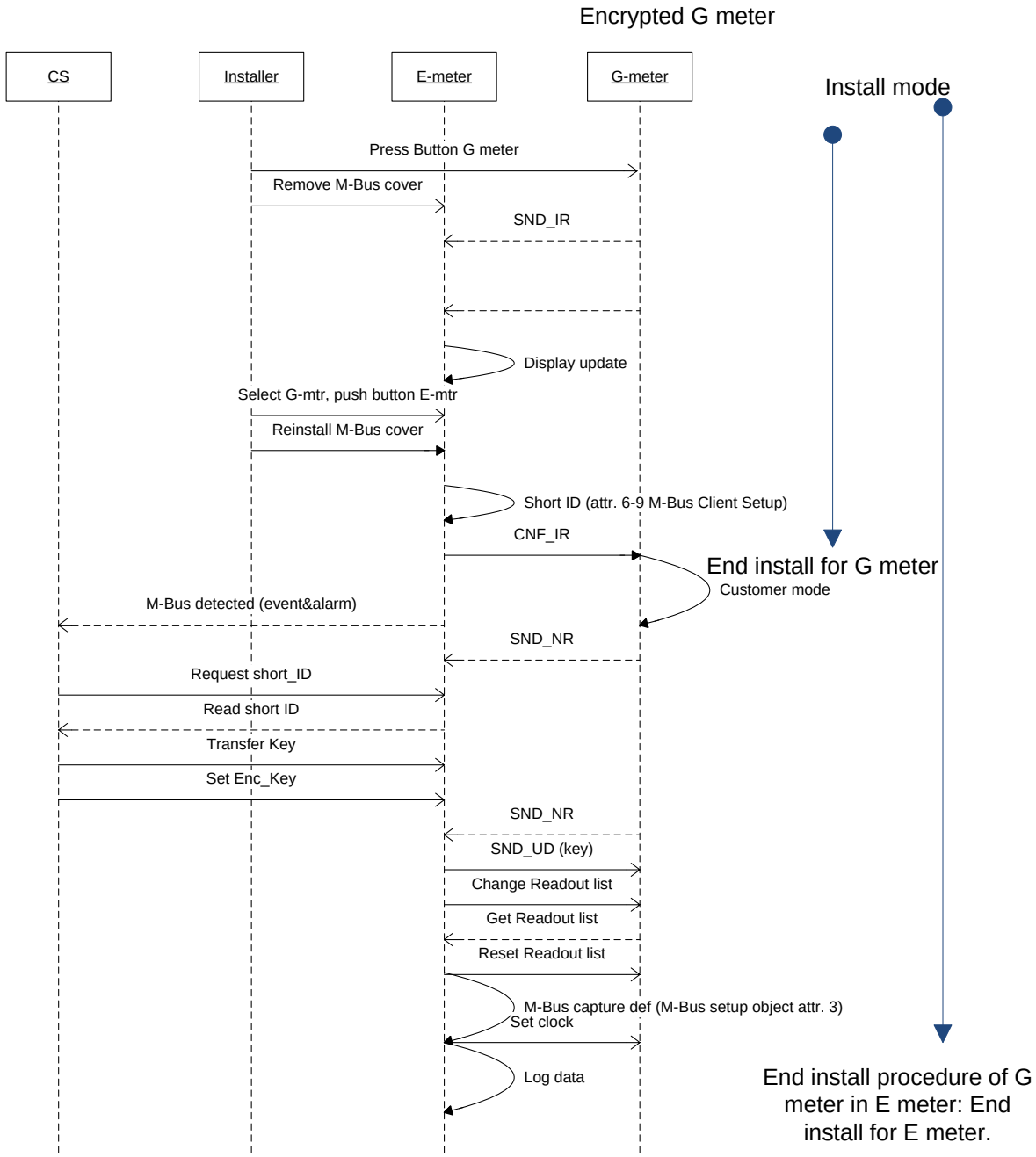


Figure 11: Example wireless binding procedure with manual selection.

Figure 11 describes how an installer manually starts the M-bus installation process by pushing a button on the gasmeter and by removing the M-bus cover on the E-meter to start the installation mode on the E-meter. The gasmeter in this example is delivered with the User-key.

The various steps are in detail:

1. The installer instructs the M-Bus device to go into Installation mode;
2. The installer removes the M-Bus cover of the E-meter;
3. The M-Bus device sends a SND_IR containing the Short ID as sender address (ref.4.2.1);
4. The M-Bus device sends out SND_IR messages every minute for a period of 60 minutes. If the M-Bus device hasn't received a CNF_IR after 60 minutes yet then the M-Bus device will continue sending SND_IR messages every hour. It must be possible to return to sending SND_IR every minute again by means of the push-button;
5. The correct M-Bus device is selected by the E-meter.
   Selecting manually the correct M-Bus device at the E-meter;
   i. The installer searches the correct M-Bus device at the display of the E-meter based on a list of (partial) Short IDs;
   ii. The installer selects the correct M-Bus device with a button action at the E-meter;
   iii. The E-meter writes the Short ID from the SND_IR message of the selected M-Bus device into the DLMS objects;
6. Once the Short ID of the M-Bus device is written in the E-meter's DLMS objects and the E-meter receives a SND_IR message of that M-Bus device, the E-meter replies with a CNF_IR;
7. The installer replaces the M-Bus cover;
8. From this moment on the M-Bus device will send regular hourly data, by sending SND_NR messages including meter reading data and if applicable the valve status data. Notice that the keys of the M-Bus device are not yet set and unknown by the E-meter. As the clock is not set yet, the time of the first hourly transmission of the M-Bus device appears as completely random for the E-meter;
9. Upon receiving a set of keys from the CS, the E-meter shall send the encrypted key to the M-Bus device as described in section 6.5.1. There is no timing restriction on the exchange of User keys;
10. After the keys are set in both the E-meter and the M-Bus device, also the clock of the M-Bus device can be set[6];
11. The E-meter shall retrieve meter configuration data from the M-Bus device by modifying the standard readout list.

After these steps the M-Bus device will send regular hourly data, by sending SND_NR messages including meter reading data and/or valve status data. Now the keys and the clock of the M-Bus device are set and synchronised with the E-meter.

[6] The assumption here is that the M-Bus device is encrypted with an unknown (random) key at installation time. An alternative configuration option is that the M-Bus device is delivered unencrypted. In that case the time can be set directly after the first SND_NR message without setting the keys first.

8.4.2.3 Remote wireless M-Bus binding Procedure via CS

The binding procedure is shown in figure 12. In this case it is assumed that the initial user key is set by the manufacturer and unknown by the system or E-meter. An alternative option is to configure the M-Bus device without the key set (null key).

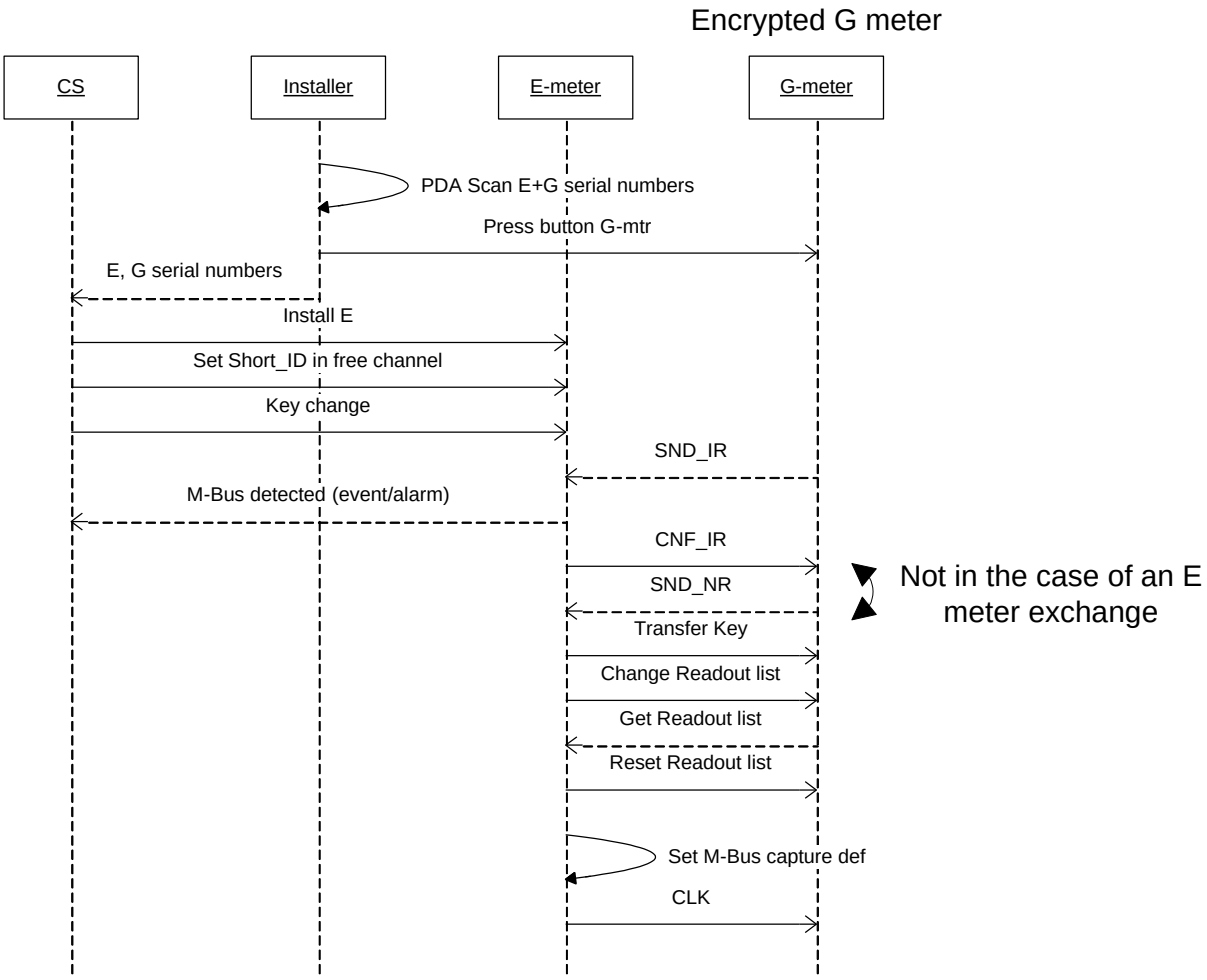


Figure 12: Example wireless binding procedure via the Central System.

This usecase describes how an installer scans the meternumbers of the E- and G-meter that are sent to the Central System (e.g. by PDA). The Central System will bind the E- and G-meter by writing attributes in the M-bus Client Setup. The gasmeter in this example is delivered with the User-key.

The various steps are in detail:

1. The installer will scan the barcodes of the E- and G-meter with the use of a PDA;

2. The installer will bring the gasmeter in installation mode by pressing the button on the gasmeter;
3. The M-Bus device sends a SND_IR containing the Short ID as sender address (ref.4.2.1);
4. The M-Bus device sends out SND_IR messages every minute for a period of 60 minutes. If the M-Bus device hasn't received a CNF_IR after 60 minutes yet then the M-Bus device will continue sending SND_IR messages every hour (It must be possible to return to sending SND_IR every minute again by means of the push-button);
5. The CS will transfer the appropriate Short ID into the E-meter by the DLMS protocol. There is no time limit on this action;
6. Once the Short ID of the M-Bus device is written in the E-meter's DLMS objects and the E-meter receives a SND_IR message of that M-Bus device, the E-meter replies with a CNF_IR;
7. From this moment on the M-Bus device will send regular hourly data, by sending SND_NR messages including meter reading data and if applicable valve status data. Notice that the keys of the M-Bus device are not set yet and unknown by the E-meter. As the clock is not yet set, the time of the first hourly transmission of the M-Bus device appears as completely random for the E-meter;
8. Upon receiving a set of keys from the CS, the E-meter shall send the encrypted key to the M-Bus device as described in section 6.5.1. There is no timing restriction on the exchange of User keys;
9. After the keys are set in both the E-meter and the M-Bus device, also the clock of the M-Bus device can be set[7];
10. The E-meter shall retrieve meter configuration data from the M-Bus device by modifying the standard readout list.

After these steps, the M-Bus device will send regular hourly data, by sending SND_NR messages including meter reading data and/or valve status data. Now the keys and the clock of the M-Bus device are set and synchronised with the E-meter.

8.4.2.4 Remote binding proces in case the E-meter is replaced

This scenario handles the process of binding a wireless G-meter (in general a M-Bus device) to an E-meter which is not bound yet to this M-Bus device.

Trigger	Description
Exchange M&S equipment	During installation of the M&S equipment, the manual wireless M-Bus installation process through buttons on the E-meter is not executed, e.g. the M-Bus cover has not been opened.
Corrective action	For refreshing settings in the CS or M&S equipment, Operations remotely

[7] The assumption here is that the M-Bus device is encrypted with an unknown (random) key at installation time. An alternative configuration option is that the M-Bus device is delivered unencrypted. In that case the time can be set directly after the first SND_NR message without setting the keys first.

by Operations	de-installs and reinstalls the M-Bus device.

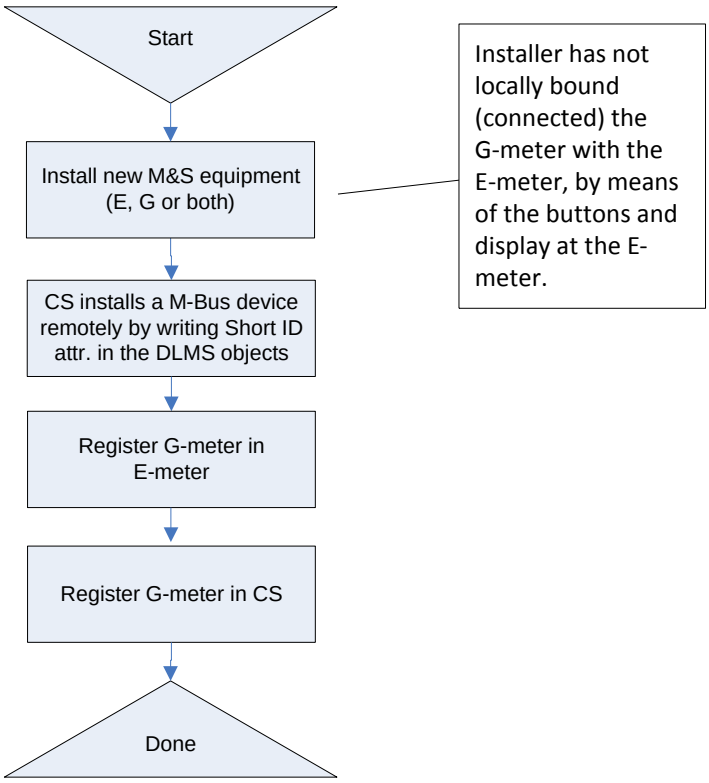


Figure 13: Wireless: Configuring DLMS M-Bus attributes in E-meter

Pre-conditions

- The E-meter is not bound to the transmitting M-Bus device;
- The M-Bus device is in one of the following states:
  - Installation Mode: Binding has not yet been performed but the G-meter is activated, sending installation requests (SND_IR) periodically;
  - Customer or Test Mode: the G-meter is activated, sending normal hourly data transmissions (SND_NR);
- The M-Bus device might be encrypted; in that case the key will be unknown to the E-meter.

Parameters

- DLMS M-Bus Client Setup (Class ID: 72) in the E-meter, specifically the Short ID attributes.

Post-conditions

- Binding of E-meter and wireless M-Bus device

Assumptions

- After transferring the keys by the CS, the E-meter shall autonomically set the capture definition, change and get the read-out list and set the clock.

Reference

- *None*

The sequence diagram is shown in Figure 14.

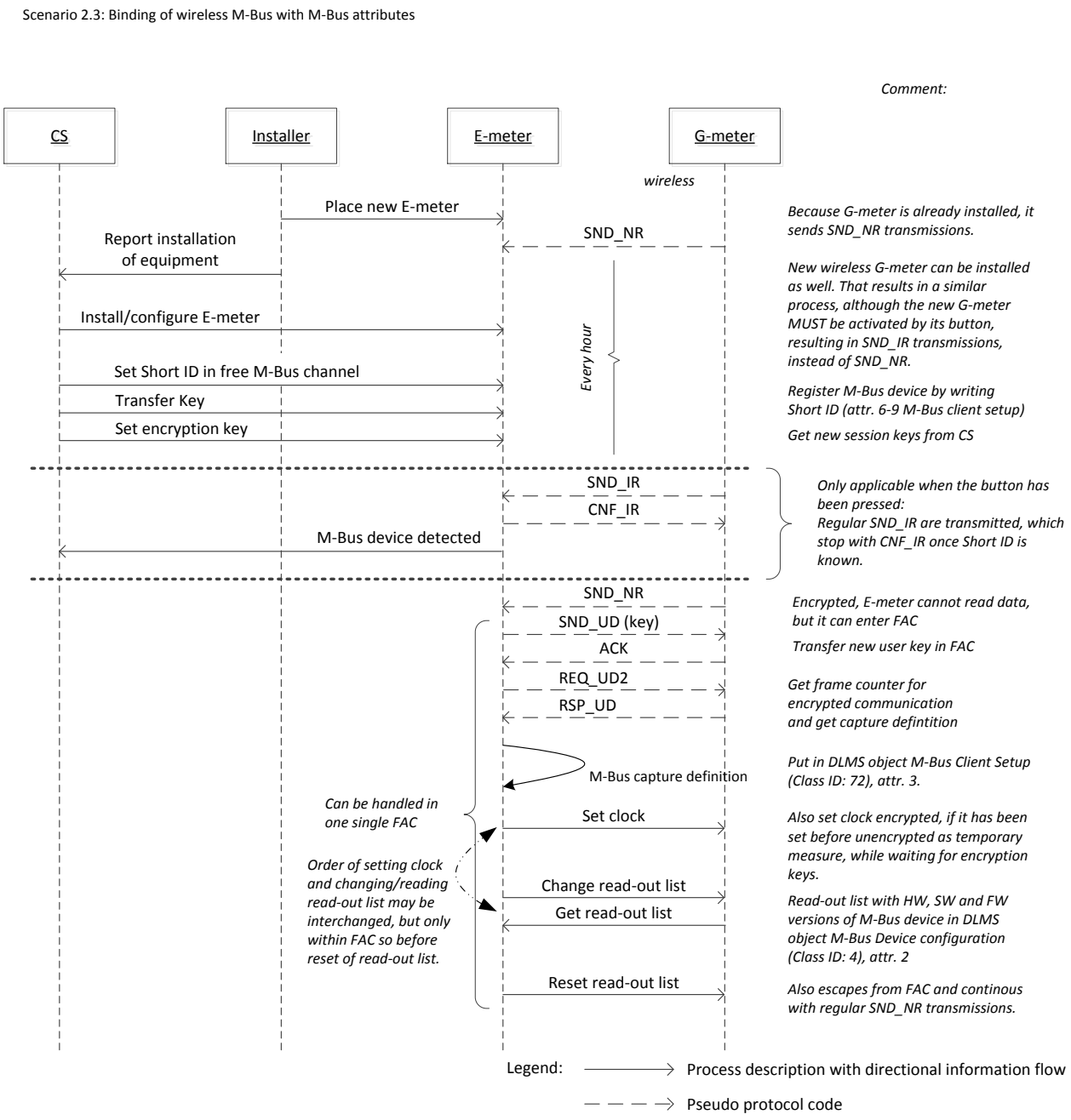
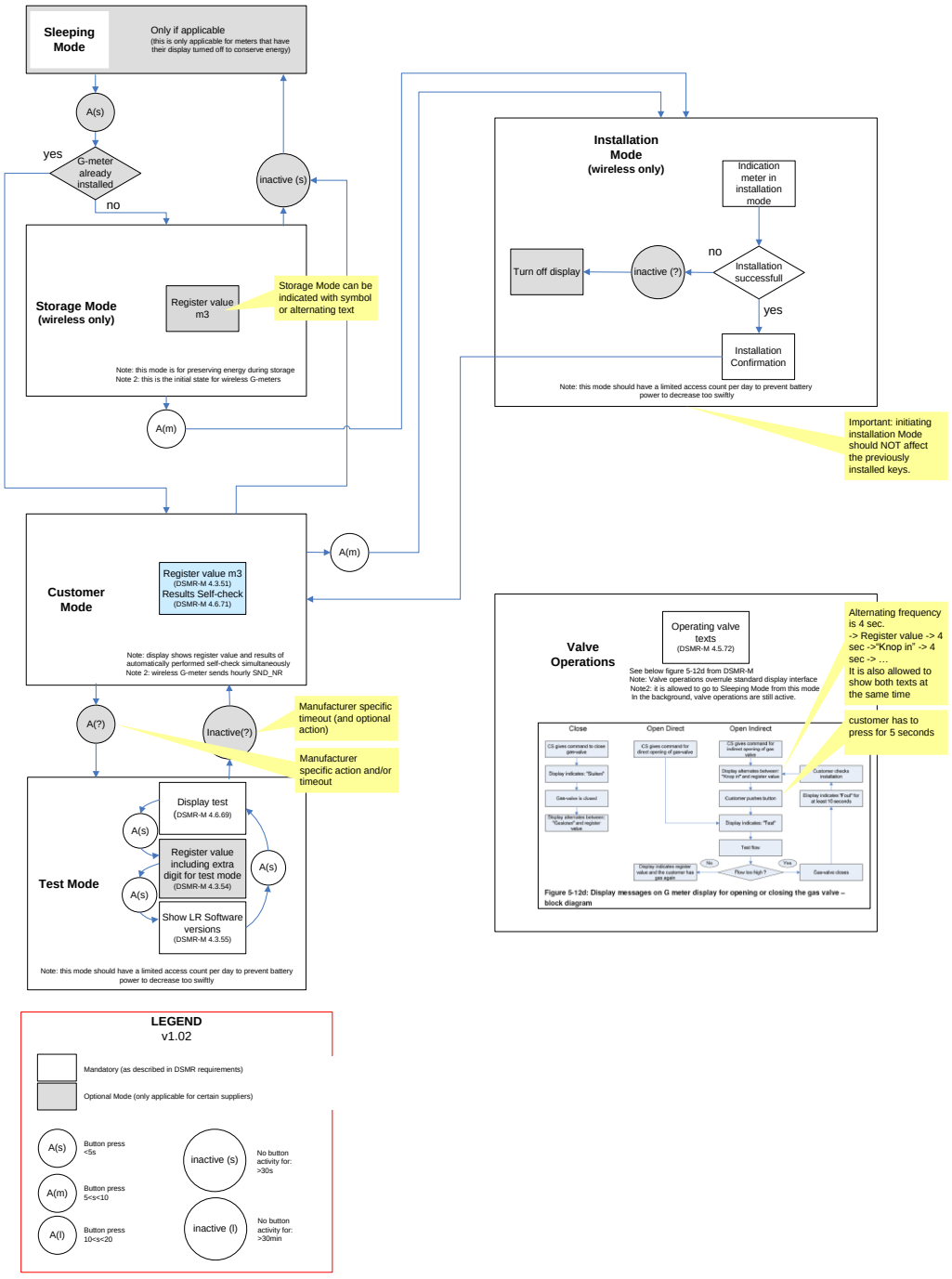


Figure 14: Sequence diagram of binding a wireless M-Bus device with M-Bus attributes.

15. In Annex A update water meter reading:

0Ch		134h		Water meter reading

16. Added Annex C



5 DSMR V4.0.6 P3 CHANGES

This section lists all the changes incorporated in the Dutch Smart Meter Requirements v4.0.6 Final P3 document. Minor editorial corrections are not listed.

1. In section 1.3 added the following references

3	DLMS UA Green Book 7.0 Amend-ment 2	Green Book, DLMS/COSEM Architecture and Protocols, Amendment 2
21	ISO/IEC 8825 Ed. 3:2002	Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)
22	IEC 61334-6 Ed 1.0:2000	Distribution automation using distribution line carrier systems – Part 6: A-XDR encoding rule

2. Updated section 2.1.3 Management client:
   The management client (Client Id 1) is the client to be used by ~~the data concentrator or~~ the central system in case of GPRS ~~and Ethernet~~ meters~~,~~ for regular point to point connections with the meters.
   ~~Additionally, this client is the addressee of the event notification request. It has Get, Set, and Action and Event notification facilities.~~

   The services which must be supported are within the Management client::
   - Block transfer with Get
   - Block transfer with Set
   - Set
   - Get
   - Set request with list
   - Get request with list
   - Selective access
   - ~~Event notification~~
   - Action

3. In section 3 updated footnote 1:
   The operation principle used in this document is based on client / server model. ~~Except for the Event notification which is based on unsolicited message sending for alarm manage-ment,~~ For ~~a~~all ~~the other~~ services the client always sends a request and the server sends back the response to the this request~~. With respect to event notification, a GPRS meter shall be able to send an unsolicited message. The grid operator shall have the ability to configure which alarms will be sent unsolicited.~~

4. In section 3 corrected the OBIS-code for TCP-UDP setup and added a footnote:

TCP-UDP setup (Class ID: 41) To set up the TCP or UDP sub-layer of the COSEM TCP or UDP based transport layer				P	M	Pr
1	Logical name	Octet-string	**0-~~b~~0:25.0.0.255**		R	
2	TCP-UDP_port	long-unsigned	Default 4059		R	
3	IP_reference	octet-string			RW	
4	MSS	long-unsigned	Min=40, max=65535, default=576		RW	
5	nb_of_sim_conn	unsigned	Value=1[2]		R	
6	inactivity_time_out	long-unsigned	Default=300		RW	
	Specific methods	***m/o***				

Footnote 2: This value describes the number of simultaneous connections for the COSEM protocol. An additional TCP connection is optional for setting up the connection using push mechanisms as described in section 9.

5. In section 3 corrected the OBIC-code for IPv4 Setup:

IPv4 setup (Class ID: 42) Handles all information that is related to the IP Address settings associated to a given device and to a lower layer connection on which these settings are used.				P	M	Pr
1	Logical name	octet-string	**0-~~b~~0:25.1.0.255**		R	
2	DL_reference port	octet-string			RW	
3	IP_address	double-long-unsigned			RW	
4	multicast_IP_address	array			RW	
5	IP-options	array			RW	
6	Subnet_mask	double-long-unsigned			RW	
7	gateway_IP_address	double-long-unsigned			RW	
8	use_DHCP_flag	boolean			RW	
9	primary_DNS_address	double-long-unsigned			RW	
10	secondary_DNS_address	double-long-unsigned			RW	
	Specific methods	***m/o***				
1	add_mc_IP_address (data)	o				
2	delete_mc_IP_address (data)	o				
3	get_nbof_mc_IP_addresses (data)	o				

6. In section 3 corrected the OBIS-code for PPP setup:

PPP setup (Class ID: 44) **Handles all information that is related to PPP settings associated to a given physical device and to a lower layer connection on which these settings are used.**				**P**	**M**	**Pr**
1	logical_name	Octet-string	**0-~~b~~0:25.3.0.255**		R	
2	PHY_reference	Octet string			RW	
3	LCP_options	LCP_options_type			RW	
4	IPCP_options	IPCP_options_type			RW	
5	PPP_authentication	PPP_auth_type			RW	
	Specific methods	***m/o***				

7. In section 3.1 corrected the OBIS-code for GPRS modem setup:

GPRS modem setup (Class ID: 45) **A "GPRS modem setup" object stores all the necessary data for a GPRS modem management.**				**P**	**M**	**Pr**
1	logical_name	octet-string	**0-~~b~~0:25.4.0.255**		R	
2	APN	octet-string			RW	
3	PIN_code	long-unsigned			RW	
4	quality_of_service	structure			RW	
	Specific methods	***m/o***				

8. In section 3.2.3.1 added a line in the requirement for Frame Counter used for communication between Meter and CS:
   - The meter shall not have a mechanism which creates a relation between the two frame counters. The frame counters for messages from meter to CS and the messages from CS to meter are independent from each other.

9. Removed section 3.1.2 including OBIS object MAC Address Setup:

3.1.2 Ethernet communication profile

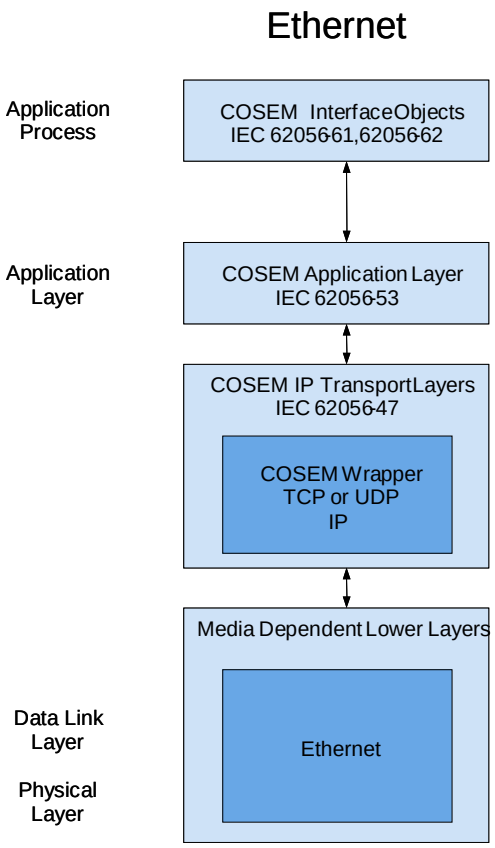


Figure 3.3: Ethernet communication profile

MAC Address Setup (Class ID: 43) **Handles all information that is related to Ethernet settings associated to a given physical device and to a lower layer connection on which these settings are used**				**P**	**M**	**Pr**
1	logical_name	Octet-string	**0-b:25.3.0.255**		R	
2	MAC_address	Octet-string	No default value		RW	
	Specific methods	***m/o***				

Table 5-1: MAC Address Setup

An instance of the MAC Address Setup class handles all information that is related to Ethernet settings associated to a given physical device and to a lower layer connection on which these settings are used. There is an instance of this class for each physical network interface of a device, using the Ethernet protocol. Specific Ethernet requirements are described in the separate DSMR Ethernet requirements document

10. Added section 3.4:

The DLMS COSEM protocol use standardized coding rules for data types as mentioned in the Green Book [2]. Two standards are used:

- ACSE APDUs (used in Application Associations) are coded in BER (ISO/IEC 8825) [20];
- xDLMS APDUs are coded in A-XDR [21];

This section gives some guidelines and explanation on the coding of data types in the xDLMS APDUs.

This companion standard uses the (basic) data types in the class attributes and method specification as listed in Table 3-5. The complex data types defined in Green Book [2] (e.g. LCP_options_type) are not listed; they are built from the basic types from Table 3-5.

Data Type	**Coding rule**
unsigned	Fixed length unsigned (8 bits) integer; section 6.1.1.1[21]
long-unsigned	Fixed length unsigned (16 bits) integer; section 6.1.1.1[21]
double-long-unsigned	Fixed length unsigned (32 bits) integer; section 6.1.1.1[21]
integer	Fixed length signed (8 bits) integer; section 6.1.1.2[21]
enum	Fixed length signed (8 bits) integer; section 6.3[21]
boolean	One byte with value zero (0) or non-zero; section 6.2[21]
octet-string	When the length is not clear from the context then a variable length byte string shall be used; section 6.5.2[21] When the length is clear from the context then a fixed length byte string shall be used; section 6.5.1[21] An empty octet string shall be encoded as H'09 (tag octet-string) and H'00 length so a code of 2 bytes
octet-string[Length]	Fixed length byte string; section 6.5.1[21]
array	When the length is not clear from the context then a variable length SEQUENCE OF values shall be used; section 6.10.2[21] When the length is clear from the context then a fixed length SEQUENCE OF values shall be used; section 6.10.1[21] An array[0] shall be encoded as H'01 (tag array) and H'00 (length) so a code of 2 bytes.
array[length]	Fixed length SEQUENCE OF values shall be used; section 6.10.1[21] In case of an array with scripttables null-data (tag = 0) should be used for not used entries.

Table 3-5: Coding rules of used basic data types.

11. Added section 3.5:

    The COSEM server shall comply to the described exception handling in Green Book[2]. In addition the following exception rules are applicable:

    - A GetRequest-WithList shall be executed as far as possible and the response shall contain a list of all available information and an error for the missing objects.
    - In cases where an action within the E meter cannot be performed in the same communication session with the Central System, the E meter shall return “success” to the Central System as soon as the command was received successfully by the E meter. If the action is executed in the same communication session the feedback depends on the actual result of that action.

12. In section 4.1 updated the following sentence:
    The “*Daily load profile values (~~E only~~ combined)”* and ”*15 min load profile values (E Only)”* are described in more detail in paragraph 6.3 (Electricity related objects).

13. In section 4.2.2 replaces the word password with keys:

    Fraud Detection Event Log [0-0:99.98.1.255] (paragraph 5.8)
    Contains all events related to the detection of fraud attempts, e.g. removal of terminal cover, removal of meter cover, strong magnetic field detection, access with wrong keys ~~password~~, etc.

14. In section 5.1 added a footnote for method 2 of OBIS-object Security Set Up:
    The new key becomes effective with the next call from the CS within the same communication session. This means that the ACK will be encrypted with the old key. The next message shall use the new key.

15. In section 5.1 changed the name of attribute 7 of OBIS object Association LN:

Association LN (Class ID: 15)				**P**	**M**	**Pr**
1	logical_name	octet-string	**0-0:40.0.0.255**	R	R	
2	object_list	objlist_type		R	R	
3	associated_partners_id	associated_partners_type		R	R	
4	application_context_ name	application_context_name		R	R	
5	xDLMS_context_info	xDLMS_context_type		R	R	
6	authentication_ mechanism_name	mechanism_name		R	R	
7	~~LLS_s~~Secret	octet-string (minimum length 16)			R	
8	association_status	enum		R	R	
9	security_setup_reference	octet-string	0-0:43.0.0.255	R	R	

	Specific methods	***m/o***				
1	reply_to_HLS_ authentication	m			X	
2	change_HLS_secret (data)[2]	m			X	
3	add_object (data)	o				
4	remove_object (data)	o				

16. In section updated footnote 2:

The new HLS secret is keywrapped. The key wrapping algorithm is as specified by the security suite. The KEK is the master key. The minimum length of the HLS secret is equal or bigger than the masterkey (i.e. 16 octets).

17. In section 5.3 added default value for attribute 3 and 8 and updated datatype of attribute 4 of OBIS-object Clock:

Clock (Class ID: 8)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:1.0.0.255**	R	R	
2	time	octet-string	current local date and time	R	RW	
3	time_zone	long	Value = -60		RW	
4	status	clock_status			R	
5	day-lights_savings_begin	octet-string	last Sunday in March at 02:00		RW	
6	daylights_savings_end	octet-string	last Sunday in October at 03:00		RW	
7	daylights_savings_ deviation	integer	Value = 60		R	
8	daylights_savings_ enabled	boolean	Value = 1		RW	
9	clock_base	enum	Value = 1. Internal crystal		R	
	Specific methods	***m/o***				
1	adjust_to_quarter (da-ta)	o				
2	ad-just_to_measuring_peri od (data)	o				
3	adjust_to_minute (da-ta)	o				
4	adjust_to_preset_time (data)	o				
5	preset_adjusting_time (data)	o				
6	shift_time (data)	o				

18. In section 5.4 updated description of attributes 3, 4 and 5 of OBIS-object Activity Calendar:

Activity Calendar (Class ID: 20) **Time of use for tariff control**				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:13.0.0.255**		R	
2	calendar_name_active	octet-string			R	
3	season_profile_active	array[4]	~~minimum of~~ 4 seasons		R	
4	week_profile_table_active	array[4]	~~minimum of~~ 4 week profiles (= 1 week profile per season)		R	
5	day_profile_table_active	array[4]	~~minimum of~~ 4 day profiles (= week-day, Saturday, Sunday, special day). Every day profile can contain at least 4 entries (switching points)		R	
6	calendar_name_passive	octet-string			RW	
7	season_profile_passive	array[4]	see above		RW	
8	week_profile_table_passive	array[4]	see above		RW	
9	day_profile_table_passive	array[4]	see above		RW	
10	activate_passive_calendar_time	octet-string	immediate activation can be done by setting the activation date to the current date		RW	
	Specific methods	***m/o***				
1	activate_passive_calendar (data)	m			X	

19. In section 5.4 added a clarification underneath OBIS-object Activity Calendar:
    NB: The order in which attributes 6 thru 9 are written by the CS is not relevant

20. In section 5.4 updated description of attribute 2 of OBIS-object Special Days Table:

Special Days Table (Class ID: 11)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:11.0.0.255**		R	
2	Entries	array[30]	~~At least~~ Maximum of 30 special days		RW	
	Specific methods	***m/o***				
1	insert (data)	m			X	
2	delete (data)	m			X	

21. In section 5.6 updated the description of attribute 2 of OBIS-object Alarm Filter:

Alarm filter (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:97.98.10.255**		R	
2	Value	double-long-unsigned	This filter defines the selection of events that are treated as alarms. Bit mask following the structure of the alarm register (See definition of alarm filters in paragraph 4.2.4) A “0” means that the event will not be treated as an alarm		RW	
	Specific methods	***m/o***				

22. In section 5.10 changed order of scripts in attribute 2 of OBIS-object Disconnector Script Table:

Disconnector Script Table (Class ID: 9)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:10.0.106.255**		R	
2	Scripts	Array[2]	Disconnect script of the discon-nector object {70, 0-0:96.3.10.255};1 Connect script of the disconnector object {70, 0-0:96.3.10.255};2		R	
	Specific methods	***m/o***				
	execute(data)	m			X	

23. In section 5.11 changed datatype of attribute 3, 4 and 5 of OBIS-object Limiter:

Limiter (Class ID: 71) **Handles the normal monitoring as well as the emergency settings (code red)**				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:17.0.0.255**		R	
2	monitored_value	value_definition	{3,1-0:1.7.0.255,2} instantaneous active power delivered +P		R	
3	threshold_active	~~Threshold~~ double_long_unsigned			R	
4	threshold_normal	~~Threshold~~ double_long_unsigned			RW	
5	treshold_emergency	~~Threshold~~ double_long_unsigned			RW	
6	min_over_threshold_duration	double_long_unsigned			RW	
7	min_under_threshold_duration	double_long_unsigned			RW	
8	emergency_profile	emergency_profile_type			RW	
9	emergency_profile_group_id	Array of long-unsigned			RW	
10	emergency_profile_active	boolean			R	
11	actions	action_set			RW	
	Specific methods	***m/o***				

24. In section 5.15 corrected the datatype of attributes 5 and 6 and added default value for attribute 9 of OBIS-object IEC HDLC Setup Object

IEC HDLC setup object (Class ID: 23)				**P**	**M**	**Pr**
1	Logical name	octet-string	**0-0:22.0.0.255**		R	
2	Comm_speed	enum	Value = 5 (9600 baud)		R	
3	Window_size_transmit	unsigned	Value = 1		R	
4	Window_size_receive	unsigned	Value = 1		R	
5	max_info_field_length_transmit	long-unsigned	Value = 128		R	
6	max_info_field_length_receive	long-unsigned	Value = 128		R	
7	inter_octet_time_out	long-unsigned	Value = 25		R	
8	inactivity_time_out	long-unsigned	Value = 120		R	
9	device_address	long-unsigned	Value = 17		R	
	Specific methods	***m/o***				

25. In section 5.16, Display readout modes added a clarification:
    The display read-out list objects in this section define which OBIS-codes must be displayed in which display mode. The actual list of OBIS-codes that must be displayed is defined in annex B. The values are not stored in the Display Readout Objects.

26. In section 6.1 added the following text:
    MID requires a certain format for the identification of the metrological part of the Firmware. For this the following is applicable:

    OBIS-object 1-0:0.2.0.255
    Active Firmware Identifier; should be a more or less "readable" identification of the FW version, for example: "1.0" or “15”

    OBIS-object 1-0:0.2.8.255
    Active Firmware Signature; should be the Hash code of this version, for example: “123AF46558283F32…”

27. In section 6.1 updated OBIS-object Active Firmware version (1-0:0.2.0.255)

Active firmware version (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:0.2.0.255**	R	R	
2	Value	Octet-string	~~Core Image identification~~ Active Firmware Identifier	R	R	
	Specific methods	***m/o***				

28. In section 6.1 updated OBIS-object Active Firmware version (1-0:0.2.8.255)

Active firmware version (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:0.2.8.255**	R	R	
2	Value	Octet-string	~~Core Active firmware version~~ Active Firmware Signature	R	R	
	Specific methods	***m/o***				

29. In section 6.1 updated OBIS-object Active Firmware version (1-1:0.2.0.255)

Active firmware version (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-1:0.2.0.255**	R	R	
2	Value	Octet-string	~~Module Version identification~~ Module Active Firmware Identifier	R	R	
	Specific methods	***m/o***				

30. In section 6.1 updated OBIS-object Active Firmware version (1-1:0.2.8.255)

Active firmware version (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-1:0.2.8.255**	R	R	
2	Value	Octet-string	~~Module Active firmware version~~ Module Firmware Signature	R	R	
	Specific methods	***m/o***				

31. In section 6.1 updated OBIS-object Active Firmware version (1-2:0.2.0.255)

Active firmware version (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-2:0.2.0.255**	R	R	
2	Value	Octet-string	~~Communication Module Version Identification~~ Communication Module Active Firmware Identifier	R	R	
	Specific methods	***m/o***				

32. In section 6.1 updated OBIS-object Active Firmware version (1-2:0.2.8.255)

Active firmware version (Class ID: 1)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-2:0.2.8.255**	R	R	
2	Value	Octet-string	~~Communication Module Active Firmware Version~~ Communication Module Firmware Signature	R	R	
	Specific methods	***m/o***				

33. In section 6.3 updated footnote 5:

This represents the combined statuses of all the devices. To identify the faulty device it is necessary to read the interval data of the different meters (this can only be done if the customer allows the reading of interval data).

34. In section 6.4 corrected scaler of OBIS-object Average Active Power (+P) L1:

Average active power (+P) L1 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:21.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,27}, scaler=~~1~~0, unit=W		R	
	Specific methods	***m/o***				
	reset (data)	o				

35. In section 6.4 corrected scaler of OBIS-object Average Active Power (-P) L1:

Average active power (-P) L1 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:22.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,27}, scaler=~~1~~0, unit=W		R	
	Specific methods	***m/o***				
	reset (data)	o				

36. In section 6.4 corrected scaler of OBIS-object Average Reactive Power (+Q) L1:

Average reactive power (+Q) L1 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:23.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,29}, scaler=~~1~~0, unit=var		R	
	Specific methods	***m/o***				
	reset (data)	o				

37. In section 6.4 corrected scaler of OBIS-object Average Reactive Power (-Q) L1:

Average reactive power (-Q) L1(Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:24.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,29}, scaler=~~1~~0, unit=var		R	
	Specific methods	***m/o***				
	reset (data)	o				

38. In section 6.4 corrected scaler of OBIS-object Average Active Power (+P) L2:

Average active power (+P) L2 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:41.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,27}, scaler=~~1~~0, unit=W		R	
	Specific methods	***m/o***				
	reset (data)	o				

39. In section 6.4 corrected scaler of OBIS-object Average Active Power (-P) L2:

Average active power (-P) L2 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:42.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,27}, scaler=~~1~~0, unit=W		R	
	Specific methods	***m/o***				
	reset (data)	o				

40. In section 6.4 corrected scaler of OBIS-object Average Reactive Power (+Q) L2:

Average reactive power (+Q) L2 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:43.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,29}, scaler=~~1~~0, unit=var		R	
	Specific methods	***m/o***				
	reset (data)	o				

41. In section 6.4 corrected scaler of OBIS-object Average Reactive Power (-Q) L2:

Average reactive power (-Q) L2 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:44.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,29}, scaler=~~1~~0, unit=var		R	
	Specific methods	***m/o***				
	reset (data)	o				

42. In section 6.4 corrected scaler of OBIS-object Average Active Power (+P) L3:

Average active power (+P) L3 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:61.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,27}, scaler=~~1~~0, unit=W		R	
	Specific methods	***m/o***				
	reset (data)	o				

43. In section 6.4 corrected scaler of OBIS-object Average Active Power (-P) L3:

Average active power (-P) L3 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:62.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,27}, scaler=~~1~~0, unit=W		R	
	Specific methods	***m/o***				
	reset (data)	o				

44. In section 6.4 corrected scaler of OBIS-object Average Active Power (+Q) L3:

Average reactive power (+Q) L3 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:63.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,29}, scaler=~~1~~0, unit=var		R	
	Specific methods	***m/o***				
	reset (data)	o				

45. In section 6.4 corrected scaler of OBIS-object Average Active Power (-Q) L3:

Average reactive power (-Q) L3 (Class ID: 3)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**1-0:64.24.0.255**		R	
2	Value	long-unsigned	10 minutes average power. Averaging scheme 3 is used		R	
3	Scaler_unit	scal_unit_type	Value = {0,29}, scaler=~~1~~0, unit=var		R	
	Specific methods	***m/o***				
	reset (data)	o				

46. Updated clarification in section 7.1, after the OBIS-object M-Bus Client Setup

The encryption status can be read out from the configuration word of any message from the M-Bus device and will be stored in attribute 13. The encryption value can either be 0 (not encrypted) or 15 (encrypted using AES).

The version byte indicates the DSMR compliancy level and is stored in attribute 8. This is relevant to deduct the method used for frame counters. To be able to fully deduct the status of the encryption on P2, the receptions of new keys for P2 as well as the keys forwarded to the M-Bus device are relevant

~~This means that the M-Bus master setup object is extended with three fields:~~

~~5. Encryption status (value is 99 (unknown), 0 or 5 as described above~~

~~6. DSMR compliancy level (one byte value see description in P2 document)~~

~~7. Key status (0 = no keys available, 1 = keys received from CS, 2 = keys forwarded to M-Bus device).~~

47. Added clarification in section 7.1, after the OBIS-object M-Bus Client Setup, just before the OBIS object M-Bus master port setup:

Slave_deinstall:

De-installs the slave device. The main purpose of this service is to uninstall the M-Bus slave device and to prepare the master for the installation of a new device.

The following actions are performed:

- the M-Bus address is set to 0 in the M-Bus slave device;
- the encryption key transferred previously to the M-Bus slave device is destroyed; the master key is not affected.
- the attribute primary_address is also set to 0.
- the attribute configuration should be set to 99
- the attrbibute encryption_key_status should be set to 0

48. Removed OBIS object M-Bus slave port setup

M-Bus slave port Setup (Class ID: 25)				**P**	**M**	**Pr**
1	logical_name	octet-string	0-0:24.0.0.255		R	
2	default_baud	enum	Value = 3; 2400 baud		R	

3	avail_baud	enum	Value = 3; 2400 baud; communication is fixed to 2400 baud		R	
4	addr_state	enum	Value = 1		R	
5	bus_address	unsigned	only relevant if the port also can act as slave		R	
	Specific methods	***m/o***				

49. In section 7.1 update the comment underneath the M-Bus Client Setup:
    The encryption status can be read out from the configuration word of any message from the M-Bus device and will be stored in attribute 13. The encryption value can either be 0 (not encrypted) or 15 (encrypted using AES). The version byte indicates the DSMR compliancy level and is stored in attribute 8. This is relevant to deduct the method used for frame counters. To be able to fully deduct the status of the encryption on P2, the receptions of new keys for P2 as well as the keys forwarded to the M-Bus device are relevant. This means that the M-Bus master setup object is extended with three fields:
    1. Encryption status (value is 99 (unknown), 0 or 15 as described above

50. In section 7.3.2 corrected the description of attribute 3 of OBIS-object M-Bus Device Configuration

M-Bus Device configuration (Class ID: 4) Instance specific (4 instances, one per channel)				P	M	Pr
1	Logical name	Octet-string	**0-x:24.2.2.255** (x=channel number (1..4), One channel per M-Bus device		R	
2	Value	octet-string[255]	String with concatenation of 5 (variable length) information fields: [Model/version] [Hardware version number] [Metrology (firmware) version number] [Other software version number] [Meter Configuration] Each fields is to be terminated with CR/LF (ASCII characters <CR><LF>) The first 4 information fields have a maximum length of 61 characters each and contain the info as received from the M-Bus. If the information from the M-Bus is too long then the leftmost octets are skipped. The last information field is 1 character (8 bits as received from M-Bus device).		R	
3	scaler_unit	scal_unit_type	~~0 (Not a numeric value)~~ Value = {0,255}, scaler = 0, unit = count		R	
4	status	octet-string	status of M-Bus device		R	
5	capture_time	octet-string	Time of last successful readout. The M-Bus device configuration is (at least) read by the E-Meter from the M-Bus device at the end of the M-Bus device installation procedure.		R	
	Specific methods	***m/o***				
1	reset (data)	o				

51. In section 7.5 update value for attribute 8 of OBIS-object M-Bus Event Log

M-Bus Event Log (Class ID: 7) **M-Bus event log containing errors and alarms**				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-0:99.98.3.255**		R	
2	buffer	array	The buffer must be filled monotonously, i.e. no irregular entries are allowed = exactly one entry per capture period		R	
3	capture_objects	Array	{8,0-0:1.0.0.255,2,0}; {1,0-0.96.11.3.255,2,0} (= clock;event code) M-Bus event codes must be defined, see 4.2.1		R	
4	capture_period	double-long-unsigned	0, asynchronously		R	
5	sort_method	enum	1, unsorted (FIFO)		R	
6	sort_object	object definition	None, unsorted		R	
7	entries_in_use	double-long-unsigned			R	
8	profile_entries	double-long-unsigned	≥~~10~~30		R	
	Specific methods	***m/o***				
1	reset ()	m			X	
2	capture ()	m				
3	Reserved from previous versions					
4	Reserved from previous versions					

52. In section 7.6 added a footnote:

ster Disconnect Control (Class ID: 70) **he opening and closing of an M-Bus disconnector (e.g. gas valve) (4 instances, one per**				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-x:24.4.0.255** (x=channel number (1..4))		R	
2	output_state	boolean			R	
3	control_state	enum			R	
4	control_mode	enum			RW	
	Specific methods	***m/o***				
1	remote_disconnect[11]	m	Data::=integer (0)		X	
2	remote_connect[11]	m	Data::=integer (0)		X	

Footnote 11: In case a M-Bus device has no disconnector (e.g. valve), error “other reason” has to be returned.

55. In section 8.3 added a sentence:

When configuration settings are changed they can be applied during the current association or directly there after. But an application association must always be closed in a proper way.

56. In section 8.3 indicated the MSB and LSB of the bitstring and added clarification for the P0_enable bit:

discover_on_open_cover (bit 0 - MSB)	Indicates whether the M-Bus discovery process (see P2 companion standard) is started when the cover of the M-Bus connections on the electricity meter is removed.
discover_on_power_on (bit 1)	Indicates whether the M-Bus discovery process (see P2 companion standard) is started when the power to the electricity meter is switched on.
dynamic_mbus_address (bit 2)	Indicates whether the M-Bus device should use dynamic or static addressing. Dynamic addressing entails that the primary address of the M-Bus device is reset to 0 if the device is decommissioned.
P0_enable (bit 3)	Indicates whether communication via P0 is enabled or not. (disabled == 0, enabled ==1)
HLS_3_on_P3_enable (bit 4)	Indicates whether authentication via HLS method 3 is enabled on P3 (disabled == 0, enabled ==1)
HLS_4_on_P3_enable (bit 5)	Indicates whether authentication via HLS method 4 is enabled on P3 (disabled == 0, enabled ==1)
HLS_5_on_P3_enable (bit 6)	Indicates whether authentication via HLS method 5 is enabled on P3 (disabled == 0, enabled ==1)
HLS_3_on_P0_enable (bit 7)	Indicates whether authentication via HLS method 3 is enabled on P0 (disabled == 0, enabled ==1)
HLS_4_on_P0_enable (bit 8)	Indicates whether authentication via HLS method 4 is enabled on P0 (disabled == 0, enabled ==1)
HLS_5_on_P0_enable (bit 9 - LSB)	Indicates whether authentication via HLS method 5 is enabled on P0 (disabled == 0, enabled ==1)

57. In section 8.6 updated description of attributes 3, 6 and 8 of OBIS-object Definable Load Profile:

Definable load profile (Class ID: 7)				**P**	**M**	**Pr**
1	Logical name	Octet-string	**0-1:94.31.6.255**		R	
2	buffer	array	~~The buffer must be filled monotonously, i.e. no irregular entries are allowed = exactly one entry per capture period~~		R	
3	capture_objects	Array	{8,0-0:1.0.0.255,2,0}; clock and other OBIS codes depending on configuration of grid operator		RW	
4	capture_period	double-long-unsigned	86400 (daily)		RW	
5	sort_method	enum	3 (1 = unsorted (FIFO) or 3 = sorted (largest))		RW	
6	sort_object	object definition	{8,0-0:1.0.0.255,2,0} (sorted by clock) ~~other obis codes to be added during operation~~		RW	
7	entries_in_use	double-long-unsigned			R	
8	profile_entries	double-long-unsigned	960 (max # of entries) ~~40 (40 days)~~		RW	
	Specific methods	***m/o***				
1	reset ()	m			X	
2	capture ()	m			X	
3	Reserved from previous versions					
4	Reserved from previous versions					

58. In section 9 updated description time windows:

Some objects in this section use time windows (listening-window, calling-window). The following settings shall be taken into account:

- A never active window is configured by setting ~~both~~ the start_time to unspecified and a dummy end_time of 23:59:59:99 ~~to 'not specified',~~
- An always active window is configured by setting this as empty (array[0]) ~~the start_time to a valid date and time in the past and the end_time to 'not specified'~~

59. In section 9.1.2 added the following text underneath the object:

The Register Monitor attribute "Actions" defines the action when the content of "MonitoredValue" crosses the "Thresholds" in the upwards direction.
In order to prevent that executing of the script is aborted because of a power-down, the comparing of the monitored value is done everytime the meter is powered up. This will results in the triggering the "Actions" again when one or more alarms in the alarm register are still active after a power down.

60. In section 9.1.3 updated datatype of attributes 7 and 8 of OBIS-object Auto Answer

Auto Answer (Class ID: 28, version=1)				**P**	**M**	**Pr**
1	logical_name	Octet string	0-0:2.2.0.255		R	
2	Mode	enum	Value: (200) Manufactory specific Mode: CSD call is used to triggger GPRS connection.		R	
3	Listening_window	array	In case CSD wakeup is not used: Listening_window is never active. In case CSD wakeup is used: Listening window is always active		RW	
4	Status	enum			R	
5	number_of_calls	unsigned	Default: (0) No limit		R	
6	number_of_rings	nr_rings_type	Default: Call is answered (rejected) after 1 ring. This means: nr_rings_in_window=1 nr_rings_out_of_window=1.		R	
7	list_of_allowed_callers	array[0]	empty		R	
8	list_of_callers_and_actions (static)	array[32]	Array of callers with associated scripts. The script contains the push method invocation of the Push Setup CSD/SMS object		RW	
	Specific methods	*m/o*				

61. In section 9.2 update datatypes of attrbibute 2 of OBIS-object Script Table

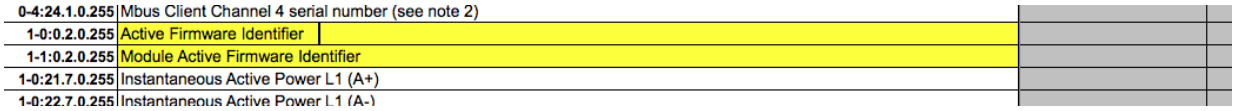
Script table (Class ID: 9, version=0)				**P**	**M**	**Pr**
1	logical_name	Octet string	0-0:10.0.108.255		R	
2	Scripts	array[3]	Contains the script which contains the push method invocation of the Push Setup object n: Script 1 invokes the push method of Push Setup scheduled object. Script 2 invokes the push method of Push Setup Alarm object. Script 3 invokes the push method of Push Setup CSD/SMS object.		RW	
	Specific methods	*m/o*				
1	*Execute(data)*	*m*	Data contains the entry in the script table (1, 2 or 3)		X	

62. In Annex B added a description for OBIS-code 1-0:2.7.0.255:
    Instantaneous Active Power (A-, sum of all phases)

63. In Annex B changed the definition of OBIS-code 1-0:115.7.0.255 to:
    Instantaneous Active Power (abs(QI+QIV)~~+~~-abs(QII+QIII)) (see note 5)

64. In Annex B changed the description of OBIS-code 0-0:97.97.0.255:
    Error register (when at least one of the bits 0, 1, 2, 3 or 4 from byte 2 is high)

65. In Annex B updated part with firmware indentifiers:



0-4:24.1.0.255	Mbus Client Channel 4 serial number (see note 2)		
1-0:0.2.0.255	Active Firmware Identifier		
1-1:0.2.0.255	Module Active Firmware Identifier		
1-0:21.7.0.255	Instantaneous Active Power L1 (A+)		
1-0:22.7.0.255	Instantaneous Active Power L1 (A-)		

66. In Annex B updated footnote 5
    Register value can either be positive or negative, the displayed value is always positive. Direction of power can be determined by the arrows of the actual power on the display

6 DSMR V4.0.6 GPRS CHANGES

This section lists all the changes incorporated in the Dutch Smart Meter Requirements v4.0.6 Final GPRS document. Minor editorial corrections are not listed.

1. In section 3.4 updated the reference:
   The requirements related to the initiation of the communication process are described in the Dutch Smart Meter Requirements P3 Companion standard, section 9.

2. In section 3.5 updated the reference:
   The procedures to initiate the data exchange are described in the Dutch Smart Meter Requirements P3 Companion standard, section 9.

3. In section 3.6 updated the reference:
   The procedures for the actual data Exchange are described in the Dutch Smart Meter Requirements P3 Companion standard.

4. In section 3.7 updated the reference:
   At the end of the data exchange the GPRS connection can be closed again until the next regular or on demand data exchange, according to the Dutch Smart Meter Requirements P3 Companion standard, section 9