Open Metering System
Conformance Test

Volume 4
Application layer

Issue 4.0.7 / 2019-01-23

Release

Document History

Version	Date	Comment	Editor
1.0.0	2011-10-11	Final version	J. Feuchtmeier
1.0.1	2012-10-15	Adoption of coding of data points	J. Feuchtmeier
1.9.0	2013-08-09	Adaptions to OMS-S V3 To be released as OMS-CT V2.0	J. Feuchtmeier
2.0.0	2013-10-16	Adaption according Enquiry results document status changed to “Release”	J. Feuchtmeier
2.0.1	2014-08-14	Correction of meaning for reference VW05 and VM06 in Table 9 For correct [T42-GB3] the manufacturer needs to state the base pressure in [OMSCT-ManDec] For correct [T42-GT3] the manufacturer needs to state the base temperature in [OMSCT-ManDec]	J. Feuchtmeier
2.0.2	2014-09-04	Concretisation of resolution of data object for gas meters ([T42-GT1], [T42-GM1], [T42-GB1]) Add Storage number definition in DIV table and for relevant data objects	J. Feuchtmeier
3.0.0	2014-10-06	Adopting version number of the OMS-CT to be in line with the corresponding OMS-S version Table 17 adopted symbol for power	J. Feuchtmeier
3.0.0	2015-03-04	[T41-AD1]: Editorial, table notes as food notes, remark that order is different to [T41-ADR1] added	J. Feuchtmeier
4.0.0	2015-03-04	Start Version for OMS-CT V4	J. Feuchtmeier
4.0.0.1	2015-05-06	Replacement Configuration Word by Configuration Field	L. Möllendorf
4.0.0.1	2015-05.07	Adaption of Status Field Test Using Gateway instead of MUC	J. Feuchtmeier
4.0.0.2	2015-06-17	Integration of Security Profile	A. Seeberg
4.0.0.3	2015-07-07	Included AFL and Security from Vol 3	A. Seeberg
4.0.0.4	2015-08-05	Restructure all Test cases of Part 2 and adding new test cases according to al Data points of OMSS Annex B Version 4.0.2A, Revision of 6.3	U.Pahl / AG1
4.0.0	2015-10-16	Version for Enquiry	J. Feuchtmeier
4.0.0	2016-01-19	Adaption of Testpoint naming for AFL & Security according agreed syntax Version for Vote	J. Feuchtmeier
4.0.0	2016-05-09	Version for Release	J. Feuchtmeier
4.0.1	2016-07-11	Correction of Appendix A: Applicable Test Cases	J. Feuchtmeier
4.0.2	2017-05-29	Update to OMS-S V4.1.2	A. Seeberg, J. Hampel, J. Feuchtmeier
4.0.3	2017-10-07	Release Version	J. Feuchtmeier

4.0.4	2018-01-18	[T42-P2] Compact Load Profil is optional not mandatory	J. Feuchtmeier
4.0.5	2018-10-04	Change from [1, 0Eh, 0Fh] to [1…4, 6, 7, 9…0Ch, 0Eh] in chapter 8.2.2.1.	A. Reissinger
4.0.6	2018-10-23	Additonal location for change from [1, 0Eh, 0Fh] to [1…4, 6, 7, 9…0Ch, 0Eh] in chapter 8.2.2.1.	A. Reissinger
4.0.7	2019-01-23	Release Version	A. Reissinger

Table of contents

List of Tables

1 Scope

This document describes the OMS conformance tests for basic meters with focus on the application layer.

This issue is applicable only together with [OMSCT-GEN].

It is split into 2 parts, one covering CI fields and header usage; the other concentrates on the M-Bus Application Layer. The other possible application protocols (refer to Table 9) will be covered in additional parts.

Tests for Physical and Link Layer are covered in the other volumes of the test specification.

2 References

The references used are defined in [OMSCT-GEN] (OMS Open Metering System – Conformance Test Volume 1 – General Part).

3 Definitions, symbols and abbreviations

The term definitions, symbols and abbreviations used are defined in [OMSCT-GEN] (OMS Open Metering System – Conformance Test Volume 1 – General Part).

Part 1:

Generic Application Header

4 AFL

4.1 General

The AFL provides two services:

- Authentication
- Fragmentation

If at least one of these services are needed the AFL shall be used.

The AFL is tested only for unidirectional meters using Security Profiles A or B.

The AFL starts with the CI-field 90h.

Overview of valid datagram types (informative):

Table 1 describes different datagram types and their content. The criteria for the different types are given in *italic* style. For the description of each element please refer to [OMSS-Vol2] subclause 6.

	Security Profile A	Security Profile B		Security Profile with Multi Fragments (for Information only)		
AFL message Type	**Unfragmented Message** **(Length [Byte])**	**Unfragmented Message** **(Length [Byte])**		**Fragmented Message #1 (first)** **(Length [Byte])**	**Fragmented Message #2…(n-1)** **(Length [Byte])**	**Fragmented Message #n (last)** **(Length [Byte])**
AFL Element #1	CI (1)	CI (1)		CI (1)	CI (1)	CI (1)
AFL Element #2	AFLL (1)	AFLL (1)		AFLL (1)	AFLL (1)	AFLL (1)
AFL Element #3	FCL (2) *(MF=0, MCLP=1, MLP=0, MCRP=0, MACP=0, FID=0)*	FCL (2) *(MF=0, MCLP=1, MLP=0, MCRP=1, MACP=1, FID=0)*		FCL (2) *(MF=1, MCLP=1, MLP=1, MCRP=1, MACP=0, FID=1)*	FCL (2) *(MF=1, MCLP=0, MLP=0, MCRP=0, MACP=0, FID=(2…(n-1))*[1]	FCL (2) *(MF=0, MCLP=0, MLP=0, MCRP=0, MACP=1, FID=n)*[2]
AFL Element #4	MCL (1) *(MLMP=0, MCMP=0, AT=00b, ATO=00b)*	MCL (1) *(MLMP=0, MCMP=1, AT=01b, ATO=01b)*		MCL (1) *(MLMP=1, MCMP=1, AT=01b, ATO=01b)*		MAC (8)
AFL Element #5		MCR (4)		MCR (4)		
AFL Element #6		MAC (8)		ML (2)		
AFL Length (calculated) [Bytes]	AFLL: 3	AFLL: 15		AFLL: 9	AFLL: 2	AFLL: 10

Table 1: Valid AFL-datagrams

4.2 [T41-AFL1] Test for unfragmented message

If AFL is present:

Only one fragment shall be used (AFL.FCL.MF = 0)

AFL.FCL.FID shall be 0

[1] The maximum of n shall be 255.

[2] The maximum of n shall be 255.

4.3 [T41-AFL2] Test for Message-Control-Field present

If AFL is present:

AFL.MCF shall be present (AFL.FCL.MCLP = 1)

4.4 [T41-AFL3] Test Message-Counter

If AFL.FCL.MCRP is 1:

The AFL.MCR shall be strictly monotonously increasing for all messages of the observation period[3].

The AFL.MCR shall never wrap around to zero in the observation period.

4.5 [T41-AFL4] Test Message-Length

If AFL is present:

Message-Length shall not be present (AFL.FCL.MLP = 0)

(For an unfragmented message the AFL.ML shall not be used.)

4.6 [T41-AFL5] Test MAC

If AFL.FCL.MACP is 1:

AFL.FCL.MCRP shall be 1 (message-counter present)

AFL.MCL.MCMP shall be 1 (message-counter present)

AFL.MCL.AT shall be 01b (CMAC-AES128)

AFL.MCL.ATO shall be 01b (8 byte MAC)

Calculate MAC as follows (OMS-TR01_Security_v110, 5.4):

MAC = CMAC (Kmac, {AFL.MCL || AFL.MCR[7..0] || AFL.MCR[15..8] || AFL.MCR[23..16] || AFL.MCR[31..24] } || NextCI || ... || Last Byte of Message)

With (OMS-TR01_Security_v110, 5.5):

Kmac = CMAC(MK, 0x01 || C[7..0] ||C[15..8] ||C[23..16] ||C[31..24] || ID_0||ID_1||ID_2||ID_3 ||0x07||0x07||0x07||0x07||0x07||0x07||0x07)

With

C = AFL.MCR

MK is the master-key from the [OMSCT-ManDec]

ID is the meter-ID

MAC shall be equal to AFL.MAC

4.7 [T41-AFL6] Test AFLL (AFL Length Field)

If AFL is present:

AFL.AFLL shall either be 3 or 15 (depending on Security-Profile).

[3] Due to possible loss of telegrams in RF communication it can not be tested for increasing by 1.

This test is passed if the datagram contains at least one valid byte after the end of the AFL. This location is indicated by AFL.AFLL +1 starting from the FCL field. This byte shall be a valid CI Field ([OMSS-Vol2] Table 1: List of supported CI-Fields)

5 Security

5.1 [T41-SEC1] Security Profile used

The manufacturer shall state in the [OMSCT-ManDec], which security profile is used.

Only the following profiles shall be stated: Profile A or Profile B (see [OMSS-Vol2]: subclause 9).

Profile C is only to be used with bidirectional communication.

5.2 [T41-SEC5] AFL

Test whether the AFL is used:

The test shall pass if the AFL confirms to the security profile given in [OMSCT-ManDec].

Other combinations as listed are not allowed and therefore this test shall fail.

Security Profile	AFL
A	with or without AFL (unfragmented message)
B	AFL shall be used (unfragmented message)

Table 2: AFL for security profiles

5.3 [T41-SEC6] MAC

Test whether the MAC is available.

The test shall pass if the MAC confirms to the security profile given in [OMSCT-ManDec].

Other combinations as listed are not allowed and therefore this test shall fail.

Security Profile	MAC
A	MAC shall not be present
B	MAC shall be present (MAC-calculation shall be correct. See [T41-AFL5])

Table 3: MAC for security profiles

5.4 [T41-SEC2] Master key

The manufacturer shall provide the master key in the [OMSCT-ManDec].

5.5 [T41-SEC3] Encryption mode

The test shall pass if the encryption mode conforms to the security profile given in Table 4.

Other combinations as listed are not valid and therefore this test shall fail.

Security Profile	Mode	Description
A	Shall be 5	AES128-CBC persistent key No MAC is calculated, if AFL is present. AFL.MCL.AT shall be 00b. AFL.MCL.ATO shall be 00b.

B	Shall be 7	AES128-CBC with ephemeral key Calculate Kenc and Kmac for each transmission using the master-key. The MAC shall be available (AFL.FCL.MACP=1) and MAC calculation must be correct.

Table 4: Valid decryption modes for profiles

5.6 [T41-SEC4] ELL Present

The OMS Conformance test shall test if the ELL is applied under the correct conditions as defined in Table 5. The table summarizes the “Condition to apply the Extended Link Layer” of [OMSS-Vol2] subclause 5.3.4.

The ELL is indicated by using the CI Fields 8Ch or 8Eh.

Security Profile	Unidirectional	Bidirectional
A	ELL may be omitted	ELL shall be present
B	ELL shall be present	ELL shall be present
C	ELL shall be present	ELL shall be present

Table 5 Condition to apply the ELL

5.7 [T41-SEC7] Encryption verification

This test shall be passed if after decryption of the message two bytes of encryption verification 0x2F, 0x2F shall follow the TPL.

Otherwise this test shall fail.

6 Check of the fixed part of the application frame

The following fields shall be checked out of the application frame's fixed part.

6.1 [T41-CI1] CI-Field

The Application frame always starts with a CI-Field. The CI-Fields applied for OMS-communication are listed in [OMSS-Vol2] Table 1.

The CI-Filed shall be one out of the Table 1 in [OMSS-Vol2]. CI-fields for "no header" shall not be used.

Otherwise the test fails.

6.2 [T41-AD1] Address (8 Byte)

If the CI-Field has the type "long header" (APL header length of 12 or 14 byte) then the TPL address field is present and has to fulfil the limits of Table 6.

Otherwise this test shall fail.

Byte number	Content	remark
Byte 1..4	Ident number	BCD only (from 00000001 to 99999999)
Byte 5..6	Manufacturer	Binary (binary coded 3-Letter Manufacture ID as listed by Flag association)[4]
Byte 7	Version	Binary (from 00h to FEh)
Byte 8	Device type	Binary (all values from [EN13757-3] Table 3 and [OMSS-Vol2] Table 2)

Table 6: Valid range for parts of TPL address[5]

6.3 [T41-AN1] Access Number (1 Byte)

If the CI-Field of a datagram has the type "long header" (APL header length of 12 or 14 bytes) or short header (APL header length of 4 or 6 bytes) the field Access Number is present and has to be tested.

[OMSS-Vol2] subclause 4.2.2 distinguishes between meter Access Number and Gateway Access Number and defines which message type has to apply which type of Access Number.

The meter Access Number may consist of every value between 0d and 255d. It is increased by 1 with each synchronous transmission. In case of datagram repetition, the Access Number remains constant.

The Gateway Access Number is generated by the Gateway. It may consist of every value from 0d to 255d. It is incremented with each transmission to a single meter/actuator containing new data. Additional restrictions applie as the Gateway shall not reuse an Access Number for the same meter/ actuator within a period of 300 seconds.

[4] The Manufacturer must be listed in [FLAG]. The three letters of a Manufacturer ID can be derived by the calculation given in [EN13757-3] clause 5.5.

[5] The content is in different sequence as in [T41-ADR1] of [OMS-CT DLL].

6.4 [T41-ST1] Status (1 Byte)

If the CI-field of a datagram has the type “long header” (APL header length of 12 or 14 bytes) or short header (APL header length of 4 or 6 bytes) the field Status is present and shall be tested.

[OMSS-Vol2] subclause 7.2.3 distinguishes between meter Status and Gateway Status by CI-Field.

The meter Status byte shall be conform to [EN13757-3].

> While the bit “Permanent Error” signals a fatal device error that requires a service action, this bit shall be not set by the DUT. Otherwise this test is fails.

The Gateway Status byte shall be conform to [EN13757-3].

> [ToDo]: define tests for Gateway Status

6.5 Configuration Field

The Configuration Field is specified in [OMSS-Vol2] subclause 7.2.4.

6.5.1 [T41-CF1] Configuration Field Precondition

If the CI-Field of a datagram has the type “long header” or “short header” (refer to [OMSS-Vol2] table 1), the Configuration Field is present and has to be tested according to [T41-CF2] Configuration Field Structure. Otherwise it can be skipped and this test shall be passed.

6.5.2 [T41-CF2] Configuration Field Structure

The security mode is defined in the MMMMM bits of the configuration field according to [OMSS-Vol2].

The number of encrypted blocks is defined by the NNNN bits of the configuration field according to [OMSS-Vol2].

If the mode is 7d then:

- [T41-CF3] has to be executed

If the (mode is 5d) and (ELL is present[6]) then:

- [T31-ELL4] shall be executed
  (This test will check the Communication Control Field of the ELL. The Bits B, A, S, R, H of the Configuration Field are ignored)
- The Bits 2, 3 (Content of Message CC) of the Configuration Field shall be in range of 00b, 01b, 10b. Otherwise the test shall fail.

If the (mode is 5d) and (ELL is NOT present) then:

- The Bits B, A, R and H of the **Configuration Field** shall be set to 0b. Otherwise the test shall fail.

6.5.3 [T41-CF3] Special Bits of Mode 7

It shall be tested if the values of all special bits of Mode 7 are within the given ranges listed in Table 7 and Table 8. Otherwise the test shall fail.

BitNr	Bit Name	Accepted range	Remarks
14-15	CC	00b, 10b	Content of Message

[6] ELL is indicated by using CI fields 8Ch and 8Eh

13	0	0b	Reserved for Counter Size
8-12	MMMMM	07h	Security Mode
4-7	NNNN	0…15d	Number of encrypted blocks[7]
0-3	0	0b	Reserved for Content Index

Table 7: Valid range of special bits in the configuration field of Mode 7

BitNr	Bit Name	Accepted range	Remarks
7	0	0b	Reserved
6	0	0b	Reserved for Version
4-5	DD	01b	Key Derivation Function Selection
0-3	KKKK	0000b	Key-ID

Table 8: Valid range of special bits in configuration field extension of Mode 7

6.6 Encryption/Decryption Test

6.6.1 [T41-E1] Encryption

Wireless meter/actuator shall support data encryption. Encryption is optional for wired meters only. The applied security profile and encryption key has to be listed in [OMSCT-ManDec].

The encryption of a received datagram is tested by the OMS Conformance Test tool. The Encryption key shall be provided by the manufacturer.

The meter shall send an encrypted datagram with a valid encryption method. The encryption mode is defined in the MMMMM bits of the configuration field according to [OMSS-Vol2].

The test passes, if at least two datagrams with Encryption method “5” or “7” could be successfully decrypted and verified by the AES check sequence “2Fh 2Fh”.

6.6.2 [T41-E2] Decryption

The decryption of a received datagram is tested by OMS Conformance Test tool. The Manufacturer shall provide an unencrypted Command sequence e.g. “Switch Valve” and valid encryption key of the meter. The Command sequence and Encryption key has to be imported into the OMS-Test tool.

The OMS-Conformance Test tool request standard data by REQ-UD2 (refer to [OMSS-Vol2] Table 1). When the meter responds the OMS Conformance test tool shall forward a simple Test-Command. An Acknowledge (ACK) has to be responded from meter.

The test has to be executed twice. The first time OMS Conformance Test tool send with unencrypted telegram to verify test procedure. (This test is not mandatory!) The second test will be applied with the encrypted command. (This test is mandatory!)

The test passes when meter executes the encrypted command (e.g. state of valve is changed).

7 Check of the variable part of the application frame

The CI field determines the used application protocol of the message. The available application protocols are shown in Table 9. The CI-Field shall be one out of the CI-Fields

[7] 1111b means that all blocks are encrypted, there is no un-encrypted data transmitted.

listed in [OMSS-Vol2] Table 1. If an application frame exists the type of Application protocol is declared in column “Application protocol” of this table. The test specification of the Application protocols is listed in Table 9.

Application protocol	Tested by
M-Bus	OMS-Conformance Test Volume 4 - Part 2 (this document)
DLMS	DLMS/COSEM - To be defined!
SML	To be defined!

Table 9: Table of possible application protocols

Part 2:

M-Bus Protocol

8 Check an M-Bus-Application frame

The M-Bus Application frame consists of one or several data records as chained M-Bus string. To verify every standardised data records the M-Bus String has to be separated into data records. The test tool for Conformance test shall parse the M-Bus-string as defined in next subclause.

8.1 [T42-P1] Parsing an M-Bus-String

The M-Bus string shall always start with a valid DIF. The DIF describes the format and length of the contained data. Each data record needs to be evaluated to determine the length and thus the beginning of the next record. The length can be calculated as follows:

Length = Sum of all DIF/DIFE + Sum of all VIF/VIFE + Length of Data

The Number of DIF/DIFE-fields shall be calculated by summing up all octets until the Extension Bit is cleared.

The Number of VIF/VIFE-fields shall be calculated by summing up all octets until the Extension Bit is cleared.

The Length of data shall be calculated according to the predefined length as given in [EN13757-3] Table 6.

Exceptions have to be applied in case of data field DIF=Dh (LVAR) and data field DIF=Fh (special functions)

In case of variable data length, an 8 bit length field can be found at the end of the VIF/VIFE sequence. The field indicated the length of the data following.

Using special functions all special DIF are allowed but the special DIF 2Fh may be supported only. After 2Fh no VIF follows and the length of data is 0. For all other special functions the parsing should be stopped at this position. Alternatively the special parser may also consider other special functions, if the interpretations rule is known.

Applying these rules the telegram can be separated in different data records before the interpretation of every data record is started.

EXAMPLE 1:

This example shows an M-Bus-string for a volume in gallons represented by a hexadecimal number. As gallons are not part of OBIS-Table, the OMS-Standard interpreter may ignore this data record and continues parsing with the next data record. The length of the ignored data record can be found as following:

M-Bus-string [hex]: CC 80 01 FB 23 78 56 34 12 0F 12 34 56 2F 2F

DIF, DIFE, VIF, VIFE, example 12345678

Length = 8 Digits BCD for Data (Type 1100b in Table 3) = 4 octets

+ DIF (set extension bit) and DIFE (set ext. bit) and DIFE (cleared ext. bit) = 3 octets

+ VIF (set extension bit) and VIFE (cleared extension bit) = 2 octets

Thus the next DIF (0Fh) follows after 9 octets!

EXAMPLE 2:

The example shows a complete application layer frame (hexadecimal numbers; without CRC). The parsing starts after the configuration word by separating the individual data records.

Application layer frame [Hex]:

7A 02 04 00 00 2F 2F 0B 13 56 34 12 8B 82 00 93 3E 67 45 23 0D FD
10 0A 30 31 32 33 34 35 36 37 38 39 0F 88 2F

	Data [hex]	Content, Meaning
-	7A 02 04 00 00	CI-Field 7Ah is followed by 4 Byte fix header
1	2F	First DIF Special function (1 DIF, 0 VIF, no data → L=1)
2	2F	Special function (1 DIF, 0 VIF, no data) → L=1
3	0B 13 56 34 12	Data record (1 DIF, 1 VIF, 3 Byte of data) → L=5
4	8B 82 00 93 3E 67 45 23	Data record (3 DIF/DIFE, 2 VIF/VIFE, 3 Byte of data) → L=8
5	0D FD 10 0A 30 31 32 33 34 35 36 37 38 39	LVAR (1 DIF, 2 VIF/VIFE, 1 Length-field (showing 10 (0Ah) remaining bytes) and 10 Byte ASCII) → L=14
?	0F 88 2F	Special function (manufacture specific) unknown Length → stop parsing here

8.2 [T42-P2] Compact Load Profile

8.2.1 Informative

The load-profile defines a list of values that can be defined relative or absolute to each other.

A base-value, a base-time, and a compact-profile define the load-profile. The base-value is a separate m-bus string that defines a start-value. The base-time is the time associated to the base-value.

In the compact-profile-string further values are stored in a compact format, which are referenced to the base-value.

Base-value and base-time are linked to the compact-profile by the same storage-No.

Structure of the compact-profile:

DIF/DIFE	VIF/VIFE	LVAR	Spacing ControlByte	Spacing ValueByte	Data

A compact-profile-structure can be identified by a DIF of xDh and a VIFE of 13h, 1Eh or 1Fh.

8.2.2 Test

8.2.2.1 Conditions for the fields of a compact-profile:

DIF/DIFE:

DIF_DataField (Bit 0..3):

MUST: xDh

ELSE: → error

DIF_FunctionFiled (Bit 4/5):

value has no restrictions

DIF_StorageNumber :

IF VIFE == 1Fh („compact profile without register“) OR VIFE == 13h („reverse compact profile without register“):

MUST: ≥ 8

ELSE: → error

ELSE:

MUST: ≥ 0 AND ≤125

The DIF_StorageNumber must not be zero, since this value is used for the current time.

ELSE: → error

DIF_TariffNumber:

MUST: ≤255

ELSE: → error

DIF_SubunitNumber:

MUST: ≤255

ELSE: → error

Info:

- Link to base-time is done by DIF_StorageNumber
- Link to base-value is done by DIF_StorageNumber, DIF_TariffNumber, and DIF_SubunitNumber

VIF/VIFE:

Value-information:

has no restrictions (combination of the DataFormat(SpacingControlByte)/VIF- fields for the meter must be valid)

last VIFE:

MUST: 13h, 1Eh or 1Fh (identification of the compact profile)

ELSE: → error

LVAR:

MUST: 02h..BFh (02h means that no data is available)

ELSE: → error

SpacingControlByte:

Bit 3..0: DataFormat

MUST: be out of [1…4, 6, 7, 9…0Ch, 0Eh]

ELSE: → error

Bit 5/4: SpacingUnit (time-spacing):

00b=sec,

01b=min,

10b=hours,

11b=days/months

Bit 7/6: IncrementMode:

00b=absolute value (signed)

01b=Increments (positive unsigned)

10b=Decrements (negative unsigned)

11b=Signed difference

SpacingValueByte:

Value 0: Test shall pass

Value 1..250:

time-increment/decrement in the unit that is defined by SpacingControlByte

Value 253:

IF SpacingUnit == 11b:

Number of half months

ELSE:

→ error (reserved)

Value 254:

IF SpacingUnit != 00b:

→Pass test

ELSE:

→ error (reserved)

other values:

→ error (reserved)

Data:

Data in the format defined by SpacingControlByte.

IF IncrementMode is 01b or 10b:

IF DataFormat is in [1…4, 6, 7, 9…0Ch, 0Eh] AND is signed ([EN13757-3] Annex B):

→ error

ELSE:

The data shall be interpreted as unsigned integer
(data typ B ([EN13757-3] Annex A) OR unsigned BCD ([EN13757-3] Annex B))

IF IncrementMode is 00b or 11b:

The data shall be interpreted as signed integer
(data typ B ([EN13757-3] Annex A) OR signed BCD ([EN13757-3] Annex B))

Info:

- If IncrementMode != 00b (absolute) then the Base-Value shall be used as initial value. Every new value is determined by adding or subtracting (depending on IncrementMode) the data-value to the already calculated value. Calculation begins with the first data-value.
- If IncrementMode == 00b (absolute) the data-value shall be used as it is (without calculation).
- If the base-value is missing then the first value shall be used in absolute-mode. Otherwise an error shall be issued.
- According to ([EN13757-3] negative BCD-values are preceded by Fh.

8.2.2.2 Conditions for Base-Time:

If SpacingValueByte != 0

Time with same storage-number as in CompactProfile available:

YES: use as base-time

NO: → error

Time in the format F to J except H ([EN13757-3], Annex A):

YES: OK

NO: → error

Else

Test passed

8.2.2.3 Conditions for Base-Value:

Value available with the same Storage-, Tariff-, und Subunit-Number as in the CompactProfile:

YES: use as base-value

NO:

IncrementMode == 00b (absolute):

YES: use first data-value of CompactProfile as base-value

NO: → error

Info:

- The base-value and the values in CompactProfile are connected by the same Storage-, Tariff-, und Subunit-Numbers.
- The first data-value of the CompactProfile is always associated to the base-time plus the time-increment of SpacingValueByte and SpacingControlByte. This is also true if there is no base-balue available.

Info:

- Base-value and base-time may occur in arbitrary order to the CompactProfile.

8.2.3 Test-Cases

The test cases shall be used to check the conformance test and do not reflect a real meter implementation.

Test-case 1

IF/VIFE	EEh, 1Fh	HCA units (current value), compact profile without registers
LVAR	0Ah	number of bytes
data	34h	spacing: absolute values + days + 32 bit integer
	FDh	days between values
	02h, 00h, 00h, 00h	value 2: 2 HCA units
	03h, 00h, 00h, 00h	value 3: 3 HCA units

Test-case 11

Error condition: SpacingValueByte == 254 but SpacingUnit != 11b

DIF/DIFE	84h, 04h	32 bit integer, storage no. = 8
VIF	6Eh	HCA units
data	01h, 00h, 00h, 00h	value 1: 1 HCA units

DIF/DIFE	82h, 04h	16 bit integer, storage no. = 8
VIF	6Ch	data (format G)
data	5Fh, 1Ch	date 31.12.2010

DIF/DIFE	8Dh, 04h	variable length, storage no. = 8
VIF/VIFE	EEh, 1Fh	HCA units (current value), compact profile without registers
LVAR	0Ah	number of bytes
data	34h	spacing: absolute values + days + 32 bit integer
	FEh	days between values

	02h, 00h	00h,	00h,	value 2: 2 HCA units
	03h, 00h	00h,	00h,	value 3: 3 HCA units

Test-case 12

Error condition: missing Base-Time

DIF/DIFE	84h, 04h			32 bit integer, storage no. = 8
VIF	6Eh			HCA units
data	01h, 00h	00h,	00h,	value 1: 1 HCA units

DIF/DIFE	8Dh, 04h			variable length, storage no. = 8
VIF/VIFE	EEh, 1Fh			HCA units (current value), compact profile without registers
LVAR	0Ah			number of bytes
data	34h			spacing: absolute values + days + 32 bit integer
	01h			days between values
	02h, 00h	00h,	00h,	value 2: 2 HCA units
	03h, 00h	00h,	00h,	value 3: 3 HCA units

Test-case 13

Error condition: Base-Value not available for IncrementMode != 00b

DIF/DIFE	82h, 04h			16 bit integer, storage no. = 8
VIF	6Ch			data (format G)
data	5Fh, 1Ch			date 31.12.2010

DIF/DIFE	8Dh, 04h			variable length, storage no. = 8
VIF/VIFE	EEh, 1Fh			HCA units (current value), compact profile without registers
LVAR	0Ah			number of bytes
data	74h			spacing: increments + days + 32 bit integer
	01h			days between values
	02h, 00h	00h,	00h,	value 2: 2 HCA units
	03h, 00h	00h,	00h,	value 3: 3 HCA units

5

8.3 Test of a single M-Bus data record

Typically an M-Bus data record consists of a DIB, a VIB and data (see 6.1 in [EN13757-3]).

8.3.1 DIB coding (informative)

The DIF has always the Structure

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
E	X	F	F	D	D	D	D

Table 10: DIF coding

with

E Extension bit according to subclause 6.7 of [EN13757-3]

X LSB of Storage number according to 6.6 of [EN13757-3]

FF Function field according to 6.5 of [EN13757-3]

DDDD Data field according to 6.4 of [EN13757-3]

The DIFE has always the Structure

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
E	S	T	T	X	X	X	X

Table 11: DIFE coding

With

E Extension bit according to subclause 6.7 of [EN13757-3]

S bit[n] of Subunit according to 6.10 of [EN13757-3]
(with n=0 for first DIFE; n=1 for second DIFE and so on)

TT bits [n+1…n] of Tariff information according to 6.9 of [EN13757-3]
(with n=0 for first DIFE; n=2 for second DIFE and so on)

XXXX bits [n+4…n+1] of Storage number according to 6.6 of [EN13757-3]
(with n=0 for first DIFE; n=4 for second DIFE and so on)

A final DIFE is (according to Annex G1 of [OMSS-Vol2]) a DIFE with a value 00h.

8.3.2 VIB coding (informative)

The VIB-Type List in Annex B.3 of [OMSS-Vol2] defines for each VIB-Type the applied VIF/VIFE-combination.

8.3.3 OMS-Compatible Data records (informative)

Each supported M-Bus data record is presented by an MB-Tag.

The M-Bus-Tag-List in Annex B.2 of [OMSS-Vol2] defines for each MB-Tag the applicable range of Data field, Function field, Storage number and Finale DIFE. Additionally it defined the applicable VIB-Types.

8.3.4 Tests

8.3.4.1 Presence

If field ‘Pre.’ contains an ‘M’ (for mandatory) check if the data record is present. Otherwise the test is failed.

If field ‘Pre.’ contains an ‘A1’ or ‘A2’ (for alternative) check if at least one of the alternative data records with same number is present. Otherwise the test is failed.

If field ‘Pre.’ contains an ‘O’ (for optional) the data record doesn’t need to be present.

For each data record detected under above mentioned conditions (mandatory, alternative, optional) the following tests shall be executed:

8.3.4.2 Doublet

A doublet is a second data record in a message which corresponds to same MB-Tag.

There are several MB-Tags allowing a range of Storage numbers, Tariff-registers or Subunits like e.g. "EW1!RT". A repetition of an MB-Tag with a different Storage number, Tariff-register and/or Subunits unit shall not be considered as a doublet.

If field ‘Dbl.’ contains an ‘x’ check for each found data record if no doublet exist. Otherwise the test is failed.

8.3.4.3 Resolution

If field ‘Res.’ contains a limitation then check if the data record conforms to this limitation.

8.3.4.4 Encryption

The field ‘Enc.’ is reserved for future use.

8.4 [T42-GD*] Generic Data points

The generic data points are applicable for all device types.

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD1] - 1	DP1!	O	x	-	-	
[T42-GD2] - 1	DP2!	O	x	-	-	Not applicable for HCA
[T42-GD3] - 1	DP3!	O	x	-	-	
[T42-GD4] - 1	DP4!	O	x	-	-	
[T42-GD5] - 1	DT1!	O	x	-	-	
[T42-GD6] - 1	DT2!	O	x	-	-	
[T42-GD7] - 1	ID1!	O	x	-	-	
[T42-GD8] - 1	ID2!	O	x	-	-	
[T42-GD9] - 1	ID3!	O	x	-	-	
[T42-GD10] - 1	ID4!	O	x	-	-	
[T42-GD11] - 1	ID5!	O	x	-	-	
[T42-GD12] - 1	ID6!	O	x	-	-	
[T42-GD13] - 1	MM1!	O	x	-	-	
[T42-GD14] - 1	MM1!I	O	x	-	-	
[T42-GD15] - 1	MM1!E	O	x	-	-	
[T42-GD16] - 1	MM2!	O	x	-	-	
[T42-GD17] - 1	MM3!	O	x	-	-	
[T42-GD18] - 1	MM4!	O	x	-	-	
[T42-GD19] - 1	MM5!	O	x	-	-	

Table 12: Generic data points for all devices – Test cases

8.5 [T42-EL*] Electricity meters

All following tests of this subclause are applicable for the device types shown in Table 13:

Device Type	Code (refer to [OMSS-Vol2] table 2)
Electricity meter	02h

Table 13: Electricity meter – supported Device Types

The Electricity meter shall pass the following test cases:

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD*]	See 8.4					Applicable tests are defined in 8.4
[T42-EL1] – 1	EW1!	A1	x	-	x [b]	
[T42-EL1] – 2	EW2!	A1	x	-	x [b]	
[T42-EL1] – 3	EW3!	A1	x	-	x [b]	
[T42-EL2] – 1	PW1!	O [c]	x	-	≤ 1 W	
[T42-EL2] – 2	PW3!	O [c]	x	-	≤ 1 W	
[T42-EL2] – 3	PW7!	O [c]	x	-	≤ 1 W	
[T42-EL3] – 1	EW1!R	O	x [d]	-	-	
[T42-EL4] – 1	EW1!T	O	x [d]	-	-	
[T42-EL5] – 1	EW1!RT	O	x [d]	-	-	
[T42-EL13] – 1	EW2!R	O	x	-	-	
[T42-EL14] – 1	EW2!T	O	x	-	-	
[T42-EL15] – 1	EW2!RT	O	x	-	-	
[T42-EL23] – 1	EW3!R	O	x [d]	-	-	
[T42-EL24] – 1	EW3!T	O	x [d]	-	-	
[T42-EL25] – 1	EW3!RT	O	x [d]	-	-	
[T42-EL30] – 1	PW1!A	O [a]	X	-	-	
[T42-EL31] – 1	PW1!AR	O [a]	x [d]	-	-	
[T42-EL32] – 1	PW1!AT	O [a]	x [d]	-	-	
[T42-EL33] – 1	PW1!ART	O [a]	x [d]	-	-	
[T42-EL34] – 1	PW3!A	O [a]	X	-	-	
[T42-EL35] – 1	PW3!AR	O [a]	x [d]	-	-	
[T42-EL36] – 1	PW3!AT	O [a]	x [d]	-	-	
[T42-EL37] – 1	PW3!ART	O [a]	x [d]	-	-	
[T42-EL38] – 1	PW4!AC	O [a]	x	-	-	

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-EL39] – 1	PW4!ACT	O [a]	x [d]	-	-	
[T42-EL40] – 1	PW6!AC	O [a]	X	-	-	
[T42-EL41] – 1	PW6!ACT	O [a]	x [d]	-	-	
[T42-EL50] – 1	RE1!	O	X	-	-	
[T42-EL51] – 1	RE1!T	O	x	-	-	
[T42-EL52] – 1	RE1!R	O	x	-	-	
[T42-EL53] - 1	RE1!RT	O	x	-	-	
[T42-EL54] - 1	RE2!	O	x	-	-	
[T42-EL55] - 1	RE2!T	O	x	-	-	
[T42-EL56] - 1	RE2!R	O	x	-	-	
[T42-EL57] - 1	RE2!RT	O	x	-	-	
[T42-EL58] - 1	RP1!	O	x	-	-	
[T42-EL59] - 1	RP2!	O	x	-	-	
[T42-EL60] - 1	DT1!A	O [a]	x	-	-	
[T42-EL61]– 1	DT1!R	O	x	-	-	
[T42-EL62] - 1	DT1!AR	O [a]	x	-	-	
[T42-EL63] - 1	DT1!AT	O [a]	x	-	-	
[T42-EL64] - 1	DT1!ART	O [a]	x	-	-	
[T42-EL65] - 1	DT2!R	O	x	-	-	
[T42-EL66] – 1	DT2!A	O	x	-	-	
[T42-EL67] – 1	DT2!AR	O	x	-	-	
[T42-EL68] – 1	DT2!AT	O	x	-	-	
[T42-EL69] – 1	DT2!ART	O	x	-	-	
[T42-EL70] – 1	DT3!A	O	x	-	-	
[T42-EL71] – 1	DT3!AR	O	x	-	-	
[T42-EL72] – 1	DT3!AT	O	x	-	-	
[T42-EL73] – 1	DT3!ART	O	x	-	-	
[T42-EL74] – 1	DT4!A	O	x	-	-	
[T42-EL75] – 1	DT4!AR	O	x	-	-	
[T42-EL76] – 1	DT4!AT	O	x	-	-	
[T42-EL77] – 1	DT4!ART	O	x	-	-	
[T42-EL80] – 1	VV1!	O	x	-	-	
[T42-EL81] – 1	VV2!	O	x	-	-	

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-EL82] – 1	VV3!	O	x	-	-	
[T42-EL83] – 1	CA1!	O	x	-	-	
[T42-EL84] – 1	CA2!	O	x	-	-	
[T42-EL85] – 1	CA3!	O	x	-	-	
[T42-EL86] – 1	CA4!	O	x	-	-	
[T42-EL90] – 1	PD1!	O	x	-	-	
[T42-EL91] - 1	PD2!	O	x	-	-	
[T42-EL92] - 1	PD3!	O	x	-	-	
[T42-EL93] - 1	PD4!	O	x	-	-	
[T42-EL94] - 1	PD5!	O	x	-	-	
[T42-EL95] - 1	PD6!	O	x	-	-	
[T42-EL75] - 1	FR1!	O	x	-	-	
[T42-EL75] - 1	MM7!	O	x	-	-	

Remarks:

[a] If an electricity meter supports power maximum registers, the objects containing the actual maximum value (PW*!A*) and the associated point of time of the actual maximum value (DT*!A*) must always be transmitted to pass the test. Both data points shall be within the same M-Bus message.

[b] If ≤ 1 kWh & > 0,1 Wh then the respective data object [T42-EL2] for power is mandatory.
If > 1 kWh the test shall be failed.

[c] Check if data-point is mandatory according to [T42-EL1]

[d] This M-Bus Tag may appear several times within the same M-Bus message; but each of them has to be distinguishable by different tariff or storage numbers.

Table 14: Electricity meter – Test cases

8.6 [T42-W*] Water meters

All following tests of this subclause are applicable for the device types shown in Table 15.

Device Type	Code (refer to [OMSS-Vol2] table 2)
Water meter	07h
Warm water meter	06h
Hot water meter	15h
Cold water meter	16h

Table 15: Water meters – supported Device Types

The Water meter shall pass the following test cases:

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD*]	See 8.4			-		Applicable tests are defined in 8.4
[T42-W1] - 1	VM1!	M	x	-	≤ 1 m^3	
[T42-W2] - 1	VF1!	O	x	-	-	
[T42-W3] - 1	VM1!D	O	x	-	≤ 1 m^3	
[T42-W4] - 1	DT2!D	O	x	-		

Table 16: Water meter – Test cases

8.7 [T42-HC*] Heat meter, Cooling meter or comb. Heat cooling meters

8.7.1 [T42-HC*] Heat meter and Cooling meter

All following tests of this subclause are applicable for the device types shown in Table 17.

Device Type	Code (refer to [OMSS-Vol2] table 2)
Cooling meter	0Ah, 0Bh
Heat meter	04h, 0Ch

Table 17: Heat/Cold meters – supported Device Types

The Cooling or Heat meter shall pass the following test cases:

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD*]	See 8.4					Applicable tests are defined in 8.4
[T42-HC1] - 1	EJ1!	A1	x	-	x [a]	
[T42-HC2] - 1	EW1!	A1	x	-	x [a]	
[T42-HC7] - 1	EJ1!D	O	x	-	-	
[T42-HC8] - 1	EW1!D	O	x	-	-	
[T42-HC13] - 1	DT2!D	O	x	-	-	
[T42-HC14] - 1	PJ1!	O	x	-	-	
[T42-HC15] - 1	PW1!	O [b]	x	-	-	
[T42-HC18] - 1	TC1!	O	x	-	-	
[T42-HC19] - 1	TC2!	O	x	-	-	
[T42-HC20] - 1	VF1!	O	x	-	-	
[T42-HC22] - 1	VM1!	O	x	-	-	
[T42-HC24] - 1	VM1!D	O	x	-	-	

Remarks:

[a] Minimum resolution is according to DIN EN 13757-3:2013, table L.1:
≤ 1 kWh in case Q_p < 10 m³/h,
≤ 10 kWh in case 10 m³/h ≤ Q_p < 100 m³/h,
≤ 100 kWh otherwise
If the minimum resolution requirement is not met, one of the data objects [T42-HC15] for power is mandatory.

[b] Data-point may be mandatory in dependency of [T42-HC1] or [T42-HC2].

Table 18: Heat meter and cooling meters - Test cases

8.7.2 [T42-HC*] combined Heat/Cooling meters

All following tests of this subclause are applicable for the device types shown in Table 17.

Device Type	Code (refer to [OMSS-Vol2] table 2)
Combined Heat/cooling	0Dh

Table 19: combined Heat/Cooling meters – supported Device Types

The Heat/Cooling meter shall pass the following test cases:

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD*]	See 8.4				-	Applicable tests are defined in 8.4
[T42-HC1] - 1	EJ1!	A1	x	-	x [a]	
[T42-HC2] - 1	EW1!	A1	x	-	x [a]	
[T42-HC3] - 1	EJ1!T	A2	x	-	x [a]	
[T42-HC4] - 1	EJ2!	A2	x	-	x [a]	
[T42-HC5] - 1	EW1!T	A2	x	-	x [a]	
[T42-HC6] - 1	EW2!	A2	x	-	x [a]	
[T42-HC7] - 1	EJ1!D	O	x	-	-	
[T42-HC8] - 1	EW1!D	O	x	-	-	
[T42-HC9] - 1	EJ1!DT	O	x	-	-	
[T42-HC10] - 1	EJ2!D	O	x	-	-	
[T42-HC11] - 1	EW1!DT	O	x	-	-	
[T42-HC12] - 1	EW2!D	O	x	-	-	
[T42-HC13] - 1	DT2!D	O	x	-	-	
[T42-HC14] - 1	PJ1!	O	x	-	-	
[T42-HC15] - 1	PW1!	O [b]	x	-	-	
[T42-HC16] - 1	PJ1!T	O	x	-	-	
[T42-HC17] - 1	PW1!T	O [c]	x	-	-	
[T42-HC18] - 1	TC1!	O	x	-	-	
[T42-HC19] - 1	TC2!	O	x	-	-	
[T42-HC20] - 1	VF1!	O	x	-	-	
[T42-HC21] - 1	VF1!T	O	x	-	-	
[T42-HC22] - 1	VM1!	O	x	-	-	
[T42-HC23] - 1	VM1!T	O	x	-	-	
[T42-HC24] - 1	VM1!D	O	x	-	-	
[T42-HC25] - 1	VM1!DT	O	x	-	-	

Remarks:

[a] Minimum resolution is according to DIN EN 13757-3:2013, table L.1:
≤ 1 kWh in case Q_p < 10 m³/h,
≤ 10 kWh in case 10 m³/h ≤ Q_p < 100 m³/h,
≤ 100 kWh otherwise
If the minimum resolution requirement is not met, then one of the data objects [T42-HC15] to [T42-HC17] for power is mandatory.

[b] Data-point may be mandatory in dependency from [T42-HC1] or [T42-HC2]

[c] Data-point may be mandatory in dependency from [T42-HC3] or [T42-HC4] or [T42-HC5] or [T42-HC6]

Table 20: combined Heat/Cold meters - Test cases

8.8 [T42-HCA*] Heat cost allocator

All following test of this subclause are applicable for the device types shown in Table 21.

Device Type	Code (refer to [OMSS-Vol2] table 2)
Heat Cost Allocator	08h

Table 21: Heat cost allocator – supported Device Types

The Heat cost allocator shall pass the following test cases:

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD*]	See 8.4					Applicable tests are defined in 8.4
[T42-HCA1] - 1	HC1!	M	x	-	-	Previously [T42-H1]
[T42-HCA2] - 1	HC1!D	M	x	-	-	Previously [T42-H2]
[T42-HCA3] - 1	DT2!D	M	x	-	-	Previously [T42-H3]

Table 22: Heat Cost Allocator – Test cases

8.9 [T42-G*] Gas meter

All following tests of this subclause are applicable for the device types shown in Table 23:

Device Type	Code (refer to [OMSS-Vol2] table 2)
Gas	03h

Table 23: Gas meter – supported Device types

The Gas meter shall pass the following test cases:

Reference	Related MB-Tag in Annex B of [OMSS]	Applicable Tests (see 8.3.4)				Remarks
		Pre.	Dbl.	Enc.	Res.	
[T42-GD*]	See 8.4					Applicable tests are defined in 8.4
[T42-GG1] - 1	DT1!R	O	x	-	-	
[T42-GG2] - 1	DT2!R	O	x	-	-	
[T42-GT1] - 1	VM1!	A1	x	-	x [d]	
[T42-GT2] - 1	VF1!	O[a,d]	x	-	x [e]	
[T42-GT3] - 1	TC3!	O[a,c,f]	x	-	-	
[T42-GT4] - 1	VM1!T	O[a]	x	-	≤1 m³	
[T42-GT5] - 1	VM1!R	O[a]	x	-	≤1 m³	
[T42-GT6] - 1	VM1!RT	O[a]	x	-	≤1 m³	
[T42-GM1] - 1	VM2!	A1	x	-	x [d]	
[T42-GM2] - 1	VF2!	O[b,d]	x	-	x [e]	
[T42-GM3] - 1	VM2!T	O[b]	x	-	≤1 m³	
[T42-GM5] - 1	VM2!R	O[b]	x	-	≤1 m³	
[T42-GM6] - 1	VM2!RT	O[b]	x	-	≤1 m³	
[T42-GB1] - 1	VM3!	A1	x	-	x [d]	
[T42-GB2] - 1	VF3!	O[c,d]	x	-	x [e]	
[T42-GB3] - 1	PR1!	O[c,g]	x	-	-	
[T42-GB4] - 1	VM3!T	O[c]	x	-	≤1 m³	
[T42-GB5] - 1	VM3!R	O[c]	x	-	≤1 m³	
[T42-GB6] - 1	VM3!RT	O[c]	x	-	≤1 m³	

Remarks:

[a] Only if VM1! is present.

[b] Only if VM2! is present.

[c] Only if VM3! is present.

[d] Resolution of VM1! and VM2! and VM3! shall be:
≤ 10 l (Qmax ≤ 6 m³/h)
≤ 100 l (Qmax ≤ 60 m³/h)

	≤ 1000 l (Qmax > 60 m³/h) otherwise: Resolution of VM1! and VM2! and VM3! shall be ≤ 1 m³ and presence of VF1! or VF2! or VF3! is mandatory (Pre. = M).
e	Resolution shall be: ≤ 10 l/h (Qmax ≤ 6 m³/h) ≤ 100 l/h (Qmax ≤ 60 m³/h) <= 1000 l/h (Qmax > 60 m³/h)
f	Mandatory if the base temperature for the compensation is not 15 °C. The manufacturer shall state in the [OMSCT-ManDec] whether the base temperature is 15 °C or not.
g	Mandatory if the base pressure for the compensation is not 1013,25 mbar. The manufacturer shall state in the [OMSCT-ManDec] whether the base pressure is 1013,25 mbar or not.

Table 24: Gas meter – Test cases

8.10 Radio converter

8.10.1 Radio converter (meter side)

All following tests of this subclause are applicable for the device types shown in Table 25:

Device Type	Code (refer to [OMSS-Vol2] table 3)
Radio converter (meter side)	37h

Table 25: Radio converter – supported Device types

A radio converter transmits information of the connected meter. The address of the connected meter including its device type is provided in the Application Layer Address of the telegram (see also **[T41-AD1]** Address (8 Byte)). For such converter all test cases shall be executed ae type of the connected meter.

8.11 Other devices

8.11.1 [T42-MD1] Mandatory data points

It shall be checked if the device type of the DUT is listed in one of the listed tables and therefore mandatory data points shall be transmitted.

- Table 13: Electricity meter – supported Device Types
- Table 15: Water meters – supported Device Types
- Table 17: Heat/Cold meters – supported Device Types
- Table 19: combined Heat/Cooling meters – supported Device Types
- Table 21: Heat cost allocator – supported Device Types
- Table 23: Gas meter – supported Device types
- Table 25: Radio converter – supported Device types

If the DUT is not listed there this test shall failed, otherwise it shall be passed.

Appendix A: Applicable Test cases of OMS-CT (Normative)

1. Test cases of M-Bus and wireless M-Bus devices

Test case	Description	EL[1)]	W[2)]	HC[3)]	H[4)]	G[5)]	UDR[6)]	GW[7)]
[T41-AFL*]	AFL Test	M	M	M	M	M	N	N
[T41-SEC*]	Security Profile Test	M	M	M	M	M	N	N
[T41-CI1]	CI-Field	M	M	M	M	M	N	N
[T41-AD1]	Address	M	M	M	M	M	N	N
[T41-AN1]	Access Number	M	M	M	M	M	N	N
[T41-ST1]	Status	M	M	M	M	M	N	N
[T41-CF*]	Configuration Field	M	M	M	M	M	N	N
[T41-E1]	Encryption	M	M	M	M	M	N	N
[T41-E2]	Decryption						N	N
[T42-P1]	Parsing an M-Bus-String						N	N
[T42-P2]	Compact Load Profile	O	O	O	O	O		
[T42-GD*]	Generic data points	O	O	O	O	O	N	N
[T42-EL*]	Specific data points	8.5					N	N
[T42-W*]	Specific data points		8.6				N	N
[T42-HC*]	Specific data points			8.7			N	N
[T42-HCA*]	Specific data points				8.8		N	N
[T42-G]**	Specific data points					8.9	N	N
[T42-MD1]	Mandatory Data Points	M	M	M	M	M	N	N

Note:

M	This Test case is mandatory (Data point has to exist!)
O	This Test case is applied only if data point exists
Ax	One alternative Test case with same x is mandatory (Data point has to exist!)
N	Test case is not defined yet
6.x	Test cases according definition in subclause 6.x (e.g subclause 6.5)

1)	EL	= Electricity Meter
2)	W	= Water meter (heat and cold)
3)	HC	= Heat meter (also Cooling meter or combined Heat/Cooling meter)
4)	H	= Heat Coast Allocator
5)	G	= Gas meter
6)	UDR	= Unidirectional Repeater
7)	GW	= Gateway (communication controller)

Table 26: Test Cases related to DUT type