



## **Application Descriptions**

**7**

### **Metering**

**60**

### **Metering M-Bus Data Collector Functional Blocks**

**1**

#### **Summary**

This document specifies the mapping of M-Bus Metering information to KNX Metering M-Bus Data Collector Functional Blocks.

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01.04.07	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

Copies with the same version number but a newer save date contain small corrections without impact on the content.

## Referenced documents

- [01] M-Bus "Specification EN13757-3"
- [02] M-Bus "Specification EN13757-4"
- [03] Part 10/3 "RF Metering protocol"
- [04] Chapter 3/7/1 "Interworking Model"
- [05] Chapter 3/7/2 "Datapoint Types"

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# 1 Introduction

## 1.1 Scope

This document is part of the KNX Application Interworking Standard.

It contains the specification of the Metering Functional Blocks, the rules for data conversion from M-Bus to the KNX system, including a new KNX metering Datapoint Type and some general requirements on the KNX side for a Metering Data Collector (M-Bus RF Metering to KNX gateway)

Commissioning procedures are specified where appropriate to support a reasonable workflow between the M-Bus and KNX subsystems. For that purpose some specific mechanisms and Datapoints are defined in the Data Collector.

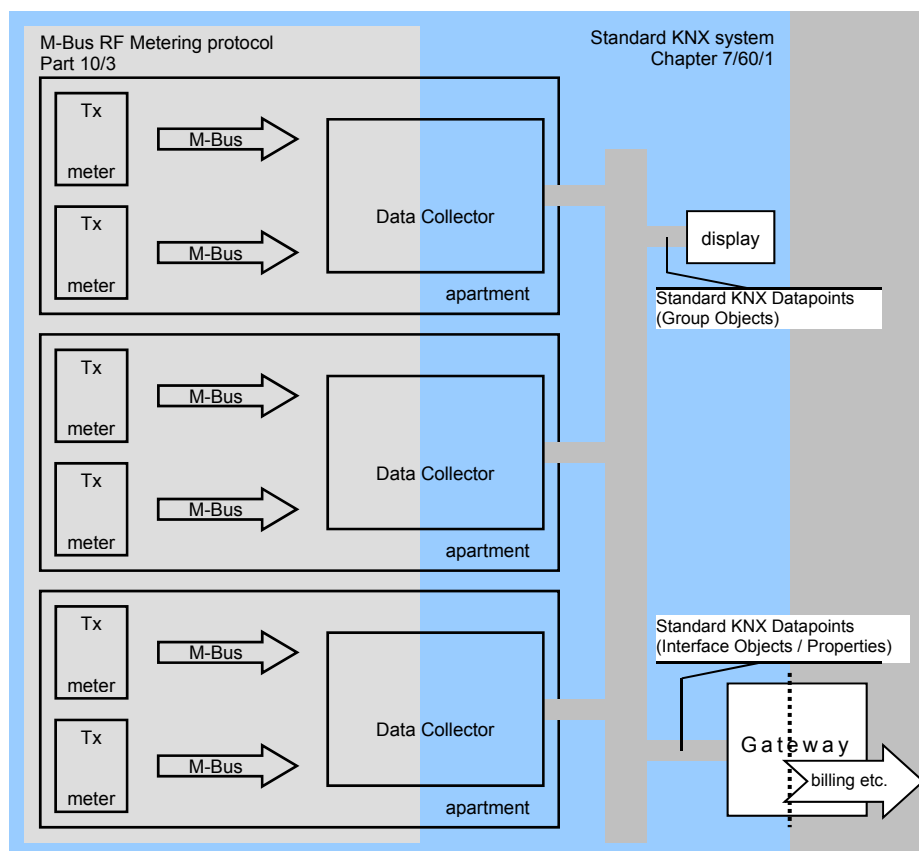
The M-Bus RF Metering protocol is not part of this document and is specified in [03].

## 1.2 Objectives

This document specifies the mapping of M-Bus Metering information to the corresponding KNX Functional Block representation in a Data Collector. Only unidirectional RF transmit-only meters are considered. The various types of metering devices are mapped to a predefined set of KNX Metering Functional Blocks, which are specified in this document.

The main applications are

- automated remote meter readout via a telephone gateway
- visualization on displays
- etc ...



**Figure 1 – Metering system topology**

Every M-Bus RF Metering device shall be mapped in a Data Collector to a KNX Interface Object and Datapoints in the M-Bus RF message shall be mapped to standard Properties of the corresponding Interface Objects.

For each connected metering device the Data Collector shall hold an instance of the corresponding Interface Object Type. The Data Collector shall act as an M-Bus proxy to the KNX system. Normally one or multiple Data Collectors are connected to a remote telephone gateway for remote meter readout.

A limited set of metering Datapoints are also available as Group Objects in Standard Mode for visualization on existing KNX displays etc.

### **Metering data access in the standard KNX system**

- **Automated Meter Readout via a central unit / telephone gateway**

The purpose of this application is to read out a complete and consistent set of metering data from the Data Collector by a data client for billing purposes.

Type of data access: Property polling in client/server mode using point-to-point addressing.

Frequency of data access by the client: rare / a few times per day / uncritical data latency.

Spontaneous distribution of the complete set of metering data in the KNX system using standard multicast Group Objects is not the preferred solution because of the following reasons.

- Each metering device provides a large number of Datapoints (e.g. history values).  
⇒ This needs an excessive number of Group Addresses.
- Confirmed client/server Property services (polling) better support the need for data consistency and data integrity for billing applications.
- Reception of each RF metering frame would normally lead to a spontaneous update of many Group Objects by the Data Collector.  
⇒ This generates peak bus traffic.
- In client/server mode however, the busload can be controlled by the client (central unit/telephone gateway) and peak busload can be avoided.  
⇒ The client shall respect the rules of “friendly coexistence” and bus access fairness on the network and shall limit the rate of read requests.

- **Visualization of metering data on displays etc.**

Metering data may also be used for visualization on displays etc. Runtime communication of existing display devices is based on standard multicast communication (Standard Mode). Therefore the Data Collector shall provide a subset (current accumulated energy/volume consumption) of metering data also in Standard Mode. Other Datapoints may be provided in Standard Mode in addition.

In the M-Bus RF system data are transmitted periodically, typically 2 times to 6 times per day. Normally reception of an M-Bus message will trigger an update of the corresponding Group Objects.

The Group Objects are also readable, so a display device may read out the Group Objects after a power up to get current data.

A subset of metering data may also be distributed with LTE multicast communication using geographical zoning information Apartment.Room.Subzone



The following M-Bus Device Types (physical media) are supported in the KNX system.

**Table 1 - Supported M-Bus Device Types**

Device Type	M-Bus Device Type Code	KNX FB	KNX Interface Object type
Other <sup>a)</sup>	00h	M_GENERICM	1110
Oil <sup>a)</sup>	01h	M_GENERICM	1110
Electricity <sup>a)</sup>	02h	M_GENERICM <sup>b)</sup> M_ELECM <sup>b)</sup>	1110 1104
Gas <sup>a)</sup>	03h	M_GENERICM <sup>b)</sup> M_GASM <sup>b)</sup>	1110 1105
Heat (outlet)	04h	M_HEATM	1101
Steam <sup>a)</sup>	05h	M_GENERICM	1110
Warm Water (30°C to 90°C)	06h	M_WATERM	1103
Water	07h	M_WATERM	1103
Heat cost allocator	08h	M_HCA	1102
Compressed Air	09h	Not available	
Cooling Load meter (outlet)	0Ah	M_HEATM	1101
Cooling Load meter (inlet)	0Bh	M_HEATM	1101
Heat (inlet)	0Ch	M_HEATM	1101
Heat and Cool	0Dh	M_HEATM	1101
Breaker	20h	M_BREAKERM	1106
Valve	21h	M_VALVEM	1107
Waste water meter	28h	M_WATERM	1103
Garbage	29h	M_GENERICM	1110
<sup>a)</sup> Basic metering information for these Media is covered by FB M_GENERICM. This is an intermediate solution. <sup>b)</sup> It is allowed to use M_GENERICM as KNX FB for Gas and Electricity purpose, during a transition period. But the KNX FB M_ELECM is preferred for Electricity and M_GASM is preferred for Gas.			

This is a technical specification with informative material provided as needed to convey key concepts. The approach taken here is a top-down view of interoperability.

Every Functional Block may be part of a complex device containing more than one Functional Block. Because of this modular approach, there is no attempt in this specification to describe or dictate the internal construction of a Functional Block or to describe specific device types.

This document only includes details of the transport protocol as needed to specify interoperability and easy installation mechanisms.

## 1.3 Glossary

Meter	Metering device that collects metering consumption data and provides metering values by M-Bus RF communication
Metering Data Collector (MDC)	Unit with M-Bus RF receiver able to store and forward metering data on a KNX medium with standard KNX protocol mechanisms, on event, periodically or by request.

## 1.4 Abbreviations

Abbreviation	Description
cs	Company Specific
GO	Group Object mandatory
(GO)	Group Object optional
M	Mandatory
NA	Not Allowed / Not Applicable
O	Optional
S	Has to be implemented in Standard Mode, if implemented in LTE-Mode.
HEE	HVAC Easy Extension
HVAC	Heating Ventilation Air Conditioning
LTE	Logical Tag Extended
IR	LTE-Service InfoReport
W	LTE-Service Write
MDC	Metering Data Collector

## 2 General requirements for a KNX Metering Data Collector

A Metering Data Collector that shall map M-Bus RF metering data to the KNX system shall fulfil the following general requirements.

- Implementation of the RF-metering protocol according to [03].
- Minimal number of M-Bus RF metering devices that can be linked to the Data Collector:  
**10 devices.**  
For each metering device the Data Collector shall hold a local data image and map the data to the KNX system.
- Linking procedure of M-Bus RF metering device: via pushbutton and an unambiguous M-Bus address, see [03].
- For each connected metering device the Data Collector shall create one related Interface Object. The order of metering Interface Objects and assignment of Object Indices in the Data Collector is company specific.  

EXAMPLE      The order of the Interface Objects may be dependent on the binding sequence of the meters, or there can be a grouping of Interface Objects according to the metering device type and the corresponding Interface Object Type.
- A subset of metering data shall also be provided as Group Objects in Standard Mode.
- The Data Collector shall be able to handle all types of meters according to Table 1.  

NOTE    Electricity and Gas meters are currently excluded and will be specified in a second step.
- Handling of Metering History values: M-Bus RF meters also provide data history values (e.g. monthly data). The Data Collector shall be able to store for each meter at least an array of **8 history data sets**.
- Only a few metering Datapoints shall be stored by the Data Collector in non-volatile memory. Most of the Datapoints may be stored in volatile memory and data loss is acceptable in case of power down. The related requirements are specified per Datapoint.

### Further requirements

- During the installation and teach-in procedures of metering devices, the Data Collector shall create a meter device directory to assign linked meters.  
The format and management of the metering device directory in the Data Collector is company specific and not part of this specification. The Data Collector shall however provide appropriate procedures to
  - add a new metering device, and
  - replace a metering device by a another device (with different identification number and e.g. different unit/resolution of the metering data), and
  - delete a metering device.
- The Data Collector shall support the workflow from metering device installation to Standard Mode commissioning by appropriate means (e.g. device localisation via display, text information).
- In case of replacement of a metering device, the Data Collector shall provide appropriate information to support the installer to adapt existing links to related KNX devices (like e.g. displays). Two Properties 'MeterReplacement' and 'MeterReplacementCounter' are defined for each metering Functional Block to detect and manage replacement of metering devices. Further company specific mechanisms can be implemented to simplify the meter replacement workflow.

- For each meter a 'UserText' may be configured on the Data Collector to simplify identification and localization of the meter. This 'UserText' can be useful in case of
  - service, maintenance
  - binding of metering data to KNX displays (e.g. via ETS)
  - billing information for the end user
  - etc.
- In case of removal or deletion of a metering device from the device directory in the Data Collector, it is highly recommended to keep the corresponding instance of the Interface Object alive and set all data in the Interface Object to void values (see below). It is not recommended to re-assign Object Indices of the remaining Metering Objects because data processing in the data client (e.g. tel. gateway) could be corrupted.
- After commissioning or power up of the Data Collector, metering data can be void or outdated for hours until a new message from an RF metering device is received.

### Handling of void data

The 'OutOfService' Status attribute in metering Properties shall indicate void data. This status attribute shall be set in the following cases.

- No metering device is connected to the metering Interface Object (ex-factory default data).
- A previously connected metering device is removed or deleted from the device directory in the Data Collector. Handling of the metering device directory of the Data Collector is manufacturer specific.
- In case of meter replacement, all metering data of the original metering device are deleted. Metering Properties in the corresponding Interface Object as well as the related Standard Mode Datapoints are then void until the first valid M-Bus RF message from the new device is received. This may take several hours.

**NOTE** This specification does not foresee specific mechanisms in the Data Collector to supervise the presence/function of connected metering devices using life-check mechanisms etc. Because of very manufacturer specific cyclic update periods for M-Bus RF messages, a life-check 'timeout' cannot be standardized. Therefore this specification does not put requirements on the Data Collector to set metering data automatically 'OutOfService' in case of missing/outdated data from the connected metering device.

### 3 General requirements for a KNX metering data client

Metering data clients like central units and telephone gateways shall access metering data by polling of Interface Objects and Properties from the Data Collector.

#### Busload limitation

Normally the central units and telephone gateway needs an update of the metering data once a day or on request. The busload resulting from polling of metering data is controlled by the client and not by the server (Metering Data Collector). Therefore the client shall respect the rules of “friendly coexistence” and bus access fairness on the network and shall limit the rate of read requests.

The following guidelines are defined in [04] and listed in this document for information.

If Property values in a Property Server are accessed (write/read) by a Property Client, then the bus load generated by this communication is fully controlled by the Property Client. Therefore, the Property Client shall guard the following rules to keep the bus load within limits.

1. The Property Client shall not access a next Property value before the Property Server has responded to the previous Property access (A\_PropertyValue\_Response-PDU).
2. While waiting for the response of one Property Server, the Property Client shall not address another Property Server.

In subsequent accesses to Property values, in between the response from the Property Server and the next access to a Property value, the Property Client shall guard a longer interframe time than for low priority data. This will allow normal process data to access the bus meanwhile. This may in the application in the Property client either be given automatically by the delays in processing the received Property values, or may be handled explicitly by introducing additional small wait times of e.g. 1 ms added to the standard interframe time on the medium; this should allow other KNX devices to access the bus.

#### Data consistency

In billing applications consistent metering data are needed. During polling of metering data from the Data Collector a new M-Bus RF frame may be received and read-out data may be inconsistent. For data consistency checking each metering Functional Block shall provide a Property ‘RxSequenceCounter’ that shall be incremented each time a new M-Bus metering frame is received from the corresponding metering device.

The client reading out metering data shall check the ‘RxSequenceCounter’ counter before and after read out of the complete set of metering data. If the sequence counter value has changed, metering data may be inconsistent. The client shall then retry the procedure.

## 4 Metering Data model

### 4.1 Introduction


Data are encoded differently in the M-Bus system and in the standard KNX system. Therefore a Datapoint Type conversion is necessary from M-Bus to KNX data representation. The following clauses specify the mapping of M-Bus data to standard KNX Datapoint Types.

#### **IMPORTANT NOTE**

**Physical data representation in the KNX APDU and M-Bus frame is different.**

- In the M-Bus system and RF metering protocol all datapoint values are presented in “little endian” format (Intel-like), so the least significant byte LSB is always transferred firstly.
- In the KNX system all Datapoint values shall be presented in “big endian” format (Motorola-like), so the most significant byte MSB is always transferred firstly.

## 4.2 Datapoint Type “MeteringValue”

 This new DPT will after the acceptance in Final Voting of this document be moved to Chapter 3/7/2 “Datapoint Types”.

The KNX Datapoint Type DPT\_MeteringValue supports flexible and dynamic encoding of various metering values with different units and resolutions. Because of this flexible data format, the number of metering Datapoints (Properties) in the Data Collector can be reduced to a minimum.

<u>Format:</u>	6 octets: $V_{32}N_8Z_8$				
	6 MSB CountVal	5 CountVal	4 CountVal	3 LSB CountVal	2 ValInfField
	VVVVVVVV	VVVVVVVV	VVVVVVVV	VVVVVVVV	NNNNNNNN
	1 Status/ Command				
	ZZZZZZZZ				
<u>Encoding:</u>	See below				
<u>Range:</u>	See below				
<u>Unit:</u>	See below				
<b>Datapoint Types</b>					
<u>ID:</u>	Name:	Range:	Unit:	Usage:	
229.001	DPT_MeteringValue	See below	See below	FB	

Data fields	Description	Unit / Range
CountVal	Counter Value 32 bit Signed value Encoding of void value, fault, overridden etc. using $Z_8$ Field	$V_{32}$ , -2 147 483 648 to 2 147 483 647 unit and resolution according to VallnfField
VallnfField	Encoding of unit and resolution of the counter value	$N_8$ , 00h to 7Fh subset of M-Bus VIF table, and the subset of VIFE table for MWh, GJ, MW, GJ/h and dimensionless counter value mapped to: 80h, 81h 88h, 89h A8h, A9h B0h, B1h BAh encoding see table below
Status/Command	standard Status/Command	$Z_8$ (This is specified in [05].)

**VallInfField**

This field shall contain the indications about the encoding of unit and resolution of the counter value. A part of the encoding range < 80h is a subset of the primary VIF Table according to the M-Bus specification [03]. VallInfField vales  $\geq 80h$  contain the mapping of VIFE range for GWh, GJ, MW, MJ/h and dimensionless counter values.

coding	description	range coding	range
00000nnn	energy	$10^{(nnn-3)}$ Wh	0,001 Wh to 10 000 Wh
1000000n	energy	$10^{(n+5)}$ Wh	0,1 MWh to 1 MWh
00001nnn	energy	$10^{(nnn)}$ J	0,001 kJ to 10 000 kJ
1000100n	energy	$10^{(n+8)}$ J	0,1 GJ to 1 GJ
00010nnn	volume	$10^{(nnn-6)}$ m <sup>3</sup>	0,001 l to 10 000 l
00011nnn	mass	$10^{(nnn-3)}$ kg	0,001 kg to 10 000 kg
00101nnn	power	$10^{(nnn-3)}$ W	0,001 W to 10 000 W
1010100n	power	$10^{(n+5)}$ W	0,1 MW to 1 MW
00110nnn	power	$10^{(nnn)}$ J/h	0,001 kJ/h to 10 000 kJ/h
1011000n	power	$10^{(n+8)}$ J/h	0,1 GJ/h to 1 GJ/h
00111nnn	volume flow	$10^{(nnn-6)}$ m <sup>3</sup> /h	0,001 l/h to 10 000 l/h
01000nnn	volume flow	$10^{(nnn-7)}$ m <sup>3</sup> /min	0,000 l/min to 1000 l/min
01001nnn	volume flow	$10^{(nnn-9)}$ m <sup>3</sup> /sec	0,001 ml/s to 10 000 ml/s
01010nnn	mass flow	$10^{(nnn-3)}$ kg/h	0,001 kg/h to 10 000 kg/h
01101110	units for HCA		dimensionless
10111010	dimensionless counter		dimensionless
Others *)	reserved		

\*) Mapping of other M-Bus VIF/VIFE-field codes to VallInfField

The mapping of VIF/VIFE codes to DPT\_MeteringValue only considers metering data. Other Datapoints in the M-Bus frame that do not represent metering counter values are encoded in the KNX standard system with other standard KNX DPT. The mapping for this is specified in clause 4.3.

**Remark**

During data conversion from M-Bus to standard KNX Datapoint Types there may be rounding errors or truncations, depending of the original M-Bus data encoding size and resolution.

**M-Bus Device Type**

The M-Bus Device Type is not encoded in DPT\_MeteringValue. The information about the device type is usually implicitly contained in the metering Datapoint address (Interface Object Type). In addition the M-Bus Device Type shall be encoded explicitly via an additional Datapoint in the metering object (e.g. in case of a water meter object to indicate if hot or cold water is measured).



### 4.3 Encoding of metering data in standard Group Objects

DPT\_MeteringValue is currently not supported by KNX devices using standard group communication (Standard Mode). For visualization on existing KNX displays etc. a limited set of metering Datapoints (current accumulated energy or volume consumption) is also available as Group Objects in Standard Mode using DPT\_Value\_4\_Count (13.001).

NOTE 1 Other Standard Mode DPTs, like DPT\_ActiveEnergy (13.010) and DPT\_ActiveEnergy\_kWh (13.013) can be used as well. This is an alternative, non FB compliant implementation. In Property Value encoding, DPT\_Value\_4\_Count (13.001) shall always be used; an alternative DPT in Property Value encoding would be a different Property with a different Property Identifier.

These Group Objects do not contain semantic information concerning unit and resolution of the metering data. This information can be retrieved from the Data Collector by the installer via Property access and the metering data link can be configured accordingly e.g. by ETS.

In case of meter replacement it may be necessary to reconfigure the link by ETS (see below).

#### Void metering data

- On standard group communication void or faulty metering data shall be encoded with value = 0.
- The reason for void data is not encoded and may be detected via other Properties.

Possible reasons are:

- no data available (default value in the Data Collector after power up), or
- metering device error, or
- meter replacement (data interpretation may have changed due to different unit/resolution).

#### 4.4 Mapping of M-Bus VIF/VIFE codes to standard KNX property DPT

M-Bus VIF code	description	range coding	Mapping to standard KNX DPT	
Metering values: according to primary VIF table				
0000 0nnn	energy	10 <sup>(nnn-3)</sup> Wh	229.001	DPT_MeteringValue
00001nnn	energy	10 <sup>(nnn)</sup> J	229.001	DPT_MeteringValue
0001 0nnn	volume	10 <sup>(nnn-6)</sup> m³	229.001	DPT_MeteringValue
0001 1nnn	mass	10 <sup>(nnn-3)</sup> kg	229.001	DPT_MeteringValue
0010 1nnn	power	10 <sup>(nnn-3)</sup> W	229.001	DPT_MeteringValue
0011 0nnn	power	10 <sup>(nnn)</sup> J/h	229.001	DPT_MeteringValue
0011 1nnn	volume flow	10 <sup>(nnn-6)</sup> m³/h	229.001	DPT_MeteringValue
0100 0nnn	volume flow	10 <sup>(nnn-7)</sup> m³/min	229.001	DPT_MeteringValue
0100 1nnn	volume flow	10 <sup>(nnn-9)</sup> m³/s	229.001	DPT_MeteringValue
0101 0nnn	mass flow	10 <sup>(nnn-3)</sup> kg/h	229.001	DPT_MeteringValue
0110 1110	Units for HCA		229.001	DPT_MeteringValue

Additional Metering values: subset with Linear VIF-Extension FBh. This subset of VIFE allows Datapoints using Energy units MWh or GJ respectively Power units MW or GJ/h.				
0000 000n	energy	10 <sup>(n-1)</sup> MWh	229.001	DPT_MeteringValue
0000 100n	energy	10 <sup>(n-1)</sup> GJ	229.001	DPT_MeteringValue
0010 100n	power	10 <sup>(n-1)</sup> MW	229.001	DPT_MeteringValue
0011 000n	power	10 <sup>(n-1)</sup> GJ/h	229.001	DPT_MeteringValue

Timer information				
0010 00nn	On Time (Duration of Meter power up)	nn = 00 seconds nn = 01 minutes nn = 10 hours nn = 11 days	13.100	DPT_LongDeltaTimeSec
0010 01nn	Operating Time (Duration of meter accu- mulation)	coded like OnTime	13.100	DPT_LongDeltaTimeSec
0111 00nn	Averaging Duration	coded like OnTime	13.100	DPT_LongDeltaTimeSec
0111 01nn	Actuality Duration	coded like OnTime	13.100	DPT_LongDeltaTimeSec

M-Bus VIF code	description	range coding	Mapping to standard KNX DPT	
Date/Time information Mapping see 4.5				
0110 1100	Date (current or associated with a storage number/function)		19.001	DPT_DateTime
0110 1101	Date and Time (actual or associated with a storage number/function)		19.001	DPT_DateTime
Sensor information				
0101 10nn	Flow Temperature	10 <sup>(nn-3)</sup> °C	9.001 205.100	DPT_Value_Temp DPT_TempHVACAbs_Z
0101 11nn	Return Temperature	10 <sup>(nn-3)</sup> °C	9.001 205.100	DPT_Value_Temp DPT_TempHVACAbs_Z
0110 00nn	Temperature Difference	10 <sup>(nn-3)</sup> K	9.002 205.101	DPT_Value_Tempd DPT_TempHVACRel_Z
0110 01nn	External Temperature	10 <sup>(nn-3)</sup> °C	9.001 205.100	DPT_Value_Temp DPT_TempHVACAbs_Z
0110 10nn	Pressure	10 <sup>(nn-3)</sup> bar	9.006	DPT_Value_Pres

Identifiers				
0111 1000	Fabrication No		12.001	DPT_Value_4_Ucount mapping from Fabrication number according to DIF
0111 1001	(Enhanced)Identi fication			Not mapped
0111 1010	Bus Address			Not mapped

For M-Bus data with other VIF codes no standard mapping to KNX DPT is defined and the datapoint shall be discarded.

## 4.5 Mapping of date and time

### 4.5.1 Format of KNX DPT\_DateTime

<b>Format:</b>	8 octets: U <sub>8</sub> [r <sub>4</sub> U <sub>4</sub> ][r <sub>3</sub> U <sub>5</sub> ][U <sub>3</sub> U <sub>5</sub> ][r <sub>2</sub> U <sub>6</sub> ][r <sub>2</sub> U <sub>6</sub> ]B <sub>16</sub>															
octet nr.	8 <sub>MSB</sub>				7				6				5			
field names	Year				0	0	0	0	Month	0	0	0	DayOfMonth	DayOf-Week	HourOfDay	
encoding	U	U	U	U	U	U	U	U	r	r	r	r	U	U	U	U
octet nr.	4				3				2				1 <sub>LSB</sub>			
field names	0	0	Minutes		0	0	Seconds		F	WD	NWD	NY	ND	NDoW	NT	SUTL
encoding	r	r	U	U	U	U	U	U	U	B	B	B	B	B	B	B

### 4.5.2 M-Bus data Type F

#### Compound CP32 Date and Time

	msb								lsb
LSB	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>	
	2 <sup>15</sup>	2 <sup>14</sup>	2 <sup>13</sup>	2 <sup>12</sup>	2 <sup>11</sup>	2 <sup>10</sup>	2 <sup>9</sup>	2 <sup>8</sup>	
	2 <sup>23</sup>	2 <sup>22</sup>	2 <sup>21</sup>	2 <sup>20</sup>	2 <sup>19</sup>	2 <sup>18</sup>	2 <sup>17</sup>	2 <sup>16</sup>	
MSB	2 <sup>31</sup>	2 <sup>30</sup>	2 <sup>29</sup>	2 <sup>28</sup>	2 <sup>27</sup>	2 <sup>26</sup>	2 <sup>25</sup>	2 <sup>24</sup>	

- **Seconds:** not available on M-Bus ⇒ fixed value 0 in DPT\_DateTime.
- **Minutes:** b0-b5, normal range 0 ... 59 can be mapped to DPT\_DateTime. Value 63 means “every minute” cannot be mapped ⇒ set NT = 1.
- **Hours:** b8-b12, normal range 0 ... 23 can be mapped to DPT\_DateTime value 31 means “every hour” cannot be mapped ⇒ set NT = 1.
- **Day of month:** b16-b20, normal range 1 ... 31 can be mapped to DPT\_DateTime value 0 means “every day” cannot be mapped ⇒ set ND = 1.
- **Month:** b24-b27, normal range 1 ... 12 can be mapped to DPT\_DateTime value 15 means “every month” cannot be mapped ⇒ set ND = 1.
- **Year:** b21-b23 and b28-b31, normal range 0 ... 99  
value 127 means “every year” cannot be mapped ⇒ set NY = 1  
b13-b14: hundred year: 0 ... 3  
Year = 1900 + 100\*hundred year + year, range 1900 – 2299
- ONLY the sub range 1900-2155 can be mapped to DPT\_DateTime  
other values: ⇒ set NY = 1.
- **IV (invalid)** b7: is mapped to DPT\_DateTime fields NY, ND and NT.
- **SU (summertime):** is mapped to DPT\_DateTime field SUTL.
- **Day of week:** not available in M-Bus data Type F ⇒ DPT\_DateTime field NDoW = 1.
- **WorkingDay:** not available in M-Bus data Type F ⇒ DPT\_DateTime field NWD = 1.
- **Fault:** not available in M-Bus data Type F ⇒ DPT\_DateTime field F = 0.
- **CLQ:** not available in M-Bus data Type F ⇒ DPT\_DateTime field CLQ = 0.

### 4.5.3 M-Bus data type G

#### Compound CP16 Date

	msb							lsb
LSB	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
MSB	2 <sup>15</sup>	2 <sup>14</sup>	2 <sup>13</sup>	2 <sup>12</sup>	2 <sup>11</sup>	2 <sup>10</sup>	2 <sup>9</sup>	2 <sup>8</sup>

Type G: is a subset of type F: same mapping to DPT\_DateTime as Type F, unsupported fields shall be set to invalid or to the default value.

- **Seconds:** not available in M-Bus data Type G  $\Rightarrow$  set NT = 1.
- **Minutes:** not available in M-Bus data Type G  $\Rightarrow$  set NT = 1.
- **Hours:** not available in M-Bus data Type G  $\Rightarrow$  set NT = 1.
- **Day of month:** b0-b4, normal range 1 ... 31 can be mapped to DPT\_DateTime value 0 means “every day” cannot be mapped  $\Rightarrow$  set ND = 1.
- **Month:** b8-b11, normal range 1 ... 12 can be mapped to DPT\_DateTime value 15 means “every month” cannot be mapped  $\Rightarrow$  set ND = 1.
- **Year:** b5-b7 and b12-b15, normal range 0 ... 99  
value 127 means “every year” cannot be mapped  $\Rightarrow$  set NY = 1  
Year = 2000 + year, range 2000 – 2099.
- **Day of week:** not available in M-Bus data Type G  $\Rightarrow$  NDoW = 1.
- **WorkingDay:** not available in M-Bus data Type G  $\Rightarrow$  DPT\_DateTime field NWD = 1.
- **Fault:** not available in M-Bus data Type G  $\Rightarrow$  DPT\_DateTime field F = 0.
- **CLQ:** not available in M-Bus data Type G  $\Rightarrow$  DPT\_DateTime field CLQ = 0.

### 4.5.4 M-Bus data type I

#### Year down to second (48 bits)

	msb							lsb
LSB	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
	2 <sup>15</sup>	2 <sup>14</sup>	2 <sup>13</sup>	2 <sup>12</sup>	2 <sup>11</sup>	2 <sup>10</sup>	2 <sup>9</sup>	2 <sup>8</sup>
	2 <sup>23</sup>	2 <sup>22</sup>	2 <sup>21</sup>	2 <sup>20</sup>	2 <sup>19</sup>	2 <sup>18</sup>	2 <sup>17</sup>	2 <sup>16</sup>
	2 <sup>31</sup>	2 <sup>30</sup>	2 <sup>29</sup>	2 <sup>28</sup>	2 <sup>27</sup>	2 <sup>26</sup>	2 <sup>25</sup>	2 <sup>24</sup>
	2 <sup>39</sup>	2 <sup>38</sup>	2 <sup>37</sup>	2 <sup>36</sup>	2 <sup>35</sup>	2 <sup>34</sup>	2 <sup>33</sup>	2 <sup>32</sup>
MSB	2 <sup>47</sup>	2 <sup>46</sup>	2 <sup>45</sup>	2 <sup>44</sup>	2 <sup>43</sup>	2 <sup>42</sup>	2 <sup>41</sup>	2 <sup>40</sup>

- **Seconds:** b0-b5, normal range 0 ... 59 can be mapped to DPT\_DateTime value 63 means “every second” cannot be mapped  $\Rightarrow$  set NT = 1.
- **Minutes:** b8-b13, normal range 0 ... 59 can be mapped to DPT\_DateTime value 63 means “every minute” cannot be mapped  $\Rightarrow$  set NT = 1.
- **Hours:** b16-b20, normal range 0 ... 23 can be mapped to DPT\_DateTime value 31 means “every hour” cannot be mapped  $\Rightarrow$  set NT = 1.
- **Day of month:** b24-b28, normal range 1 ... 31 can be mapped to DPT\_DateTime value 0 means “not specified” cannot be mapped  $\Rightarrow$  set ND = 1.

- **Month:** b32-b35, normal range 1 ... 12 can be mapped to DPT\_DateTime value 0 means “not specified” cannot be mapped  $\Rightarrow$  set ND = 1.
- **Year:** b29-b31 and b36-b39, normal range 0 ... 99 value 127 means “not specified” cannot be mapped  $\Rightarrow$  set NY = 1.  
Year = 2000 + year, range 2000 – 2099.
- **Day of week:** b21-b23, normal range 1 ... 7 can be mapped to DPT\_DateTime value 0 means “not specified”  $\Rightarrow$  NDoW = 1.
- **Week:** b40-b45, not available in DPT\_DateTime.
- **TimeDuringDaylightSaving:** b6, shall be mapped to DPT\_DateTime field SUTI.
- **LeapYear:** b7, not available in DPT\_DateTime.
- **TimeInvalid:** b15, shall be mapped to DPT\_DateTime field NT = 1.
- **DaylightDeviationHour:** b14, b46-b47: not available in DPT\_DateTime.
- **WorkingDay:** not available in M-Bus data Type I  $\Rightarrow$  DPT\_DateTime field NWD = 1.
- **Fault:** not available in M-Bus data Type I  $\Rightarrow$  DPT\_DateTime field F = 0.
- **CLQ:** not available in M-Bus data Type I  $\Rightarrow$  DPT\_DateTime field CLQ = 0.

#### 4.5.5 M-Bus data type J

##### Time of Day

	msb							lsb
LSB	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
	$2^{15}$	$2^{14}$	$2^{13}$	$2^{12}$	$2^{11}$	$2^{10}$	$2^9$	$2^8$
MSB	$2^{23}$	$2^{22}$	$2^{21}$	$2^{20}$	$2^{19}$	$2^{18}$	$2^{17}$	$2^{16}$

Type J: is a subset of type I: the same mapping to DPT\_DateTime shall be applied as for Type I, unsupported fields shall be set to invalid or the default value.

- **Seconds:** b0-b5, normal range 0 ... 59 can be mapped to DPT\_DateTime value 63 means “every second” cannot be mapped  $\Rightarrow$  set NT = 1.
- **Minutes:** b8-b13, normal range 0 ... 59 can be mapped to DPT\_DateTime value 63 means “every minute” cannot be mapped  $\Rightarrow$  set NT = 1.
- **Hours:** b16-b20, normal range 0 ... 23 can be mapped to DPT\_DateTime value 31 means “every hour” cannot be mapped  $\Rightarrow$  set NT = 1.
- **Date:** not available in M-Bus data Type J  $\Rightarrow$  set DPT\_DateTime field ND = 1.
- **Year:** not available in M-Bus data Type J  $\Rightarrow$  set DPT\_DateTime field NY = 1.
- **Day of week:** not available in M-Bus data Type J  $\Rightarrow$  set DPT\_DateTime field NDoW = 1.
- **WorkingDay:** not available in M-Bus data Type J  $\Rightarrow$  DPT\_DateTime field NWD = 1.
- **Fault:** not available in M-Bus data Type J  $\Rightarrow$  DPT\_DateTime field F = 0.
- **CLQ:** not available in M-Bus data Type J  $\Rightarrow$  DPT\_DateTime field CLQ = 0

## 4.6 Mapping of M-Bus raw data

It shall be possible to encode M-Bus raw data on standard KNX frames in order to transport company specific M-Bus data that cannot be interpreted and mapped by the Data Collector.

Mapping of M-Bus Raw data: DPT\_Value\_1\_Ucount[n] shall contain raw data of the last received M-Bus frame starting from and including the CI-field.

Raw data shall be encoded as in the original M-Bus frame. This is, there shall be no conversion from Intel-like to Motorola-like data representation.

### Exception handling for very long M-Bus frames that do not fit into MbusRawData.

Longer frames shall be truncated at the end, see [03].

## 4.7 Recommended display format for metering data

For some encodings of ValInfField in DPT\_MeteringValue, the corresponding display format is ambiguous.

EXAMPLE Should a value be displayed with the format/resolution of 1 kWh or 0,001 MWh?

With the following recommendation, deviating display formats for the same value on different devices can be avoided.

Display format for Energy  $10^{(-3)}$  Wh to  $10^{(6)}$  Wh.

ValInfField	Unit coding	Display format /resolution
00000000	$10^{(-3)}$ Wh	0,001 Wh
00000001	$10^{(-2)}$ Wh	0,01 Wh
00000010	$10^{(-1)}$ Wh	0,1 Wh
00000011	$10^{(0)}$ Wh	0,001 kWh
00000100	$10^{(1)}$ Wh	0,01 kWh
00000101	$10^{(2)}$ Wh	0,1 kWh
00000110	$10^{(3)}$ Wh	0,001 MWh
00000111	$10^{(4)}$ Wh	0,01 MWh
10000000	$10^{(5)}$ Wh	0,1 MWh
10000001	$10^{(6)}$ Wh	0,001 GWh

The same rules apply for energy values in J and power values in W or J/h.

## 4.8 Handling of M-Bus history data

### 4.8.1 Introduction

A meter provides more than current consumption values. Moreover it stores consumption values at several preset time points. This is typically the consumption at the end of a billing period. Additional time points may be the middle or end of every month. For every consumption value a consumption date exists. To combine consumption dates and consumption values, and to separate them from other consumptions every M-Bus datapoint has a property called storage number. Every consumption value with the same storage number is related to consumption date with this same storage number.

Some meters generate only one value during the reference period .e.g. one value for each month. This will be called single historical value. The single historical value uses typically the same storage number (e.g. always 1) or the same range of storage numbers (e.g. 2 to 4). Heat cost allocator, water or heat meter are typical devices using single historical values.

Other meters generate several historical values during a reference period. These values are called recent values. Such a meter generates for example 24 hourly values each day. All historical values are stored in the meter for the referenced period. Several or all values could be transported within one single radio telegram. Such a meter uses always different Storage numbers to address each recent value of the historical data set. The storage number is incremented with each historical value. The range of used storage numbers is always from 0 to 99. To avoid confusion with the current value (using also the Storage number 0) or other historical values (like Storage number 1) the recent values are marked with an additional special DIFE, which has always the value 00h. If this special DIFE is detected in a Datapoint it shall be handled as recent value independent of the content of the storage number. Typical devices are the electricity meter or the gas meter.

#### 4.8.2 Meters with single historical values

Meters with a device type 04h, 06h, 07h, 08h, 0Ah, 0Bh, 0Ch, 0Dh and 28h (refer Table 1 in [03]) shall always apply single historical values.

NOTE 2 Meters with single historical values never apply recent values. For that reason they should not use the special DIFE = 00h in any Datapoint. If however such a Datapoint is received for a meter with single historical values then this Datapoint shall be ignored.

Current consumption and status information always use **Storage number 0** and are not part of the history array.

Datapoints with storage number higher than 0 are called History dates or History values and shall be saved in the History array by the Data Collector. To save a received value to the History array the corresponding date information of this storage number shall be traced firstly.

Datapoints with **Storage number 1** shall exclusively be used to identify Consumption values at the end of the billing period. These values shall always be saved to Property value array index 1 of the History array. If no storage number 1 exists in first telegram received from this meter, the data in History array index 1 shall be marked void.

**Storage numbers higher than 1** shall be mapped to remaining History array indexes. Array indexes shall be assigned according to the following rules.

If received Datapoint has storage number #0

No historical value; treat as current value; exit

Check if Storage number of received Datapoint already exists in History array.

If new Storage number:

Search for free array index > 1 (with void data):

If free entry left:

save the corresponding data; exit

Else:

discard the data for this storage number; exit

Else (Storage number already exists):

Check if date information of received history data is newer than HistoryDate in current History entry.

If newer:

Then repeat this check for other History entries with same Storage number.

When all entries are checked:

Search for free array index > 1 (with void data):

If free entry left:

save the corresponding data; exit

Else:

search for the entry with oldest date for this storage number and overwrite it; exit

If older or same: discard the data for this storage number; exit

If no date information (HistoryDate) for the Storage number exists in the M-Bus message, all Datapoints to this storage number shall be discarded (error in the M-Bus metering device).



### 4.8.3 Meters with recent values

Meters with a device type 02h, 03h, 20h and 21h (refer to [03] Table 1) shall always apply recent values.

Current consumption and status information always use the simple storage number 0 and are not part of the data history. Historical datapoints are sent as a single recent value or as a set of historical values. The storage number presents the register number of the recent value. The value and the storage number shall be stored as one data set.

NOTE 3 In contrast to meters with a single historical value the gateway shall not circulate the storage number of stored register values when new historical value is received.

A recent value uses the register numbers from 0 to 99. To avoid confusion with the current value (using also the Storage number 0) or other historical values the recent values are marked with an additional DIFE that has the value 00h. If this DIFE is detected in a datapoint it shall be handled as recent value independent of the content of the storage number.

To save one or several received recent values to the History array the corresponding date information of this storage number shall be traced firstly.

```

If received Datapoint has storage number #0 (without DIFE = 00h)
    No historical value; treat as current value; exit
Check if Storage number of received Datapoint already exists in History array.
    If Storage number exist:
        Check if HistoryDate of received Datapoint is older or equal than the stored Datapoint
        Then repeat this check for other History entries with same Storage number.
        If received HistoryDate is older or equal than all of stored Datapoints
            discard received Datapoint, exit    // stored value is newer than received one
Search for free entry
    if free entry left
        store the new Datapoint at the lowest free property array index
    else    // If no free entry left
        search oldest Datapoint
        if HistoryDate of oldest Datapoint is older than HistoryDate of received Datapoint
            overwrite oldest Datapoint with received Datapoint; exit    // overwrite oldest value
        else,
            discard received Datapoint, exit // received value is older than the oldest historical value

```

### 4.8.4 The History array

The Data Collector shall support a History array length of **at least 8 entries**. In case of partly filled history, the Data Collector may handle either a dynamic array length or fixed length with unused elements set to void values. The array element handling shall be the same for all history array Properties of one metering Interface Object.

#### Behaviour after installation or power up of the Data Collector in case of fixed array length

- Initialize storage number fields with value 0.
- Initialize HistoryDate fields with void date information.
- Initialize metering values with 'void' data.

#### Behaviour after installation or power up of the Data Collector in case of dynamic array length handling.

- Set array length to 0.

All Datapoints in the History array may be saved in volatile or non-volatile memory. In case of volatile memory, History data is lost after a power down.

NOTE 4 History Datapoint descriptions in this document are specified for volatile data storage only. In case of optional non-volatile data storage the 'power-up' / 'exception handling' behaviour is different.

**Table 2 – Example structure of history array for a heat meter with single historical values**


Property Array index	Property							
	Storage Number (>0) DPT_Value_1_Ucount	HistoryDate DPT_DateTime	HistoryEnergyConsumption DPT_MeteringValue	HistoryEnergyConsumption_T1 DPT_MeteringValue	HistoryVolumeMaxFlow DPT_MeteringValue	HistoryVolumeMinFlow DPT_MeteringValue	HistoryMaxPower DPT_MeteringValue	HistoryMinPower DPT_MeteringValue
1	1 (fixed) (billing period)	31.12.2003	150 kWh	void	void	void	void	void
2	3 (monthly value)	30.06.2004	160 kWh	void	16 x 0,1 m <sup>3</sup> /h	void	350 W	void
3	3 (monthly value)	31.07.2004	170 kWh	void	17 x 0,1 m <sup>3</sup> /h	void	180 W	void
4	3 (monthly value)	31.08.2004	180 kWh	void	18 x 0,1 m <sup>3</sup> /h	void	200 W	void
...	...	...	...	...	...	...	...	...
n	void	void	Void	void	void	void	void	void

**Table 3 – Example structure of history array for an electricity meter with recent values.**

Property Array index	Property			
	Storage Number (>0) DPT_Value_1_Ucount	HistoryDate DPT_DateTime	HistoryEnergyConsumption_T1 DPT_MeteringValue	HistoryEnergyConsumption_T2 DPT_MeteringValue
1	98 (hourly value)	28.02.2012 23:00	100 kWh	80 kWh
2	99 (hourly value)	29.02.2012 00:00	102 kWh	80 kWh
3	0 (hourly value)	29.02.2012 01:00	102 kWh	83 kWh
4	1 (hourly value)	29.02.2012 02:00	102 kWh	85 kWh
...	...	...	...	...
n	void	void	void	void

NOTE 5 This example show a change of tariff register at time 00:00.

## 4.9 Datapoint Type DPT\_Metering\_DeviceType

 This new DPT will after the acceptance in Final Voting of this document be moved to Chapter 3/7/2 "Datapoint Types".

<u>Format:</u>	1 octet: N <sub>8</sub>								
octet nr.	1								
field names	<table border="1"><tr><td><i>field1</i></td></tr></table>	<i>field1</i>							
<i>field1</i>									
encoding	<table border="1"><tr><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td></tr></table>	N	N	N	N	N	N	N	N
N	N	N	N	N	N	N	N		
<u>Encoding:</u>	Encoding absolute value N = [0 ... 255]								
<u>Unit:</u>	none								
<u>Resol.:</u>	none								
<u>PDT:</u>	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)								

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.114	DPT_Metering_DeviceType	<i>field1</i> = Metering_DeviceType 0 = Other device type <sup>b)</sup> 1 = Oil meter 2 = Electricity meter 3 = Gas meter 4 = Heat meter 5 = Steam meter 6 = Warm Water meter 7 = Water meter 8 = Heat cost allocator 9 = reserved <sup>c)</sup> 10 = Cooling Load meter (outlet) 11 = Cooling Load meter (inlet) 12 = Heat (inlet) 13 = Heat and Cool 14 = reserved <sup>c)</sup> 15 = reserved <sup>c)</sup> 16 to 31 = reserved, unused 32 = breaker (electricity) 33 = valve (gas or water) 34 to 39 = reserved, unused 40 = waste water meter 41 = garbage 42 to 254 = reserved, unused 255 = void device type <sup>a)</sup>	, 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 32, 33, 40, 41, 255}	FB

<sup>a)</sup> Metering device type is void; i.e. the metering FB does not contain meaningful data.

<sup>b)</sup> In the M-Bus specification Metering Device Type = 0 is marked as "Other" device type, used for undefined M-Bus device types.

<sup>c)</sup> In the M-Bus specification these encodings are reserved for very specific Device Types that are not supported in the KNX system. In DPT\_Metering\_DeviceType these enum values are kept as 'reserved'.

## 4.10 History Query (PID = 152)

- Property name: History Query (PID\_HISTORY\_QUERY)
- Property Datatype: PDT\_FUNCTION
- Datapoint Type: None

### 4.10.1 Abstract Resource definition

The goal of this Function Property shall be to query Property Values from different Properties that shall be related by relating elements that have the same Property Value element array index.

The assumption is that the Property Value element array indices connect the data in the different Properties to each other.

EXAMPLE 1 This is the case in the M-Bus Data Collector. Property value array elements with the same array index in different Properties are related to each other. This is shown in Figure 2.

	Property Array index	Property							
		Orange Number (>0) DPT_Value_1_Ucount	HistoryDate DPT_DateTime	HistoryEnergyConsumption DPT_MeteringValue	HistoryEnergyConsumption_T1 DPT_MeteringValue	HistoryVolumeMaxFlow DPT_MeteringValue	HistoryVolumeMinFlow DPT_MeteringValue	HistoryMaxPower DPT_MeteringValue	HistoryMinPower DPT_MeteringValue
data set 1	1	1 (fixed) (billing period)	31.12.2011	1 150 kWh	void	void	void	void	void
data set 2	2	3 (monthly value)	31.01.2012	1 490 kWh	void	16 x 0,1 m³/h	void	350 W	void
data set 3	3	4 (monthly value)	29.02.2012	1 810 kWh	void	15 x 0,1 m³/h	void	180 W	void
data set 4	4	5 (monthly value)	31.03.2012	2 120 kWh	void	13 x 0,1 m³/h	void	200 W	void
data set 5	5	6 (monthly value)	30.04.2012	2 425 kWh	void	7 x 0,1 m³/h	void	200 W	void
data set 6	6	7 (monthly value)	31.05.2012	2 705 kWh	void	5 x 0,1 m³/h	void	200 W	void
data set 7	7	7 (monthly value)	30.06.2012	2 905 kWh	void	5 x 0,1 m³/h	void	200 W	void
data set 8	8	8 (monthly value)	31.07.2012	3 085 kWh	void	6 x 0,1 m³/h	void	200 W	void
data set 9	9	9 (monthly value)	31.08.2012	3 085 kWh	void	4 x 0,1 m³/h	void	200 W	void
data set 10	10	10 (monthly value)	30.09.2012	3 285 kWh	void	4 x 0,1 m³/h	void	200 W	void
data set 11	11	11 (monthly value)	31.10.2012	3 495 kWh	void	3 x 0,1 m³/h	void	200 W	void
...	...	...	...	...	...	...	...	...	...
n	void	void	void	Void	void	void	void	void	void

Figure 2 – Property Value array elements related through array indices

These datasets can be filtered using a query request with a certain expression. The query request specifies which Property shall be evaluated with a certain expression.

EXAMPLE 2 HistoryEnergyConsumption > 2 500 kWh

The result of a query shall be presented in a separate Property, named “Query Result” that shall be referred in the Server’s response to the Client. This is indicated in Figure 3.

	Property Array Index	Property								Query Reesult
		Orange Number (>0) DPT_Value_1_Ucount	storyDate DPT_DateTime	HistoryEnergyConsumption DPT_MeteringValue	HistoryEnergyConsumption_T1 DPT_MeteringValue	HistoryVolumeMaxFlow DPT_MeteringValue	HistoryVolumeMinFlow DPT_MeteringValue	HistoryMaxPower DPT_MeteringValue	HistoryMinPower DPT_MeteringValue	
data set 1	1	1 (fixed) (billing period)	31.12.2011	1 150 kWh	void	void	void	void	void	6
data set 2	2	3 (monthly value)	31.01.2012	1 490 kWh	void	16 x 0,1 m³/h	void	350 W	void	7
data set 3	3	4 (monthly value)	29.02.2012	1 810 kWh	void	15 x 0,1 m³/h	void	180 W	void	8
data set 4	4	5 (monthly value)	31.03.2012	2 120 kWh	void	13 x 0,1 m³/h	void	200 W	void	9
data set 5	5	6 (monthly value)	30.04.2012	2 425 kWh	void	7 x 0,1 m³/h	void	200 W	void	10
data set 6	6	7 (monthly value)	31.05.2012	2 705 kWh	void	5 x 0,1 m³/h	void	200 W	void	11
data set 7	7	7 (monthly value)	30.06.2012	2 905 kWh	void	5 x 0,1 m³/h	void	200 W	void	
data set 8	8	8 (monthly value)	31.07.2012	3 085 kWh	void	6 x 0,1 m³/h	void	200 W	void	
data set 9	9	9 (monthly value)	31.08.2012	3 085 kWh	void	4 x 0,1 m³/h	void	200 W	void	
data set 10	10	10 (monthly value)	30.09.2012	3 285 kWh	void	4 x 0,1 m³/h	void	200 W	void	
data set 11	11	11 (monthly value)	31.10.2012	3 495 kWh	void	3 x 0,1 m³/h	void	200 W	void	
	...	...	...	...	...	...	...	...	...	
	n	void	void	Void	void	void	void	void	void	

**Figure 3 – Query result in a separate Property**

The Query Result shall be a Property that shall hold the array indices of the Property Value array elements that meet the expressions of the query.

The Query Result Property shall be a normal Data Property. This means for instance, that it shall be an array Property of which the element 0 shall contain the current\_nr\_of\_elem and thus the number of data sets that match the current query conditions. The Client can read this element 0 to learn the number of data sets that match his query condition(s).

The Query Result can be instantiated multiple times by the Data Server. It may thus not be a single Property. Multiple instances relate to multiple query results, for one or more Clients.

In a next step, the Client may continue according either one of the following.

1. It may read out the Query Result and read the Property Value array elements that are referred by the Query Result, or
2. it may apply a subsequent query, in which the Server shall limit the queried Properties to the already existing Query result. This may be done multiple times.

This is achieved by requesting data again, querying for a certain PID with a certain expression (such as > 2 500 kWh), but additionally stating that only the contents of the PID array references in the Query Result shall be evaluated.

**EXAMPLE 3** If it is wanted to find the consumption data in between 2 500 kWh and 3 000 kWh, then a first query could read the consumption data > 2 500 kWh and a next query could read the consumption data < 3 000 kWh but limit the query to the properties that resulted from the first query.

After finishing the querying of the data, the Client may either clear its query or it can be cleared automatically by the Server.

Since it can occur that two different Clients request data from a single Server, a request handle shall be used in order to distinguish different requests and their former results, as well as giving the Server a possibility to reject requests if there are too many. The request handle shall be requested by the Client. Whether or not the Client gets a request handle, as well as the numerical value of the request handle shall be concluded by the Server.

It is implementation dependent whether the Server supports more than just one request handle at a time, as well as whether it uses different Properties for every single query result, or whether it uses the same Property all the time (e.g. because it is running out of PIDs).

The Client may indicate that it wants the Server to use a new Query Result Property to store the results for a subsequent filter step. This may however fail due to multiple reasons, such as a lack of RAM or a lack of remaining PIDs. In this case, the Server shall indicate an error and not overwrite or remove the results from any previous query.

The Client may at any time manually de-allocate a Property used in a query step by setting its Property length (array element 0) to 0. The Server shall interpret that so it knows that the according Property has been freed and that he can reuse that Property for subsequent query requests from a Client.

#### 4.10.2 Format

The field *HQ Command* shall contain the identification of the command that is issued by the Client. The size and format of the field *Command Parameters* is variable and shall depend on the value of the *HQ Command*.

octet 10	octet 11	octet 12	octet 13	octet 14	...	octet n
HQ Command	Command Parameters Depends on the HistoryDataRangeRequestCommand					

**Figure 4 – Function *History Query*  
A\_FunctionPropertyCommand-PDU (general)**

#### 4.10.2.1 Overview Commands

HQ Command	Command name and short description
00h	<b>HistoryQueryData</b> This command shall be used to execute a query and store the outcome in a Result Property. This command can be iterative.
01h	<b>HistoryQueryDataCount</b> This command shall be used to request the possible number of results of the contained query, without effectively executing the query.
02h	<b>HistoryQueryState</b> This command shall be used to keep a request handle open for a longer time or close it.
03h to FFh	Reserved. These commands are reserved for future standardisation within KNX and shall not be used. The Client shall ignore totally <sup>1)</sup> Telegrams that contain reserved HQ Commands.

#### 4.10.2.2 Command HistoryQueryData

##### 4.10.2.2.1 Goal of the command

This command shall be used to execute a query on data out of arrays of Properties.

The Client may apply this command subsequent times to

- extend the results of a HistoryQueryCommand with the results of a subsequent call again basing on all Properties, or
- reduce the results of a preceding HistoryQueryCommand by a subsequent call, by narrowing down the Properties queried by this command call to the Query Result of this preceding call instead of to all Properties.

##### 4.10.2.2.2 Format and parameters of the command

octet 10	octet 11	octet 12	octet 13	octet 14	octet 15
00h	Query flags	Request Handle	Pre-filtered Result PID	PIDOfDataTo Filter	MathOperator

octet 16	octet 17	octet 18	octet 19	octet 20	octet 21	octet ...	octet n
FilterValue							

**Figure 5 – HistoryQueryData in an A\_FunctionProperty\_Command-PDU (example)**

<sup>1)</sup> This is, also timers, counters, etc. shall not be handled.

- **Query flags**

Description: A flag set setting different options for this query

Format, encoding: B<sub>8</sub>

7	6	5	4	3	2	1	0
r	r	r	r	N	A	H	R

#### References (R)

0: Ignore “Pre-Filtered result PID”

1: Use references in “Pre-Filtered result PID” to filter again

This flag shall indicate whether the new query shall be limited to the references in the query result Property indicated in the field PIDOfData-ToFilter or not. With this flag set, this shall allow narrowing down the final query result to ever more precise References (see EXAMPLE 3).

#### Handle (H)

0: Do not use already opened handle (in “Request Handle”)

1: Use already opened handle (in “Request Handle”)

#### AND-flag (A):

0: This query shall extend an existing Query Result. This query shall base on all Properties and the resulting Property Indexes shall be added to the existing Query Result.

This query expression and the result of the possible preceding query expression build an OR-operation.

1: This query shall reduce an existing Query Result. This query shall base solely on the Properties that are already referred in the Query Result indicated in *Pre-Filtered result PID*.

This query expression and the result of the possible preceding query expression build an AND-operation.

The DaS shall evaluate the flag *A* only if the flag *R* is set. If the flag ‘*R*’ is cleared, then the DaS shall ignore the value of the flag *A*.

#### New-flag (N):

This flag shall allow the Client to force the Server to use a new Property for the Query Result of this Command.

0: The result of this query may either be presented in a new Property or it may overwrite an already populated Property (from a former query). The choice is up to the DaS.

1: The result of this query shall be presented in a new Property. An already used Property shall not be reused / overwritten.

The DaS shall always evaluate this flag. For new requests however, this flag shall implicitly be evaluated as ‘1’, since a new Property will be used for a new request.

r: reserved

These bits shall be cleared (“0”). If a DaS receives a request with any of these reserved bits is set, then it shall return the error

*E\_RequestParametersInvalid*.

Error handling:

If the New flag is set and the DaS is out of memory or out of usable PIDs, it shall explicitly return a “RequestOKTooLittleMemory” in the Response-PDU.



- **Request Handle**

- Description: The Client shall use the field *Request Handle* to pass a valid Handle to the Server.
- The Server shall only evaluate the field *Request Handle* if the flag *Handle* in the field *Query flags* is set. Otherwise, its content shall not be evaluated and the Server shall interpret the request as a new request.
- Format, encoding: U<sub>8</sub> value
- Error handling: If the flag *Handle* is set and the value of the passed *Request Handle* is invalid then the Server shall return the error *E\_Query HandleInvalid*.

- **Pre-Filtered result PID**

- Description: The Client shall use the field Pre-Filtered result PID to pass the result of a former, still valid, Query Result. In this way, it shall be possible to extend or reduce an already existing Query Result with a new Query.
- The Server shall only interpret the field *Pre-Filtered result PID* if the flag *R* in the field Query flags is set. Otherwise, the value of *Pre-Filtered result PID* shall be ignored.
- Format, encoding: U<sub>8</sub> value
- Error handling: If the flag *R* is set and if the passed “Pre-Filtered Result PID” does not exist, then the Server shall return with the error code *E\_RequestParametersInvalid*.

- **PIDOfDataToFilter**

- Description: The Client shall use the field PIDOfDataToFilter to pass the Property Identifier of the Property to which the query shall be applied.
- EXAMPLE 4 PID 85 to filter for HistoryEnergyConsumptionTariff1 of an electricity meter
- Format, encoding: U<sub>8</sub> value
- Error handling: If the field *PIDOfDataToFilter* contains a PID-value that does not exist in the Server, then the Server shall respond with the error *E\_RequestParametersInvalid*.

- **MathOperator**

- Description: This field shall identify the mathematical or logical operator to be applied on the array elements of the specified or referred PID and the value passed in *FilterValue*.
- Format, encoding: Enumeration [N<sub>8</sub>]:
- |             |   |                          |
|-------------|---|--------------------------|
| 00h:        | < | Smaller than             |
| 01h:        | ≤ | Smaller than or equal to |
| 02h:        | = | Equal to                 |
| 03h:        | ≥ | Greater than or equal to |
| 04h:        | > | Greater than             |
| 05h:        | ≠ | not equal to             |
| 06h to FFh: |   | Reserved                 |
- Error handling: If the Server receives a query with a MathOperator that it does not support or that is reserved, then it shall respond with the error *E\_RequestParametersInvalid*.

- **FilterValue**

- Description:** The *FilterValue* shall be the value that shall be compared with the values of the passed - or referred PIDs, with the *MathOperator* applied in between.
- Format, encoding:** The encoding of this field shall be identical to the encoding of the passed - or referred PIDs.
- Wildcards are not supported, unless the encoding of the queried PID also uses wildcards.
- Error handling:** It is the responsibility of the Client that this field is properly formatted. There are no requirements to the error handling of this field by the Server. The following behaviour is possible. The Server may
- respond with the error *E\_RequestParametersInvalid*, or
  - it may not recognise this and returns nonsense Query Results
- This may happen in the following cases. These are examples only. This list is not exhausting.
- If the *FilterValue* is incorrectly formatted, e.g. if the size is incorrect or the encoding is incorrect.
- EXAMPLE 5** Fields that are reserved in the DPT encoding of the Property Value are not 0.
- If the *FilterValue* contains meaningless data
- EXAMPLE 6** Consumption data is queried for a meaningless date, such as April 31<sup>st</sup>.

#### 4.10.2.2.3 Format and parameters of the response

The Server shall respond to a command *HistoryQueryData* with an *A\_FunctionPropertyState\_Response-PDU* containing the *return\_code* and possible additional data in the field *ResponseData* indicated in Figure 6.

The response shall state whether the request is processed successfully and optionally also deliver a request handle, as well as a PID of the Property in which the resulting references are stored.

The resulting PID references shall be ordered in an ascending order from array index 1 to 4095.

This Server shall respond with this message not earlier than when the requested data is ready.

octet 10	octet 11	octet 12
return_code	Query Handle	DataReferencesIn PID

**Figure 6 – Return\_code and ResponseData  
in an A\_FunctionPropertyState\_Response-PDU (example)**

- **return\_code**

Description:	A return code stating whether the request has been processed successfully or any error that has occurred.		
Format, encoding:	Enumeration [N <sub>8</sub> ]: QueryError		
	00h:	<b>E_RequestOKAndDataReady</b>	The requested data are put into the Property value array specified in <i>DataReferencesInPID</i> .
	01h:	<b>E_RequestedDataNotFound</b>	There are no results when applying the query, so there is no valid PID value in <i>DataReferencesInPID</i> . The field <i>DataReferencesInPID</i> shall contain the value 00h.
	02h:	<b>E_RequestParametersInvalid</b>	There is an error with the parameters passed, e.g. invalid “math operator”, “PIDOfDataToFilter” is not an array etc.
	03h:	<b>E_QueryHandleInvalid</b>	The passed Query Handle is invalid.
	04h to 0Fh:	Reserved	These return codes are reserved for future standard extensions and shall not be used. The Server shall not use these return codes.
	10h:	<b>RequestOKTooLittleMemory</b>	The Server would run out of memory it would create the result.  EXAMPLE 7 If there would be 4095 results and the Server does not have the space to save the references.
	11h...FFh:	Reserved	These return codes are reserved for future standard extensions and shall not be used. The Server shall not use these return codes.

- **Query Handle**

Description:	This 8 bit value shall serve as a handle for the query (to block new queries from overwriting the collected data).  The Server shall assign this Query Handle to identify a query. The Client may use this Query Handle for subsequent commands, e.g. for extending or reducing the query result.		
Format, encoding:	U <sub>8</sub> value		
Error handling:	The Server shall provide a valid handle in this field only if the return_code equals E_RequestOKAndDataReady; if any error occurs, this Server shall fill this field with 00h.		

- **DataReferencesInPID**

Description:	The Server shall in this field indicate the PID of the Property in which the references to the Properties matching the current query conditions are stored.		
Format, encoding:	U <sub>8</sub> value		
Error handling:	The Server shall provide a PID in this field only if the return_code equals E_RequestOKAndDataReady; if any error occurs, this Server shall fill this field with 00h.		

### 4.10.2.3 Command HistoryQueryDataCount

#### 4.10.2.3.1 Goal of the command

This command shall be used to request the counting of queried PIDs.

The command can be used to count queried data before really filtering the data.

This may be useful if the Client does not know in advance the number of resulting Properties that would be contained in the Query Result. This command allows retrieving this number without actually executing the query and thus occupying Resources (PID, memory...) in the Server.

#### 4.10.2.3.2 Format and parameters of the command

octet 10	octet 11	octet 12	octet 13	octet 14	octet 15
01h	Query flags	Request Handle	Pre-filtered Result PID	PIDOfDataTo Filter	MathOperator

octet 16	octet 17	octet 18	octet 19	octet 20	octet 21	octet 22	octet 23
FilterValue							

**Figure 7 – HistoryQueryDataCount in an A\_FunctionProperty\_Command-PDU (example)**

The HistoryQueryDataCount shall be identified by the command 01h. The format and Parameters are further identical as in the command HistoryQueryData as specified in 4.10.2.2.2.

The difference is that no Query Result is created and that the error codes differ.

#### 4.10.2.3.3 Format and parameters of the response

The Server shall respond to a command HistoryQueryDataCount with an A\_FunctionPropertyState\_Response-PDU containing the return\_code and possible additional data in the field ResponseData as indicated in Figure 8.

octet 10	octet 11	octet 12
return_code	ResponseData	

**Figure 8 – Return\_code and ResponseData  
in an A\_FunctionPropertyState\_Response-PDU (example)**

- **return\_code**

Description: A return code stating whether the request is processed successfully or any error that has occurred.

Format, encoding: Enumeration [N<sub>8</sub>]: **CountError**

00h: **E\_RequestOKAndDataReady**

The requested count is put into *ResponseData*.

The following return\_codes indicate an error in the query: the field *ResponseData* shall have the value 00h in case any of these errors occurs.

01h: **E\_RequestedDataNotFound**

There are no results when applying the query.

02h: **E\_RequestParametersInvalid**

There is an error in the parameters passed, e.g. invalid “math operator”, “PIDOfDataToFilter” is not an array etc.

03h: **E\_QueryHandleInvalid**

The passed Query Handle is invalid.

04h to FFh: Reserved

These return codes are reserved for future standard extensions and shall not be used. The Server shall not use these return codes.

- **ResponseData**

Description: Number of results if performing this request. The maximal value shall be 4095.  
This field shall be 00h if the return\_code equals 00h.

Format, encoding: U<sub>16</sub> value

#### 4.10.2.4 Command HistoryQueryState

##### 4.10.2.4.1 Goal of the command

The Client shall use this command to

- close a session and clear the Query Handle
- keep a session open but release a previously assigned Query Handle
- keep a session open and keep the Query Handle but clear the Query Result.

##### 4.10.2.4.2 Format and parameters of the command

octet 10	octet 11	octet 12
02h	Query Handle	State Command

**Figure 9 – HistoryQueryState in an A\_FunctionProperty\_Command-PDU (example)**

- **Query Handle**

Description: This 8 bit value shall be the Query Handle of the query to which this command shall apply.

The Client shall use a valid Query Handle for this field.

Format, encoding: U<sub>8</sub> value

- **State Command**

**Description:** This field shall contain the identification of the command that shall be applied to close the query, release the Query Handle, keep the query open, clear the query results, etc. as specified in the commands below.

The State Command shall affect the query items as specified in Table 4.

Clearing a Query Result shall mean that the length of the Property or Properties is set to 0. It is not required that the PIDs become invalid.

**Format, encoding:** Enumeration [N<sub>8</sub>]:

00h: **RequestFinishedReleaseHandle**

This command shall clear an existing query, release the query handle and close the session.

01h: **KeepQueryHandleOpen**

This command is the opposite of the RequestFinished-ReleaseHandle. It shall keep the session open and all identifiers and results valid. This command shall prevent a Server from automatically finishing a query by timeout of 6 s.

02h: **ClearResultsKeepHandleOpen**

This command shall keep the Query Handle valid, but shall clear the Query Result. The session shall remain open.

This command is useful if the Client is not satisfied with the Query Result or if it intends to start a totally new query without closing the session and thus risking not getting a handle anymore.

03h to FFh: **Reserved**

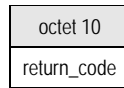
These commands are reserved. The Client shall not issue a HistoryQueryState with a command in this range.

**Table 4 – State Commands overview (normative)**

State Command	Item			
	Query session timer	Session	Query Result	Query Handle
RequestFinishedReleaseHandle	stopped	closed	cleared	released
KeepQueryHandleOpen	restarted	kept open	unchanged	maintained
ClearResultsKeepHandleOpen	restarted	kept open	cleared	maintained

#### 4.10.2.4.3 Format and parameters of the response

The Server shall respond to a command *HistoryQueryState* with an *A\_FunctionPropertyState\_Response-PDU* containing the *return\_code* as indicated in Figure 9.



**Figure 10 – Return\_code  
in an A\_FunctionPropertyState\_Response-PDU (example)**

- **return\_code**

Description:	The return_code shall indicate whether the <i>HistoryQueryState</i> is handled successfully or whether there is any error.
Format, encoding:	Enumeration [N <sub>8</sub> ]:
00h:	<b>E_NoError</b> The <i>HistoryQueryState</i> command is handled successfully. NOTE 6 This is a valid answer to all <i>HistoryQueryState</i> commands.
01h:	<b>E_GeneralError</b> The Server encountered a general error. The Server shall issue this error code for any other error than any of the errors listed below or if it does not support the applicable error code.
02h:	<b>E_Query HandleInvalid</b> The data client has passed an invalid Query Handle in the <i>HistoryDataState</i> Command
03h:	<b>E_QueryStateCommandInvalid</b> The Client has passed a Query State Command that the Server does not support.
03h to FFh:	Reserved

### 4.10.3 Usage by the Data Client

#### 4.10.3.1 General approach

The device requesting metering data shall use the Function *HistoryQuery* to apply a query on metering data from the M-Bus data collector.

For this purpose, the general approach is the following:

1. Request a query on the metering data
2. Receive a response whether the query request is successfully processed (or an error occurred), as well as the Identifier of the Property where the query result references are stored.
3. (Optional) keep the query handle alive or close the handle.
4. (Optional) Apply a subsequent query to the existing query result, to further reduce the number of results, or to extend the query with additional references to Properties that meet additional query conditions.
5. (Optional) Read out the references to the queried data (from specially filled Properties).
6. After a timeout of 6 s without any actions, the M-Bus data collector shall close the handle autonomously.

Since the HistoryQuery is directed to a certain Interface Object, the command is directly addressed to only one meter instance.

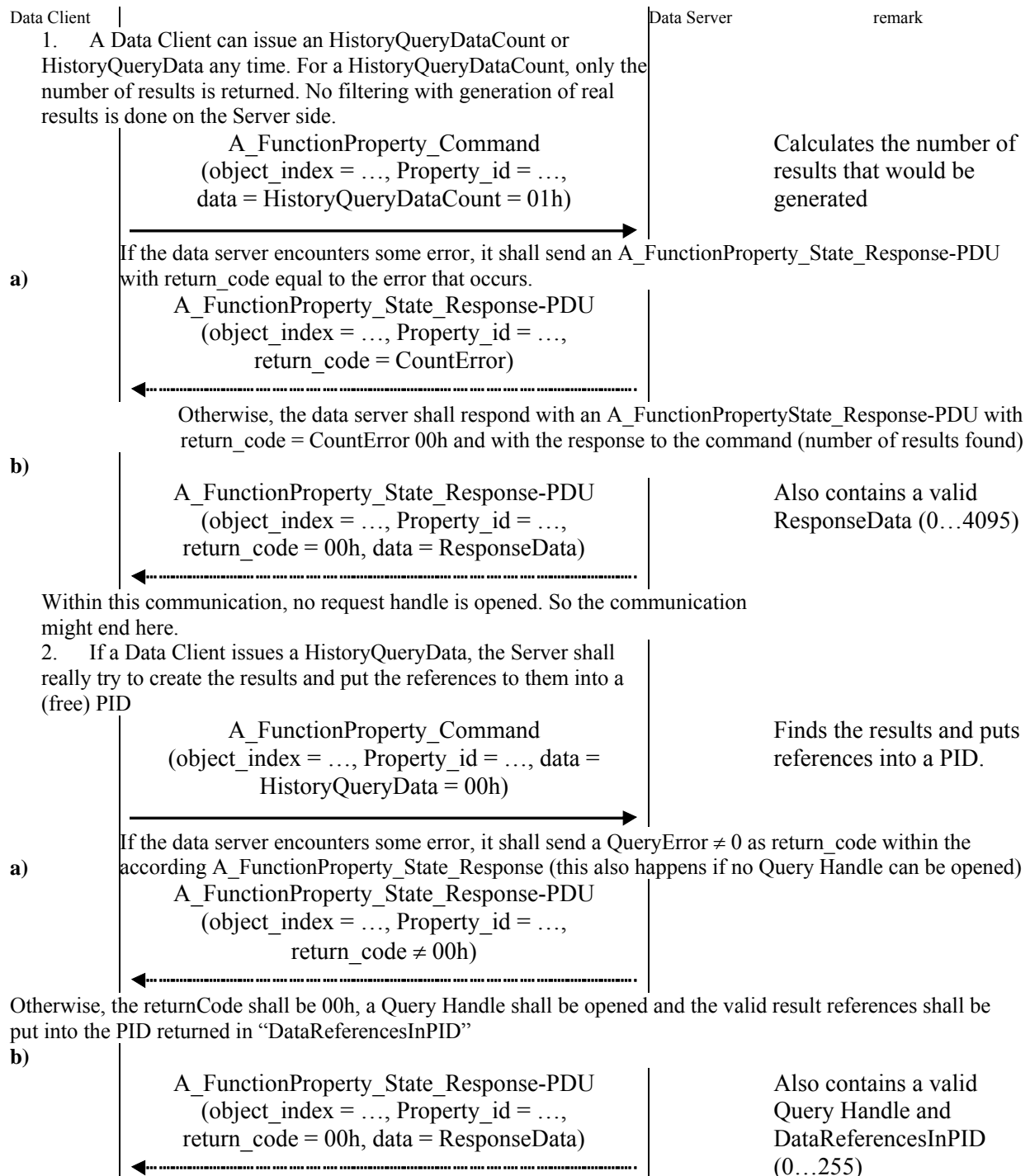
#### Communication mode

The communication shall be possible in point-to-point connectionless communication mode. If the Data Server supports Transport Layer connections, then this shall be possible using point-to-point connection oriented communication as well.

#### 4.10.3.2 Data Client Procedures

The following sequence diagram furthermore explains how the involved messages work.

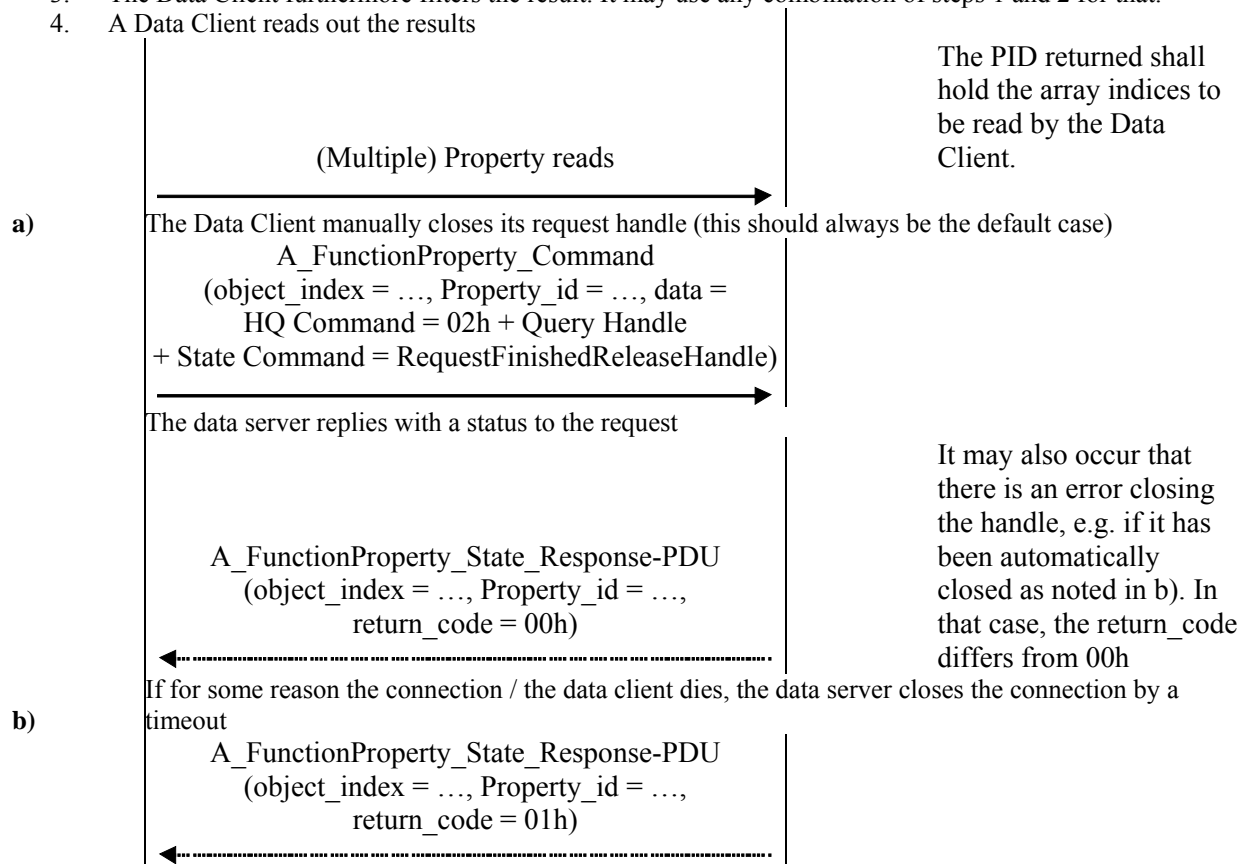
NOTE 7 Issuing a HistoryQueryDataCount ahead of a HistoryQueryData is an optional step. If a Client knows well what it is doing, it may ignore the possibility to use the HistoryQueryDataCount.





At this point, the Data Client may be satisfied with the result and read the returned result references, or it may further more want to filter the data. Please refer to 4. for the case where the client chooses to close the connection.

3. The Data Client furthermore filters the result. It may use any combination of steps 1 and 2 for that.
4. A Data Client reads out the results



## 4.10.4 Usage by the Data Server

### 4.10.4.1 General requirements

The Data Server shall support the HistoryQuery and the Query Commands as specified in 4.10.1 and 4.10.2.

### 4.10.4.2 Error and exception handling

#### 4.10.4.2.1 Reception of M-Bus messages while a Client session is open

If the Data Server receives an M-Bus message that it shall process while one or more Data Client sessions are open, then it shall behave as follows.

- The Data Server shall not modify any Property of the M-Bus Data Collector.
- The Data Server shall instead store the relevant received M-Bus message for later processing. The M-Bus message shall be processed as soon as there is no more session open for any Client.

NOTE 8 M-Bus messages that are not relevant for this M-Bus Data Collector, e.g. because they relate to a device type that is not supported, need not to be stored.

- The Data Server is not required to report in any way to the Data Client that an M-Bus message has been received.

## 5 Metering Functional Blocks of MDC

### 5.1 MDC Heat Meter (M\_HEATM)

#### 5.1.1 Aims and objectives

The Functional Block ‘MDC Heat Meter’ shall map M-Bus heat meter data (M-Bus Device Type = 4, 10 to 13) to the KNX system (standard KNX physical media, services and Datapoint Types).

NOTE The same Functional Block also covers measurement of cooling energy.

#### 5.1.2 Functional specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features shall be supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages), see clause 1.2

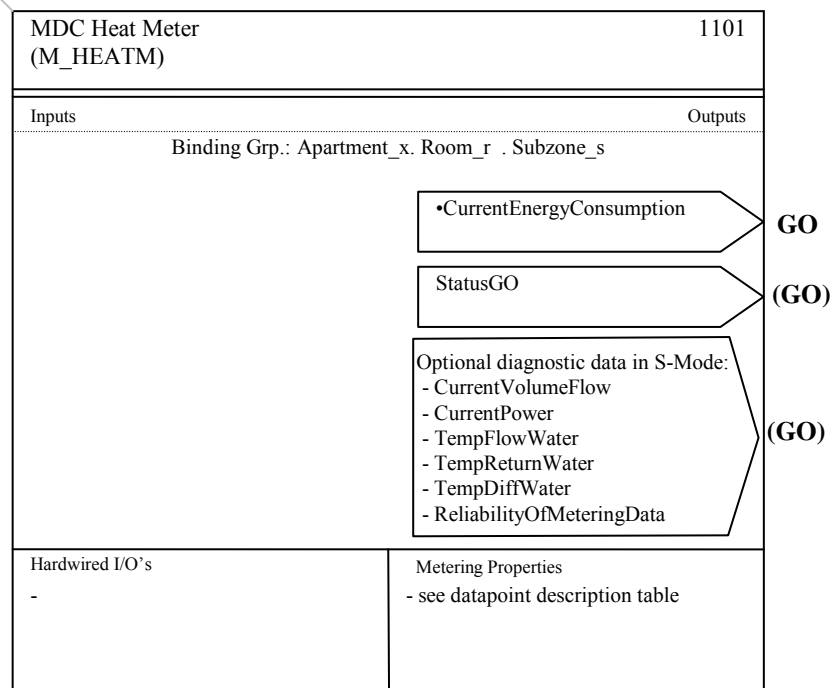
Therefore the complete set of supported Heat Meter datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

In addition a subset of metering datapoints may be available also as standard Group Object in Standard Mode for visualization on displays etc. See clause 1.2.

#### 5.1.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

#### 5.1.4 Functional Block diagram



## 5.1.5 Datapoint description

### 5.1.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs (multicast communication)</b>				
CurrentEnergyConsumption	51	Accumulated energy value	<b>Property:</b> DPT_MeteringValue / PDT_GENERIC_6 <hr/> <b>Standard Mode:</b> DPT_Value_4_Count (See NOTE 1.)	229.001   13.001
StatusGO		Z <sub>8</sub> information of CurrentEnergyConsumption as a Group Object	<b>Standard Mode only</b> DPT_StatusGen	21.001
CurrentPower	52	Current measured power	<b>Standard Mode:</b> DPT_Power	9.024
CurrentVolumeFlow	53	Current measured volume flow	<b>Standard Mode:</b> DPT_Value_Volume_Flow	9.025
TempFlowWater	70	Current flow temperature	<b>Standard Mode:</b> DPT_Value_Temp	9.001
TempReturnWater	71	Current Return temperature	<b>Standard Mode:</b> DPT_Value_Temp	9.001
TempDiffWater	72	Current Temperature difference	<b>Standard Mode:</b> DPT_Value_Tempd	9.002
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Inputs</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties (polling)</b>				
CurrentEnergyConsumption	51	Accumulated energy value	<b>Property:</b> DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentPower	52	Current measured power	DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentVolumeFlow	53	Current measured volume flow	DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentEnergyConsumption_T1	54	Current energy consumption Tarif 1	DPT_MeteringValue / PDT_GENERIC_6	229.001
HistoryStorageNumbers	60	Array of storage numbers for history values	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR[n] n ≥ 8	5.010
HistoryDate	61	Array of date/time information for history values	DPT_DateTime[n], n ≥ 8 / PDT_DATE_TIME	19.001
HistoryEnergyConsumption	62	Array of energy consumption history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties (polling)</b>				
HistoryEnergyConsumption_T1	63	Array of energy consumption tarif 1 history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryVolumeMaxFlow	64	Array of Max Volume Flow history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryVolumeMinFlow	65	Array of Min Volume Flow history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryMaxPower	66	Array of Max. Power history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryMinPower	67	Array of Min. Power history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
TempFlowWater	70	Current Flow temperature	DPT_TempHVACAbs_Z / PDT_GENERIC_3	205.100
TempReturnWater	71	Current Return temperature	DPT_TempHVACAbs_Z / PDT_GENERIC_3	205.100
TempDiffWater	72	Current Temperature difference	DPT_TempHVACRel_Z / PDT_GENERIC_3	205.101

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z / PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z / PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z / PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This Property shall be used for consistency checking.	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
MeteringDeviceType	115	Metering Device Type. Supported values in M_HEATM are: 4 : Heat meter 10 : Cooling Load energy meter (outlet) 11 : Cooling Load energy meter (inlet) 12 : Heat energy (inlet) 13 : Heat and Cool energy 255 : void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
MaxPowerDate	122	Date and time of Maximum Power	DPT_DateTime / PDT_DATE_TIME	19.001
MaxPower	123	Measured maximum power value, reset after change of storage nr	DPT_MeteringValue / PDT_GENERIC_6	229.001
MinPowerDate	124	Date and time of Minimum Power	DPT_DateTime / PDT_DATE_TIME	19.001
MinPower	125	Measured minimum power value	DPT_MeteringValue / PDT_GENERIC_6	229.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorConsumption	127	value of energy consumption at the moment when an error occurred	DPT_MeteringValue / PDT_GENERIC_6	229.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	DPT_Bool / PDT_BINARY_INFORMATION	1.002
AveragingDuration	129	Measuring time for current min/max value generation (integration time)	DPT_LongDeltaTimeSec / PDT_LONG	13.100
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] / PDT_UNSIGNED_CHAR[n] n $\geq 128$	5.010
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
MeterReplacement	161	Indicates that the connected M-Bus heat meter is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician.	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a meter is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

### M\_HEATM Runtime Interworking - Dependency on Configuration Modes

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
<b>Inputs</b>	(none)				
<b>Outputs</b>	CurrentEnergyConsumption	GO <sub>b</sub>	GO	GO	O
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA
	CurrentPower	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	CurrentVolumeFlow	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	TempFlowWater	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	TempReturnWater	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	TempDiffWater	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	ReliabilityOfMeteringData	(GO <sub>b</sub> )	(GO)	(GO)	(O)*

(O)\*: optionally possible/allowed but not specified in this document

### M\_HEATM LTE Zoning Parameters

		Support
<b>Parameter</b>	Apartment	M*
	Room	M*
	Subzone	M*

\* mandatory in LTE implementations only

**M\_HEATM Standard Properties of Interface Objects**

Parameter / Diagnostic Value	Support
CurrentEnergyConsumption	<b>M</b>
CurrentPower	<b>O</b>
CurrentVolumeFlow	<b>O</b>
CurrentEnergyConsumption_T1	<b>O</b>
HistoryStorageNumbers	<b>M</b>
HistoryDate	<b>M</b>
HistoryEnergyConsumption	<b>M</b>
HistoryEnergyConsumption_T1	<b>O</b>
HistoryMaxVolumeFlow	<b>O</b>
HistoryMinVolumeFlow	<b>O</b>
HistoryMaxPower	<b>O</b>
HistoryMinPower	<b>O</b>
TempFlowWater	<b>O</b>
TempReturnWater	<b>O</b>
TempDiff	<b>O</b>
RxSequenceCounter	<b>M</b>
RxReceptionTime	<b>M</b>
Manufacturer	<b>M</b>
IdentificationNumber	<b>M</b>
VersionNumber	<b>M</b>
MeteringDeviceType	<b>M</b>
FabricationNumber	<b>C*</b>
AccessNumber	<b>M</b>
DeviceStatus	<b>M</b>
OperatingTime	<b>O</b>
OnTime	<b>O</b>
CurrentDate	<b>M</b>
MaxPowerDate	<b>O</b>
MaxPower	<b>O</b>
MinPowerDate	<b>O</b>
MinPower	<b>O</b>
ErrorDate	<b>M</b>
ErrorConsumption	<b>O</b>
ReliabilityOfMeteringData	<b>O</b>
AveragingDuration	<b>O</b>
MBusRawData	<b>M</b>
History Query	<b>O</b>
UserText	<b>O</b>
MeterReplacement	<b>M</b>
MeterReplacementCounter	<b>O</b>

\* Conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.

## 5.1.6 Detailed specification of the Datapoints

### 5.1.6.1 Output / diagnostic data CurrentEnergyConsumption

#### Property specification:

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyConsumption</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>	<b>Optional</b> <input type="checkbox"/>
<b>Description:</b>					
Current accumulated energy value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT	MeteringValue	DPT ID	229.001
				Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description			Sup.	Range
CountVal	counter value			M	full
VallnfField	1) Encoding of unit and resolution of the counter value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h
Status	Value is not available / void			M	bitset
– OutOfService				NA	true/false
– Overridden				M	false
– Fault	metering failure, corrupted value			NA	true/false
– InAlarm				NA	false
– AlarmUnAck				NA	unack
Command	standard Command field			NA	enum
– all commands	not supported, Datapoint shall be read only				
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1101 (M_HEATM)	Property ID:	51	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.					



**LTE-Mode:**

<b>FB:</b>	<b>M_HEATM</b>	<b>LTE Server Output Name:</b>	<b>CurrentEnergyConsumption</b>				Mandatory <input type="checkbox"/>	
							Optional <input checked="" type="checkbox"/>	
<b>Description:</b>								
Current accumulated energy value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.								
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field	Description		Sup.	Range	Unit	COV	Default	
See Property specification above.								
<b>Communication:</b>								
<b>Binding Group:</b>								
Class		Type				Default		
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone				1.1.1 <sup>2)</sup>		
Application Specific <input type="checkbox"/>								
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/>		Configurable <input type="checkbox"/>				
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)		Property ID:		51
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTime:		300 sec		Heartbeat: 60 min
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input checked="" type="checkbox"/>		Binding Group Wildcard allowed		<input type="checkbox"/>		
(LTE Read-Response polling of the output shall always be supported)		Tx Prio:		High <input type="checkbox"/>		Normal <input checked="" type="checkbox"/>		Low <input type="checkbox"/>
		Transm after Powerup:		Stored Value <input type="checkbox"/>		Act Value <input type="checkbox"/>		Default Value <input checked="" type="checkbox"/>
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
<b>Exception Handling:</b>							Save at Powerdown <input type="checkbox"/>	
None.								
<b>Special Features:</b>								
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ Value depends on the increment of the heat meter (according to ValInfField).								
<sup>2)</sup> If there is only one M_HEATM per Apartment zone, the Room number and Subzone number shall be set to the default value 1.1.								

**Group Object (Standard Mode):**

DP Name:	CurrentEnergyConsumption	Abbr.:	---	Mandatory	<input checked="" type="checkbox"/>
FB Name:	M_HEATM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current accumulated energy value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 9 Alternative or additional DPTs are possible: see NOTE 1.					
<b>Datapoint Type</b>					
DPT Name:	DPT_Value_4_Count				
DPT Format:	V <sub>32</sub>	DPT ID:	13.001		
Field	Description	Supp.	Range	Unit	Default
	Counter value encoded as plain 32 bit signed integer. <sup>1)</sup> unit, resolution and display format have to be engineered on the receiver of the information according to ValInfField in Property 'CurrentEnergyConsumption'. In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.	M	full	<sup>1)</sup>	0
<b>Access Type</b>					
◆ Output					
this → M		<input checked="" type="checkbox"/>	this → 1		<input type="checkbox"/>
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>2)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>2)</sup>	Min repetition period: 5 min
Cyclic	<input type="checkbox"/>	Period:			
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>	
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 0. In case of MeterReplacement = true, the value of CurrentEnergyConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.					
<b>Special Features</b>					
<sup>2)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the heat meter (according to ValInfField).					

**5.1.6.2 Output StatusGO****Standard Mode only**

DP Name:	StatusGO	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HEATM	Can be internal	<input type="checkbox"/>		
<b>Description</b>					
This Output shall contain the Z <sub>8</sub> status information of CurrentEnergyConsumption as a Group Object.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_StatusGen				
DPT Format:	B <sub>8</sub>	DPT_ID:	21.001		
Field	Description	Supp.	Range	Unit	Default
Status	Z <sub>8</sub> Status information	O	Bitset		
Bit 0	OutOfService	M		t/f	true
Bit 1	Fault	M		t/f	false
Bit 2	Overridden	NA		f	false
Bit 3	InAlarm	NA		f	false
Bit 4	AlarmUnAcknowledged	NA		u	unack
Bits 5 to 7	reserved	NA			
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Delta-Value:	---
		Cyclic	<input type="checkbox"/>	Period:	---
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value:	<input type="checkbox"/>
Transmit on bus:		<input checked="" type="checkbox"/>			
<b>Exception Handling</b>					
None.					
<b>Special Features</b>					
None.					

**5.1.6.3 Output / diagnostic data CurrentPower**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>CurrentPower</b>	<b>Mandatory</b> <input type="checkbox"/>		<b>Optional</b> <input checked="" type="checkbox"/>	
<b>Description:</b>							
Current measured power in W or J/h units. This value is received from the M-Bus heatmeter and stored by the Data Collector. The measured value is read-only and shall be accessible by polling.							
NOTE 10 The Property implementation does not allow for an alternative DPT.							
<b>DPT:</b>	<b>Name</b>	<b>DPT</b>	<b>MeteringValue</b>	<b>DPT ID</b>	<b>229.001</b>	<b>Datatype format</b>	<b>V<sub>32</sub>N<sub>8</sub>Z<sub>8</sub></b>
<b>Field</b>	<b>Description</b>			<b>Sup.</b>	<b>Range</b>	<b>Unit</b>	<b>Default</b>
CountVal	measured value			M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value			M	28h to 2Fh 30h to 37h A8h to A9h B0h to B1h		
<b>Status</b>	Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true
– OutOfService				NA	false		false
– Overridden				M	true/false	true/false	
– Fault				NA	false	false	
– InAlarm				NA	false		false
– AlarmUnAck				NA	unack		unack
<b>Command</b>	standard Command field not supported, Datapoint shall be read only			NA		enum	
– all commands							
<b>Communication:</b>							
<b>DP Address:</b>		<b>IO Type(ID):</b>		<b>1101 (M_HEATM)</b>		<b>Property ID:</b>	
<b>(in the server)</b>		<b>Start-Index:</b>		<b>1</b>		<b>N° of elements</b>	
<b>Property access:</b>		<b>Read only</b> <input checked="" type="checkbox"/>		<b>Read/Write</b> <input type="checkbox"/>			
<b>Protection</b>		<b>Read level</b>		<b>---</b>		<b>Write level</b>	
						<b>---</b>	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							

**Group Object (Standard Mode):**

DP Name:	CurrentPower	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HEATM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current measured power in kW units. This value is received from the M-Bus heat meter and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 11 An alternative, general usable, Standard Mode DPT may be used as well. (Example: DPT_Value_Power, F <sub>32</sub> , 14.056).					
<b>Datapoint Type</b>					
DPT_Name:	DPT_Power				
DPT Format:	F <sub>16</sub>	DPT_ID:	9.024		
Field	Description	Supp.	Range	Unit	Default
	Value encoded as 16 bit float.		full	kW	7FFFh
<b>Access Type</b>					
◆ Output					
	this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>	
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
Transmit on bus (only for output):			<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the type of the connected heat meter (nominal power)					

**5.1.6.4 Output / diagnostic data CurrentVolumeFlow****Property specification**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>CurrentVolumeFlow</b>	Mandatory <input type="checkbox"/>		
				Optional <input checked="" type="checkbox"/>		
<b>Description:</b>						
Current measured volume flow in m <sup>3</sup> /s ... m <sup>3</sup> /h units. This value is received from the M-Bus heatmeter and stored by the Data Collector. The measured value is read-only and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
CountVal	measured value		M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	38h to 3Fh 40h to 47h 48h to 4Fh		
Status	Value is not available / void		M	true/false	bitset	true
– OutOfService	measurement failure, corrupted value		NA	false		false
– Overridden			M	true/false		false
– Fault			NA	false		false
– InAlarm			NA	unack		unack
– AlarmUnAck						
Command	standard Command field				enum	
– all commands	not supported, Datapoint shall be read only		NA			
<b>Communication:</b>						
<b>DP Address:</b>		IO Type(ID):	1101 (M_HEATM)	Property ID:	53	
<b>(in the server)</b>		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.						

**Group Object (Standard Mode)**

DP Name:	CurrentVolumeFlow	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HEATM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current measured volume flow in l/h units. This value is received from the M-Bus heat meter and stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_Value_Volume_Flow				
DPT_Format:	F <sub>16</sub>	DPT_ID:	9.025		
Field	Description	Supp.	Range	Unit	Default
	Value encoded as 16 bit float.		full	l/h	7FFFh
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the type of the connected heat meter (nominal volume flow)					

**5.1.6.5 Diagnostic data CurrentEnergyConsumption\_T1**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b> CurrentEnergyConsumption_T1				Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
<b>Description:</b>									
Current accumulated energy consumption Tarif 1 value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.									
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format		V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field	Description		Sup.	Range		Unit	Default		
CountVal	measured value		M	full		<sup>1)</sup>	cs		
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h					
Status						bit set			
– OutOfService	Value is not available / void		M	true/false			true		
– Overridden			NA	false			false		
– Fault	measurement failure, corrupted value		M	true/false			false		
– InAlarm			NA	false			false		
– AlarmUnAck			NA	unack			unack		
Command	standard Command field					enum			
– all commands	not supported, Datapoint shall be read only		NA						
<b>Communication:</b>									
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:		54		
<b>(in the server)</b>		Start-Index:		1	N° of elements		1		
<b>Property access:</b>		Read only		<input checked="" type="checkbox"/>	Read/Write		<input type="checkbox"/>		
<b>Protection</b>		Read level		---	Write level		---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>									
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.									
<b>Special Features:</b>									
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.									



**5.1.6.6 Diagnostic data HistoryStorageNumbers**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>HistoryStorageNumbers</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>		
				<b>Optional</b> <input type="checkbox"/>		
<b>Description:</b>						
<p>Array of storage numbers for history values that are received from the M-Bus device and shall be stored by the Data Collector.</p> <p>In the received M-Bus message each storage number is associated with a given time point. So all data records in the M-Bus message with the same storage number belong together and refer to the value of the associated time stamp variable. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index.</p> <p>In the M-Bus message normally (but not necessarily) higher storage numbers indicate an older time point. The M_HEATM object shall support an array size <math>\geq 8</math> elements.</p> <ul style="list-style-type: none"> <li>- storage number '0' = void element</li> <li>- storage number '1' is reserved for billing period data</li> <li>- other storage numbers are e.g. used for daily, weekly, monthly values</li> <li>- only M-Bus datapoints with storage number higher than 0 are mapped to the history array</li> <li>- array length handling if a part of the history array is not yet filled with valid data: <ul style="list-style-type: none"> <li>⇒ both fixed array length with void data elements or variable array length are allowed</li> <li>⇒ for further details see clause 4.8</li> </ul> </li> </ul> <p>The Data Collector shall create and maintain a local data history out of the received M-Bus frames and fill up the history array buffer with previously received historic values. Therefore it is possible that various history array elements contain the same storage number (e.g. monthly values). See clause 4.8</p> <p>The array of storage numbers shall be read-only and shall be accessible by polling.</p>						
<b>DPT:</b>	<b>Name</b>	<b>DPT_Value_1_Ucount</b>	<b>DPT ID</b>	<b>5.010</b>	<b>Datatype format</b>	<b>U<sub>8</sub>[n]</b>
<b>Field</b>	<b>Description</b>			<b>Sup.</b>	<b>Range</b>	<b>Unit</b>
	0: void 1: billing period 2 to 255: other valid storage numbers				0 to 255	None
<b>Communication:</b>						
<b>DP Address:</b> (in the server)		IO Type(ID): 1101 (M_HEATM)		Property ID: 60		
		Start-Index: 1		N° of elements		≥ 8 fixed or variable length
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>		
<b>Protection</b>		Read level ---		Write level ---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the StorageNumbers array shall be left unchanged.						

**5.1.6.7 Diagnostic data HistoryDate**

FB:	M_HEATM	Property Name (Server):	HistoryDate	Mandatory <input checked="" type="checkbox"/>				Optional <input type="checkbox"/>
Description:								
Array of date/time information for history values that are received from the M-Bus device and shall be stored by the Data Collector. In the received M-Bus message each HistoryDate is associated with a storage number.								
In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6								
Some of the Date/Time fields may be void if not supported in the M-Bus frame								
The array of history date information is read-only and shall be accessible by polling.								
DPT:	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet [n]		
Field	Description				Sup.	Range	Unit	Default
Year	Year information, valid if NY = 0 and Fault = 0				M	0 to 255		<sup>1)</sup>
Month	Date.Month information, valid if ND = 0 and Fault = 0				M	1 to 12		<sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0				M	1 to 31		<sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0				O	1 to 7		<sup>1)</sup>
Hour	Time.Hour, valid if NT = 0 and Fault = 0				O	0 to 23	h	<sup>1)</sup>
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0				O	0 to 59	min	<sup>1)</sup>
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0				O	0 to 59	s	<sup>1)</sup>
Attributes	Bitset containing status info							
– Fault	Date/Time information ok {0} / fault {1}				M	fault/ok	bool	ok
– WD	bank day {0} / working day {1}				O	true/false	bool	WD invalid
– NWD	validity of WD field invalid {1} / valid {0}				M	true/false	bool	WD invalid
– NY	validity of Year field invalid {1} / valid {0}				M	true/false	bool	Year invalid
– ND	validity of Month & DayofMonth fields invalid {1} / valid {0}				M	true/false	bool	Date invalid
– NdoW	validity of DoW field invalid {1} / valid {0}				M	true/false	bool	DoW invalid
– NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}				M	true/false	bool	Time invalid
– SUTl	summertime {1} / standardtime {0} flag				NA	true/false	bool	Standard
– CLQ	clock quality bit: with {1} / without {0} external synchronization				NA	with / without	bool	without
Communication:								
DP Address: (in the server)		IO Type(ID):	1101 (M_HEATM)	Property ID:	61	N° of elements ≥8 fixed or variable length		
		Start-Index:	1					
Property access:		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
<sup>1)</sup> Initialisation value shall be ‘void’ until historic values are available, all ‘valid bits’ shall be set to ‘not valid’.								

**5.1.6.8 Diagnostic data HistoryEnergyConsumption**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> HistoryEnergyConsumption		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>				
<b>Description:</b>							
<p>Array of accumulated energy consumption information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyConsumption value in the received M-Bus message shall be associated with a storage number. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6</p> <p>The array of history information shall be read-only and shall be accessible by polling.</p>							
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]	
Field	Description		Sup.	Range	Unit	Default	
CountVal	measured value		M	full	<sup>1)</sup>	cs	
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h			
Status	Value is not available / void		M	true/false	bitset	true	
– OutOfService			NA	false		false	
– Overridden	measurement failure, corrupted value		M	true/false		false	
– Fault			NA	false		false	
– InAlarm			NA	unack		unack	
– AlarmUnAck							
Command	standard Command field				enum		
– all commands	not supported, Datapoint shall be read only		NA				
<b>Communication:</b>							
<b>DP Address:</b> (in the server)	IO Type(ID): 1101 (M_HEATM)		Property ID: 62				
	Start-Index: 1		N° of elements ≥ 8		fixed or variable length		
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
<b>Protection</b>	Read level ---		Write level ---				
<b>Exception Handling:</b>	Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.							

**5.1.6.9 Diagnostic data HistoryEnergyConsumption\_T1**

FB: M_HEATM		Property Name (Server):		HistoryEnergyConsumption_T1		Mandatory <input type="checkbox"/>		
						Optional <input checked="" type="checkbox"/>		
Description:								
Array of energy consumption Tarif 1 information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyConsumption_T1 value in the received M-Bus message shall be associated with a storage number. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6. The array of history information shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status		Value is not available / void			M	true/false	bitset	true
– OutOfService					NA	false		false
– Overridden		measurement failure, corrupted value			M	true/false		false
– Fault					NA	false		false
– InAlarm					NA	unack		unack
– AlarmUnAck								
Command		standard Command field			NA		enum	
- all commands		not supported, Datapoint shall be read only						
Communication:								
DP Address:		IO Type(ID):	1101 (M_HEATM)	Property ID:	63			
(in the server)		Start-Index:	1	N° of elements	≥ 8	fixed or variable length		
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field ‘status’ with ‘permanent error’ then the history shall be left unchanged.								

**5.1.6.10 Diagnostic data HistoryVolumeMaxFlow**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> HistoryVolumeMaxFlow		Mandatory <input type="checkbox"/>	
				Optional <input checked="" type="checkbox"/>
<b>Description:</b>				
<p>Array of measured max. volume flow (in m<sup>3</sup>/s ... m<sup>3</sup>/h units) information for history values that are received from the M-Bus device and shall be stored by the Data Collector.</p> <p>The max. volume flow is calculated by the M-Bus meter for the time period of the storage number and is reset at the beginning of each new storage number period.</p> <p>Each HistoryVolumeMaxFlow value in the received M-Bus message shall be associated with a storage number. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6.</p> <p>The array of history information shall be read-only and shall be accessible by polling.</p>				
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001
				Datatype format V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]
Field	Description	Sup.	Range	Unit
CountVal	measured value	M	full	<sup>1)</sup>
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value	M	38h to 3Fh 40h to 47h 48h to 4Fh	
Status	Value is not available / void	M	true/false	bitset
– OutOfService		NA	false	
– Overridden	measurement failure, corrupted value	M	true/false	
– Fault		NA	false	
– InAlarm		NA	unack	
– AlarmUnAck				
Command	standard Command field	NA		enum
– all commands	not supported, Datapoint shall be read only			
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID): 1101 (M_HEATM)	Property ID: 64		
	Start-Index: 1	N° of elements ≥ 8	fixed or variable length	
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level ---	Write level ---		
<b>Exception Handling:</b>	Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>			
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.				
<b>Special Features:</b>				
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.				

**5.1.6.11 Diagnostic data HistoryVolumeMinFlow**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> HistoryVolumeMinFlow		Mandatory <input type="checkbox"/>	
				Optional <input checked="" type="checkbox"/>
<b>Description:</b>				
<p>Array of measured min. volume flow (in m<sup>3</sup>/s ... m<sup>3</sup>/h units) information for history values that are received from the M-Bus device and shall be stored by the Data Collector.</p> <p>The min. volume flow is calculated by the M-Bus meter for the time period of the storage number and reset at the beginning of each new storage number period.</p> <p>Each HistoryVolumeMinFlow value in the received M-Bus message shall be associated with a storage number. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6.</p> <p>The array of history information shall be read-only and shall be accessible by polling.</p>				
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001
			Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]
Field	Description		Sup.	Range
CountVal	measured value		M	full
VallnfField	1) Encoding of unit and resolution of the measured value		M	38h to 3Fh 40h to 47h 48h to 4Fh
Status	Value is not available / void		M	true/false
– OutOfService			NA	false
– Overridden	measurement failure, corrupted value		M	true/false
– Fault			NA	false
– InAlarm			NA	false
– AlarmUnAck			NA	unack
Command	standard Command field			enum
– all commands	not supported, Datapoint shall be read only		NA	
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	65
	Start-Index:	1	N° of elements	≥ 8
	fixed or variable length			
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>				
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.				
<b>Special Features:</b>				
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.				

**5.1.6.12 Diagnostic data HistoryMaxPower**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> HistoryMaxPower	<b>Mandatory</b> <input type="checkbox"/>
		<b>Optional</b> <input checked="" type="checkbox"/>
<b>Description:</b>		
<p>Array of measured maximum power (in W or J/h units) information for history values that are received from the M-Bus device and shall be stored by the Data Collector.</p> <p>The max power value is calculated by the M-Bus meter for the time period of the storage number and reset at the beginning of each new storage number period.</p> <p>Each HistoryMaxPower value in the received M-Bus message shall be associated with a storage number. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6.</p> <p>The array of history information shall be read-only and shall be accessible by polling.</p>		
<b>DPT:</b>	Name	DPT_MeteringValue
	DPT ID	229.001
	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]
<b>Field</b>	<b>Description</b>	<b>Sup.</b>
CountVal	measured value	M
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value	M
		28h to 2Fh 30h to 37h A8h to A9h B0h to B1h
<b>Status</b>		
– OutOfService	Value is not available / void	M
– Overridden		NA
– Fault	measurement failure, corrupted value	M
		true/false false true/false
– InAlarm		NA
– AlarmUnAck		NA
		false unack
<b>Command</b>		
– all commands	standard Command field not supported, Datapoint shall be read only	NA
		enum
<b>Communication:</b>		
<b>DP Address:</b>	IO Type(ID): 1101 (M_HEATM)	Property ID: 66
<b>(in the server)</b>	Start-Index: 1	N° of elements ≥ 8
		fixed or variable length
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>
<b>Protection</b>	Read level ---	Write level ---
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>		
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.		
<b>Special Features:</b>		
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.		

**5.1.6.13 Diagnostic data HistoryMinPower**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> HistoryMinPower		Mandatory <input type="checkbox"/>	
				Optional <input checked="" type="checkbox"/>
<b>Description:</b>				
<p>Array of measured minimum power (in W or J/h units) information for history values that are received from the M-Bus device and shall be stored by the Data Collector.</p> <p>The min power value is calculated by the M-Bus meter for the time period of the storage number and reset at the beginning of each new storage number period.</p> <p>Each HistoryMinPower value in the received M-Bus message shall be associated with a storage number. In the M_HEATM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6.</p> <p>The array of history information shall be read-only and shall be accessible by polling.</p>				
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001
		Datatype format		V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]
Field	Description	Sup.	Range	Unit
CountVal	measured value	M	full	<sup>1)</sup>
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value	M	28h to 2Fh 30h to 37h A8h to A9h B0h to B1h	
Status				bitset
– OutOfService	Value is not available / void	M	true/false	
– Overridden		NA	false	
– Fault	measurement failure, corrupted value	M	true/false	
– InAlarm		NA	false	
– AlarmUnAck		NA	unack	
Command				enum
– all commands	standard Command field not supported, Datapoint shall be read only	NA		
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID): 1101 (M_HEATM)	Property ID: 67		
	Start-Index: 1	N° of elements ≥ 8	fixed or variable length	
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level ---	Write level ---		
<b>Exception Handling:</b>	Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>			
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.				
<b>Special Features:</b>				
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.				



**5.1.6.14 Output / diagnostic data TempFlowWater****Property specification**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>TempFlowWater</b>			Mandatory <input type="checkbox"/>	
Optional <input checked="" type="checkbox"/>							
<b>Description:</b>							
Current flow temperature value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_HVACTempAbs_Z	DPT ID	205.100	Datatype format	V <sub>16</sub> Z <sub>8</sub>	
Field	Description			Sup.	Range	Unit	Default
Temp	temperature value			M	full <sup>1)</sup>	° C	none
Status	Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true
– OutOfService				NA	false		false
– Overridden				M	true/false		false
– Fault				NA	false		false
– InAlarm				NA	unack		unack
– AlarmUnAck							
Command	standard Command field			NA		enum	
– all commands	not supported, Datapoint shall be read only						
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID): 1101 (M_HEATM)		Property ID: 70			
<b>(in the server)</b>		Start-Index: 1		N° of elements		1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							
<sup>1)</sup> The range of the temperature value is determined by the M-Bus device; the Data Collector shall map the full range.							

**Group Object (Standard Mode):**

DP Name:	TempFlowWater	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HEATM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current flow temperature value that is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F <sub>16</sub>	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
			Full	°C	7FFFh
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value is company specific.					

### 5.1.6.15 Output / diagnostic data TempReturnWater

#### Property specification:

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> TempReturnWater				Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>
<b>Description:</b>							
Current return water temperature value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT	HVACTempAbs_Z	DPT ID	205.100	Datatype format	V <sub>16</sub> Z <sub>8</sub>
Field	Description			Sup.	Range	Unit	Default
Temp	temperature value			M	full <sup>1)</sup>	° C	none
Status	Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true
- OutOfService				NA	false		false
- Overridden				M	true/false		false
- Fault				NA	false		false
- InAlarm				NA	false		false
- AlarmUnAck				NA	unack		unack
Command	standard Command field					enum	
- all commands	not supported, Datapoint shall be read only			NA			
<b>Communication:</b>							
<b>DP Address: (in the server)</b>	IO Type(ID):	1101 (M_HEATM)		Property ID:	71		
	Start-Index:	1		N° of elements	1		
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
<b>Protection</b>	Read level	---		Write level	---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							
<sup>1)</sup> The range of the temperature value is determined by the M-Bus device; the Data Collector shall map the full range.							

**Group Object (Standard Mode):**

DP Name:	TempReturnWater		Abbr.:	---		Mandatory	<input type="checkbox"/>
FB Name:	M_HEATM				Can be internal	<input type="checkbox"/>	
<b>Description</b>							
Current return temperature value that is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.							
<b>Datapoint Type</b>							
DPT_Name:	DPT_Value_Temp						
DPT Format:	F <sub>16</sub>			DPT_ID:	9.001		
Field	Description			Supp.	Range	Unit	Default
					Full	°C	7FFFh
<b>Access Type</b>							
◆ Output							
this → M	<input checked="" type="checkbox"/>	this → 1		<input type="checkbox"/>			
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value:	cs <sup>1)</sup>	Min repetition period:	5 min
		Cyclic	<input type="checkbox"/>	Period:			
Request	<input checked="" type="checkbox"/>						
<b>Communication Type</b>							
◆ Group Object Datapoint						Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---					
<b>Dynamics</b>							
Power down:	Save:	<input type="checkbox"/>					
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:		<input checked="" type="checkbox"/>	
		Saved value:	<input type="checkbox"/>	Actual value (not for input):		<input type="checkbox"/>	
	Transmit on bus (only for output):			<input type="checkbox"/>	Read from bus (only for input):		
<b>Exception Handling</b>							
Void values or faulty values shall be indicated with default value 7FFFh.							
<b>Special Features</b>							
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value is company specific.							

**5.1.6.16 Output / diagnostic data TempDiffWater****Property specification**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> TempDiffWater				Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>
<b>Description:</b>							
Current water temperature difference (flow – return) value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_HVACTempRel_Z	DPT ID	205.101	Datatype format	V <sub>16</sub> Z <sub>8</sub>	
Field	Description			Sup.	Range	Unit	Default
Temp	temperature difference value			M	full <sup>1)</sup>	K	none
Status	Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true
– OutOfService				NA	false		false
– Overridden				M	true/false		false
– Fault				NA	false		false
– InAlarm				NA	unack		unack
– AlarmUnAck							
Command	standard Command field					enum	
– all commands	not supported, Datapoint shall be read only			NA			
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID): 1101 (M_HEATM)		Property ID: 72			
<b>(in the server)</b>		Start-Index: 1		N° of elements 1			
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							
<sup>1)</sup> The range of the temperature value is determined by the M-Bus device; the Data Collector shall map the full range.							

**Group Object (Standard Mode):**

DP Name:	TempDiffWater	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HEATM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current water temperature difference (flow – return) value that is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_Value_Tempd				
DPT Format:	F <sub>16</sub>	DPT_ID:	9.002		
Field	Description	Supp.	Range	Unit	Default
			Full	K	7FFFh
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value is company specific.					

**5.1.6.17 Output / Diagnostic data ReliabilityOfMeteringData**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>ReliabilityOfMeteringData</b>	<b>Mandatory</b> <input type="checkbox"/>			
				<b>Optional</b> <input checked="" type="checkbox"/>			
<b>Description:</b>							
<p>The purpose of this Property is to indicate whether or not metering values of this FB are up-to-date or outdated.</p> <p>ReliabilityOfMeteringData is set to 'true' each time an M-Bus RF frame containing valid metering data is received and a receive time stamp is stored in the Property RxReceptionTime.</p> <p>By comparison of current Date &amp; Time with RxReceptionTime a receive-timeout on M-Bus RF metering frames can be detected. The timeout is implementation specific (recommended value: 24 hours + small Δt).</p> <p>If the timeout expires (e.g. due to an interruption or persistent disturbance of the RF data link or due to a defect of the metering device), the Property ReliabilityOfMeteringData is set to the value 'false' to indicate that metering values are outdated'.</p> <p>The implementation of this Output ReliabilityOfMeteringData is recommended to provide information of reliability of metering data to display units.</p>							
<b>DPT:</b>	Name	DPT_Bool	DPT ID	1.002	Datatype format		B <sub>1</sub>
Field	Description			Sup.	Range	Unit	Default
	0: false 1: true			M	{0, 1}	none	false
<b>Access Type</b>							
◆ <b>Output</b>							
	this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>			
	Spontaneous	<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Δ-Value:	1	Min repetition time: none
			Cyclic	<input type="checkbox"/>	Period:	none	
	Request	<input checked="" type="checkbox"/>					
<b>Communication Type</b>							
◆ <b>Group Object Datapoint</b>						<b>Mandatory:</b>	<input type="checkbox"/>
	Default Group Address:		none				
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID):		1101 (M_HEATM)		Property ID: 128	
		Start-Index:		1		N° of elements 1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>							
None.							
<b>Special Features:</b>							
None.							

**5.1.6.18 LTE Zoning Parameter Apartment**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>Apartment</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
LTE zone: Apartment number used for LTE binding and in addition as localization information for the metering device.					
<b>DPT:</b>	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format U <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit
CounterValue	Apartment number		M	1 to 126	none
Status					bitset
- OutOfService	zone active /inactive		O	true/false	
- all other flags	not supported, fixed to '0'		NA		
Command					enum
- NormalWrite			M		
- SetOSV & ResetOSV	set zone inactive / active		O		
- all other commands	not supported		NA		
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1101 (M_HEATM)	Property ID:	101	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input type="checkbox"/>	Read/Write	<input checked="" type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
---					
<b>Special Features:</b>					
M_HEATM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Room and Subzone is 'OutOfService' (common flag).					
<sup>1)</sup> Mandatory in LTE implementations only.					



**5.1.6.19 LTE Zoning Parameter Room**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>Room</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
LTE zone: Room number. parameter used for LTE binding and in addition as localization information for the metering device.					
<b>DPT:</b>	Name	DPT	UcountValue8_Z	DPT ID	202.002
				Datatype format	U <sub>8</sub> Z <sub>8</sub>
<b>Field</b>	<b>Description</b>			<b>Sup.</b>	<b>Range</b>
CounterValue	Room number			M	1 to 63
Status				O	
– OutOfService	zone active /inactive			O	true/false
– all other flags	not supported, fixed to '0'			NA	
Command					
– NormalWrite				M	
– SetOSV & ResetOSV	set zone inactive / active			O	
– all other commands	not supported			NA	
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1101 (M_HEATM)	Property ID:	102	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input type="checkbox"/>	Read/Write	<input checked="" type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
---					
<b>Special Features:</b>					
M_HEATM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Room and Subzone is 'OutOfService' (common flag).					
<sup>1)</sup> Mandatory in LTE implementations only.					

### 5.1.6.20 LTE Zoning Parameter Subzone

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> Subzone		Mandatory <input checked="" type="checkbox"/> <sup>1)</sup> Optional <input type="checkbox"/>	
<b>Description:</b>				
LTE zone: Subzone number within the Apartment & Room used for LTE binding and in addition as localization information for the metering device.				
<b>DPT:</b>	Name	DPT_Value8_Z	DPT ID	202.002
			Datatype format	U <sub>8</sub> Z <sub>8</sub>
Field	Description	Sup.	Range	Unit
CounterValue	Subzone number	M	1 to 15	none
Status				bitset
- OutOfService	zone active /inactive	O	true/false	
- all other flags	not supported, fixed to '0'	NA		false
Command				enum
- NormalWrite		M		
- SetOSV & ResetOSV	set zone inactive / active	O		
- all other commands	not supported	NA		
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	103
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
---				
<b>Special Features:</b>				
M_HEATM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Subzone is 'OutOfService' (common flag).				
<sup>1)</sup> Mandatory in LTE implementations only				

### 5.1.6.21 Diagnostic data RxSequenceCounter

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> RxSequenceCounter		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>	
<b>Description:</b>				
This Datapoint shall contains the sequence counter that shall be generated locally by the Data Collector and shall be incremented each time an M-Bus message is received from the corresponding M-Bus device. This Property shall be used for consistency checking if metering data is retrieved from the Data Collector.				
During readout of metering data from the Data Collector a new M-Bus frame could be received and read out data would be inconsistent. Therefore the client reading out metering data shall check the sequence counter before and after read out. If the sequence counter value has changed, metering data may be inconsistent ⇒ retry by the client				
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010
			Datatype format	U <sub>8</sub> [n]
Field	Description	Sup.	Range	Unit
			0 to 255	---
				0
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	110
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>
Free running counter with overflow 255 → 0.				
<b>Special Features:</b>				
None.				

**5.1.6.22 Diagnostic data RxReceptionTime**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>RxReceptionTime</b>	Mandatory <input checked="" type="checkbox"/>		Optional <input type="checkbox"/>	
<b>Description:</b>							
Time stamp generated locally by the Data Collector each time an M-Bus message is received.							
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet	
Field	Description			Sup.	Range	Unit	Default
Year	Year information, valid if NY=0 and Fault=0			M	0 to 255		<sup>1)</sup>
Month	Date.Month information, valid if ND=0 and Fault=0			M	1 to 12		<sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND=0 and Fault=0			M	1 to 31		<sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW=0 and Fault=0			O	1 to 7		<sup>1)</sup>
Hour	Time.Hour, valid if NT=0 and Fault=0			M	0 to 23	h	<sup>1)</sup>
Minutes	Time.Minutes, valid if NT=0 and Fault=0			M	0 to 59	min	<sup>1)</sup>
Seconds	Time.Seconds, valid if NT=0 and Fault=0			M	0 to 59	s	<sup>1)</sup>
Attributes	Bitset containing status info						
- Fault	Date/Time information ok {0} / fault {1}			M	fault/ok	bool	ok
- WD	bank day {0} / working day {1}			O	true/false	bool	WD invalid
- NWD	validity of WD field invalid {1} / valid {0}			M	true/false	bool	WD invalid
- NY	validity of Year field invalid {1} / valid {0}			M	true/false	bool	Year invalid
- ND	validity of Month & DayofMonth fields invalid {1} / valid {0}			M	true/false	bool	Date invalid
- NdoW	validity of DoW field invalid {1} / valid {0}			M	true/false	bool	DoW invalid
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}			M	true/false	bool	Time invalid
- SUTl	summertime {1} / standardtime {0} flag			NA	true/false	bool	Standard
- CLQ	clock quality bit: with {1} / without {0} external synchronization			NA	with / without	bool	without
<b>Communication:</b>							
<b>DP Address:</b>		<b>IO Type(ID):</b>		1101 (M_HEATM)	<b>Property ID:</b>		111
<b>(in the server)</b>		<b>Start-Index:</b>		1	<b>N° of elements</b>		1
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
<sup>1)</sup> The Property is stored in volatile memory. After power up the initialisation value is 'void' until a valid M-Bus frame is received from the corresponding M-Bus device, all 'valid bits' are set to 'not valid'							
<b>Special Features:</b>							
With this Datapoint the metering client can check if the Data Collector has up to date metering data.							

**5.1.6.23 Diagnostic data Manufacturer**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>Manufacturer</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>			
				<b>Optional</b> <input type="checkbox"/>			
<b>Description:</b>							
<p>M-Bus specific 16 bit manufacturer code that is received from the M-Bus device and shall be stored by the Data Collector during installation procedure.</p> <p>In the M-Bus message the manufacturer code is contained in the MID field (see [02] and [03][03]). The MID field contains the Manufacturer ID encoded as a 2 octet unsigned binary value. This Manufacturer ID is calculated from the ASCII code of manufacturer identification (three uppercase letters) with a formula defined in [02].</p> <p>The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit #0 of Property Manufacturer.</p> <p>The value shall be read-only and shall be accessible by polling.</p>							
<b>DPT:</b>	Name	DPT Value	2 Ucount	DPT ID	7.001	Datatype format	U <sub>16</sub>
Field	Description			Sup.	Range	Unit	Default
					full range	none	0
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)		Property ID: 112	
<b>(in the server)</b>		Start-Index:		1		N° of elements 1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level		Write level			
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>		Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>	
None.							
<b>Special Features:</b>							
Manufacturer 0000h = void value							

**5.1.6.24 Diagnostic data IdentificationNumber**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>IdentificationNumber</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>			
				<b>Optional</b> <input type="checkbox"/>			
<b>Description:</b>							
<p>Every meter has a unique current identification number preset by manufacture. The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark worldwide unique meter identification.</p> <p>The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit ≠0 of Property Manufacturer. In this case the FabricationNumber will be additionally provided by meter. The FabricationNumber contains a copy of the original IdentificationNumber.</p> <p>In the M-Bus message the identification number is an M-Bus specific 8 digit BCD code. It shall be received from the M-Bus meter during installation, then mapped to a 32 bit counter value and stored by the Data Collector.</p> <p>The value shall be read-only and shall be accessible by polling.</p>							
<b>DPT:</b>	Name	DPT Value	4 Ucount	DPT ID	12.001	Datatype format	U <sub>32</sub>
Field	Description			Sup.	Range	Unit	Default
					full range	---	FFFFFFFFh
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)		Property ID:	
<b>(in the server)</b>		Start-Index:		1		N° of elements	
						1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level		---		Write level	
						---	
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>		Act Value <input type="checkbox"/>	
						Default Value <input type="checkbox"/>	
<b>Special Features:</b>							
IdentificationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for wildcard addressing and is never a valid part of the M-Bus address).							

**5.1.6.25 Diagnostic data VersionNumber**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> VersionNumber		Mandatory <input checked="" type="checkbox"/>	
Optional <input type="checkbox"/>				
<b>Description:</b>				
Version of the heat meter that is received from the M-Bus device during commissioning. The structure is manufacturer specific. Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the version number information is provided by the M-Bus meter. The raw value shall be stored by the Data Collector and shall be accessible by polling.				
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010
	Datatype format		U <sub>8</sub>	
Field	Description	Sup.	Range	Unit
			full	None
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	114
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
---				
<b>Special Features:</b>				
The structure of the version number is completely manufacturer specific. Therefore no special features can be defined.				

**5.1.6.26 Diagnostic data MeteringDeviceType**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> MeteringDeviceType		Mandatory <input checked="" type="checkbox"/>	
Optional <input type="checkbox"/>				
<b>Description:</b>				
Device Type of the heat meter device. Supported values in M_HEATM are: 4 : Heat energy (outlet) 10 : Cooling Load energy meter (outlet) 11 : Cooling Load energy meter (inlet) 12 : Heat energy (inlet) 13 : Heat and Cool energy 255 : void device type Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the MeteringDeviceType information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.				
<b>DPT:</b>	Name	DPT_Metering_DeviceType	DPT ID	20.114
	Datatype format		N <sub>8</sub>	
Field	Description	Sup.	Range	Unit
			{4, 10, 11, 12, 13, 255}	enum.
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	115
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
None.				
<b>Special Features:</b>				
Device type '255' = void (default value); used to indicate that the FB is not connected to a meter.				

**5.1.6.27 Diagnostic data FabricationNumber**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>FabricationNumber</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Every meter has a unique current identification number preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.					
The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit ≠ 0 of Property Manufacturer. In this case the FabricationNumber will be additionally provided by meter. The FabricationNumber contains a copy of the original IdentificationNumber.					
In the M-Bus message the fabrication number is an M-Bus specific 8 digit BCD code. It shall be received from the M-Bus meter during installation, then mapped to a 32 bit counter value and stored by the Data Collector.					
The value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_Value 4 Ucount	DPT ID	12.001	Datatype format U <sub>32</sub>
Field	Description	Sup.	Range	Unit	Default
			full range	none	FFFFFFFFh
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	116	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
None.					
<b>Special Features:</b>					
FabricationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for wildcard addressing and is never a valid part of the M-Bus address).					
<sup>1)</sup> Conditional: mandatory in case of M-Bus "soft addressing" in order to have an unambiguous identification of the metering data.					

**5.1.6.28 Diagnostic data AccessNumber**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>AccessNumber</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Consecutive message number that is generated by the heat meter and that is received from the M-Bus device and shall be stored by the Data Collector. The mechanism of access number is manufacturer specific. The value shall be read-only and shall be accessible by polling.					
The encoding of the AccessNumber in the M-Bus Message is specified in [03].					
<b>DPT:</b>	Name	DPT_Value 1 Ucount	DPT ID	5.010	Datatype format U <sub>8</sub> [n]
Field	Description	Sup.	Range	Unit	Default
			0 ... 255	None.	0
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1101 (M_HEATM)	Property ID:	117	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input checked="" type="checkbox"/>
Data is stored in volatile memory and is void after power up of the Data Collector.					
<b>Special Features:</b>					
None.					

**5.1.6.29 Diagnostic data DeviceStatus**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>DeviceStatus</b>					Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>
<b>Description:</b>									
M-Bus specific combined Status/Error-code (bitset) of the heat meter that is received from the M-Bus device.									
The encoding of the DeviceStatus in the M-Bus Message is specified in [03].									
The raw value shall be stored by the Data Collector and shall be accessible by polling.									
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format		U <sub>8</sub>		
Field	Description		Sup.		Range	Unit	Default		
					full	None	0		
<b>Communication:</b>									
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:		118		
<b>(in the server)</b>		Start-Index:		1	N° of elements		1		
<b>Property access:</b>		Read only		<input checked="" type="checkbox"/>	Read/Write		<input type="checkbox"/>		
<b>Protection</b>		Read level		---	Write level		---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>									
None.									
<b>Special Features:</b>									
If data in the metering telegram are marked in field 'DeviceStatus' with 'permanent error' (bit 3) then the Status flag 'Fault' of various metering datapoints shall be set to 'true'.									

**5.1.6.30 Diagnostic data OperatingTime**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>OperatingTime</b>					Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>									
Duration of meter accumulation of the heat meter that is received from the M-Bus device.									
The value shall be stored by the Data Collector and shall be accessible by polling.									
<b>DPT:</b>	Name	DPT_LongDeltaTimeSec	DPT ID	13.100	Datatype format		V <sub>32</sub>		
Field	Description		Sup.		Range	Unit	Default		
					full <sup>1)</sup> ≥0	s	0		
<b>Communication:</b>									
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:		119		
<b>(in the server)</b>		Start-Index:		1	N° of elements		1		
<b>Property access:</b>		Read only		<input checked="" type="checkbox"/>	Read/Write		<input type="checkbox"/>		
<b>Protection</b>		Read level		---	Write level		---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>									
None.									
<b>Special Features:</b>									
<sup>1)</sup> encoding on 32 bit signed integer value with 1 second transport format resolution.									
Display resolution: 1 h. The granularity of the internal resolution may be higher.									
Used range: 0 to ~68 years. In practice no binary overflow is thus possible.									



**5.1.6.31 Diagnostic data OnTime**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>OnTime</b>	<b>Mandatory</b> <input type="checkbox"/>		
				<b>Optional</b> <input checked="" type="checkbox"/>		
<b>Description:</b>						
Duration of heat meter power up that is received from the M-Bus device. The value shall be stored by the Data Collector and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT	LongDeltaTimeSec	DPT ID	13.100	Datatype format
						V <sub>32</sub>
Field	Description			Sup.	Range	Unit
					full <sup>1)</sup> ≥0	s
<b>Communication:</b>						
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:	
<b>(in the server)</b>		Start-Index:		1	N° of elements	
<b>Property access:</b>		Read only		<input checked="" type="checkbox"/>	Read/Write	
<b>Protection</b>		Read level		---	Write level	
				---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
None.						
<b>Special Features:</b>						
<sup>1)</sup> encoding on 32 bit signed integer value with 1 second <u>transport format</u> resolution. Display resolution: 1 h. The granularity of the internal resolution may be higher. Used range: 0 to ~68 years. In practice no binary overflow is thus possible.						

**5.1.6.32 Diagnostic data CurrentDate**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> CurrentDate		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>			
<b>Description:</b>						
Current date and time information of heat meter that is received from the M-Bus device (time stamp information of the heat meter for the last M-Bus message containing this information). The value shall be stored by the Data Collector and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet
Field	Description		Sup.	Range	Unit	Default
Year	Year information, valid if NY = 0 and Fault = 0		M	0 to 255		<sup>1)</sup>
Month	Date.Month information, valid if ND = 0 and Fault = 0		M	1 to 12		<sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0		M	1 to 31		<sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0		O	1 to 7		<sup>1)</sup>
Hour	Time.Hour, valid if NT = 0 and Fault = 0		M	0 to 23	h	<sup>1)</sup>
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0		M	0 to 59	min	<sup>1)</sup>
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0		M	0 to 59	s	<sup>1)</sup>
Attributes	Bitset containing status info					
– Fault	Date/Time information ok {0} / fault {1}		M	fault/ok	bool	ok
– WD	bank day {0} / working day {1}		O	true/false	bool	WD invalid
– NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool	WD invalid
– NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool	Year invalid
– ND	validity of Month & DayofMonth fields invalid {1} / valid {0}		M	true/false	bool	Date invalid
– NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool	DoW invalid
– NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool	Time invalid
– SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool	Standard
– CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool	without
<b>Communication:</b>						
<b>DP Address:</b> (in the server)		IO Type(ID):	1101 (M_HEATM)	Property ID:	121	
		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
None.						
<b>Special Features:</b>						
<sup>1)</sup> initialisation value is 'void' until a valid M-Bus frame was received, all 'valid bits' are set to 'not valid'						

**5.1.6.33 Diagnostic data MaxPowerDate**

FB:	M_HEATM	Property Name (Server):	MaxPowerDate	Mandatory <input type="checkbox"/>				Optional <input checked="" type="checkbox"/>
Description:								
Date and time of Maximum Power occurrence of power measurement by the heat meter. This value is related to MaxPower datapoint. The value is normally reset by the metering device together with MaxPower after creation of the corresponding history date. It is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling.								
DPT:	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet		
Field	Description				Sup	Range	Unit	Default
Year	Year information, valid if NY = 0 and Fault = 0				M	0 to 255		<sup>1)</sup>
Month	Date.Month information, valid if ND = 0 and Fault = 0				M	1 to 12		<sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0				M	1 to 31		<sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0				O	1 to 7		<sup>1)</sup>
Hour	Time.Hour, valid if NT = 0 and Fault = 0				M	0 to 23	h	<sup>1)</sup>
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0				M	0 to 59	min	<sup>1)</sup>
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0				M	0 to 59	s	<sup>1)</sup>
Attributes	Bitset containing status info							
– Fault	Date/Time information ok {0} / fault {1}				M	fault/ok	bool	ok
– WD	bank day {0} / working day {1}				O	true/false	bool	WD invalid
– NWD	validity of WD field invalid {1} / valid {0}				M	true/false	bool	WD invalid
– NY	validity of Year field invalid {1} / valid {0}				M	true/false	bool	Year invalid
– ND	validity of Month & DayofMonth fields invalid {1} / valid {0}				M	true/false	bool	Date invalid
– NdoW	validity of DoW field invalid {1} / valid {0}				M	true/false	bool	DoW invalid
– NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}				M	true/false	bool	Time invalid
– SUT1	summertime {1} / standardtime {0} flag				NA	true/false	bool	Standard
– CLQ	clock quality bit: with {1} / without {0} external synchronization				NA	with / without	bool	without
Communication:								
DP Address: (in the server)		IO Type(ID):	1101 (M_HEATM)	Property ID:		122		
		Start-Index:	1	N° of elements		1		
Property access:		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field ‘status’ with ‘permanent error’ then the value shall be unchanged.								
<sup>1)</sup> Initialisation value is ‘void’ until a valid M-Bus frame was received, all ‘valid bits’ are set to ‘not valid’								

**5.1.6.34 Diagnostic data MaxPower**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>MaxPower</b>	Mandatory <input type="checkbox"/>		
				Optional <input checked="" type="checkbox"/>		
<b>Description:</b>						
Result of maximum power value measurement by the heat meter according to averaging duration integration period. This value is related to MaxPowerDate datapoint. The measured power can be indicated in W or J/h units.						
The value is normally reset by the metering device after creation of the corresponding history value.						
This value is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
CountVal	measured value		M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	28 to 2Fh 30 to 37h A8 to A9h B0 to B1h		
Status	Value is not available / void		M	true/false	bitset	true
- OutOfService			NA	false		false
- Overridden	measurement failure, corrupted value		M	true/false		false
- Fault			NA	false		false
- InAlarm			NA	unack		unack
- AlarmUnAck						
Command	standard Command field				enum	
- all commands	not supported, Datapoint shall be read only		NA			
<b>Communication:</b>						
<b>DP Address:</b>		IO Type(ID):	1101 (M_HEATM)	Property ID:	123	
<b>(in the server)</b>		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be unchanged						

**5.1.6.35 Diagnostic data MinPowerDate**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>MinPowerDate</b>	Mandatory <input type="checkbox"/>	
				Optional <input checked="" type="checkbox"/>	
<b>Description:</b>					
Date and time of Minimum Power occurrence of power measurement by the heat meter. This value is related to MinPower datapoint.					
The value is normally reset by the metering device together with MinPower after creation of the corresponding history date.					
It is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format 8 octet
Field	Description		Sup.	Range	Unit Default
Year	Year information, valid if NY=0 and Fault=0		M	0 to 255	h <sup>1)</sup>
Month	Date.Month information, valid if ND=0 and Fault=0		M	1 to 12	h <sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND=0 and Fault=0		M	1 to 31	h <sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW=0 and Fault=0		O	1 to 7	h <sup>1)</sup>
Hour	Time.Hour, valid if NT=0 and Fault=0		M	0 to 23	h
Minutes	Time.Minutes, valid if NT=0 and Fault=0		M	0 to 59	min
Seconds	Time.Seconds, valid if NT=0 and Fault=0		M	0 to 59	s
Attributes	Bitset containing status info				
- Fault	Date/Time information ok {0} / fault {1}		M	Fault/ok	bool ok
- WD	bank day {0} / working day {1}		O	true/false	bool WD invalid
- NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool WD invalid
- NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool Year invalid
- ND	validity of Month & DayofMonth fields invalid {1} / valid {0}		M	true/false	bool Date invalid
- NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool DoW invalid
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool Time invalid
- SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool Standard
- CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool without
<b>Communication:</b>					
<b>DP Address:</b>		IO Type(ID):	1101 (M_HEATM)	Property ID:	124
<b>(in the server)</b>		Start-Index:	1	N° of elements	1
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be unchanged.					
<sup>1)</sup> Initialisation value is 'void' until a valid M-Bus frame is received, all 'valid bits' shall be set to 'not valid'.					

**5.1.6.36 Diagnostic data MinPower**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>MinPower</b>	Mandatory <input type="checkbox"/>		
				Optional <input checked="" type="checkbox"/>		
<b>Description:</b>						
Result of minimum power value measurement by the heat meter. This value is related to MinPowerDate datapoint. The measured power can be indicated in W or J/h units. The value is normally reset by the metering device after creation of the corresponding history value. This value is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
CountVal	measured value		M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	28h to 2Fh 30h to 37h A8h to A9h B0h to B1h		
Status	Value is not available / void		M	true/false	bitset	true
- OutOfService			NA	false		false
- Overridden	measurement failure, corrupted value		M	true/false		false
- Fault			NA	false		false
- InAlarm			NA	unack		unack
- AlarmUnAck						
Command	standard Command field		NA		enum	
- all commands	not supported, Datapoint shall be read only					
<b>Communication:</b>						
<b>DP Address:</b>		IO Type(ID):	1101 (M_HEATM)	Property ID:	125	
<b>(in the server)</b>		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be unchanged.						

**5.1.6.37 Diagnostic data ErrorDate**

<b>FB:</b> M_HEATM	<b>Property Name (Server):</b> ErrorDate		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>				
<b>Description:</b>							
Date and time information for an error occurrence in the heat meter that is received from the M-Bus device. This information is related to datapoint ErrorConsumption The value shall be stored by the Data Collector and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octets	
Field	Description		Sup.	Range	Unit	Default	
Year	Year information, valid if NY = 0 and Fault = 0		M	0 to 255		1)	
Month	Date.Month information, valid if ND = 0 and Fault = 0		M	1 to 12		1)	
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0		M	1 to 31		1)	
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0		O	1 to 7		1)	
Hour	Time.Hour, valid if NT = 0 and Fault = 0		M	0 to 23	h	1)	
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0		M	0 to 59	min	1)	
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0		M	0 to 59	s	1)	
Attributes	Bitset containing status info						
- Fault	Date/Time information ok {0} / fault {1}		M	fault/ok	bool	ok	
- WD	bank day {0} / working day {1}		O	true/false	bool	WD invalid	
- NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool	WD invalid	
- NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool	Year invalid	
- ND	validity of Month & DayofMonth fields invalid {1} / valid {0}		M	true/false	bool	Date invalid	
- NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool	DoW invalid	
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool	Time invalid	
- SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool	standard	
- CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool	without	
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID):	1101 (M_HEATM)	Property ID:	126		
		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>				
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>		
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the date shall be accepted by the Data Collector. This is the last reliable and valid consumption date from the metering device. 1) Initialisation value is 'void' until a valid M-Bus frame was received, all 'valid bits' are set to 'not valid'							

**5.1.6.38 Diagnostic data ErrorConsumption**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>ErrorConsumption</b>	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Value of CurrentEnergyConsumption datapoint at the moment when an error occurred in the heat meter. The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling. This information is related to datapoint ErrorDate.							
<b>DPT:</b>	Name	DPT	MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description			Sup.	Range	Unit	Default
CountVal	measured value			M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status	Value is not available / void			M	true/false	bitset	true
- OutOfService				NA	false		false
- - Overridden	measurement failure, corrupted value			M	true/false		false
- Fault				NA	false		false
- InAlarm				NA	unack		unack
- AlarmUnAck							
Command	standard Command field					enum	
- all commands	not supported, Datapoint shall be read only			NA			
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:		127
<b>(in the server)</b>		Start-Index:		1	N° of elements		1
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level		---	Write level		---
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be accepted by the Data Collector. This is the last reliable and valid consumption value from the metering device.							



**5.1.6.39 Diagnostic data AveragingDuration**

FB:	M_HEATM	Property Name (Server):	AveragingDuration			Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>		
Description:								
Measuring time for current min/max value generation (integration time for power measurement). The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling.								
DPT:	Name	DPT_LongDeltaTimeSec	DPT ID	13.100	Datatype format	V <sub>32</sub>		
Field		Description			Sup.	Range	Unit	Default
						full <sup>1)</sup> ≥0	s	0
Communication:								
DP Address: (in the server)		IO Type(ID):	1101 (M_HEATM)		Property ID:	129		
		Start-Index:	1		N° of elements	1		
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---		Write level	---		
Exception Handling:		Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
None.								
Special Features:								
<sup>1)</sup> Encoding on 32 bit signed integer value with 1 second transport format resolution. Display resolution: 1h The granularity of the internal resolution may be higher.								

**5.1.6.40 Diagnostic data MBusRawData**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>MBusRawData</b>		<b>Mandatory</b> <input checked="" type="checkbox"/>	
<b>Optional</b> <input type="checkbox"/>						
<b>Description:</b>						
Raw data of received M-Bus telegram starting from CI field. Data shall be stored by the Data Collector as a Property array, the supported Property length shall be ≥ 128 elements. For further details see 4.6 “Mapping of M-Bus raw data”.						
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format	U <sub>8</sub> [n]
Field	Description		Sup.	Range	Unit	Default
				full	None.	array length= 0
<b>Communication:</b>						
<b>DP Address:</b> (in the server)		IO Type(ID):	1101 (M_HEATM)	Property ID:	130	
		Start-Index:	1	N° of elements	Variable, max length ≥128	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: <input type="checkbox"/> Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Please refer to clause 4.6 “Mapping of M-Bus raw data”.						
<b>Special Features:</b>						
The Property shall have a variable length according to the last received M-Bus message. The effective length can be checked by the client via A_PropertyDescription_Read-service.						

**5.1.6.41 History Query**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>		<b>History Query</b>		Mandatory <input type="checkbox"/>	
						Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Function Property to query the contents of metering Properties according 4.10.							
<b>DPT:</b>	Name	None.	DPT ID	n/a	Datatype format	n/a	
Field	Description	Sup.	Range	Unit	Default		
See specification in 4.10.							
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):	1101 (M_HEATM)	Property ID:	152		
<b>(in the server)</b>		Start-Index:	1	N° of elements	1		
<b>Data Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>				
<b>Function Property:</b>		Client: <input type="checkbox"/>	Server: <input checked="" type="checkbox"/>				
<b>Protection</b>		Read level	---	Write level	---		
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>		
None.							
<b>Special Features:</b>							
None.							

**5.1.6.42 Parameter UserText**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>		<b>UserText</b>		Mandatory <input type="checkbox"/>	
						Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Additional text information to the metering device, which can be entered on the Data Collector by the installer during commissioning. See clause 2.							
<b>DPT:</b>	Name	DPT_VarString_8859_1	DPT ID	24.001	Datatype format	A[n]	
Field	Description	Sup.	Range	Unit	Default		
UserText	Null terminated string.	M	see datatype "char set"		'00h'		
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):	1101 (M_HEATM)	Property ID:	160		
<b>(in the server)</b>		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>				
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>		
None.							
<b>Special Features:</b>							
None.							

**5.1.6.43 Parameter MeterReplacement**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>MeterReplacement</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>			
				<b>Optional</b> <input type="checkbox"/>			
<b>Description:</b>							
<p>Management of metering device directory in the Data Collector is company specific and not part of this specification. The Data Collector shall however provide appropriate procedures to manage and detect the replacement of a metering device by another device (with different identification number and e.g. different unit/resolution of the metering data). See also clause 2.</p> <p>In case of meter replacement the corresponding M_HEATM Interface Object will normally contain data of the newly connected M-Bus device and M-Bus Identifiers (Manufacturer, IdentificationNumber, VersionNumber, MeteringDeviceType, FabricationNumber etc) of the original meter are overwritten as well as metering data etc.</p> <p>In case of meter replacement it may be necessary to reconfigure the link for S-Mode objects by ETS data because data interpretation may have changed due to different data unit/resolution. See also clause 4.3.</p> <p>Each time a metering device is replaced the Property MeterReplacement shall be set automatically in the corresponding Interface Object and the related metering standard Group Objects shall be 'void'. After link adaptation by ETS the MeterReplacement flag shall be reset manually by the installer/service technician (e.g. via the local user interface of the Data Collector or remotely via property write using ETS or another tool).</p>							
<b>DPT:</b>	Name	DPT Bool	DPT ID	1.002	Datatype format		B <sub>1</sub>
Field	Description		Sup.	Range	Unit	Default	
				true/false	bool	false	
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:		161
<b>(in the server)</b>		Start-Index:		1	N° of elements		1
<b>Property access:</b>		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
None.							
<b>Special Features:</b>							
None.							

**5.1.6.44 Parameter MeterReplacementCounter**

<b>FB:</b>	<b>M_HEATM</b>	<b>Property Name (Server):</b>	<b>MeterReplacementCounter</b>	<b>Mandatory</b> <input type="checkbox"/>			
				<b>Optional</b> <input checked="" type="checkbox"/>			
<b>Description:</b>							
<p>This Property shall indicate the number of meter replacements and shall be handled together with the Property MeterReplacement (see above).</p> <p>The counter value shall be incremented automatically each time a connected meter is replaced.</p> <p>The Datapoint is (normally) read only, but may be reset by the installer/technician.</p> <p>The MeterReplacementCounter is useful for additional diagnostic information in the billing process.</p>							
<b>DPT:</b>	Name	DPT Value_1_Ucount	DPT ID	5.010	Datatype format		U <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default	
				0 to 255	None	0	
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1101 (M_HEATM)	Property ID:		162
<b>(in the server)</b>		Start-Index:		1	N° of elements		1
<b>Property access:</b>		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
Free running counter with overflow 255 - > 0.							
<b>Special Features:</b>							
<p>If there is no meter connected to the Interface Object the initial value shall be 0 (ex-factory). After connection of the first meter, the value is incremented and has the value 1. The value shall be stored in non-volatile memory.</p>							

## 5.2 MDC Heat Cost Allocator (M\_HCA)

### 5.2.1 Aims and objectives

The Functional Block MDC ‘Heat Cost Allocator’ shall map M-Bus heat cost allocator data (M-Bus Medium Type = 8) to the KNX system (standard KNX physical media, services and Datapoint Types).

A heat cost allocator provides the measured relative cumulated heat consumption of e.g. a radiator.

### 5.2.2 Functional specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features is supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages), see clause 1.2.

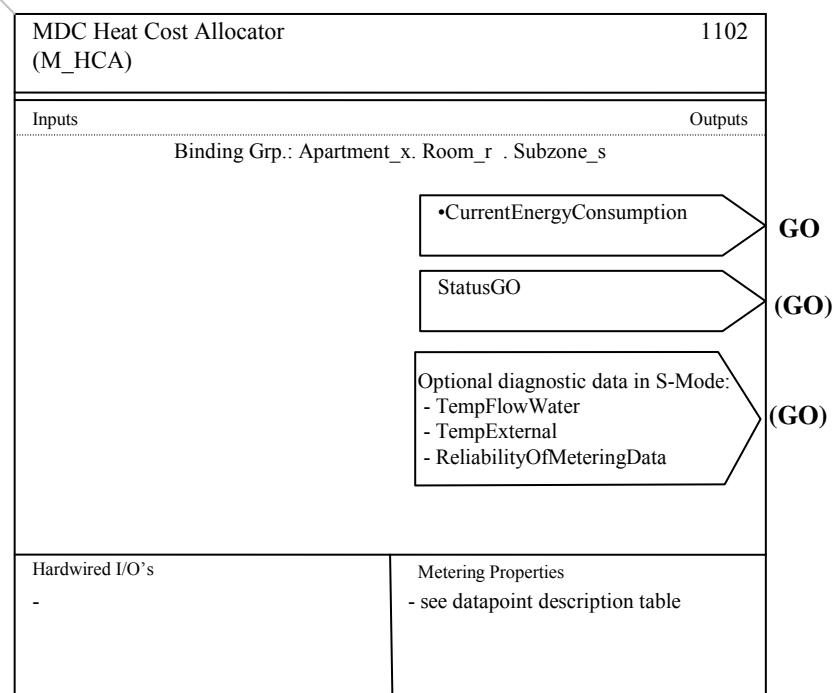
Therefore the complete set of supported Heat Cost Allocator datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

In addition, a subset of metering datapoints may be available also as standard Group Object in Standard Mode for visualization on displays etc. At least the current energy consumption value shall be provided as a Group Object and can be sent on KNX spontaneously. See clause 1.2.

### 5.2.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.2.4 Functional Block diagram



## 5.2.5 Datapoint description

### 5.2.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>Outputs</b>				
CurrentEnergyConsumption	51	Accumulated HCA units. Can be accessed as a Property or can be distributed as a standard Group Object.	<b>Property:</b> DPT_MeteringValue / PDT_GENERIC_6	229.001
			<b>Standard Mode:</b> DPT_Value_4_Count (See NOTE 1.)	13.001
StatusGO		Z <sub>8</sub> information of CurrentEnergyConsumption as a Group Object	<b>Standard Mode only</b> DPT_StatusGen)	21.001
TempFlowWater	70	Flow temperature (radiator temperature)	<b>Standard Mode:</b> DPT_Value_Temp	9.001
TempExternal	71	External temperature (room temperature)	<b>Standard Mode:</b> DPT_Value_Temp	9.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>Inputs</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>Metering Properties</b>				
HistoryStorageNumbers	60	Array of storage numbers for history values.	PDT_UNSIGNED_CHAR[n] n ≥ 8	5.010
HistoryDate	61	Array of date/time information for history values.	DPT_DateTime[n], n ≥ 8 / PDT_DATE_TIME	19.001
HistoryEnergyConsumption	62	Array of energy consumption history values.	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
TempFlowWater	70	Flow temperature (radiator temperature)	DPT_TempHVACAbs_Z / PDT_GENERIC_3	205.100
TempExternal	71	External temperature (room temperature).	DPT_TempHVACAbs_Z / PDT_GENERIC_3	205.100

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This Property shall be used for consistency checking.	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
MeteringDeviceType	115	Metering Device Type. Supported values in M_HCA are: 8: Heat cost allocator 255: void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorConsumption	127	value of energy consumption HCA units at the moment when an error occurred	DPT_MeteringValue / PDT_GENERIC_6	229.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	DPT_Bool / PDT_BINARY_INFORMATION	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>Diagnostic Properties (polling)</b>				
AveragingDuration	129	Measuring time for min/max values	DPT_LongDeltaTimeSec / PDT_LONG	13.100
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n $\geq 128$	5.010
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning.	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus heat meter is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician.	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a meter is replaced. The Datapoint is (normally) read-only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

### M\_HCA Runtime Interworking - Dependency on Configuration Modes

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
<b>Inputs</b>	None.				
<b>Outputs</b>	CurrentEnergyConsumption	GO <sub>b</sub>	GO	GO	O
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA
	TempFlowWater	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	TempExternal	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	ReliabilityOfMeteringData	(GO <sub>b</sub> )	(GO)	(GO)	(O)*

(O)\*: optionally possible/allowed but not specified in this document.

**M\_HCA LTE Zoning Parameters**

		Support
Parameter	Apartment	M*
	Room	M*
	Subzone	M*

\* mandatory in LTE implementations only

**M\_HCA Standard Properties of Interface Objects**

		Support
Parameter / Diagnostic Value	CurrentEnergyConsumption	M
	HistoryStorageNumbers	M
	HistoryDate	M
	HistoryEnergyConsumption	M
	TempFlowWater	O
	TempExternal	O
	RxSequenceCounter	M
	RxReceptionTime	M
	Manufacturer	M
	IdentificationNumber	M
	VersionNumber	M
	MeteringDeviceType	M
	FabricationNumber	C*
	AccessNumber	M
	DeviceStatus	M
	OperatingTime	O
	OnTime	O
	CurrentDate	M
	ErrorDate	M
	ErrorConsumption	O
	ReliabilityOfMeteringData	O
	AveragingDuration	O
	MBusRawData	M
	History Query	O
	UserText	O
	MeterReplacement	M
	MeterReplacementCounter	O

\* conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.



## 5.2.6 Detailed specification of the Datapoints

### 5.2.6.1 Output / diagnostic data CurrentEnergyConsumption

#### Property specification

<b>FB:</b>	<b>M_HCA</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyConsumption</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>	<b>Optional</b> <input type="checkbox"/>
<b>Description:</b>					
Current accumulated HCA units value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit Default
CountVal	counter value		M	full	<sup>1)</sup> cs
ValInfField	<sup>1)</sup> dimensionless HCA counter value		M	6Eh	
Status					bitset
- OutOfService	Value is not available / void		M	true/false	true
- Overridden			NA	false	false
- Fault	metering failure, corrupted value		M	true/false	false
- InAlarm			NA	false	false
- AlarmUnAck			NA	unack	unack
Command	standard Command field				enum
- all commands	not supported, Datapoint shall be read only		NA		
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1102 (M_HCA)	Property ID:	51	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.					

**LTE mode**

<b>FB:</b>	<b>M_HCA</b>	<b>LTE Server Output Name:</b>	<b>CurrentEnergyConsumption</b>				Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>								
Current accumulated HCA units value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.								
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field	Description		Sup.	Range	Unit	COV	Default	
See Property specification above.								
<b>Communication:</b>								
<b>Binding Group:</b>								
Class		Type				Default		
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone				1.1.1 <sup>2)</sup>		
Application Specific <input type="checkbox"/>								
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/>		Configurable <input type="checkbox"/>				
<b>DP Address:</b>		IO Type(ID):		1102 (M_HCA)		Property ID: 51		
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTim		300 s		Heartbeat: 60 min
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input checked="" type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>				
(LTE Read-Response polling of the output shall always be supported)		Tx Prio:		High <input type="checkbox"/>		Normal <input checked="" type="checkbox"/>		Low <input type="checkbox"/>
		Transm after Powerup:		Stored Value <input type="checkbox"/>		Act Value <input type="checkbox"/>		Default Value <input checked="" type="checkbox"/>
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
<b>Exception Handling:</b>						Save at Powerdown <input type="checkbox"/>		
None.								
<b>Special Features:</b>								
<sup>1)</sup> In the M-Bus RF system HCA meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ Value depends on the increment of the HCA meter (according to ValInfField). <sup>2)</sup> If there is only one M_HCA per Room zone, the Subzone number shall be set to the default value 1								

**Group Object (Standard Mode)**

DP Name:	CurrentEnergyConsumption	Abbr.:	---	Mandatory	<input checked="" type="checkbox"/>
FB Name:	M_HCA	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current accumulated HCA units value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 12 Alternative or additional DPTs are possible: see NOTE 1.					
<b>Datapoint Type</b>					
DPT Name:	DPT_Value_4_Count				
DPT Format:	V <sub>32</sub>	DPT ID:	13.001		
Field	Description	Supp.	Range	Unit	Default
	Dimensionless counter value encoded as plain 32 bit signed integer. <sup>1)</sup> Unit, resolution and display format have to be engineered on the receiver of the information according to ValInfField in Property 'CurrentEnergyConsumption'. In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.		full	<sup>1)</sup>	0
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>2)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>2)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		None			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>	
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 0. In case of MeterReplacement = true, the value of CurrentEnergyConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.					
<b>Special Features</b>					
<sup>2)</sup> In the M-Bus RF system HCA meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the heat meter (according to ValInfField).					

### 5.2.6.2 Output StatusGO

#### Standard Mode only

DP Name:	StatusGO	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HCA	Can be internal	<input type="checkbox"/>		
<b>Description</b>					
This Output shall contain the Z <sub>8</sub> status information of CurrentEnergyConsumption as a Group Object.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_StatusGen				
DPT Format:	B <sub>8</sub>	DPT_ID:	21.001		
Field	Description	Supp.	Range	Unit	Default
Status	Z <sub>8</sub> Status information	O	Bitset		
- Bit 0	OutOfService	M		t/f	true
- Bit 1	Fault	M		t/f	false
- Bit 2	Overridden	NA		f	false
- Bit 3	InAlarm	NA		f	false
- Bit 4	AlarmUnAcknowledged	NA		u	unack
- Bits 5 to 7	reserved	NA			
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Delta-Value:	None.
		Cyclic	<input type="checkbox"/>	Period:	--
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value:	<input type="checkbox"/>
	Transmit on bus:		<input checked="" type="checkbox"/>		
<b>Exception Handling</b>					
None.					
<b>Special Features</b>					
None.					

### 5.2.6.3 Diagnostic data HistoryStorageNumbers

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA), see 5.1.6.6.

### 5.2.6.4 Diagnostic data HistoryDate

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA), see 5.1.6.7.

### 5.2.6.5 Diagnostic data HistoryEnergyConsumption

<b>FB:</b> M_HCA	<b>Property Name (Server):</b> HistoryEnergyConsumption		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>			
<b>Description:</b>						
Array of accumulated HCA units consumption information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyConsumption value in the received M-Bus message shall be associated with a storage number. In the M_HCA Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6. The array of history information shall be read-only and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>6</sub> Z <sub>8</sub> [n]
Field	Description		Sup.	Range	Unit	Default
CountVal	measured value		M	full	<sup>1)</sup>	cs
ValInfField	<sup>1)</sup> dimensionless HCA units		M	6Eh		
Status	Value is not available / void		M	true/false	bitset	true
- OutOfService	measurement failure, corrupted value		NA	false		false
- Overridden			M	true/false		false
- Fault			NA	false		false
- InAlarm			NA	unack		unack
- AlarmUnAck						
Command	standard Command field				enum	
- all commands	not supported, Datapoint shall be read only		NA			
<b>Communication:</b>						
<b>DP Address:</b> (in the server)	IO Type(ID):	1102 (M_HCA)	Property ID:	62		
	Start-Index:	1	N° of elements	≥ 8	fixed or variable length	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---		
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>		
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' error' then the history shall be left unchanged.						

### 5.2.6.6 Output / diagnostic data TempFlowWater

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA), see 5.1.6.14.

**5.2.6.7 Output / diagnostic data TempExternal****Property specification**

<b>FB:</b> M_HCA	<b>Property Name (Server):</b> TempExternal		Mandatory <input type="checkbox"/>	
		Optional <input checked="" type="checkbox"/>		
<b>Description:</b>				
Current external temperature (room temperature) value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.				
<b>DPT:</b>	Name	DPT_HVACTempAbs_Z	DPT ID	205.100
		Datatype format		V <sub>16</sub> Z <sub>8</sub>
Field	Description		Sup.	Range
Temp	temperature value		M	Full <sup>1)</sup>
Status				Unit
- OutOfService	Value is not available / void		M	bitset
- Overridden			NA	° C
- Fault	measurement failure, corrupted value		M	° C
- InAlarm			NA	° C
- AlarmUnAck			NA	° C
Command	standard Command field			enum
- all commands	not supported, Datapoint shall be read only		NA	enum
<b>Communication:</b>				
<b>DP Address:</b>	IO Type(ID):	1102 (M_HCA)	Property ID:	71
<b>(in the server)</b>	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>				
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.				
<b>Special Features:</b>				
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.				
<sup>1)</sup> The range of the temperature value is determined by the M-Bus device; the Data Collector shall map the full range.				

**Group Object (Standard Mode)**

DP Name:	TempExternal	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_HCA			Can be internal	<input type="checkbox"/>
<b>Description</b>					
Current external temperature (room temperature) value that is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F <sub>16</sub>	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
			Full	°C	7FFFh
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
Transmit on bus (only for output):			<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system heat cost allocator data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value is company specific.					

**5.2.6.8 LTE Zoning Parameter Apartment**

Same as in M\_HEATM Object except IO Type(ID)=1102 (M\_HCA), see 5.1.6.17.

**5.2.6.9 LTE Zoning Parameter Room**

Same as in M\_HEATM Object except IO Type(ID)=1102 (M\_HCA), see 5.1.6.19.

**5.2.6.10 LTE Zoning Parameter Subzone**

Same as in M\_HEATM Object except IO Type(ID)=1102 (M\_HCA), see 0.

**5.2.6.11 Diagnostic data RxSequenceCounter**

Same as in M\_HEATM Object except IO Type(ID)=1102 (M\_HCA), see 5.1.6.21.

**5.2.6.12 Diagnostic data RxReceptionTime**

Same as in M\_HEATM Object except IO Type(ID)= 1102 (M\_HCA), see 5.1.6.22.

**5.2.6.13 Diagnostic data Manufacturer**

Same as in M\_HEATM Object except IO Type(ID)= 1102 (M\_HCA),  
see 5.1.6.23.

**5.2.6.14 Diagnostic data IdentificationNumber**

Same as in M\_HEATM Object except IO Type(ID)= 1102 (M\_HCA),  
see 5.1.6.24.

**5.2.6.15 Diagnostic data VersionNumber**

Same as in M\_HEATM Object except IO Type(ID)= 1102 (M\_HCA),  
see 5.1.6.25.

**5.2.6.16 Diagnostic data MeteringDeviceType**

<b>FB:</b>	<b>M_HCA</b>	<b>Property Name (Server):</b>	MeteringDeviceType				Mandatory <input checked="" type="checkbox"/>	
							Optional <input type="checkbox"/>	
<b>Description:</b>								
Device Type of the water meter device. Supported values in M_HCA are: 8: Heat cost allocator 255: void device type								
Every meter has a unique M-Bus “address” preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the MeteringDeviceType information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.								
<b>DPT:</b>	Name	DPT_Metering_DeviceType	DPT ID	20.114	Datatype format	N <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
						{8, 255}	enum.	255
<b>Communication:</b>								
<b>DP Address:</b> (in the server)		IO Type(ID):	1102 (M_HCA)		Property ID:	115		
		Start-Index:	1		N° of elements	1		
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
<b>Protection</b>		Read level	---		Write level	---		
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>			
None.								
<b>Special Features:</b>								
Device type ‘255’ = void (default value); used to indicate that the FB is not connected to a meter.								

**5.2.6.17 Diagnostic data FabricationNumber**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA),  
see 5.1.6.27.

**5.2.6.18 Diagnostic data AccessNumber**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA),  
see 5.1.6.28.

**5.2.6.19 Diagnostic data DeviceStatus**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA),  
see 5.1.6.29.

**5.2.6.20 Diagnostic data OperatingTime**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA),  
see 5.1.6.30.



**5.2.6.21 Diagnostic data OnTime**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA), see 5.1.6.31.

**5.2.6.22 Diagnostic data CurrentDate**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA), see 5.1.6.32.

**5.2.6.23 Diagnostic data ErrorDate**

Same as in M\_HEATM Object except IO Type(ID) = 1102 (M\_HCA), see 5.1.6.37.

**5.2.6.24 Diagnostic data ErrorConsumption**

<b>FB:</b> M_HCA		<b>Property Name (Server):</b>		<b>ErrorConsumption</b>		Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>		
<b>Description:</b>								
Value of CurrentEnergyConsumption datapoint at the moment when an error occurred in the heat cost allocator. The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling. This information is related to datapoint ErrorDate.								
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
ValInfField		<sup>1)</sup> dimensionless HCA units			M	6Eh		
Status		Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true false false false unack
• OutOfService					NA	false		
• Overridden					M	true/false		
• Fault					NA	false		
• InAlarm					NA	unack		
• AlarmUnAck								
Command		standard Command field			NA		enum	
• all commands		not supported, Datapoint shall be read only						
<b>Communication:</b>								
<b>DP Address:</b> (in the server)		IO Type(ID):	1102 (M_HCA)	Property ID:	127			
		Start-Index:	1	N° of elements	1			
<b>Property access:</b>		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
<b>Protection</b>		Read level	---	Write level	---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
<b>Special Features:</b>								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be accepted by the Data Collector. This is the last reliable and valid consumption value from the metering device.								

**5.2.6.25 Diagnostic data ReliabilityOfMeteringData**

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA), see 5.1.6.17.

**5.2.6.26 Diagnostic data AveragingDuration**

Same as in M\_HEATM Object except IO Type (ID)=1102 (M\_HCA), see 5.1.6.39.

**5.2.6.27 Diagnostic data MBusRawData**

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA),  
see 5.1.6.40.

**5.2.6.28 Function Property History Query**

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA),  
see 5.1.6.41.

**5.2.6.29 Parameter UserText**

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA),  
see 5.1.6.42.

**5.2.6.30 Parameter MeterReplacement**

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA),  
see 5.1.6.43.

**5.2.6.31 Parameter MeterReplacementCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1102 (M\_HCA),  
see 5.1.6.44.

## 5.3 MDC Water Meter (M\_WATERM)

### 5.3.1 Aims and objectives

The Functional Block MDC ‘Water Meter’ shall map M-Bus water meter data (M-Bus Medium Type = 6, 7 and 40) to the KNX system (standard KNX physical media, services and Datapoint Types).

The Functional Block covers measurement of cold and warm water volume.

### 5.3.2 Functional specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features is supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages) see clause 1.2.

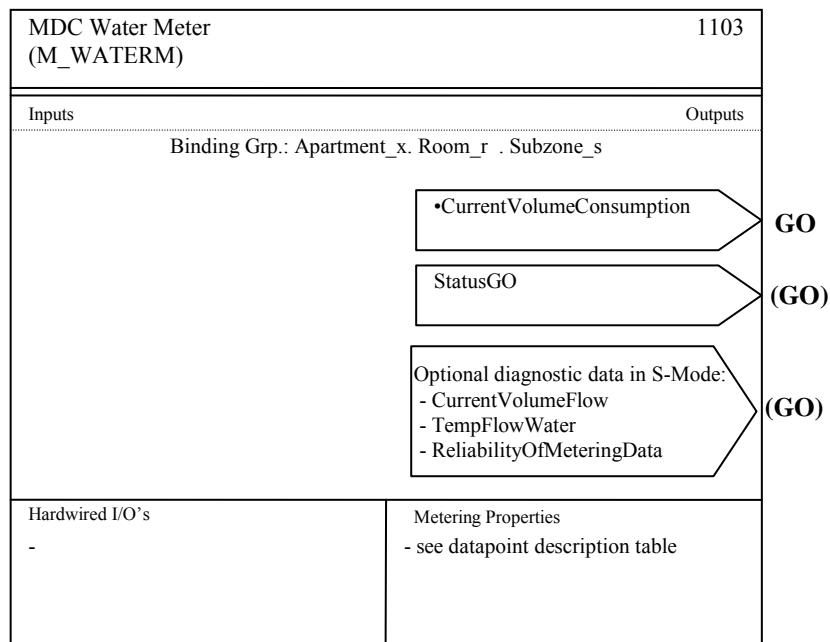
Therefore the complete set of supported Water Meter datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

In addition a subset of metering datapoints may be available also as standard Group Object in Standard Mode for visualization on displays etc. At least the current volume consumption shall be provided as a Group Object and can be sent on KNX spontaneously. See clause 1.2.

### 5.3.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.3.4 Functional Block diagram



### 5.3.5 Datapoint description

#### 5.3.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs</b>				
CurrentVolumeConsumption	51	Accumulated water volume. Can be accessed as a property or can be distributed as a standard Group Object	<b>Property:</b> DPT_MeteringValue / PDT_GENERIC_6	229.001
			<b>Standard Mode:</b> DPT_Value_4_Count	13.001
StatusGO		Z <sub>8</sub> information of CurrentVolumeConsumption as a Group Object	<b>Standard Mode only</b> DPT_StatusGen,	21.001
CurrentVolumeFlow	53	Current measured volume flow	<b>Standard Mode:</b> DPT_Value_Volume_Flow	9.025
TempFlowWater	70	Current flow temperature	<b>Standard Mode:</b> DPT_Value_Temp	9.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Inputs</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties</b>				
CurrentVolumeFlow	53	Current measured volume flow	DPT_MeteringValue / PDT_GENERIC_6	229.001
HistoryStorageNumbers	60	Array of storage numbers for history values	PDT_UNSIGNED_CHAR[n] n ≥ 8	5.010
HistoryDate	61	Array of date/time information for history values	DPT_DateTime[n], n ≥ 8 / PDT_DATE_TIME	19.001
HistoryVolumeConsumption	62	Array of volume consumption history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryVolumeMaxFlow	64	Array of Max Volume Flow history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryVolumeMinFlow	65	Array of Min Volume Flow history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
TempFlowWater	70	Current Flow temperature	DPT_TempHVACAbs_Z / PDT_GENERIC_3	205.100

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This property is used for consistency checking	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
MeteringDeviceType	115	Metering Device Type. Supported values in M_WATERM are: 6: Warm Water volume (30°C to 90°C) 7: Water volume 40: waste water meter 255: void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorConsumption	127	value of volume consumption at the moment when an error occurred	DPT_MeteringValue / PDT_GENERIC_6	229.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	DPT_Bool / PDT_BINARY_INFORMATION	1.002
AveragingDuration	129	Measuring time for current min/max value generation (integration time)	DPT_LongDeltaTimeSec / PDT_LONG	13.100
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n $\geq 128$	5.010
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus heat meter is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a meter is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

**M\_WATERM Runtime Interworking - Dependency on Configuration Modes**

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentVolumeConsumption	GO <sub>b</sub>	GO	GO	O
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA
	CurrentVolumeFlow	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	TempFlowWater	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	ReliabilityOfMeteringData	(GO <sub>b</sub> )	(GO)	(GO)	(O)*

(O)\*: optionally possible/allowed but not specified in this document

**M\_WATERM LTE Zoning Parameters**

		Support
<b>Parameter</b>	Apartment	<b>M*</b>
	Room	<b>M*</b>
	Subzone	<b>M*</b>

\* mandatory in LTE implementations only

**M\_WATERM Standard Properties of Interface Objects**

Parameter / Diagnostic Value	Support
CurrentVolumeConsumption	<b>M</b>
CurrentVolumeFlow	<b>O</b>
HistoryStorageNumbers	<b>M</b>
HistoryDate	<b>M</b>
HistoryVolumeConsumption	<b>M</b>
HistoryMaxVolumeFlow	<b>O</b>
HistoryMinVolumeFlow	<b>O</b>
TempFlowWater	<b>O</b>
RxSequenceCounter	<b>M</b>
RxReceptionTime	<b>M</b>
Manufacturer	<b>M</b>
IdentificationNumber	<b>M</b>
VersionNumber	<b>M</b>
MeteringDeviceType	<b>M</b>
FabricationNumber	<b>C*</b>
AccessNumber	<b>M</b>
DeviceStatus	<b>M</b>
OperatingTime	<b>O</b>
OnTime	<b>O</b>
CurrentDate	<b>M</b>
ErrorDate	<b>M</b>
ErrorConsumption	<b>O</b>
ReliabilityOfMeteringData	<b>O</b>
AveragingDuration	<b>O</b>
MBusRawData	<b>M</b>
History Query	<b>O</b>
UserText	<b>O</b>
MeterReplacement	<b>M</b>
MeterReplacementCounter	<b>O</b>

\* conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.



### 5.3.6 Detailed specification of the Datapoints

#### 5.3.6.1 Output / diagnostic data CurrentVolumeConsumption

##### Property specification

<b>FB:</b>	<b>M_WATERM</b>	<b>Property Name (Server):</b>	<b>CurrentVolumeConsumption</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>	<b>Optional</b> <input type="checkbox"/>
<b>Description:</b>					
Current accumulated water volume value (m <sup>3</sup> ) that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit
CountVal	counter value		M	full	<sup>1)</sup>
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the counter value		M	40h to 47h	
Status	Value is not available / void		M	true/false	bitset
• OutOfService			NA	false	true
• Overridden			M	true/false	false
• Fault	metering failure, corrupted value		NA	false	false
• InAlarm			NA	unack	unack
• AlarmUnAck					
Command	standard Command field		NA		enum
• all commands	not supported, Datapoint shall be read only				
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1103 (M_WATERM)	Property ID:	51	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.					

**LTE mode**

<b>FB:</b>	<b>M_WATERM</b>	<b>LTE Server Output Name:</b>	<b>CurrentVolumeConsumption</b>	Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>					
Current accumulated water volume value (m <sup>3</sup> ) that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format
Field	Description		Sup.	Range	Unit
See Property specification above.			COV	Default	
<b>Communication:</b>					
<b>Binding Group:</b>					
Class		Type		Default	
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone		1.1.1 <sup>2)</sup>	
Application Specific <input type="checkbox"/>					
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>			
<b>DP Address:</b>		IO Type(ID): 1103 (M_WATERM)		Property ID: 51	
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTime: 300 sec Heartbeat: 60 min	
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input checked="" type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>	
(LTE Read-Response polling of the output shall always be supported)		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>			
		Transm after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>			
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/> Read/Write <input type="checkbox"/>			
<b>Exception Handling:</b>				Save at Powerdown <input type="checkbox"/>	
None.					
<b>Special Features:</b>					
<sup>1)</sup> In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful $\Delta$ Value depends on the increment of the heat meter (according to ValInfField). <sup>2)</sup> If there is only one M_WATERM per Apartment zone, the Room number and Subzone number shall be set to the default value 1.1.					

**Group Object (Standard Mode)**

<b>DP Name:</b>	CurrentVolumeConsumption	<b>Abbr.:</b>	---			<b>Mandatory</b>	<input checked="" type="checkbox"/>
<b>FB Name:</b>	M_WATERM	<b>Can be internal</b>					<input type="checkbox"/>
<b>Description</b>							
Current accumulated water volume value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.							
NOTE 13 Alternative or additional DPTs are possible: see NOTE 1.							
<b>Datapoint Type</b>							
<b>DPT Name:</b>	DPT_Value_4_Count						
<b>DPT Format:</b>	V <sub>32</sub>	<b>DPT ID:</b>	13.001				
<b>Field</b>	<b>Description</b>	<b>Supp.</b>	<b>Range</b>	<b>Unit</b>	<b>Default</b>		
	Counter value encoded as plain 32 bit signed integer. 1) unit, resolution and display format have to be engineered on the receiver of the information according to VallnField in Property 'CurrentVolumeConsumption' In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.	M	full	1)	0		
<b>Access Type</b>							
◆ <b>Output</b>							
this → M		<input checked="" type="checkbox"/>	this → 1		<input type="checkbox"/>		
Spontaneous		<input checked="" type="checkbox"/>	COV: 1)	<input checked="" type="checkbox"/>	Δ-Value: cs 1)	Min repetition period:	5 min
Cyclic		<input type="checkbox"/>	Period:				
Request		<input checked="" type="checkbox"/>					
<b>Communication Type</b>							
◆ <b>Group Object Datapoint</b>						<b>Mandatory:</b>	<input checked="" type="checkbox"/>
<b>Default Group Address:</b>		---					
<b>Dynamics</b>							
Power down:		Save:	<input type="checkbox"/>				
Power up:		Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>	
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>		
Transmit on bus (only for output):			<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>		
<b>Exception Handling</b>							
Void values or faulty values shall be indicated with the default value 0. In case of MeterReplacement = true, the value of CurrentVolumeConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.							
<b>Special Features</b>							
1) In the M-Bus RF system heat meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the water meter (according to VallnField).							

### 5.3.6.2 Output StatusGO

#### Standard Mode only

<b>DP Name:</b>	StatusGO	<b>Abbr.:</b>	---	<b>Mandatory</b>	<input type="checkbox"/>
<b>FB Name:</b>	M_WATERM	<b>Can be internal</b>			<input type="checkbox"/>
<b>Description</b>					
This Output shall contain the Z <sub>8</sub> status information of CurrentVolumeConsumption as a Group Object.					
<b>Datapoint Type</b>					
<b>DPT_Name:</b>	DPT_StatusGen				
<b>DPT Format:</b>	B <sub>8</sub>	<b>DPT_ID:</b>	21.001		
<b>Field</b>	<b>Description</b>	<b>Supp.</b>	<b>Range</b>	<b>Unit</b>	<b>Default</b>
Status	Z <sub>8</sub> Status information	O	Bitset		
• Bit 0	OutOfService	M		t/f	true
• Bit 1	Fault	M		t/f	false
• Bit 2	Overridden	NA		f	false
• Bit 3	InAlarm	NA		f	false
• Bit 4	AlarmUnAcknowledged	NA		u	unack
• Bits 5 to 7	reserved	NA			
<b>Access Type</b>					
♦ Output					
this → M		<input checked="" type="checkbox"/>	this → 1		<input type="checkbox"/>
Spontaneous		<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Delta-Value: None. MinRepTime: 5 min
Request		<input checked="" type="checkbox"/>	Cyclic	<input type="checkbox"/>	Period: ---
<b>Communication Type</b>					
♦ Group Object Datapoint				<b>Mandatory:</b>	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value:	<input type="checkbox"/>
	Transmit on bus:		<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Exception Handling</b>					
None.					
<b>Special Features</b>					
None.					

### 5.3.6.3 Output / diagnostic data CurrentVolumeFlow

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.4.

### 5.3.6.4 Diagnostic data HistoryStorageNumbers

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.6.

### 5.3.6.5 Diagnostic data HistoryDate

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.7.

### 5.3.6.6 Diagnostic data HistoryVolumeConsumption

FB: M_WATERM		Property Name (Server): HistoryVolumeConsumption		Mandatory <input checked="" type="checkbox"/>		
				Optional <input type="checkbox"/>		
Description:						
Array of accumulated volume consumption information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryVolumeConsumption value in the received M-Bus message shall be associated with a storage number. In the M_WATERM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6. The array of history information shall be read-only and shall be accessible by polling.						
DPT:	Name	DPT MeteringValue	DPT ID	229.001	Datatype format V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]	
Field	Description		Sup.	Range	Unit	Default
CountVal	measured value		M	full	1)	cs
VallnField	1) Encoding of unit and resolution of the measured value		M	40h to 47h		
Status					bitset	
- OutOfService	Value is not available / void		M	true/false		true
- Overridden			NA	false		false
- Fault	measurement failure, corrupted value		M	true/false		false
- InAlarm			NA	false		false
- AlarmUnAck			NA	unack		unack
Command	standard Command field				enum	
• All commands	not supported, Datapoint shall be read only		NA			
Communication:						
DP Address: (in the server)		IO Type(ID):	1103 (M_WATERM)	Property ID:	62	
		Start-Index:	1	N° of elements	≥ 8	
					fixed or variable length	
Property access:		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
Protection		Read level	---	Write level	---	
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
Special Features:						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.						

### 5.3.6.7 Diagnostic data HistoryVolumeMaxFlow

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.10.

### 5.3.6.8 Diagnostic data HistoryVolumeMinFlow

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.11.

### 5.3.6.9 Output / diagnostic data TempFlowWater

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.14.

**5.3.6.10 LTE Zoning Parameter Apartment**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.17.

**5.3.6.11 LTE Zoning Parameter Room**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.19.

**5.3.6.12 LTE Zoning Parameter Subzone**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.20.

**5.3.6.13 Diagnostic data RxSequenceCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.21.

**5.3.6.14 Diagnostic data RxReceptionTime**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.22.

**5.3.6.15 Diagnostic data Manufacturer**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.23.

**5.3.6.16 Diagnostic data IdentificationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.24.

**5.3.6.17 Diagnostic data VersionNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.25.

**5.3.6.18 Diagnostic data MeteringDeviceType**

FB:	M_WATERM	Property Name (Server):	MeteringDeviceType	Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>			
Description:							
Device Type of the water meter device. Supported values in M_WATERM are: 6: Warm Water volume (30°C to 90°C) 7: Water volume 40: waste water meter 255: void device type Every meter has a unique M-Bus “address” preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the MeteringDeviceType information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.							
DPT:	Name	DPT_Metering_DeviceType	DPT ID	20.114	Datatype format	N <sub>8</sub>	
Field		Description			Sup.	Range	Unit
						{6, 7, 255}	enum.
Communication:							
DP Address: (in the server)		IO Type(ID):	1103 (M_WATERM)	Property ID:	115		
		Start-Index:	1	N° of elements	1		
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>		
Protection		Read level	---	Write level	---		
Exception Handling:		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>		
None.							
Special Features:							
Device type ‘255’ = void (default value) ; used to indicate that the FB is not connected to a meter.							

**5.3.6.19 Diagnostic data FabricationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.27.

**5.3.6.20 Diagnostic data AccessNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.28.

**5.3.6.21 Diagnostic data DeviceStatus**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.29.

**5.3.6.22 Diagnostic data OperatingTime**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.30.

**5.3.6.23 Diagnostic data OnTime**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.31.

**5.3.6.24 Diagnostic data CurrentDate**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.32.

**5.3.6.25 Diagnostic data ErrorDate**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.37.

**5.3.6.26 Diagnostic data ErrorConsumption**

FB:	M_WATERM	Property Name (Server):	ErrorConsumption	Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>				
Description:								
Value of CurrentVolumeConsumption datapoint at the moment when an error occurred in the water meter. The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling. This information is related to datapoint ErrorDate.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	40h to 47h		
Status – OutOfService – Overridden – Fault – InAlarm – AlarmUnAck		Value is not available / void  measurement failure, corrupted value			M NA M NA NA	true/false False true/false False Unack	bitset	true false false false unack
Command – all commands		standard Command field not supported, Datapoint shall be read only			NA		enum	
Communication:								
DP Address: (in the server)		IO Type(ID):	1103 (M_WATERM)	Property ID:	127			
		Start-Index:	1	N° of elements	1			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be accepted by the Data Collector. This is the last reliable and valid consumption value from the metering device.								

**5.3.6.27 Diagnostic data ReliabilityOfMeteringData**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.17.

**5.3.6.28 Diagnostic data AveragingDuration**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.39.

**5.3.6.29 Diagnostic data MBusRawData**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM),  
see 5.1.6.40.



**5.3.6.30 Function Property History Query**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.41.

**5.3.6.31 Parameter UserText**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.42.

**5.3.6.32 Parameter MeterReplacement**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.43.

**5.3.6.33 Parameter MeterReplacementCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1103 (M\_WATERM), see 5.1.6.44.

## 5.4 MDC Generic Meter (M\_GENERICM)

### 5.4.1 Aims and objectives

The already defined FBs M\_HEATM, M\_HCA and M\_WATERM do not cover electricity, gas, oil and steam metering media types. The Functional Block MDC 'Generic Meter' is an extension of the current Metering Data Collector FBs to fill this gap as an intermediate solution.

M\_GENERICM cannot be used if a dedicated meter type is already standardised. Usage of M\_GENERICM is therefore currently restricted to M-Bus Medium Types:

- 00: Other device type
- 01: Oil meter
- 02: Electricity meter
- 03: Gas meter
- 05: Steam meter
- 41: Garbage

One Property MeteringDeviceType of M\_GENERICM holds the type of meter.

Specific FBs for some of these Medium Types could be defined in the future and the usage of M\_GENERICM would then be more restricted.

FB M\_GENERICM covers only basic functions of electricity, gas meters etc. Sophisticated tariff schemes of e.g. complex electricity meters are not supported.

Currently there are not many electricity meter implementations on the basis of M-Bus available. Therefore mapping definitions of M-Bus electricity meter data might probably be a quite academic work. However FB M\_GENERICM may be used to implement a KNX interface to an electricity meter via a S0 impulse output or other.

### 5.4.2 Functional specification

Metering Medium Type shall be encoded in the Property MeteringDeviceType.

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features is supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages) see clause 1.2.

Therefore the complete set of supported meter datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

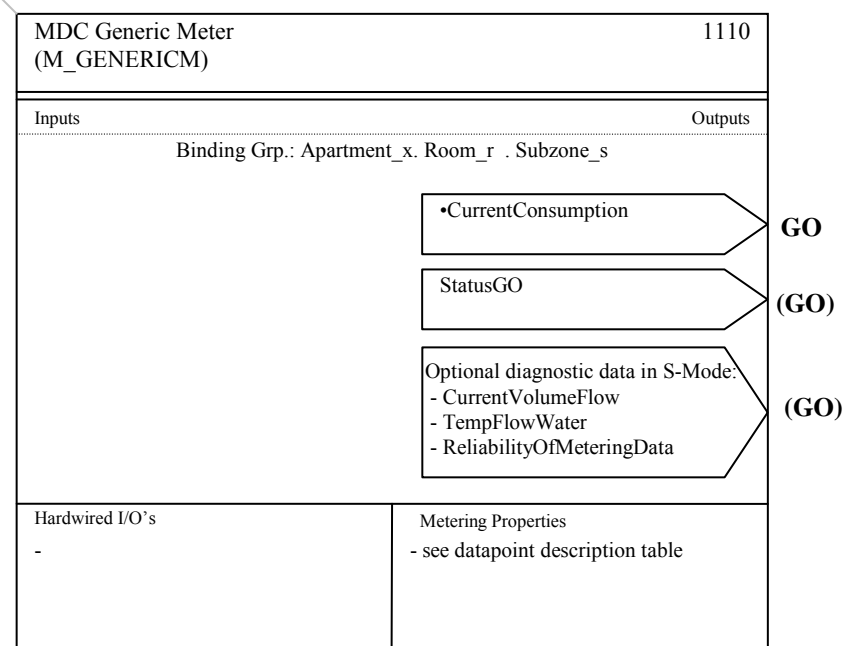
In addition a subset of metering data may be available also as standard Group Object in Standard Mode for visualization on displays etc. At least the current consumption value shall be provided spontaneously as a Group Object and can be sent on KNX spontaneously. See clause 1.2.

If M\_GENERICM is implemented in an interface for meters with a pulse output, the functionality of the FB exceeds pure mapping of metering data. In this case M\_GENERICM shall calculate metering data out of metering impulses and emulate the behaviour of M-Bus Meter. However this is a local, product specific, not standardised functionality of the FB.

### 5.4.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.4.4 Functional Block diagram



### 5.4.5 Datapoint description

#### 5.4.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs</b>				
CurrentConsumption	51	Accumulated metering value. Type of value to be interpreted according to ValInfField and MeteringDeviceType Property.  Data can be accessed as a Property or can be distributed as a standard Group Object	<b>Property:</b> DPT_MeteringValue / PDT_GENERIC_6 <hr/> <b>Standard Mode:</b> DPT_Value_4_Count	229.001 <hr/> 13.001
StatusGO		Z <sub>8</sub> information of CurrentVolumeConsumption as a Group Object.	<b>Standard Mode:</b> DPT_StatusGen	21.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Inputs</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties</b>				
HistoryStorageNumbers	60	Array of storage numbers for history values	PDT_UNSIGNED_CHAR[n] n ≥ 8	5.010
HistoryDate	61	Array of date/time information for history values	DPT_DateTime[n], n ≥ 8 / PDT_DATE_TIME	19.001
HistoryConsumption	62	Array of volume consumption history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This property is used for consistency checking	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
MeteringDeviceType	115	Metering Device Type. Supported values in M_GENERICM are: 0: Other device type 1: Oil meter 2: Electricity meter 3: Gas meter 5: Steam meter 41: Garbage 255: void device type	DPT_Metering_DeviceType PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorConsumption	127	value of volume consumption at the moment when an error occurred	DPT_MeteringValue / PDT_GENERIC_6	229.001
ReliabilityOfMeteringData		Indicates whether metering data are up-to-date or outdated.	DPT_Bool / PDT_BINARY_INFORMATION	1.002
AveragingDuration	129	Measuring time for current min/max value generation (integration time)	DPT_LongDeltaTimeSec / PDT_LONG	13.100
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] $n \geq 128$	5.010
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus heat meter is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a meter is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

**M\_GENERICM Runtime Interworking - Dependency on Configuration Modes**

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentConsumption	GO <sub>b</sub>	GO	GO	O
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA
	ReliabilityOfMeteringData	(GO <sub>b</sub> )	(GO)	(GO)	(O)*

(O)\*: optionally possible/allowed but not specified in this document

**M\_GENERICM LTE Zoning Parameters**

		Support
<b>Parameter</b>	Apartment	<b>M*</b>
	Room	<b>M*</b>
	Subzone	<b>M*</b>

\* mandatory in LTE implementations only

**M\_GENERICM Standard Properties of Interface Objects**

Parameter / Diagnostic Value	Support
CurrentConsumption	<b>M</b>
HistoryStorageNumbers	<b>M</b>
HistoryDate	<b>M</b>
HistoryConsumption	<b>M</b>
RxSequenceCounter	<b>M</b>
RxReceptionTime	<b>M</b>
Manufacturer	<b>M</b>
IdentificationNumber	<b>M</b>
VersionNumber	<b>M</b>
MeteringDeviceType	<b>M</b>
FabricationNumber	<b>C*</b>
AccessNumber	<b>M</b>
DeviceStatus	<b>M</b>
OperatingTime	<b>O</b>
OnTime	<b>O</b>
CurrentDate	<b>M</b>
ErrorDate	<b>M</b>
ErrorConsumption	<b>O</b>
ReliabilityOfMeteringData	<b>O</b>
AveragingDuration	<b>O</b>
MBusRawData	<b>M</b>
History Query	<b>O</b>
UserText	<b>O</b>
MeterReplacement	<b>M</b>
MeterReplacementCounter	<b>O</b>

\* conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.

## 5.4.6 Detailed specification of the Datapoints

### 5.4.6.1 Output / diagnostic data CurrentConsumption

#### Property specification

<b>FB:</b> M_GENERICM	<b>Property Name (Server):</b> CurrentConsumption		Mandatory <input checked="" type="checkbox"/>		Optional <input type="checkbox"/>	
<b>Description:</b>						
Current accumulated metering value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
CountVal	counter value		M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the counter value		M	according to Metering Medium		
Status	Value is not available / void		M	true/false	bitset	true
• OutOfService			NA	false		false
• Overridden	metering failure, corrupted value		M	true/false		false
• Fault			NA	false		false
• InAlarm			NA	unack		unack
• AlarmUnAck						
Command	standard Command field				enum	
• all commands	not supported, Datapoint shall be read only		NA			
<b>Communication:</b>						
<b>DP Address:</b>	IO Type(ID): 1110 (M_GENERICM)		Property ID: 51			
<b>(in the server)</b>	Start-Index: 1		N° of elements: 1			
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>	Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.						



**LTE mode**

<b>FB:</b>	<b>M_GENERICM</b>	<b>LTE Server Output Name:</b>	<b>CurrentConsumption</b>	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Current accumulated metering value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.							
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>	
Field	Description		Sup.	Range	Unit	COV	Default
See Property specification above.							
<b>Communication:</b>							
<b>Binding Group:</b>							
Class		Type			Default		
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone			1.1.1 <sup>2)</sup>		
Application Specific <input type="checkbox"/>							
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/>		Configurable <input type="checkbox"/>			
<b>DP Address:</b>		IO Type(ID):		1110 (M_GENERICM)	Property ID:		51
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTim	300 sec	Heartbeat:	60 min
InfoReport <input checked="" type="checkbox"/>		Output per default communicating		<input checked="" type="checkbox"/> Binding Group Wildcard allowed		<input type="checkbox"/>	
(LTE Read-Response polling of the output shall always be supported)		Tx Prio:		High <input type="checkbox"/>	Normal <input checked="" type="checkbox"/>	Low <input type="checkbox"/>	
		Transm after Powerup:		Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Exception Handling:</b>						Save at Powerdown <input type="checkbox"/>	
None.							
<b>Special Features:</b>							
<sup>1)</sup> In the M-Bus RF system meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful $\Delta$ Value depends on the increment of the meter (according to ValInfField). <sup>2)</sup> If there is only one M_GENERICM per Apartment zone, the Room number and Subzone number shall be set to the default value 1.1.							

**Group Object (Standard Mode)**

<b>DP Name:</b>	CurrentConsumption	<b>Abbr.:</b>	---	<b>Mandatory</b>	<input checked="" type="checkbox"/>
<b>FB Name:</b>	M_GENERICM	<b>Can be internal</b>	<input type="checkbox"/>		
<b>Description</b>					
Current accumulated metering value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 14 Alternative or additional DPTs are possible: see NOTE 1.					
<b>Datapoint Type</b>					
<b>DPT Name:</b>	DPT_Value_4_Count				
<b>DPT Format:</b>	V <sub>32</sub>	<b>DPT ID:</b>	13.001		
<b>Field</b>	<b>Description</b>	<b>Supp.</b>	<b>Range</b>	<b>Unit</b>	<b>Default</b>
	Counter value encoded as plain 32 bit signed integer. <sup>1)</sup> unit, resolution and display format have to be engineered on the receiver of the information according to VallnField in Property 'CurrentConsumption' In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.	M	full	<sup>1)</sup>	0
<b>Access Type</b>					
◆ <b>Output</b>					
<input type="checkbox"/>	this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>	
<input type="checkbox"/>	Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup> Min repetition period: 5 min
<input type="checkbox"/>	Cyclic	<input type="checkbox"/>	Period:		
<input type="checkbox"/>	Request	<input checked="" type="checkbox"/>			
<b>Communication Type</b>					
◆ <b>Group Object Datapoint</b>					<b>Mandatory:</b> <input checked="" type="checkbox"/>
<b>Default Group Address:</b>		---			
<b>Dynamics</b>					
<input type="checkbox"/>	Power down:	Save:	<input type="checkbox"/>		
<input type="checkbox"/>	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):			<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 0.					
In case of MeterReplacement = true, the value of CurrentConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the meter (according to VallnField).					

### 5.4.6.2 Output StatusGO

#### Standard Mode only

<b>DP Name:</b>	StatusGO	<b>Abbr.:</b>	---	<b>Mandatory</b>	<input type="checkbox"/>
<b>FB Name:</b>	M_GENERICM	<b>Can be internal</b>	<input type="checkbox"/>		
<b>Description</b>					
This Output shall contain the Z <sub>8</sub> status information of CurrentConsumption as a Group Object.					
<b>Datapoint Type</b>					
<b>DPT_Name:</b>	DPT_StatusGen				
<b>DPT Format:</b>	B <sub>8</sub>	<b>DPT_ID:</b>	21.001		
<b>Field</b>	<b>Description</b>	<b>Supp.</b>	<b>Range</b>	<b>Unit</b>	<b>Default</b>
Status	Z <sub>8</sub> Status information	O	Bitset		
• Bit 0	OutOfService	M		t/f	true
• Bit 1	Fault	M		t/f	false
• Bit 2	Overridden	NA		f	false
• Bit 3	InAlarm	NA		f	false
• Bit 4	AlarmUnAcknowledged	NA		u	unack
• Bits 5 to 7	reserved	NA			
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Delta-Value:	None.
		Cyclic	<input type="checkbox"/>	Period:	---
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value:	<input type="checkbox"/>
	Transmit on bus:		<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Exception Handling</b>					
None.					
<b>Special Features</b>					
None.					

### 5.4.6.3 Diagnostic data HistoryStorageNumbers

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.6.

### 5.4.6.4 Diagnostic data HistoryDate

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.7.

### 5.4.6.5 Diagnostic data HistoryConsumption

FB: M_GENERICM		Property Name (Server): HistoryConsumption		Mandatory <input checked="" type="checkbox"/>		Optional <input type="checkbox"/>		
Description:								
Array of accumulated consumption information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryConsumption value in the received M-Bus message shall be associated with a storage number. In the M_GENERICM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8 and Property HistoryStorageNumbers in clause 5.1.6.6. The array of history information shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	1)	cs
VallnfField		1) Encoding of unit and resolution of the measured value			M	according to Metering Medium		
Status							bitset	
- OutOfService		Value is not available / void			M	true/false		true
- Overridden					NA	false		false
- Fault		measurement failure, corrupted value			M	true/false		false
- InAlarm					NA	false		false
- AlarmUnAck					NA	unack		unack
Command		standard Command field					enum	
• All commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address: (in the server)		IO Type(ID): 1110(M_GENERICM)		Property ID: 62				
		Start-Index: 1		N° of elements		≥ 8 fixed or variable length		
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
Protection		Read level		---		Write level ---		
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.								

### 5.4.6.6 LTE Zoning Parameter Apartment

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.17.

### 5.4.6.7 LTE Zoning Parameter Room

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.19.

### 5.4.6.8 LTE Zoning Parameter Subzone

Same as in M\_HEATM Object except IO Type(ID)=1110 (M\_GENERICM), see 5.1.6.20.

**5.4.6.9 Diagnostic data RxSequenceCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.21.

**5.4.6.10 Diagnostic data RxReceptionTime**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.22.

**5.4.6.11 Diagnostic data Manufacturer**

Same as in M\_HEATM Object except IO Type (ID) = 11110 (M\_GENERICM),  
see 5.1.6.23.

**5.4.6.12 Diagnostic data IdentificationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.24.

**5.4.6.13 Diagnostic data VersionNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.25.

**5.4.6.14 Diagnostic data MeteringDeviceType**

FB:	M_GENERICM	Property Name (Server):	MeteringDeviceType	Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>				
<b>Description:</b>								
Metering Device Type of the meter device. Supported values in M_GENERICM are: 0: Other Medium 1: Oil 2: Electricity 3: Gas volume 5: Steam 255: void device type Every meter has a unique M-Bus “address” preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the MeteringDeviceType information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.								
DPT:	Name	DPT_Metering_DeviceType	DPT ID	20.114	Datatype format	N <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
						{0,1,2,3,5,255}	enum.	255
<b>Communication:</b>								
DP Address: (in the server)		IO Type(ID):	1110 (M_GENERICM)	Property ID:	115			
		Start-Index:	1	N° of elements	1			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling:		Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value	<input type="checkbox"/>
None.								
<b>Special Features:</b>								
Device type ‘255’ = void (default value) ; used to indicate that the FB is not connected to a meter.								

**5.4.6.15 Diagnostic data FabricationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.27.

**5.4.6.16 Diagnostic data AccessNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.28.

**5.4.6.17 Diagnostic data DeviceStatus**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.29.

**5.4.6.18 Diagnostic data OperatingTime**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.30.

**5.4.6.19 Diagnostic data OnTime**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.31.

**5.4.6.20 Diagnostic data CurrentDate**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.32.

**5.4.6.21 Diagnostic data ErrorDate**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.37.

**5.4.6.22 Diagnostic data ErrorConsumption**

FB: M_GENERIC		Property Name (Server):		ErrorConsumption		Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>		
Description:								
Value of CurrentConsumption datapoint at the moment when an error occurred in the meter. The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling. This information is related to datapoint ErrorDate.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnfField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 7Fh		
Status		Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true false false false unack
– OutOfService					NA	false		
– Overridden					M	true/false		
– Fault					NA	false		
– InAlarm					NA	Unack		
– AlarmUnAck								
Command		standard Command field			NA		enum	
– all commands		not supported, Datapoint shall be read only						
Communication:								
DP Address: (in the server)		IO Type(ID):	1110 (M_GENERICM	Property ID:	127			
		Start-Index:	1	N° of elements	1			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be accepted by the Data Collector. This is the last reliable and valid consumption value from the metering device.								

**5.4.6.23 Diagnostic data ReliabilityOfMeteringData**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.17.

**5.4.6.24 Diagnostic data AveragingDuration**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.39.

**5.4.6.25 Diagnostic data MBusRawData**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.40.

**5.4.6.26 Function Property History Query**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM),  
see 5.1.6.41.

**5.4.6.27 Parameter UserText**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.42.

**5.4.6.28 Parameter MeterReplacement**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.43.

**5.4.6.29 Parameter MeterReplacementCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1110 (M\_GENERICM), see 5.1.6.44.



## 5.5 MDC Gas Meter (M\_GASM)

### 5.5.1 Aims and objectives

The Functional Block MDC ‘Gas Meter’ shall map M-Bus gas meter data (M-Bus Device Type = 3) to the KNX system (standard KNX physical media, services and Datapoint Types).

The Functional Block covers measurement of gas volume.

### 5.5.2 Functional specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features is supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages) see clause 1.2.

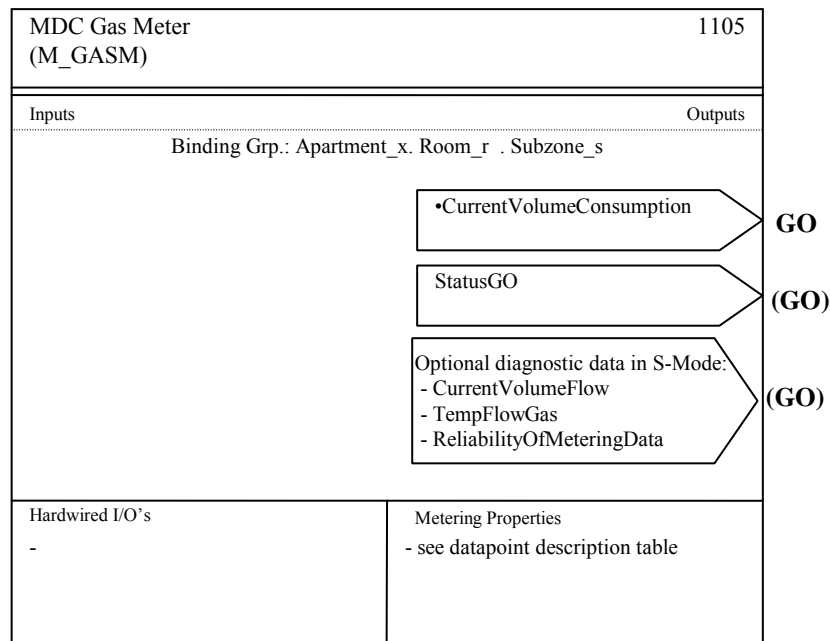
Therefore the complete set of supported Gas Meter datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

In addition a subset of metering datapoints may be available also as standard Group Object in Standard Mode for visualization on displays etc. At least the current volume consumption value shall be provided spontaneously as a Group Object. See clause 1.2.

### 5.5.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.5.4 Functional Block diagram



## 5.5.5 Datapoint description

### 5.5.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs</b>				
CurrentVolumeConsumption	51	Accumulated gas volume. Can be accessed as a property or can be distributed as a standard Group Object	<b>Property:</b> DPT_MeteringValue / PDT_GENERIC_6 <b>Standard Mode:</b> DPT_Value_4_Count	229.001 13.001
StatusGO		Z <sub>8</sub> information of CurrentVolumeConsumption as a Group Object	<b>Standard Mode only</b> DPT_StatusGen <sub>1</sub>	21.001
CurrentVolumeFlow	53	Current measured volume flow	<b>Standard Mode:</b> DPT_Value_Volume_Flow	9.025
TempFlowGas	70	Current flow temperature	<b>Standard Mode:</b> DPT_Value_Temp	9.001
MeasurementCondition	80	The measurement condition	<b>Standard Mode:</b> DPT_Gas_Measurement_Condition	20.1202
ValveState	153	Describing the status of the valve: energy supply is closed or open or released.	<b>Property:</b> DPT_MBus_BreakerValve_State / PDT_ENUM8 <b>Standard Mode:</b> DPT_MBus_BreakerValve_State	20.1200 20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002
<b>Inputs</b>				
None.				
<b>Metering Properties</b>				
CurrentVolumeFlow	53	Current measured volume flow	DPT_MeteringValue / PDT_GENERIC_6	229.001
HistoryStorageNumbers	60	Array of storage numbers for history values	PDT_UNSIGNED_CHAR[n] n ≥ 8	5.010
HistoryDate	61	Array of date/time information for history values	DPT_DateTime[n], n ≥ 8 / PDT_DATE_TIME	19.001
HistoryVolumeConsumption	62	Array of volume consumption history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryVolumeMaxFlow	64	Array of Max Volume Flow history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryVolumeMinFlow	65	Array of Min Volume Flow history values	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
TempFlowGas	70	Current Flow temperature	DPT_TempHVACAbs_Z / PDT_GENERIC_3	205.100
ValveState	153	Describing the status of the valve: energy supply is closed or open or released.	DPT_MBus_BreakerValve_State / PDT_ENUM8	20.1200
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This property is used for consistency checking	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
MeteringDeviceType	115	Metering Device Type. Supported value in M_GASM is: 3 : Gas meter 255 : void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD -> unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorConsumption	127	value of volume consumption at the moment when an error occurred	DPT_MeteringValue / PDT_GENERIC_6	229.001
ReliabilityOfMeteringData	128	Indicates whether metering data up-to-date or outdated.	DPT_Bool / PDT_BINARY_INFORMATION	1.002
AveragingDuration	129	Measuring time for current min/max value generation (integration time)	DPT_LongDeltaTimeSec / PDT_LONG	13.100
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be ≥128 octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n ≥128	5.010
<b>History Query</b>	152	Function Property to query metering data according 4.10.	PDT_Function	none
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus heat meter is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a meter is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

**M\_GASM Runtime Interworking - Dependence on Configuration Modes**

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentVolumeConsumption	GO <sub>b</sub>	GO	GO	O
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA
	CurrentVolumeFlow	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	TempFlowGas	(GO <sub>b</sub> )	(GO)	(GO)	(O)*
	ValveState	(GO <sub>b</sub> )	(GO)	(GO)	NA

(O)\*: optionally possible/allowed but not specified in this document

**M\_GASM LTE Zoning Parameters**

		Support
<b>Parameter</b>	Apartment	<b>M*</b>
	Room	<b>M*</b>
	Subzone	<b>M*</b>

\* mandatory in LTE implementations only

**M\_GASM Standard Properties of Interface Objects**

<b>Parameter / Diagnostic Value</b>	<b>Support</b>
ValveState	<b>O</b>
CurrentVolumeConsumption	<b>M</b>
CurrentVolumeFlow	<b>O</b>
HistoryStorageNumbers	<b>M</b>
HistoryDate	<b>M</b>
HistoryVolumeConsumption	<b>M</b>
HistoryMaxVolumeFlow	<b>O</b>
HistoryMinVolumeFlow	<b>O</b>
TempFlowGas	<b>O</b>
MeasurementCondition	<b>M</b>
RxSequenceCounter	<b>M</b>
RxReceptionTime	<b>M</b>
Manufacturer	<b>M</b>
IdentificationNumber	<b>M</b>
VersionNumber	<b>M</b>
MeteringDeviceType	<b>M</b>
FabricationNumber	<b>C*</b>
AccessNumber	<b>M</b>
DeviceStatus	<b>M</b>
OperatingTime	<b>O</b>
OnTime	<b>O</b>
CurrentDate	<b>M</b>
ErrorDate	<b>M</b>
ErrorConsumption	<b>O</b>
ReliabilityOfMeteringData	<b>O</b>
AveragingDuration	<b>O</b>
MBusRawData	<b>M</b>
History Query	<b>O</b>
UserText	<b>O</b>
MeterReplacement	<b>M</b>
MeterReplacementCounter	<b>O</b>

\*conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.

## 5.5.6 Detailed specification of the Datapoints

### 5.5.6.1 Output ValveState

Same as in M\_BREAKERM Object except IO Type (ID) = 1105 (M\_GASM);  
see 5.7.6.1.

### 5.5.6.2 Output / diagnostic data CurrentVolumeConsumption

#### Property specification

FB: M_GASM		Property Name (Server):		CurrentVolumeConsumption		Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>		
Description:								
Current accumulated gas volume value (m <sup>3</sup> ) that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
CountVal		counter value			M	full	<sup>1)</sup>	cs
VallnfField		<sup>1)</sup> Encoding of unit and resolution of the counter value			M	40h to 47h		
Status							bitset	
• OutOfService		Value is not available / void			M	true/false		true
• Overridden					NA	false		false
• Fault		metering failure, corrupted value			M	true/false		false
• InAlarm					NA	false		false
• AlarmUnAck					NA	unack		unack
Command		standard Command field					enum	
• all commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address:		IO Type(ID):	1105 (M_GASM)	Property ID:	51			
(in the server)		Start-Index:	1	N° of elements	1			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.								

**LTE mode**

<b>FB:</b>	<b>M_GASM</b>	<b>LTE Server Output Name:</b>	<b>CurrentVolumeConsumption</b>	Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>					
Current accumulated gas volume value (m <sup>3</sup> ) that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format
Field	Description	Sup.	Range	Unit	COV
See Property specification above.					
<b>Communication:</b>					
<b>Binding Group:</b>					
Class		Type		Default	
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone		1.1.1 <sup>2)</sup>	
Application Specific <input type="checkbox"/>					
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>			
<b>DP Address:</b>		IO Type(ID): 1105 (M_GASM)		Property ID: 51	
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTime: 300 sec Heartbeat: 60 min	
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input checked="" type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>	
(LTE Read-Response polling of the output shall always be supported)		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>			
		Transm after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>			
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>	
<b>Exception Handling:</b>					Save at Powerdown <input type="checkbox"/>
None.					
<b>Special Features:</b>					
<sup>1)</sup> In the M-Bus RF system gas meter data are transmitted periodically, typically once per hour. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful $\Delta$ Value depends on the increment of the heat meter (according to ValInfField). <sup>2)</sup> If there is only one M_GASM per Apartment zone, the Room number and Subzone number shall be set to the default value 1.1.					

**Group Object (Standard Mode)**

<b>DP Name:</b>	CurrentVolumeConsumption	<b>Abbr.:</b>	---			<b>Mandatory</b>	<input checked="" type="checkbox"/>
<b>FB Name:</b>	M_GASM	<b>Can be internal</b>					<input type="checkbox"/>
<b>Description</b>							
Current accumulated gas volume value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.							
<b>Datapoint Type</b>							
<b>DPT_Name:</b>	DPT_Value_4_Count						
<b>DPT Format:</b>	V <sub>32</sub>	<b>DPT_ID:</b>	13.001				
<b>Field</b>	<b>Description</b>	<b>Supp.</b>	<b>Range</b>	<b>Unit</b>	<b>Default</b>		
	Counter value encoded as plain 32 bit signed integer. <sup>1)</sup> unit, resolution and display format have to be engineered on the receiver of the information according to VallnField in Property 'CurrentVolumeConsumption' In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.	M	full	<sup>1)</sup>	0		
<b>Access Type</b>							
◆ Output							
	this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>			
	Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period:	5 min
			Cyclic	<input type="checkbox"/>	Period:		
	Request	<input checked="" type="checkbox"/>					
<b>Communication Type</b>							
◆ Group Object Datapoint							<b>Mandatory:</b> <input checked="" type="checkbox"/>
	Default Group Address:	---					
<b>Dynamics</b>							
	Power down:	Save:	<input type="checkbox"/>				
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>	
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>		
		Transmit on bus (only for output):	<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>		
<b>Exception Handling</b>							
Void values or faulty values shall be indicated with the default value 0. In case of MeterReplacement = true, the value of CurrentVolumeConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.							
<b>Special Features</b>							
<sup>1)</sup> In the M-Bus RF system gas meter data are transmitted periodically, typically once per hour. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the gas meter (according to VallnField).							



### 5.5.6.3 Output StatusGO

#### Standard Mode only

<b>DP Name:</b>	StatusGO	<b>Abbr.:</b>	---	<b>Mandatory</b>	<input type="checkbox"/>
<b>FB Name:</b>	M_GASM	<b>Can be internal</b>			<input type="checkbox"/>
<b>Description</b>					
This Output shall contain the Z <sub>8</sub> status information of CurrentVolumeConsumption as a Group Object.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_StatusGen				
DPT_Format:	B <sub>8</sub>	DPT_ID:	21.001		
Field	Description	Supp.	Range	Unit	Default
Status	Z <sub>8</sub> Status information	O	Bitset		
• Bit 0	OutOfService	M		t/f	true
• Bit 1	Fault	M		t/f	false
• Bit 2	Overridden	NA		f	false
• Bit 3	InAlarm	NA		f	false
• Bit 4	AlarmUnAcknowledged	NA		u	unack
• Bits 5 to 7	reserved	NA			
<b>Access Type</b>					
♦ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Delta-Value:	None.
		Cyclic	<input type="checkbox"/>	Period:	---
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
♦ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value:	<input type="checkbox"/>
	Transmit on bus:		<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Exception Handling</b>					
None.					
<b>Special Features</b>					
None.					

### 5.5.6.4 Output / diagnostic data CurrentVolumeFlow

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.4.

### 5.5.6.5 Diagnostic data HistoryStorageNumbers

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.6.

### 5.5.6.6 Diagnostic data HistoryDate

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.7.

**5.5.6.7 Diagnostic data HistoryVolumeConsumption**

FB: M_GASM		Property Name (Server):		HistoryVolumeConsumption		Mandatory <input checked="" type="checkbox"/>		
						Optional <input type="checkbox"/>		
Description:								
Array of accumulated volume consumption information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryVolumeConsumption value in the received M-Bus message shall be associated with a storage number. In the M_GASM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. Historical values are marked with a special DIFE = 00h. Refer to 4.8. The array of history information shall be read-only and shall be accessible by polling."								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	1)	cs
VallnField		1) Encoding of unit and resolution of the measured value			M	40h to 47h		
Status							bitset	
- OutOfService		Value is not available / void			M	true/false		true
- Overridden					NA	false		false
- Fault		measurement failure, corrupted value			M	true/false		false
- InAlarm					NA	false		false
- AlarmUnAck					NA	unack		unack
Command		standard Command field					enum	
- All commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address: (in the server)		IO Type(ID):	1105 (M_GASM)	Property ID:	62			
		Start-Index:	1	N° of elements	≥ 8	fixed or variable length		
Property access:		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be left unchanged.								

**5.5.6.8 Diagnostic data HistoryVolumeMaxFlow**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.10.

**5.5.6.9 Diagnostic data HistoryVolumeMinFlow**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.11.

**5.5.6.10 Output / diagnostic data TempFlowGas**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.14.

**5.5.6.11 LTE Zoning Parameter Apartment**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.17.

**5.5.6.12 LTE Zoning Parameter Room**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.19.

**5.5.6.13 LTE Zoning Parameter Subzone**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 0.

**5.5.6.14 Diagnostic data RxSequenceCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.21.

**5.5.6.15 Diagnostic data RxReceptionTime**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.22.

**5.5.6.16 Diagnostic data Manufacturer**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.23.

**5.5.6.17 Diagnostic data IdentificationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.24.

**5.5.6.18 Diagnostic data VersionNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM), see 5.1.6.25.

**5.5.6.19 Diagnostic data MeteringDeviceType**

<b>FB:</b>	<b>M_GASM</b>	<b>Property Name (Server):</b>	MeteringDeviceType	<b>Mandatory</b> <input checked="" type="checkbox"/>	<b>Optional</b> <input type="checkbox"/>
<b>Description:</b>					
<p>Metering Device Type of the gas meter device. Supported values in M_GASM is:</p> <p>3: Gas meter</p> <p>255: void device type</p> <p>Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>During the installation procedure the MeteringDeviceType information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.</p>					
<b>DPT:</b>	Name	DPT_Metering_DeviceType	DPT ID	20.114	Datatype format N <sub>8</sub>
Field	Description		Sup.	Range	Unit
				{6, 7, 255}	enum.
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1105 (M_GASM)	Property ID:	115	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
None.					
<b>Special Features:</b>					
Device type '255' = void (default value) ; used to indicate that the FB is not connected to a meter.					

**5.5.6.20 Diagnostic data FabricationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.27.

**5.5.6.21 Diagnostic data AccessNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.28.

**5.5.6.22 Diagnostic data DeviceStatus**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.29.

**5.5.6.23 Diagnostic data OperatingTime**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.30.

**5.5.6.24 Diagnostic data OnTime**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.31.

**5.5.6.25 Diagnostic data CurrentDate**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.32.

**5.5.6.26 Diagnostic data ErrorDate**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.37.

**5.5.6.27 Diagnostic data ErrorConsumption**

FB:	M_GASM	Property Name (Server):	ErrorConsumption	Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>				
Description:								
Value of CurrentVolumeConsumption datapoint at the moment when an error occurred in the gas meter. The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling. This information is related to datapoint ErrorDate.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	40h to 47h		
Status		Value is not available / void  measurement failure, corrupted value			M	true/false	bitset	true false false false unack
– OutOfService					NA	False		
– Overridden					M	true/false		
– Fault					NA	False		
– InAlarm					NA	Unack		
– AlarmUnAck								
Command		standard Command field			NA		enum	
– all commands		not supported, Datapoint shall be read only						
Communication:								
DP Address: (in the server)		IO Type(ID):	1105 (M_GASM)	Property ID:	127			
		Start-Index:	1	N° of elements	1			
Property access:		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be accepted by the Data Collector. This is the last reliable and valid consumption value from the metering device.								

**5.5.6.28 Diagnostic data ReliabilityOfMeteringData**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.17.

**5.5.6.29 Diagnostic data AveragingDuration**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.39.

**5.5.6.30 Diagnostic data MBusRawData**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.40.

**5.5.6.31 Function Property History Query**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.41.

**5.5.6.32 Parameter UserText**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.42.

**5.5.6.33 Parameter MeterReplacement**


Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.43.

**5.5.6.34 Parameter MeterReplacementCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1105 (M\_GASM),  
see 5.1.6.44.

**5.5.6.35 MeasurementCondition**

<b>FB:</b>	<b>M_GASM</b>	<b>Property Name (Server):</b>	<b>MeasurementCondition</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>			
<b>Optional</b> <input type="checkbox"/>							
<b>Description:</b>							
The measurement condition. For encoding see below. The Gasmeter may consider or assume different condition like temperature or pressure for the measurement of the gas volume. This Datapoint describes the applied Measurement condition. Refer also to [03].							
<b>DPT:</b>	Name	DPT_Metering_DeviceType	DPT ID	20.1202	Datatype format	N <sub>8</sub>	
Field	Description			Sup.	Range	Unit	Default
					{0, 1, 2, 3}	enum.	0
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):	1105 (M_GASM)	Property ID:	80		
<b>(in the server)</b>		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>		
<b>Protection</b>		Read level	---	Write level	---		
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value	<input type="checkbox"/>
None.							
<b>Special Features:</b>							

 This new DPT will after the acceptance in Final Voting of this document be moved to Chapter 3/7/2 "Datapoint Types".

<u>Format:</u>	1 octet: N <sub>8</sub>			
octet nr.	1			
field names	<div><div>field1</div></div>			
encoding	<div>NNNNNNNN</div>			
<u>Encoding:</u>	Encoding absolute value N = [0 ... 255]			
<u>Unit:</u>	none			
<u>Resol.:</u>	none			
<u>PDT:</u>	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)			
<b>Datapoint Types</b>				
<u>ID:</u>	<u>Name:</u>	<u>Encoding:</u>	<u>Range:</u>	<u>Use:</u>
20.1202	DPT_Gas_Measurement_Condition	field1 = GasMeasurementCondition 0 unknown 1 temperature converted 2 at base condition 3 at measurement condition 4 to 255: reserved. shall not be used	[0 to 3]	FB

## 5.6 MDC Electricity Meter (M\_ELECM)

### 5.6.1 Aims and objectives

The Functional Block ‘MDC Electricity Meter’ shall map M-Bus electricity meter data (M-Bus Medium Type = 2) to the KNX system (standard KNX physical media, services and Datapoint Types).

The purpose of this Functional Block is the visualization of energy and/or the management of energy.

### 5.6.2 Functional specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features shall be supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages), see clause 1.2

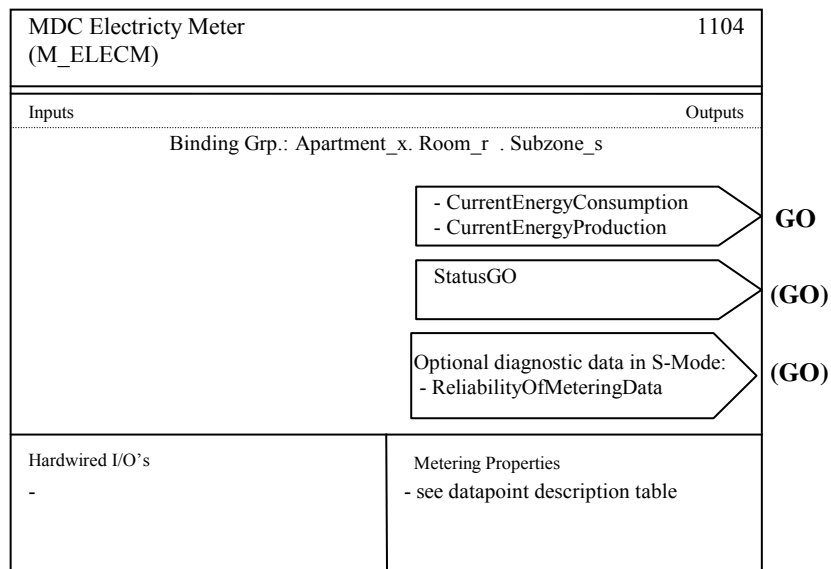
Therefore the complete set of supported Electricity Meter datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

In addition a subset of metering datapoints may be available also as standard Group Object in Standard Mode for visualization on displays etc. At least the current energy consumption value shall be provided as a Group Object and can be sent on KNX spontaneously. See clause 1.2.

### 5.6.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.6.4 Functional Block diagram





## 5.6.5 Datapoint description

### 5.6.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs (multicast communication)</b>				
CurrentEnergyConsumption	51	Accumulated active energy import value	<b>LTE-Mode:</b> DPT_MeteringValue / PDT_GENERIC_6 (See NOTE 1.)	229.001
			<b>Standard Mode:</b> DPT_ActiveEnergy	13.010
CurrentEnergyProduction	52	Accumulated active energy export value	<b>LTE-Mode:</b> DPT_MeteringValue / PDT_GENERIC_6 (See NOTE 1.)	229.001
			<b>Standard Mode:</b> DPT_ActiveEnergy	13.010
StatusGO		Z <sub>8</sub> information of CurrentEnergyConsumption as a Group Object	<b>Standard Mode only</b> DPT_StatusGen	21.001
BreakerState	153	Describing the status of the breaker: Energy supply is closed or open or released.	<b>Property:</b> DPT_MBus_BreakerValve_- State / PDT_ENUM8	20.1200
			<b>Standard Mode:</b> DPT_MBus_BreakerValve_- State	20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up- to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Inputs</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties (polling)</b>				
CurrentEnergyConsumption	51	Accumulated active energy import value	DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentEnergyProduction	52	Accumulated active energy export value	DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentEnergyConsumptionTariff1	53	Accumulated active energy import value Tariff 1	DPT_MeteringValue / PDT_GENERIC_6	229.001
...	...	...		
CurrentEnergyConsumptionTariff16	68	Accumulated active energy import value Tariff 16	DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentEnergyProductionTariff1	69	Accumulated active energy export value Tariff 1	DPT_MeteringValue / PDT_GENERIC_6	229.001
...	...	...		
CurrentEnergyProductionTariff16	84	Accumulated active energy export value Tariff 16	DPT_MeteringValue / PDT_GENERIC_6	229.001

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties (polling)</b>				
HistoryEnergyConsumptionTariff1	85	Array of energy consumption history values Tariff1	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
...	...	...		
HistoryEnergyConsumptionTariff16	100	Array of energy consumption history values Tariff16	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
HistoryEnergyProductionTariff1	131	Array of energy production history values Tariff1	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
...	...	...		
HistoryEnergyProductionTariff16	146	Array of energy production history values Tariff16	DPT_MeteringValue[n], n ≥ 8 / PDT_GENERIC_6	229.001
CurrentActivePowerConsumption	147	Current measured power consumption	<b>Standard Mode:</b> DPT_Power	9.024
CurrentActivePowerProduction	148	Current measured power production	<b>Standard Mode:</b> DPT_Power	9.024
CurrentTariff	149	Current tariff register value	DPT_Tariff / PDT_UNSIGNED_CHAR	5.006
HistoryStorageNumbers	150	Array of storage numbers for history values	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR[n] n ≥ 8	5.010
HistoryDate	151	Array of date/time information for history values	DPT_DateTime[n], n ≥ 8 / PDT_DATE_TIME	19.001
BreakerState	153	Describing the status of the breaker: energy supply is closed or open or released.	DPT_MBus_BreakerValve_State / PDT_ENUM8	20.1200

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This Property shall be used for consistency checking.	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
MeteringDeviceType	115	Metering Device Type. Supported values in M_ELECM are: 2: electricity meter 255: void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	DPT_Bool / PDT_BINARY_INFORMATION	1.002
AveragingDuration	129	Measuring time for current min/max value generation (integration time)	DPT_LongDeltaTimeSec / PDT_LONG	13.100
MbusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n $\geq 128$	5.010
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus electricity meter is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician.	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a meter is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

**M\_ELECM Runtime Interworking - Dependency on Configuration Modes**

			STANDARD MODE	EXTENDED MODE		
			Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	(none)					
Outputs	CurrentEnergyConsumption	GO <sub>b</sub>	GO	GO		O
	CurrentEnergyProduction	(GO <sub>b</sub> )	(GO)	(GO)		(O)*
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)		NA
	BreakerState	(GO <sub>b</sub> )	(GO)	(GO)		NA
	ReliabilityOfMeteringData	(GO <sub>b</sub> )	(GO)	(GO)		(O)*

(O)\*: optionally possible/allowed but not specified in this document

**M\_ELECM LTE Zoning Parameters**

		Support
<b>Parameter</b>	Apartment	<b>M*</b>
	Room	<b>M*</b>
	Subzone	<b>M*</b>

\* mandatory in LTE implementations only

**M\_ELECM Standard Properties of Interface Objects**

Parameter / Diagnostic Value	Support
BreakerState	<b>O</b>
CurrentEnergyConsumption	<b>M</b>
CurrentEnergyProduction	<b>O</b>
CurrentEnergyConsumptionTariff1 ...	<b>O</b>
CurrentEnergyConsumptionTariff16	
CurrentEnergyProductionTariff1 ...	<b>O</b>
CurrentEnergyProductionTariff16	
HistoryEnergyConsumptionTariff1 ...	<b>O</b>
HistoryEnergyConsumptionTariff16	
HistoryEnergyProductionTariff1 ...	<b>O</b>
HistoryEnergyProductionTariff16	
CurrentActivePowerConsumption	<b>O</b>
CurrentActivePowerProduction	<b>O</b>
CurrentTariff	<b>O</b>
HistoryStorageNumbers	<b>M</b>
HistoryDate	<b>M</b>
RxSequenceCounter	<b>M</b>
RxReceptionTime	<b>M</b>
Manufacturer	<b>M</b>
IdentificationNumber	<b>M</b>
VersionNumber	<b>M</b>
MeteringDeviceType	<b>M</b>
FabricationNumber	<b>C*</b>
AccessNumber	<b>M</b>
DeviceStatus	<b>M</b>
OperatingTime	<b>O</b>
OnTime	<b>O</b>
CurrentDate	<b>M</b>
ReliabilityOfMeteringData	<b>O</b>
ErrorDate	<b>M</b>
AveragingDuration	<b>O</b>
MBusRawData	<b>M</b>
History Query	<b>O</b>
UserText	<b>O</b>
MeterReplacement	<b>M</b>
MeterReplacementCounter	<b>O</b>

\* Conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.

## 5.6.6 Detailed specification of the Datapoints

### 5.6.6.1 Output BreakerState

Same as in M\_BREAKERM Object except IO Type (ID) = 1104 (M\_ELECM);  
see 5.7.6.1.

### 5.6.6.2 Output / diagnostic data CurrentEnergyConsumption

Property specification:

FB:	M_ELECM	Property Name (Server):	CurrentEnergyConsumption				Mandatory	<input type="checkbox"/>
							Optional	<input checked="" type="checkbox"/>
Description:								
Current accumulated energy value that is received from the M-Bus device for consumption and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT	MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>	
Field	Description			Sup.	Range	Unit	Default	
CountVal	counter value			M	full	<sup>1)</sup>	cs	
ValInfField	<sup>1)</sup> Encoding of unit and resolution of the counter value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h			
Status	Value is not available / void			M	true/false	bitset	true	
– OutOfService				NA	false		false	
– Overridden	metering failure, corrupted value			M	true/false		false	
– Fault				NA	false		false	
– InAlarm				NA	unack		unack	
– AlarmUnAck								
Command	standard Command field					enum		
– all commands	not supported, Datapoint shall be read only			NA				
Communication:								
DP Address:	IO Type(ID):	1104 (M_ELECM)	Property ID:	51				
(in the server)	Start-Index:	1	N° of elements	1				
Property access:	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>				
Protection	Read level	---	Write level	---				
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.								

**LTE-Mode:**

<b>FB:</b>	<b>M_ELECM</b>	<b>LTE Server Output Name:</b>	<b>CurrentEnergyConsumption</b>				Mandatory <input type="checkbox"/>	
							Optional <input checked="" type="checkbox"/>	
<b>Description:</b>								
Current accumulated energy value that is received from the M-Bus device for consumption and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.								
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>		
Field	Description		Sup.	Range	Unit	COV	Default	
See Property specification above.								
<b>Communication:</b>								
<b>Binding Group:</b>								
Class		Type				Default		
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone				1.1.1 <sup>2)</sup>		
Application Specific <input type="checkbox"/>								
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/>		Configurable <input type="checkbox"/>				
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)	Property ID:		51	
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTime:	300 sec	Heartbeat:	60 min	
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input checked="" type="checkbox"/>		Binding Group Wildcard allowed		<input type="checkbox"/>		
(LTE Read-Response polling of the output shall always be supported)		Tx Prio:		High <input type="checkbox"/>	Normal <input checked="" type="checkbox"/>	Low <input type="checkbox"/>		
		Transm after Powerup:		Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>		
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/>		Read/Write		<input type="checkbox"/>		
<b>Exception Handling:</b>							Save at Powerdown <input type="checkbox"/>	
None.								
<b>Special Features:</b>								
<sup>1)</sup> In the M-Bus RF system electricity meter data are transmitted periodically, typically every 15 minutes. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ Value depends on the increment of the electricity meter (according to VallnField). <sup>2)</sup> If there is only one M_ELECM per Apartment zone, the Room number and Subzone number shall be set to the default value 1.1.								

**Group Object (Standard Mode):**

DP Name:	CurrentEnergyConsumption	Abbr.:	---	Mandatory	<input checked="" type="checkbox"/>
FB Name:	M_ELECM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current accumulated energy value that is received from the M-Bus device for consumption and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 15 Alternative or additional DPTs are possible: see NOTE 1.					
<b>Datapoint Type</b>					
DPT Name:	DPT_ActiveEnergy				
DPT Format:	V <sub>32</sub>	DPT ID:	13.010		
Field	Description	Supp.	Range	Unit	Default
	Counter value encoded as plain 32 bit signed integer. <sup>1)</sup> unit, resolution and display format have to be engineered on the receiver of the information according to ValInfField in Property 'CurrentEnergyConsumption'. In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.	M	full	<sup>1)</sup>	0
<b>Access Type</b>					
◆ Output					
this → M		<input checked="" type="checkbox"/>	this → 1		<input type="checkbox"/>
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>2)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>2)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>	
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 0. In case of MeterReplacement = true, the value of CurrentEnergyConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.					
<b>Special Features</b>					
<sup>2)</sup> In the M-Bus RF system electricity meter data are transmitted periodically, typically every 15 minutes. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the electricity meter (according to ValInfField).					



### 5.6.6.3 Output / diagnostic data CurrentEnergyProduction

#### Property specification:

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyProduction</b>	<b>Mandatory</b> <input type="checkbox"/>	<b>Optional</b> <input checked="" type="checkbox"/>
<b>Description:</b>					
Current accumulated energy value that is received from the M-Bus device for production and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit
CountVal	counter value		M	full	<sup>1)</sup>
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the counter value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h	
Status	Value is not available / void  metering failure, corrupted value		M NA M NA NA	true/false false true/false false unack	bitset
Command	standard Command field not supported, Datapoint shall be read only		NA		enum
all commands					
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1104 (M_ELECM)	Property ID:	52	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.					

**LTE-Mode:**

<b>FB:</b>	<b>M_ELECM</b>	<b>LTE Server Output Name:</b>	<b>CurrentEnergyProduction</b>	Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>					
Current accumulated energy value that is received from the M-Bus device for production and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format
Field	Description	Sup.	Range	Unit	COV
See Property specification above.					
<b>Communication:</b>					
<b>Binding Group:</b>					
Class		Type		Default	
Geographical <input checked="" type="checkbox"/>		Apartment.Room.Subzone		1.1.1 <sup>2)</sup>	
Application Specific <input type="checkbox"/>					
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>			
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM) Property ID: 52	
<b>LTE-Services (event):</b>		COV <input checked="" type="checkbox"/> <sup>1)</sup>		MinRepTime: 300 sec Heartbeat: 60 min	
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input checked="" type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>	
(LTE Read-Response polling of the output shall always be supported)		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>			
		Transm after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>			
<b>Property-Service (individual access):</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>	
<b>Exception Handling:</b>				Save at Powerdown <input type="checkbox"/>	
None.					
<b>Special Features:</b>					
<sup>1)</sup> In the M-Bus RF system electricity meter data are transmitted periodically, typically every 15 minutes. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful $\Delta$ Value depends on the increment of the electricity meter (according to VallnField). <sup>2)</sup> If there is only one M_ELECM per Apartment zone, the Room number and Subzone number shall be set to the default value 1.1.					

**Group Object (Standard Mode):**

DP Name:	CurrentEnergyProduction	Abbr.:	---	Mandatory	<input checked="" type="checkbox"/>
FB Name:	M_ELECM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current accumulated energy value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 16 Alternative or additional DPTs are possible: see NOTE 1.					
<b>Datapoint Type</b>					
DPT Name:	DPT_Value_4_Count				
DPT Format:	V <sub>32</sub>	DPT ID:	13.001		
Field	Description	Supp.	Range	Unit	Default
	Counter value encoded as plain 32 bit signed integer. 1) unit, resolution and display format have to be engineered on the receiver of the information according to ValInfField in Property 'CurrentEnergyConsumption'. In case of meter replacement the corresponding Property shall be set automatically by the Data Collector and manually reset by the installer or service technician.	M	full	1)	0
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: 2)	<input checked="" type="checkbox"/>	Δ-Value: cs 2)	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>	
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with the default value 0. In case of MeterReplacement = true, the value of CurrentEnergyConsumption shall be 0 in order to indicate, that the unit/resolution of the value may no longer be valid.					
<b>Special Features</b>					
2) In the M-Bus RF system electricity meter data are transmitted periodically, typically every 15 minutes. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the increment of the electricity meter (according to ValInfField).					

**5.6.6.4 Output StatusGO****Standard Mode only**

DP Name:	StatusGO	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_ELECM	Can be internal	<input type="checkbox"/>		
<b>Description</b>					
This Output shall contain the Z <sub>8</sub> status information of CurrentEnergyConsumption as a Group Object.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_StatusGen				
DPT_Format:	B <sub>8</sub>	DPT_ID:	21.001		
Field	Description	Supp.	Range	Unit	Default
Status	Z <sub>8</sub> Status information	O	Bitset		
Bit 0	OutOfService	M		t/f	true
Bit 1	Fault	M		t/f	false
Bit 2	Overridden	NA		f	false
Bit 3	InAlarm	NA		f	false
Bit 4	AlarmUnAcknowledged	NA		u	unack
Bits 5 to 7	reserved	NA			
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV:	<input checked="" type="checkbox"/>	Delta-Value:	---
		Cyclic	<input type="checkbox"/>	Period:	---
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value:	<input type="checkbox"/>
Transmit on bus:		<input checked="" type="checkbox"/>			
<b>Exception Handling</b>					
None.					
<b>Special Features</b>					
None.					

**5.6.6.5 Diagnostic data CurrentEnergyConsumptionTariff1**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyConsumptionTariff1</b>	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Current accumulated energy consumption Tariff 1 value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>	
Field	Description		Sup.	Range	Unit	Default	
CountVal	measured value		M	full	<sup>1)</sup>	cs	
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h			
Status	Value is not available / void		M	true/false	bitset	true	
– OutOfService			NA	false		false	
– Overridden	measurement failure, corrupted value		M	true/false		false	
– Fault							
– InAlarm			NA	false		false	
– AlarmUnAck			NA	unack		unack	
Command	standard Command field				enum		
– all commands	not supported, Datapoint shall be read only		NA				
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):	1104 (M_ELECM)	Property ID:	53		
<b>(in the server)</b>		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>				
<b>Protection</b>		Read level	---	Write level	---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							

**5.6.6.6 Diagnostic data CurrentEnergyConsumptionTariff16**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyConsumptionTariff16</b>	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Current accumulated energy consumption Tariff 16 value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>	
Field	Description		Sup.	Range	Unit	Default	
CountVal	measured value		M	full	<sup>1)</sup>	cs	
VallnField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h			
Status	Value is not available / void		M	true/false	bitset	true	
– OutOfService			NA	false		false	
– Overridden	measurement failure, corrupted value		M	true/false		false	
– Fault							
– InAlarm			NA	false		false	
– AlarmUnAck			NA	unack		unack	
Command	standard Command field				enum		
– all commands	not supported, Datapoint shall be read only		NA				
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID): 1104 (M_ELECM)		Property ID: 68			
<b>(in the server)</b>		Start-Index: 1		N° of elements 1			
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							

**5.6.6.7 Diagnostic data CurrentEnergyProductionTariff1**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyProductionTariff1</b>	Mandatory <input type="checkbox"/>		
				Optional <input checked="" type="checkbox"/>		
<b>Description:</b>						
Current accumulated energy production Tariff 1 value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
CountVal	measured value		M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status	Value is not available / void		M	true/false	bitset	true
– OutOfService			NA	false		false
– Overridden	measurement failure, corrupted value		M	true/false		false
– Fault						
– InAlarm			NA	false		false
– AlarmUnAck			NA	unack		unack
Command	standard Command field				enum	
– all commands	not supported, Datapoint shall be read only		NA			
<b>Communication:</b>						
<b>DP Address:</b>		IO Type(ID):	1104 (M_ELECM)	Property ID:	69	
<b>(in the server)</b>		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.						

**5.6.6.8 Diagnostic data CurrentEnergyProductionTariff16**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentEnergyProductionTariff16</b>	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
<b>Description:</b>							
Current accumulated energy production Tariff 16 value that is received from the M-Bus device and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>	
Field	Description		Sup.	Range	Unit	Default	
CountVal	measured value		M	full	<sup>1)</sup>	cs	
VallnField	<sup>1)</sup> Encoding of unit and resolution of the measured value		M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h			
Status	Value is not available / void		M	true/false	bitset	true	
– OutOfService			NA	false		false	
– Overridden	measurement failure, corrupted value		M	true/false		false	
– Fault							
– InAlarm			NA	false		false	
– AlarmUnAck			NA	unack		unack	
Command	standard Command field				enum		
– all commands	not supported, Datapoint shall be read only		NA				
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID): 1104 (M_ELECM)		Property ID: 84			
<b>(in the server)</b>		Start-Index: 1		N° of elements 1			
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.							



**5.6.6.9 Diagnostic data HistoryEnergyConsumptionTariff1**

FB: M_ELECM		Property Name (Server): HistoryEnergyConsumptionTariff1				Mandatory <input type="checkbox"/>		
						Optional <input checked="" type="checkbox"/>		
Description:								
Array of energy consumption Tarif 1 information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyConsumptionTariff1 value in the received M-Bus message shall be associated with a storage number. In the M_ELECM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8.								
The array of history information shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnfField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status							bitset	
– OutOfService		Value is not available / void			M	true/false		true
– Overridden					NA	false		false
– Fault		measurement failure, corrupted value			M	true/false		false
– InAlarm					NA	false		false
– AlarmUnAck					NA	unack		unack
Command		standard Command field					enum	
- all commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address: (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	85			
		Start-Index:	1	N° of elements	≥ 8			
		fixed or variable length						
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field ‘status’ with ‘permanent error’ then the history shall be left unchanged.								

**5.6.6.10 Diagnostic data HistoryEnergyConsumptionTariff16**

FB: M_ELECM		Property Name (Server): HistoryEnergyConsumptionTariff16				Mandatory <input type="checkbox"/>		
						Optional <input checked="" type="checkbox"/>		
Description:								
Array of energy consumption Tariff 16 information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyConsumptionTariff16 value in the received M-Bus message shall be associated with a storage number. In the M_ELECM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8.								
The array of history information shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnfField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status							bitset	
– OutOfService		Value is not available / void			M	true/false		true
– Overridden					NA	false		false
– Fault		measurement failure, corrupted value			M	true/false		false
– InAlarm					NA	false		false
– AlarmUnAck					NA	unack		unack
Command		standard Command field					enum	
- all commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address: (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	100			
		Start-Index:	1	N° of elements	≥ 8	fixed or variable length		
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field ‘status’ with ‘permanent error’ then the history shall be left unchanged.								

**5.6.6.11 Diagnostic data HistoryEnergyProductionTariff1**

FB:	M_ELECM	Property Name (Server):	HistoryEnergyProductionTariff1			Mandatory	<input type="checkbox"/>	
						Optional	<input checked="" type="checkbox"/>	
Description:								
Array of energy consumption Tarif 1 information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyProductiontariff1 value in the received M-Bus message shall be associated with a storage number. In the M_ELECM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8. The array of history information shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnfField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status		Value is not available / void			M	true/false	bitset	true
– OutOfService					NA	false		false
– Overridden		measurement failure, corrupted value			M	true/false		false
– Fault					NA	false		false
– InAlarm					NA	unack		unack
– AlarmUnAck								
Command		standard Command field					enum	
- all commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address: (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	131			
		Start-Index:	1	N° of elements	≥ 8			
		fixed or variable length						
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling:		Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field ‘status’ with ‘permanent error’ then the history shall be left unchanged.								

**5.6.6.12 Diagnostic data HistoryEnergyProductionTariff16**

FB:	M_ELECM	Property Name (Server):	HistoryEnergyProductionTariff16			Mandatory	<input type="checkbox"/>	
						Optional	<input checked="" type="checkbox"/>	
Description:								
Array of energy consumption Tariff 16 information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyProductionTariff16 value in the received M-Bus message shall be associated with a storage number. In the M_ELECM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8. The array of history information shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub> [n]		
Field		Description			Sup.	Range	Unit	Default
CountVal		measured value			M	full	<sup>1)</sup>	cs
VallnfField		<sup>1)</sup> Encoding of unit and resolution of the measured value			M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status							bitset	
– OutOfService		Value is not available / void			M	true/false		true
– Overridden					NA	false		false
– Fault		measurement failure, corrupted value			M	true/false		false
– InAlarm					NA	false		false
– AlarmUnAck					NA	unack		unack
Command		standard Command field					enum	
- all commands		not supported, Datapoint shall be read only			NA			
Communication:								
DP Address:		IO Type(ID):	1104 (M_ELECM)	Property ID:	146			
(in the server)		Start-Index:	1	N° of elements	≥ 8			
					fixed or variable length			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field ‘status’ with ‘permanent error’ then the history shall be left unchanged.								

**5.6.6.13 Output / diagnostic data CurrentActivePowerConsumption**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentActivePowerConsumption</b>	Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>					
Current measured power in W units. This value is received from the M-Bus electricity meter and stored by the Data Collector. The measured value is read-only and shall be accessible by polling.					
NOTE 17 The Property implementation does not allow for an alternative DPT.					
<b>DPT:</b>	Name	DPT_MeteringValue	DPT ID	229.001	Datatype format V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description	Sup.	Range	Unit	Default
CountVal	measured value	M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value	M	28h to 2Fh 30h to 37h A8h to A9h B0h to B1h		
Status				bitset	
– OutOfService	Value is not available / void	M	true/false		true
– Overridden		NA	false		false
– Fault	measurement failure, corrupted value	M	true/false		false
– InAlarm		NA	false		false
– AlarmUnAck		NA	unack		unack
Command	standard Command field			enum	
– all commands	not supported, Datapoint shall be read only	NA			
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1104 (M_ELECM)	Property ID:	147	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.					

**Group Object (Standard Mode):**

DP Name:	CurrentActivePowerConsumption	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_ELECM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current measured power in kW units. This value is received from the M-Bus electricity meter and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 18 An alternative, general usable, Standard Mode DPT may be used as well. (Example: DPT_Value_Power, F <sub>32</sub> , 14.056).					
<b>Datapoint Type</b>					
DPT Name:	DPT_Power				
DPT Format:	F <sub>16</sub>	DPT ID:	9.024		
Field	Description	Supp.	Range	Unit	Default
	Value encoded as 16 bit float.		full	kW	7FFFh
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>	
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system electricity meter data are transmitted periodically, typically 2 times to 6 times per day. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the type of the connected electricity meter (nominal power)					

**5.6.6.14 Output / diagnostic data CurrentActivePowerProduction**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>CurrentActivePowerProduction</b>	Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>					
Current measured power in W units. This value is received from the M-Bus electricity meter and stored by the Data Collector. The measured value is read-only and shall be accessible by polling.					
NOTE 19 The Property implementation does not allow for an alternative DPT.					
<b>DPT:</b>	Name	DPT	MeteringValue	DPT ID	229.001
				Datatype format	V <sub>32</sub> N <sub>8</sub> Z <sub>8</sub>
Field	Description	Sup.	Range	Unit	Default
CountVal	measured value	M	full	<sup>1)</sup>	cs
VallnfField	<sup>1)</sup> Encoding of unit and resolution of the measured value	M	28h to 2Fh 30h to 37h A8h to A9h B0h to B1h		
Status				bitset	
– OutOfService	Value is not available / void	M	true/false		true
– Overridden		NA	false		false
– Fault	measurement failure, corrupted value	M	true/false		false
– InAlarm		NA	false		false
– AlarmUnAck		NA	unack		unack
Command	standard Command field			enum	
– all commands	not supported, Datapoint shall be read only	NA			
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1104 (M_ELECM)	Property ID:	148	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.					

**Group Object (Standard Mode):**

DP Name:	CurrentActivePowerProduction	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	M_ELECM	Can be internal			<input type="checkbox"/>
<b>Description</b>					
Current measured power in kW units. This value is received from the M-Bus electricity meter and shall be stored by the Data Collector. The metering value shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
NOTE 20 An alternative, general usable, Standard Mode DPT may be used as well. (Example: DPT_Value_Power, F <sub>32</sub> , 14.056).					
<b>Datapoint Type</b>					
DPT_Name:	DPT_Power				
DPT Format:	F <sub>16</sub>	DPT_ID:	9.024		
Field	Description	Supp.	Range	Unit	Default
	Value encoded as 16 bit float.		full	kW	7FFFh
<b>Access Type</b>					
♦ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
♦ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input): <input type="checkbox"/>	
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value 7FFFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus RF system electricity meter data are transmitted periodically, typically every 15 minutes. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object. The definition of a meaningful Δ-Value depends on the type of the connected electricity meter (nominal power)					



**5.6.6.15 Diagnostic data CurrentTariff**

FB:	M_ELECM	Property Name (Server):	CurrentTariff	Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>				
Description:								
Current tariff register value that is received from the M-Bus device and shall be stored by the Data Collector. The value shall be read-only and shall be accessible by polling.								
DPT:	Name	DPT_Tariff	DPT ID	5.006	Datatype format	U <sub>8</sub>		
Field		Description			Sup.	Range	Unit	Default
Tariff		Tariff register value			M	full	none	cs
Communication:								
DP Address: (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	149			
		Start-Index:	1	N° of elements	1			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
Special Features:								
If data in the metering telegram are marked in field 'status' with 'permanent error' then the Status flag 'Fault' shall be set to 'true'.								

**5.6.6.16 Diagnostic data HistoryStorageNumbers**

<b>FB:</b> M_ELECM		<b>Property Name (Server):</b> HistoryStorageNumbers		<b>Mandatory</b> <input checked="" type="checkbox"/> <b>Optional</b> <input type="checkbox"/>			
<b>Description:</b>							
Array of accumulated energy consumption information for history values that are received from the M-Bus device and shall be stored by the Data Collector. Each HistoryEnergyConsumptionTariffx value in the received M-Bus message shall be associated with a storage number. In the M_ELECM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. Historical values are marked with a special DIFE = 00h. Refer to 4.8. The array of history information shall be read-only and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format	U <sub>8</sub> [n]	
Field		Description		Sup.	Range	Unit	Default
		0: void 1: billing period 2 to 255: other valid storage numbers			0 to 255	None	0
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID): 1104 (M_ELECM)		Property ID: 150 ≥ 8		N° of elements fixed or variable length	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level ---		Write level ---			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the StorageNumbers array shall be left unchanged.							

**5.6.6.17 Diagnostic data HistoryDate**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>HistoryDate</b>				Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>
<b>Description:</b>								
<p>Array of date/time information for history values that are received from the M-Bus device and shall be stored by the Data Collector. In the received M-Bus message each HistoryDate is associated with a storage number.</p> <p>In the M_ELECM Interface Object storage numbers, time stamps and historic values belonging together shall be associated with the same Property Value array index. See clause 4.8.</p> <p>Some of the Date/Time fields may be void if not supported in the M-Bus frame</p> <p>The array of history date information is read-only and shall be accessible by polling.</p>								
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet [n]		
Field	Description			Sup.	Range	Unit	Default	
Year	Year information, valid if NY = 0 and Fault = 0			M	0 to 255		1)	
Month	Date.Month information, valid if ND = 0 and Fault = 0			M	1 to 12		1)	
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0			M	1 to 31		1)	
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0			O	1 to 7		1)	
Hour	Time.Hour, valid if NT = 0 and Fault = 0			O	0 to 23	h	1)	
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0			O	0 to 59	min	1)	
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0			O	0 to 59	s	1)	
Attributes	Bitset containing status info							
– Fault	Date/Time information ok {0} / fault {1}			M	fault/ok	bool	ok	
– WD	bank day {0} / working day {1}			O	true/false	bool	WD invalid	
– NWD	validity of WD field invalid {1} / valid {0}			M	true/false	bool	WD invalid	
– NY	validity of Year field invalid {1} / valid {0}			M	true/false	bool	Year invalid	
– ND	validity of Month & DayofMonth fields invalid {1} / valid {0}			M	true/false	bool	Date invalid	
– NdoW	validity of DoW field invalid {1} / valid {0}			M	true/false	bool	DoW invalid	
– NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}			M	true/false	bool	Time invalid	
– SUTl	summertime {1} / standardtime {0} flag			NA	true/false	bool	Standard	
– CLQ	clock quality bit: with {1} / without {0} external synchronization			NA	with / without	bool	without	
<b>Communication:</b>								
<b>DP Address:</b>		IO Type(ID):	1104 (M_ELECM)	Property ID:	151			
<b>(in the server)</b>		Start-Index:	1	N° of elements	≥8			
		fixed or variable length						
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>					
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>			
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.								
<b>Special Features:</b>								
1) Initialisation value shall be 'void' until historic values are available, all 'valid bits' shall be set to 'not valid'.								

**5.6.6.18 LTE Zoning Parameter Apartment**

<b>FB:</b> M_ELECM	<b>Property Name (Server):</b> Apartment		Mandatory <input checked="" type="checkbox"/> <sup>1)</sup> Optional <input type="checkbox"/>	
<b>Description:</b>				
LTE zone: Apartment number used for LTE binding and in addition as localization information for the metering device.				
<b>DPT:</b>	Name	DPT_UcountValue8_Z	DPT ID	202.002
			Datatype format	U <sub>8</sub> Z <sub>8</sub>
Field	Description	Sup.	Range	Unit
CounterValue	Apartment number	M	1 to 126	none
Status				bitset
- OutOfService	zone active /inactive	O	true/false	
- all other flags	not supported, fixed to '0'	NA		
Command				enum
- NormalWrite		M		
- SetOSV & ResetOSV	set zone inactive / active	O		
- all other commands	not supported	NA		
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1104 (M_ELECM)	Property ID:	101
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
---				
<b>Special Features:</b>				
M_ELECM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Room and Subzone is 'OutOfService' (common flag).				
<sup>1)</sup> Mandatory in LTE implementations only.				

**5.6.6.19 LTE Zoning Parameter Room**

<b>FB:</b>	M_ELECM	<b>Property Name (Server):</b>	Room	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
LTE zone: Room number. parameter used for LTE binding and in addition as localization information for the metering device.					
<b>DPT:</b>	Name	DPT	UcountValue8_Z	DPT ID	202.002
				Datatype format	U <sub>8</sub> Z <sub>8</sub>
<b>Field</b>	<b>Description</b>			<b>Sup.</b>	<b>Range</b>
CounterValue	Room number			M	1 to 63
Status				O	
– OutOfService	zone active /inactive			O	true/false
– all other flags	not supported, fixed to '0'			NA	
Command					
– NormalWrite				M	
– SetOSV & ResetOSV	set zone inactive / active			O	
– all other commands	not supported			NA	
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1104 (M_ELECM)	Property ID:	102	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input type="checkbox"/>	Read/Write	<input checked="" type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
---					
<b>Special Features:</b>					
M_ELECM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Room and Subzone is 'OutOfService' (common flag).					
<sup>1)</sup> Mandatory in LTE implementations only.					

### 5.6.6.20 LTE Zoning Parameter Subzone

<b>FB:</b> M_ELECM	<b>Property Name (Server):</b> Subzone		Mandatory <input checked="" type="checkbox"/> <sup>1)</sup> Optional <input type="checkbox"/>	
<b>Description:</b>				
LTE zone: Subzone number within the Apartment & Room used for LTE binding and in addition as localization information for the metering device.				
<b>DPT:</b>	Name	DPT_Value8_Z	DPT ID	202.002
			Datatype format	U <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range
CounterValue	Subzone number		M	1 to 15
Status				Unit
- OutOfService	zone active /inactive		O	bitset
- all other flags	not supported, fixed to '0'		NA	
Command				Default
- NormalWrite			M	1
- SetOSV & ResetOSV	set zone inactive / active		O	
- all other commands	not supported		NA	
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1104 (M_ELECM)	Property ID:	103
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
---				
<b>Special Features:</b>				
M_ELECM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Subzone is 'OutOfService' (common flag).				
<sup>1)</sup> Mandatory in LTE implementations only				

### 5.6.6.21 Diagnostic data RxSequenceCounter

<b>FB:</b> M_ELECM	<b>Property Name (Server):</b> RxSequenceCounter		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>	
<b>Description:</b>				
This Datapoint shall contains the sequence counter that shall be generated locally by the Data Collector and shall be incremented each time an M-Bus message is received from the corresponding M-Bus device. This Property shall be used for consistency checking if metering data is retrieved from the Data Collector.				
During readout of metering data from the Data Collector a new M-Bus frame could be received and read out data would be inconsistent. Therefore the client reading out metering data shall check the sequence counter before and after read out. If the sequence counter value has changed, metering data may be inconsistent ⇒ retry by the client				
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010
			Datatype format	U <sub>8</sub> [n]
Field	Description		Sup.	Range
				0 to 255
				Unit
				Default
				0
<b>Communication:</b>				
<b>DP Address:</b> (in the server)	IO Type(ID):	1104 (M_ELECM)	Property ID:	110
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>
Free running counter with overflow 255 → 0.				
<b>Special Features:</b>				
None.				

**5.6.6.22 Diagnostic data RxReceptionTime**

FB:	M_ELECM	Property Name (Server):		RxReceptionTime		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>	
Description:							
Time stamp generated locally by the Data Collector each time an M-Bus message is received.							
DPT:	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet	
Field	Description			Sup.	Range	Unit	Default
Year	Year information, valid if NY=0 and Fault=0			M	0 to 255		1)
Month	Date.Month information, valid if ND=0 and Fault=0			M	1 to 12		1)
DayofMonth	Date.DayofMonth information, valid if ND=0 and Fault=0			M	1 to 31		1)
DayofWeek	Day of Week information, valid if NdoW=0 and Fault=0			O	1 to 7		1)
Hour	Time.Hour, valid if NT=0 and Fault=0			M	0 to 23	h	1)
Minutes	Time.Minutes, valid if NT=0 and Fault=0			M	0 to 59	min	1)
Seconds	Time.Seconds, valid if NT=0 and Fault=0			M	0 to 59	s	1)
Attributes	Bitset containing status info						
- Fault	Date/Time information ok {0} / fault {1}			M	fault/ok	bool	ok
- WD	bank day {0} / working day {1}			O	true/false	bool	WD invalid
- NWD	validity of WD field invalid {1} / valid {0}			M	true/false	bool	WD invalid
- NY	validity of Year field invalid {1} / valid {0}			M	true/false	bool	Year invalid
- ND	validity of Month & DayofMonth fields invalid {1} / valid {0}			M	true/false	bool	Date invalid
- NdoW	validity of DoW field invalid {1} / valid {0}			M	true/false	bool	DoW invalid
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}			M	true/false	bool	Time invalid
- SUTI	summertime {1} / standardtime {0} flag			NA	true/false	bool	Standard
- CLQ	clock quality bit: with {1} / without {0} external synchronization			NA	with / without	bool	without
Communication:							
DP Address: (in the server)		IO Type(ID):		1104 (M_ELECM)	Property ID:		111
		Start-Index:		1	N° of elements		1
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
1) The Property is stored in volatile memory. After power up the initialisation value is 'void' until a valid M-Bus frame is received from the corresponding M-Bus device, all 'valid bits' are set to 'not valid'							
Special Features:							
With this Datapoint the metering client can check if the Data Collector has up to date metering data.							

**5.6.6.23 Diagnostic data Manufacturer**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>Manufacturer</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>			
				<b>Optional</b> <input type="checkbox"/>			
<b>Description:</b>							
<p>M-Bus specific 16 bit manufacturer code that is received from the M-Bus device and shall be stored by the Data Collector during installation procedure.</p> <p>In the M-Bus message the manufacturer code is contained in the MID field (see [02] and [03]). The MID field contains the Manufacturer ID encoded as a 2 octet unsigned binary value. This Manufacturer ID is calculated from the ASCII code of manufacturer identification (three uppercase letters) with a formula defined in [02].</p> <p>The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit #0 of Property Manufacturer.</p> <p>The value shall be read-only and shall be accessible by polling.</p>							
<b>DPT:</b>	Name	DPT Value	2 Ucount	DPT ID	7.001	Datatype format	U <sub>16</sub>
Field	Description			Sup.	Range	Unit	Default
					full range	none	0
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)		Property ID: 112	
<b>(in the server)</b>		Start-Index:		1		N° of elements 1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
<b>Protection</b>		Read level		Write level			
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>		Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>	
None.							
<b>Special Features:</b>							
Manufacturer 0000h = void value							

**5.6.6.24 Diagnostic data IdentificationNumber**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>IdentificationNumber</b>					Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>
<b>Description:</b>									
<p>Every meter has a unique current identification number preset by manufacture. The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit ≠0 of Property Manufacturer. In this case the FabricationNumber will be additionally provided by meter. The FabricationNumber contains a copy of the original IdentificationNumber.</p> <p>In the M-Bus message the identification number is an M-Bus specific 8 digit BCD code. It shall be received from the M-Bus meter during installation, then mapped to a 32 bit counter value and stored by the Data Collector.</p> <p>The value shall be read-only and shall be accessible by polling.</p>									
<b>DPT:</b>	Name	DPT Value	4	Ucount	DPT ID	12.001	Datatype format	U <sub>32</sub>	
Field	Description				Sup.	Range	Unit	Default	
						full range	---	FFFFFFFFh	
<b>Communication:</b>									
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)		Property ID:		113	
(in the server)		Start-Index:		1		N° of elements		1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
<b>Protection</b>		Read level		---		Write level		---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>									
---									
<b>Special Features:</b>									
IdentificationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for wildcard addressing and is never a valid part of the M-Bus address).									

**5.6.6.25 Diagnostic data VersionNumber**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>VersionNumber</b>					Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>
<b>Description:</b>									
<p>Version of the electricity meter that is received from the M-Bus device during commissioning. The structure is manufacturer specific.</p> <p>Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>During the installation procedure the version number information is provided by the M-Bus meter. The raw value shall be stored by the Data Collector and shall be accessible by polling.</p>									
<b>DPT:</b>	Name	DPT Value	1	Ucount	DPT ID	5.010	Datatype format	U <sub>8</sub>	
Field	Description				Sup.	Range	Unit	Default	
						full	None	0	
<b>Communication:</b>									
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)		Property ID:		114	
(in the server)		Start-Index:		1		N° of elements		1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
<b>Protection</b>		Read level		---		Write level		---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>									
---									
<b>Special Features:</b>									
The structure of the version number is completely manufacturer specific. Therefore no special features can be defined.									



**5.6.6.26 Diagnostic data MeteringDeviceType**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	MeteringDeviceType			<b>Mandatory</b> <input checked="" type="checkbox"/>	<b>Optional</b> <input type="checkbox"/>
<b>Description:</b>							
<p>Metering Device Type of the electricity meter device. Supported values in M_ELECM are:</p> <p>02h: electricity meter</p> <p>255: void device type</p> <p>Every meter has a unique M-Bus “address” preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>During the installation procedure the MeteringDeviceType information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.</p>							
<b>DPT:</b>	Name	DPT_Metering_DeviceType	DPT ID	20.114	Datatype format	N <sub>8</sub>	
	Field	Description	Sup.	Range	Unit	Default	
				{2, 255}	enum.	255	
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	115		
		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>				
<b>Protection</b>		Read level	---	Write level	---		
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>		
None.							
<b>Special Features:</b>							
Device type '255' = void (default value); used to indicate that the FB is not connected to a meter.							

**5.6.6.27 Diagnostic data FabricationNumber**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>FabricationNumber</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Every meter has a unique current identification number preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.					
The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit ≠ 0 of Property Manufacturer. In this case the FabricationNumber will be additionally provided by meter. The FabricationNumber contains a copy of the original IdentificationNumber.					
In the M-Bus message the fabrication number is an M-Bus specific 8 digit BCD code. It shall be received from the M-Bus meter during installation, then mapped to a 32 bit counter value and stored by the Data Collector.					
The value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_Value 4 Ucount	DPT ID	12.001	Datatype format U <sub>32</sub>
Field	Description	Sup.	Range	Unit	Default
			full range	none	FFFFFFFFh
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1104 (M_ELECM)	Property ID:	116	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/> Default Value <input type="checkbox"/>
None.					
<b>Special Features:</b>					
FabricationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for wildcard addressing and is never a valid part of the M-Bus address).					
<sup>1)</sup> Conditional: mandatory in case of M-Bus "soft addressing" in order to have an unambiguous identification of the metering data.					

**5.6.6.28 Diagnostic data AccessNumber**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>AccessNumber</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Consecutive message number that is generated by the electricity meter and that is received from the M-Bus device and shall be stored by the Data Collector. The mechanism of access number is manufacturer specific. The value shall be read-only and shall be accessible by polling.					
The encoding of the AccessNumber in the M-Bus Message is specified in [03].					
<b>DPT:</b>	Name	DPT_Value 1 Ucount	DPT ID	5.010	Datatype format U <sub>8</sub> [n]
Field	Description	Sup.	Range	Unit	Default
			0 ... 255	None.	0
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1104 (M_ELECM)	Property ID:	117	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/> Default Value <input checked="" type="checkbox"/>
Data is stored in volatile memory and is void after power up of the Data Collector.					
<b>Special Features:</b>					
None.					

**5.6.6.29 Diagnostic data DeviceStatus**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>DeviceStatus</b>					Mandatory <input checked="" type="checkbox"/>
Optional <input type="checkbox"/>								
<b>Description:</b>								
M-Bus specific combined Status/Error-code (bitset) of the electricity meter that is received from the M-Bus device.								
The encoding of the DeviceStatus in the M-Bus Message is specified in [03].								
The raw value shall be stored by the Data Collector and shall be accessible by polling.								
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format		U <sub>8</sub>	
Field	Description		Sup.		Range	Unit	Default	
					full	None	0	
<b>Communication:</b>								
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)	Property ID:		118	
<b>(in the server)</b>		Start-Index:		1	N° of elements		1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
<b>Protection</b>		Read level		---	Write level		---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
None.								
<b>Special Features:</b>								
If data in the metering telegram are marked in field 'DeviceStatus' with 'permanent error' (bit 3) then the Status flag 'Fault' of various metering datapoints shall be set to 'true'.								

**5.6.6.30 Diagnostic data OperatingTime**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>OperatingTime</b>					Mandatory <input type="checkbox"/>
Optional <input checked="" type="checkbox"/>								
<b>Description:</b>								
Duration of meter accumulation of the electricity meter that is received from the M-Bus device.								
The value shall be stored by the Data Collector and shall be accessible by polling.								
<b>DPT:</b>	Name	DPT_LongDeltaTimeSec	DPT ID	13.100	Datatype format		V <sub>32</sub>	
Field	Description		Sup.		Range	Unit	Default	
					full <sup>1)</sup> ≥0	s	0	
<b>Communication:</b>								
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)	Property ID:		119	
<b>(in the server)</b>		Start-Index:		1	N° of elements		1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
<b>Protection</b>		Read level		---	Write level		---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>								
None.								
<b>Special Features:</b>								
<sup>1)</sup> encoding on 32 bit signed integer value with 1 second transport format resolution.								
Display resolution: 1 h. The granularity of the internal resolution may be higher.								
Used range: 0 to ~68 years. In practice no binary overflow is thus possible.								

**5.6.6.31 Diagnostic data OnTime**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>OnTime</b>	<b>Mandatory</b> <input type="checkbox"/>	
				<b>Optional</b> <input checked="" type="checkbox"/>	
<b>Description:</b>					
Duration of electricity meter power up that is received from the M-Bus device. The value shall be stored by the Data Collector and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT	LongDeltaTimeSec	DPT ID	13.100
				Datatype format	V <sub>32</sub>
Field	Description			Sup.	Range
					full <sup>1)</sup> ≥0
					Unit s
					Default 0
<b>Communication:</b>					
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)	Property ID:
<b>(in the server)</b>		Start-Index:		1	N° of elements
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>	
<b>Protection</b>		Read level		---	Write level
				---	---
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>					
None.					
<b>Special Features:</b>					
<sup>1)</sup> encoding on 32 bit signed integer value with 1 second <u>transport format</u> resolution. Display resolution: 1 h. The granularity of the internal resolution may be higher. Used range: 0 to ~68 years. In practice no binary overflow is thus possible.					

**5.6.6.32 Diagnostic data CurrentDate**

<b>FB:</b> M_ELECM	<b>Property Name (Server):</b> CurrentDate		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>			
<b>Description:</b>						
Current date and time information of electricity meter that is received from the M-Bus device (time stamp information of the electricity meter for the last M-Bus message containing this information). The value shall be stored by the Data Collector and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octet
Field	Description		Sup.	Range	Unit	Default
Year	Year information, valid if NY = 0 and Fault = 0		M	0 to 255		<sup>1)</sup>
Month	Date.Month information, valid if ND = 0 and Fault = 0		M	1 to 12		<sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0		M	1 to 31		<sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0		O	1 to 7		<sup>1)</sup>
Hour	Time.Hour, valid if NT = 0 and Fault = 0		M	0 to 23	h	<sup>1)</sup>
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0		M	0 to 59	min	<sup>1)</sup>
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0		M	0 to 59	s	<sup>1)</sup>
Attributes	Bitset containing status info					
– Fault	Date/Time information ok {0} / fault {1}		M	fault/ok	bool	ok
– WD	bank day {0} / working day {1}		O	true/false	bool	WD invalid
– NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool	WD invalid
– NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool	Year invalid
– ND	validity of Month & DayofMonth fields invalid {1} / valid {0}		M	true/false	bool	Date invalid
– NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool	DoW invalid
– NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool	Time invalid
– SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool	Standard
– CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool	without
<b>Communication:</b>						
<b>DP Address:</b> (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	121	
		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
None.						
<b>Special Features:</b>						
<sup>1)</sup> initialisation value is 'void' until a valid M-Bus frame was received, all 'valid bits' are set to 'not valid'						

**5.6.6.33 Diagnostic data ErrorDate**

<b>FB:</b> M_ELECM	<b>Property Name (Server):</b> ErrorDate		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>				
<b>Description:</b>							
Date and time information for an error occurrence in the electricity meter that is received from the M-Bus device. This information is related to datapoint ErrorConsumption The value shall be stored by the Data Collector and shall be accessible by polling.							
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octets	
Field	Description		Sup.	Range	Unit	Default	
Year	Year information, valid if NY = 0 and Fault = 0		M	0 to 255		1)	
Month	Date.Month information, valid if ND = 0 and Fault = 0		M	1 to 12		1)	
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0		M	1 to 31		1)	
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0		O	1 to 7		1)	
Hour	Time.Hour, valid if NT = 0 and Fault = 0		M	0 to 23	h	)	
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0		M	0 to 59	min	)	
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0		M	0 to 59	s	)	
Attributes	Bitset containing status info						
- Fault	Date/Time information ok {0} / fault {1}		M	fault/ok	bool	ok	
- WD	bank day {0} / working day {1}		O	true/false	bool	WD invalid	
- NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool	WD invalid	
- NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool	Year invalid	
- ND	validity of Month & DayofMonth fields invalid {1} / valid {0}		M	true/false	bool	Date invalid	
- NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool	DoW invalid	
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool	Time invalid	
- SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool	standard	
- CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool	without	
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	126		
		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>				
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>		
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.							
<b>Special Features:</b>							
If data in the metering telegram are marked in field 'status' with 'permanent error' then the date shall be accepted by the Data Collector. This is the last reliable and valid consumption date from the metering device. 1) Initialisation value is 'void' until a valid M-Bus frame was received, all 'valid bits' are set to 'not valid'							

**5.6.6.34 Diagnostic data AveragingDuration**

FB:	M_ELECM	Property Name (Server):	AveragingDuration			Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>		
Description:								
Measuring time for current min/max value generation (integration time for power measurement). The value is received from the M-Bus device and shall be stored by the Data Collector and shall be accessible by polling.								
DPT:	Name	DPT_LongDeltaTimeSec	DPT ID	13.100	Datatype format		V <sub>32</sub>	
Field		Description			Sup.	Range	Unit	Default
						full <sup>1)</sup> ≥0	s	0
Communication:								
DP Address: (in the server)		IO Type(ID):	1104 (M_ELECM)		Property ID:	129		
		Start-Index:	1		N° of elements	1		
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write		<input type="checkbox"/>		
Protection		Read level	---		Write level	---		
Exception Handling:		Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>	
None.								
Special Features:								
<sup>1)</sup> Encoding on 32 bit signed integer value with 1 second transport format resolution. Display resolution: 1h The granularity of the internal resolution may be higher.								

**5.6.6.35 Diagnostic data ReliabilityOfMeteringData**

Same as in M\_HEATM Object except IO Type (ID) = 1104 (M\_ELECM), see 5.1.6.17.

**5.6.6.36 Diagnostic data MBusRawData**

FB:	M_ELECM	Property Name (Server):	MBusRawData			Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>	
Description:							
Raw data of received M-Bus telegram starting from CI field. Data shall be stored by the Data Collector as a Property array, the supported Property length shall be ≥ 128 elements. For further details see 4.6 “Mapping of M-Bus raw data”.							
DPT:	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format	U <sub>8</sub> [n]	
Field	Description		Sup.	Range	Unit	Default	
				full	None.	array length= 0	
Communication:							
DP Address: (in the server)		IO Type(ID):	1104 (M_ELECM)		Property ID:	130	
		Start-Index:	1		N° of elements	Variable, max length ≥128	
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>		
Protection		Read level	---		Write level	---	
Exception Handling:		Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>
Please refer to clause 4.6 “Mapping of M-Bus raw data”.							
Special Features:							
The Property shall have a variable length according to the last received M-Bus message. The effective length can be checked by the client via A_PropertyDescription_Read-service.							

**5.6.6.37 History Query**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>History Query</b>			Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>							
Function Property to query the contents of metering Properties according 4.10.							
<b>DPT:</b>	Name	None.	DPT ID	n/a	Datatype format	n/a	
Field	Description	Sup.	Range	Unit	Default		
See specification in 4.10.							
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	152		
		Start-Index:	1	N° of elements	1		
<b>Data Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>				
<b>Function Property:</b>		Client: <input type="checkbox"/>	Server: <input checked="" type="checkbox"/>				
<b>Protection</b>		Read level	---		Write level	---	
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							
None.							
<b>Special Features:</b>							
None.							

**5.6.6.38 Parameter UserText**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>UserText</b>			Mandatory <input type="checkbox"/>	Optional <input checked="" type="checkbox"/>
<b>Description:</b>							
Additional text information to the metering device, which can be entered on the Data Collector by the installer during commissioning. See clause 2.							
<b>DPT:</b>	Name	DPT_VarString_8859_1	DPT ID	24.001	Datatype format	A[n]	
Field	Description	Sup.	Range	Unit	Default		
UserText	Null terminated string.	M	see datatype "char set"			'00h'	
<b>Communication:</b>							
<b>DP Address:</b> (in the server)		IO Type(ID):	1104 (M_ELECM)	Property ID:	160		
		Start-Index:	1	N° of elements	1		
<b>Property access:</b>		Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>				
<b>Exception Handling:</b> Value after Powerup: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							
None.							
<b>Special Features:</b>							
None.							



**5.6.6.39 Parameter MeterReplacement**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>MeterReplacement</b>	<b>Mandatory</b> <input checked="" type="checkbox"/>			
				<b>Optional</b> <input type="checkbox"/>			
<b>Description:</b>							
<p>Management of metering device directory in the Data Collector is company specific and not part of this specification. The Data Collector shall however provide appropriate procedures to manage and detect the replacement of a metering device by another device (with different identification number and e.g. different unit/resolution of the metering data). See also clause 2.</p> <p>In case of meter replacement the corresponding M_ELECM Interface Object will normally contain data of the newly connected M-Bus device and M-Bus Identifiers (Manufacturer, IdentificationNumber, VersionNumber, MeteringDeviceType, FabricationNumber etc) of the original meter are overwritten as well as metering data etc.</p> <p>In case of meter replacement it may be necessary to reconfigure the link for S-Mode objects by ETS data because data interpretation may have changed due to different data unit/resolution. See also clause 4.3.</p> <p>Each time a metering device is replaced the Property MeterReplacement shall be set automatically in the corresponding Interface Object and the related metering standard Group Objects shall be 'void'. After link adaptation by ETS the MeterReplacement flag shall be reset manually by the installer/service technician (e.g. via the local user interface of the Data Collector or remotely via property write using ETS or another tool).</p>							
<b>DPT:</b>	Name	DPT Bool	DPT ID	1.002	Datatype format		B <sub>1</sub>
Field	Description		Sup.	Range	Unit	Default	
				true/false	bool	false	
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)	Property ID:		161
<b>(in the server)</b>		Start-Index:		1	N° of elements		1
<b>Property access:</b>		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
None.							
<b>Special Features:</b>							
None.							

**5.6.6.40 Parameter MeterReplacementCounter**

<b>FB:</b>	<b>M_ELECM</b>	<b>Property Name (Server):</b>	<b>MeterReplacementCounter</b>	<b>Mandatory</b> <input type="checkbox"/>			
				<b>Optional</b> <input checked="" type="checkbox"/>			
<b>Description:</b>							
<p>This Property shall indicate the number of meter replacements and shall be handled together with the Property MeterReplacement (see above).</p> <p>The counter value shall be incremented automatically each time a connected meter is replaced.</p> <p>The Datapoint is (normally) read only, but may be reset by the installer/technician.</p> <p>The MeterReplacementCounter is useful for additional diagnostic information in the billing process.</p>							
<b>DPT:</b>	Name	DPT Value_1 Ucount	DPT ID	5.010	Datatype format		U <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default	
				0 to 255	None	0	
<b>Communication:</b>							
<b>DP Address:</b>		IO Type(ID):		1104 (M_ELECM)	Property ID:		162
<b>(in the server)</b>		Start-Index:		1	N° of elements		1
<b>Property access:</b>		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
Free running counter with overflow 255 - > 0.							
<b>Special Features:</b>							
<p>If there is no meter connected to the Interface Object the initial value shall be 0 (ex-factory). After connection of the first meter, the value is incremented and has the value 1. The value shall be stored in non-volatile memory.</p>							

## 5.7 MDC Breaker (M\_BREAKERM)

### 5.7.1 Aims and objectives

The Functional Block ‘MDC Breaker’ shall map M-Bus Breaker data (M-Bus device type = 2 and 32) to the KNX system (standard KNX physical media, services and Datapoint Types).

NOTE 21 The Breaker is either an integrated part of the electricity meter (Device type 2) or a dedicated device to interrupt the electricity supply (Device type 32).

### 5.7.2 Functional Specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features shall be supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages), see clause 1.2.

The breaker acts like an actuator on the M-BUS. But for security reasons there is no control function of the breaker via the KNX connection. The KNX Data Collector may only present the current state of the breaker. The breaker may have one of these three states:

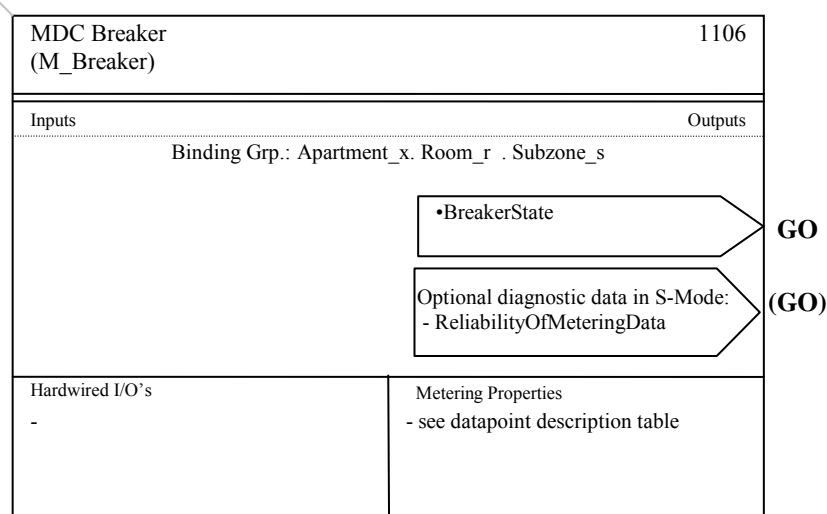
- Closed (Energy supply is active).
- Open (Energy supply is intentionally interrupted by the energy supplier).
- Released (Energy supply is still interrupted, but energy supplier released the breaker, the consumer may enable service by pressing a service button on the breaker).

The Breaker state and other typically metering device Datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service. In addition the breaker state may be available also as standard Group Object in Standard Mode for visualization on displays etc. See clause 1.2. Therefore the complete set of supported breaker datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

### 5.7.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.7.4 Functional Block diagram



## 5.7.5 Datapoint description

### 5.7.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs (multicast communication)</b>				
BreakerState	153	Describing the status of the breaker: Energy supply is closed or open or released.	<b>Property:</b> DPT_MBus_BreakerValve_ - State / PDT_ENUM8	20.1200
			<b>Standard Mode:</b> DPT_MBus_BreakerValve_ - State	20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Input</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties (polling)</b>				
BreakerState	153	Describing the status of the breaker: Energy supply is closed or open or released.	DPT_MBus_BreakerValve_ - State / PDT_ENUM8	20.1200

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter (watchdog)	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This Property shall be used for consistency checking.	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received.	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
MeteringDeviceType	115	Metering Device Type. Supported values in M_BREAKERM are: 2: Electricity meter 32: Breaker (electricity) 255: void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] $n \geq 128$	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus breaker is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician.	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a breaker is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

**M\_BREAKERM Runtime Interworking - Dependence on Configuration Modes**

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
<b>Inputs</b>	none				
<b>Outputs</b>	BreakerState	GO <sub>b</sub>	GO	GO	NA
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA

(O)\*: optionally possible/allowed but not specified in this document

**M\_BREAKERM Zoning Parameters**

		Support
<b>Parameter</b>	Apartment	M*
	Room	M*
	Subzone	M*

\* mandatory in LTE implementations only

**M\_BREAKERM Standard Properties of Interface Objects**

Parameter / Diagnostic Value	Support
BreakerState	M
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	O
OnTime	O
CurrentDate	M
ErrorDate	M
MBusRawData	M
UserText	O
MeterReplacement	M
MeterReplacementCounter	O

- \* Conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.

**5.7.6 Detailed specification of the Datapoints****5.7.6.1 Output BreakerState****Property specification**

<b>FB: M_BREAKERM</b>		<b>Property Name (Server):</b>		<b>BreakerState</b>		<b>Mandatory</b> <input checked="" type="checkbox"/>		<b>Optional</b> <input type="checkbox"/>	
<b>Description:</b>									
This value is received from the M-Bus Breaker or Valve and contains the current state of the breaker or valve.									
The breaker may be a dedicated device or may be a function integrated in a metering device, like the electricity meter.									
	Name	DPT_MBus_BreakerValve_State			DPT ID	20.1200	Datatype format		N <sub>8</sub>
Field		Description			Sup.	Range	Unit	Default	
Breaker State		This field shall indicate whether the breaker is open, closed or released.			M	0 to 2, 255	None	255	
<b>Communication:</b>									
<b>DP Address: (in the server)</b>		IO Type(ID):		1106 (M_BREAKERM)	Property ID:		153		
		Start-Index:		1	N° of elements		1		
<b>Property access:</b>		Read only		<input checked="" type="checkbox"/>	Read/Write		<input type="checkbox"/>		
<b>Protection</b>		Read level		---	Write level		---		
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>									
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.									
<b>Special Features:</b>									

**Group Object (Standard Mode):**

DP Name:	BreakerState	Abbr.:	---	Mandatory	<input checked="" type="checkbox"/>
FB Name:	M_BREAKERM			Can be internal	<input type="checkbox"/>
<b>Description</b>					
This value is received from the M-Bus Breaker and shall be stored by the Data Collector. The state shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_MBus_BreakerValve_State				
DPT_Format:	N <sub>8</sub>	DPT_ID:	20.1200		
Field	Description	Supp.	Range	Unit	Default
Breaker State	This field shall indicate whether the breaker is open, closed or released.		0 to 2, 255	None	255
<b>Access Type</b>					
◆ Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
Transmit on bus (only for output):			<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value FFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus Breaker data are transmitted periodically, typically 2 times to 8 times per hour. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object.					

**5.7.6.2 LTE Zoning Parameter Apartment**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>Apartment</b>		<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
					<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>						
LTE zone: Apartment number used for LTE binding and in addition as localization information for the metering device.						
<b>DPT:</b>	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
CounterValue	Apartment number		M	1 to 126	none	1
Status					bitset	
- OutOfService	zone active /inactive		O	true/false		false
- all other flags	not supported, fixed to '0'		NA			
Command					enum	
- NormalWrite			M			
- SetOSV & ResetOSV	set zone inactive / active		O			
- all other commands	not supported		NA			
<b>Communication:</b>						
<b>DP Address:</b>	IO Type(ID): 1106 (M_BREAKERM)		Property ID: 101			
<b>(in the server)</b>	Start-Index: 1		N° of elements 1			
<b>Property access:</b>	Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
<b>Protection</b>	Read level ---		Write level ---			
<b>Exception Handling:</b>	Value after Powerup: Stored Value <input checked="" type="checkbox"/>		Act Value <input type="checkbox"/>		Default Value <input type="checkbox"/>	
---						
<b>Special Features:</b>						
M_BREAKERM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Room and Subzone is 'OutOfService' (common flag).						
<sup>1)</sup> Mandatory in LTE implementations only.						



**5.7.6.3 LTE Zoning Parameter Room**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>Room</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
LTE zone: Room number. parameter used for LTE binding and in addition as localization information for the metering device.					
<b>DPT:</b>	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format U <sub>8</sub> Z <sub>8</sub>
Field	Description		Sup.	Range	Unit
CounterValue	Room number		M	1 to 63	none
Status					bitset
– OutOfService	zone active /inactive		O	true/false	
– all other flags	not supported, fixed to '0'		NA		false
Command					enum
– NormalWrite			M		
– SetOSV & ResetOSV	set zone inactive / active		O		
– all other commands	not supported		NA		
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID): 1106 (M_BREAKERM)		Property ID:		102
<b>(in the server)</b>	Start-Index: 1		N° of elements		1
<b>Property access:</b>	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>			
<b>Protection</b>	Read level ---	Write level ---			
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
---					
<b>Special Features:</b>					
M_BREAKERM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Room and Subzone is 'OutOfService' (common flag).					
<sup>1)</sup> Mandatory in LTE implementations only.					

### 5.7.6.4 LTE Zoning Parameter Subzone

FB: M_BREAKERM		Property Name (Server): Subzone			Mandatory <input checked="" type="checkbox"/> <sup>1)</sup>	
					Optional <input type="checkbox"/>	
Description:						
LTE zone: Subzone number within the Apartment & Room used for LTE binding and in addition as localization information for the metering device.						
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U <sub>8</sub> Z <sub>8</sub>
Field		Description		Sup.	Range	Unit Default
CounterValue		Subzone number		M	1 to 15	none 1
Status						bitset
- OutOfService		zone active /inactive		O	true/false	
- all other flags		not supported, fixed to '0'		NA		false
Command						enum
- NormalWrite				M		
- SetOSV & ResetOSV		set zone inactive / active		O		
- all other commands		not supported		NA		
Communication:						
DP Address: (in the server)		IO Type(ID):	1106 (M_BREAKERM)	Property ID:	103	
		Start-Index:	1	N° of elements	1	
Property access:		Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>			
Protection		Read level	---	Write level	---	
Exception Handling:		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
---						
Special Features:						
M_BREAKERM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService' also the corresponding Subzone is 'OutOfService' (common flag).						
<sup>1)</sup> Mandatory in LTE implementations only						

### 5.7.6.5 Diagnostic data RxSequenceCounter

FB:	M_BREAKERM	Property Name (Server):	RxSequenceCounter	Mandatory	<input checked="" type="checkbox"/>			
				Optional	<input type="checkbox"/>			
Description:								
This Datapoint shall contains the sequence counter that shall be generated locally by the Data Collector and shall be incremented each time an M-Bus message is received from the corresponding M-Bus device. This Property shall be used for consistency checking if metering data is retrieved from the Data Collector.								
During readout of metering data from the Data Collector a new M-Bus frame could be received and read out data would be inconsistent. Therefore the client reading out metering data shall check the sequence counter before and after read out. If the sequence counter value has changed, metering data may be inconsistent ⇒ retry by the client								
DPT:	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format	U <sub>8</sub> [n]		
Field	Description			Sup.	Range	Unit	Default	
					0 to 255	---	0	
Communication:								
DP Address: (in the server)	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	110	Start-Index:	1	N° of elements	1
Property access:	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>				
Protection	Read level	---	Write level	---				
Exception Handling:	Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value	<input checked="" type="checkbox"/>	
Free running counter with overflow 255 → 0.								
Special Features:								
None.								

**5.7.6.6 Diagnostic data RxReceptionTime**

FB: M_BREAKERM		Property Name (Server):		RxReceptionTime		Mandatory <input checked="" type="checkbox"/>	
						Optional <input type="checkbox"/>	
Description:							
Time stamp generated locally by the Data Collector each time an M-Bus message is received.							
DPT:	Name	DPT_DateTime	DPT ID	19.001	Datatype format		8 octet
Field	Description			Sup.	Range	Unit	Default
Year	Year information, valid if NY=0 and Fault=0			M	0 to 255		1)
Month	Date.Month information, valid if ND=0 and Fault=0			M	1 to 12		1)
DayofMonth	Date.DayofMonth information, valid if ND=0 and Fault=0			M	1 to 31		1)
DayofWeek	Day of Week information, valid if NdoW=0 and Fault=0			O	1 to 7		1)
Hour	Time.Hour, valid if NT=0 and Fault=0			M	0 to 23	h	1)
Minutes	Time.Minutes, valid if NT=0 and Fault=0			M	0 to 59	min	1)
Seconds	Time.Seconds, valid if NT=0 and Fault=0			M	0 to 59	s	1)
Attributes	Bitset containing status info						
- Fault	Date/Time information ok {0} / fault {1}			M	fault/ok	bool	ok
- WD	bank day {0} / working day {1}			O	true/false	bool	WD
- NWD	validity of WD field invalid {1} / valid {0}			M	true/false	bool	invalid WD
- NY	validity of Year field invalid {1} / valid {0}			M	true/false	bool	invalid Year
- ND	validity of Month & DayofMonth fields invalid {1} / valid {0}			M	true/false	bool	invalid Date
- NdoW	validity of DoW field invalid {1} / valid {0}			M	true/false	bool	invalid DoW
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}			M	true/false	bool	invalid Time
- SUTI	summertime {1} / standardtime {0} flag			NA	true/false	bool	Standard
- CLQ	clock quality bit: with {1} / without {0} external synchronization			NA	with / without	bool	without
Communication:							
DP Address: (in the server)		IO Type(ID):		1106 (M_BREAKERM)	Property ID:		111
		Start-Index:		1	N° of elements		1
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>							
1) The Property is stored in volatile memory. After power up the initialisation value is 'void' until a valid M-Bus frame is received from the corresponding M-Bus device, all 'valid bits' are set to 'not valid'							
Special Features:							
With this Datapoint the metering client can check if the Data Collector has up to date metering data.							

**5.7.6.7 Diagnostic data Manufacturer**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>Manufacturer</b>	Mandatory	<input checked="" type="checkbox"/>
				Optional	<input type="checkbox"/>
<b>Description:</b>					
<p>M-Bus specific 16 bit manufacturer code that is received from the M-Bus device and shall be stored by the Data Collector during installation procedure.</p> <p>In the M-Bus message the manufacturer code is contained in the MID field (see [02] and [03][03]). The MID field contains the Manufacturer ID encoded as a 2 octet unsigned binary value. This Manufacturer ID is calculated from the ASCII code of manufacturer identification (three uppercase letters) with a formula defined in [02].</p> <p>The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.</p> <p>The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit #0 of Property Manufacturer.</p> <p>The value shall be read-only and shall be accessible by polling.</p>					
<b>DPT:</b>	Name	DPT Value	2 Ucount	DPT ID	7.001
				Datatype format	U <sub>16</sub>
Field	Description			Sup.	Range
					full range
				Unit	none
				Default	0
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	112	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
None.					
<b>Special Features:</b>					
Manufacturer 0000h = void value					

**5.7.6.8 Diagnostic data IdentificationNumber**

FB:	M_BREAKERM	Property Name (Server):	IdentificationNumber	Mandatory	<input checked="" type="checkbox"/>
				Optional	<input type="checkbox"/>
Description:					
Every meter has a unique current identification number preset by manufacture. The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.					
The IdentificationNumber may have been changed in the meter by the installer during commissioning (“soft addressing”). This is indicated in the most significant bit ≠0 of Property Manufacturer. In this case the FabricationNumber will be additionally provided by meter. The FabricationNumber contains a copy of the original IdentificationNumber.					
In the M-Bus message the identification number is an M-Bus specific 8 digit BCD code. It shall be received from the M-Bus meter during installation, then mapped to a 32 bit counter value and stored by the Data Collector.					
The value shall be read-only and shall be accessible by polling.					
DPT:	Name	DPT Value	4 Ucount	DPT ID	12.001
				Datatype format	U <sub>32</sub>
Field	Description			Sup.	Range
					full range
				Unit	Default
				---	FFFFFFFFh
Communication:					
DP Address: (in the server)	IO Type(ID):	1106 (M_BREAKERM	Property ID:	113	
	Start-Index:	1	N° of elements	1	
Property access:	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
Protection	Read level	---	Write level	---	
Exception Handling:	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
---					
Special Features:					
IdentificationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for wildcard addressing and is never a valid part of the M-Bus address).					

**5.7.6.9 Diagnostic data VersionNumber**

<b>FB:</b> M_BREAKERM	<b>Property Name (Server):</b> VersionNumber		Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>
<b>Description:</b>				
Version of the heat meter that is received from the M-Bus device during commissioning. The structure is manufacturer specific. Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the version number information is provided by the M-Bus meter. The raw value shall be stored by the Data Collector and shall be accessible by polling.				
<b>DPT:</b>	Name	DPT Value 1 Ucount	DPT ID	5.010 Datatype format U <sub>8</sub>
Field	Description	Sup.	Range	Unit Default
			full	None 0
<b>Communication:</b>				
<b>DP Address: (in the server)</b>	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	114
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
---				
<b>Special Features:</b>				
The structure of the version number is completely manufacturer specific. Therefore no special features can be defined.				

**5.7.6.10 Diagnostic data MeteringDeviceType**

<b>FB:</b> M_BREAKERM	<b>Property Name (Server):</b> MeteringDeviceType		Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>
<b>Description:</b>				
Applied Device Type of the breaker device. Supported values in M_BREAKERM are: 2: Electricity meter 32: external Breaker (electricity) 255: void device type Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the Metering Medium information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.				
<b>DPT:</b>	Name	DPT Metering_DeviceType	DPT ID	20.114 Datatype format N <sub>8</sub>
Field	Description	Sup.	Range	Unit Default
Metering_DeviceType	KNX specific indication of the M-Bus device type.	M	{2, 32, 255}	none 255
<b>Communication:</b>				
<b>DP Address: (in the server)</b>	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	115
	Start-Index:	1	N° of elements	1
<b>Property access:</b>	Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Protection</b>	Read level	---	Write level	---
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
None.				
<b>Special Features:</b>				
Device type '255' = void (default value); used to indicate that the FB is not connected to a meter.				

**5.7.6.11 Diagnostic data FabricationNumber**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>FabricationNumber</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/> <sup>1)</sup>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Every meter has a unique current identification number preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification.					
The IdentificationNumber may have been changed in the meter by the installer during commissioning ("soft addressing"). This is indicated in the most significant bit ≠ 0 of Property Manufacturer. In this case the FabricationNumber will be additionally provided by meter. The FabricationNumber contains a copy of the original IdentificationNumber.					
In the M-Bus message the fabrication number is an M-Bus specific 8 digit BCD code. It shall be received from the M-Bus meter during installation, then mapped to a 32 bit counter value and stored by the Data Collector.					
The value shall be read-only and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_Value 4 Ucount	DPT ID	12.001	Datatype format U <sub>32</sub>
Field	Description	Sup.	Range	Unit	Default
			full range	none	FFFFFFFFh
<b>Communication:</b>					
<b>DP Address: (in the server)</b>	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	116	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
None.					
<b>Special Features:</b>					
FabricationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for wildcard addressing and is never a valid part of the M-Bus address).					
<sup>1)</sup> Conditional: mandatory in case of M-Bus "soft addressing" in order to have an unambiguous identification of the metering data.					

**5.7.6.12 Diagnostic data AccessNumber**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>AccessNumber</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Consecutive message number that is generated by the heat meter and that is received from the M-Bus device and shall be stored by the Data Collector. The mechanism of access number is manufacturer specific. The value shall be read-only and shall be accessible by polling.					
The encoding of the AccessNumber in the M-Bus Message is specified in [03].					
<b>DPT:</b>	Name	DPT_Value 1 Ucount	DPT ID	5.010	Datatype format U <sub>8</sub> [n]
Field	Description	Sup.	Range	Unit	Default
			0 ... 255	None.	0
<b>Communication:</b>					
<b>DP Address: (in the server)</b>	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	117	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input checked="" type="checkbox"/>
Data is stored in volatile memory and is void after power up of the Data Collector.					
<b>Special Features:</b>					
None.					

**5.7.6.13 Diagnostic data DeviceStatus**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>DeviceStatus</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
M-Bus specific combined Status/Error-code (bitset) of the heat meter that is received from the M-Bus device.					
The encoding of the DeviceStatus in the M-Bus Message is specified in [03].					
The raw value shall be stored by the Data Collector and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format
Field	Description		Sup.	Range	Unit
				full	None
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	118	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input checked="" type="checkbox"/>
None.					
<b>Special Features:</b>					
If data in the metering telegram are marked in field 'DeviceStatus' with 'permanent error' (bit 3) then the Status flag 'Fault' of various metering datapoints shall be set to 'true'.					

**5.7.6.14 Diagnostic data OperatingTime**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>OperatingTime</b>	<b>Mandatory</b>	<input type="checkbox"/>
				<b>Optional</b>	<input checked="" type="checkbox"/>
<b>Description:</b>					
Duration of meter accumulation of the heat meter that is received from the M-Bus device.					
The value shall be stored by the Data Collector and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_LongDeltaTimeSec	DPT ID	13.100	Datatype format
Field	Description		Sup.	Range	Unit
				full <sup>1)</sup> ≥0	s
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	119	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input checked="" type="checkbox"/>
None.					
<b>Special Features:</b>					
<sup>1)</sup> Encoding on 32 bit signed integer value with 1 second transport format resolution. Display resolution: 1 h. The granularity of the internal resolution may be higher. Used range: 0 to ~68 years. In practice no binary overflow is thus possible.					



**5.7.6.15 Diagnostic data OnTime**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b> OnTime				<b>Mandatory</b> <input type="checkbox"/>		<b>Optional</b> <input checked="" type="checkbox"/>	
<b>Description:</b>									
Duration of heat meter power up that is received from the M-Bus device. The value shall be stored by the Data Collector and shall be accessible by polling.									
<b>DPT:</b>	Name	DPT	LongDeltaTimeSec	DPT ID	13.100	Datatype format		V <sub>32</sub>	
Field	Description			Sup.	Range	Unit	Default		
					full <sup>1)</sup> ≥0	s	0		
<b>Communication:</b>									
<b>DP Address:</b> (in the server)		IO Type(ID):		1106 (M_BREAKERM)		Property ID:		120	
		Start-Index:		1		N° of elements		1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
<b>Protection</b>		Read level		---		Write level		---	
<b>Exception Handling:</b>		Value after Powerup:		Stored Value <input type="checkbox"/>		Act Value <input type="checkbox"/>		Default Value <input checked="" type="checkbox"/>	
None.									
<b>Special Features:</b>									
<sup>1)</sup> Encoding on 32 bit signed integer value with 1 second <u>transport format</u> resolution. Display resolution: 1 h. The granularity of the internal resolution may be higher. Used range: 0 to ~68 years. In practice no binary overflow is thus possible.									

**5.7.6.16 Diagnostic data CurrentDate**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>CurrentDate</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
Current date and time information of heat meter that is received from the M-Bus device (time stamp information of the heat meter for the last M-Bus message containing this information). The value shall be stored by the Data Collector and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format 8 octet
Field	Description		Sup.	Range	Unit Default
Year	Year information, valid if NY = 0 and Fault = 0		M	0 to 255	h <sup>1)</sup>
Month	Date.Month information, valid if ND = 0 and Fault = 0		M	1 to 12	h <sup>1)</sup>
DayofMonth	Date.DayofMonth information, valid if ND = 0 and Fault = 0		M	1 to 31	h <sup>1)</sup>
DayofWeek	Day of Week information, valid if NdoW = 0 and Fault = 0		O	1 to 7	h <sup>1)</sup>
Hour	Time.Hour, valid if NT = 0 and Fault = 0		M	0 to 23	h <sup>1)</sup>
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0		M	0 to 59	min <sup>1)</sup>
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0		M	0 to 59	s <sup>1)</sup>
Attributes	Bitset containing status info				
– Fault	Date/Time information ok {0} / fault {1}		M	fault/ok	bool ok
– WD	bank day {0} / working day {1}		O	true/false	bool WD invalid
– NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool WD invalid
– NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool Year invalid
– ND	validity of Month & DayofMonth fields invalid {1} / valid {0}		M	true/false	bool Date invalid
– NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool DoW invalid
– NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool Time invalid
– SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool Standard
– CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool without
<b>Communication:</b>					
<b>DP Address:</b> (in the server)		IO Type(ID):	1106 (M_BREAKERM)	Property ID:	121
		Start-Index:	1	N° of elements	1
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>		
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input checked="" type="checkbox"/>
None.					
<b>Special Features:</b>					
<sup>1)</sup> initialisation value is 'void' until a valid M-Bus frame was received, all 'valid bits' are set to 'not valid'					

**5.7.6.17 Diagnostic data ErrorDate**

<b>FB:</b> M_BREAKERM	<b>Property Name (Server):</b> ErrorDate			Mandatory <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>	
<b>Description:</b>						
Date and time information for an error occurrence in the heat meter that is received from the M-Bus device.						
This information is related to datapoint ErrorConsumption						
The value shall be stored by the Data Collector and shall be accessible by polling.						
<b>DPT:</b>	Name	DPT_DateTime	DPT ID	19.001	Datatype format	8 octets
Field	Description		Sup.	Range	Unit	Default
Year	Year information, valid if NY = 0 and Fault = 0		M	0 to 255		<sup>1)</sup>
Month	Date.Month information, valid if ND = 0 and Fault = 0		M	1 to 12		<sup>1)</sup>
DayOfMonth	Date.DayOfMonth information, valid if ND = 0 and Fault = 0		M	1 to 31		<sup>1)</sup>
DayOfWeek	Day of Week information, valid if NdoW = 0 and Fault = 0		O	1 to 7		<sup>1)</sup>
Hour	Time.Hour, valid if NT = 0 and Fault = 0		M	0 to 23	h	<sup>1)</sup>
Minutes	Time.Minutes, valid if NT = 0 and Fault = 0		M	0 to 59	min	<sup>1)</sup>
Seconds	Time.Seconds, valid if NT = 0 and Fault = 0		M	0 to 59	s	<sup>1)</sup>
Attributes	Bitset containing status info					
- Fault	Date/Time information ok {0} / fault {1}		M	fault/ok	bool	ok
- WD	bank day {0} / working day {1}		O	true/false	bool	WD invalid
- NWD	validity of WD field invalid {1} / valid {0}		M	true/false	bool	WD invalid
- NY	validity of Year field invalid {1} / valid {0}		M	true/false	bool	Year invalid
- ND	validity of Month & DayOfMonth fields invalid {1} / valid {0}		M	true/false	bool	Date invalid
- NdoW	validity of DoW field invalid {1} / valid {0}		M	true/false	bool	DoW invalid
- NT	validity of Hour, Minutes, Seconds fields invalid {1} / valid {0}		M	true/false	bool	Time invalid
- SUTl	summertime {1} / standardtime {0} flag		NA	true/false	bool	standard
- CLQ	clock quality bit: with {1} / without {0} external synchronization		NA	with / without	bool	without
<b>Communication:</b>						
<b>DP Address:</b>		IO Type(ID):	1106 (M_BREAKERM)	Property ID:	126	
<b>(in the server)</b>		Start-Index:	1	N° of elements	1	
<b>Property access:</b>		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
<b>Exception Handling:</b> Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
<b>Special Features:</b>						
If data in the metering telegram are marked in field 'status' with 'permanent error' then the date shall be accepted by the Data Collector. This is the last reliable and valid consumption date from the metering device.						
<sup>1)</sup> Initialisation value is 'void' until a valid M-Bus frame was received, all 'valid bits' are set to 'not valid'						

**5.7.6.18 Diagnostic data MBusRawData**

FB:	M_BREAKERM	Property Name (Server): MBusRawData				Mandatory	<input checked="" type="checkbox"/>	
						Optional	<input type="checkbox"/>	
Description:								
Raw data of received M-Bus telegram starting from CI field. Data shall be stored by the Data Collector as a Property array, the supported Property length shall be ≥ 128 elements. For further details see 4.6 “Mapping of M-Bus raw data”.								
DPT:	Name	DPT_Value_1_Ucount	DPT ID	5.010	Datatype format	U <sub>8</sub> [n]		
Field	Description	Sup.	Range	Unit	Default			
			full	None.	array length= 0			
Communication:								
DP Address: (in the server)		IO Type(ID):	1106 (M_BREAKERM)	Property ID:	130			
		Start-Index:	1	N° of elements	Variable, max length ≥128			
Property access:		Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>			
Protection		Read level	---	Write level	---			
Exception Handling:		Value after Powerup:	Stored Value	<input type="checkbox"/>	Act Value	<input type="checkbox"/>	Default Value	<input checked="" type="checkbox"/>
Please refer to clause 4.6 “Mapping of M-Bus raw data”.								
Special Features:								
The Property shall have a variable length according to the last received M-Bus message. The effective length can be checked by the client via A_PropertyDescription_Read-service.								

**5.7.6.19 Parameter UserText**

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>UserText</b>	<b>Mandatory</b>	<input type="checkbox"/>
				<b>Optional</b>	<input checked="" type="checkbox"/>
<b>Description:</b>					
Additional text information to the metering device, which can be entered on the Data Collector by the installer during commissioning. See clause 2.					
<b>DPT:</b>	Name	DPT_VarString_8859_1	DPT ID	24.001	Datatype format
					A[n]
Field	Description		Sup.	Range	Unit
					Default
UserText	Null terminated string.		M	see datatype "char set"	'00h'
<b>Communication:</b>					
<b>DP Address:</b>		IO Type(ID): 1106 (M_BREAKERM)		Property ID:	160
<b>(in the server)</b>		Start-Index: 1		N° of elements	1
<b>Property access:</b>		Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
<b>Exception Handling:</b>		Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>
None.					
<b>Special Features:</b>					
None.					


### 5.7.6.20 Parameter MeterReplacement

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>MeterReplacement</b>	<b>Mandatory</b>	<input checked="" type="checkbox"/>
				<b>Optional</b>	<input type="checkbox"/>
<b>Description:</b>					
<p>Management of metering device directory in the Data Collector is company specific and not part of this specification. The Data Collector shall however provide appropriate procedures to manage and detect the replacement of a metering device by another device (with different identification number and e.g. different unit/resolution of the metering data). See also clause 2.</p> <p>In case of meter replacement the corresponding M_BREAKERM Interface Object will normally contain data of the newly connected M-Bus device and M-Bus Identifiers (Manufacturer, IdentificationNumber, VersionNumber, MeteringDeviceType, FabricationNumber etc) of the original meter are overwritten as well as metering data etc.</p> <p>In case of meter replacement it may be necessary to reconfigure the link for S-Mode objects by ETS data because data interpretation may have changed due to different data unit/resolution. See also clause 4.3.</p> <p>Each time a metering device is replaced the Property MeterReplacement shall be set automatically in the corresponding Interface Object and the related metering standard Group Objects shall be 'void'. After link adaptation by ETS the MeterReplacement flag shall be reset manually by the installer/service technician (e.g. via the local user interface of the Data Collector or remotely via property write using ETS or another tool).</p>					
<b>DPT:</b>	Name	DPT Bool	DPT ID	1.002	Datatype format B <sub>1</sub>
Field	Description		Sup.	Range	Unit Default
				true/false	bool false
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	161	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>			
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
None.					
<b>Special Features:</b>					
None.					

### 5.7.6.21 Parameter MeterReplacementCounter

<b>FB:</b>	<b>M_BREAKERM</b>	<b>Property Name (Server):</b>	<b>MeterReplacementCounter</b>	<b>Mandatory</b>	<input type="checkbox"/>
				<b>Optional</b>	<input checked="" type="checkbox"/>
<b>Description:</b>					
<p>This Property shall indicate the number of meter replacements and shall be handled together with the Property MeterReplacement (see above).</p> <p>The counter value shall be incremented automatically each time a connected meter is replaced.</p> <p>The Datapoint is (normally) read only, but may be reset by the installer/technician.</p> <p>The MeterReplacementCounter is useful for additional diagnostic information in the billing process.</p>					
<b>DPT:</b>	Name	DPT Value_1 Ucount	DPT ID	5.010	Datatype format U <sub>8</sub>
Field	Description		Sup.	Range	Unit Default
				0 to 255	None 0
<b>Communication:</b>					
<b>DP Address:</b> (in the server)	IO Type(ID):	1106 (M_BREAKERM)	Property ID:	162	
	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>			
<b>Exception Handling:</b>	Value after Powerup:	Stored Value <input checked="" type="checkbox"/>	Act Value <input type="checkbox"/>	Default Value <input type="checkbox"/>	
Free running counter with overflow 255 - > 0.					
<b>Special Features:</b>					
If there is no meter connected to the Interface Object the initial value shall be 0 (ex-factory). After connection of the first meter, the value is incremented and has the value 1. The value shall be stored in non-volatile memory.					

### 5.7.7 Datapoint Type DPT\_MBus\_BreakerValve\_State

 This new DPT will after the acceptance in Final Voting of this document be moved to Chapter 3/7/2 "Datapoint Types".

<u>Format:</u>	1 octet: N <sub>8</sub>								
octet nr.	1								
field names	<table border="1"><tr><td><i>field1</i></td></tr></table>	<i>field1</i>							
<i>field1</i>									
encoding	<table border="1"><tr><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td></tr></table>	N	N	N	N	N	N	N	N
N	N	N	N	N	N	N	N		
<u>Encoding:</u>	Encoding absolute value N = [0 ... 255]								
<u>Unit:</u>	none								
<u>Resol.:</u>	none								
<u>PDT:</u>	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)								

Datapoint Types				
<u>ID:</u>	<u>Name:</u>	<u>Encoding:</u>	<u>Range:</u>	<u>Use:</u>
20.1200	DPT_MBus_BreakerValve_State	<i>field1</i> = Breaker State 0: Breaker/Valve is closed 1: Breaker/Valve is open 2: Breaker/Valve is released 3 to 254: reserved 255 invalid	0 to 2, 255	FB

## 5.8 MDC Valve (M\_VALVEM)

### 5.8.1 Aims and objectives

The Functional Block ‘MDC Valve’ shall map M-Bus Valve data (M-Bus device type = 3 and 33) to the KNX system (standard KNX physical media, services and Datapoint Types).

NOTE 22 The Valve is either an integrated part of the gas meter (Device type 3) or a dedicated device to interrupt the gas supply (Device type 33).

### 5.8.2 Functional Specification

A received M-Bus string shall be parsed according to DIF/DIFE and VIF/VIFE information. Details of the M-Bus string format are specified in [03]. M-Bus frames contain a structure of concatenated data. Each data field shall be mapped to an individual KNX Datapoint. Within KNX only a relevant subset of all M-Bus data features shall be supported and mapped. Other M-Bus information shall be ignored.

On M-Bus each metering device may provide a large amount of data. On KNX physical media it is not useful to provide all information spontaneously according to COV mechanisms (e.g. via multicast communication with standard Group Objects or LTE messages), see clause 1.2.

The valve acts like an actuator on the M-BUS. But for security reasons there is no control function of the valve via the KNX connection. The KNX Data Collector may only present the current state of the valve. The valve may have one of these three states:

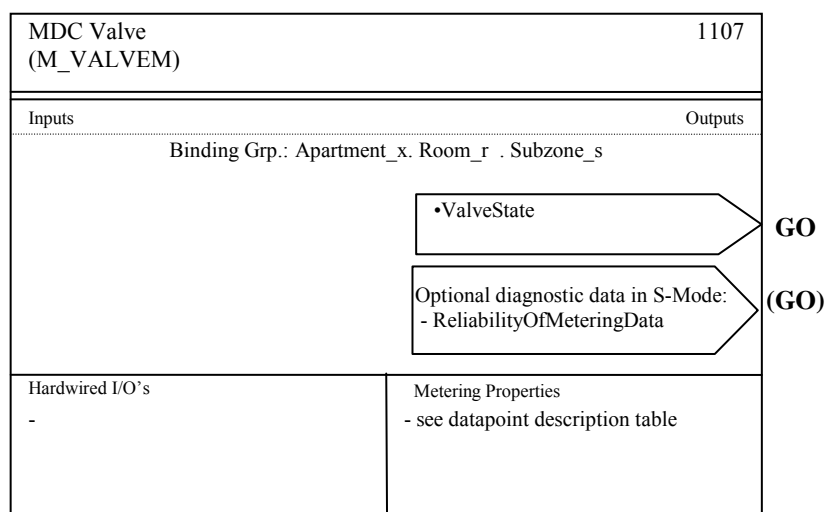
- Closed (Energy supply is active).
- Open (Energy supply is intentionally interrupted by the energy supplier).
- Released (Energy supply is still interrupted, but energy supplier released the valve, the consumer may enable service by pressing a service button on the valve).

The valve state and other typically metering device Datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service. In addition the valve state may be available also as standard Group Object in Standard Mode for visualization on displays etc. See clause 1.2. Therefore the complete set of supported valve datapoints shall be mapped to Properties that can be accessed on demand by the A\_PropertyValue\_Read-service.

### 5.8.3 Constraints

Only a subset of M-Bus data can be mapped to KNX Datapoints. The effective number of data that is provided by M-Bus meters is very company specific.

### 5.8.4 Functional Block diagram



## 5.8.5 Datapoint description

### 5.8.5.1 Overview

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Outputs (multicast communication)</b>				
ValveState	153	Describing the status of the valve: Energy supply is closed or open or released.	<b>Property:</b> DPT_MBus_BreakerValve_ - State / PDT_ENUM8	20.1200
			<b>Standard Mode:</b> DPT_MBus_BreakerValve_ - State	20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	<b>Standard Mode:</b> DPT_Bool	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Input</b>				
None.				

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Metering Properties (polling)</b>				
ValveState	153	Describing the status of the valve: Energy supply is closed or open or released.	DPT_MBus_BreakerValve_ - State / PDT_ENUM8	20.1200

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>LTE Zoning Parameters</b>				
Apartment	101	LTE zone: Apartment number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Room	102	LTE zone: Room number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002
Subzone	103	LTE zone: Subzone number used for binding and meter localization	DPT_UcountValue8_Z PDT_GENERIC_2	202.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
RxSequenceCounter (watchdog)	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This Property shall be used for consistency checking.	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
RxReceptionTime	111	Time stamp generated locally by the receiver each time an M-Bus message is received	DPT_DateTime / PDT_GENERIC_8	19.001
Manufacturer	112	M-Bus manufacturer code	DPT_Value_2_Ucount / PDT_UNSIGNED_INT	7.001
IdentificationNumber	113	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
VersionNumber	114	Version of the device, structure is manufacturer specific	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010



Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Diagnostic Properties (polling)</b>				
MeteringDeviceType	115	Metering Device Type. Supported values in M_VALVEM are: 3: gas meter 33: valve (gas or water) 255: void device type	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	Mapping 8 Digit BCD to unsigned long integer	DPT_Value_4_Ucount	12.001
AccessNumber	117	Consecutive message number that is generated by the metering device	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
DeviceStatus	118	Combined Status/Error-code (bitset)	DPT_Value_1_Ucount / PDT_UNSIGNED_CHAR	5.010
OperatingTime	119	Duration of meter accumulation	DPT_LongDeltaTimeSec / PDT_LONG	13.100
OnTime	120	Duration of Meter power up	DPT_LongDeltaTimeSec / PDT_LONG	13.100
CurrentDate	121	Date and time of the meter	DPT_DateTime / PDT_DATE_TIME	19.001
ErrorDate	126	Date and time of Error event	DPT_DateTime / PDT_DATE_TIME	19.001
MBusRawData	130	raw data of M-Bus telegram starting from CI field. The Property length shall be $\geq 128$ octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] $n \geq 128$	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
<b>Parameters</b>				
UserText	160	Additional text information to the metering device, which can be entered by the installer during commissioning	DPT_VarString_8859-1	24.001
MeterReplacement	161	Indicates that the connected M-Bus valve is replaced. This Property shall be set automatically by the Data Collector and has to be reset manually by the installer/service technician.	DPT_Bool	1.002
MeterReplacementCounter	162	Indicates the number of meter replacements. The counter shall be incremented automatically each time a valve is replaced. The Datapoint is (normally) read only.	DPT_Value_1_Ucount PDT_UNSIGNED_CHAR	5.010

**M\_VALVEM Runtime Interworking - Dependence on Configuration Modes**

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	none				
Outputs	ValveState	GO <sub>b</sub>	GO	GO	NA
	StatusGO	(GO <sub>b</sub> )	(GO)	(GO)	NA

(O)\*: optionally possible/allowed but not specified in this document

**M\_VALVEM Zoning Parameters**

		Support
Parameter	Apartment	M*
	Room	M*
	Subzone	M*

\* mandatory in LTE implementations only

**M\_VALVEM Standard Properties of Interface Objects**

Parameter / Diagnostic Value	Support
ValveState	M
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	O
OnTime	O
CurrentDate	M
ErrorDate	M
MBusRawData	M
UserText	O
MeterReplacement	M
MeterReplacementCounter	O

\* Conditional: mandatory in case of M-Bus soft addressing in order to have an unambiguous identification of the metering data.

## 5.8.6 Detailed specification of the Datapoints

### 5.8.6.1 Output ValveState

#### Property specification

FB: M_VALVEM	Property Name (Server): ValveState				Mandatory	<input checked="" type="checkbox"/>
Optional						<input type="checkbox"/>
Description:						
This value is received from the M-Bus valve and contains the current state of the valve. The valve may be a dedicated device or may be a function integrated in a metering device, like the gas meter.						
	Name	DPT_MBus_BreakerValve_State	DPT ID	20.1200	Datatype format	N <sub>8</sub>
Field	Description		Sup.	Range	Unit	Default
Breaker State	This field shall indicate whether the valve is open, closed or released.		M	0 to 2, 255	None	255
Communication:						
DP Address: (in the server)		IO Type(ID): 1107 (M_VALVEM)	Property ID: 153			
		Start-Index: 1	N° of elements 1			
Property access:		Read only <input checked="" type="checkbox"/>	Read/Write <input type="checkbox"/>			
Protection		Read level ---	Write level ---			
Exception Handling: Value after Powerup: Stored Value <input type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input checked="" type="checkbox"/>						
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.						
Special Features:						

**Group Object (Standard Mode):**

DP Name:	ValveState	Abbr.:	---	Mandatory	<input checked="" type="checkbox"/>
FB Name:	M_VALVEM			Can be internal	<input type="checkbox"/>
<b>Description</b>					
This value is received from the M-Bus valve and shall be stored by the Data Collector. The state shall be read-only and shall be accessible by polling or it is sent spontaneously in case of change of value.					
<b>Datapoint Type</b>					
DPT_Name:	DPT_MBus_BreakerValve_State				
DPT_Format:	N <sub>8</sub>	DPT_ID:	20.1200		
Field	Description	Supp.	Range	Unit	Default
Breaker State	This field shall indicate whether the valve is open, closed or released.	M	0 to 2, 255	None	255
<b>Access Type</b>					
Output					
this → M	<input checked="" type="checkbox"/>	this → 1	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	COV: <sup>1)</sup>	<input checked="" type="checkbox"/>	Δ-Value: cs <sup>1)</sup>	Min repetition period: 5 min
		Cyclic	<input type="checkbox"/>	Period:	
Request	<input checked="" type="checkbox"/>				
<b>Communication Type</b>					
Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
<b>Dynamics</b>					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>	Actual value (not for input):	<input type="checkbox"/>
	Transmit on bus (only for output):		<input type="checkbox"/>	Read from bus (only for input):	<input type="checkbox"/>
<b>Exception Handling</b>					
Void values or faulty values shall be indicated with default value FFh.					
<b>Special Features</b>					
<sup>1)</sup> In the M-Bus valve data are transmitted periodically, typically 2 times to 8 times per hour. Therefore the definition of an adequate COV is sufficient to guarantee that the most current M-Bus data is provided to the KNX system and that the KNX busload is not too high. Normally reception of an M-Bus message will trigger an update of the Group Object.					

**5.8.6.2 LTE Zoning Parameter Apartment**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.18.

**5.8.6.3 LTE Zoning Parameter Room**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.19.

**5.8.6.4 LTE Zoning Parameter Subzone**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.20.

**5.8.6.5 Diagnostic data RxSequenceCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.21.

**5.8.6.6 Diagnostic data RxReceptionTime**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.22.

**5.8.6.7 Diagnostic data Manufacturer**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.23.

**5.8.6.8 Diagnostic data IdentificationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.24.

**5.8.6.9 Diagnostic data VersionNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.25.

**5.8.6.10 Diagnostic data MeteringDeviceType**

<b>FB:</b>	<b>M_VALVEM</b>	<b>Property Name (Server):</b>	MeteringDeviceType	Mandatory	<input checked="" type="checkbox"/>
				Optional	<input type="checkbox"/>
<b>Description:</b>					
Applied Device Type of the valve device. Supported values in M_VALVEM are: 3: Gas meter 33: external Breaker (gas) 255: void device type Every meter has a unique M-Bus "address" preset by manufacture. All the Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together mark a worldwide unique meter identification. During the installation procedure the Metering Medium information is provided by the M-Bus meter. The value shall be stored by the Data Collector and shall be accessible by polling.					
<b>DPT:</b>	Name	DPT_Metering_DeviceType	DPT ID	20.114	Datatype format N <sub>8</sub>
Field	Description	Sup.	Range	Unit	Default
Metering_DeviceType	KNX specific indication of the M-Bus device type.	M	{3, 33, 255}	none	255
<b>Communication:</b>					
<b>DP Address:</b>	IO Type(ID):	1107 (M_VALVEM)	Property ID:	115	
<b>(in the server)</b>	Start-Index:	1	N° of elements	1	
<b>Property access:</b>	Read only	<input checked="" type="checkbox"/>	Read/Write	<input type="checkbox"/>	
<b>Protection</b>	Read level	---	Write level	---	
<b>Exception Handling:</b>	Value after Powerup:	Stored Value	<input checked="" type="checkbox"/>	Act Value	<input type="checkbox"/>
				Default Value	<input type="checkbox"/>
None.					
<b>Special Features:</b>					
Device type '255' = void (default value); used to indicate that the FB is not connected to a meter.					

**5.8.6.11 Diagnostic data FabricationNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.27.

**5.8.6.12 Diagnostic data AccessNumber**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.28.

**5.8.6.13 Diagnostic data DeviceStatus**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.29.

**5.8.6.14 Diagnostic data OperatingTime**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.30.

**5.8.6.15 Diagnostic data OnTime**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.31.

**5.8.6.16 Diagnostic data CurrentDate**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.32.

**5.8.6.17 Diagnostic data ErrorDate**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.37.

**5.8.6.18 Diagnostic data MBusRawData**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.40.

**5.8.6.19 Parameter UserText**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.42.

**5.8.6.20 Parameter MeterReplacement**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.43.

**5.8.6.21 Parameter MeterReplacementCounter**

Same as in M\_HEATM Object except IO Type (ID) = 1107 (M\_VALVEM), see 5.1.6.44.

## 6 Metering M-Bus Data Collector Object Types and Property Identifiers

### 6.1 MDC Heat Meter

Object Name: M\_HEATM

Object Type: 1101

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties (polling)</b>			
51	CurrentEnergyConsumption	DPT_MeteringValue	229.001
52	CurrentPower	DPT_MeteringValue	229.001
53	CurrentVolumeFlow	DPT_MeteringValue	229.001
54	CurrentEnergyConsumption_T1	DPT_MeteringValue	229.001
60	HistoryStorageNumbers	DPT_Value_1_Ucount	5.010
61	HistoryDate	DPT_DateTime[n]	19.001
62	HistoryEnergyConsumption	DPT_MeteringValue[n]	229.001
63	HistoryEnergyConsumption_T1	DPT_MeteringValue[n]	229.001
64	HistoryVolumeMaxFlow	DPT_MeteringValue[n]	229.001
65	HistoryVolumeMinFlow	DPT_MeteringValue[n]	229.001
66	HistoryMaxPower	DPT_MeteringValue[n]	229.001
67	HistoryMinPower	DPT_MeteringValue[n]	229.001
70	TempFlowWater	DPT_TempHVACAbs_Z	205.100
71	TempReturnWater	DPT_TempHVACAbs_Z	205.100
72	TempDiffWater	DPT_TempHVACRel_Z	205.101
<b>LTE-Mode Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
122	MaxPowerDate	DPT_DateTime	19.001
123	MaxPower	DPT_MeteringValue	229.001
124	MinPowerDate	DPT_DateTime	19.001
125	MinPower	DPT_MeteringValue	229.001
126	ErrorDate	DPT_DateTime	19.001
127	ErrorConsumption	DPT_MeteringValue	229.001
128	ReliabilityOfMeteringData	DPT_Bool	1.002
129	AveragingDuration	DPT_LongDeltaTimeSec	13.100
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
152	History Query	None (Function Property)	none
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

## 6.2 MDC Heat Cost Allocator

**Object Name:** M\_HCA

**Object Type:** 1102

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Outputs</b>			
51	CurrentEnergyConsumption	DPT_MeteringValue	229.001
<b>Metering Properties</b>			
60	HistoryStorageNumbers	DPT_Value_1_Ucount	5.010
61	HistoryDate	DPT_DateTime[n]	19.001
62	HistoryEnergyConsumption	DPT_MeteringValue[n]	229.001
70	TempFlowWater	DPT_TempHVACAbs_Z	205.100
71	TempExternal	DPT_TempHVACAbs_Z	205.100



Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
127	ErrorConsumption	DPT_MeteringValue	229.001
128	ReliabilityOfMeteringData	DPT_Bool	1.002
129	AveragingDuration	DPT_LongDeltaTimeSec	13.100
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
152	History Query	None (Function Property)	none
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

### 6.3 MDC Water Meter

**Object Name:** M\_WATERM

**Object Type:** 1103

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Outputs</b>			
51	CurrentVolumeConsumption	DPT_MeteringValue	229.001
53	CurrentVolumeFlow	DPT_Value_Volume_Flow	9.025
70	TempFlowWater	DPT_Value_Temp	9.001

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties</b>			
53	CurrentVolumeFlow	DPT_MeteringValue	229.001
60	HistoryStorageNumbers	DPT_Value_1_Ucount	5.010
61	HistoryDate	DPT_DateTime[n]	19.001
62	HistoryVolumeConsumption	DPT_MeteringValue[n]	229.001
64	HistoryVolumeMaxFlow	DPT_MeteringValue[n]	229.001
65	HistoryVolumeMinFlow	DPT_MeteringValue[n]	229.001
70	TempFlowWater	DPT_TempHVACAbs_Z	205.100
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
127	ErrorConsumption	DPT_MeteringValue	229.001
128	ReliabilityOfMeteringData	DPT_Bool	1.002
129	AveragingDuration	DPT_LongDeltaTimeSec	13.100
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
152	History Query	None (Function Property)	none
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

## 6.4 MDC Electricity Meter

**Object Name:** M\_ELECM

**Object Type:** 1104

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties (polling)</b>			
51	CurrentEnergyConsumption	DPT_MeteringValue	229.001
52	CurrentEnergyProduction	DPT_MeteringValue	229.001
53	CurrentEnergyConsumptionTariff1	DPT_MeteringValue	229.001
54	CurrentEnergyConsumptionTariff2	DPT_MeteringValue	229.001
55	CurrentEnergyConsumptionTariff3	DPT_MeteringValue	229.001
56	CurrentEnergyConsumptionTariff4	DPT_MeteringValue	229.001
57	CurrentEnergyConsumptionTariff5	DPT_MeteringValue	229.001
58	CurrentEnergyConsumptionTariff6	DPT_MeteringValue	229.001
59	CurrentEnergyConsumptionTariff7	DPT_MeteringValue	229.001
60	CurrentEnergyConsumptionTariff8	DPT_MeteringValue	229.001
61	CurrentEnergyConsumptionTariff9	DPT_MeteringValue	229.001
62	CurrentEnergyConsumptionTariff10	DPT_MeteringValue	229.001
63	CurrentEnergyConsumptionTariff11	DPT_MeteringValue	229.001
64	CurrentEnergyConsumptionTariff12	DPT_MeteringValue	229.001
65	CurrentEnergyConsumptionTariff13	DPT_MeteringValue	229.001
66	CurrentEnergyConsumptionTariff14	DPT_MeteringValue	229.001
67	CurrentEnergyConsumptionTariff15	DPT_MeteringValue	229.001
68	CurrentEnergyConsumptionTariff16	DPT_MeteringValue	229.001
69	CurrentEnergyProductionTariff1	DPT_MeteringValue	229.001
70	CurrentEnergyProductionTariff2	DPT_MeteringValue	229.001
71	CurrentEnergyProductionTariff3	DPT_MeteringValue	229.001
72	CurrentEnergyProductionTariff4	DPT_MeteringValue	229.001
73	CurrentEnergyProductionTariff5	DPT_MeteringValue	229.001
74	CurrentEnergyProductionTariff6	DPT_MeteringValue	229.001
75	CurrentEnergyProductionTariff7	DPT_MeteringValue	229.001
76	CurrentEnergyProductionTariff8	DPT_MeteringValue	229.001
77	CurrentEnergyProductionTariff9	DPT_MeteringValue	229.001
78	CurrentEnergyProductionTariff10	DPT_MeteringValue	229.001
79	CurrentEnergyProductionTariff11	DPT_MeteringValue	229.001
80	CurrentEnergyProductionTariff12	DPT_MeteringValue	229.001
81	CurrentEnergyProductionTariff13	DPT_MeteringValue	229.001
82	CurrentEnergyProductionTariff14	DPT_MeteringValue	229.001
83	CurrentEnergyProductionTariff15	DPT_MeteringValue	229.001
84	CurrentEnergyProductionTariff16	DPT_MeteringValue	229.001
85	HistoryEnergyConsumptionTariff1	DPT_MeteringValue[n]	229.001
86	HistoryEnergyConsumptionTariff2	DPT_MeteringValue[n]	229.001
87	HistoryEnergyConsumptionTariff3	DPT_MeteringValue[n]	229.001
88	HistoryEnergyConsumptionTariff4	DPT_MeteringValue[n]	229.001
89	HistoryEnergyConsumptionTariff5	DPT_MeteringValue[n]	229.001
90	HistoryEnergyConsumptionTariff6	DPT_MeteringValue[n]	229.001
91	HistoryEnergyConsumptionTariff7	DPT_MeteringValue[n]	229.001
92	HistoryEnergyConsumptionTariff8	DPT_MeteringValue[n]	229.001

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties (polling)</b>			
93	HistoryEnergyConsumptionTariff9	DPT_MeteringValue[n]	229.001
94	HistoryEnergyConsumptionTariff10	DPT_MeteringValue[n]	229.001
95	HistoryEnergyConsumptionTariff11	DPT_MeteringValue[n]	229.001
96	HistoryEnergyConsumptionTariff12	DPT_MeteringValue[n]	229.001
97	HistoryEnergyConsumptionTariff13	DPT_MeteringValue[n]	229.001
98	HistoryEnergyConsumptionTariff14	DPT_MeteringValue[n]	229.001
99	HistoryEnergyConsumptionTariff15	DPT_MeteringValue[n]	229.001
100	HistoryEnergyConsumptionTariff16	DPT_MeteringValue[n]	229.001
153	BreakerState	DPT_MBus_BreakerValve_State	20.1200

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
128	ReliabilityOfMeteringData	DPT_Bool	1.002
129	AveragingDuration	DPT_LongDeltaTimeSec	13.100
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
131	HistoryEnergyProductionTariff1	DPT_MeteringValue[n]	229.001
132	HistoryEnergyProductionTariff2	DPT_MeteringValue[n]	229.001
133	HistoryEnergyProductionTariff3	DPT_MeteringValue[n]	229.001
134	HistoryEnergyProductionTariff4	DPT_MeteringValue[n]	229.001
135	HistoryEnergyProductionTariff5	DPT_MeteringValue[n]	229.001
136	HistoryEnergyProductionTariff6	DPT_MeteringValue[n]	229.001
137	HistoryEnergyProductionTariff7	DPT_MeteringValue[n]	229.001
138	HistoryEnergyProductionTariff8	DPT_MeteringValue[n]	229.001
139	HistoryEnergyProductionTariff9	DPT_MeteringValue[n]	229.001

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Diagnostic Properties (polling)</b>			
140	HistoryEnergyProductionTariff10	DPT_MeteringValue[n]	229.001
141	HistoryEnergyProductionTariff11	DPT_MeteringValue[n]	229.001
142	HistoryEnergyProductionTariff12	DPT_MeteringValue[n]	229.001
143	HistoryEnergyProductionTariff13	DPT_MeteringValue[n]	229.001
144	HistoryEnergyProductionTariff14	DPT_MeteringValue[n]	229.001
145	HistoryEnergyProductionTariff15	DPT_MeteringValue[n]	229.001
146	HistoryEnergyProductionTariff16	DPT_MeteringValue[n]	229.001
147	CurrentActivePowerConsumption	DPT_Power	9.024
148	CurrentActivePowerProduction	DPT_Power	9.024
149	CurrentTariff	DPT_Tariff	5.006
150	HistoryStorageNumbers	DPT_Value_1_Ucount	5.010
151	HistoryDate	DPT_DateTime[n]	19.001
152	History Query	None (Function Property)	none

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

## 6.5 MDC Gas Meter

**Object Name:** M\_GASM

**Object Type:** 1105

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties</b>			
51	CurrentVolumeConsumption	DPT_MeteringValue	229.001
53	CurrentVolumeFlow	DPT_MeteringValue	229.001
60	HistoryStorageNumbers	PDT_UNSIGNED_CHAR[n]	5.010
61	HistoryDate	DPT_DateTime[n]	19.001
62	HistoryVolumeConsumption	DPT_MeteringValue[n]	229.001
64	HistoryVolumeMaxFlow	DPT_MeteringValue[n]	229.001
65	HistoryVolumeMinFlow	DPT_MeteringValue[n]	229.001
70	TempFlowGas	DPT_TempHVACAbs_Z	205.100
80	MeasurementCondition	DPT_Gas_Measurement_Condition	20.1202
153	ValveState	DPT_MBus_BreakerValve_State	20.1200
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
127	ErrorConsumption	DPT_MeteringValue	229.001
128	ReliabilityOfMeteringData	DPT_Bool	1.002
129	AveragingDuration	DPT_LongDeltaTimeSec	13.100
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
152	History Query	PDT_Function	none
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

## 6.6 MDC Breaker

**Object Name:** M\_BREAKERM

**Object Type:** 1106

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties (polling)</b>			
153	BreakerState	DPT_MBus_BreakerValve_State	20.1200
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Metering Properties (polling)</b>			
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

## 6.7 MDC Valve

**Object Name:** M\_VALVEM

**Object Type:** 1107

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Outputs</b>			
153	ValveState	DPT_MBus_BreakerValve_State	20.1200
128	ReliabilityOfMeteringData	DPT_Bool	1.002
<b>Metering Properties (polling)</b>			
153	ValveState	DPT_MBus_BreakerValve_State	20.1200
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
130	MBusRawData	DPT_Value_1_Ucount[n]	5.010
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010

## 6.8 MDC Generic Meter

**Object Name:** M\_GENERICM

**Object Type:** 1110

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Outputs</b>			
51	CurrentConsumption	DPT_MeteringValue	229.001
<b>Metering Properties</b>			
60	HistoryStorageNumbers	DPT_Value_1_Ucount	5.010
61	HistoryDate	DPT_DateTime[n]	19.001
62	HistoryConsumption	DPT_MeteringValue[n]	229.001
<b>LTE Zoning Parameters</b>			
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002
<b>Diagnostic Properties (polling)</b>			
110	RxSequenceCounter	DPT_Value_1_Ucount	5.010
111	RxReceptionTime	DPT_DateTime	19.001
112	Manufacturer	DPT_Value_2_Ucount	7.001
113	IdentificationNumber	DPT_Value_4_Ucount	12.001
114	VersionNumber	DPT_Value_1_Ucount	5.010
115	MeteringDeviceType	DPT_Metering_DeviceType	20.114
116	FabricationNumber	DPT_Value_4_Ucount	12.001
117	AccessNumber	DPT_Value_1_Ucount	5.010
118	DeviceStatus	DPT_Value_1_Ucount	5.010
119	OperatingTime	DPT_LongDeltaTimeSec	13.100
120	OnTime	DPT_LongDeltaTimeSec	13.100
121	CurrentDate	DPT_DateTime	19.001
126	ErrorDate	DPT_DateTime	19.001
127	ErrorConsumption	DPT_MeteringValue	229.001
128	ReliabilityOfMeteringData	DPT_Bool	1.002
129	AveragingDuration	DPT_LongDeltaTimeSec	13.100
130	MBusRawData	DPT_Value_1_Ucount [n]	5.010
152	History Query	None (Function Property)	none



Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
<b>Parameters</b>			
160	UserText	DPT_VarString_8859-1	24.001
161	MeterReplacement	DPT_Bool	1.002
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010