



Open Metering System Specification

**Communication profiles
for compliance with national regulations and
international associations**

**Annex E to
Volume 2 Primary Communication
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E.1 Germany – Compliance with BSI TR-03109

The German law requires an approval for the operation of a Smart Meter Gateway in Germany. This approval confirms both the security and the interoperability of a Smart Meter Gateway. The [BSI TR03109] describes the requirements for such a Smart Meter Gateway.

Such a Smart Meter Gateway has to ignore an unsecure communication link to a smart meter. This Annex describes which services and security methods of the OMS-Specification shall be applied to comply with [BSI TR03109].

E.1.1 Smart Meter Gateway

E.1.1.1 Wireless M-Bus Interface of the Smart Meter Gateway

The requirements for a Smart Meter Gateway are specified in [BSI TR03109]. According to this technical guideline a Smart Meter Gateway shall always support wireless interface. This wireless interface shall fulfil all requirements of Table E.1.1.

The Smart Meter Gateway shall support a collision avoiding according to Annex I).

The M-Bus Data point conversion shall base on Annex A.

**Table E.1.1 – OMS-Requirements for the wM-Bus interface
of a Smart Meter Gateway to comply with [BSI TR03109]**

| Layer | Wireless M-Bus |
|--|---|
| Physical Layer | Subclause 4.3 „Wireless Communication (wM-Bus)“, Modes S, T and C (Other Device to Meter) Annex I „Collision avoiding“ Annex L “Timing” |
| Data Link Layer | Subclause 5.2 “Wireless Communication (wM-Bus)” Subclause 5.3 “Extended Link Layer” (mandatory) |
| Authentication and Fragmentation Layer | Subclause 6 “Authentication and Fragmentation Layer” (mandatory) Message Counter C and C’ shall be according subclause 9.3.2; see also Annex J |
| Transport Layer | Subclause 7.2 “Common Part for all combined Transport/Application Layers” The Device Type 31h shall be used according subclause 2.3 Table 3 Subclause 9 “Communication security”, Security Profile B for unidirectional meter connection, Security Profile C for bidirectional meter connection |
| Application Layer | Subclause 8.1 “General requirements” Subclause 8.4 “M-Bus Application Protocol” together with Annex B Subclause 8.4.6 “OBIS-Code” The support of self-declared OBIS-declaration according to EN13757-3:2018 Annex H.3 is not allowed! Subclause 8.8 “Application Error Protocol” |

Detailed information about additional mandatory wired and wireless interfaces can be found in [BSI TR03109-1] subclause 3.3.

E.1.1.2 Optional Wired M-Bus Interface of the Smart Meter Gateway

The requirements for a Smart Meter Gateway are specified in [BSI TR03109]. According to this technical guideline the support of a wired M-Bus interface by the Smart Meter Gateway is optional. But if it is present it shall follow the requirements of Table E.1.2.

The M-Bus Data point conversion shall base on Annex A.

**Table E.1.2 – OMS Requirements for the optional M-Bus interface
of a Smart Meter Gateway to comply with [BSI TR03109]**

| Layer | optional wired M-Bus |
|--|---|
| Physical Layer | Subclause 4.2 “Wired Communication (M-Bus)” |
| Data Link Layer | Subclause 5.1 “Wired Communication (M-Bus)” |
| Authentication and Fragmentation Layer | Subclause 6 “Authentication and Fragmentation Layer” (mandatory) Message Counter C and C’ shall be according subclause 9.3.2; see also Annex J |
| Transport Layer | Subclause 7.2 “Common Part for all combined Transport/Application Layers” Subclause 9 “Communication security”, Security Profile C only |
| Application Layer | Subclause 8.1 “General requirements” Subclause 8.4 “M-Bus Application Protocol” together with Annex B Subclause 8.4.6 “OBIS-Code” The support of self-declared OBIS-declaration according to EN13757-3:2018 Annex H.3 is not allowed! Subclause 8.8 “Application Error Protocol” |

Detailed information about additional mandatory wired and wireless interfaces can be found in [BSI TR03109-1] subclause 3.3.

E.1.2 Meter

[BSI TR03109] does not impose directly any requirements on meters to interoperate with a BSI compliant Smart Metering Gateway in its LMN (Local Metrological Network). However, to ensure interoperability with such a Gateway the wireless or wired M-Bus interface of the meter shall fulfil the OMS-Specification with the following restrictions. If the meter applies other than allowed functionalities (e.g. usage of Security profile A) the Smart Metering Gateway will only accept allowed functionalities and ignore any other messages.

E.1.2.1 Wireless M-Bus Interface of the Meter

**Table E.1.3 – OMS-Requirements for the wM-Bus interface of meters
for interoperability with a Smart Meter Gateway**

| Layer | Unidirectional wM-Bus-meters | Bidirectional wM-Bus-meters |
|--|--|---|
| Physical Layer | Subclause 4.3 “Wireless Communication (wM-Bus)”, Modes S1 or T1 or C1 Annex L | Subclause 4.3 “Wireless Communication (wM-Bus)”, Modes S2 or T2 or C2 (Meter to Other Device) Annex I Annex L |
| Data Link Layer | Subclause 5.2 “Wireless Communication (wM-Bus)” Subclause 5.3 “Extended Link Layer” (mandatory) | |
| Authentication and Fragmentation Layer | Subclause 6 “Authentication and Fragmentation Layer” (mandatory) Subclause 9.3.2 Message Counter C and C’ shall be according Annex J | |
| Transport Layer | Subclause 7.2 “Common Part for all combined Transport/Application Layers”, Only Device Types listed in Table 2 of this [OMS-S2] Subclause 9 “Communication security”, Security Profile B only | Subclause 7.2 “Common Part for all combined Transport/Application Layers”, Only Device Types listed in Table 2 of this [OMS-S2] Subclause 9 “Communication security”, Security Profile C only, together with Annex F |
| Application Layer | Subclause 8.1 “General requirements” Subclause 8.4 “M-Bus Application Protocol” together with Annex B and Annex G Subclause 8.4.6 “OBIS-Code” The support of self-declared OBIS-declaration according to EN13757-3:2018 Annex H.3 is not allowed! Subclause 8.8 “Application Error Protocol” The support of subclause 8.7 “Clock Synchronisation Protocol” is not allowed! | |

E.1.2.2 Wired M-Bus Interface of the Meter

**Table E.1.4 – OMS-Requirements for the M-Bus interface of meters
for interoperability with a Smart Meter Gateway**

| Layer | wired M-Bus meter |
|--|--|
| Physical Layer | Subclause 4.2 “Twisted Pair Connection (M-Bus)” |
| Data Link Layer | Subclause 5.1 “Wired Communication (M-Bus)” |
| Authentication and Fragmentation Layer | Subclause 6 “Authentication and Fragmentation Layer” (mandatory) Subclause 9.3.2 Message Counter C and C’ shall be according to Annex J |
| Transport Layer | Subclause 7.2 “Common Part for all combined Transport/Application Layers” Subclause 9 “Communication security”, Security Profile C only |
| Application Layer | Subclause 8.1 “General requirements” Subclause 8.4 “M-Bus Application Protocol” together with Annex B and Annex G Subclause 8.4.6 “OBIS-Code” The support of self-declared OBIS-declaration according to EN13757-3:2018 Annex H.3 is not allowed! Subclause 8.8 “Application Error Protocol” The support of subclause 8.7 “Clock Synchronisation Protocol” is not allowed! |

E.1.3 Actuator

The support of OMS actuators by the BSI compliant Smart Meter Gateway is currently not allowed.

E.2 Europe – Compliance with IDIS association

E.2.1 Scope

This section describes the functionalities and features that an OMS meter/actuator must support in order to be able to communicate with an IDIS E-meter according to IDIS Pack 3 (see [IDIS]). This IDIS E-meter fulfils the role of a gateway and is called in this document as “IDIS Gateway”. The function of an IDIS Gateway may also be provided by another device than an IDIS E-Meter.

If a meter/actuator is intended to be used together with an IDIS Gateway it shall fulfil all requirement of this clause.

The following paragraphs indicate where a further limitation of the OMS specification is applied.

E.2.2 System Overview

The figure below gives a global system overview, consisting of a Head End System, an IDIS Gateway, which also functions as an E-meter and several OMS meters. The communication protocol between the Head End System and an IDIS Gateway is the IDIS profile of the DLMS specifications [IP3].

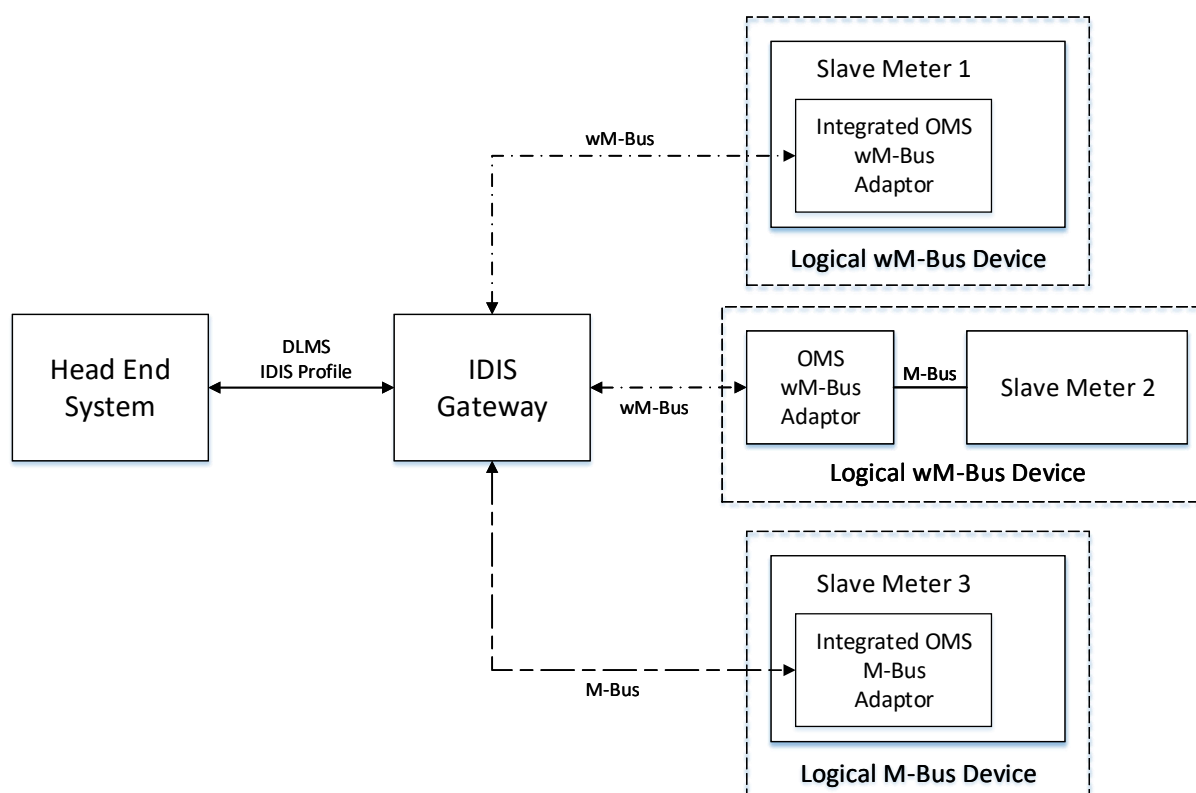


Figure E.2.1: IDIS Gateway with OMS meters.

With respect to the IDIS Gateway and the OMS meters, and in case of wireless M-Bus, only the following situations are supported. Either:

- The slave OMS wM-Bus meter has an integrated wM-Bus Adaptor.
- The slave OMS meter uses of an external RF-Adaptor.

The IDIS Gateway may also support wired M-Bus meters.

In total, an IDIS Gateway is able to handle 4 different logical M-Bus devices (wired or wireless)

E.2.3 Address Handling Conditions

As described in section E.2.2, the OMS meters can either have an integrated radio module or use an external RF-Adapter (e.g. a clickable module on the meter/actuator, see [OMS-S2], 3.1.3).

In case no adapter is used:

- When the meter communicates with the IDIS Gateway, it will use its address in the link layer
- When the IDIS Gateway communicates with the meter, it will use its address in the link layer, and the address of the meter in the transport layer.

In case an adapter is used:

- When the meter communicates with the IDIS Gateway, the OMS adapter will use its address in the link layer and will use the address of the meter in the transport layer.
- When the IDIS Gateway communicates with the meter, it will use its address in the link layer, and the address of the meter in the transport layer (and the address of the OMS adapter is not used).
- The IDIS Gateway will only allow the adapter to connect with one device. From the IDIS Gateway, the RF adapter and its slave meter are seen as a single logical M-Bus device, see [IP3] clause 5.3.1.6.

E.2.4 Communication Interfaces

E.2.4.1 Wireless M-Bus

For the interoperability with the IDIS Gateway the OMS meter shall fulfil the requirements of Table E.2.1

**Table E.2.1 – OMS-Requirements for the wireless M-Bus interface of meters
for interoperability with an IDIS Gateway**

| Feature | Acc. to [OMS-S2] | Requirements/Limitations | Explanation |
|---|------------------|---|-------------|
| Radio mode | 4.3.1 | For unidirectional meters: mode C1 or T1 ^a For bidirectional meters: mode C2 or T2 ^a | |
| Security | 9.1 | Security Profile A and B according to [OMS-S2], Table 37. | |
| ^a Mode T is deprecated/not recommended for future development beginning with OMS-Specification Volume 2 Version 4.2. | | | |

E.2.4.2 Wired M-Bus

**Table E.2.2 – OMS-Requirements for the wired M-Bus interface of meters
for interoperability with an IDIS Gateway**

| Feature | Acc. to [OMS-S2] | Requirements/Limitations | Explanation |
|----------------------------|------------------|---|-------------|
| Addressing | 3.1.2 | Primary address shall be supported | |
| CI-Field / Transport layer | 7.3 | SND-UD2 shall be supported | |
| Security | 9.1 | Security Profile A, B or No Security Profile according to Table 37. | |

E.2.5 Support of Use Cases

The described use cases of Annex M are generally optional for OMS devices. All IDIS-OMS profile compliant devices needs to implement at least [OMS-UC-01] Meter Registration. Specific requirements or limitations to certain use cases are depicted in Table E.2.2.

The IDIS Gateway supports all use cases of this table. See [IP3] Table 2 ‘Use Cases supported by IDIS Package 3’ for more information. It is prepared to be interoperable with OMS devices that implement different (sub)sets of those use cases.

Table E.2.3 – OMS-Use cases to be supported for interoperability with an IDIS Gateway

| Use Case | Obligation | Requirements/Limitations | Explanation |
|---|-----------------------|---|--|
| [OMS-UC-01] Meter Registration | Mandatory | Shall be implemented as described in Annex M [OMS-UC-01] | [OMS-S2] 5.2.3 and 4.3.2.3 |
| [OMS-UC-03] Disconnection & Reconnection | Optional ^a | Shall be implemented as described in Annex M [OMS-UC-03]. The use case is only possible from the AMM-Head-End not from the IDIS gateway. | The AMM-Head-End has to provide the SITP container applying the “transfer_key” method of “Mbus Client Setup InterfaceClass” object. |
| [OMS-UC-04] Clock Management | Optional ^a | Shall be implemented as described in Annex M [OMS-UC-04]. | [OMS-UC-04a] can be applied by the IDIS gateway directly. [OMS-UC-04b] and [OMS-UC-04c] can only be applied by the AMM-Head-End providing the SITP container applying the “transfer_key” method of “Mbus Client Setup InterfaceClass” object. |

| Use Case | Obligation | Requirements/Limitations | Explanation |
|--|-----------------------|--|---|
| [OMS-UC-05] Firmware update | Optional ^a | <p>A block size of 200 Byte shall be supported by the meter. The Seq_SND-UD2 shall be supported additionally for the Transfer Command.</p> <p>SITP wrapping is not mandatory for the Image Activate Command and the optional Image Terminate Command. IDIS gateway shall apply the defined transport Security Profile.</p> <p>The AMM-Head-End can apply those commands with APL security in addition.</p> | <p>A datagram-length of up to 255 Bytes is to be supported according to [OMS-S2] 5.2.2 (which is sufficient to carry an update-block of 200 Bytes)</p> <p>The AMM-Head-End has to provide the SITP container applying the “transfer_key” method of “MBus Client Setup InterfaceClass” object.</p> |
| [OMS-UC-06] Meter supervision | Optional ^a | <p>Shall be implemented as described in Annex M [OMS-UC-06]. The use case is only possible from the AMM-Head-End not from the IDIS gateway.</p> | <p>The AMM-Head-End has to provide the SITP container applying the “transfer_key” method of “MBus Client Setup InterfaceClass” object.</p> |
| [OMS-UC-07] Consumer information | Optional | Shall be implemented as described in Annex M [OMS-UC-07]. | |
| [OMS-UC-08] Key Management | Optional ^a | Shall be implemented as described in Annex M [OMS-UC-08]. | |
| ^a Only applicable for bidirectional devices | | | |

E.3 References

| Ref. Nr. | References |
|----------|--|
| 1. | [OMS-S2]: OMS Specification Volume 2, Version 4.3.x |
| 2. | [IDIS]: IDIS Web Page: http://www.idis-association.com |
| 3. | [IP3] IDIS Package 3 (Excerpt): https://docs.wixstatic.com/ugd/4d5ee4_403a9bb24c8b4772a5ce966a3fe7d597.pdf |