

Application Descriptions

Metering

Metering M-Bus Data Collector Functional Blocks

Summary

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

Version 01.04.07 is a KNX Approved Standard.

This document is part of the KNX Specifications v2.1.

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Document updates

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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 ...

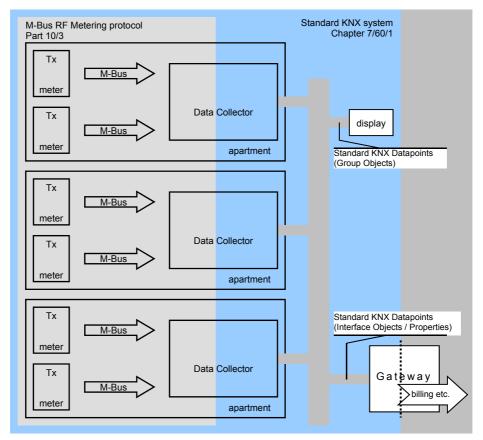


Figure 1 – Metering system topology

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 ^{a)}	00h	M_GENERICM	1110
Oil ^{a)}	01h	M_GENERICM	1110
Electricity ^{a)}	02h	M_GENERICM b) M_ELECM b)	1110 1104
Gas ^{a)}	03h	M_GENERICM b) M_GASM b)	1110 1105
Heat (outlet)	04h	M_HEATM	1101
Steam a)	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

Basic metering information for these Media is covered by FB M_GENERICM. This is an intermediate solution.

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.

b) 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.

1.3 Glossary

Metering device that collects metering consumption data and provides

metering values by M-Bus RF communication

Metering Data Collector Unit with M-Bus RF receiver able to store and forward metering data on a

(MDC) 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
- 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

8 history data sets.

- 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.

Format:	6 octets: V ₃₂ N ₈ Z ₈							
		5 4 intVal CountVal	3 LSB CountVal	2 ValInfField				
	VVVVVV VVV	VVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV	VVVVVVV	NNNNNNN				
	1 Status/ Command							
	ZZZZZZZZ							
Encoding:	See below							
Range:	See below							
<u>Unit:</u>	See below							
Datapoint	oint Types							
ID:	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 ValInfField
ValInfField	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].)

ValInfField

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]. ValInfField vales ≥ 80h contain the mapping of VIFE range for GWh, GJ, MW, MJ/h and dimensionless counter values.

coding	description	range codi	ing	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^3	0,001	1	to	10 000	1
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 ³ /h	0,001	l/h	to	10 000	l/h
01000nnn	volume flow	10 ⁽ⁿⁿⁿ⁻⁷⁾	m ³ /min	0,000	11/min	to	1000	l/min
01001nnn	volume flow	10 ⁽ⁿⁿⁿ⁻⁹⁾	m ³ /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			dimen	sionles	S		
10111010	dimensionless counter			dimensionless				
Others *)	reserved							

^{*} Mapping of other M-Bus VIF/VIFE-field codes to ValInfField

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			
	Mete	ring values:	according to	primary VI	F table		
0000 0nnn	energy	10 ⁽ⁿⁿⁿ⁻³⁾	Wh	229.001	DPT_MeteringValue		
00001nnn	energy	10 ⁽ⁿⁿⁿ⁾	J	229.001	DPT_MeteringValue		
0001 0nnn	volume	10 ⁽ⁿⁿⁿ⁻⁶⁾	m^3	229.001	DPT_MeteringValue		
0001 1nnn	mass	10 ⁽ⁿⁿⁿ⁻³⁾	kg	229.001	DPT_MeteringValue		
0010 1nnn	power	10 ⁽ⁿⁿⁿ⁻³⁾	W	229.001	DPT_MeteringValue		
0011 0nnn	power	10 ⁽ⁿⁿⁿ⁾	J/h	229.001	DPT_MeteringValue		
0011 1nnn	volume flow	10 ⁽ⁿⁿⁿ⁻⁶⁾	m ³ /h	229.001	DPT_MeteringValue		
0100 0nnn	volume flow	10 ⁽ⁿⁿⁿ⁻⁷⁾	m ³ /min	229.001	DPT_MeteringValue		
0100 1nnn	volume flow	10 ⁽ⁿⁿⁿ⁻⁹⁾	m^3/s	229.001	DPT_MeteringValue		
0101 0nnn	mass flow	10 ⁽ⁿⁿⁿ⁻³⁾	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	0 000n energy 10 ⁽ⁿ⁻¹⁾ MWh 229.001 DPT_MeteringValue								
0000 100n	energy	10 ⁽ⁿ⁻¹⁾	GJ	229.001	DPT_MeteringValue				
0010 100n	0010 100n power 10 ⁽ⁿ⁻¹⁾ MW 229.001 DPT_MeteringValue								
0011 000n	power								

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

M-Bus VIF code	description	range coding	Map	pping to standard KNX DPT
	D	ate/Time information M	Iapping 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 informa	tion	
0101 10nn	Flow Temperature	10 ⁽ⁿⁿ⁻³⁾ °C	9.001 205.100	DPT_Value_Temp DPT_TempHVACAbs_Z
0101 11nn	Return Temperature	10 ⁽ⁿⁿ⁻³⁾ °C	9.001 205.100	DPT_Value_Temp DPT_TempHVACAbs_Z
0110 00nn	Temperature Difference	10 ⁽ⁿⁿ⁻³⁾ K	9.002 205.101	DPT_Value_Tempd DPT_TempHVACRel_Z
0110 01nn	External Temperature	10 ⁽ⁿⁿ⁻³⁾ °C	9.001 205.100	DPT_Value_Temp DPT_TempHVACAbs_Z
0110 10nn	Pressure	10 ⁽ⁿⁿ⁻³⁾ 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

Format:	8 octets: $U_8[r_4U_4][r_3U_5][U_3U_5][r_2U_6][r_2U_6]B_{16}$						
octet nr.	8 _{MSB} 7	6	5				
field names	Year 0 0 0 0 Month	0 0 DayOfMonth	DayOf- Week HourOfDay				
encoding		r r r U U U U U					
octet nr.	4 3	2	1 _{LSB}				
field names	0 0 Minutes 0 0 Seconds	MWD NY	0000000				
encoding		B B B B B B B	Brrrrrrr				

4.5.2 M-Bus data Type F

Compound CP32 Date and Time

	msb							lsb
LSB	27	26	25	24	23	22	21	20
	215	214	213	212	211	210	29	28
	2 ²³	222	221	220	219	218	217	216
MSB	231	230	2 ²⁹	228	227	226	225	224

- *Seconds*: not available on M-Bus ⇒ fixed value 0 in DPT DateTime.
- **Minutes**: b0-b5, normal range $0 \dots 59$ can be mapped to DPT_DateTime. Value 63 means "every minute" cannot be mapped \Rightarrow set NT = 1.
- **Hours**: b8-b12, normal range $0 \dots 23$ can be mapped to DPT_DateTime value 31 means "every hour" cannot be mapped \Rightarrow 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 SUTI.
- Day of week: not available in M-Bus data Type $F \Rightarrow DPT$ DateTime field NDoW = 1.
- WorkingDay: not available in M-Bus data Type $F \Rightarrow DPT_D$ ateTime field NWD = 1.
- Fault: not available in M-Bus data Type $F \Rightarrow DPT$ DateTime field F = 0.
- CLQ: not available in M-Bus data Type F \Rightarrow DPT DateTime field CLQ = 0.

4.5.3 M-Bus data type G

Compound CP16 Date

	msb							lsb
LSB	27	26	25	24	23	22	21	20
MSB	215	214	213	212	211	210	29	28

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 $G \Rightarrow \text{set NT} = 1$.
- *Minutes*: not available in M-Bus data Type $G \Rightarrow \text{set NT} = 1$.
- *Hours*: not available in M-Bus data Type $G \Rightarrow \text{set NT} = 1$.
- **Day of month**: b0-b4, normal range 1 ... 31 can be mapped to DPT_DateTime value 0 means "every day" cannot be mapped ⇒ set ND = 1.
- **Month**: b8-b11, normal range 1 ... 12 can be mapped to DPT_DateTime value 15 means "every month" cannot be mapped ⇒ set ND = 1.
- Year: b5-b7 and b12-b15, normal range 0 ... 99 value 127 means "every year" cannot be mapped ⇒ 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	27	26	25	24	23	22	21	20
	215	214	213	212	211	210	29	28
	223	222	221	220	219	218	217	216
	231	230	229	228	227	226	225	224
	239	238	_	_	235	234	233	232
MSB	247	246	245	244	243	242	241	240

- **Seconds**: b0-b5, normal range $0 \dots 59$ 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 ⇒ set NT = 1.
- **Hours**: b16-b20, normal range 0 ... 23 can be mapped to DPT_DateTime value 31 means "every hour" cannot be mapped ⇒ 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 ⇒ set ND = 1.

- Month: b32-b35, normal range 1 ... 12 can be mapped to DPT_DateTime value 0 means "not specified" cannot be mapped ⇒ set ND = 1.
- Year: b29-b31 and b36-b39, normal range 0 ... 99 value 127 means "not specified" cannot be mapped ⇒ 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" ⇒ 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	27	26	25	24	23	22	21	20
	215	214	213	212	211	210	29	28
MSB	223	222	221	220	219	218	217	216

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 $0 \dots 59$ 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 ⇒ set NT = 1.
- **Hours**: b16-b20, normal range 0 ... 23 can be mapped to DPT_DateTime value 31 means "every hour" cannot be mapped ⇒ 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 <u>at the end of the billing period</u>. 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.
                      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.
- Initalize 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							
Property Array index	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 ³ /h	void	350 W	void	
3	3 (monthly value)	31.07.2004	170 kWh	void	17 x 0,1 m ³ /h	void	180 W	void	
4	3 (monthly value)	31.08.2004	180 kWh	void	18 x 0,1 m ³ /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.

		Prope	erty	
Property Array index	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".

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

Datapoin	t Types				
ID:	Name:	Encoding:		Range:	<u>Use:</u>
20.114	DPT_Metering_DeviceType	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 to 31 32 33 34 to 39 40 41	Water meter Heat cost allocator reserved color Cooling Load meter (outlet) Cooling Load meter (inlet Heat (inlet) Heat and Cool reserved color reserved color reserved, unused breaker (electricity) valve (gas or water) reserved, unused waste water meter	, 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 32, 33, 40, 41, 255}	FB

^{a)} Metering device type is void; i.e. the metering FB does not contain meaningful data.

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

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						
	roperty Array index	orage 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
data set 2	2	3 (monthly value)	31.01.2012	1 490 kWh	void	16 x 0,1 m ³ /h	void	350 W	void
data set 3	3	4 (monthly value)	29.02.2012	1 810 kWh	void	15 x 0,1 m ³ /h	void	180 W	void
data set 4	4	5 (monthly value)	31.03.2012	2 120 kWh	void	13 x 0,1 m ³ /h	void	200 W	void
data set 5	5	6 (monthly value)	30.04.2012	2 425 kWh	void	7 x 0,1 m ³ /h	void	200 W	void
data set 6	6	7 (monthly value)	31.05.2012	2 705 kWh	void	5 x 0,1 m ³ /h	void	200 W	void
data set 7	7	7 (monthly value)	30.06.2012	2 905 kWh	void	5 x 0,1 m ³ /h	void	200 W	void
data set 8	8	8 (monthly value)	31.07.2012	3 085 kWh	void	6 x 0,1 m ³ /h	void	200 W	void
data set 9	9	9 (monthly value)	31.08.2012	3 085 kWh	void	4 x 0,1 m ³ /h	void	200 W	void
data set 10	10	10 (monthly value)	30.09.2012	3 285 kWh	void	4 x 0,1 m ³ /h	void	200 W	void
data set 11	11	11 (monthly value)	31.10.2012	3 495 kWh	void	3 x 0,1 m ³ /h	void	200 W	void
	 n	 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.

					Prop	erty					
	roperty Array index	orage 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		Ouery Reesult
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 m ³ /h	void	350 W	void	7	7
data set 3	3	4 (monthly value)	29.02.2012	1 810 kWh	void	15 x 0,1 m ³ /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 m ³ /h	void	200 W	void	₹	10
data set 6	6	7 (monthly value)	31.05.2012	2 705 kWh	void	5 x 0,1 m ³ /h	void	200 W	void	₹	11
data set 7	7	7 (monthly value)	30.06.2012	2 905 kWh	void	5 x 0,1 m ³ /b	void	200 W	void		
data set 8	8	8 (monthly value)	31.07.2012	3 085 kWh	void	6 x 0,1 m ³ /h	void	200 W	void		
data set 9	9	9 (monthly value)	31.08.2012	3 085 kWh	void	4 x 0,1 m³∕/n	void	200 W	void		
data set 10	10	10 (monthly value)	30.09.2012	3 285 kWh	void	4 x 0,1 m ³ /h	void	200 W	void		
data set 11	11	11 (monthly value)	31.10.2012	3 495 kWh	void	3 x 0,1 m ³ /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*.

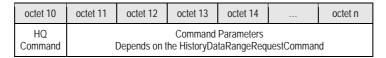


Figure 4 – Function *History Query*A_FunctionPropertyCommand-PDU (general)

4.10.2.1 Overview Commands

HQ Command	Command name and short description
00h	HistoryQueryData
	This command shall be used to execute a query and store the outcome in a Result Property. This command can be iterative.
01h	HistoryQueryDataCount
	This command shall be used to request the possible number of results of the contained query, without effectively executing the query.
02h	HistoryQueryState
	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 ¹⁾ 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
			Filter'	Value			

Figure 5 – HistoryQueryData in an A_FunctionProperty_Command-PDU (example)

¹⁾ 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_8

7	6	5	4	3	2	1	0
r	r	r	r	N	A	Н	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 *Ouery flags* is set. Otherwise, its content shall not be evaluated and

the Server shall interpret the request as a new request.

Format, encoding: U₈ 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 $E_Query\ \bar{H}$ and leInvalid.

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 $Pre\text{-}Filtered\ result$

PID shall be ignored.

Format, encoding: U₈ 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: U₈ 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 $[N_8]$:

00h: < Smaller than

01h: \leq Smaller than or equal to

02h: = Equal to

03h: \geq 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 31st.

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 $[N_8]$: QueryError

00h: **E_RequestOKAndDataReady**

The requested data are put into the Property value array specified in

DataReferencesInPID.

01h: **E_RequestedDataNotFound**

There are no results when applying the query, so there is no valid PID

value in DataReferencesInPID.

The field DataReferencesInPID shall contain the value 00h.

02h: **E_RequestParametersInvalid**

There is an error with 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 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: **RequestOKTooLittleMemory**

The Server would run out of memory it would create the result.

EXAMPLE 7If 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: U₈ 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: U₈ 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

 $0\overline{0}h$.

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
			Filter	Value			

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	Respor	nseData

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 $[N_8]$: 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_{16} 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: U₈ 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 $[N_8]$:

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 identfiers 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)

		Item				
State Command	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 HistoryQueryState is handled

successfully or whether there is any error.

Format, encoding: Enumeration $[N_8]$:

00h: **E_NoError**

The HistoryQueryState command is handled successfully.

NOTE 6 This is a valid answer to all HistoryQueryState commands.

01h: **E_GeneralError**

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: **E_Query HandleInvalid**

The data client has passed an invalid Query Handle in the

HistoryDataState Command

03h: **E_QueryStateCommandInvalid**

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.

Data Client Data Server remark 1. A Data Client can issue an HistoryQueryDataCount or HistoryQueryData any time. For a HistoryQueryDataCount, only the number of results is returned. No filtering with generation of real results is done on the Server side. A FunctionProperty Command Calculates the number of (object index = \dots , Property id = \dots , results that would be data = HistoryOueryDataCount = 01hgenerated If the data server encounters some error, it shall send an A FunctionProperty State Response-PDU with return code equal to the error that occurs. a) A FunctionProperty State Response-PDU (object index = \dots , Property id = \dots , return code = CountError) Otherwise, the data server shall respond with an A FunctionPropertyState Response-PDU with return code = CountError 00h and with the response to the command (number of results found) b)

A_FunctionProperty_State_Response-PDU Also contains a valid (object index = ..., Property id = ..., Response-Data (0...4095)

Within this communication, no request handle is opened. So the communication might end here.

return_code = 00h, data = ResponseData)

2. If a Data Client issues a HistoryQueryData, the Server shall really try to create the results and put the references to them into a (free) PID

```
A_FunctionProperty_Command
(object_index = ..., Property_id = ..., data =
HistoryQueryData = 00h)
```

Finds the results and puts references into a PID.

If the data server encounters some error, it shall send a QueryError ≠ 0 as return_code within the according A_FunctionProperty_State_Response (this also happens if no Query Handle can be opened)

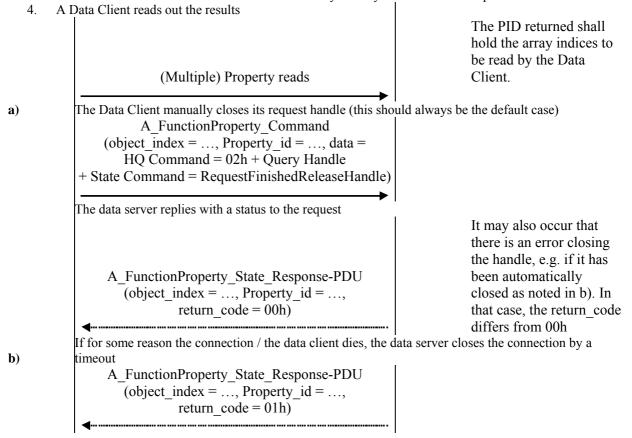
```
A_FunctionProperty_State_Response-PDU
(object_index = ..., Property_id = ...,
return_code ≠ 00h)
```

Otherwise, the returnCode shall be 00h, a Query Handle shall be opened and the valid result references shall be put into the PID returned in "DataReferencesInPID"

a)

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.



4.10.4 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

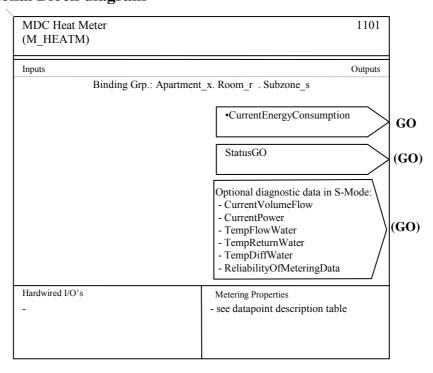
Therefore the complete set of supported Heat Meter datapoints shall be mapped to Properties that can be accessed on demand by the A_PropertyValue_Read-service.

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

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

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Metering Properties (polling)				
CurrentEnergyConsumption	51	Accumulated energy value	Property: 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 °
Metering Properties (polling)				
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°	
LTE Zoning Parameters					
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°
Diagnostic Properties (polling)				
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°
Diagnostic Properties (polling)				
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_INFORMA- TION		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	raw data of M-Bus telegram starting from CI field. The Property length shall PDT_UNSIGNED_CHAR[n]	
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Parameters				
UserText		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°
Parameters				
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
Inputs	(none)				
Outputs	CurrentEnergyConsumption	GO_b	GO	GO	0
	StatusGO	(GO _b)	(GO)	(GO)	NA
	CurrentPower	(GO _b)	(GO)	(GO)	(O)*
	CurrentVolumeFlow	(GO _b)	(GO)	(GO)	(O)*
	TempFlowWater	(GO _b)	(GO)	(GO)	(O)*
	TempReturnWater	(GO _b)	(GO)	(GO)	(O)*
	TempDiffWater	(GO _b)	(GO)	(GO)	(O)*
	ReliabilityOfMeteringData	(GO _b)	(GO)	(GO)	(O)*

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

M_HEATM LTE Zoning Parameters

		Support
Parameter	Apartment	M *
	Room	M *
	Subzone	M *

^{*} mandatory in LTE implementations only

M_HEATM Standard Properties of Interface Objects

Parameter / Diagnostic Value

	Support
CurrentEnergyConsumption	M
CurrentPower	0
CurrentVolumeFlow	0
CurrentEnergyConsumption_T1	0
HistoryStorageNumbers	M
HistoryDate	M
HistoryEnergyConsumption	M
HistoryEnergyConsumption_T1	0
HistoryMaxVolumeFlow	0
HistoryMinVolumeFlow	0
HistoryMaxPower	0
HistoryMinPower	0
TempFlowWater	0
TempReturnWater	0
TempDiff	0
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	0
OnTime	0
CurrentDate	M
MaxPowerDate	0
MaxPower	0
MinPowerDate	0
MinPower	0
ErrorDate	M
ErrorConsumption	0
ReliabilityOfMeteringData	0
AveragingDuration	0
MBusRawData	M
History Query	0
UserText	0
MeterReplacement	M
MeterReplacementCounter	0

^{*} 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:

FB:	M_HEATM	Pro	perty Name (<u>Server</u>):	CurrentEn	ergy	Cons	umption			ndatory 🖂 ptional 🗌
Desc	ription:										p 4.1 0 1.1 6.1 .
		d ene	ergy value that is rece	eive	d from the N	И-Bus	s devi	ce and shal	l be s	tored by	the Data
			alue shall be read-or								
DPT:	Name [DPT_	MeteringValue	D	PT ID 22	9.001	1 Da	atatype forn	nat	V ₃₂ N ₈ Z	, -8
Field			Description				Sup.	Range		Jnit	Default
Coun	tVal		counter value				М	full	1)	cs
ValInf	Field		 Encoding of unit the counter value 		resolution (of	М	00h to 07h 08h to 0Fh			
			the counter value	_				80h to 81h			
								88h to 89h			
Status	 3									itset	
Οι	ıtOfService		Value is not availab	le / v	void		M	true/false			true
- O\	erridden						NA	false			false
– Fa	ult		metering failure, cor	rrupt	ted value		M	true/false			false
– In/	Alarm						NA	false			false
– Ala	armUnAck						NA	unack			unack
Comr	nand		standard Command	l field	d				e	num	
– all	commands		not supported, Data read only	poin	nt shall be		NA				
Comr	nunication:					<u> </u>		<u> </u>	<u> </u>		-
DP.	Address:		IO Type(ID): 1	101	(M_HEATM	<u>/I)</u>	Prop	erty ID:		51	
(in t	he server)		Start-Index: 1		` _	,	N° o	f elements		1	
Pro	perty access:		Read only	1	Re	ad/W	√rite				
Pro	tection		Read level	-			Write	e level			
	otion Handling		Value after Powerup		Stored Value			Value □		ult Valu	e 🛛
Data	shall be stored	in vo	platile memory and sl	hall	be void afte	r pov	ver up	of the Data	Coll	ector.	
	ial Features:										
		_	egram are marked in	i fiel	d 'status' wi	ith 'pe	erman	ent error' th	en th	e Status	s flag
'Fault	' shall be set to	true '	e'.								

LTE-Mode:

FB:	M_HEATM	LTE S	Server Output N	ame:	Currer	tEner	gyCo	nsumpt	ion		andatory ☐ Optional ⊠
Desci	ription:	-								-	
			gy value that is re								
			ue shall be read	-only an	d shall	be acc	essibl	e by po	lling or	it is sent	
			hange of value.								
DPT:	Name D		eteringValue	DPT ID	229	.001		atatype		V_{32}	
Field			cription			Sup.	Rang	ge	Unit	COV	Default
	roperty specifi	ication	above.								
	nunication:										
Bind	ding Group:										
Clas	ss		Туре					Defau			
	eographical		Apartment.Roor	n.Subzo	ne			1.1.1	2) 		
Ap	plication Spec	ific 🔲									
	assigned		Broadcast		nfigura						
	Address:		IO Type(ID):	110	1 (M_H	EATM)		perty ID		51	
	-Services (ev	ent):	COV 🛛 1)		epTime		300			artbeat:	60 min
	oReport	\boxtimes	Output per defa	ult comn	nunicat	ng 🖂				dcard all	owed 🗌
•	ΓΕ Read-Resp		Tx Prio:	Hig	gh 🗌		N	lormal 🛭	<	Lo	w 🗌
	lling of the out	put									
	all always be		Transm after Po	werup:	Stored	Value		Act Val	ue 💹	Default	Value 🖂
	pported)										
	perty-Service	,	Read only	\bowtie		Read/V	Vrite	П			
	ividual acces								T-0		
	otion Handling	g:							Save	e at Powe	erdown 🔲
None.											
_	al Features:				•••						
			heat meter data								
			nition of an adequ								
			to the KNX syste								
			nessage will trigg								ra
			ends on the incr								or aball be
11 (nere is only or t to the default		IEATM per Apart	ineni 20	ine, ine	KUUIII	HUHL	el allo	Subzon	ie numbe	ei siiaii be
se	t to the delault	value	1.1.								

Group Object (Standard Mode):

	urrentEnergyC	onsumption	Abbr.:	 		Mand		
	_HEATM					Can b	<u>oe interna</u>	
Description								
Current accumu Collector. The m spontaneously in NOTE 9 Alternati	etering value s	hall be read ge of value.	-only and	shall be acces				the Data
		·						
Datapoint Type DPT Name:		Count						
	DPT_Value_4_	Count			DDT ID	: 13.00	14	
	V ₃₂				DPT_ID			Default
	Description Counter value		1 : 001		Supp.	Range full	Unit	Default 0
	Integer. I) unit, resolution Integer on the condition In case of meter of the collector and necessive technice.	on and displ the receiver allnfField in F Consumption or replacement oe set automentanually rese	ay format of the info Property n'. ent the cornatically by	have to be ormation responding of the Data				
Access Type	Service tecrinic	iaii.						
◆ Output								
this → M Spontaneous Request Communication	COV:		Δ-Value: Period:	cs ²⁾ M	in repetiti	on period:	5 min	
◆ Group Object						Mandato	ry: 🛛	
Default Grou						Iviaridato	''y. <u>□</u>	
Dynamics	p Address. -							
	Cover							
Power up:	Value:	No initialisa Saved valu bus (only fo	e:	Actua		not for inpu		
Exception Hand						<u> </u>	1/	
Void values or fa In case of Meter indicate, that the	aulty values sha Replacement =	true, the va	lue of Cur	rentEnergyCo	nsumptio	n shall be	0 in order	to
Special Feature				Ť				
In the M-Bus day. Therefor M-Bus data is reception of a	RF system hear re the definition is provided to the an M-Bus mess in of a meaningf	of an adeque KNX syste age will trigg	uate COV em and tha ger an upo	is sufficient to at the KNX bus late of the Gro	guarante sload is no up Objec	e that the lot too high	most curro . Normally	ent /

5.1.6.2 Output StatusGO

Standard Mode only

FB Name: M_HEATM Can be internal	
Description	
This Output shall contain the Z ₈ status information of CurrentEnergyConsumption as a Group Object	t.
Datapoint Type	
DPT_Name: DPT_StatusGen	
DPT Format: B ₈ DPT_ID: 21.001	
	efault
Status Z ₈ Status information O Bitset	
Bit 0 OutOfService M t/f	rue
	alse
	alse
	alse
	nack
Bits 5 to 7 reserved NA	
Access Type	
◆ Output	
this \rightarrow M \square this \rightarrow 1 \square	
Spontaneous 🛛 COV: 🔻 Delta-Value: MinRepTime: 5 min	
Cyclic Period:	
Request	
Communication Type	
♦ Group Object Datapoint Mandatory:	
Default Group Address:	
Dynamics	
Power down: Save:	
Power up: Value: No initialisation: Default value:	
Saved value: Actual value:	
Transmit on bus:	
Exception Handling	
None.	
Special Features	
None.	

5.1.6.3 Output / diagnostic data CurrentPower

FB:	M_HEATM	Prop	erty Name (<u>Server</u>):	Currenti	Power				datory ☐ ptional ⊠
Desci	ription:			-			<u> </u>		
Curre	nt measured p		n W or J/h units. This						stored
by the	Data Collecto	r. The	measured value is re	ad-only and	d shall be	access	sible by poll	ing.	
NOTE	10 The Property	implem	entation does not allow for	an alternative	DPT.				
DPT:	Name D		0	DPT ID 2	29.001		ype format	$V_{32}N_8Z_8$	
Field			Description		Sup		lange	Unit	Default
Count			neasured value		M		<u>. </u>	1)	cs
ValInf	Field		Encoding of unit and		M		8h to 2Fh		
		(of the measured value	!			0h to 37h		
							8h to A9h		
						B	0h to B1h		
Status				,			<i>(</i> 5)	bitset	
	ıtOfService	'	/alue is not available /	/ void	M		ue/false		true
	rerridden				NA		alse		false
– Fa	ult		measurement failure, o value	corrupted	М	tr	ue/false		false
– In	Narm	'			NA	fa	alse		false
	armUnAck				NA	u	nack		unack
Comn	nand		standard Command fie	eld				enum	
- all	commands	r	not supported, Datapo	int shall	NA				
		k	oe read only						
	nunication:		1						
	ddress:			1101 (M_HE		Propert		52	
	the server)		Start-Index: 1	•			ements	1	
	perty access:		Read only 🖂	F	Read/Wri		<u> </u>		
	ection		Read level -			Write le			
	otion Handling		Value after Powerup:	Stored Va		Act Valu		ault Value	
		ın vol	atile memory and shal	il be void af	ter powe	r up of t	ine Data Co	llector.	
	al Features:	- ا حامید	avena eve permissid in fil	ald (at-t)	حادان		annami Haara i	ha C1-1	floo
		_	gram are marked in fie	eid status'	with peri	manent	error then t	ine Status	ılag
rault	shall be set to	ı ııue	•						

Group Object (Standard Mode):

DP	Name:	CurrentPower	Abbr.:			Mandat	tory	
FB	Name:	M_HEATM				Can be	internal	
	scription							
sto is s	red by the E sent spontar	Data Collector. The neously in case of	units. This value is re e metering value shal change of value. de, Standard Mode DPT m	ll be read-only	and shall b	oe accessik	ole by po	olling or it
Da	tapoint Typ	oe .						
	T Name:	DPT Power						
_	T Format:	F ₁₆			DPT ID:	9.024		
Fie	eld	Description			Supp.	Range	Unit	Default
		Value encoded	as 16 bit float.			full	kW	7FFFh
Ac	cess Type							
•	Output							
	$this \to M$		$nis \rightarrow 1$					
	Spontaneo	us 🛛 COV:	1) Δ-Value:	cs 1) Mi	n repetitio	n period:	5 min	
		Cyclic	Period:					
	Request							
Co	mmunicati							
♦		ect Datapoint				Mandatory	<i>r</i> : 🛛	
	Default Gro	up Address:	-					
Dy	namics	-						
	Power dow							
	Power up:		No initialisation:		ılt value:			
			Saved value:			t for input)	_	
			bus (only for output):	Read	from bus	only for in	out):	
	ception Ha				· — ı			
			II be indicated with de	fault value /FF	·⊦h.			
Sp	ecial Featu				- 11 4	. II O. ti	1 - 0 1	
,	day. Theref M-Bus data reception o	fore the definition is provided to the fan M-Bus messa	t meter data are trans of an adequate COV e KNX system and tha age will trigger an upo ιΙ Δ-Value depends οι	is sufficient to g at the KNX bus late of the Grou	guarantee load is not up Object.	that the mo	ost curre Normally	ent . ,

${\bf 5.1.6.4}\quad {\bf Output\,/\,diagnostic\,\,data\,\,CurrentVolumeFlow}$

Property specification

FB:	M_HEATM	Prope	erty Name (<u>Server</u>):	: C	urrent\	/olumel	low			andatory 🗌 Optional 🔯
Desci	ription:									
			flow in m ³ /s m ³ /h llector. The measure							
DPT:			teringValue	DPT I		9.001		pe forma		
Field		Descr				Sup.	Range	9	Unit	Default
Count	Val		ured value			M	full		1)	cs
ValInf	Field		oding of unit and resured value	olution	of the	M	38h to 40h to 48h to	47h		
– Ov – Fa – In <i>l</i>	ıtOfService verridden		is not available / voi		/alue	M NA M NA	true/fa false true/fa false unack	alse	bitset	true false false false unack
Comn – all	nand commands		ard Command field pported, Datapoint s	shall be	e read	NA			enum	
Comr	nunication:	-				-	-		_	_
	Address: he server)		IO Type(ID): Start-Index:	1101 (1	(M_HEA	,		rty ID: elements	53 1	
	perty access:		Read only 🛛		Re	ad/Write				
	tection		Read level				/rite lev			
	ption Handlin		/alue after Powerup:		red Valu		ct Valu		efault Val	ue 🗵
		ın vola	atile memory and sha	all be v	oid afte	r power	up of t	ne Data C	collector.	
_	ial Features:	4-1		6 : - 1 -1 (-41	'tl- (- 41 01- 1	- CI
	a in the meterii ' shall be set to	•	gram are marked in t	tiela 'st	atus' w	ıtn 'perm	nanent	error thei	n the Stati	us flag

Group Object (Standard Mode)

DP Name: CurrentVolumeFlow Abbr.: Mand	datory
	be internal
Description	
Current measured volume flow in I/h units. This value is received from the M-Bus heat by the Data Collector. The metering value shall be read-only and shall be accessible by sent spontaneously in case of change of value.	
Datapoint Type	
DPT_Name: DPT_Value_Volume_Flow	
DPT Format: F ₁₆ DPT_ID: 9.025	5
Field Description Supp. Range	Unit Default
Value encoded as 16 bit float. full	l/h 7FFFh
Access Type	
♦ Output	
this \rightarrow M \square this \rightarrow 1 \square	
Spontaneous \square COV: 1) \square \square \square \square -Value: \square Min repetition period: \square Period:	: 5 min
Request	
Communication Type	
♦ Group Object Datapoint Mandate	ory: 🛛
Default Group Address:	
Dynamics	
Power down: Save:	
Power up: Value: No initialisation: Default value:	
Saved value: Actual value (not for input	ut):
Transmit on bus (only for output): Read from bus (only for	
Transmit on bus (only for output): Read from bus (only for Exception Handling	
Transmit on bus (only for output): Read from bus (only for Exception Handling Void values or faulty values shall be indicated with default value 7FFh.	
Transmit on bus (only for output): Read from bus (only for Exception Handling Void values or faulty values shall be indicated with default value 7FFh. Special Features	input):
Transmit on bus (only for output): Read from bus (only for Exception Handling Void values or faulty values shall be indicated with default value 7FFh. Special Features 1) In the M-Bus RF system heat meter data are transmitted periodically, typically 2 tim	input):
Transmit on bus (only for output): Read from bus (only for Exception Handling Void values or faulty values shall be indicated with default value 7FFh. Special Features 1) In the M-Bus RF system heat meter data are transmitted periodically, typically 2 tim day. Therefore the definition of an adequate COV is sufficient to guarantee that the	input):
Transmit on bus (only for output): Read from bus (only for Exception Handling Void values or faulty values shall be indicated with default value 7FFFh. Special Features 1) In the M-Bus RF system heat meter data are transmitted periodically, typically 2 tim day. Therefore the definition of an adequate COV is sufficient to guarantee that the M-Bus data is provided to the KNX system and that the KNX busload is not too high	input):
Transmit on bus (only for output): Read from bus (only for Exception Handling Void values or faulty values shall be indicated with default value 7FFh. Special Features 1) In the M-Bus RF system heat meter data are transmitted periodically, typically 2 tim day. Therefore the definition of an adequate COV is sufficient to guarantee that the	input):

5.1.6.5 Diagnostic data CurrentEnergyConsumption_T1

FB:	M_HEATM	Pro	perty Name (<u>Server</u>):	CurrentE	Ener	rgyCon	sumption_T1			ry 🔲
Dasc	ription:							U	ווטוו	al 🛚
		d enc	ergy consumption Tarif	1 value th	at ie	receive	ad from the M-Rus o	device a	nd el	nall
			llector. The metering v							
DPT:			eteringValue			9.001	Datatype format			N_8Z_8
Field	Traine Di		Description	101 1 10 1		Sup.	Range		Uni	
			_ 000p			oup.	1 1590		t	ault
Coun	tVal		measured value			M	full		1)	CS
Valln	fField		1)Encoding of unit and		1	М	00h to 07h			
		ļ	of the measured value)			08h to 0Fh			
			1				80h to 81h			
							88h to 89h			
Statu	S	ļ	l						bit	
									set	
_	utOfService		Value is not available	/ void		M	true/false			true
– O	verridden	ļ	i			NA	false			fals
_	11									e
– Fa	ault		measurement failure,	corrupted		M	true/false			fals
ما	Alarm		value			NA	false			e fals
– In	Alarin		ì			INA	laise			e
_ Δι	armUnAck		ì			NA	unack			una
	allionack	ļ	İ			INA	unack			ck
Comr	nand		standard Command fie	eld					en	
		ļ	i						um	
– al	commands	ļ	not supported, Datapo	oint shall be	е	NA				
			read only							
	munication:									
	Address:			1 (M_HEA	(MT		roperty ID:		54	
_ `	the server)		Start-Index: 1				° of elements			
	perty access:		Read only		Rea	ad/Write				
	tection		1 (000 10) 01				rite level			
	ption Handlin		Value after Powerup:					ult Value	e 🖂	
		in vo	platile memory and sha	Il be void a	after	power	up of the Data Colle	ector.		
	ial Features:									
			egram are marked in fi	eld 'status'	' wit	th 'perm	anent error' then the	e Status	flag	
'Fault	t' shall be set to	ว 'true	e'.							

5.1.6.6 Diagnostic data HistoryStorageNumbers

Description: Array of storage numbers 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 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. 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 ≥ 8 elements. - storage number '0' = void element - storage number '1' is reserved for billing period data - other storage numbers are e.g. used for daily, weekly, monthly values - only M-Bus datapoints with storage number higher than 0 are mapped to the history array - array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ (n) Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60 2 to 255: other valid storage numbers 2 to 255: other valid storage nu
Array of storage numbers 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 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. 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 ≥ 8 elements. 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 ≥ 8 elements. In the M-Bus datapoints with storage number array size ≥ 8 elements. In the M-Bus datapoints with storage number higher than 0 are mapped to the history array earray length handling if a part of the history array is not yet filled with valid data: In the M-Bus datapoints with storage number higher than 0 are mapped to the history array earray length are allowed. In the mapped to the history array length are allowed array length are allowed. In the mapped to the history array length are allowed array length are allowed. In the mapped to the history array length are allowed array length are allowed. In 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 and the history array elements contain the same storage number (e.g. monthly values). See clause 4.8 and the history array of storage numbers shall be read-only and shall be accessible by polling. In the array of storage numbers are e.g. the property in the p
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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 nistoric values belonging together shall be associated with the same Property Value array index. 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 ≥ 8 elements. 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 ≥ 8 elements. In the M-Bus datapoints with storage number of the history array size ≥ 8 elements. In the M-Bus datapoints with storage number higher than 0 are mapped to the history array or array length handling if a part of the history array is not yet filled with valid data: In the M-Bus datapoints with storage number higher than 0 are mapped to the history array elementh array length with void data elements or variable array length are allowed to the history array length are allowed to fruither details see clause 4.8 In 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 In array of storage numbers shall be read-only and shall be accessible by polling. In the Manuer of the value of the history of the received M-Bus frames and fill be pescription to the proviously received historic values. Therefore it is possible that various nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 In array of storage numbers shall be read-only and shall be accessible by polling. In the M-Bus data provided the policy of the received M-Bus frames and fill be possible to the history of the received M-Bus frames and fill be
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. 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 ≥ 8 elements. - storage number '0' = void element - storage number '1' is reserved for billing period data - other storage numbers are e.g. used for daily, weekly, monthly values - only M-Bus datapoints with storage number higher than 0 are mapped to the history array - array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
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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 ≥ 8 elements. - storage number '0' = void element - storage number '1' is reserved for billing period data - other storage numbers are e.g. used for daily, weekly, monthly values - only M-Bus datapoints with storage number higher than 0 are mapped to the history array - array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
The M_HEATM object shall support an array size ≥ 8 elements. - storage number '0' = void element - storage number '1' is reserved for billing period data - other storage numbers are e.g. used for daily, weekly, monthly values - only M-Bus datapoints with storage number higher than 0 are mapped to the history array - array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 0:
- storage number '0' = void element - storage number '1' is reserved for billing period data - other storage numbers are e.g. used for daily, weekly, monthly values - only M-Bus datapoints with storage number higher than 0 are mapped to the history array - array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
- storage number '1' is reserved for billing period data - other storage numbers are e.g. used for daily, weekly, monthly values - only M-Bus datapoints with storage number higher than 0 are mapped to the history array - array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
other storage numbers are e.g. used for daily, weekly, monthly values only M-Bus datapoints with storage number higher than 0 are mapped to the history array array length handling if a part of the history array is not yet filled with valid data: ⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 instory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
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⇒ both fixed array length with void data elements or variable array length are allowed ⇒ for further details see clause 4.8 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 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
⇒ for further details see clause 4.8 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 nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
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 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U8[n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
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 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U8[n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers 0 Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
nistory array elements contain the same storage number (e.g. monthly values). See clause 4.8 The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name
The array of storage numbers shall be read-only and shall be accessible by polling. DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 0:
DPT: Name DPT_Value_1_Ucount DPT ID 5.010 Datatype format U ₈ [n] Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers 0 to 255 None 0 Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
Field Description Sup. Range Unit Default 0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
0: void 1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
1: billing period 2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
2 to 255: other valid storage numbers Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
Communication: DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
DP Address: IO Type(ID): 1101 (M_HEATM) Property ID: 60
Start-Index: 1 N° of elements fixed or variable
Property access: Read only ⊠ Read/Write ☐
Protection Read level Write level Exception Handling: Value after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐
Data shall be stored in volatile memory and shall be void after power up of the Data Collector.

5.1.6.7 Diagnostic data HistoryDate

FB: M_	HEATM	Pro	perty Name	(<u>Server</u>):	History	toryDate Manda Opti						
Descripti	on.	L			-		Ŀ		- p			
		nforma	tion for histo	ry values tha	at are recei	ived from	the M-Ru	s device a	nd shall he			
				ceived M-Bus								
stored by		Ooncol	or. III the rec	cived ivi-bu.	3 message	Caciffil	otor y Date	13 43300141	ica with a			
		terface	- Ohiect stor	ane number	e time etai	mne and	historic va	ilues helor	nging together			
				perty Value								
			n clause 5.1.		array iridex	. OCC CIE	103C 4.0 ai	id i Topert	у			
				void if not su	nnorted in	the M-Ri	ie frama					
				read-only a				ina				
						_			1			
			ateTime	DPT ID	19.001		e format	8 octet				
Field		cription				Sup.	Range	Unit	Default			
Year			mation, valid	d if NY = 0 ar	nd	M	0 to 255		.,			
		It = 0										
Month			th information	n, valid if ND	e = 0 and	М	1 to 12		1)			
		It = 0										
DayofMonth Date.DayofMonth information, valid if ND = 0 M 1 to 31												
and Fault = 0												
DayofWee	ek Day	of We	ek information	on, valid if N	doW = 0	0	1 to 7		וי			
	and	Fault:	= 0									
Hour	Tim	e.Hour	, valid if NT	= 0 and Faul	lt = 0	0	0 to 23	h	1)			
Minutes	Tim	e.Minu	tes, valid if N	NT = 0 and F	ault = 0	0	0 to 59	min	1)			
Seconds	Tim	e.Seco	onds, valid if	NT = 0 and	Fault = 0	0	0 to 59	s	1)			
Attributes			aining status									
Fault				ok {0} / fault	{1}	М	fault/ok	bool	ok			
- WD			0} / working	• •	(-)	Ö	true/false		WD invalid			
- NWD				alid {1} / valid	4 (U)	M	true/false		WD invalid			
– NY				/alid {1} / val		M	true/false		Year invalid			
		-		ofMonth fiel		M	true/false		Date invalid			
– ND				onvioriti nei	us irivaliu	IVI	liue/iaise	DOOI	Date IIIvaliu			
NI-I-NA/		valid {		rolld (1) / vol	14 (U)	N.4	true/false	bool	DoW invalid			
NdoW				valid {1} / val		M						
– NT				es, Seconds	Tielas	M	true/false	bool	Time invalid			
OLITI			/ valid {0}	d = == d (0) .	£1	NIA.		h 1	Ota mala mal			
- SUTI				dardtime {0}		NA	true/false		Standard			
CLQ				1} / without {(0}	NA	with /	bool	without			
	exte	ernal sy	nchronizatio	on			without					
Commun	ication:											
DP Add	ress:		IO Type(ID)): 1101 (M	1_HEATM)	Prop	erty ID:	61				
(in the s	server)		Start-Index:	1		N° of	elements	≥8				
	fixed or variable length											
Propert	y access		Read only	\square	Rea	ad/Write			-			
Exception	n Handlir	a: `	Value after F	Powerup: S	Stored Valu	Je □ Ad	t Value	Defaul	t Value 🛚			
				y and shall b								
Special F				, 3 5 5			c. a.o D					
		ie shal	Il he 'void' ur	ntil historic va	alues are a	vailable	all 'valid h	its' shall h	e set to 'not			
valid'.	cation vali	. 5 5 TIG	20 1014 41	1110t0110 VE	2.400 are a	· anabic,	an valia b	Gridii D	0 000 100			

5.1.6.8 Diagnostic data HistoryEnergyConsumption

FB:	M_HEATM	Prop	erty Name (<u>Server</u>): HistoryEnergyConsumption Mandatory Optional									
Dagas	intion.									Орі	ionai 🔲	
Array device M-Bus numbe Value	e and shall be smessage shers, time stam array index. Stray of history Name Di	store all be nps an See cl inforr PT_Me	ergy consumption infollowing the Data Collect associated with a study historic values belause 4.8 and Propermation shall be readetering Value Description measured value	tor. E orage ongir ty Hi	Each Histo e number. ng togethe storyStora	ryEneron In the I r shall I geNum	gyConsu M_HEA ⁻ pe asso pbers in essible b	umption IM In ciated claus by pol	on value ir terface Ob I with the s e 5.1.6.6 ling. e format	n the rec oject stor	eived age operty	
ValInf	Field		¹⁾ Encoding of unit an measured value	id res	solution of	the	M	00h 08h 80h	to 07h to 0Fh to 81h to 89h			
Status Ou Ov Fa InA	ue	M NA M NA	false	/false e	bitset	true false false false unack						
Comn – all	nand commands		standard Command not supported, Datar only		shall be re	ead	NA			enum		
Comr	nunication:	•				•		*				
	Address: he server)		Start-Index: 1	,	1_HEATM)	N°	operty II of elem		62 ≥ 8 fixed or v	variable	length_	
Pro	perty access		Read only		Re	ad/Writ	te					
	ection		Read level				Write					
	otion Handlin		Value after Powerup		Stored Val		Act Valu			: Value 🛭		
		d in vo	latile memory and s	hall b	e void afte	er powe	er up of t	he D	ata Collec	tor.		
_	pecial Features: data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be											
	i in the meteri changed.	ng tel	egram are marked ir	field	l 'status' w	ith 'per	manent	error	then the l	history s	hall be	

5.1.6.9 Diagnostic data HistoryEnergyConsumption_T1

FB: N	: M_HEATM Property Name (<u>Server</u>): HistoryEnergyConsumption_T1										Mandatory ☐ Optional ⊠		
Descri	ption:			-						-			
device a receive storage Propert	and shall be ad M-Bus me e numbers, til by Value arra ay of history	stored ssage me sta y inde	tion Tarif 1 inford by the Data Cashall be associamps and historex. See clause 4	ollector. iated wit ic value: I.8 and F	Each H h a stora s belong Property	istoryEne age numb iing toget HistoryS	rgyCons per. In the her shall torageNu cessible	umpt e M_ be a umbe by po	tion_T1 v HEATM ssociate rs in clar olling.	value in t Interface ed with th	he Object e same		
DPT:	Name DF	PT_Me	eteringValue	DPT ID	229.0	001	Dat	atype	format	$V_{32}N_8Z$			
Field			Description				Sup.	Ran	ige	Unit	Default		
CountV ValInfFi			measured value ^{f)} Encoding of ur measured value	nit and re	esolution	of the	M M	08h 80h	to 07h to 0Fh to 81h to 89h	1)	CS		
Status - OutOfService									true false false false unack				
Comma - all cor	and mmands		standard Comm not supported, I only			e read	NA			enum			
Commi	unication:	-					_	=		-			
	ddress: e server)		IO Type(ID): Start-Index:	1	M_HEA	N°	operty ID of eleme		63 ≥ 8 fixed	or variab	le length		
	erty access:		Read only	\boxtimes		Read/W							
Prote			Read level				Write						
	ion Handlin		Value after Pov		Stored		Act Val			ault Value	$\mathbf{e} \boxtimes$		
		ın vo	latile memory a	nd shall	be void	after pow	er up of	the L	Data Col	lector.			
	Special Features: f data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be												
	hanged.	ng tel	ogram are mark		ia statu	o with pe	Zimanem		i ilicii ii	ic filotory	, strain be		

5.1.6.10 Diagnostic data HistoryVolumeMaxFlow

FB:	M_HEATM	Pro	perty Name (<u>Serv</u>	<u>ver</u>):	Histor	yVolu	ımeM	axFlow			ndatory 🔲
Desc	ription:	<u> </u>								U	paonai 🖂
Array receiv The n reset Each numb togeth Histor	of measured yed from the Max. volume flat the beginni HistoryVolumer. In the M_Her shall be as yStorageNum	M-Bus low is ing of leMax HEAT ssocia nbers	volume flow (in modevice and shall calculated by the each new storage Flow value in the M Interface Objected with the same in clause 5.1.6.6.	be stored M-Bus more number received t storage e Property	by the eter for period. M-Bus number Value	Data (the tir messars, time array	Collec me pe age sh e stan index.	tor. riod of the all be asso nps and his See claus	stora ociate storic e 4.8	ge numbered with a servalues be	er and is storage elonging
DPT:	Name D	PT M	eteringValue	DP	T ID	229.0	01 C	atatype fo	rmat	V ₃₂ N ₈ Z ₈	₃ [n]
Field	' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	_	Description		l -		Sup.	Range		Unit	Default
Coun	tVal		measured value				M	full		1)	CS
ValInf			Encoding of u	init and re d value	solutior	n of	М	38h to 3F 40h to 47 48h to 4F	h		
- 0\ - Fa - In/	utOfService verridden		Value is not avail			alue	M NA M NA NA	true/false false true/false false unack		bitset	true false false false unack
Comr – all	nand commands		standard Comma not supported, D only		hall be	read	NA			enum	
	munication:	,						•			
	Address: he server)		IO Type(ID): Start-Index:	1101 (M __	_	ŕ	N° of	erty ID: elements	64 ≥ 8 fixe	d or varial	ole length
	perty access	:	Read only	\boxtimes	R	lead/V					
Pro	tection		Read level				Write	level		-	
	ption Handlir		Value after Powe		ored Va			Value		fault Valu	e 🖾
Data :	shall be store	d in vo	olatile memory an	d shall be	void af	ter po	wer u	p of the Da	ta Co	ollector.	
	ial Features:										
	a in the meter nchanged.	ing tel	egram are marke	d in field '	status'	with 'p	ermai	nent error'	then	the histor	y shall be

5.1.6.11 Diagnostic data HistoryVolumeMinFlow

FB: N	//_HEATM	Prop	erty Name (<u>Ser</u>	<u>ver</u>):	Hist	oryVo	lumeMii	nFlow			latory □ tional ⊠
Descri	ption:	<u> </u>			-				-	<u> </u>	
Array or eceive The mile eset at Each Haumbel eogethe	f measured of from the Mon. volume flot the beginning istoryVolumer. In the M_Fer shall be as StorageNumay of history	I-Bus ow is ong of eMinF IEATI ssocial obers	volume flow (in modevice and shall calculated by the each new storage) Flow value in the Modes With the samin clause 5.1.6.6 mation shall be resident of the samin clause for the	be store M-Bus me numbe received ct storage e Proper	d by t neter f r perio M-Bu e num ty Val	he Dat for the od. is mes bers, t ue arra	a Collectime per sage shaime stan ay index.	tor. iod of the s all be associons and his See claus	torage ciated toric v e 4.8 a	e number with a sto values bel	and orage onging
DPT:	Name DF		eteringValue	DP1	ΓID	229.0	01 Dat	tatype form	at '	$V_{32}N_8Z_8[n]$	
Field			Description				Sup.	Range		Unit	Default
CountV			measured value				M	full		1)	cs
/alInfF	ield		of the measu			ion	M	38h to 3F 40h to 47l 48h to 4F	ı		
Status								1		bitset	
- Out	OfService		Value is not avai	lable / vo	id		М	true/false			true
- Ove	rridden						NA	false			false
- Fau			measurement fa value	ilure, cori	rupted	İ	М	true/false			false
- InAl	arm						NA	false			false
- Alar	mUnAck						NA	unack			unack
Comma - all c	and ommands		standard Comma not supported, D read only		shall l	ре	NA			enum	
	unication:							-		-	
	ddress:		IO Type(ID):	1101 (M	LHEA	(MT	Prope	erty ID:	65		
`	e server)		Start-Index:	1				elements	≥ 8 fixed	or variabl	e length
	erty access:		Read only	\boxtimes		Read	l/Write				
Prote			Read level				Write				
	ion Handlin		Value after Pow				e 🗌 Act			ault Value	\boxtimes
		d in vo	olatile memory ar	nd shall b	e voic	l after	power uj	o of the Da	ta Col	lector.	
	I Features:										
	n the meteri hanged.	ng tel	egram are marke	ed in field	l 'statu	ıs' with	ı 'permaı	nent error'	hen tl	he history	shall be

5.1.6.12 Diagnostic data HistoryMaxPower

FB:	M_HEATM	Prop	erty Name (<u>Se</u>	rver):	Hist	oryMa	IXP(ower				ndatory
Dac -	intion.											Optional 🛚
	ription:			/ a.a. 1/la ::	:4-\	!. 	_4! -	f	h!a4am!:	41	h = 4 =	! d
			um power (in W						nistory valu	es ti	nat are re	ceived
			d shall be store						mind of the c			a a
			alculated by the				e ur	ne pe	mod of the s	SIOIE	age numb	erano
			ach new storag alue in the recei				a ch	all be	accociated	l vazitl	h a etorao	ıe number
			e Object storage									
			ie same Proper									logether
			n clause 5.1.6.6		array	y inidex	. 00	JC Gla	4.0 and		эрсту	
			ation shall be re		and	shall h	e a	ccess	ible by polli	na		
DPT:			eteringValue	DPT		229.00			atype forma		V ₃₂ N ₈ Z ₈	ูโทไ
Field	Traine Bi		Description		<u> </u>				Range		Unit	Default
Count	Val		measured value	,				M	full		1)	CS
ValInf			Encoding of ur		esolu	tion		M	28h to 2Fh			
• • • • • • • • • • • • • • • • • • • •			of the measured						30h to 37h			
									A8h to A9h			
									B0h to B1h	ı		
Status	; ;										bitset	
– Ou	tOfService	,	Value is not ava	ilable / v	/oid			М	true/false			true
– Ov	erridden						Ν	۱A	false			false
- Fa		ı	measurement fa	ailure, co	orrupt	ed		М	true/false			false
			value		•							
– InA	Alarm						N	NA	false			false
– Ala	rmUnAck						N	NA	unack			unack
Comm	nand		standard Comm								enum	
– all	commands		not supported, [Datapoin	nt sha	II be	١	NΑ				
		l l	read only									
		<u> </u>							-			
	nunication:		I.o. =									
	Address:		IO Type(ID):	1101 (N	и_нь	AIM)	F	rope	rty ID:	66		
(in t	he server)		Start-Index:	1			١	√° of €	elements	≥ 8 fixe		ble length
Prop	perty access:		Read only	\boxtimes		Re	ad/\	Write				
Prot	ection		Read level					Vrite I	level		-	
Excep	tion Handling	g: \	Value after Pow	erup:	Store	ed Valu	ıe [Ac	t Value 🗌	D	efault Valu	ue 🛛
Data s	shall be stored	in vol	atile memory ar	nd shall l	be vo	id afte	r po	wer u	ıp of the Da	ta C	ollector.	
	al Features:											
		ng tele	gram are marke	ed in field	d 'sta	tus' wi	th 'p	perma	nent error'	ther	the histo	ry shall be
left un	changed.											

5.1.6.13 Diagnostic data HistoryMinPower

rb:		Prop	erty Name (<u>Serve</u>	<u>er</u>):	HISTO	rywini	Power				ndatory \square
										(Optional 🛚
	ription:										
			um power (in W o				ion for h	istory va	alues th	at are rec	eived from
			all be stored by the								
			alculated by the M				time per	iod of th	e storaç	ge numbe	er and
			each new storage								
			alue in the receive								
			e Object storage i								together
			he same Property	Value	array	index.	See cla	use 4.8	and Pro	perty	
			n clause 5.1.6.6.								
			nation shall be rea								
DPT:	Name [/leteringValue	DP	T ID	229.0		tatype for			$\sqrt{8Z_8[n]}$
Field			Description				Sup.	Range		Unit	Default
Count			measured value				M	full		1)	cs
ValInf	Field) Encoding of unit		esolutio	on of	M	28h to			
			the measured va	alue				30h to			
								A8h to			
								B0h to	B1h		
Status										bitset	
- Οι	ıtOfService	'	√alue is not availa	ble / v	oid		M	true/fal	se		true
– Ov	erridden						NA	false			false
– Fa	ult	r	measurement failu	ire, coi	rupted	i	M	true/fal	se		false
		\	/alue								
– In/	Alarm						NA	false			false
– Ala	armUnAck						NA	unack			unack
Comn	nand		standard Comman	d field				1		enum	1
– all	commands	r	not supported, Dat	tapoint	shall l	be	NA				
			ead only	•							
			·								
Comr	nunication:	-						- 5		<u> </u>	-
DP /	Address:		IO Type(ID): 1	101 (N	Л_HEA	TM)	Propert	y ID:	67		
(in t	he server)		Otant Inda	•	_	•	NIO -£ -1		≥ 8		
•	•		Start-Index: 1				N° of el	ements	fixed	or variabl	e length
Pro	perty access:		Read only	\boxtimes		Read	d/Write				
Prot	ection		Read level				Write	level		-	
Excep	otion Handlin	ıg:	Value after Power	rup:	Stored	Value	e 🔲 Act	Value [De	efault Valu	ıe 🛛
Data s	shall be stored	in vo	latile memory and	shall l	be voic	after	power u	p of the	Data C	ollector.	
Speci	al Features:		-								
		ng tele	egram are marked	in field	d 'statı	ıs' with	ı 'perma	nent err	or' then	the histo	ry shall be
	changed.	-	-				•				•

5.1.6.14 Output / diagnostic data TempFlowWater

Property specification

FB:	M_HEATI	М	Prop	erty Name (<u>Se</u>	erver):	TempF	lowWa	ter					andatory 🗌
Dane	w!m4! a.m.											<u> </u>	Optional 🛚
	ription:			value that is w		frama tha	M Due	نا ده ا		and ahall ha	2422	ا الما	the Dete
				value that is re							Stor	ed by i	ine Data
DPT:				alue shall be re ACTempAbs		DPT ID	205.1			tatype form	ot [\/ Z	
Field		DF		ription		טרווט	205.1		т <u>ра</u> up.		ur Ur	$V_{16}Z_8$	Default
Temp				erature value					ир. И	Range full 1)	° (none
Statu			temp	erature value				!	VI	luli		set	none
	s utOfService		Valu	e is not availab	do / voic	4			М	true/false	Dit	SEL	true
_	utorservice verridden	7	value	e is flot availab	ile / VOIC	,			VI JA	false			false
			mood	suromont failur	o corru	intod valu	0	1 -		true/false			false
										false			
InAlarm NA false NA unack										unack			
- AlarmUnAck NA unack u											unack		
Com	mand		stand	dard Command	d field					1	en	um	
– al	l command	s	not s	upported, Data	apoint sl	hall be rea	ad	N	lΑ				
			only										
Com	municatio	n:	=					_		•	=		
DP	Address:			IO Type(ID):	1101 (M_{HEAT}	M)			erty ID:	70)	
(in	the server)		Start-Index:	1					elements	1		
Pro	perty acce	ess:	1	Read only	\boxtimes		Read/V						
Pro	tection			Read level				V	Vrite	level			
	ption Han			Value after Po	•					√alue 🗌			lue 🛛
Data	Data shall be stored in volatile memory and shall be void after power up of the Data Collector.												
Spec	ial Feature	es:											
				egram are mar	ked in f	ield 'statu	s' with	'perr	man	ent error' th	en th	ne Stat	tus flag
4.5	t' shall be s										_		
	The range of the temperature value is determined by the M-Bus device; the Data Collector shall map												
th	e full range) .											

Group Object (Standard Mode):

DP	Name: 1	- empFlowWater	Abbr.:			Mandat	ory		
FB	Name: N	/_HEATM				Can be	interna	al	
De	scription								
Cu	rrent flow ter	nperature value that is received from the	e M-Bus d	evi	ce and sha	all be store	d by the	e Data	
		alue shall be read-only and shall be ac	cessible by	y po	olling or it i	is sent spoi	ntaneo	usly in	
_	se of change								
	tapoint Typ								
	T_Name:	DPT_Value_Temp							
	T Format:	F ₁₆			DPT_ID:	9.001			
Fie	eld	Description			Supp.	Range	Unit	Defa	
						Full	°C	7FFF	<u>-</u> h
Ac	cess Type								
♦	Output								
	this \rightarrow M								
	Spontaneou	s \square COV: 1) \square \triangle \triangle -Value:	cs 1)	Mi	n repetitio	n period:	5 m	nin	
		Cyclic Period:							
	Request								
Co	mmunicatio								
♦		ect Datapoint				Mandatory	: 🛛		
	Default Grou	up Address:							
Dy	namics								
	Power down								
	Power up:	Value: No initialisation:			It value:				
		Saved value:				ot for input)			_
		Transmit on bus (only for output):	Re	ad	from bus	only for inp	out):		
	ception Han								
		faulty values shall be indicated with the	default val	ue	7FFFh.				
	ecial Featur								
1)		s RF system heat meter data are transm							r
		ore the definition of an adequate COV is							
		is provided to the KNX system and that				too high. N	Normall	У	
		an M-Bus message will trigger an upda		irou	ip Object.				
	rne definitio	on of a meaningful Δ -Value is company s	specific.						

5.1.6.15 Output / diagnostic data TempReturnWater

Property specification:

FB:	M_HEATM	Pro	perty Name (<u>Server</u>)	: Temp	Return			M	andatory ∐ Optional ⊠		
Desc	ription:	<u> </u>							<u> </u>		
			perature value that is							e st	ored by the
			ering value shall be re								
DPT:	Name	DPT_	HVACTempAbs_Z	DPT ID	205.1			tatype format		V ₁₆ 2	
Field			Description			Su	p.	Range	Unit		Default
Temp			temperature value			N	1	full ¹⁾	° C		none
Status									bitset	:	
	OfService		Value is not availabl	e / void		N		true/false			true
	rridden					N.	-	false			false
- Faul	t		measurement failure value	ed	M true/false					false	
- InAla	arm			NA false					false		
- AlarmUnAck NA								unack			unack
Comn	nand		standard Command					enum	1		
- all c	ommands		not supported, Data	point sha	ll be	N.	Α				
			read only								
Comr	nunication:										
	Address: he server)		IO Type(ID):	1101 (M_HEA	TM)	Р	rope	erty ID:	71		
·	,		Start-Index:	1	ŕ	Ν	° of	elements	1		
Pro	perty access	: :	Read only		Read	d/Writ	te				
Prof	ection		Read level			W	/rite	level			
	otion Handlii		Value after Poweru		ed Value						lue 🛛
Data	shall be store	d in v	olatile memory and s	hall be vo	oid after	powe	er up	of the Data	Collec	tor.	
Speci	al Features:										
			legram are marked ir	n field 'sta	ıtus' witl	า 'per	mar	nent error' the	en the	Sta	tus flag
4.5	shall be set										
		e tem	perature value is dete	ermined b	y the M	-Bus	dev	ice; the Data	Collec	ctor	shall map
the	e full range.										

Group Object (Standard Mode):

DP Name:	TempReturnWater	Abbr.:	-	Mandato	ory	
FB Name:	M_HEATM			Can be	internal	
Description						
	temperature value that is received from					
case of chang	e value shall be read-only and shall be ac	cessible by p	polling or it i	s sent spor	itaneou	siy in
Datapoint Ty						
DPT Name:	DPT_Value_Temp					
DPT Format:	F ₁₆		DPT ID:	9.001		
Field	Description		Supp.	Range	Unit	Default
. 10.0	2 000		00.66	Full	°C	7FFFh
Access Type			1	-	-	
♦ Output						
this \rightarrow M	\boxtimes this \rightarrow 1					
Spontaneo	ous 🛛 COV: 1) 🔻 Δ-Value:	cs 1) N	1in repetition	n period:	5 mi	in
	Cyclic Period:					
Request						
Communicat						
	oject Datapoint			Mandatory:		
	oup Address:					
Dynamics						
Power dov		15.6			157	
Power up:			ult value:			
	Saved value:		al value (no			
Everytian III	Transmit on bus (only for output):	L Read	d from bus (only for inp	ut):	
Exception Ha	andling r faulty values shall be indicated with defa	oult value 75	EEb			
Special Feat	,	auit value 7F	FFII.			
	us RF system heat meter data are transr	nitted period	ically typica	ally 2 times	to 6 tim	es ner
	efore the definition of an adequate COV is					
	a is provided to the KNX system and that					
	of an M-Bus message will trigger an upda				y	
	tion of a meaningful Δ-Value is company		,,			
	<u> </u>					

5.1.6.16 Output / diagnostic data TempDiffWater

Property specification

FB:	M_HEATM Property Name (<u>Server</u>): TempDiffWater											andatory 🔲
	<u> </u>										'	Optional 🔀
	ription:											
			ture difference (flow									
		y the [Data Collector. The r	neterin	ıg valu	e shall	be read-	-only a	nd sha	ıll be a	cces	ssible by
polling	g											
DPT:	Name	DPT_	HVACTempRel_Z	DP	T ID	205.10	01 Da	tatype t			₁₆ Z ₈	
Field			Description				Sup.	Range	9	Unit		Default
Temp			temperature differ	ence v	alue		М	full 1)		K		none
Status	S									bitset		
Οι	utOfService	•	Value is not availa	ible / v	oid		М	true/fa	alse			true
- O\	erridden/						NA	false				false
 Fault measurement failure, corrup 					rrupted	i	М	true/fa			false	
value												
- In	Alarm						NA	false				false
– Ala	armUnAck							unack				unack
Comr	nand		standard Commar	nd field						enum	1	
- all	command	S	not supported, Da	tapoint	shall l	oe	NA					
			read only	-								
Comr	nunicatio	า:										
DP .	Address:		IO Type(ID):	1101 (N	M_HEA	TM)	Prope	erty ID:		72		
(in t	he server))	Start-Index:	1	_		N° of	elemer	nts	1		
Pro	perty acce	ss:	Read only	\boxtimes		Read	I/Write					
Pro	tection		Read level -				Write	level				
Exce	ption Hand	dling:	Value after Powe	rup:	Stored	l Value	e 🗌 Act	Value		Defaul	t Val	ue 🛚
Data:	shall be sto	red in	volatile memory and	l shall l	be void	after	power up	of the	Data	Collec	ctor.	
Spec	ial Feature	es:										
If data	a in the me	tering t	telegram are marked	l in fiel	d 'statı	ıs' with	ı 'permar	nent eri	or' the	n the	Stat	us flag
'Fault	' shall be s	et to 'tı	ue'.									-
1) Th	e range of	the ter	mperature value is d	etermiı	ned by	the M-	-Bus dev	rice; the	e Data	Collec	ctors	shall map
the	e full range											-

Group Object (Standard Mode):

FB Name: M_HEATM											
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. Datapoint Type	Description										
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. Datapoint Type											
Is sent spontaneously in case of change of value. Datapoint Type	Current water temperature difference (flow – return) value that is received from the M-Bus device and										
DATA DORANGE: DPT_Value_Tempd DPT Format: F16											
DPT_Name: DPT_Value_Tempd DPT Format: F16	· · · · · · · · · · · · · · · · · · ·										
DPT Format: F ₁₆											
Field Description Supp. Range Unit Default Access Type ◆ Output this → M											
Full K 7FFh											
Access Type this → M □ this → 1 □ Spontaneous □ COV: ¹) □ Δ-Value: cs ¹) Min repetition period: 5 min Request □ Request □ Communication Type ◆ Group Object Datapoint Mandatory: □ Default Group Address: Dynamics Power down: Save: □ No initialisation: □ Default value: □ Power up: Value: No initialisation: □ Default value (not for input): □ Saved value: □ Actual value (not for input): □ Transmit on bus (only for output): □ Read from bus (only for input): □ Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
♦ Output this → M □ Spontaneous □ COV: ¹) □ Cyclic □ Period: Communication Type Group Object Datapoint Default Group Address:											
this → M											
Spontaneous											
Cyclic											
Request Communication Type I Group Object Datapoint Default Group Address: Power down: Save: Power up: Value: No initialisation: Saved value: Transmit on bus (only for output): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Communication Type ◆ Group Object Datapoint											
◆ Group Object Datapoint											
Default Group Address: Dynamics Power down: Save: Default value: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Power down: Save: Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Power down: Save: Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Power up: Value: No initialisation: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Saved value: Transmit on bus (only for output): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Exception Handling Void values or faulty values shall be indicated with the default value 7FFFh.											
Void values or faulty values shall be indicated with the default value 7FFFh.											
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 is company specific.											

5.1.6.17 Output / Diagnostic data ReliabilityOfMeteringData

FB:	M_HEATM	F	Property Na	erty Name (<u>Server</u>): ReliabilityOfN					fMeteri	ngData		datory □ ptional ⊠
Dose	crintion:						<u> </u>					plioriai 🖂
Description: The purpose of this Property is to indicate whether or not metering values of this FB are up-to-date or												
		3110	perty is to i	ilaic	ate wrict	iici c	or mot mic	, terning	values	01 1113 1 15 4	ic up-to-uc	
	outdated. ReliabilityOfMeteringData is set to <i>'true'</i> each time an M-Bus RF frame containing valid metering data is											
	received and a receive time stamp is stored in the Property RxReceptionTime.											
	By comparison of current Date & Time with RxReceptionTime a receive-timeout on M-Bus RF metering											
	es can be det l Δt).	ected	I. The timed	ut is	s implem	entat	tion spec	ific (re	ecomme	ended value	24 hours	+
	timeout expi	res (e	e.g. due to a	ın in	terruptio	n or _l	persisten	ıt distu	ırbance	of the RF d	ata link or	due to a
	ct of the mete				perty Re	liabili	ityOfMete	eringD	ata is s	set to the val	ue <i>'fal</i> se' to	indicate
	metering value											
	implementation					Mete	ringData	is rec	ommer	nded to provi	de informa	tion of
	oility of meteri			y ur	nits.				r			
DPT		DPT	_Bool			DPT	Γ ID 1.	002		atype format		
Field Description Sup. Range Unit							Unit	Default				
			0: false						M	{0, 1}	none	false
			1. true									
	ess Type											
_	 ◆ Output this → M X Ithis → 1 											
			this \rightarrow 1			-						
S	Spontaneous								ne			
_		<u> </u>	Cyclic	Ш	Period:	r	none					
	equest											
Communication Type ◆ Group Object Datapoint Mandatory: ☐												
										livianda	tory:	
	efault Group	Adare	ess: none)								
	munication:			// -	\ 1	101	/A	T. 4\	Б		100	
	Address:		IO Type	•	,	101 ((M_HEA	I IVI)	Prope		128	
•	the server)		Start-In					I /\ A /		elements	1	
	perty access	s:	Read o		\boxtimes		R	ead/W		<u> </u>		
Protection Read level Write level Exception Handling: Value after Powerup: Stored Value □ Act Value □ Default Value □												
	•	ng:	value att	er P	owerup:	St	ored val	ue	ACT V	alue 🖂 De	etauit value	9 □
None												
Special Features:												
None	2 .											

5.1.6.18 LTE Zoning Parameter Apartment

FB:	FB: M_HEATM Property Name (Server):				Apartment Mandatory □ Optional □						
Desc	Description:										
LTE z	LTE zone: Apartment number used for LTE binding and in addition as localization information for the										
meter	ing device.										
DPT:	Name	DPT_L	JcountValue8_Z	DPT	ID	202.0	02	Datatype	format	U ₈ Z ₈	
Field			Description				Sup.	Range	Unit	Default	
Coun	terValue		Apartment number			M		1 to 126	none	1	
Statu	 S								bitset		
- Oı	utOfService		zone active /inactiv	е			0	true/false		false	
- all	other flags		not supported, fixed	d to '0	,		NA				
Comr	nand								enum		
- No	ormalWrite						М				
- SetOSV & ResetOSV set zone inactive / active							0				
- all other commands not supported NA											
Communication:											
DP	Address:		IO Type(ID):	1101	(M	HEATI	M) Pro	perty ID:	101		
(in t	he server)		Start-Index: 1 N° of elements 1								
Pro	Property access: Read only ☐ Read/Write ☒										
Pro	tection		Read level				Write	level			
Exce	ption Handli	ng:	Value after Powerup	o: S	tore	d Value	e 🖄 Act	Value 🗌	Default	Value 🗌	
Special Features:											
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). 1) Mandatory in LTE implementations only.											

5.1.6.19 LTE Zoning Parameter Room

FB:	M_HEATM	Prop	perty Name (<u>Server</u>):	Roo	m				Mandatory \boxtimes^1 Optional \square	
Desc	ription:								<u> </u>		
			parameter used for	LTE	bindi	ng and	in a	dditic	n as localiz	ation info	rmation for
the m	etering device										
DPT:	Name DP	T_Uc	ountValue8_Z	DPT	ID	202.0	02	Data	itype format	U_8Z_8	
Field			Description				Su	ıp. l	Range	Unit	Default
Coun	terValue		Room number				N	1	1 to 63	none	1
Statu	S									bitset	
Οι	utOfService		zone active /inactive				C) t	true/false		false
– all	other flags		not supported, fixed to '0'			N.	Α				
Comr	nand									enum	
– No	ormalWrite						N	1			
– Se	etOSV & Reset	OSV	set zone inactive / a	active	!		C)			
– all	other commar	nds	not supported				N.	Α			
Com	munication:						•	•		•	
DP	Address:		IO Type(ID):	1101	(M_H	HEATN	M)	Prop	erty ID:	102	
(in t	he server)		Start-Index:	1				N° o	f elements	1	
Pro	perty access:		Read only			Read	l/Wri	te	\boxtimes		
Pro	tection		Read level				W	/rite le	evel		
Exce	ption Handlin	g:	Value after Powerup): S	torec	l Value	e 🔯	Act \	/alue 🗌	Default V	alue 🗌
Spec	Special Features:										
M_HE	ATM DPs are	not L	TE communicating in	zone	e is 'C	OutOfS	ervic	e'. If	Apartment i	is 'OutOf	Service' also
	ne corresponding Room and Subzone is 'OutOfService' (common flag). Mandatory in LTE implementations only.										

5.1.6.20 LTE Zoning Parameter Subzone

FB:	M_HEATM	Prop	erty Name (<u>Server</u>	one				Mandate Optiona		
	ription:	-		-						
			er within the Apartn		om used	for L	TE b	oinding and	d in addition	n as
localiz	zation informa	tion for	the metering device	e.						
DPT:	Name [DPT_U	countValue8_Z	DPT ID	202.002	2 D	ataty	ype format	U_8Z_8	
Field			Description			Sup). R	ange	Unit	Default
Coun	terValue		Subzone number			М	1	to 15	none	1
Status	S							bitset		
- Oı	utOfService		zone active /inact	ive		0	tr	ue/false		false
- all	other flags		not supported, fix		NA					
Comr									enum	
- No	rmalWrite					M				
- Se	tOSV & Rese	tOSV	set zone inactive	/ active		0				
- all	other comma	nds	not supported			NA				
Comr	nunication:		•				•			
DP.	Address:		IO Type(ID):	1101	(M_HEA	ATM)	Pro	operty ID:	103	
(in t	he server)		Start-Index:	1			N°	of elemen	nts 1	
Pro	perty access:		Read only		Read/\	Write		\boxtimes		
Pro	tection		Read level			Writ	te lev	vel		
Exce	ption Handlin	ıg: ∖	/alue after Powerup	o: Store	d Value [×Α	ct Va	alue 🗌	Default Va	alue 🗌
Spec	ial Features:									
M_HE	ATM DPs are	not LT	E communicating in	f zone is '(OutOfSe	rvice'	. If A	partment	is 'OutOfS	ervice' also
	ne corresponding Subzone is 'OutOfService' (common flag).									
¹⁾ Ma	Mandatory in LTE implementations only									

5.1.6.21 Diagnostic data RxSequenceCounter

FB:	M_HEATM	Pro	perty Name (<u>Server</u>): RxSe	equenc	eCount	er		Mar	ndatory 🗵
									0	ptional 🗌
Desci	iption:									
This D	Datapoint shall o	conta	ins the sequence cou	inter that	shall be	genera	ted local	y by t	the Data C	Collector
and sl	nall be increme	nted	each time an M-Bus	message	is receiv	ed fron	n the corr	espor	nding M-B	lus
device	e. This Property	shal	I be used for consiste	ency checl	king if m	netering	data is r	etriev	ed from th	າe Data
Collec	ctor.									
During	g readout of me	tering	g data from the Data	Collector	a new N	/I-Bus fr	ame cou	ld be	received a	and read
			stent. Therefore the o							
count	er before and at	fter re	ead out. If the sequer	nce counte	er value	has cha	anged, m	eterin	ng data ma	ay be
incons	$sistent \Rightarrow retry t$	by the	e client							
DPT:	Name D	PT_V	/alue_1_Ucount	DPT ID	5.010	Da	atatype fo	ormat	U ₈ [n]	
Field		I	Description			Sup.	Range		Unit	Default
							0 to 25	5		0
Comr	nunication:	-								
DP /	Address:		IO Type(ID):	1101	(M_HE	ATM)	Propert	y ID:	110	
(in t	he server)		Start-Index:	1			N° of el	emen	ts 1	
Pro	perty access:		Read only		Read/	Write				
Prot	ection		Read level			Write	e level			
Excep	tion Handling	: '	Value after Powerup:	Stored	Value [☐ Act \	/alue 🗌	De	fault Valu	e 🛛
Free r	unning counter	with	overflow 255 → 0.							
Speci	al Features:									
None.										

5.1.6.22 Diagnostic data RxReceptionTime

FB: M_HEATM Property Name (<u>Server</u>):	ATM Property Name (<u>Server</u>): RxReceptionTime Mandatory Optional										
Description:											
Time stamp generated locally by the Data Collector											
_	TID	19.00°		tatype form		3 octet					
Field Description			Sup.	Range	Unit	Default					
Year Year information, valid if NY=0 an			M	0 to 255							
Month Date.Month information, valid if NE Fault=0			M	1 to 12		,					
DayofMonth Date.DayofMonth information, validated and Fault=0	d if ND	=0	М	1 to 31		7)					
DayofWeek Day of Week information, valid if N and Fault=0	ldoW=0)	0	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 Fa			М	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} / faul	t {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} / vali	id {0}		M	true/false	bool	WD invalid					
- NY validity of Year field invalid {1} / va	lid {0}		M	true/false	bool	Year invalid					
- ND validity of Month & DayofMonth fie {1} / valid {0}	lds inv	alid	M	true/false	bool	Date invalid					
- NdoW validity of DoW field invalid {1} / va	alid {0}		M	true/false	bool	DoW invalid					
- NT validity of Hour, Minutes, Seconds invalid {1} / valid {0}	fields		М	true/false	bool	Time invalid					
- SUTI summertime {1} / standardtime {0}	flag		NA	true/false	bool	Standard					
 CLQ clock quality bit: with {1} / without { synchronization 	(0) exte	rnal	NA	with / without	bool	without					
Communication:				without	<u> </u>	<u> </u>					
DP Address: IO Type(ID):	1101	(M L	ΙΕΔΤΙΛΙ	Property	ID.	111					
(in the server) Start-Index:	1	(141_1	i = /			1					
(in the server) Start-Index: 1 N° of elements 1 Property access: Read only ☑ Read/Write ☐											
Exception Handling: Value after Powerup: Stored Value Act Value Default Value											
The Property is stored in volatile memory. Afte M-Bus frame is received from the correspondir	r powe	r up th	e initial	isation value	e is 'voi	d' until a valid					
Special Features:	-					<u> </u>					
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

FB:	M_HEATI	M P	operty Name (<u>Serv</u>	<u>'er</u>):	Mar	nufactı	urer		M	1andatory <u>⊠</u>		
										Optional		
Desc	ription:	-			-							
M-Bu	s specific 1	6 bit m	anufacturer code tha	t is rec	eive	from t	the M-Bu	s device and	shall be	stored by		
the D	ata Collect	or durin	g installation proced	ure.						-		
In the	M-Bus me	ssage t	he manufacturer cod	de is co	ontair	ned in t	he MID fi	eld (see [02]] and [03][[03]).		
The N	IID field co	ntains t	he Manufacturer ID	encode	ed as	a 2 oc	tet unsigi	ned binary v	alue. This			
Manu	Manufacturer ID is calculated from the ASCII code of manufacturer identification (three uppercase letters)											
with a formula defined in [02]. The Properties Manufacturer, IdentificationNumber, VersionNumber and MeteringDeviceType together												
					, Ver	sionNu	ımber an	d MeteringD	eviceType	together		
			e meter identificatior									
			er may have been ch							ssioning		
			is indicated in the m					perty Manuf	acturer.			
	alue shall b		only and shall be ac		_	<u> </u>].					
DPT:	Name	DPT_\	/alue_2_Ucount	DPT	· ID	7.001		atype forma	t U ₁₆			
Field			Description				Sup.	Range	Unit	Default		
								full range	none	0		
Comi	nunication	ո։	-			•	-		<u>-</u>	-		
DP	Address:		IO Type(ID):		110	1 (M_F	HEATM)	Property ID): 112	<u> </u>		
(in t	he server))	Start-Index:		1			N° of eleme	ents 1			
Pro	perty acce	ess:	Read only	\leq		Read	d/Write					
Pro	tection		Read level				Write	level				
Exce	ption Hand	dling:	Value after Power	up: S	Store	d Value	e 🗵 Act	Value 🗌	Default Va	alue 🗌		
None	-											
Spec	ial Feature	es:										
Manu	facturer 00	00h = v	oid value			•						

5.1.6.24 Diagnostic data IdentificationNumber

FB:	M_HEAT	M P	roperty Name (<u>S</u>	erver):	nNuml	per		Mandatory ⊠ Optional □			
Desc	ription:							<u> </u>		Ориона	
		s a unio	ue current identific	cation n	ımher	nreset	hy man	ufacture The	Prone	rties	
			tionNumber, Vers								
	e meter id			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	bor arr	a moto	mgbov	ico i ypo toge) (1101 TITE	ant wondwide	
			er may have beer	i change	ed in th	e mete	r by the	installer dur	ina com	missionina	
			s is indicated in the								
			will be additionall								
	riginal Iden			, ,							
In the	M-Bus me	essage	the identification r	number i	s an M	l-Bus s	pecific 8	3 digit BCD c	ode. It s	shall be	
receiv	ved from th	ie M-Bu	s meter during ins	stallation	, then	mappe	d to a 3	2 bit counter	value a	ind stored by	
the D	ata Collect	or.	_							-	
The value shall be read-only and shall be accessible by polling.											
DPT:	Name	DPT_\	/alue_4_Ucount	DP	PT ID	12.00	1 Da	atatype forma	at U ₃	32	
Field			Description				Sup.	Range	Unit	Default	
								full range		FFFFFFFh	
Com	municatio	n:	-			-		-		_	
DP	Address:		IO Type(ID):		1101	(M_HE	EATM)	Property ID:	11	3	
(in t	the server)	Start-Index:		1			N° of eleme	nts 1		
Pro	perty acce	ess:	Read only	\boxtimes		Read	I/Write				
Pro	tection		Read level				Write	e level			
Exce	ption Han	dling:	Value after Pov	verup:	Store	d Value	e 🖄 Ac	t Value 🗌	Default	t Value 🗌	
Spec	Special Features:										
Identi	ficationNu	mber Fl	FFFFFFFh = void	value (o	n M-Bı	us the i	dentifica	ation number	FFFFF	FFFh is used	
for wi	ldcard add	ressing	and is never a va	lid part o	of the N	Л-Bus а	address).			

5.1.6.25 Diagnostic data VersionNumber

FB:	M_HEATM	Property Name (Server)	: Versio	nNumber			andatory 🔀
					-		Optional
	ription:						
		neter that is received from	the M-Bu	is device during	commission	ing.	
		ufacturer specific.					
		nique M-Bus "address" pre					
		, VersionNumber and Met	eringDevi	ceType togethe	er mark a woi	rldwide uni	ique meter
	ification.						
		n procedure the version nu				M-Bus met	er. The
DPT:		ored by the Data Collector T Value 1 Ucount D				11	
Field		Description	ן טוויקי		type format Range	Unit U ₈	Default
rieiu		Description			ull	None	0
Com	munication:	<u> </u>			<u> </u>	INOTIC	
	Address:	IO Type(ID): 11	01 (M HI	EATM) Pro	perty ID:	114	
	the server)	Start-Index: 1	01 (IVI_11I		of elements	1	
	perty access:	Read only		Read/Write			
	tection	Read level		Write le	vel		
	ption Handling		Storec	l Value ⊠ Act		Default Va	lue 🗍
		<u>, </u>					
Spec	ial Features:						
		version number is complet	ely manu	facturer specific	. Therefore r	no special	features
	e defined.	•	•	·			
5.1.6	5.26 Diagnosti	c data MeteringDevice	Type				
FB:	M HEATM	Property Name (Server): Meter	ingDeviceType		Ma	andatory 🛛
	_	. , , , , , , , , , , , , , , , , , , ,		J.			Optional 🔲
Desc	ription:		_				
Devid	ce Type of the h	eat meter device. Support	ed values	in M HEATM	are:		
		ergy (outlet)		_			
		Load energy meter (outlet	t)				
		Load energy meter (inlet)					
		ergy (inlet)					
		d Cool energy					
		vice type					
		nique M-Bus "address" pre	eset by ma	anufacture. All t	he Propertie	s Manufac	turer.
		, VersionNumber and Met					
	ification.	, voicion tambér and met	ogz ov.	oo i ypo togoti io	, mant a wo	ilamae am	ique moter
		n procedure the Metering[)eviceTvr	ne information is	nrovided by	the M-Ru	s meter
		ored by the Data Collector				tile ivi bu	o motor.
DPT:		T Metering DeviceType			tatype forma	t N ₈	
Field		Description	Sup.	Range		Unit	Default
				{4, 10, 11, 12,	13, 255}	enum.	255
Com	munication:	<u> </u>		<u> </u>		<u> </u>	-
	Address:	IO Type(ID):	1101 (M	HEATM) P	roperty ID:	115)
	the server)	_ ` ` ` ` `	1	,	° of elements		

Read only

Read level

Value after Powerup:

Property access:

Exception Handling:

Special Features:

Protection

None.

Device type '255' = void (default value); used to indicate that the FB is not connected to a meter.

Read/Write

Stored Value ⊠ Act Value □

Write level

Default Value

5.1.6.27 Diagnostic data FabricationNumber

	57.1												
FB: N	M_HEATM	Pro	perty Name (<u>Ser</u>	lumber	Manda Option	,	∑ 1) □						
Descri	ption:	_			-		•	-					
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.													
	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 ₃₂												
		_van	ue_4_Ocount			2.001	Unit	e iormat	Default				
Field	Description			Sup.	Range full range	70	none		FFFFFFFFF	<u> </u>			
Comm	unication		<u> </u>		Tiuli rang	Je	TIONE			1			
DP A	unication: ddress: e server) erty access:		IO Type(ID): Start-Index: Read only	1101 (1	M_HEAT	,	Property II N° of elem		116 1				
Prote			Read level				Write leve						
	ion Handling:	V	alue after Poweru	ıp: St	ored Val		Act Value		ault Value [
None.													
Specia	I Features:												
wildcare	FabricationNumber FFFFFFFFh = void value (on M-Bus the identification number FFFFFFFFh is used for vildcard addressing and is never a valid part of the M-Bus address). 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

FB:	M_HEATM	Pr	operty Name (<u>Server</u>):			Acc	essNumb	er	Mandatory ⊠ Optional □				
					_							Ориона 🗀	
Desci	ription:												
Conse	ecutive mess	sage n	umber that	is genera	ted by	the	heat mete	r and t	that is recei	ived from	om th	ne M-Bus	
device	e and shall b	e stor	ed by the D	ata Collec	ctor. Th	e m	echanism	of acc	ess numbe	er is m	anufa	acturer	
	ic. The value												
	he encoding of the AccessNumber in the M-Bus Message is specified in [03].												
DPT:	Name	DPT_	Value_1_U	lcount	DPT	ID	5.010	Data	atype forma	it	U ₈ [ı	n]	
Field			Description	n			Sup.		Range	Unit		Default	
							-		0 255	None	Э.	0	
Comr	nunication:		-			-		-					
DP A	Address:		IO Type(ID):	1101	(M_I	HEATM)	Prop	perty ID:	1	117		
(in t	he server)		Start-Ind	ex:	1			N° c	f elements	1			
Pro	perty acces	s:	Read onl	ly 🗵]		Read/W	rite					
Prof	ection		Read lev	el			1	Nrite I	evel				
Exce	Exception Handling: Value after Powerup: Stored Value 🗌 Act Value 🔲 Default Value 🖂												
Data i	ata is stored in volatile memory and is void after power up of the Data Collector.												
Speci	al Features	:											
None.													

5.1.6.29 Diagnostic data DeviceStatus

FB:	FB: M_HEATM F		operty Name (<u>S</u>	Gerver):	Device	St	atus			Mandatory 🖂		
										Optional		
Desc	ription:											
M-Bu	s specific cor	mbine	d Status/Error-co	ode (bitset)	of the h	nea	t meter	that is receiv	ed from th	ne M-Bus		
device	€.											
			iceStatus in the									
The ra	aw value sha	ll be s	tored by the Dat	a Collector	r and sh	all	be acce	ssible by pol	ling.			
DPT:												
Field Description Sup. Range Unit Default												
	full None 0											
Comr	nunication:											
DP .	Address:		IO Type(ID):	1101 (N	M_HEA	TΜ) Prop	erty ID:	118			
(in t	he server)		Start-Index:	1			N° o	f elements	1			
Pro	perty access	s:	Read only	\boxtimes	F	Rea	d/Write					
Pro	ection		Read level				Write	e level				
Exce	otion Handli	ng:	Value after Pov	werup: S	Stored V	alu	ie 🗋 Ad	t Value 🗌	Default \	∕alue ⊠		
None												
Special Features:												
			legram are mark					n 'permanent	error' (bit	3) then the		
Status	tatus flag 'Fault' of various metering datapoints shall be set to 'true'.											

5.1.6.30 Diagnostic data OperatingTime

FB:	M_HEATM	Pro	pperty Name (<u>Server</u>	<u>r</u>):	Operating	Time		ſ	Mandatory ☐ Optional ⊠			
Desc	ription:								- Pare 11-10			
Durat	ion of meter a	ccumi	ulation of the heat me	eter th	nat is receiv	ed from	the M-Bus	device.				
The v	alue shall be s	stored	l by the Data Collecto	or and	shall be a	cessible	by polling.					
DPT:	Name [PT_L	_ongDeltaTimeSec	DPT	ID 13.10	0 Dat	atype form	at V	['] 32			
Field			Description			Sup.	Range	Unit	Default			
							full 1)	S	0			
							≥0					
Comr	nunication:											
DP	Address:		IO Type(ID):	1101	(M_HEATN	Л)	Property	ID:	119			
(in t	he server)		Start-Index:	1			N° of eler	nents	1			
Pro	perty access:	1	Read only		Read	I/Write						
Prof	tection		Read level			Write	level					
Exce	otion Handlin	g:	Value after Powerup): S	tored Value	e 🗌 Act	Value	Default V	′alue ⊠			
None.												
Speci	ial Features:											
1) en	coding on 32 I	bit sig	ned integer value wit	th 1 se	econd trans	port forn	nat resoluti	on.				
Dis	splay resolutio	n: 1 h	n. The granularity of the	he int	ernal resolu	ution may	/ be higher					
Us	ed range: 0 to	~68 v	years. In practice no	binar	y overflow i	s thus po	ossible.					

5.1.6.31 Diagnostic data OnTime

FB:	M_HEATM	Pr	operty Name (<u>Serve</u>	<u>r</u>):	OnT	ime						ndatory 🗌 Optional 🔯
Desc	ription:				_							paoriai 🔼
Durat	ion of heat m	eter p	ower up that is receive	ved fro	m th	e M-	Bus de	evice.				
The v	alue shall be	store	d by the Data Collect	or and	d sha	ll be a	acces	sible l	by polling.			
DPT:	Name	DPT_	LongDeltaTimeSec	DPT	ID	13.1	00	Da	atatype forma	at	V_{32}	
Field			Description				Sı	лр.	Range	Unit		Default
									full 1)	s		0
									≥0			
Comi	munication:								-	<u>-</u>		
DP	Address:		IO Type(ID):	1101	(M_I	HEAT	TM)	Prop	erty ID:	120		
(in t	he server)		Start-Index:	1				N° o	f elements	1		
Pro	perty access	s:	Read only			Rea	ad/Wri	te				
Pro	tection		Read level					Write	e level			
Exce	ption Handli	ng:	Value after Poweru	p: S	torec	d Valu	ле 🔲	Act \	/alue 🔲 🏻 🗈	efault	Valu	e 🛛
None												
Spec	ial Features											
1) en	coding on 32	2 bit si	gned integer value wi	th 1 s	econ	d <u>tra</u> r	nsport	forma	at resolution.			
Di	splay resolut	ion: 1	h. The granularity of	the int	erna	l resc	lution	may	be higher.			
Us	sed range: 0	to ~68	years. In practice no	binar	ν ονε	erflow	is thu	is pos	ssible.			

5.1.6.32 Diagnostic data CurrentDate

FB:	M_HEA	ГМ	Property Name	(<u>Server</u>):	Cur	rentDate	е			Mandatory 🖂	
		Optional									
	ription:										
			information of he							ne stamp	
			meter for the las						n).		
			ed by the Data C								
DPT:	Name		DPT_DateTime	DPT	· ID	19.001		atype forma		3 octet	
Field		Descrip					Sup.	Range	Unit	Default	
Year			nformation, valid				M	0 to 255		1)	
Month Date.Month information, valid if ND = 0 and M 1 to 12											
Fault = 0											
DayofMonth Date.DayofMonth information, valid if ND = 0 M 1 to 31											
		and Fa								 ₃₃	
Dayof	Week		Week information	n, valid if No	: Wob	= 0 and	0	1 to 7		1)	
Hour		Fault =	our, valid if NT =	∩ and Faul	t = 0		М	0 to 23	h	1,	
Minut			linutes, valid if N			· · · · · · · · · · · · · · · · · · ·	<u>'Y!</u> M	0 to 59	min	₇ /	
Secor			econds, valid if N				<u>!V!</u> M	0 to 59	S	₁ /	
Attribu			containing status		auit	0		0.10.39	3		
– Fau			me information of		51 1		М	fault/ok	bool	ok	
– WD	it.		ay {0} / working d		۱ ، ۱		Ö	true/false	bool	WD invalid	
– NW	D		of WD field inval		1 (U)		M	true/false	bool	WD invalid	
– NY			of Year field inva				M	true/false	bool	Year invalid	
– ND			of Month & Dayo			/alid {1}	M	true/false	bool	Date invalid	
110		/ valid {		JIIVIOITAT IICI	ao	ana (1)	101	ti de/idioc	5001	Bate invalia	
- Ndo	W	validity	of DoW field inva	alid {1} / val	id {0}		M	true/false	bool	DoW invalid	
– NT		validity	of Hour, Minutes	s, Seconds t	fields	invalid	M	true/false	bool	Time invalid	
		{1} / va									
- SUI	ΓΙ		rtime {1} / standa				NA	true/false	bool	Standard	
- CLC	Q		uality bit: with {1}	/ without {0)} ext	ernal	NA	with /	bool	without	
		synchro	onization					without			
Comr	nunicatio	on:									
	Address:		IO Type(ID):		110	1 (M_HE	EATM)	Property II	D: 1	121	
(in t	(in the server) Start-Index: 1 N° of elements 1										
Pro	perty acc	ess:	Read only	\boxtimes		Read/\	Write				
	otion Hai	ndling:	Value after Po	owerup: S	Store	l Value	Act	Value 🗌	Default	: Value ⊠	
None.	None.										
	ial Featu										
¹⁾ ini	tialisation	value is	s 'void' until a val	id M-Bus fra	ame v	vas rece	eived, al	l 'valid bits'	are set	to 'not valid	

5.1.6.33 Diagnostic data MaxPowerDate

FB:	M_HEA	ГМ	Prop	perty Name (<u>Serv</u> e	<u>er</u>):	MaxPowe	erDate				Mandatory Optional
Dasc	ription:							<u>_</u>		optional 🖂	
Date a	and time d to Maxl	⊃ower	data		•			•			
				eset by the meterin	ng devi	ce togeth	er with	MaxP	ower after	creation	of the
	sponding										
		om the	M-B	us device and sha	all be s	tored by t	he Data	a Colle	ector and s	hall be a	ccessible by
polling						T = = = T					
DPT:	Name			_DateTime		DPT ID	19.001		atatype forr		octet
Field		Descr	·					Sup	Range	Unit	Default
Year Year information, valid if NY = 0 and Fault = 0									0 to 255		1)
Month Date.Month information, valid if ND = 0 and Fault = 0									1 to 12		1)
DayofMonth Date.DayofMonth information, valid if ND = 0 and M 1 to 31 Fault = 0										1)	
DayofWeek Day of Week information, valid if NdoW = 0 and DayofWeek Fault = 0											1)
Hour		Time.	Hour	, valid if NT = 0 an	d Faul	t = 0		М	0 to 23	h	1)
Minut	es			tes, valid if NT = 0				М	0 to 59	min	1)
Secor	nds			nds, valid if NT = 0				М	0 to 59	S	1)
Attrib				aining status info						-	
– Fau				information ok {0}	/ fault	{1}		М	fault/ok	bool	ok
– WD				0} / working day (1		` ,		0	true/false	bool	WD invalid
– NW	D	validit	y of \	VD field invalid {1}	/ valid	1 {0}		M	true/false	bool	WD invalid
– NY		validit	y of \	ear field invalid {1	I} / vali	id {0}		M	true/false	bool	Year invalid
– ND		validit valid {		Month & DayofMor	nth fiel	ds invalid	{1} /	М	true/false	bool	Date invalid
– Ndc	W	validit	y of [DoW field invalid {1	1} / val	id {0}		M	true/false	bool	DoW invalid
– NT		validit / valid		Hour, Minutes, Sec	conds	fields inva	llid {1}	M	true/false	bool	Time invalid
– SU	ΓΙ	summ	ertim	ne {1} / standardtim	ne {0} 1	flag		NA	true/false	bool	Standard
– CLC)	clock synch		ty bit: with {1} / witl ation	hout {()} externa	I	NA	with / without	bool	without
Comr	nunication	on:						-		-	
DP	Address			IO Type(ID):		1101 (M_	HEATM	1)	Property II) :	122
(in the server) Start-Index: 1 N° of elements 1											
Pro	perty acc	ess:		Read only	3	Re	ad/Writ	:e			
Exce	ption Ha	ndling	: '	/alue after Poweru	лр: 🤄	Stored Val	lue 🗌	Act V	alue 🔲 🗆	Default \	/alue ⊠
Data	shall be s	tored i	n vol	atile memory and	shall b	e void afte	er powe	er up o	of the Data	Collecto	or.
Speci	ial Featu	res:									
			g tele	gram are marked i	in field	'status' w	vith 'per	mane	nt error' the	en the va	alue shall be
	nchanged.										

5.1.6.34 Diagnostic data MaxPower

FB: M_	HEATM	Prope	erty Name (<u>Serv</u>	<u>/er</u>):	MaxPo	wer	•			M	andatory ☐ Optional ⊠
Descripti	on:				<u> </u>			<u> </u>			Optional 🖂
		power	value measurer	nent	by the hea	at n	neter ac	cording	to averac	ing dura	tion
			lue is related to l								
	in W or J/ł										
			t by the metering								
			the M-Bus dev			e st	ored by	the Dat	ta Collecto	or. The v	alue shall
			accessible by po			200	2.004	Datation		\ \ \ \ \	1.7
DPT: N Field	lame DF		teringValue		DPT ID	22	9.001		pe format		N ₈ ∠ ₈ Default
CountVal		Descr	ured value				Sup. M	Range full		Unit	
ValInfField	d		oding of unit and	rosc	dution of t	 ho	<u>IVI</u>	28 to 2	⊑h		CS
valililiriei	u		ured value	11650	ו וטווטוו טו	iie	IVI	30 to			
		meas	arca value					A8 to	-		
								B0 to			
Status										bitset	1
- OutOf	Service	Value	is not available	/ voi	d		M	true/fal	se		true
- Overri	dden						NA	false			false
- Fault		meas	urement failure,	corru	upted valu	е	M	true/fal	se		false
- InAlarr	m						NA	false			false
- Alarml							NA	unack			unack
7 ((0))	orn told										
Command	d	standa	ard Command fi	eld						enum	
- all con	nmands	not su	ipported, Datapo	oint s	hall be rea	ad	NA				
		only									
								<u> </u>			
Commun			IO T (ID)		4404 (14 1	<u> </u>	TNA	D	t - ID-		00
DP Add			IO Type(ID): Start-Index:		1101 (M_F	1E <i>P</i>	(I IVI)		erty ID: elements		23
(in the s	y access:		Read only	\boxtimes	1	Do	ad/Writ			1	
Protecti			Read level			110		√rite leve	اد اد		
	n Handlin	u. /	/alue after Powe	erino.	Stored	Val		Act Valu		efault Va	lue 🕅
			atile memory and								
Special F							1				
	data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be										
unchange	ed						-				

5.1.6.35 Diagnostic data MinPowerDate

FB:	M_HEAT	ГМ	Property Name (Se	erver):	MinF	Power	Date		N	landatory ☐ Optional ⊠
Desci	ription:		<u> </u>					<u> </u>		<u> </u>
		of Minii	mum Power occurrer	nce of powe	er me	asurei	ment by	the heat m	eter. This	value is
	d to MinP						,			
			reset by the metering	device to	gethe	er with	MinPov	ver after cre	ation of th	е
	sponding I			5	•					
			M-Bus device and s	hall be stor	red by	the D	ata Col	llector and s	hall be ac	cessible by
polling					•					-
DPT:	Name	DF	PT DateTime	DPT	ID	19.00°	1 Da	atatype form	at 8 octe	et .
Field		Descr	ription	l e			Sup.	Range	Unit	Default
Year			information, valid if N	NY=0 and F	-ault=	:0	M	0 to 255		1)
Month)		Month information, va				M	1 to 12	-	1)
		Fault=								
Davof	Month		DayofMonth informat	ion. valid if	ND=	0	M	1 to 31		1)
and Fault=0										
Davof	Week		of Week information, v	valid if Ndo	W=0	and	0	1 to 7	-	1)
Fault=0										
Hour			Hour, valid if NT=0 a	nd Fault=0)		М	0 to 23	h	''')
Minute	es		Minutes, valid if NT=				M	0 to 59	min	·····-/
Secor			Seconds, valid if NT=				M	0 to 59	S	·····- ₁ ′····-
Attribu			containing status inf					3.39.39	-	
- Fa			Time information ok {		13		M	Fault/ok	bool	ok
- WI			day {0} / working day		٠,		Ö	true/false	bool	WD invalid
	VD		y of WD field invalid		O3		M	true/false	bool	WD invalid
- NY			y of Year field invalid				M	true/false	bool	Year
		valian	y or roar nota invalid	(i) / valia	ر			ti domaioo		invalid
- NE)	validit	y of Month & DayofM	onth fields	inva	id	M	true/false	bool	Date
			alid {0}							invalid
- Nd	loW		y of DoW field invalid	d {1} / valid	{0}		M	true/false	bool	DoW
			,	()	(-)					invalid
- NT	-	validit	y of Hour, Minutes, S	Seconds fie	lds in	valid	M	true/false	bool	Time
			alid {0}							invalid
- SL	JTI		nertime {1} / standard	time {0} fla	ıg		NA	true/false	bool	Standard
- CL	Q		quality bit: with {1} / v			nal	NA	with /	bool	without
			ronization	. ,				without		
Comr	nunicatio	n:						•		
	Address:		IO Type(ID):		1101	(M H	IEATM)	Prope	rty ID:	124
	(in the server) Start-Index: 1 N° of elements 1									
_	perty acc	•	Read only	\boxtimes		Read/	Write			
	otion Han			erup: Sto		′alue [_	√alue □	Default Va	alue 🖂
			n volatile memory and							
	al Featur						<u> </u>			
_			telegram are marke	d in field 's	tatus'	with 'ı	perman	ent error' the	en the val	ue shall be
	changed.									
4 \	•	value	is 'void' until a valid I	M-Bus fram	ne is r	eceive	ed, all 'v	alid bits' sha	all be set t	o 'not valid.

5.1.6.36 Diagnostic data MinPower

FB: M_HEATM	Prope	erty Name (<u>Server</u>):	MinPower				ndatory 🗌 Optional 🖂	
Description:			-				ptional 🔼	
Result of minimum p datapoint. The meas The value is normal This value is receive	sured p ly rese ed from	value measurement by power can be indicated t by the metering device the M-Bus device and accessible by polling.	d in W or J/h u ce after creation	nits. on of the	e correspond	ding history va	alue.	
			OPT ID 229	.001	Datatype for	rmat V ₃₂ N ₈	$_{3}Z_{8}$	
Field	Desc	cription		Sup.	Range	Unit	Default	
CountVal ValInfField	1)Enc	sured value coding of unit and reso sured value	olution of the	M M	full 28h to 2Fh 30h to 37h A8h to A9h B0h to B1h	n	CS	
Status - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck		e is not available / void		M NA M NA	true/false false true/false false unack	bitset	true false false false unack	
Command - all commands		dard Command field supported, Datapoint s	hall be read	NA		enum		
Communication:	-			-	-	-	-	
DP Address: (in the server)		Start-Index: 1	01 (M_HEATN	, N°	operty ID: of elements	125 s 1		
Property access:		Read only	Rea	d/Write				
Protection		Read level	-		rite level			
Exception Handlin		/alue after Powerup:	Stored Value		t Value	Default Valu	ıe ⊠	
	i in vola	atile memory and shall	be void after	power ι	up of the Da	ta Collector.		
Special Features:	na teler	gram are marked in fie	ald 'etatue' with	ı 'nerma	anent error' t	then the value	shall he	
unchanged.	data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be nchanged.							

5.1.6.37 Diagnostic data ErrorDate

FB: M_H	HEAT	М	Pro	perty Name (<u>Ser</u>	<u>ver</u>):	Erro	Date					Ν	Mandatory ⊠ Optional □
Description	on:					-							ориона:
		nform	atior	n for an error occ	urren	ce in th	ne hea	t mete	r tha	t is received f	rom t	he	M-Bus
device.													
This inform	natior	is re	lated	d to datapoint Err	orCor	amuar	tion						
				by the Data Coll				acces	sible	by polling.			
	lame			DateTime		T ID	19.00			ype format	8	3 00	tets
Field		Descri		_				Sup.		nge	Uni		Default
Year				mation, valid if N	/ = 0	and		M		o 255			1)
		=ault =		,									
Month]	Date.N	Viont	th information, va	lid if N	ND = 0	and	M	11 to	o 12	1		1)
		-ault =		,									
DayofMon	DayofMonth Date.DayofMonth information, valid if M 1 to 31												
ND = 0 and Fault = 0													
DayofWee	k [Day of	f We	ek information, v	alid if	NdoV	/ = 0	Ö	1 to	o 7	7	!	1)
	á	and Fa	ault	= 0							.]		
Hour	-	Time.l	Hou	r, valid if NT = 0 a	and Fa	ault = (0	M	0 to	o 23	h	l	1)
Minutes		Time.I	Minu	ites, valid if NT =	0 and	l Fault	= 0	M	0 to	o 59	min		1)
Seconds	-	Time.	Seco	onds, valid if NT =	0 an	d Fau	lt = 0	M	0 to	o 59	s		1)
Attributes				taining status info					7]		
- Fault	1	Date/1	Гіте	information ok {()} / fa	ult {1}		M	fau	lt/ok	boo	ı	ok
- WD				{0} / working day				О		e/false	boo	ı	WD invalid
- NWD				WD field invalid {				M		e/false	boo		WD invalid
- NY				Year field invalid)}	M	tru	e/false	boo	ı	Year invalid
- ND				Month & DayofMo	onth f	ields		M	tru	e/false	boc	ı	Date invalid
				/ valid {0}									
- NdoW				DoW field invalid				M		e/false	boo		DoW invalid
- NT				Hour, Minutes, So	econo	ds field	ls	M	tru	e/false	boo	ı	Time invalid
OLIT!				/ valid {0}		o) (I			١.	<i>(</i> 5 1	١.	.	
- SUTI				ne {1} / standardt				NA		e/false	boc		standard
- CLQ				ity bit: with {1} / w	/ithou	t {U}		NA	WIT	h / without	boo	ol	without
			aı sy	ynchronization									
Communi		n:	1	10 T (ID)		4404	/N A . I . I .	- A - T A A	, 5		400		
DP Addr				IO Type(ID):			(M_HI	EATM,	,	roperty ID:	126	i	
_ `	(in the server) Start-Index: 1 N° of elements 1												
Property access: Read only ☑ Read/Write ☐ Exception Handling: Value after Powerup: Stored Value ☐ Act Value ☐ Default Value ☒													
Exception				Value after Powe									
			n vo	latile memory an	d sha	ll be v	oid afte	er pow	er u	o of the Data	Colle	ctor	ſ <u>.</u>
Special Fe													
				egram are marke									
	accepted by the Data Collector. This is the last reliable and valid consumption date from the metering												
device.	- 4.5	1	•- '			. c.				11.611.3.1.11.1			64P-1
i / Initialisa	atıon	value	IS 'V	/oid' until a valid l	vi-Bus	s tram	e was I	receive	ed, a	ili 'valid bits' a	re se	t to	not valid

5.1.6.38 Diagnostic data ErrorConsumption

FB:	M_HEATM	Pro	perty Name (<u>Server</u>):	: ErrorCo			ndatory 🗌 optional 🖂		
Desc	ription:	<u> </u>							<u> </u>
The v	alue is receiv sible by pollir	red froi ng.	Consumption datapoin methe M-Bus device and to datapoint ErrorDa	ind shall be					
DPT:	Name		Metering Value	DPT ID	229.00)1 D	atatype format	t V ₃₂ N ₈ Z	7 -8
Field		_	Description	<u>'</u>		Sup.	Range	Unit	Default
Coun	tVal		measured value			M	full	1)	CS
ValInfField 1)Encoding of unit and resolution of the measured value							00h to 07h 08h to 0Fh 80h to 81h 88h to 89h		
Status	S OutOfServ Overridden	ice	Value is not available		M NA	true/false false	bitset	true false	
- Faul - InAla	t		measurement failure	, corrupted	value	M NA NA	true/false false unack		false false unack
Comr - all c	nand ommands		standard Command f not supported, Datap read only		e	NA		enum	
Comr	nunication:				-		•	•	
	Address: he server)		Start-Index: 1	101 (M_HE	ATM)		perty ID: of elements	127 1	
	perty access	S :	Read only		Read/\				
	tection		Read level		_	_	e level		
	ption Handli		Value after Powerup:					efault Valu	e 🖂
			platile memory and sh	all be void a	arter po	wer up	or the Data C	onector.	
	ial Features:		ogram are marked in	fiold 'status	' with 'r	ormor	ont orror' than	the value	chall be
	data in the metering telegram are marked in field 'status' with 'permanent error' then the value shall be ccepted by the Data Collector. This is the last reliable and valid consumption value from the metering evice.								

5.1.6.39 Diagnostic data Averaging Duration

FB:	M_HEATM	Pi	rop	perty Name (<u>Se</u>	rver	<u>)</u> : /	AveragingDuration			1	Man	idatory 🔲
											0	ptional 🔯
Desci	ription:					-				-		
				min/max value o								
value	is received f	rom th	ie N	M-Bus device an	nd sl	nall be s	store	ed by the	Data (Collector and	I shall be a	ccessible
by pol	ling.											
DPT:	Name	DPT_	Lo	ngDeltaTimeSed	С	DPT II)	13.100	Dat	atype format	V ₃₂	
Field			D	escription					Sup.	Range	Unit	Default
										full 1)	S	0
										≥0		
Comr	nunication:		-							-	-	
DP A	Address:			IO Type(ID):	1	101 (M __	_HE	ATM)	Prope	rty ID:	129	
(in t	he server)			Start-Index:	1				N° of	elements	1	
Pro	perty access	s:		Read only	\boxtimes			Read/W	rite			
Prot	ection			Read level	-	-			Write	level		
Excep	otion Handli	ng:	V	alue after Powe	rup:	Store	ed V	/alue 🗌	Act Va	alue 🔲 De	fault Value	e 🛛
None.												
Speci	al Features:											
¹⁾ En	coding on 32	2 bit si	gne	ed integer value	with	1 seco	ond '	transpor	t forma	t resolution.		
Dis	splay resoluti	ion: 1h	ı Tl	he granularity of	the	interna	ıl res	solution i	may be	higher.		

5.1.6.40 Diagnostic data MBusRawData

					-							
FB:	M_HEATM	Pı	roperty Name (Serve	<u>r</u>):	MBus	RawDat	а				Mandatory 🗵
												Optional 🔝
Descr	iption:					-			-			
Raw c	lata of receiv	ved M-	Bus telegram st	arting	from	CI field	d. Data s	hall be	e sto	red b	y the D	ata Collector as
			ported Property	/ leng	th sha	all be ≥	128 eler	nents.	For	furth	er detai	ls see 4.6
"Mapp	ing of M-Bu	s raw	data".									
DPT:	Name	DPT_	Value_1_Ucour	nt	DP.	T ID	5.010	Da	itaty	oe fo	rmat	U ₈ [n]
Field		Descr	ription	Sı	ıp.	Range)		Unit			Default
						full			Non	e.	arr	ay length= 0
Comr	nunication:			_		-					3	
DP /	Address:		IO Type(ID):		1101	(M_HE	ATM)	Prop	erty	ID:	13	0
(in t	he server)		Start-Index:		1	_		N° of	olor	nonto	\ Va	ariable,
			Start-Index.		I			IN OI	CICI	пенк	n m	ax length ≥128
Prop	perty acces	s:	Read only	\geq]		Read/W	rite				
Prot	ection		Read level					Write	leve	el		-
Excep	tion Handl	ing:	Value after Po	werup): S	tored \	/alue 🗌	Act \	/alue	<u> </u>	Defau	ılt Value 🛚
Please	Please refer to clause 4.6 "Mapping of M-Bus raw data".											
Speci	Special Features:											
The P	ne Property shall have a variable length according to the last received M-Bus message. The effective											
length	can be che	cked b	y the client via	A Pro	pertyl	Descrip	tion Re	ad-se	rvice		-	

5.1.6.41 History Query

FB:	M_HEATM	Prop	perty Name (<u>S</u>	Server):	History Que	ry		Mandatory ☐ Optional ⊠
Desc	ription:	<u>.</u>			-	•		
Funct	ion Property	to query	the contents	of metering	Properties ac	cording 4.	10.	
DPT:	Name	None.		DP	T ID n/a	Dataty	/pe format	n/a
Field		Descrip	tion	Sup.	Range	Un	it	Default
See s	pecification i	n 4.10.						
Comi	munication:							
DP	Address:		IO Type(ID):	1101	(M_HEATM)	Property	ID:	152
(in t	he server)		Start-Index:	1		N° of ele	ments	1
Data	a Property a	ccess:	Read only	\boxtimes	Read/V	Vrite		
Fun	ction Prope	rty:	Client:			Server:		\boxtimes
Pro	tection		Read level			Write lev	⁄el	
Exce	ption Handli	ng: \	/alue after Pov	verup: S	tored Value 🗌	Act Valu	e 🔲 De	fault Value 🗌
None								
Spec	ial Features	:						
None								

5.1.6.42 Parameter UserText

FB:	M HEATM	Pro	perty Name (Serv	er):	UserTex	t			Ma	indatory 🗌
			(<u></u>	<u></u> ,-						Optional 🖂
Desc	ription:									
Additi	ional text infori	mation	to the metering de	vice. wh	nich can	be e	ntered on th	ne Data C	ollector I	ov the
			ning. See clause 2							. ,
IIIStai	iei during com							7		
DPT:	Name	DPT_	VarString_8859_1		DPT I	D	24.001	Datatype	e format	A[n]
Field		Descri	ption		Sup.	Ran	nge		Unit	Default
User	Text	Null te	erminated string.		M	see	e datatype "d	char set"		'00h'
Com	munication:				-	-				
DP	Address:		IO Type(ID):	1101 (M_HEAT	M)	Property I	D:	160	
(in t	he server)		Start-Index:	1			N° of elen	nents	1	
Pro	perty access:	1	Read only		Re	ad/V	Vrite 🛭			
Exce	ption Handlin	g : ∖	/alue after Poweru	ıp: Sto	ored Valu	ле 🗵	Act Value	De	fault Val	ue 🗌
None										
Spec	ial Features:									
None										

5.1.6.43 Parameter MeterReplacement

FB:	M_HEATM	Pro	perty Name (<u>Server</u>):	MeterRep	laceme	nt		ndatory 🛚
Desc	ription:						<u>!</u>	
Mana	gement of mete	ring o	levice directory in the Data	Collector is	compar	ny specific an	d not part	of this
			llector shall however provide					
			device by another device		t identif	ication numbe	er and e.g	. different
			ing data). See also clause					
			ent the corresponding M_F					n data of
			s device and M-Bus Identif					4
			DeviceType, FabricationNu	mber etc) of	the orig	ınaı meter ar	e overwrit	ten as
	s metering data		ent it may be necessary to	roconfiguro t	ho link	for S. Mada a	hiooto by	ETC data
			n may have changed due t					
			ce is replaced the Property					
			oject and the related meter					
			erReplacement flag shall be					
			rface of the Data Collector					
tool).								
DPT:	Name	DPT_	Bool	DPT ID	1.002	Datatype	e format	B ₁
Field			Description		Sup.	Range	Unit	Default
						true/false	bool	false
Com	munication:							
	Address:		31 \ /	(M_HEATM)		perty ID:	161	
•	he server)		Start-Index: 1			of elements	1	
	perty access:		Read only	Read/W				
	ption Handling	: \	/alue after Powerup: Sto	red Value 🗵	Act V	alue 🗌 🛮 De	fault Valu	e 🗌
None								
	ial Features:							
None								

5.1.6.44 Parameter MeterReplacementCounter

FB:	M_HEATM	ATM Property Name (<u>Server</u>): MeterReplacementCounter						Mandatory 🔲					
												О	ptional 🔯
Desc	Description:												
This F	This Property shall indicate the number of meter replacements and shall be handled together with the												
Prope	erty MeterRe	place	men	ıt (se	e above).								
The c	ounter value	shall	be i	incre	mented a	utomatica	ally	each	time a	connec	cted meter is	replaced.	
The D	atapoint is (norma	ally)	read	only, but	may be r	ese	et by t	he inst	taller/te	chnician.		
The N	/leterReplace	ement	tCou	ınter	is useful	for additic	nal	diagr	nostic	informa	tion in the bil	ling proce	SS.
DPT:	Name	DPT	_Va	_lue_	1_Ucount	t		DPT	ID	5.010	Datatype	e format	U ₈
Field			Do	escri	ption					Sup.	Range	Unit	Default
											0 to 255	None	0
Comi	nunication:												
DP	Address:			ЮТу	/pe(ID):	1101	(M	_HEA	(MT	Prope	erty ID:	162	
(in t	he server)			Start-	-Index:	1				N° of	elements	1	
Pro	perty acces	s:		Read	donly			R	lead/W	/rite	\boxtimes		
Exce	ption Handl	ing:	Va	alue a	after Pow	erup: S	Store	ed Va	ılue 🛚	Act V	alue 🔲 De	fault Valu	e 🗌
Free	running cour	iter w	ith o	verflo	ow 255 - :	> 0.							
Special Features:													
If there is no meter connected to the Interface Object the initial value shall be 0 (ex-factory). After													
conne	connection of the first meter, the value is incremented and has the value 1. The value shall be stored in												
non-v	non-volatile memory.												

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.

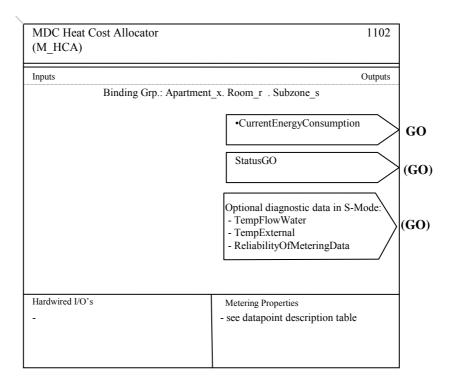
Therefore the complete set of supported Heat Cost Allocator datapoints shall be mapped to Properties that can be accessed on demand by the A PropertyValue Read-service.

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

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
Inputs				
None.				

Datapoint PID		Description	Datapoint Type / PDT	DPT_ID
Metering Properties				
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
LTE Zoning Parameters				
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
Diagnostic Properties (polling)				
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 upto-date or outdated.	DPT_Bool / PDT_BINARY_INFORMA- TION	1.002

Datapoint	PID	Description	Datapoint Type / PDT	DPT_ID
Diagnostic Properties (polling)				
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 ≥128 octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n ≥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
Parameters				
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

$M_HCA\ Runtime\ Interworking\ \textbf{-}\ Dependency\ on\ Configuration\ Modes$

			STANDARD MODE	Exter Mo	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentEnergyConsumption	GO _b	GO	GO	0
	StatusGO	(GO_b)	(GO)	(GO)	NA
	TempFlowWater	(GO_b)	(GO)	(GO)	(O)*
	TempExternal	(GO _b)	(GO)	(GO)	(O)*
	ReliabilityOfMeteringData	(GO _b)	(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	0
	TempExternal	0
	RxSequenceCounter	M
	RxReceptionTime	M
	Manufacturer	M
	IdentificationNumber	M
	VersionNumber	M
	MeteringDeviceType	M
	FabricationNumber	C*
	AccessNumber	M
	DeviceStatus	M
	OperatingTime	0
	OnTime	0
	CurrentDate	M
	ErrorDate	M
	ErrorConsumption	0
	ReliabilityOfMeteringData	0
	AveragingDuration	0
	MBusRawData	M
	History Query	0
	UserText	0
	MeterReplacement	M
	MeterReplacementCounter	0

^{*} 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

FB:	M_HCA	Propert	Property Name (<u>Server</u>): CurrentEnergyConsumption									
Description:												
	Current accumulated HCA units value that is received from the M-Bus device and shall be stored by the											
Data (Data Collector. The metering value shall be read-only and shall be accessible by polling.											
DPT:	Name		eteringValue	DPT ID	229.001		tatype format	V ₃₂	$V_{32}N_8Z_8$			
Field		Descr				Sup.	Range	Un	it	Default		
Count		L	er value			М	full	1)		cs		
ValInf	Field	¹⁾ dime	nsionless HCA count	ter value		M	6Eh					
ValInfField Status - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck Command standard Command field - all commands - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck Standard Command field - all commands - not supported, Datapoint shall be read only						M NA M NA NA	true/false false true/false false unack	bits t en m		true false false false unack		
Comr	nunication:					<u> </u>						
DP /	Address:		IO Type(ID):	1102 (M	I_HCA)	Prope	erty ID:	51				
(in t	he server)		Start-Index:	1		N° of	elements	1				
Pro	perty acces	Read only 🛛	/rite									
Protection Read level						Write						
Exception Handling: Value after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐												
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'	'Fault' shall be set to 'true'.											

LTE mode

FB:	M_HCA	LTE Serv	ver Output Name	: Curre	entEner	gyCor	nsump	tion	Mandator Optiona	
Descr	ription:	-		-						
Data (Collector. Th	e meterin	units value that is r g value shall be re ange of value.							те
DPT:	Name	DPT Me	teringValue	DPT ID	229.001	1	Dataty	pe format	$V_{32}N_8Z_8$	
Field		Descrip	otion		Sup.	Rang		Unit		ault
See P	roperty spec	cification a	bove.					•		
Comn	nunication:									
Bind	ding Group:									
Clas			Type					ault		
	ographical		Apartment.Room	.Subzone			1.1	.1 ²⁾		
	plication Spe	ecific 🔲	<u></u>			<u></u>				
	assigned		Broadcast		gurable					
	Address:		IO Type(ID):		(M_HC				51	
	-Services (e		COV 🛛 1)	MinRep1		300			rtbeat: 60 r	<u>nin</u>
	oReport	\boxtimes	Output per defaul		icating	⊠ Bi			lcard allowed [
	ΓΕ Read-Res		Tx Prio:	High [Norma	al 🖂	Low L	
sha	lling of the o all always be pported)		Transm after Pow	verup: Sto	red Val	ue 🗌	Act \	∕alue □	Default Value	
	perty-Servic		Read only	\boxtimes	Rea	d/Write	е			
Excep	otion Handli	ing:						Save a	at Powerdown[
None.										
	al Features	:								
			HCA meter data a							er
			tion of an adequat							
			o the KNX system							
			essage will trigger							
			ends on the increm							
²⁾ If th	ere is only o	ne M_HC	A per Room zone	, the Subz	one nur	nber s	hall be	set to the	default value 1	

Group Object (Standard Mode)

DP Name:	CurrentEnergyC	onsumption	Abbr.:			Manda	atory			
FB Name:	M_HCA	•				Can b	Can be internal			
Description	_					<u> </u>				
Data Collector spontaneously	nulated HCA unit The metering v in case of chan	alue shall be ge of value.	read-only	and shall be a						
	ative or additional DI	- is are possible	e. see NOTE	1.						
Datapoint Typ										
DPT_Name:	DPT_Value_4	_Count								
DPT Format:	V ₃₂				DPT_ID:		_	I ·		
Field	Description				Supp.	Range	Unit	Default		
	according to	nteger. tion and disp on the receiv o ValInfField ergyConsump er replaceme be set autom nanually rese	lay format ver of the i in Propert otion'. nt the corr atically by	have to be nformation y responding the Data		full		0		
Access Type	Service tecrimic	iaii.								
◆ Output										
this → M Spontaneo Request	us		Δ-Value: Period:	cs ²⁾ Mi	n repetitio	on period:	5 min			
Communicati						Manalata	[7]			
	ject Datapoint	\				Mandator	ry: 🛛			
	oup Address:	None								
Dynamics		T-								
Power dow Power up:	Value:	No initialisa Saved value bus (only fo	e:	Actua		ot for input				
Exception Ha		\ ,								
Void values or In case of Met	faulty values sherReplacement =	= true, the va	lue of Cur	rentEnergyCor	0. sumption	shall be 0	in order	to		
Special Featu										
day. There M-Bus data reception o	us RF system HC fore the definition a is provided to the fan M-Bus mession of a meaning.	n of an adequ ne KNX syste sage will trigg	uate COV em and tha ger an upd	is sufficient to out the KNX bus ate of the Grou	guarantee load is no up Object	e that the not too high.	nost curre Normally	ent · /		

5.2.6.2 Output StatusGO

Standard Mode only

DP Name: StatusGO Abbr.: Mand	datory
FB Name: M_HCA Can	be internal
Description	
This Output shall contain the Z ₈ status information of CurrentEnergyConsumption as a	Group Object.
Datapoint Type	
DPT_Name: DPT_StatusGen	
DPT Format: B ₈ DPT_ID: 21.00	
Field Description Supp. Range	
Status Z ₈ 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	
Access Type	
◆ Output	
this \rightarrow M \square this \rightarrow 1 \square	T= .
Spontaneous COV: Delta-Value: None. MinRepTime: Cyclic Period:	5 min
Request	
Communication Type	
♦ Group Object Datapoint Mandato	ory: 🛛
Default Group Address:	
Dynamics	
Power down: Save:	
Power up: Value: No initialisation: Default value:	
Saved value: Actual value:	
Transmit on bus:	
Exception Handling	
None.	
Special Features	
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

FB: M_HCA	Prop	erty Name (<u>Server</u>):	History	erty Name (Server): HistoryEnergyConsumption							
								0	ptional 🗌		
Description:	·-		<u>-</u>				_				
		CA units consumption									
		be stored by the Data									
		e shall be associated									
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.											
	_							1			
DPT: Name	DP1_	MeteringValue	DPT ID	229.001		atype form		V ₃₂ N ₈ Z			
Field		Description			Sup.	Range	1	<u>Jnit</u>	Default		
CountVal		measured value			М	full		, 	CS		
ValInfField		¹⁾ dimensionless HCA	A units		M	6Eh					
Status			,			, ,,,		itset			
- OutOfService	!	Value is not available	e / void		M	true/false			true		
- Overridden		man a say mana ant failt man	NA	false			false				
- Fault - InAlarm		measurement failure	M NA	true/false false			false false				
- AlarmUnAck			NA NA	unack			unack				
- Alaimonack					INA	unack			unack		
Command		standard Command				num					
- all commands		not supported, Data		e read	NA			, i i di i i			
	•	only		o road	147 (
		J									
Communication	1:	<u> </u>			<u></u>	<u> </u>	<u></u>				
DP Address:		IO Type(ID): 11	02 (M HCA) Prop	erty ID	: 62					
(in the server)		Start-Index: 1	` _	, NIO O	f eleme	to ≥ 8					
		Start-Index: 1		IN O	i eleme	fixed	d or v	variable	length		
Property acce	ss:	Read only		Read/W	/rite						
Protection		Read level			Write	level	-				
Exception Hand	lling:	Value after Powerup	: Stored \	/alue 🗌	Act V	alue 🗌	Defa	ult Valu	e 🛛		
Data shall be sto	red in v	olatile memory and sh	nall be void a	after pow	ver up d	of the Data	Coll	ector.			
Special Features:											
		legram are marked in	field 'status	' with 'pe	ermane	nt error' er	ror' t	hen the	history		
shall be left unch	nanged.										

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

FB:	M_H	CA	Pro	perty	Name	TempExternal					Mandatory □			
			(Se	rver):								С	ptional 🛚	
Desc	ription	n:	<u>-</u>			_					-			
					e (room temperat									
be sto	ored by	y the D	Data	Collec	ctor. The metering	value	shall l	oe read-c	only	and	d shall be ac	cessible b	by polling.	
DPT:	Na	me	DPT	_HVA	ACTempAbs_Z	DPT I	ID	205.100)		atype format	ype format V ₁₆ Z ₈		
Field				Descri					Sι	ıp.	Range	Unit	Default	
Temp temperature value				rature value				١	/	Full 1)	° C	none		
Status										bitset				
- Ou	utOfSe	ervice	١	∕alue	is not available /	void			Λ	Л	true/false		true	
- Overridden								Ν		false		false		
-	ult		r	neası	urement failure, co	orrupte	d valu	е			true/false		false	
	Alarm										false		false	
- Ala	armUn	nAck							N	Α	unack		unack	
Comn					ard Command fiel	-						enum		
	comm		•	not su	pported, Datapoir	nt shall	be rea	ad only	N	Α				
		ation:		1										
	Addre				IO Type(ID):	110	2 (M_ł	HCA)			ty ID:			
•	he se				Start-Index:	1					elements	1		
		acces	ss:			\boxtimes		Read/W						
	tectio				Read level				_		evel			
		Handl			alue after Poweru			/alue 🔲				fault Valu	e 🛚	
Data	shall b	e stor	ed in	volat	ile memory and s	hall be	void a	ifter powe	er u	ıp of	the Data Co	ollector.		
		atures												
					am are marked ir	field 's	status'	with 'per	rma	nen	t error' then	the Statu	s flag	
41		be set												
		-	he te	mpera	ature value is dete	ermine	d by th	e M-Bus	de	vice	; the Data C	ollector sl	nall map	
the	e full ra	ange.												

Group Object (Standard Mode)

DP Name:	TempExternal		Abbr.:		Mano	latory			
FB Name:	M_HCA				Can l	oe internal			
Description									
be stored by t	he Data Collect	(room temperature) value or. The value shall be rea							
		f change of value.							
Datapoint Ty									
DPT_Name:	DPT_Value_	Temp		1					
DPT Format:	F ₁₆			DPT_ID:					
Field	Description			Supp.	Range	Unit	Default		
					Full	°C	7FFFh		
Access Type									
♦ Output									
this \rightarrow M		this \rightarrow 1							
Spontaneo	Spontaneous COV: 1) Δ-Value: cs 1) Min repetition period: 5 min								
	Cyclic Period:								
Request	\boxtimes								
Communicat	ion Type								
♦ Group Ob	ject Datapoint				Mandato	ry: 🛛			
	oup Address:								
Dynamics									
Power dov	n: Save:								
Power up:	Value:	No initialisation:	De	fault value:					
		Saved value:		tual value (n					
	Transmit of	on bus (only for output):	Re	ad from bus	(only for	input):			
Exception Ha									
Void values o	r faulty values s	hall be indicated with defa	ault value 7	7FFFh.					
Special Feat	ıres								
		eat cost allocator data are							
		e the definition of an adeq							
		ided to the KNX system a				oo high. N	√ormally		
		ssage will trigger an upda		Group Object.					
The definit	ion of a meanin	gful 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

FB:	M_HCA	Prope	rty Name (<u>Server</u>):	Metering	eviceTyp	е			datory 🔀 ptional 🗌
Desc	ription:								ptional
Devic	•	st allocat	•	orted values	s in M_HC	CA are:			
Identi identi Durin	ficationNumb fication. g the installa	oer, Vers	M-Bus "address" prosionNumber and Me cedure the Metering by the Data Collector	teringĎevio DeviceTyp	ceType to	gether i	mark a world	wide uniqı	ue meter
DPT:	Name	DPT_M	letering_DeviceType	DPT ID	20.114	Data	atype format	N ₈	
Field			Description			Sup.	Range	Unit	Default
							{8, 255}	enum.	255
Com	munication:								
	Address:		IO Type(ID):	1102 (M_	HCA)	Prope	•	115	
(in t	he server)		Start-Index:	1		N° of e	elements	1	
Pro	perty acces	s:	Read only		Read/W	rite			
Pro	tection		Read level			Write	level		
Exce	otion Handli	ing: `	Value after Powerup	: Stored	Value 🛚	Act Va	alue 🗌 🛮 De	fault Value	e 🗌
None	•								
Spec	ial Features	:							
Devic	e type '255'	= void (d	default value): used t	to indicate	that the F	B is no	connected t	o 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

FB:	M_HCA	Proper	ty Name (<u>Serve</u>	<u>er</u>):	ErrorC	onsump	otion		Mandatory [Optional [
Desc	ription:				_			<u>.</u>		<u> </u>				
Value	of CurrentEr	nergyCo	nsumption data	point a	t the mo	ment wh	en an e	error occurre	d in the he	at cost				
alloca	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 i	This information is related to datapoint ErrorDate.													
DPT:	Name		leteringValue		PT ID	229.00		tatype forma						
Field		Descr					Sup.	Range	Unit	Default				
Coun		measured value						full	1)	cs				
	/alInfField ¹⁾ dimensionless HCA units							6Eh						
Statu									bitset					
_	utOfService	Value	is not available	/ void			M	true/false		true				
• O	verridden						NA	false		false				
• Fa	ault	meası	ırement failure,	corrup	ted value)	M	true/false		false				
• In	Alarm						NA	false		false				
• Al	armUnAck						NA	unack		unack				
Comr	nand	standa	ard Command fie	eld					enum					
• all	commands	not su	pported, Datapo	int sha	all be rea	d only	NA							
Com	munication:													
DP	Address:		IO Type(ID):	1102	2 (M_HC	A)	Prop	erty ID:	127					
(in t	the server)		Start-Index:	1			N° of	elements	1					
Pro	perty access	s:	Read only	\boxtimes		Read/W	Vrite							
Pro	tection		Read level				Write	level						
Exce	ption Handli	ng: \	alue after Powe	erup:	Stored	Value 🗌	Act V	′alue 🔲 D	efault Valu	ıe 🛛				
Data	shall be store	ed in vol	atile memory and	d shall	be void	after pov	ver up	of the Data C	Collector.					
	ial Features:													
If data	a in the meter	ring tele	gram are marke	d in fie	ld 'status	' with 'pe	ermane	ent error' thei	n the value	shall be				
acce	oted by the Da	ata Colle	ector. This is the	last re	eliable ar	nd valid c	consum	nption value f	rom the m	etering				
devic	e.													

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 Averaging Duration

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.

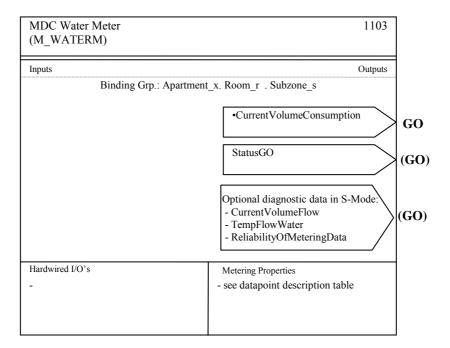
Therefore the complete set of supported Water Meter datapoints shall be mapped to Properties that can be accessed on demand by the A PropertyValue Read-service.

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°
Outputs				
CurrentVolumeConsumption	51	Accumulated water volume. Can be accessed as a property or can be distributed as a standard Group Object	Property: DPT_MeteringValue / PDT_GENERIC_6	229.001
			Standard Mode: DPT_Value_4_Count	13.001
StatusGO		Z ₈ information of CurrentVolumeConsumption as a Group Object	Standard Mode only DPT_StatusGen ₎	21.001
CurrentVolumeFlow	53	Current measured volume flow	Standard Mode: DPT_Value_Volume_Flow	9.025
TempFlowWater	70	Current flow temperature	Standard Mode: DPT_Value_Temp	9.001
ReliabilityOfMeteringData	128	Indicates whether metering data are upto-date or outdated.	Standard Mode: DPT_Bool	1.002

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

Datapoint PID		Description	Datapoint Type / PDT	DPT N°
Metering Properties				
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°
LTE Zoning Parameters				
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 PII		Description	Datapoint Type / PDT	DPT N °
Diagnostic Properties (polling)				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This property is uded 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_INFORMA- TION	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
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint PID		Description	Datapoint Type / PDT	DPT N°
Parameters				
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	EXTEN MO	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentVolumeConsumption	GO_b	GO	GO	0
	StatusGO	(GO _b)	(GO)	(GO)	NA
	CurrentVolumeFlow	(GO _b)	(GO)	(GO)	(O)*
	TempFlowWater	(GO _b)	(GO)	(GO)	(O)*
	ReliabilityOfMeteringData	(GO _b)	(GO)	(GO)	(O)*

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

M_WATERM LTE Zoning Parameters

		Support
Parameter	Apartment	M*
	Room	M *
	Subzone	M *

^{*} mandatory in LTE implementations only

M_WATERM Standard Properties of Interface Objects

Parameter / Diagnostic Value

	Support
CurrentVolumeConsumption	M
CurrentVolumeFlow	0
HistoryStorageNumbers	M
HistoryDate	M
HistoryVolumeConsumption	M
HistoryMaxVolumeFlow	0
HistoryMinVolumeFlow	0
TempFlowWater	0
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	0
OnTime	0
CurrentDate	M
ErrorDate	M
ErrorConsumption	0
ReliabilityOfMeteringData	0
AveragingDuration	0
MBusRawData	M
History Query	0
UserText	0
MeterReplacement	M
MeterReplacementCounter	0

^{*} 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

${\bf 5.3.6.1} \quad Output \ / \ diagnostic \ data \ Current Volume Consumption$

Property specification

FB:	M_WATERN	M	Pro	operty Name (<u>Server</u>): CurrentVo				ırrentVo	olumeConsumption				Mandatory ⊠ Optional □	
Desci	ription:													
	Current accumulated water volume value (m ³) that is received from the M-Bus device and shall be stored													
by the	by the Data Collector. The metering value shall be read-only and shall be accessible by polling.													
DPT:	5													
Field				Description					Sı	up.	Range	Ur	nit	Default
Count	Val		c	counter value					[Μ	full	1)		cs
ValInf	Field		1	Encoding of the counter v		nd reso	lutio	on of	ı	M	40h to 47h			
Status OutOfService Value is not available / void Overridden Fault InAlarm AlarmUnAck Standard Command field					N 1 N	JA JA M	true/false false true/false false unack		tset	true false false false unack				
	commands		r	not supported, Donly	-		ıll b	e read	٨	lΑ				
	nunication:													
	Address:			IO Type(ID):	110	03 (M_V	۷A	TERM)			rty ID:	51	1	
	he server)			Start-Index:	1						ele <u>me</u> nts	1		
	perty access	S :		Read only	\boxtimes			Read/W						
	ection			Read level							level		<u>- </u>	
	otion Handli			/alue after Powe				/alue 🗌					ılt Value	e 🛛
			า vol	atile memory ar	nd sh	all be v	oid	after pov	ver	up	of the Data C	<u> Colle</u>	ector.	
	al Features:													
	a in the meter ' shall be set			gram are marke	d in f	field 'sta	itus	' with 'pe	erm	ane	nt error' then	the	e Status	flag

LTE mode

FB:	M_WATERM	LTE	Server Output N	lame:	me: CurrentVolumeConsumption							ndatory 🗌 Optional 🔀
Desc	ription:											- p
			r volume value (m									
	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.											
DPT:			eringValue	DPT ID	22	9.001	D	atatyp	e forma	at	$V_{32}N$	₈ Z ₈
Field			ription		S	Sup.	Range	e L	Init	CO	/	Default
	Property specific	cation	above.									
	munication:											
Bin	ding Group:											
Clas	SS		Туре					Defa				
	eographical	<u>⊠</u> .	Apartment.Roon	n.Subzo	ne			1.1.1	2)			
Ap	plication Speci	fic 🗌										
Ur	nassigned		Broadcast		nfigura							
	Address:			1103 (M				perty II		51		
	-Services (eve	ent):	COV \(\sigma^{1)}	MinRe	epTime		300	sec	Hea	artbeat:	6	0 min
	oReport	\boxtimes	Output per defau			ing	🛛 Bind	ding G	roup W	/ildcard	allov	ved 🗌
	TE Read-Resp		Tx Prio:	Hig	gh 🗌			Norma	I 🛛		Lov	v 🗌
•	lling of the outp	out								_		
	all always be		Transm after Po	werup:	Stored	Valu	e 🗌	Act V	alue 🗌] Defa	ıult V	′alue ⊠
	pported)											
	perty-Service	. \	Read only	\bowtie		Read	l/Write					
	ividual access	_	,									
	otion Handling] :							Sav	e at Pov	verd	own
None												
	ial Features:											
			n heat meter data									
			nition of an adequ									
	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).											
												ال - مام سم
i II (VATERM per Apa	irtment z	zone, t	ne Ro	om nu	ımber a	and Su	ibzone r	iumb	er snall
be	set to the defa	uit val	ue 1.1.									

Group Object (Standard Mode)

	CurrentVolumeC M WATERM		Mandatory Can be internal						
Description	IVI_VVATERIVI					Call	e intern	aı	
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.									
Datapoint Ty	ре								
DPT_Name:	DPT_Value_4_	Count							
DPT Format:	V ₃₂		DPT_ID			_			
Field	Description				Supp.	Range	Unit	Default	
	Counter value integer. 1) unit, resoluti engineered on according to Va 'CurrentVolume In case of meter Property shall I Collector and in service technic	on and displathe receiver of all of the receiver of all of the receiver replacement of the receiver replacement of the receiver replacement of the receiver of	y format had the informate from the information of the correction	nave to be mation esponding the Data	M	full	,	0	
Access Type									
◆ Output									
this → M Spontaneo Request			Δ-Value: Period:	cs 1)	/lin repetiti	on period:	5 mi	n	
Communicat	ion Type								
	ject Datapoint					Mandato	ry: 🛛 🖂		
	oup Address: -								
Dynamics									
Power dow Power up:	Value:	No initialisation Saved value: bus (only for		Actu		not for inpu			
Exception Ha							1 /		
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.									
Special Featu									
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 ValInfField).									

5.3.6.2 Output StatusGO

Standard Mode only

DP Name:	StatusGO		Manda	tory							
FB Name:	M_WATERM Can be internal										
Description											
This Output shall contain the Z ₈ status information of CurrentVolumeConsumption as a Group Object.											
Datapoint Type											
DPT_Name:											
DPT Format:	DPT_ID: 21.001										
Field	Description		Supp.	Range	Unit	Default					
Status	Z ₈ Status information		0	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			İ					
Access Type											
◆ Output											
this $\rightarrow M$	\boxtimes this \rightarrow 1										
Spontaneo	us 🛛 COV: 🔻 Delta-Value	e: Non	e. MinRep	Time:	5 min						
	Cyclic Period:										
Request											
Communicati	on Type										
	ect Datapoint			Mandatory	<i>r</i> : 🛛						
	up Address:										
Dynamics											
Power dow											
Power up:	Value: No initialisation:	De	efault value:								
	Saved value:		tual value:								
	Transmit on bus:										
Exception Ha	ndling										
None.											
Special Featu	res										
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:	W_WAIERW	Pro	perty Name (<u>Ser</u>	<u>ver</u>):	Historyvolui	neCon	sum	ption		ptional
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:			eteringValue		T ID 229.00			e format	V ₃₂ N ₈ Z ₈	[n]
Field			Description			Sup.	Rar	nge	Unit	Default
Count ValInf		r	neasured value Fincoding of ur the measured		esolution of	M M	full 40h	to 47h	1)	cs
- Ov - Fa - In	tOfService erridden		Value is not available / void M NA f measurement failure, corrupted value NA f NA f					e/false e e/false e ick	bitset	true false false false unack
Comn • All	nand commands	r	standard Commar not supported, Da only		shall be read	NA			enum	
Comr	nunication:	*				*	*	-		
	Address: he server)		IO Type(ID): Start-Index:	1103 (N	M_WATERM)	Prope N° of	•		62 ≥ 8 fixed or v length	<i>r</i> ariable
Pro	perty access:		Read only	\boxtimes	Read/V	Vrite			-	
Prot	ection		Read level			Write	leve			
	tion Handling:		/alue after Power		tored Value 🗌	Act V			fault Valu	e 🗵
		ı vol	atile memory and	shall be	void after po	wer up	of the	e Data Co	llector.	
	al 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_WATER	M Pr	operty Name (<u>Se</u>	rver):	Mete	ringDevic	еТур	9		Man	datory 🖂
			· · ·			•	•			0	otional 🔲
Desc	ription:	÷			•			<u>.</u>			
Devic	e Type of th	e water	meter device. Su	pported	value	s in M WA	ATER	M are:			
			olume (30°C to 90			_					
7	': Water vo		•	,							
2	0: waste w	ater me	eter								
2	255: void dev	ice tvp	е								
			e M-Bus "address	" preset	by ma	nufacture	. All th	ne Prope	erties N	/lanufactu	rer.
			rsionNumber and								
identi	fication.			`						•	
Durin	g the installa	ation pro	ocedure the Meter	ringDevi	сеТур	e informat	ion is	provide	d by th	ne M-Bus i	neter.
The v	alue shall be	e stored	by the Data Colle	ector and	d shall	be acces	sible	by pollin	g.		
DPT:	Name	DPT_	Metering_DeviceT	ype DP	T ID	20.114	Da	atatype f	ormat	N ₈	
Field			Description				Sup.	Range	;	Unit	Default
								{6, 7,2	:55}	enum.	255
Comi	nunication:		•			-					
DP	Address:		IO Type(ID):	1103 (M_W/	TERM)	Prop	erty ID:		115	
(in t	he server)		Start-Index:	1			N° o	f elemer	ts	1	
Pro	perty acces	s:	Read only	\boxtimes		Read/W	rite				
Pro	tection		Read level				Write	e level			
Exce	otion Handl	ing:	Value after Powe	erup: S	Stored	Value 🛚	Act \	/alue 🗌	De	fault Value	e 🗌
None											
_	ial Features										
Devic	e type '255'	= void	(default value) ; us	sed to in	dicate	that the F	B is r	not conn	ected	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 (<u>Server</u>):	Operty Name (Server):ErrorConsumptionMandatoryOptional						
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.								
, ,		T ID 229.001	Datat	ype format	V ₃₂ N	₈ Z ₈		
Field	Description			Range	Unit	Default		
CountVal	measured value			ااد	1)	CS		
ValInfField	1) Encoding of unit and ro the measured value	esolution of	M 4	0h to 47h				
Status - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck	Value is not available / vo		NA F M tr NA F	rue/false false rue/false false Jnack	bitset	true false false false unack		
Command – all commands	standard Command field not supported, Datapoint only	shall be read	NA		enum			
Communication:								
DP Address: (in the server) Property access:	IO Type(ID): 1103 (N Start-Index: 1 Read only	M_WATERM) Read/W	Property N° of ele		127 1			
Protection	Read level		Write lev	vel				
Exception Handling:	-	tored Value	Act Valu		fault Value	e 🛛		
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 Averaging Duration

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.

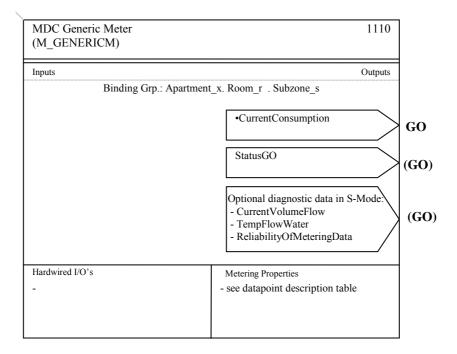
In addition a subset of metering data may be available also as standard Group Object in Standard Mode for visualization on displays etc. At least the current consumption value shall be provided spontaneously as a Group Object and can be sent on KNX spontaneously. See clause 1.2.

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

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

Datapoint	PID	Description	Datapoint Type / PDT	DPT N °
Metering Properties				
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 °
LTE Zoning Parameters				
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°
Diagnostic Properties (polling)				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This property is uded 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°
Diagnostic Properties (polling)				
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 upto-date or outdated.	DPT_Bool / PDT_BINARY_INFORMA- TION	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
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Parameters				
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	EXTEN Mo:	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentConsumption	GO_b	GO	GO	0
	StatusGO	(GO _b)	(GO)	(GO)	NA
	ReliabilityOfMeteringData	(GO _b)	(GO)	(GO)	(O)*

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

M_GENERICM LTE Zoning Parameters

		Support
Parameter	Apartment	M *
	Room	M *
	Subzone	M*

^{*} mandatory in LTE implementations only

M_GENERICM Standard Properties of Interface Objects

Parameter / Diagnostic Value

	Support
CurrentConsumption	M
HistoryStorageNumbers	M
HistoryDate	M
HistoryConsumption	M
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	0
OnTime	0
CurrentDate	M
ErrorDate	M
ErrorConsumption	О
ReliabilityOfMeteringData	0
AveragingDuration	0
MBusRawData	M
History Query	0
UserText	0
MeterReplacement	M
MeterReplacementCounter	0

^{*} 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

FB: M_GENERICM			Property Name	(<u>Server</u>): C	urrentCo	nsur	nption		ndatory 🔯 optional 🔲
Desc	ription:	l l								
Curre	nt accumulat	ted me	tering value that	is receiv	ved fron	n the M-B	us de	vice and shall	be stored	by the
			ering value shall l	<u>be read-</u>	only an			essible by pollin	ıg.	
DPT:	Name	DPT_	MeteringValue	D	PT ID	229.001		atatype format	<u> </u>	
Field			Description				Sup	. Range	Unit	Default
Coun			counter value				M	full	1)	cs
ValInf	Field		1) Encoding of the counter v		l resolut	tion of	М	according to Metering		
								Medium		
Status	s								bitset	
• Ot	utOfService		Value is not ava	ailable / ˈ	void		M	true/false		true
• O\	erridden/						NA			false
• Fa	ult		metering failure	, corrup	ted valu	ie	М	true/false		false
 In/ 	Alarm						NA	false		false
• Ala	armUnAck						NA	unack		unack
Comr	nand		standard Comm	nand fiel	d				enum	
• all	commands		not supported, I only	Datapoir	nt shall l	be read	NA			
Comi	nunication:		-							
	Address:		IO Type(ID):	1110 /	1 CENI	ERICM)	Droi	perty ID:	51	
	he server)		Start-Index:	1110 (1	/I_GLINI	_IXICIVI)		of elements	1	
	perty access	s:	Read only			Read/W				
	tection		Read level				Writ	e level		
	ption Handli		Value after Pow		Stored				fault Valu	e 🛛
			olatile memory a	and shall	be voic	d after pov	ver u	p of the Data C	ollector.	
	ial Features									
		-	legram are marke	ed in fiel	ld 'statu	s' with 'pe	rmar	ent error' then	the Status	s flag
'Fault	' shall be set	to 'tru	e'.							

LTE mode

FB:	M_GENER	RICM	LTE	Server Output	Name:	CurrentC	onsump	tion	М	andatory ☐ Optional ⊠
Desci	ription:	<u> </u>								opaona. 🔼
Curre Data	nt accumula Collector. T	he me	eterin	ing value that is g value shall be ange of value.						
DPT:	Name	DPT	Mete	eringValue	DPT ID	229.00	1 Da	tatype format	V ₃₂ l	N_8Z_8
Field See F	roperty spe			ption above.		Sup.	Range	Unit	COV	Default
	nunication									
Bind	ding Group):								
Clas	S			Туре				Default		
Ap	eographical plication Sp assigned	ecific		Apartment.Roo Broadcast		ne nfigurable		1.1.1 2)		
DP A	Address:				1110 (M_	GENERI	CM) Pro	operty ID:	51	
Inf (L ⁻ po sh	-Services (oReport TE Read-Re Iling of the d all always b pported)	spon output	´⊠ se	Output per defa Tx Prio: Transm after Po	ult comm Hig	ıh 🗌	!	sec Heart ling Group Wild Normal Act Value	dcard allo L	60 min owed ow t Value
	perty-Servi ividual acc			Read only	\boxtimes	Rea	ad/Write			
	otion Hand	ling:						Save	at Power	down
None.	1									
_	al Features									
Th da M- de 2) If t	erefore the ta is provide Bus messa pends on th	definied to to to to to to to to to to to to to	tion on the Kolorian trings of the Kolorian t	meter data are of an adequate (NX system and ger an update of the meter (ENERICM per Ale 1.1.	COV is su that the hast the Grou according	ufficient to KNX buslo up Object. g to ValInf	guaranto ad is not The defi Field).	ee that the mo t too high. Norn inition of a mea	st current mally rectaningful <i>L</i>	t M-Bus eption of an Value

Group Object (Standard Mode)

DP Name:	CurrentConsumpt	tion	Abbr.:	Ī		Manda	tory	
	M GENERICM	шотт	71001				interna	
Description						- Cuii B		
Current accum Data Collector spontaneously	ulatedmetering va . The metering va in case of changative or additional DP	llue shall be r e of value.	read-only	and shall be				
Datapoint Typ	10							
DPT Name:	DPT Value 4 (Count						
DPT Format:	V ₃₂				DPT ID:	13.001		
Field	Description				Supp.	Range	Unit	Default
Access Type ◆ Output this → M Spontaneon		on and display the receiver of the receiver of the receiver of the replacement of the replacement of the replacement of the receiver of the r	y format had the information of the information of the correction of the correction of the information of th	nave to be mation esponding the Data staller or	/lin repetition	on period:	5 min	0
Request			i crioa.					
Communicati	on Type							
	ect Datapoint					Mandatory	<i>y</i> : 🛛	
Default Gro	oup Address:	_						
Dynamics								
Power dow								
Power up:	_	No initialisati			ault value:			
		Saved value:			<u>ıal value (n</u>			
Fusantian Ha	Transmit on	bus (only for	output):	_ ∟ Rea	d from bus	(only for in	iput):	
Exception Ha		II ba indicata	d with the	dofoult value	· ^			
In case of Met	faulty values sha erReplacement = tion of the value n	true, the value	ue of Curr	entConsumpt		e 0 in orde	r to indic	ate, that
Special Featu								
Therefore to data is prov M-Bus mes	is RF system met he definition of an rided to the KNX s sage will trigger a of a meaningful Δ	n adequate C system and than update of the	OV is suf hat the KI the Group	ficient to guar NX busload is o Object.	antee that not too hig	the most c jh. Normall	urrent M y recept	-Bus ion of an

5.4.6.2 Output StatusGO

Standard Mode only

DP Name:	Statu	isGO				Ab	br∴			Manda	tory		
FB Name:	M_GI	ENERICM								Can be	e intern	al	
Description													
This Output s		ontain the Z	Z ₈ status i	inform	ation o	of Curre	ntCor	nsun	nption as	a Group O	bject.		
Datapoint Ty													
DPT_Name:		T_StatusG	en										
DPT Format:	B ₈								DPT_ID:				
Field		scription							Supp.	Range	Unit	Defa	ault
Status		Status infor	mation						0	Bitset	ļļ		
 Bit 0 		OfService							M		t/f	tru	
 Bit 1 	Fau	ılt							M		t/f	fals	se
 Bit 2 	Ove	erridden							NA		f	fals	
 Bit 3 	InAl	larm							NA		f	fals	se
 Bit 4 	Alar	rmUnAckno	owledged	l					NA		u	una	ck
 Bits 5 to 7 	rese	erved							NA				
Access Type)												
♦ Output													
this \rightarrow M	\boxtimes		this $\rightarrow 1$										
Spontaneo	ous		': [Delta-\	Value:	Nor	ne.	MinRep	Time:	5 min		
		Cycl	ic [Period	:							
Request													
Communicat	tion Ty	уре											
♦ Group Ob										Mandatory	/: <u> </u>		
Default Gr	oup A	ddress:											
Dynamics													
Power dov	vn: S	Save:											
Power up:	'	Value:	No initia	alisati	on:		D	efau	It value:				
			Saved	value:			A	ctua	l value:				
		Transmit o	n bus:										
Exception Ha	<u>andlin</u>	ıg											
None.													
Special Feat	ures												
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	1 P	roperty N	lame (<u>Serve</u>	<u>er</u>):	Histo	ryCons	umptic	n			datory ⊠ ptional □
Descr	iption:	<u> </u>										
Array and sh	of accumulated hall be stored by	y the	Data Coll	ector. Each	Histo	oryĆor	nsumptio	n value	e in th	ne receiv	ed M-Bus	3
	age shall be ass											
	ers, time stamp											Property
	array index. Se										0.0.	
	rray of history ir				_						N/ N/ 7	r1
DPT:	Name DF	1_M	leteringVa		אט	T ID	229.001			e format	<u> </u>	
Field			Descripti					Sup.	Ran	ge	Unit	Default
Count			measure					M	full			CS
ValInfl	Field			ding of unit a leasured val		esolut	tion of	M		ording letering lium		
Status	3]		bitset	
- Ou	tOfService		Value is	not available	e / vo	oid		M	true	/false		true
- Ov	erridden							NA	false	Э		false
- Fa			measure	ment failure	. cor	rupted	lvalue	М	true	/false		false
_	Marm				,			NA	false			false
	-							NA	una	_		unack
- Ala	rmUnAck							INA	una	UK .		unack
Comm	nand		standard	Command	field						enum	
• All	commands		not supp	orted, Datap	ooint	shall l	be read	NA				
			Joiny 1									
Comn	nunication:		l						l			
DP A	Address:	IO T	Type(ID):	1110(M_GE	ENEF	RICM)	Prope	erty ID:		62		
(in t	he server)	Star	t-Index:	1		·	N° of	elemer	nts	≥ 8 fixed or	variable l	ength
Prop	perty access:	Rea	nd only	\boxtimes		Read	/Write					
Prot	ection	Rea	id level					Write	level			
Excep	tion Handling	: \	Value afte	r Powerup:	Sto	ored V	′alue 🗌	Act Va	llue [Def	ault Value	
Data s	shall be stored i	n vol	atile mem	ory and sha	ll be	void a	fter powe	er up o	f the	Data Co	llector.	
	al Features:											
	in the metering	tele	gram are	marked in fi	eld 's	tatus'	with 'per	rmaner	nt erro	or' then t	the history	shall be
left un	changed.											

5.4.6.6 LTE Zoning Parameter Apartment

Same as in M_HEATM Object except IO Type (ID) = $1110 \text{ (M_GENERICM)}$, 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_GENER	ICM F	Property Name		Meteri	ingDevic	еТуре		Man	datory 🔯
		(Server):						0	ptional 🗌
Desc	ription:	-			=			•		
Meter	ing Device	Type of t	the meter device.	Support	ed valu	es in M_	GENE	RICM are:		
C): Other M	ledium								
-	: Oil									
	2: Electrici									
	3: Gas vol	ume								
_	5: Steam									
	255: void de									
			M-Bus "address"							
		ber, Ver	sionNumber and	Metering	Device	eType too	gether	mark a world	wide uniqi	ue meter
	fication.				_					
			cedure the Meter						ie M-Bus i	meter.
		_	by the Data Colle							
DPT:	Name	DPT_N	/letering_DeviceT	ype DP	TID	20.114		atype format	N ₈	
Field			Description				Sup.	Range	Unit	Default
								{0,1,2,3,5,	enum.	255
								255}		
	nunication									
	Address:		IO Type(ID):	1110 (N	Λ_GEN	IERICM)			115	
_	he server)		Start-Index:	1				elements	1	
	perty acces	ss:	Read only			Read/W				
Prof	tection		Read level				Write	level		
Exce	otion Hand	ling:	Value after Powe	rup: S	tored V	/alue ⊠	Act Va	alue 🗌 🛮 De	fault Valu	e 🗌
None.										
	ial Features									
Devic	e tyne '255'	- void (default value); us		11 4 - 4					
	C type 200	- voiu (ueiauit vaiue), us	ea to inc	ilcate t	hat the F	·B is no	ot 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	Pro	perty Name (<u>Ser</u>	rver):	Error	Consum	ption			ndatory 🔲 ptional 🔯
Descr	ription:	<u>.</u>			-			_		paronai Z
Value receiv polling	of CurrentConsed from the M-	Bus (otion datapoint at t device and shall b I to datapoint Erro	e stored						
DPT:			1eteringValue		T ID	229.001	Data	atype format	V ₃₂ N	√.Z.
Field	1.100		Description					Range	Unit	Default
Count	Val		measured value					full	1)	CS
ValInf	Field		Encoding of ur		esoluti	ion of	М	00h to 7Fh		
OvFaInA	tOfService erridden		Value is not availa			value	NA M	true/false false true/false false Unack	bitset	true false false false unack
Comn – all	nand commands		standard Comma not supported, Da only		shall b	e read	NA		enum	
Comr	nunication:	•					<u> </u>		-	
(in t	Address: he server) perty access:		IO Type(ID): Start-Index: Read only	1110 (N 1	Л_GEN	NERICM Read/W	N° of e	rty ID: elements	127 1	
	ection		Read level			TCau/VV	Write I	 evel		
	otion Handling	15	Value after Power	rup: S	tored '	Value 🗌	Act Va		fault Valu	e 🛛
			latile memory and	•						
	al Features:									
If data	in the metering ted by the Data		egram are marked lector. This is the							

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 Averaging Duration

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.

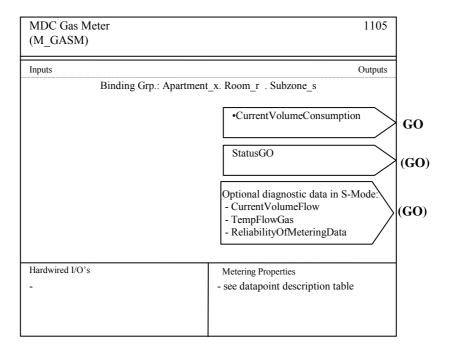
Therefore the complete set of supported Gas Meter datapoints shall be mapped to Properties that can be accessed on demand by the A PropertyValue Read-service.

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°
Outputs				
CurrentVolumeConsumption	51	Accumulated gas volume. Can be accessed as a property or can be distributed as a standard Group Object	Property: DPT_MeteringValue / PDT_GENERIC_6 Standard Mode:	229.001
0.1.00			DPT_Value_4_Count	13.001
StatusGO		Z ₈ information of CurrentVolumeConsumption as a Group Object	Standard Mode only DPT_StatusGen,	21.001
CurrentVolumeFlow	53	Current measured volume flow	Standard Mode:	9.025
TempFlowGas	70	Current flow temperature	DPT_Value_Volume_Flow Standard Mode: DPT Value Temp	9.001
MeasurementCondition	80	The measurement condition	DPT_Gas_Measurement_ Condition	20.1202
ValveState	153	Describing the status of the valve: energy supply is closed or open or released.	Property: DPT_MBus_BreakerValve State / PDT_ENUM8	20.1200
			Standard Mode: DPT_MBus_BreakerValve State	20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	Standard Mode: DPT_Bool	1.002
Inputs				
None.				
Metering Properties				
CurrentVolumeFlow	53	Current measured volume flow	DPT_MeteringValue /	229.001
HistoryStorageNumbers	60	Array of storage numbers for history values	PDT_GENERIC_6 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
LTE Zoning Parameters				
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 °
Diagnostic Properties (polling)				
RxSequenceCounter	110	Sequence counter generated locally by the receiver and incremented each time an M-Bus message is received. This property is uded 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	DPT_Value_4_Ucount	12.001
VersionNumber	114	integer 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	DPT_Metering_DeviceType / PDT_ENUM8	20.114
FabricationNumber	116	255 : void device type 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_INFORMA- TION	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	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n]	5.010
History Query	152	be ≥128 octets Function Property to query metering data according 4.10.	n ≥128 PDT_Function	none
Parameters				
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	EXTEN Mo	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	None.				
Outputs	CurrentVolumeConsumption	GO_b	GO	GO	О
	StatusGO	(GO _b)	(GO)	(GO)	NA
	CurrentVolumeFlow	(GO _b)	(GO)	(GO)	(O)*
	TempFlowGas	(GO _b)	(GO)	(GO)	(O)*
	ValveState	(GO _b)	(GO)	(GO)	NA

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

M_GASM LTE Zoning Parameters

		Support
Parameter	Apartment	M*
	Room	M *
	Subzone	M *

^{*} mandatory in LTE implementations only

M_GASM Standard Properties of Interface Objects

Parameter / Diagnostic Value

	Support
ValveState	0
CurrentVolumeConsumption	M
CurrentVolumeFlow	0
HistoryStorageNumbers	M
HistoryDate	M
HistoryVolumeConsumption	M
HistoryMaxVolumeFlow	0
HistoryMinVolumeFlow	0
TempFlowGas	0
MeasurementCondition	M
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	0
OnTime	0
CurrentDate	M
ErrorDate	M
ErrorConsumption	0
ReliabilityOfMeteringData	0
AveragingDuration	0
MBusRawData	M
History Query	0
UserText	0
MeterReplacement	М
MeterReplacementCounter	0

^{*}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 Pr	roperty Name (<u>Server</u>):	CurrentVolumeConsumption				Mandatory ☐ Optional ⊠		
Description:								
Current accumulated gas volume value (m ³) 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	D 229.001	1 Dat	atype format	$V_{32}N_8Z$	8		
Field	Description		Sup.	Range	Unit	Default		
CountVal	counter value		M	full	1)	cs		
ValInfField	Encoding of unit and resolution of the counter value			40h to 47h				
Status			1		bitset			
 OutOfService 	Value is not available / void			true/false		true		
 Overridden 			NA M	false		false		
Fault	metering failure, corrupted value			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							
Communication:								
DP Address:	IO Type(ID): 1105 (M_GASM) Property ID:		51					
(in the server)	Start-Index: 1			<u>elements</u>	1			
Property access:	Read only	Read/W						
Protection	Read level		Write					
Exception Handling: Value after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐								
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

FB:	M_GASM	LTE	Server Output	Name:	ne: CurrentVolumeConsumption			Mandatory	
				·			Optional 🔀		
	ription:	_						_	
Curre	Current accumulated gas volume value (m³) that is received from the M-Bus device and shall be stored								
			e metering value s		ead-only ar	nd shall l	be accessible	by poll	ng or it is
sent s	sent spontaneously in case of change of value.								
DPT:	Name [OPT_M	eteringValue	DPT ID	229.00	1 Da	itatype format	t V	$V_{32}N_8Z_8$
Field									
See F	roperty spec	cification	n above.						
Comr	nunication:								
Bind	ding Group:								
Clas									
Ge	eographical Apartment.Room.Subzone 1.1.1 2)								
Ap	Application Specific								
Un	assigned		Broadcast	Co	nfigurable [
DP A	Address:		IO Type(ID):	1105 (M	_GASM)	Prop	erty ID:	51	
LTE-Services (event):		COV 🛛 1)		epTim€	300 s		rtbeat:	60 min	
	InfoReport		ing Group Wi	Idcard a	llowed				
	ΓE Read-Response Tx Prio: High ☐ Normal ⊠			Low					
	lling of the o								
	shall always be Transm after Powerup: Stored Value Act Value Default Value				ılt Value ⊠				
	pported)								
	perty-Service		Read only	\bowtie	Read	d/Write			
	ividual acce						<u> </u>		
	Exception Handling: Save at Powerdown						erdown		
None.									
	al Features								
1) 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 heat meter (according to ValInfField).									
	if there is only one ivi_GASivi per Apartment zone, the Room number and Subzone number shall be								
se	set to the default value 1.1.								

Group Object (Standard Mode)

DP Name:	CurrentVolumeConsumption Abbr.:	Manda	Mandatory						
FB Name:									
FB Name: M_GASM Can be internal Description									
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									
	in case of change of value.								
Datapoint Type									
DPT_Name: DPT Format:	DPT_Value_4_Count V ₃₂	DPT ID:	12 001						
Field	13.001 ange Unit Default								
rieiu	Description Counter value encoded as plain 32 bit signed	Supp. R	ange	1)	0				
	integer.	IVI IU	"		U				
	1) unit, resolution and display format have to be								
	engineered on the receiver of the information								
	according to ValInfField 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.								
Access Type									
◆ Output									
this \rightarrow M	$ \square $ this $\rightarrow 1$ $ \square $								
Spontaneou	is \square COV: 1) \square \square \square \square \square \square Mir	n repetition	period:	5 mir	1				
Cyclic Period:									
Request									
Communication	V 1			1 5 3					
	ect Datapoint	M	andatory	: 🛛					
Default Group Address:									
Dynamics									
Power down									
Power up:	Power up: Value: No initialisation: Default value:								
	Saved value: Actual value (not for input):								
Transmit on bus (only for output): Read from bus (only for input):									
Exception Handling Void values or faulty values shall be indicated with the default value 0									
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.									
Special Features									
1) 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									
ValInfField).									

5.5.6.3 Output StatusGO

Standard Mode only

DP Name:	StatusGO	Abbr.:		Manda	tory	
FB Name:	M_GASM			Can be	intern	al 🗌
Description						
This Output sh	all contain the Z ₈ status information of Ci	urrentVolυ	umeConsump	tion as a G	Group O	bject.
Datapoint Typ						
DPT_Name:	DPT_StatusGen					
DPT Format:	B ₈		DPT_ID:	21.001		
Field	Description		Supp.	Range	Unit	Default
Status	Z ₈ Status information		0	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			
Access Type						
◆ Output						
this \rightarrow M						
Spontaneo		ie: Non	e. MinRep	Time:	5 min	
	Cyclic Period:					
Request						
Communicati					15-7	
	ect Datapoint			Mandatory	<i>r</i> : 🛛	
	up Address:					
Dynamics						
Power dow						
Power up:	Value: No initialisation:		efault value:			
	Saved value:		tual value:			
Francisco II	Transmit on bus:					
Exception Ha	naling					
None.						
Special Featu	res					
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	Pro	perty Name (<u>Ser</u>	otion		datory 🖂 ptional 🗌						
Desci	ription:								-			
Array Bus d receiv storag Prope	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:	_ 0 1 0 0 1											
Field			Description			Sup.	Ran	ge	Unit	Default		
Count	:Val	r	neasured value			M	full		1)	CS		
ValInf	Field	1	Encoding of un the measured		esolution of	М	40h	to 47h				
- Ov - Fa - In	rtOfService rerridden		/alue is not availa			M NA M NA	false	/false e /false e	bitset	true false false false unack		
Comn - All	nand commands	r	standard Commar not supported, Da only		shall be read	NA			enum			
Comr	nunication:	<u> </u>				-	*	•				
	Address: he server)		IO Type(ID): Start-Index:	1105 (N 1	/I_GASM)	Prope N° of	•		62 ≥ 8 fixed or variable length			
Pro	perty access:		Read only	\boxtimes	Read/W	/rite]				
Prot	ection		Read level			Write	level					
	otion Handling:		/alue after Power		tored Value 🗌	Act V			ault Value	e 🛛		
Datas	shall be stored ir	ı vola	atile memory and	shall be	void after pow	ver up c	of the	Data Co	llector.			
	al Features:											
	in the metering ichanged.	tele	gram are marked	in field	status' with 'pe	ermane	nt er	ror' then t	the history	/ shall be		

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

LR:	IVI_GASIVI	Pro	perty Name (<u>Ser</u>	ver):	Mete	eringDevic	erype			datory 🔼	
									0	ptional 🗌	
Desc	ription:	_						-			
Meter	ing Device Type	of th	ne gas meter devi	ice. Sup	porte	d values ir	n M G	ASM is:			
	3: Gas meter		· ·	•			_				
2	255: void device	tvpe									
		-71-									
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											
	fication.				,	,, ,	•		'		
Durin	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:			etering_DeviceTy			20.114		atype format	N ₈		
Field			Description	, <u> </u>				Range	Unit	Default	
			•				<u> </u>	{6, 7,255}	enum.	255	
Comi	nunication:					<u> </u>					
DP	Address:		IO Type(ID):	1105 (N	И GA	SM)	Prope	rty ID:	115		
(in t	he server)		Start-Index:	1	_	,	N° of	elements	1		
Pro	perty access:		Read only	\boxtimes		Read/W	rite				
Pro	tection		Read level				Write	level			
Exce	ption Handling:	: \	/alue after Power	rup: S	tored	Value 🖂	Act Va	alue 🔲 De	fault Value	e 🗌	
None											
Spec	ial Features:										
Devic	e type '255' = vo	oid (d	efault value) ; us	ed to inc	dicate	that the F	B is no	ot 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	Pro	perty Name (<u>Se</u>	rty Name (<u>Server</u>): ErrorConsumption Mandatory ☐ Optional ☐									
Desc	ription:	•						ë					
			onsumption data										
			the M-Bus device	ce and sh	าall be	stored b	y the D	ata Coll	ector	and shal	l be		
	sible by polling												
			to datapoint Erro			T							
DPT:	Name Di		eteringValue	DP	T ID	229.001		atype fo	rmat		V ₈ Z ₈		
Field			Description					Range		Unit	Default		
Count			measured value				M	full		''	cs		
ValInfField 1) Encoding of unit and resolution of the measured value							M	40h to 4	17h				
Status										bitset			
– Οι	ıtOfService	1	Value is not avail		M	true/fals	se		true				
- Ov	erridden						NA	False			false		
– Fa	ult	ı	measurement fail	lure, corr	upted	value	M	true/fals	se		false		
– In	Alarm				·		NA	False			false		
– Ala	armUnAck						NA	Unack			unack		
Comn	nand		standard Comma							enum			
– all	commands		not supported, Da	atapoint :	shall b	e read	NA						
		(only										
Comr	nunication:												
	Address:		IO Type(ID):	1105 (N	4 GA9	SM)	Prope	rty ID:		127			
	he server)		Start-Index:	1	/I_O/\	JIVI)		elements	3	1			
_	perty access:		Read only	\boxtimes		Read/W							
	tection		Read level				Write	level					
Exce	otion Handling	: \	Value after Powe	rup: S	tored \	Value 🗌	Act Va	alue 🗌	De	fault Valu	ıe 🛛		
Data	shall be stored	in vol	atile memory and	shall be	oid :	after pow	er up c	f the Da	ta Co	ollector.			
	al Features:												
			gram are marked										
	•	Coll	ector. This is the	last relia	ıble an	nd valid c	onsum	otion val	ue fro	om the m	etering		
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 Averaging Duration

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

FB:	M_GASM		Pro	perty Name (<u>S</u>	erver):	Meas	surement	Condi	tion			datory 🖂
Desci	ription:	_				_						
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].												
DPT:	Name	DPT	Г_М	etering_Device	Type DP	T ID	20.1202	Dat	atype f	ormat	N ₈	
Field				Description				Sup.	Range		Unit	Default
									{0, 1, 2	2, 3}	enum.	0
Comr	nunication:	!										
DP A	Address:			IO Type(ID):	1105 (M_GA	SM)	Prope	rty ID:		80	
(in t	he server)			Start-Index:	1	_		N° of	elemen	ts	1	
Pro	perty acces	s:		Read only	\boxtimes		Read/W	rite				
Prof	ection			Read level				Write	level			
Exce	otion Handl	ing:	\ 	alue after Pow	erup: S	Stored	Value 🛚	Act Va	alue 🗌	De	fault Valu	e 🗌
None.												
Speci	al Features	S :										
-												

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

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

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

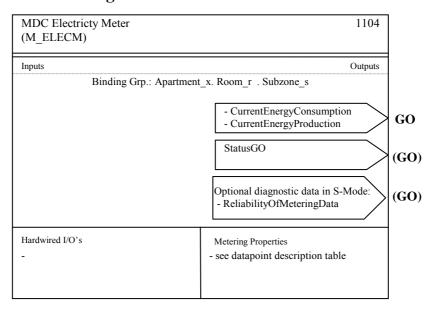
Therefore the complete set of supported Electricity Meter datapoints shall be mapped to Properties that can be accessed on demand by the A PropertyValue Read-service.

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

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

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Metering Properties (polling)				
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
CurrentEnergyConsumptionTarif f1	53	Accumulated active energy import value Tariff 1	DPT_MeteringValue / PDT_GENERIC_6	229.001
CurrentEnergyConsumptionTarif f16	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
CurrentEnergyProductionTariffl 6	84	Accumulated active energy export value Tariff 16	DPT_MeteringValue / PDT_GENERIC_6	229.001

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Metering Properties (polling)				
HistoryEnergyConsumptionTarif fl	85	Array of energy consumption history values Tariff1	DPT_MeteringValue[n], n ≥8 / PDT_GENERIC_6	229.001
	•••			
HistoryEnergyConsumptionTarif f16	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
HistoryEnergyProductionTariff1 6	146	Array of energy production history values Tariff16	DPT_MeteringValue[n], n ≥8 / PDT_GENERIC_6	229.001
CurrentActivePowerConsumption	147	Current measured power consumption	Standard Mode: DPT_Power	9.024
CurrentActivePowerProduction	148	Current measured power production	Standard Mode: 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°
LTE Zoning Parameters				
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°
Diagnostic Properties (polling)				
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°
Diagnostic Properties (polling)				
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 upto-date or outdated.	DPT_Bool / PDT_BINARY_INFORMA- TION	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
History Query	152	Function Property to query metering data according 4.10.	PDT_Function	none

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Parameters				
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	EXTEN MO	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	(none)				
Outputs	CurrentEnergyConsumption	GO_b	GO	GO	0
	CurrentEnergyProduction	(GO _b)	(GO)	(GO)	(O)*
	StatusGO	(GO _b)	(GO)	(GO)	NA
	BreakerState	(GO _b)	(GO)	(GO)	NA
	ReliabilityOfMeteringData	(GO _b)	(GO)	(GO)	(O)*

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

M_ELECM LTE Zoning Parameters

		Support
Parameter	Apartment	M *
	Room	M *
	Subzone	M *

^{*} mandatory in LTE implementations only

M_ELECM Standard Properties of Interface Objects

Parameter / Diagnostic Value

	Support
BreakerState	0
CurrentEnergyConsumption	M
CurrentEnergyProduction	0
CurrentEnergyConsumptionTariff1	0
CurrentEnergyConsumptionTariff16	
CurrentEnergyProductionTariff1	О
 CurrentEnergyProductionTariff16	
HistoryEnergyConsumptionTariff1	0
HistoryEnergyConsumptionTariff16	
HistoryEnergyProductionTariff1	О
 HistoryEnergyProductionTariff16	
CurrentActivePowerConsumption	0
CurrentActivePowerProduction	0
CurrentTariff	0
HistoryStorageNumbers	M
HistoryDate	M
RxSequenceCounter	M
RxReceptionTime	M
Manufacturer	M
IdentificationNumber	M
VersionNumber	M
MeteringDeviceType	M
FabricationNumber	C*
AccessNumber	M
DeviceStatus	M
OperatingTime	0
OnTime	0
CurrentDate	M
ReliabilityOfMeteringData	0
ErrorDate	M
AveragingDuration	0
MBusRawData	M
History Query	0
UserText	0
MeterReplacement	M
MeterReplacementCounter	0

^{*} 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.

${\bf 5.6.6.2}\quad {\bf Output\,/\,diagnostic\,\,data\,\,CurrentEnergyConsumption}$

Property specification:

FB:	M_ELECM	Pro	perty Name (<u>Server</u>): CurrentEnergyConsumption							ndatory 🗌 optional 🖂
Dosc	ription:									pilonai 🖂
		od one	ergy value that is rec	oived from t	ho M P	us dovi	co for concu	mntior	and	chall ho
			ctor. The metering va							
DPT:	Name		MeteringValue	DPT ID	229.0		atatype form		$V_{32}N_{8}Z$	
Field			Description			Sup.	Range	Un	it	Default
Coun	tVal		counter value			M	full	1)		CS
Valint	Field		Encoding of unit the counter valu		ion of	M	00h to 07h 08h to 0Fh 80h to 81h 88h to 89h			
Statu	 S							bits	set	
- Ot	utOfService		Value is not availab	ole / void		M	true/false			true
Overridden				NA	false			false		
– Fa	ult		metering failure, co	M	true/false			false		
– In	Alarm					NA	false			false
– Ala	armUnAck					NA	unack			unack
Comr	 nand		standard Command	d field				en	 um	-
– all	commands		not supported, Data read only		e	NA				
Comi	nunication:		•			-	-	-		
DP	Address:		IO Type(ID): 1	104 (M_ELE	ECM)	Prop	erty ID:	į	51	
(in t	he server)		Start-Index: 1				f elements		1	
	perty access	S:	Read only		Read/					
	tection		1100001				e level			
	ption Handli		Value after Poweru						lt Valu	e 🛛
			platile memory and s	hall be void	after po	ower up	of the Data	Collec	ctor.	
	Special Features:									
	a in the meter ' shall be set		egram are marked ir	n field 'status	s' with '	perman	ent error' the	n the	Statu	s flag
i auit	SHAII DE SEL	io iiu	5.							

LTE-Mode:

FB:	M_ELECM	LTE Se	erver Output Na	ame:	Currer	ntEner	gyCor	sumpti	on		andatory 🗌 Optional 🖂
Desci	ription:									<u> </u>	
stored	by the Data C	Collector	y value that is re The metering see of change of	value sh							
DPT:			teringValue	DPT ID	229	0.001	D	atatype 1	format	V ₃₂ N	I_8Z_8
Field		Desc	ription			Sup.	Rang		Unit	COV	
	roperty specifi	cation a	ibove.								
	nunication:										
Clas	ding Group:		Typo					Dofoul	+		
	eographical		Type Apartment.Roo	m Subz	one			Defaul 1.1.1 2			
	plication Spec		Apartment.1100	111.SUDZ	OIIC						
	assigned	····	Broadcast	С	onfigur	able	1				
	Address:		IO Type(ID):		4 (M E		Prop	erty ID:		51	
LTE	-Services (eve	ent):	COV 🔯 1)	Minf	RepTim	e:	300		Hea	rtbeat:	60 min
	oReport	\boxtimes	Output per defa	ault com	munica	ting [Bind	ling Grou	up Wild	dcard all	owed \square
	ΓΕ Read-Resp		Tx Prio:	Н	igh 🗌		١	lormal 🛭		L	ow 🗌
sh	lling of the out _l all always be pported)	put	Transm after P	owerup:	Store	d Value	e 🗌	Act Valu	ue 🗌	Defaul	t Value ⊠
	perty-Service ividual acces	s):	Read only	\boxtimes		Read	/Write				
Exce	otion Handling	g:							Save	at Pow	erdown 🗌
None.											
Speci	al Features:										
			electricity meter								
da	ta is provided t	to the K	of an adequate (NX system and	that the	KNX b	usload	is not	too high	. Norm	ally rece	eption 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).										
			ECM per Apart						ubzon	e numbe	er shall be
se	t to the default	value 1	.1.								

Group Object (Standard Mode):

DP Name:	CurrentEnergy	Consumption	Abbr.:		Mandatory				
	M ELECM	•					internal		
Description	_								
Current accum stored by the I is sent spontar	ulated energy Data Collector. neously in case	The metering version of the contract of the co	value shall value.	be read-only a					
NOTE 15 Alterna	ative or additional I	DPTs are possible	: see NOTE 1	-					
Datapoint Typ	ре								
DPT_Name:	DPT_ActiveE	nergy							
DPT Format:	V_{32}				DPT_ID:	13.010			
Field	Description				Supp.	Range	Unit	Default	
	integer. 1) unit, resolution engineered of according to VicurrentEneror In case of me Property shall Collector and	e encoded as partion and displain the receiver of ValInfField in PayConsumption ter replacement be set automatically reserved.	ay format hof the informat hor the information of the correction o	ave to be mation esponding he Data	М	full	1)	0	
A T	service techn	ıcıan.							
Access Type									
◆ Output		I	_						
this → M Spontaneou Request	Cyc		Δ-Value: Period:	cs ²⁾ Mi	n repetitio	on period:	5 min		
Communication	on Type								
	ect Datapoint					Mandatory	<i>/</i> : 🗵		
	up Address:								
Dynamics									
Power down Power up:	Value:	No initialisate Saved value on bus (only for	e: 🗌	Actua		ot for input			
Exception Ha		, , , , , , , , , , , , , , , , , , , ,				\- J =	1/		
Void values or In case of Mete	faulty values s erReplacement ne unit/resolution	= true, the val	lue of Curre	entEnergyCor		shall be 0	in order	to	
Special Featu	res								
Therefore to data is prov M-Bus mes	is RF system e he definition of rided to the KN sage will trigge on of a meaning	an adequate C X system and t r an update of	COV is suffi that the KN the Group	icient to guara IX busload is l Object.	entee that not too hi	the most c gh. Normal	urrent M ly recept	-Bus ion of an	

5.6.6.3 Output / diagnostic data CurrentEnergyProduction Property specification:

FB:	M_ELECM	Pro	perty Name (<u>Server</u>): CurrentEnergyProduction						andatory ☐ Optional ⊠
Desc	ription:								Optional 🖂
		ed ene	ergy value that is re	ceived from	the M-B	Bus devi	ce for produc	tion and s	hall be
			ctor. The metering v						
DPT:			MeteringValue	DPT ID	229.0		atatype forma		
Field			Description			Sup.	Range	Unit	Default
Coun	tVal		counter value			M	full	1)	cs
Valln	Field		Encoding of un	it and resolu	ition of	М	00h to 07h		
			the counter val	ue			08h to 0Fh		
							80h to 81h		
							88h to 89h		
Statu								bitset	
	utOfService		Value is not availa	ble / void		M	true/false		true
Overridden				NA M	false		false		
Fault			metering failure, corrupted value				true/false		false
	Alarm					NA	false		false
– Al	armUnAck					NA	unack		unack
Comr	nand		standard Comman	d field				enum	
– all	commands		not supported, Dat	tapoint shall	be	NA			
			read only						
	munication:								
	Address:		,	1104 (M_EL	.ECM)		erty ID:	52	
•	he server)		Start-Index:	1			f elements	1	
	perty access	<u>:</u>		\boxtimes	Read				
	tection		Read level				e level		
	ption Handliı		Value after Power		l Value			Default Val	ue 🖂
			platile memory and	shall be voic	d after p	ower 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:

FB:	M_ELECM	LTE S	Server Output N	ame:	Currer	ntEner	gyProd	ductio	n			ndatory 🗌 ptional 🔀
Descri	iption:	-								-		
Curren	nt accumulated	d energ	gy value that is re	eceived	from the	е М-Ви	ıs devid	ce for p	roducti	on an	d sh	all be
			or. The metering		nall be r	ead-or	nly and	shall b	e acce	ssible	by p	olling or it
is sent	spontaneous	ly in ca	se of change of	value.								
DPT:	Name D	PT_Me	eteringValue	DPT ID	229	.001			format	: \	$V_{32}N_{8}$	Z_8
Field			cription			Sup.	Range	е	Unit	CC	VC	Default
See Pr	roperty specifi	cation	above.									
Comm	nunication:											
Bind	ing Group:											
Class			Туре					Defau				
Ge	ographical	$\square \boxtimes$	Apartment.Roor	n.Subzo	ne			1.1.1	2)			
Apr	olication Spec	ific 🔲										
Una	assigned		Broadcast		nfigura							
DP A	Address:		IO Type(ID):	110	4 (M_E	LECM)) Prop	erty ID		52		
	Services (ev	ent):	COV 🛛 1)		epTime		300 s	sec	Hea	artbea	at:	60 min
	Report	\boxtimes	Output per defa	ult comn	nunicati	ing 🖂	Bind	ing Gro	oup Wile	dcard	allov	ved 🗌
	E Read-Resp		Tx Prio:	Hiç	gh 🗌		No	ormal 🛭	\leq		Low	' 🔲
	ling of the out	put					_					_
	all always be		Transm after Po	werup:	Stored	Value		ct Val	ue 💹	Defa	ult V	alue 🛚
	ported)											
	erty-Service	,	Read only	\bowtie		Read/V	Vrite					
	vidual access											
	tion Handling	g:							Save	e at P	ower	down 🗌
None.												
	al Features:											
' III U			n electricity mete									
			of an adequate									
			KNX system and									
			ger an update of							nıngtı	ulΔ\	/alue
	depends on the increment of the electricity meter (according to ValInfField). If there is only one M ELECM per Apartment zone, the Room number and Subzone number shall be											
' II U	•	_		ment zo	ne, tne	Koom	numbe	er and	Subzon	e nur	nber	snali be
set	to the default	value	1.1.									

Group Object (Standard Mode):

	CurrentEnergyl	Production	Abbr.:			Manda		
	<u>/_ELECM</u>					Can b	e interna	
Description					. ·		1 11	
Current accumu Collector. The r spontaneously NOTE 16 Alterna	metering value in case of cha	shall be readinge of value.	d-only and	shall be access				the Data
		·						
Datapoint Type DPT Name:	DPT Value 4	1 Count						
DPT_Name. DPT Format:	V ₃₂	+_Count			DPT ID	: 13.00	1	
Field	Description				Supp.	Range	Unit	Default
	integer. 1) unit, resolution engineered of according to VicurrentEnergy In case of me Property shall Collector and	Counter value encoded as plain 32 bit signed M full 1) 0						
Access Type	service tecrifi	iciaii.						
◆ Output								
this → M Spontaneou Request	Cyc ⊠		Δ-Value Period:	: cs ²⁾ Mi	n repetitio	on period:	5 min	
Communication								
	ect Datapoint	ı				Mandator	y: ⊠	
Default Grou	up Address:							
Dynamics								
Power down Power up:	Value:	No initialisate Saved value on bus (only for	ıe:	Actua		not for inpu		
Exception Han		, , ,						
Void values or f In case of Mete indicate, that th	faulty values s rReplacement	= true, the va	alue of Cu	rrentEnergyCor		n shall be 0) in order	to
Special Featur				Ť				
Therefore th data is provi M-Bus mess	e definition of ded to the KN sage will trigge on of a meaning	an adequate X system and r an update c	COV is su I that the k of the Grou	e transmitted per ufficient to guara (NX busload is up Object. on the increment	antee that not too hi	t the most of the the the the the the the the the the	current M Ily recept	I-Bus tion of an

5.6.6.4 Output StatusGO

Standard Mode only

DP Name: StatusGO Abbr.: Mandato	ory							
FB Name: M_ELECM Can be i	interna							
Description								
This Output shall contain the Z ₈ status information of CurrentEnergyConsumption as a Gro	oup Ob	oject.						
Datapoint Type								
DPT_Name: DPT_StatusGen								
DPT Format: B ₈ DPT_ID: 21.001								
Field Description Supp. Range	Unit	Default						
Status Z ₈ 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	served NA NA							
Access Type								
♦ Output								
this \rightarrow M \square this \rightarrow 1 \square								
	5 min							
Cyclic Period:								
Request								
Communication Type								
◆ Group Object Datapoint Mandatory:								
Default Group Address:								
Dynamics								
Power down: Save:								
Power up: Value: No initialisation: Default value:								
Saved value: Actual value:								
	Transmit on bus:							
Exception Handling								
None.								
Special Features								
None.								

5.6.6.5 Diagnostic data CurrentEnergyConsumptionTariff1

FB: M_ELECM Property Name (<u>Server</u>): CurrentEnergyConsumptionTariff1	Mandatory ☐ Optional ⊠								
Description:									
Current accumulated energy consumption Tariff 1 value that is received from the M-Bus dev be stored by the Data Collector. The metering value shall be read-only and shall be accessit									
	$V_{32}N_8Z_8$								
	Init Default								
CountVal measured value M full 1)	cs								
ValInfField ¹⁾ Encoding of unit and resolution M 00h to 07h									
of the measured value 08h to 0Fh									
80h to 81h 88h to 89h									
	itset								
- OutOfService Value is not available / void M true/false	true								
- Overridden NA false	false								
 Fault measurement failure, corrupted M true/false 	false								
value									
InAlarmNA false	false								
- AlarmUnAck NA unack	unack								
Command standard Command field en	num								
all commandsnot supported, Datapoint shall beNA									
read only									
Communication:									
DP Address: IO Type(ID): 1104 (M_ELECM) Property ID: 53									
(in the server) Start-Index: 1 N° of elements 1									
Property access: Read only Read/Write									
Protection Read level Write level	· Value 🔽								
Exception Handling: Value after Powerup: Stored Value Act Value Default Value Data shall be stored in volatile memory and shall be void after power up of the Data Collector	: Value ⊠								
Special Features:									
If data in the metering telegram are marked in field 'status' with 'permanent error' then the S	Status flag								
'Fault' shall be set to 'true'.	Cidius nag								

5.6.6.6 Diagnostic data CurrentEnergyConsumptionTariff16

FB:	M_ELECM	Pro	perty Name (<u>Server</u>):	Curren	tEn	nergyCo	nsumptionTarif	f16	Mandatory ☐ Optional ⊠	
Desc	ription:	•		-						
			ergy consumption Tarif ollector. The metering v							
DPT:			leteringValue	DPT ID		9.001	Datatype format		V ₃₂ N ₈	
Field			Description			Sup.	Range		Jnit	Default
Coun	tVal		measured value			M	full	1))	cs
Valln	fField		1)Encoding of unit and resolution			М	00h to 07h			
			of the measured value				08h to 0Fh			
							80h to 81h			
							88h to 89h			
Statu			\/_		N 4		b	itset	4	
_	utOfService		Value is not available / void			M	true/false			true
OverriddenFault			manage was and failure			NA	false			false
– Fa	auit		measurement failure, corrupted value			M	true/false			false
– In	Alarm					NA	false			false
– Al	armUnAck					NA	unack			unack
Comr	nand		standard Command f	ield				е	num	
– all	commands		not supported, Datap		е	NA				
			read only							
Com	munication:							-		
	Address:			4 (M_ELE	CM		operty ID:	68		
•	the server)		Start-Index: 1				of elements	1		
	perty access	S:	Read only		Re	ad/Write				
	tection		Read level				rite level			
	ption Handli		Value after Powerup:						t Value	
			platile memory and sha	all be void a	afte	r power	up of the Data Co	ollec	tor.	
_	ial Features:									
			egram are marked in f	ield 'status	' wi	th 'perm	anent error' then	the	Status	flag
'Fault	' shall be set	to 'true	e'.							

5.6.6.7 Diagnostic data CurrentEnergyProductionTariff1

FB:	M_ELECM	Prop	operty Name (<u>Server</u>): CurrentEnergyProductionTariff1					Tariff1	Mandatory ☐ Optional ⊠			
	ription:				-					-		
			rgy production Tariff tor. The metering val									
DPT:	Name D	PT_M	eteringValue	DF	PT ID	22	9.001	Datatype	format	$V_{32}N_8Z_8$		
Field			Description				Sup.	Range		Unit	Default	
Coun	tVal		measured value				М	full		1)	cs	
ValIn	Field		¹⁾ Encoding of unit and resolution of the measured value			M	00h to 07	Fh				
								80h to 89 88h to 89				
	utOfService		Value is not available / void				М	true/false	9	bitset	true	
- O	/erridden						NA	false			false	
Fault			measurement failure, corrupted value				M	true/false	9		false	
– In	Alarm						NA	false			false	
– Ala	armUnAck						NA	unack			unack	
Comr	nand		standard Command	field						enum		
– all	commands		not supported, Datapread only	oint	shall b	e	NA					
Com	munication:	•	•					-		Ė	-	
	Address: :he server)		Start-Index: 1	04 (M_ELE	.CM		operty ID of eleme		9		
	perty access	:	Read only			Re	ad/Write					
	tection		Read level					rite level		-		
	ption Handlin		Value after Powerup		Stored '			ct Value [ult Value		
	Data shall be stored in volatile memory and shall be void after power up of the Data Collector.											
	ial Features:								1.01	01.1		
			egram are marked in	tield	ı 'status	3′ Wi	tn 'perm	anent erro	or' then th	e Status	tlag	
rault	' shall be set t	o 'true	.									

5.6.6.8 Diagnostic data CurrentEnergyProductionTariff16

FB:	M_ELECM	Prop	perty Name (<u>Serv</u>	<u>ver</u>):	er): CurrentEnergyProductionTariff16						Mandatory ☐ Optional ⊠	
Desc	ription:									<u> </u>		
			rgy production Ta									
			llector. The meter							sible by	y polling.	
DPT:	Name DF	PT_M	eteringValue	D	PT ID	22	9.001	Datatype form		$V_{32}N_8$		
Field			Description				Sup.	Range		Jnit	Default	
CountVal			measured value				M	full	.'	, 	cs	
ValInt	Field		¹⁾ Encoding of unit and resolution				М	00h to 07h				
			of the measured	value				08h to 0Fh				
								80h to 81h				
								88h to 89h				
Statu	-								t	oitset		
	utOfService		Value is not available / void			М	true/false			true		
- O\	erridden/					NA	false			false		
Fault			measurement failure, corrupted			М	true/false			false		
	A 1		value					6-1			6-1	
	Alarm						NA	false			false	
– Ala	armUnAck						NA	unack			unack	
Comr	nand		standard Comma	and fiel	d				E	enum		
– all	commands		not supported, D	atapoir	nt shall b	эе	NA					
			read only									
Comi	munication:											
	Address:		IO Type(ID):	1104	(M_ELE	ECM		operty ID:	84			
(in t	he server)		Start-Index:	1			N'	of elements	1			
Pro	perty access:		Read only	\boxtimes		Re	ad/Write					
Pro	tection		Read level		-		W	rite level				
	ption Handling		Value after Powe		Stored					t Value	: 🖂	
Data	Data shall be stored in volatile memory and shall be void after power up of the Data Collector.											
	ial Features:											
			egram are marke	d in fiel	ld 'status	s' wi	ith 'perm	anent error' the	en the	Status	flag	
'Fault	' shall be set to	'true	e'.									

5.6.6.9 Diagnostic data HistoryEnergyConsumptionTariff1

FB: M_ELECM F	Property Name (<u>Server</u>): HistoryEnerg	yConsumptionTariff1	Mandatory ☐ Optional ⊠					
Description:			optional 🖂					
Array of energy cons device and shall be s received M-Bus mess storage numbers, tim Property Value array The array of history in	umption Tarif 1 information for history valustored by the Data Collector. Each History sage shall be associated with a storage notes stamps and historic values belonging to index. See clause 4.8. Information shall be read-only and shall be	EnergyConsumptionTariff1 umber. In the M_ELECM Ir ogether shall be associated accessible by polling.	value in the nterface Object with the same					
	Γ_MeteringValue DPT ID 229.001	Datatype format	$V_{32}N_8Z_8[n]$					
Field	Description		Unit Default					
CountVal ValInfField	measured value The process of the measured value	IVI JIUII) cs					
Status - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck	Value is not available / void measurement failure, corrupted value	M true/false NA false	true false false false unack					
Command - all commands	standard Command field not supported, Datapoint shall be rea only		enum					
Communication:			_					
DP Address: (in the server)	IO Type(ID): 1104 (M_ELECM) Start-Index: 1		r variable length					
Property access:	,	d/Write						
Protection	Read level	Write level	- <u> </u>					
Exception Handling			ult Value 🛚					
	in volatile memory and shall be void after	power up of the Data Colle	ector.					
Special Features: f data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be eft unchanged.								

5.6.6.10 Diagnostic data HistoryEnergyConsumptionTariff16

FB: M_ELECM P	Property Name (<u>Server</u>): HistoryEnergyCo	onsumpt	ionTariff16	Mandatory ☐ Optional ⊠	
Description:	·			- Optional 🖂	
Array of energy consudevice and shall be streceived M-Bus mess storage numbers, time Property Value array in the array of history in	umption Tariff 16 information for history value to red by the Data Collector. Each HistoryEnergy sage shall be associated with a storage number stamps and historic values belonging toget index. See clause 4.8. Information shall be read-only and shall be actoring Value DPT ID	ergyCons ber. In the ther shall cessible	umptionTariff e M_ELECM I be associated	16 value in the nterface Object	
Field	Description	Sup.		Unit Default	
CountVal ValInfField	measured value 1) Encoding of unit and resolution of the measured value	M M		The Boldan	
Status OutOfService Overridden Fault InAlarm AlarmUnAck	Value is not available / void measurement failure, corrupted value	M NA M NA NA	{	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)	Start-Index: 1 N°	operty ID	≥ 8	or variable length	
Property access:	Read only 🖂 Read/W				
Protection	Read level	Write I			
Exception Handling:		Act Val		ult Value 🗵	
	n volatile memory and shall be void after pov	ver up of	the Data Coll	ector.	
Special Features: If data in the metering left unchanged.	g telegram are marked in field 'status' with 'po	ermanent	error' then th	e history shall be	

5.6.6.11 Diagnostic data HistoryEnergyProductionTariff1

FB:	M_ELECM	Prop	perty Name (<u>Server</u>): HistoryEnergyProductionTariff1								Mandatory ☐ Optional ⊠	
Dosc	ription:	<u>.</u>		-						į Ok	nionai 🖂	
		sumr	tion Tarif 1 infor	mation fo	r history valu	ies t	that are	receiv	ed from	the M-F	Rus	
			d by the Data Co									
			shall be associa									
			amps and histori									
			ex. See clause 4.		0 0	Ū						
The a	rray of history	infor	mation shall be re	ead-only	and shall be	acc	essible	by pol	ing.			
DPT: Name DPT_MeteringValue DPT ID 229.001 Datatype format V ₃₂ N ₈ Z ₈ [n]												
Field			Description				Sup.	Rang	е	Unit	Default	
Count	tVal		measured value				M	full		1)	CS	
ValInf	Field		1)Encoding of un	it and res	solution of the	е	М	00h t	o 07h			
			measured value					08h t	o 0Fh			
									o 81h			
								88h t	o 89h			
Status										bitset		
 OutOfService 			Value is not ava	ilable / vo	oid		M	true/f	alse		true	
Overridden					NA	false			false			
– Fa	ult		measurement fa	:	M	true/f	alse		false			
– In <i>i</i>	Alarm				NA	false			false			
– Ala	armUnAck						NA	unacl	<		unack	
Comn	nand		standard Comm	and field				 -		enum		
	ommands		not supported, D		shall he read	ч	NA			Ciluiii		
an c	Jiiiiaias		only	αιαροπι	Shall be read	٦	14/3					
			Only									
Comr	nunication:	<u>\</u>						<u>L</u>				
DP	Address:		IO Type(ID):	1104 (N	1_ELECM)	Pro	perty ID):	131			
(in t	he server)		Start-Index:	1		ΝI°	of eleme	onto	≥ 8			
			Start-index.					31115	fixed	or variab	le length	
	perty access:	:	Read only	\boxtimes	Read	rW\t						
Prof	tection		Read level				Write	level				
	Exception Handling: Value after Powerup: Stored Value 🗌 Act Value 🔲 Default Value 🔯											
Data:	shall be stored	d in vo	olatile memory ar	nd shall b	e void after p	pow	er up of	the Da	ata Coll	lector.		
	ial Features:											
		ng tel	egram are marke	ed in field	l 'status' with	ı 'pe	rmanent	t error'	then th	ne history	/ shall be	
left ur	nchanged.											

5.6.6.12 Diagnostic data HistoryEnergyProductionTariff16

FB: M_ELECM Pro	perty Name (<u>Server</u>): HistoryEnergyProductionTariff16						Mandatory ☐ Optional ⊠		
Description:		-					<u> </u>		
Array of energy consumption device and shall be store received M-Bus message storage numbers, time so Property Value array ind The array of history infor	ed by the Data Co e shall be associa tamps and historio ex. See clause 4.8	llector. E ted with values 8.	ach HistoryEne a storage numb belonging toget	rgyProdu er. In the her shall	uctionTa e M_EL be ass	ariff16 .ECM .ociate	value in Interface	the Object	
		DPT ID	229.001		atype fo	_	V ₃₂ N ₈ Z	₈ [n]	
Field	Description			Sup.	Range		Unit	Default	
CountVal	measured value			М	full		1)	CS	
ValInfField	¹⁾ Encoding of uni measured value	t and res	solution of the	М	00h to 08h to 80h to 88h to	0Fh 81h			
Status - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck	Value is not avail measurement fai	M NA M NA NA	true/fa false true/fa false unack	ılse	bitset	true false false false unack			
Command - all commands	standard Comma not supported, Da only		shall be read	NA			enum		
Communication:					-				
DP Address: (in the server)	IO Type(ID): Start-Index:	1	_ ′	operty ID of eleme	ente	146 ≥ 8 fixed	or variabl	e length	
Property access:	operty access: Read only 🛛 Read/Writ								
Protection Read level Write level									
Exception Handling:									
Data shall be stored in ve	olatile memory an	d shall b	e void after pow	er up of	the Da	ta Col	lector.		
Special Features: f data in the metering telegram are marked in field 'status' with 'permanent error' then the history shall be eft unchanged.									

5.6.6.13 Output / diagnostic data CurrentActivePowerConsumption

FB:	M_ELECM	Prop	erty Name (<u>Server</u>):	rver): CurrentActivePowerConsumption						Mandatory ☐ Optional ⊠	
Desc	ription:	-		<u>-</u>					•		
Curre	nt measured p	ower	in W units. This value	is receive	ed	from the N	M-Bu	s electricity n	neter and	d stored by	
the D	ata Collector.	The m	easured value is read	d-only and	sh	nall be acc	cessik	ole by polling		-	
NOTE	17 The Property	y implen	nentation does not allow fo	r an alternat	ive	DPT.					
DPT:	Name [DPT_N	1eteringValue	DPT ID	2	29.001	Data	atype format	V ₃₂ N ₈ Z	7 -8	
Field			Description			Sup.		Range	Unit	Default	
Coun	tVal		measured value			M		full	1)	cs	
ValInf	Field		1)Encoding of unit and	d resolutio	n	М		28h to 2Fh			
			of the measured valu	е				30h to 37h			
								A8h to A9h			
								B0h to B1h			
Status									bitset		
– Οι	utOfService		Value is not available	e / void		M		true/false		true	
- O\	erridden/					NA		false		false	
- Fault			measurement failure,	corrupted	t	M		true/false		false	
			value								
– In	Alarm					NA		false		false	
– Ala	armUnAck					NA		unack		unack	
Comr	nand		standard Command f						enum		
– all	commands		not supported, Datap	oint shall		NA					
			be read only								
	munication:		_								
	ddress:		IO Type(ID):	1104 (M_	EL			rty ID:	147		
•	the server)		Start-Index:	1				elements	1		
	perty access:		Read only		F	Read/Write					
	tection		Read level				/rite le				
	ption Handlin		Value after Powerup:				ct Va		fault Val	ue 🛛	
Data	Data shall be stored in volatile memory and shall be void after power up of the Data Collector.										
_	ial Features:										
			gram are marked in f	field 'statu	s' \	with 'perm	nanen	it error' then	the Stati	ıs flag	
rault	' shall be set to	o true	•								

Group Object (Standard Mode):

FB Name: M ELECM	DP	Name:	Curre	ntActivePo	werConsump	tion	Abbr.:			Manda	tory		
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, F32, 14.056). Datapoint Type DPT_Name: DPT_Power DPT_Format: F16	FΒ	Name:	M_EL	ECM			•	•					
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, F₃₂, 14.056). Datapoint Type DPT Name: DPT_Power DPT Format: F₁6	Des	scription											
DPT_Name: DPT_Power DPT Format: F ₁₈ DPT_ID: 9.024 Field Description Supp. Range Unit Default Value encoded as 16 bit float. full kW 7FFFh Access Type ◆ Output this → M Image: This is a color of the color	sto is s	red by the [ent spontar	Data (neous	Collector. T sly in case	the metering voor of change of v	alue sha alue.	ll be read	d-only a	and shall	be accessil	ble by po	olling	or it
DPT Format: F18	Dat	tapoint Typ	ре										
Field Description Value encoded as 16 bit float. Supp. Range Unit Default	DP	T_Name:	DP1	Γ_Power									
Value encoded as 16 bit float. full kW 7FFFh Access Type ◆ Output this → M									DPT_ID:				
Access Type Output this → M □ this → 1 □ Spontaneous □ COV: ¹¹) □ Δ-Value: cs ¹¹) Min repetition period: 5 min Request □ Period: Request □ Period: Communication Type ● Group Object Datapoint Mandatory: □ Default Group Address: □ □ Default value: □ □ Power down: Save: □ □ Power down: Save: □ □ Power up: Value: No initialisation: □ Default value: □ □ Saved value: □ Actual value (not for input): □ □ Transmit on bus (only for output): □ Read from bus (only for input): □ □ Exception Handling Void values or faulty values shall be indicated with default value 7FFFh. Special Features 1) 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	Fie	<u>ld</u>							Supp.				
this → M			Valu	ue encoded	d as 16 bit floa	at.				full	kW	7FF	Fh
this → M													
Spontaneous	_		164			_							
Request Communication Type ◆ Group Object Datapoint	I –			⊠ cov	: 1)		: cs 1)	Mi	n repetitio	on period:	5 min		
Group Object Datapoint		Degrieet			C	Period:							
Default Group Address: Default Group Address: Default Group Address: Default Group Address: Default Group Address: Default Group Address: Default Group Address: Default Group Address: Default Group Address: Default Value:		on Ty	1										
Default Group Address: Dynamics Power down: Save: Default value: Default value: Saved value: Actual value (not for input): Read from bus (only for input): Read from bus (only for input): Default value (not for input): Image: Transmit on bus (only for output): Read from bus (only for input): Default value (not for input): Image: Transmit on bus (only for output): Image: Read from bus (only for input): Image: Transmit on bus (only for output): Image: Transmit on bus (only for input): Image: Transmit on bus (only for in										Mandatory	/: X		
Power down: Save: Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with default value 7FFh. Special Features 1) 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													
Power up: Value: No initialisation: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with default value 7FFh. Special Features 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	Dyı	namics		·									
Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with default value 7FFFh. Special Features 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		Power dow											
Transmit on bus (only for output): Read from bus (only for input): Exception Handling Void values or faulty values shall be indicated with default value 7FFFh. Special Features 1) 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		Power up:	\	/alue:									
 Exception Handling Void values or faulty values shall be indicated with default value 7FFFh. Special Features 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 			_			_							_
Void values or faulty values shall be indicated with default value 7FFh. Special Features 1) 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					n bus (only for	output):		Read	from bus	(only for in	put):		
1) 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					all be indicate	d with d	efoult volu	10 7FF	·Fb				
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				values si	all be indicate	a with at	elault valt	ue / F F	·F(1).				
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				system ele	ectricity meter	data are	transmit	ted ne	riodically	typically 2	times to	6 time	<u> </u>
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													
The definition of a meaningful Δ-Value depends on the type of the connected electricity meter													
											-		
				a meaning	ful Δ-Value de	epends o	n the type	e of the	e connect	ted electrici	ty meter		

5.6.6.14 Output / diagnostic data CurrentActivePowerProduction

FB:	M_ELECM	Prop	erty Name (<u>Server</u>):	Curre	CurrentActivePowerProduction					Mandatory ☐ Optional ☒	
Desc	ription:	-							<u> </u>		
Curre	nt measured p	ower	in W units. This value	is receive	ed	from the N	M-Bu	s electricity n	neter and	stored by	
the D	ata Collector.	The m	easured value is read	d-only and	st	nall be acc	cessib	ole by polling			
NOTE	19 The Property	y implen	nentation does not allow fo	r an alternat	ive	DPT.					
DPT:	Name [1eteringValue	DPT ID	2	229.001		atype format	$V_{32}N_8Z_8$		
Field			Description			Sup.		Range	Unit	Default	
Coun	tVal		measured value			M		full	1)	cs	
ValInt	Field		1)Encoding of unit and	d resolution	n	М		28h to 2Fh			
			of the measured valu	е				30h to 37h			
								A8h to A9h			
								B0h to B1h			
Statu	S								bitset		
Οι	utOfService		Value is not available	e / void		M		true/false		true	
- O\	/erridden					NA		false		false	
Fault			measurement failure,	corrupted	t	M		true/false		false	
			value								
– In	Alarm					NA		false		false	
– Ala	armUnAck					NA		unack		unack	
									ļ		
Comr	nand		standard Command f						enum		
– all	commands		not supported, Datap	oint shall		NA					
			be read only								
	munication:		_								
	ddress:		IO Type(ID):	1104 (M_	EL			rty ID:	148		
•	the server)		Start-Index:	1				elements	1		
	perty access:	•	Read only		F	Read/Write					
	tection		Read level				/rite I				
	ption Handlin		Value after Powerup:				ct Va		fault Value	e 🛛	
		d in vo	latile memory and sha	all be void	af	ter power	up o	f the Data Co	llector.		
	ial Features:										
			gram are marked in t	field 'statu	s' '	with 'perm	naner	it error' then	the Status	flag	
rault	' shall be set t	o true									

Group Object (Standard Mode):

DP	Name:	CurrentActivePo	werProduction	Abbr.:			Manda	tory		
FΒ	Name:	M ELECM		<u>'</u>				internal		
De	scription						·			
sto is s	red by the E sent spontar	Data Collector. Theously in case	V units. This value The metering valu of change of valu able, Standard Mode	e shall be read e.	l-only	and shall	be accessi	ble by po	olling	or it
Da	tapoint Typ	ре								
DP	T_Name:	DPT_Power								
	T Format:	F ₁₆				DPT_ID:				
Fie	eld	Description				Supp.	Range	Unit	Defa	
A -	T	Value encode	d as 16 bit float.				full	kW	7FF	Fh
	cess Type									
•	$\frac{\text{Output}}{\text{this} \to M}$		this \rightarrow 1							
	Spontaneou			Value: cs 1)	ΙΔi	n renetitio	on period:	5 min		
	oponianeoi	Cycl		riod:	IVII	ii repetitio	on penou.	J 111111		
	Request			illou.						
Co	mmunicati									
♦	Group Obj	ect Datapoint					Mandatory	<i>/</i> : 🛛		
		oup Address:								
Dy	namics									
	Power dow					., .				
	Power up:	Value:	No initialisation			ılt value:	- 4. (! 4)			
		Transmit	Saved value: n bus (only for ou	tout):			ot for input) (only for in			_
Fv	ception Ha		Tous (offig for ou	ιρuι). <u></u>	Reau	HOIH bus	(Offig for iff	put).		
			all be indicated w	ith default valu	ıe 7FF	Fh				
	ecial Featu		ian be indicated vi	Titil deladit vale	10 711	1 11.				
1)	Therefore to data is prov M-Bus mes	he definition of a vided to the KNX sage will trigger on of a meaning	ectricity meter dat an adequate COV (system and that an update of the ful Δ-Value depe	' is sufficient to the KNX busic Group Object.	guara ad is	antee that not too hi	the most c gh. Normal	urrent M ly recept	-Bus ion of	

5.6.6.15 Diagnostic data CurrentTariff

FB:	M_ELECM Property Name (<u>Server</u>):				Curre	ntTa	riff		Mandatory			
		-							Or	otional 🖂		
Desc	ription:	<u> </u>							<u> </u>		<u> </u>	
		iotoryo	luo	that is received	fron	the M D		ovice on	d aball	he stored by	the Det	
				that is received						be stored by	the Dat	a
Collec	ctor. The va	alue sha	all b	e read-only and	sha	II be acce	essib	le by po	lling.			
DPT:	Name	DPT_	Tari	ff		DPT ID	5.0	006	Dataty	pe format	U ₈	
Field			D	escription				Sup.	Range)	Unit	Default
Tariff			Ta	Tariff register value				М	full		none	CS
Communication:								-	-		_	
DP A	Address:			IO Type(ID):	110	4 (M_EL	ECM	1) Pi	roperty	ID: 1	49	
(in t	he server))		Start-Index: 1 N° of				° of eler	ments 1			
Pro	perty acce	ss:		Read only	\boxtimes		Re	ead/Write) [
Prof	ection			Read level				W	rite leve	el	-	
Exception Handling:			V	alue after Power	rup:	Stored	Val	ue 🔲 A	ct Value	e 🔲 Defa	ult Value	· 🛛
Data:	shall be sto	red in v	/ola	itile memory and	l sha	all be voice	l afte	er power	up of th	ne Data Colle	ector.	
Speci	al Feature	s:										
If data	in the me	tering to	eleg	gram are marked	l in f	ield 'statu	ıs' w	ith 'perm	anent e	error' then th	e Status	flag
'Fault	shall be s	et to [*] tri	ιe'.									

5.6.6.16 Diagnostic data HistoryStorageNumbers

FB:	M_ELECM	Property Name (<u>Server</u>): Histor					gel	Numbers	Mandatory ⊠ Optional □			
Desci	Description:											
Array of accumulated energy consumption information for h												
device and shall be stored by the Data Collector. Each HistoryEnergyConsumptionTariffx values												
	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.									4.8.			
						5.010				*		
Field					DPT ID	Sup.	П	Datatype forr lange			Default	
						Sup.			Unit		0	
0: void							0 to 255		None		U	
			g period 5: other valid storage numbers									
Comr	nunication:	2 10 20.	J. Other valid ste	rage	Hullibers							
	Address:		IO Type(ID):	CNA)	CM) Property ID: 1							
	he server)		io rype(ib).	1104	(M_ELE	Civi)	ivi) Floperty ID.			150 ≥ 8		
(111 t	ile seivei)		Start-Index:	1		N° of elements			fixed or variable			
			Start-index.	I-muex.			IN			ength		
Pro	perty access	S :	Read only			Read/\	Read/Write					
Prot	ection		Read level		Write level -							
Exception Handling: Value after Powerup: Stored \						Value ☐ Act Value ☐ Default Value ☒						
Data s	shall be store	ed in vol	atile memory ar	nd sha	all be void	after po	we	r up of the Da	ta Co	llecto	r.	
	al Features:											
			gram are marke			s' with '¡	peri	manent error'	then t	he		
Storag	geNumbers a	array sh	all be left unchanged.									

5.6.6.17 Diagnostic data HistoryDate

2.0.0			c data History Date								
FB:	M_ELE	CM	M Property Name (<u>Server</u>): History			oryD	ate		Mandatory 🔀		
										Optional	
	cription:										
			ormation for history v								
			ollector. In the receive	ed M-Bus	mes	sage	each Hi	storyDate is	associat	ed with a	
	ige numbe										
			erface Object storage						ues belon	ging together	
			vith the same Propert								
			ne fields may be void								
			late information is rea								
DPT	: Name	e Di	PT_DateTime	DPT	ID	19.0		atatype	8 octet [nJ	
F:-1-1			! 4!					mat	11114	D - f 14	
Field			ription				Sup.	Range	Unit	Default	
Year			information, valid if N	$\mathbf{N}\mathbf{Y} = 0 \text{ and}$	a		M	0 to 255		-,	
N 4 4		Fault		-1:-1 :¢ NID				-4-140		₃₅	
Mont	ın		Month information, va	alid if ND	= u a	na	М	1 to 12		,	
Dove	ofMonth	Fault		lion valid	if NID		М	1 to 31		 -	
Dayo	HIVIOTILIT			ofMonth information, valid if ND = 0				1 10 31			
and Fault				valid if Nd	0\\/ -		0	1 to 7		זי	
DayofWeek Day of We				eek information, valid if NdoW = 0				1 10 7			
				ur, valid if NT = 0 and Fault = 0				0 to 23	 h	₁ ,	
l			'	utes, valid if NT = 0 and Fault = 0				0 to 59	min	₁ / ₁	
				nds, valid if NT = 0 and Fault = 0				0 to 59	s	1	
			t containing status inf								
				e information ok {0} / fault {1}					bool	ok	
				{0} / working day {1}				fault/ok true/false	bool	WD invalid	
	WD			WD field invalid {1} / valid {0}					bool	WD invalid	
– N				ear field invalid {1} / valid {0}				true/false true/false	bool	Year invalid	
				Month & DayofMonth fields invalid				true/false	bool	Date invalid	
ND validity of {1} / valid										Bato invalid	
_ N	doW			DoW field invalid {1} / valid {0}					bool	DoW invalid	
- N			ry of Hour, Minutes, S				M M	true/false true/false	bool	Time invalid	
			d {1} / valid {0}								
- S	UTI		nertime {1} / standard	Itime {0} fl	ag		NA	true/false	bool	Standard	
- C	LQ		quality bit: with {1} / v				NA	with /	bool	without	
		exterr	nal synchronization	•				without			
Com	municati	on:	-					-	-		
DP	Address	:	IO Type(ID):	1104 (M	ELE	CM)	Prop	erty ID:	151		
(in	the serve	er)	Start-Index:	1	_		N° of	elements	≥8		
									fixed or variable length		
Pro	perty ac	cess:	Read only	\boxtimes		Rea	ad/Write				
Exce	ption Ha	ndling	: Value after Pow	erup: St	tored	Valu	ie 🗌 Ad	t Value 🗌	Default	t Value ⊠	
Data	shall be	stored i	in volatile memory an	nd shall be	void	afte	r power ı	up of the Da	ta Collec	tor.	
_	cial Featu										
		n value	shall be 'void' until h	nistoric val	lues	are a	vailable,	all 'valid bit	s' shall be	e set to 'not	
V	valid'.										

5.6.6.18 LTE Zoning Parameter Apartment

FB:	M_ELECM	Pro	perty Name (<u>Serve</u>	Apa	rtmen	t	Manda Option					
Desc	ription:	ë							<u>.</u>			
	LTE zone: Apartment number used for LTE binding and in addition as localization information for the											
meter	metering device.											
DPT:	Name	DPT_L	UcountValue8_Z DPT I			202.0	02	Datatype for	ormat	U_8Z_8		
Field			Description		Sup.	Range	Unit	Default				
Coun	terValue		Apartment number				М	1 to 126	none	1		
Statu	S								bitset			
 OutOfService 			zone active /inactiv	e			0	true/false		false		
- all other flags			not supported, fixed		NA		1					
Command									enum			
- NormalWrite							М					
- SetOSV & ResetOSV			set zone inactive / active				0					
- all	other comma	ands	not supported		NA							
Comi	munication:		-				-	-		_		
DP	Address:		IO Type(ID):	ELECI	M) Property ID: 101							
(in t	he server)		Start-Index:	1			N° of elements 1					
Pro	perty access	S:	Read only Read/Write X									
Pro	tection		Read level Write level									
Exce	ption Handli	ng:	Value after Poweru	Value after Powerup: Stored Value ⊠ Act Value □ Default Value □								
			-									
Spec	ial Features											
M_EL	ECM DPs ar	e not L	TE communicating i	f zone	is 'C	OutOfS	ervice'. I	f Apartment	is 'OutO	fService' also		
the co	orresponding	Room	and Subzone is 'Ou									
Spec M_EL the co												

5.6.6.19 LTE Zoning Parameter Room

FB:	M_ELECM	Prop	perty Name (<u>Server</u>	Roo	m				Mandatory ⊠ ¹⁾ Optional □			
Desc	ription:				-				<u>_</u>	•		
	LTE zone: Room number. parameter used for LTE binding and in addition as localization information for										ormation for	
the m	the metering device.											
DPT:	Name DP	T_Uc	ountValue8_Z	DPT	ID	202.0	02	Data	atype format	U_8Z_8		
Field			Description				Sup. R		Range	Unit	Default	
Coun	terValue		Room number					1	1 to 63	none	1	
Statu	S									bitset		
Οι	utOfService		zone active /inactiv	е			C) 1	true/false		false	
– all	other flags		not supported, fixed to '0'					Α				
Command										enum		
NormalWrite								1				
– Se	tOSV & Reset	OSV	set zone inactive / active				C)				
– all	other comman	ıds	not supported					Α				
Comi	nunication:									u.	•	
DP	Address:		IO Type(ID): 1104 (M ELECN					M) Property ID: 102				
(in t	he server)		Start-Index: 1					N° of elements 1				
Pro	perty access:		Read only Read/Write X									
Pro	tection		Read level Write level									
Exce	ption Handling	g:	Value after Powerup: Stored Value ⊠ Act Value □ Default Value □									
Spec	ial Features:											
M_EL	ECM DPs are	not L	TE communicating if	zone	is 'C	outOfS	ervic	e'. If	Apartment i	is 'OutOf	Service' also	
			and Subzone is 'Out lementations only.	OfSe	rvice'	(com	mon	flag).				

5.6.6.20 LTE Zoning Parameter Subzone

FB:	M_ELECM	Prop	erty Name (<u>Server</u>): Subz	one				Mandat Optiona	
	ription:	_		<u>-</u>			_			
			er within the Apartn		om used	for L	TE bind	ling an	d in addition	on as
localiz		tion for	the metering devic							
DPT:	Name [OPT_U	countValue8_Z	DPT ID	202.002	2 D	atatype	forma	t U_8Z_8	
Field			Description			Sup.	. Ran	ge	Unit	Default
Coun	terValue		Subzone number			М	1 to	15	none	1
Status	S								bitset	
- Oı	utOfService		zone active /inact	ive		Ο	true/	false		false
- all	other flags		not supported, fix	ed to '0'		NA				
Comr									enum	
- No	rmalWrite					M				
- Se	tOSV & Rese	tOSV	set zone inactive	/ active		0				
- all	other comma	nds	not supported			NA				
Comr	nunication:		•						•	
DP .	Address:		IO Type(ID):	1104	(M_ELE	CM)	Prope	erty ID:	103	
(in t	he server)		Start-Index:	1			N° of	elemer	nts 1	
Pro	perty access:		Read only		Read/\	Vrite		◁		
Pro	tection		Read level			Write	e level			
Exce	ption Handlin	ıg: ∖	/alue after Powerup	o: Store	d Value [∑ Ac	ct Value	e 🗌	Default Va	alue 🗌
Spec	ial Features:									
			E communicating if			rvice'.	. If Apa	rtment	is 'OutOfS	Service' also
			e is 'OutOfService'	(common	flag).					
¹⁾ Ma	andatory in LT	E imple	ementations only							

5.6.6.21 Diagnostic data RxSequenceCounter

FB:	M_ELECM	Pro	pperty Name (<u>Server</u>):	RxSe	quenc	eCount	er			ndatory 🔀 Optional 🥅
Desci	ription:									prioriai
This E and si device Collect During out da counte	Datapoint shall on the control of th	nted shal tering onsigner	ins the sequence coun each time an M-Bus m Il be used for consisten g data from the Data C stent. Therefore the clie ead out. If the sequence e client	essage is cy checki ollector a ent readir	receiving if mew Mangoon on the mew Mangoon of the mew Mangoon on the meg end of the meg end on the meg end on the meg end of the meg end of the meg end on the meg end of	ved from netering 1-Bus fra netering	the corr data is r ame cou data sh	etrieve	nding M-E ed from t received eck the s	Bus he Data and read equence
DPT:	Name DF	<u>۲_۲</u> ۲	/alue_1_Ucount [OPT ID	5.010	Da	tatype fo	ormat	U ₈ [n]	
Field			Description			Sup.	Range	!	Unit	Default
							0 to 25	55		0
Comr	nunication:	-							-	
DP A	Address:		IO Type(ID):	1104 ((M_ELI	ECM)	Propert	y ID:	110	
(in t	he server)		Start-Index:	1			N° of el	emen	ts 1	
Pro	perty access:		Read only		Read/	Write				
Prot	ection		Read level			Write	e level			
Exce	otion Handling:		Value after Powerup:	Stored \	/alue [Act \	/alue 🗌	De	fault Valu	ıe 🛛
Free r	unning counter	with	overflow 255 \rightarrow 0.						•	•
Speci	al Features:									
None.									•	
			· · · · · · · · · · · · · · · · · · ·							

5.6.6.22 Diagnostic data RxReceptionTime

FB: M_ELEC	/ Pro	perty Name (<u>Ser</u>	ver):	RxF	Recept	ionTim	е		Mandatory 🖂	
Decembelon									Optional	
Description:		aally by tha Data (Calla atau		h time	on M D		io roo	a is a al	
		cally by the Data C								
DPT: Name		T_DateTime	DPT	טו	19.00		atatype form		8 octet	
	Description					Sup.	Range	Unit	Default	
		rmation, valid if N				M	0 to 255			
	Date.Mon ault=0	th information, val	id if ND=	=0 ar	nd	M	1 to 12		,	
	Date.Dayond Fault	ofMonth informatio =0	n, valid	if N	0=0	М	1 to 31		1)	
,	Day of We	eek information, va =0	alid if No	loW=	=0	0	1 to 7		(1	
Hour 7	ime.Hou	r, valid if NT=0 and	d Fault=	:0		М	0 to 23	h	1)	
		utes, valid if NT=0				М	0 to 59	min	1)	
Seconds Time.Seconds, valid if NT=0 and Fault=0 M 0 to 59 s 1)										
Attributes E	Bitset con	taining status info								
		e information ok {0		{1}		M	fault/ok	bool	ok	
	ank day	{0} / working day {	1}	•		0	true/false	bool	WD invalid	
–	-	WD field invalid {1		{0}		М	true/false	bool	WD invalid	
	alidity of	Year field invalid {	[1} / valid	d {0}		М	true/false	bool	Year invalid	
- ND V	•	Month & DayofMo		٠.		М	true/false	bool	Date invalid	
		DoW field invalid	{1} / vali	d {0}	i	M	true/false	bool	DoW invalid	
- NT V	alidity of	Hour, Minutes, Se / valid {0}				М	true/false	bool	Time invalid	
		ne {1} / standardti	me {0} f	lag		NA	true/false	bool	Standard	
- CLQ	lock qua	lity bit: with {1} / wi	ithout {0	} ext	ernal	NA	with / without	bool	without	
Communication		Lation					Withiout	-		
DP Address:		IO Type(ID):		110	4 (M F	I FCM	Property	ID.	111	
DP Address:IO Type(ID):1104 (M_ELECM)Property ID:111(in the server)Start-Index:1N° of elements1										
Property acce			\boxtimes	<u> </u>	Read	d/Write			· ·	
Exception Hand		Value after Power	rup: S	tore			t Value 🗌	Defa	ult Value 🏻	
		in volatile memor								
		ed from the corres								
Special Feature						· · ·				
	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

FB:	M_ELECN	/ Pi	operty Name (<u>Se</u>	erver):	Man	ufactı	ırer		N	1andatory 🔯
										Optional
Desc	ription:				-			-		
M-Bu	s specific 1	6 bit ma	anufacturer code t	hat is rec	eived	from t	the M-Bu	s device and	shall be	stored by
the D	ata Collecto	or durin	g installation proc	edure.						
			he manufacturer							
			he Manufacturer I							
Manu	facturer ID	is calcu	lated from the AS	CII code	of ma	anufact	turer ider	ntification (th	ree upper	case letters)
	ı formula de									
			turer, Identificatio		, Vers	sionNu	ımber an	d MeteringD	eviceType	together
			e meter identificat							
			er may have been							ssioning
			is indicated in the					perty Manufa	acturer.	
			only and shall be			polling	l		•	
DPT:	Name	DPT_\	/alue_2_Ucount	DPT	ĪD	7.001		atype format	U ₁₆	
Field			Description				Sup.	Range	Unit	Default
								full range	none	0
Comr	nunication) :	-			·		-	-	-
DP.	Address:		IO Type(ID):		1104	1 (M_E	LECM)	Property ID): 112	<u> </u>
(in t	he server)		Start-Index:		1	. —		N° of eleme	ents 1	
Pro	perty acce	ss:	Read only	\boxtimes		Read	l/Write			
Pro	tection		Read level				Write	level		
Exce	ption Hand	lling:	Value after Pow	erup: S	Stored	l Value	e 🔯 Act	Value 🗌	Default Va	alue 🗌
None										
Spec	ial Feature	s:			•	•				
Manu	facturer 00	00h = v	oid value		·	•			•	•

5.6.6.24 Diagnostic data IdentificationNumber

FB:	M_ELECM	Pro	perty Name (<u>Se</u>	rver)	: Ident	ificatio	nNumb	per			Mandatory ⊠ Optional □
Doco	ription:				<u> </u>						Оршонаі 🗀
		niauc	ourrent identified	ation	numbor	propot	hu man	ufactura	The Dre		tion
			current identifica								
			onNumber, Versio	onivu	mber and	ı wete	ringDev	ice i ype ti	ogetner	ma	rk a worldwide
	e meter identifi			_	ما ل ا منا ام ما	4-		!makallam	d		!!
			may have been or indicated in the								
			ill be additionally	provi	ided by n	neter. I	ine Fac	ncationint	umber (Ont	ains a copy of
	riginal Identifica				r io on 1/1	Due e	anaifia () 4:«:+ DOI) aada	14 ~	hall ha
			e identification nu								
		Bus	meter during inst	allatio	on, then	mappe	a to a 3	2 bit coun	ter vait	ie a	na storea by
	ata Collector.		بمطالمها مامان		ا داداد	!!!					
			nly and shall be a								
DPT:	Name DP		lue_4_Ucount	L	OPT ID	12.00		tatype for		U ₃	
Field			Description				Sup.	Range	Un	it	Default
								full rang	e		FFFFFFFh
	munication:										
	Address:		IO Type(ID):		1104	(M_EL	ECM)	Property		11	3
(in t	the server)		Start-Index:		1			N° of ele	ments	1	
Pro	perty access:		Read only	\boxtimes		Read	/Write				
Pro	tection		Read level				Write	e level			
Exce	ption Handling	j :	Value after Powe	erup:	Stored	d Value	e 🔯 Ac	t Value 🗌] Def	ault	Value
	ial Features:										
			FFFFFh = void v						ber FFF	FFF	FFFh is used
for wi	Idcard address	ing a	nd is never a vali	d par	t of the N	/I-Bus a	address).			
5.6.6	.25 Diagnosti	c da	ta VersionNun	ıber							
FB:	M ELECM	Pro	perty Name (Ser	ver):	Versio	nNum	ber				Mandatory X
											Optional 🗌
Desc	ription:	•			-			•			
		city r	neter that is rece	ived 1	from the	M-Bus	device	during co	mmissi	onin	g.
	tructure is man							0			
			e M-Bus "address	" pre	set by m	anufac	ture. All	the Prope	erties M	lanι	ıfacturer,
l	c	. ;									

FB:	M_ELECM	Pr	operty Name (<u>S</u>	<u>erver</u>):	Vers	ioı	nNumbei	r		Ma	andatory ⊠
											Optional
Desc	ription:	•			_				-		
Versi	on of the ele	ctricity	meter that is red	eived f	rom the	e l	M-Bus de	vice c	during commi	ssioning.	
The s	tructure is m	anufa	cturer specific.								
Every	meter has a	a uniqi	ue M-Bus "addres	ss" pres	set by r	ma	nufacture	e. All t	the Properties	s Manufac	turer,
Identi	ficationNum	ber, V	ersionNumber ar	nd Mete	ringDe	vi	ceType to	ogethe	er mark a woı	rldwide un	ique meter
	fication.										
			rocedure the vers							M-Bus me	ter. The
raw v	alue shall be	store	d by the Data Co	llector a	and sh	all	be acces	ssible	by polling.		
DPT:	Name	DPT_	Value_1_Ucount	DF	PT ID	5	.010	Data	type format	U ₈	
Field			Description				Sup.	F	Range	Unit	Default
								f	ull	None	0
Comi	nunication:		-					_		•	
DP	Address:		IO Type(ID):	110	04 (M_I	ΕL	ECM)	Pro	perty ID:	114	
(in t	he server)		Start-Index:	1				N°	of elements	1	
Pro	perty acces	s:	Read only	\boxtimes			Read/Wr	ite			
Pro	tection		Read level				W	/rite le	evel		
Exce	ption Handl	ing:	Value after Pov	werup:	Store	ed	Value 🗵	Act	Value 📗 🏻 🖺	Default Va	lue 🗌
Spec	ial Features	:									
The s	tructure of th	ne vers	sion number is co	omplete	ly man	ıuf	acturer s	pecific	c. Therefore r	no special	features
can b	e defined.										

5.6.6.26 Diagnostic data MeteringDeviceType

FB:	M_ELEC	/I Pr	operty Name (Serve	r): Met	eringDevice	Туре	Ma	andatory 🛛
								Optional
Desc	ription:							
Meter	ing Device	Type of	the electricity meter	device. Su	pported val	ues inM_ELECM	are:	
C	2h: electric	city mete	er					
2	255: void de	evice typ	е					
			e M-Bus "address" pr					
		nber, Ve	ersionNumber and Me	eteringDevi	ceType tog	ether mark a worl	dwide uni	que meter
	fication.							
			ocedure the Metering				the M-Bu	s meter.
The v	alue shall b	<u>se storec</u>	d by the Data Collecto	or and shal	l be access	ible by polling.		
DPT:	Name	DPT_M	letering_DeviceType	DPT ID	20.114	Datatype format	N ₈	
Field			Description	Sup.	Range		Unit	Default
					{2, 255}		enum.	255
Comr	nunicatior	າ:			-			
DP A	Address:		IO Type(ID):	1104 (M_	ELECM)	Property ID:	115	
(in t	he server))	Start-Index:	1		N° of elements	1	
Pro	perty acce	ss:	Read only		Read/Writ	te 🗌		
Prof	ection		Read level		V	/rite level		
Exce	otion Hand	dling:	Value after Powerup	: Stored	Value 🛛	Act Value 🔲 D	efault Val	ue 🗌
None								
	al Feature							
Devic	e type '255	s' = void	(default value); used	to indicate	that the FB	is not connected	to a mete	er.

5.6.6.27 Diagnostic data FabricationNumber

	g		, _ 0, 2, 10, 0, 10, 11, 1		~						
FB:	M_ELECM	Pro	perty Name (<u>Se</u>	rvei):	Fab	ricationN	Number	Manda Optiona	•	∑ 1) □
Descr	iption:	<u>-</u>				-			-		
Every	meter has a ur	nique d	urrent identificati	ion i	numl	ber pr	eset by n	nanufactur	e. All the P	roperties	
			Number, Version	ıNur	mber	rand I	Meteringl	DeviceTyp	e together	mark a wor	Idwide
	e meter identific										
			nay have been ch								
			ndicated in the m								
			be additionally p	rovi	ded l	by me	ter. The	Fabricatior	nNumber co	ontains a co	py of
	ginal Identificat										
			fabrication numb								
		r durin	g installation, the	en m	парр	ed to	a 32 bit c	counter val	ue and stor	ed by the D)ata
Collec											
			y and shall be ac	ces							
DPT:		T_Val	ue_4_Ucount		DPT		12.001		e format	U ₃₂	
Field	Description			S	up.	Rang		Unit		Default	
						full ra	ange	none	F	FFFFFFFh	1
	nunication:										
	Address:		IO Type(ID):	11	04 (M_EL	ECM)	Property I	D:	116	
(in tl	ne server)		Start-Index:	1				N° of elem	nents	1	
Prop	erty access:		Read only	\boxtimes			Read/W	/rite			
Prot	ection		Read level					Write leve			
Excep	tion Handling	: V	alue after Power	up:	St	ored \	/alue 🔯	Act Value	☐ Defa	ult Value [
None.											
Speci	al Features:										
Fabric	ationNumber F	FFFFF	FFFh = void value	e (o	n M-	Bus th	ne identif	ication nur	nber FFFF	FFFFh is us	sed for
	rd addressing a	and is	never a valid par	t of	the I	M-Bus	address	s).			
1) Co	nditional: mand	datory i	in case of M-Bus	"so	ft ad	dress	ing" in or	der to have	e an unamb	oiguous	
ide	ntification of the	e mete	ring data.								

5.6.6.28 Diagnostic data AccessNumber

	0										
FB:	M_ELECM	Pr	operty Name	(<u>Serve</u>	<u>r</u>):	Acc	essNumb	oer			Mandatory ⊠ Optional ☐
Desc	ription:				•				·		
Conse	ecutive mess	age n	number that is	generat	ed by t	he e	electricity	meter	and that is r	eceived	from the
			be stored by t								is
			he value shall							ng.	
The e	ncoding of the	ne Acc	cessNumber ir	the M-	Bus Me	essa	age is spe	cified	in [03].		
DPT:	Name	DPT	Value_1_Uco	unt	DPT I	D	5.010	Data	atype format	: U	l ₈ [n]
Field			Description				Sup.		Range	Unit	Default
									0 255	None.	0
Comr	nunication:		-			-		-		-	
DP	Address:		IO Type(ID):	1104 (M_I	ELECM)	Prop	perty ID:	11	7
(in t	he server)		Start-Index	:	1			N° c	of elements	1	
Pro	perty acces	s:	Read only	\boxtimes			Read/W	rite			
Prof	tection		Read level				1	Write I	evel		
Exce	otion Handli	ing:	Value after I	Powerup	o: Sto	orec	d Value	Act \	√alue 🗌	Default	Value ⊠
Data i	s stored in v	olatile	memory and	is void a	after po	wei	r up of the	Data	Collector.		
Speci	ial Features	:									
None.											

5.6.6.29 Diagnostic data DeviceStatus

FB:	M_ELECM	Pr	operty Name	e (<u>Server</u>):	Dev	iceS	tatus				Mandatory 🖂 Optional 🗌
Desci	ription:				-						Ориона 🗀
M-Bus	s specific cor	nbine	d Status/Erro	r-code (bits	set) of th	e ele	ctricit	y met	er that is red	ceived fr	om the M-Bus
device	e. ·							-			
			riceStatus in t								
The ra	aw value sha	ll be s	tored by the	Data Collec	ctor and	shall	be a	ccess	ible by pollir	ng.	
DPT:	Name	DPT_	Value_1_Uco	ount D	PT ID	5.01	0	Data	atype format		U ₈
Field			Description				Su	ıp.	Range	Unit	Default
									full	None	0
Comr	nunication:										
DP A	Address:		IO Type(ID): 1104	4 (M_EL	ECN	l) F	roper	ty ID:	118	
(in t	he server)		Start-Index	:: 1			١	√of e	elements	1	
Pro	perty access	s:	Read only	\boxtimes		Rea	ad/Wr	ite			
Prot	ection		Read level				V	Vrite I	evel		
Exce	otion Handli	ng:	Value after	Powerup:	Stored	d Valu	ле 🔲	Act \	√alue 🔲 🔝	Default \	Value ⊠
None.	lone.										
Speci	Special Features:										
If data	in the meter	ring te	legram are m	narked in fie	eld 'Dev	iceSt	atus'	with 'p	permanent e	rror' (bit	t 3) then the
Status	ata in the metering telegram are marked in field 'DeviceStatus' with 'permanent error' (bit 3) then the tus flag 'Fault' of various metering datapoints shall be set to 'true'.										

5.6.6.30 Diagnostic data Operating Time

	0		1 0						
FB:	M_ELECM	Pro	operty Name (<u>Serve</u>	<u>r</u>):	Operating	Time		M	landatory ☐ Optional ⊠
D					<u>-</u>				Optional 🖂
	ription:								
			ulation of the electric					sus device	
The v	alue shall be	stored	d by the Data Collecto	<u>or and</u>	l shall be a	ccessible	by polling.		
DPT:	Name [DPT_I	LongDeltaTimeSec	DPT	ID 13.10	0 Dat	atype format	t V ₃	32
Field			Description			Sup.	Range	Unit	Default
							full 1)	S	0
							≥0		
Comr	nunication:								
DP A	Address:		IO Type(ID):	1104	(M_ELEC	J)	Property ID);	119
(in t	he server)		Start-Index:	1	-		N° of eleme	ents	1
Pro	perty access	:	Read only		Read	d/Write			
Prof	tection		Read level			Write	level		
Exce	otion Handlin	ng:	Value after Powerup	p: S	tored Value	e 🗌 Act	Value	Default Va	alue 🛛
None.									
Speci	ial Features:								
1) en	coding on 32	bit sig	gned integer value wi	th 1 so	econd trans	sport forn	nat resolutior	٦.	
			h. The granularity of t						
			vears. In practice no			•	_		

5.6.6.31 Diagnostic data OnTime

FB:	M ELECM	Pr	operty Name (Serve	r)-	OnT	ime				Ma	andatory 🔲
٠٠.	LLLO	• • •	operty Hame (<u>oerve</u>	<u></u> /-	0						Optional 🖾
Desc	ription:				-						optional 🖂
	•	ity mo	eter power up that is i	roooiy	od fra	m th	0 M D	luo dos	/ioo		
The v			d by the Data Collect			ı be a	acces	sible b	y polling.		
DPT:	Name	DPT_	LongDeltaTimeSec	DPT	ID	13.1	00	Dat	tatype format	V_3	2
Field			Description				Sı	лр.	Range	Unit	Default
									full 1)	s	0
									≥0		
Com	nunication:	•				•				-	-
DP.	Address:		IO Type(ID):	1104	(M_E	ELEC	CM)	Prope	erty ID:	120	
(in t	he server)		Start-Index:	1				N° of	elements	1	
Pro	perty access	S :	Read only			Rea	ad/Wri	te			
Pro	tection		Read level					Write	level		
Exce	otion Handli	ng:	Value after Poweru	p: S	torec	l Valı	ле 🔲	Act V	alue 🔲 De	efault Val	ue 🛛
None											
Spec	ial Features:										
1) en	coding on 32	bit sig	gned integer value wi	ith 1 s	econ	d <u>tra</u> r	nsport	forma	t resolution.		
Di	splay resoluti	on: 1 Ì	h. The granularity of	the int	ernal	resc	lution	may b	e higher.		
Us	ed range: 0 t	o ~68	years. In practice no	binar	y ove	erflow	is thu	us pos	sible.		

5.6.6.32 Diagnostic data CurrentDate

FB:	M_ELEC	CM	Property Na	me (<u>Serve</u>	<u>er</u>): Cu	rrentDat	е			Mandatory 🗵
	_									Optional 🗌
	ription:									
										e (time stamp
			ricity meter fo						mation).	
			ed by the Dat							
DPT:	Name		DPT_DateTi	me	DPT ID	19.001		atype forma		3 octet
Field		Descrip					Sup.	Range	Unit	Default
Year			nformation, va				M	0 to 255		1)
Month	า		onth informat	ion, valid if	ND = 0	and	М	1 to 12		77777
		Fault =							{	
Dayo	fMonth		ayofMonth inf	ormation,	valid if N	D = 0	М	1 to 31		7)
		and Fa								
Dayo	fWeek		Week informa	ation, valid	if NdoW	= 0 and	0	1 to 7		1)
-,-,		Fault =							<u></u>	
Hour			our, valid if N				M	0 to 23	h	<u>')</u>
Minut			linutes, valid i				M	0 to 59	min	')
Seco			econds, valid		and Fault	:=0	M	0 to 59	S	<u> </u> ')
Attrib			ontaining stat							
– Fau			me information		ault {1}		M	fault/ok	bool	ok
– WD			ay {0} / workir				0	true/false	bool	WD invalid
– NW	D		of WD field in				M	true/false	bool	WD invalid
– NY			of Year field i				M	true/false	bool	Year invalid
– ND			of Month & D	ayofMonth	ı fields in	valid {1}	M	true/false	bool	Date invalid
Nida	.\^/	/ valid {		المارمانا (۱۱	ا برمانط (۵	,	N 4	tru vo /foloo	baal	Do\A/ invalid
– Ndo	VV		of DoW field				M	true/false	bool	DoW invalid
– NT		fallolly {1} / va	of Hour, Minu	iles, Secoi	ias lielas	sinvalid	M	true/false	bool	Time invalid
- SU	ГІ		rtime {1} / sta	ndardtime	{0} flag		NA	true/false	bool	Standard
- CLC			uality bit: with			ternal	NA	with /	bool	without
			onizátion	.,	. ,			without		
Comi	nunication	on:						=	•	•
DP	Address		IO Type(I	D):	110)4 (M_EL	ECM)	Property II	D: ´	121
(in t	he serve	r)	Start-Inde	ex:	1	. –		N° of elem	ents 1	1
Pro	perty acc	ess:	Read only	y 🛛		Read/	Write			
Exce	ption Ha	ndling:	Value afte	r Powerup	Store	d Value	Act	Value 🗌	Default	: Value ⊠
None										
	ial Featu									
¹⁾ ini	tialisation	value is	s 'void' until a	valid M-Bu	ıs frame	was rece	eived, al	l 'valid bits'	are set	to 'not valid

5.6.6.33 Diagnostic data ErrorDate

FB: M_EI	LECM	Property Name	e (<u>Server</u>):	Error	Date				Mandatory 🖂 Optional 🗌
Description	n:	<u>!</u>		_			<u> </u>		<u> </u>
		nation for an erro	or occurren	ce in th	e elec	ctricity r	meter that is recei	ved fror	m the M-Bus
device.						,			
This informa	ation is re	elated to datapoi	nt ErrorCo	nsumpt	ion				
The value s	shall be s	tored by the Data	a Collector	and sh	all be	access	sible by polling.		
DPT : Na	ame	DPT_DateTime	DF	PT ID	19.00	1 D	atatype format	8 0	ctets
Field	Desc	ription				Sup.	Range	Unit	Default
Year	Year	information, valid	d if NY = 0	and		M	0 to 255		1)
	Fault	= 0							
Month	Date	.Month information	on, valid if l	ND = 0	and	М	1 to 12]	1)
	Fault	= 0							
DayofMontl	n Date	.DayofMonth info	rmation, va	alid if		М	1 to 31]	1,
	ND =	0 and Fault = 0]'	
DayofWeek	Day	of Week informat	tion, valid if	f NdoW	′ = 0	0	1 to 7]	1)
	and F	ault = 0]'	
Hour	Time	.Hour, valid if NT	= 0 and F	ault = 0)	M	0 to 23	h	1)
Minutes	Time	.Minutes, valid if	NT = 0 and	d Fault	= 0	М	0 to 59	min	1)
Seconds	Time	.Seconds, valid i	f NT = 0 ar	nd Faul	t = 0	M	0 to 59	s	1)
Attributes	Bitse	t containing statu	us info					1	
- Fault	Date	Time information	n ok {0} / fa	ult {1}		M	fault/ok	bool	ok
- WD	bank	day {0} / working	g day {1}			0	true/false	bool	WD invalid
- NWD	validi	ty of WD field in	/alid {1} / v	alid {0}		M	true/false	bool	WD invalid
- NY	validi	ty of Year field in	nvalid {1} / '	valid {0	}	M	true/false	bool	Year invalid
- ND	validi	ty of Month & Da	ayofMonth t	fields	-	M	true/false	bool	Date invalid
	invali	d {1} / valid {0}	-						
- NdoW	validi	ty of DoW field in	nvalid {1} /	valid {0)}	M	true/false	bool	DoW invalid
- NT	validi	ty of Hour, Minut	tes, Second	ds field	s	M	true/false	bool	Time invalid
	invali	d {1} / valid {0}							
- SUTI	sumr	nertime {1} / star	ndardtime {	0) flag		NA	true/false	bool	standard
- CLQ		quality bit: with		ıt {0}		NA	with / without	bool	without
	exter	nal synchronizat	ion						
Communic	ation:								
DP Addre	ess:	IO Type(ID):	1104	(M_EI	LECM)	Property ID:	126	
(in the se	rver)	Start-Index		1			N° of elements	1	
Property	access:	Read only	\boxtimes		Rea	ad/Write	e 🗌		
Exception	Handling	g: Value after	Powerup:	Stor	ed Va	lue 🗌	Act Value	efault \	/alue ⊠
Data shall b	e stored	in volatile memo	ory and sha	all be vo	oid aft	er powe	er up of the Data (Collecto	r.
Special Fe									
							rmanent error' the		
accepted by	y the Dat	a Collector. This	is the last	reliable	and v	valid co	onsumption date fr	om the	metering
device.									
1) Initialisa	tion valu	e is 'void' until a	valid M-Bu	s frame	was	receive	ed, all 'valid bits' a	re set to	o 'not valid

5.6.6.34 Diagnostic data Averaging Duration

FB:	M_ELECM	Pr	rop	erty Name (<u>Se</u>	rver	<u>)</u> :	Ave	ragingD	uratior	1	Man	datory 🔲
											0	otional 🔯
Desci	ription:	-				-						
				min/max value (
value	is received fi	rom th	e M	1-Bus device ar	าd sl	hall be s	store	ed by the	Data (Collector and	shall be a	ccessible
by pol	ling.											
DPT:	Name	DPT_	Lor	ngDeltaTimeSe	С	DPT II	D	13.100	Dat	atype format	V ₃₂	
Field			De	escription					Sup.	Range	Unit	Default
										full 1)	S	0
										≥0		
Comr	nunication:											
DP A	Address:		I	IO Type(ID):	1	104 (M	_EL	ECM)	Prope	rty ID:	129	
(in t	he server)			Start-Index:	1				N° of	elements	1	
Pro	perty access	s:	F	Read only	\boxtimes			Read/W	rite			
Prot	ection		F	Read level	-				Write	level		
Excep	otion Handli	ng:	Va	alue after Powe	rup:	Stor	ed \	/alue 🗌	Act Va	alue 🔲 De	fault Value	e 🛛
None.												
Speci	al Features:											
¹⁾ En	coding on 32	2 bit si	gne	ed integer value	with	n 1 seco	ond	transpor	t forma	t resolution.		
Dis	splay resoluti	ion: 1h	ո Th	ne granularity of	f the	interna	al re	solution i	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	P	Prop	erty Name (S	Serve	<u>er</u>):	MBusRawDa	ıta		Mandatory ⊠		
											Optional 🗌	
Desci	ription:	-							-			
Raw	data of recei	ved M	/I-Bu	ıs telegram st	arting	g from	CI field. Data	shall b	e stored	by the D	Data Collector as	
a Prop	perty array, t	the su	uppo	rted Property	leng	jth sha	II be ≥ 128 ele	ements	. For furt	her deta	ils see 4.6	
"Mapp	ing of M-Bu	s raw	/ dat	a".								
DPT:	Name	DPT	_Va	lue_1_Ucoun	ıt	DP.	T ID 5.010	D	atatype f	ormat	U ₈ [n]	
Field		Desc	cript	ion	S	up.	Range		Unit		Default	
							full		None.	ar	ray length= 0	
Comr	nunication:									-		
DP A	Address:			IO Type(ID):		1104	(M_ELECM)	Prop	erty ID:	1;	30	
(in t	he server)			Start-Index:		1		Nº o	f elemen	te V	ariable,	
				Start-Index.		ı		IN O	i elemen	rs m	ax length ≥128	
Pro	perty acces	s:		Read only			Read/V	Vrite				
Prot	ection			Read level				Write	e level		-	
Exce	otion Handl	ing:	V	alue after Pov	weru	p: S	tored Value 🗌] Act	Value 🗌	Defa	ult Value 🛚	
Pleas	e refer to cla	iuse 4	4.6 "	Mapping of M	1-Bus	raw d	ata".					
Speci	al Features	:										
The P	roperty shal	I have	e a v	/ariable lengtl	n acc	ording	to the last rec	ceived	M-Bus n	nessage	. The effective	
length	can be che	cked	by t	he client via A	A Pro	pertvl	Description Re	ead-se	ervice.	_		

5.6.6.37 History Query

FB:	M_ELECM	Prop	erty Name (<u>S</u>	erver):	History Query	′			Mandatory Detional]
Dagg	ription:	<u>_</u>							Optional 🗠	<u> </u>
										_
Funct	ion Property	to query	the contents of	of metering	Properties acc	ording 4.	10.			
DPT:	Name	None.		DP	T ID n/a	Dataty	pe for	mat	n/a	
Field		Descrip	tion	Sup.	Range	Uni	it		Default	
See s	pecification i	n 4.10.								
Comr	nunication:									
DP A	Address:				1104					
(in t	he server)		IO Type(ID):		(M_ELEC	Property	ID:	1	52	
					M)					
			Start-Index:	1		N° of ele	ments	1		
Data	a Property a	ccess:	Read only		Read/W	rite				
Fun	ction Prope	rty:	Client:			Server:			\leq	
Prot	ection		Read level			Write lev	el	_		
Exce	otion Handli	ng: ∖	alue after Pov	verup: S	tored Value 🗌	Act Valu	e 🗌	Defa	ult Value 🗌	
None.			·	<u>'</u>	·				·	
Speci	al Features									
None.					•	•	•	•	•	

5.6.6.38 Parameter UserText

FB:	M_ELECM	Pro	perty Name (<u>Server</u>):	U	serTex	(t			Ma	indatory 🔲	
			,						(Optional 🖂	
Desci	ription:	L					<u> </u>			- Pare 11 6.1	
Additional text information to the metering device, which can be entered on the Data Collector by the installer during commissioning. See clause 2.											
DPT:	Name	DPT	VarString_8859_1		DPT I	D	24.001	Datatype	e format	A[n]	
Field		Descr	iption		Sup.	Ran	ige		Unit	Default	
User	Text	Null t	erminated string.		M	see	datatype "d	char set"	'00h'		
Comr	nunication:										
DP A	Address:		IO Type(ID): 1104	- (N	1_ELEC	CM)	Property I	D:	160		
(in t	he server)		Start-Index: 1				N° of elen	nents	1		
Pro	perty access	:	Read only		Re	ad/V	Vrite 🛛	\overline{A}			
Exce	otion Handli	ng: \	/alue after Powerup:	Sto	red Valı	ue 🗵	Act Value	De	fault Val	ue 🗌	
None.	None.										
Speci	al Features:										
None.						•					

5.6.6.39 Parameter MeterReplacement

FB:	M_ELECM	Pro	perty Name (<u>Serve</u>	<u>r</u>):	MeterRepl	aceme	nt			ndatory 🛚
Desc	ription:	-			•					
Mana specification of the case unit/residence of the case the new Versidence well as a ln case because Each corress adapt	gement of meta fication. The Da cement of a me esolution of the se of meter repl ewly connected onNumber, Meta se of meter repl use data interpratime a metering sponding Interfaction by ETS the	ata Contention to the content of the	device directory in the ollector shall however go device by another dering data). See also dent the corresponding device and M-Bust DeviceType, Fabrication and have changed in the property of the Property of the Data Coefface of the Data Coefface	r provid levice (v clause 2 ng M_EL identificationNum sary to r d due to roperty of meterications	e appropriat with different 2. ECM Interfacers (Manufanber etc) of the different damed and standard e reset manufatter en and standard e reset manufatter etc.	e procee de identificace Objecturer, the original the link ta unit/ cement Group ually by	edures ication ect wil Identifi jinal mo for S-N resolut shall b Object	to man number I norma cation eter are Mode ol ion. Se be set a s shall staller/s	age and e.g ally contain Number, e overwrith bjects by ee also cla automatica be 'void'. service te	detect the indifferent in data of ten as ETS data ause 4.3. ally in the After link chnician
DPT:	Name	DPT	Bool		DPT ID	1.002			format	B ₁
Field			Description			Sup.	Range		Unit	Default
		<u> </u>					true/fa	alse	bool	false
	nunication:		T							
	Address:		IO Type(ID):	,	M_ELECM)		perty II		161	
	he server)		Start-Index:	1	D 104		of elem	ents	1	
	perty access:		Read only		Read/W					
	otion Handling	J:	Value after Powerup	: Stor	ed Value 🖂	Act V	alue L] De	fault Valu	e 🔲
None.										
	ial Features:									
None.	•									

5.6.6.40 Parameter MeterReplacementCounter

FB:	M_ELECM	Pr	operty	Name (Serv	ver):	MeterReplac	ement	Counter		ndatory 🔲
									O	ptional 🔀
Desc	ription:									
This I	Property sha	II indica	ate the r	number of m	neter rep	lacements ar	nd shall	be handled to	gether wi	th the
Prope	erty MeterRe	placen	nent (se	e above).						
The c	ounter value	shall b	oe incre	mented auto	omatical	lly each time	a conne	cted meter is	replaced.	
The D	Datapoint is (normal	ly) read	only, but m	ay be re	eset by the ins	staller/te	chnician.		
The N	/leterReplace	ement(Counter	is useful for	addition	nal diagnostic	informa	tion in the bil	ling proce	SS.
DPT:	Name	DPT	Value_	1_Ucount		DPT ID	5.010	Datatype	e format	U ₈
Field		_	Descri	ption			Sup.	Range	Unit	Default
								0 to 255	None	0
Com	nunication:									
DP	Address:		IO Ty	ype(ID):	1104 ((M_ELECM)	Prope	erty ID:	162	
(in t	he server)		Start	:-Index:	1		N° of	elements	1	
Pro	perty acces	s:	Read	d only		Read/\	Vrite	\boxtimes		
Exce	ption Handl	ing:	Value	after Power	up: St	tored Value 🛭	Act V	alue 🔲 🏻 De	fault Valu	e 🗌
Free	running cour	nter wit	h overflo	ow 255 - > 0).					
Spec	ial Features	;:								
If ther	e is no mete	er conn	ected to	the Interfac	ce Objec	ct the initial va	alue sha	ll be 0 (ex-fac	tory). Afte	r
conne	ection of the	first me	eter, the	value is inc	remente	ed and has th	e value	1. The value	shall be st	lored in
non-v	olatile memo	orv.								

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:

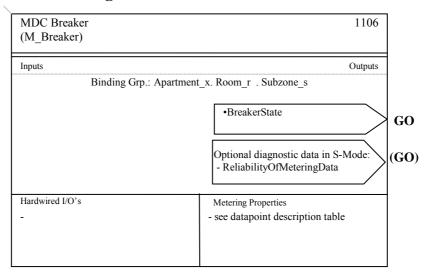
- Closed (Energy supply is active).
- Open (Energy supply is intentionally interrupted by the energy supplier).
- Released (Energy supply is still interrupted, but energy supplier released the breaker, the consumer may enable service by pressing a service button on the breaker).

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 °
Outputs (multicast communication)				
BreakerState	153	Describing the status of the breaker: Energy supply is closed or open or released.	Property: DPT_MBus_BreakerValve State / PDT_ENUM8 Standard Mode: DPT_MBus_BreakerValve State	20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	Standard Mode: DPT_Bool	1.002

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

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Metering Properties (polling)				
BreakerState		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°
LTE Zoning Parameters				
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°	
Diagnostic Properties (polling)					
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°
Diagnostic Properties (polling)				
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 ≥128 octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n ≥128	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Parameters				
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	Exter Mo	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	none				
Outputs	BreakerState	GO_b	GO	GO	NA
	StatusGO	(GO _b)	(GO)	(GO)	NA

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

M_BREAKERM Zoning Parameters

		Support
Parameter	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	О
OnTime	О
CurrentDate	M
ErrorDate	M
MBusRawData	M
UserText	0
MeterReplacement	M
MeterReplacementCounter	О

^{*} 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

FB:	M_BREAK	ERM	Property Name	e (<u>Server</u>):	Breaker	State		Mandatory ⊠ Optional □		
Desc	ription:	-					-	<u> </u>		
This v	This value is received from the M-Bus Breaker or Valve and contains the current state of the breaker or									
valve.										
The b	reaker may	be a de	dicated device of	or may be a fun	ction inte	grated in a met	ering dev	ice, like the		
electr	icity meter.	_								
	Name	ame DPT_MBus_BreakerValve_State			DPT ID	20.1200	Datatype	e format N ₈		
Field		Descri	Description			Range	Unit	Default		
Break	Breaker State This field shall indicate whether the			M	0 to 2, 255	None	one 255			
		breake	r is open, close	d or released.						
Comr	munication:	-			-	-	-	•		
	Address:		IO Type(ID):	1106		Property ID:	153			
(in t	he server)		TO Type(ID).	(M_BREAKE	RM)	r roperty ib.	100			
			Start-Index:	1		N° of elements	1			
Pro	perty acces	s:	Read only	\boxtimes	Read/W	/rite				
Pro	tection		Read level			Write level				
Exce	ption Handl	ing:	Value after Pov	verup: Stored	l Value ☐	Act Value 🗌	Defau	lt Value ⊠		
Data	Data shall be stored in volatile memory and shall be void after power up of the Data Collector.									
Spec	ial Features):								
Ī										

Group Object (Standard Mode):

DP Name:	BreakerState	Abbr.				Mandat	tory			
FB Name:	M_BREAKERM					Can be	interna			
Description										
	This value is received from the M-Bus Breaker and shall be stored by the Data Collector. The state shall									
		ssible by polling or i	t is sent sp	ontane	ously in c	ase of char	nge of v	alue.		
Datapoint Typ										
DPT_Name:		eakerValve_State								
DPT Format:	N ₈				DPT_ID:		0			
Field	Description				Supp.	Range	Unit	Default		
Breaker State		indicate whether the	e breaker is	S		0 to 2,	None	255		
	open, closed or	r released.				255				
Access Type										
♦ Output										
this \rightarrow M		his \rightarrow 1								
Spontaneou	us 🛛 COV:	$ \Sigma $ Δ -Val	ue: cs 1)	Mi	n repetition	on period:	5 min			
	Cyclic	Perio	d:							
Request										
Communication	on Type									
♦ Group Obje	ect Datapoint					Mandatory	<i>'</i> : ⊠			
Default Gro	up Address: -									
Dynamics										
Power down	n: Save:									
Power up:	Value:	No initialisation:		Defau	ılt value:					
		Saved value:		Actua	l value (n	ot for input)				
	Transmit on	bus (only for outpu	t):	Read	from bus	(only for in	out):			
Exception Hai	ndling									
Void values or	faulty values sha	all be indicated with	default val	lue FFh	١.					
Special Featu	res									
In the M-Bus Breaker data are transmitted periodically, typically 2 times to 8 times per hour. Therefore										
		e COV is sufficient t								
		and that the KNX b		not too	high. Nor	mally recep	tion of a	an M-Bus		
message w	ill trigger an upda	ate of the Group Ob	ject.							

5.7.6.2 LTE Zoning Parameter Apartment

FB: M_BREAKERM	Property Name (Server):	e (<u>Server</u>): Apartment			Mandato Optiona	- =			
Description:		-			<u> </u>				
LTE zone: Apartment nur	mber used for LTE binding and	in add	lition as l	ocalization ir	nformation	for the			
metering device.									
DPT : Name DPT_U	ormat U	₈ Z ₈							
Field	Description		Sup.	Range	Unit	Default			
CounterValue	Apartment number		M	1 to 126	none	1			
Status					bitset				
- OutOfService	Service zone active /inactive			true/false		false			
- all other flags	not supported, fixed to '0'		NA						
Command					enum				
- NormalWrite			М						
 SetOSV & ResetOSV 	set zone inactive / active	0							
- all other commands	not supported		NA						
Communication:			<u>-</u>	-	-	-			
DP Address:	IO Type(ID): 1106 (M_BRE	AKER	M) Pro	perty ID:	101				
(in the server)	Start-Index: 1		N°	of elements	1				
Property access:	Read only	Read	d/Write	\boxtimes					
Protection	Read level		Write	level	-				
Exception Handling:	Value after Powerup: Stored	l Value	e 🛛 Act	Value 🗌	Default Va	alue 🗌			
	•								
Special Features:									
	M BREAKERM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService'								
	oom and Subzone is 'OutOfSei								
¹⁾ Mandatory in LTE imp		· ·		<i>G,</i>					

5.7.6.3 LTE Zoning Parameter Room

FB:	M_BREAKE	RM	Property Name (<u>Server</u>): Room					Mandato	- =
Desc	ription:		<u> </u>		_				
LTE z	zone: Room ni	umber.	parameter used fo	r LTE bindir	ng and	in addit	ion as localiz	zation infor	rmation for
the m	the metering device.								
DPT:	Name DF	PT_Uco	ountValue8_Z	DPT ID	202.0	02 Da	tatype forma	at U_8Z_8	
Field			Description			Sup.	Range	Unit	Default
Coun	terValue		Room number			M	1 to 63	none	1
Statu	S]	bitset	
– OI	utOfService		zone active /inactive	ve		0	true/false		false
– all	l other flags		not supported, fixed to '0'			NA			
Comr	mand						1	enum	
– No	ormalWrite		M						
– Se	etOSV & Rese	etOSV	set zone inactive / active			0			
– all	l other comma	nds	not supported			NA			
Com	munication:								
DP	Address:		IO Type(ID): 1100	6 (M_BREA	KERN	/I) Pro	perty ID:	102	
(in f	the server)		Start-Index: 1			N°	of elements	1	
Pro	perty access:	:	Read only		Read	d/Write	\boxtimes		
Pro	tection		Read level			Write	level		
Exce	ption Handlin	ng: `	Value after Poweru	p: Stored	Value	e 🔯 Act	t Value 🗌	Default Va	alue 🗌
Special Features:									
M_BF	M_BREAKERM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService'								
also t	he correspond	ding Ro	oom and Subzone is	s 'OutOfSer	vice' ((commor	າ flag).		
¹⁾ M:	andatory in LT	E impl	ementations only.						

5.7.6.4 LTE Zoning Parameter Subzone

FB:	M_BREAKE	RM Pi	roperty Name (Server):	Subzo	ne			Mandato Optional	- =
	ription:	-			-					
			r within the Apa		Room u	sed	for L	TE binding and	d in additic	n as
locali	zation informa	ation for t	the metering dev	vice.						
DPT:	DPT: Name DPT_UcountValue8_Z DPT ID 202.002 Datatype format							It U_8Z_8		
Field			Description				Sup. Range		Unit	Default
Coun	terValue		Subzone numl	ber			М	1 to 15	none	1
Statu	S								bitset	
- OutOfService			zone active /in	active			0	true/false		false
- all other flags not supported, fixed to '0')'		NA	١ .			
Comr									enum	
- No	ormalWrite						M			
- Se	etOSV & Rese	etOSV	set zone inactive / active			Ο				
- all	other comma	ands	not supported			NA	\			
Com	munication:					•				
DP	Address:		IO Type(ID):	1106 (M_	BREAK	ŒRI	M)	Property ID:	103	
(in t	the server)		Start-Index:	1	-		-	N° of eleme	nts 1	
Pro	perty access	3 :	Read only		Re	ead/\	Write			
Pro	tection		Read level				Wri	te level		
Exce	ption Handli	ng: V	alue after Powe	rup: Sto	red Val	ue 🏻	ΔA	ct Value 🗌	Default Va	alue 🗌
Spec	ial Features:									
	M_BREAKERM DPs are not LTE communicating if zone is 'OutOfService'. If Apartment is 'OutOfService'									
			zone is 'OutOfS		ommon	flag).			
'' Ma	andatory in L	TE imple	mentations only							

5.7.6.5 Diagnostic data RxSequenceCounter

FB:	M_BREAKER	RM F	Property Name	(<u>Ser</u> v	<u>/er</u>):	RxSe	quen	ce(Counter	Man Opti	datory onal	
Desci	ription:											
This D	Datapoint shall	conta	ins the sequence	e cou	inter that	shall be	gener	ate	ed locally by	y the	Data C	ollector
	and shall be incremented each time an M-Bus message is received from the corresponding M-Bus											
device	e. This Propert	y shal	I be used for cor	nsiste	ency checl	king if m	eterin	g d	lata is retri	eved	from the	e Data
Collec	ctor.											
			g data from the [
			stent. Therefore									
			ead out. If the se	quen	ice counte	er value	has c	har	nged, mete	ring c	lata ma	y be
incons	nconsistent ⇒ retry by the client											
DPT:	Name [DPT_V	/alue_1_Ucount		DPT ID	5.010	[Dat	atype form	at	U ₈ [n]	
Field			Description				Sup	٠.	Range	Ur	nit	Default
							0 to 255					0
Comr	nunication:					-				-	-	
DP /	Address:		IO Type(ID):	1106	6 (M_BRE	AKERN	1)		Property ID):	110	
(in t	he server)		Start-Index:	1					N° of eleme	ents	1	
Pro	perty access:		Read only	\boxtimes		Read/	Write					
Prot	ection		Read level				Wr	ite	level			
Excep	otion Handling	g: '	Value after Powe	erup:	Stored	Value [Act	t Va	alue 🔲 🏻 🛭	Defau	It Value	\boxtimes
Free r	Free running counter with overflow 255 → 0.											
Speci	Special Features:											
None.												
			_									

5.7.6.6 Diagnostic data RxReceptionTime

	AKERM	Property Name (Serv		eception	Time	Manda				
						Option	al			
Description:										
		ally by the Data Collect								
DPT: Name			T ID 19.00		tatype forma			octet		
Field	Description			Sup.	Range		Unit	Default 1)		
Year		mation, valid if NY=0 ar		M	0 to 255			·/ 1)		
Month	Fault=0	h information, valid if NI		М	1 to 12			,		
DayofMonth	Date.Dayo and Fault=	fMonth information, vali 0	d if ND=0	M	1 to 31			1)		
DayofWeek	Day of We	ek information, valid if N :0	NdoW=0	0	1 to 7			1)		
Hour	Time.Hour	, valid if NT=0 and Faul	t=0	М	0 to 23		h	1)		
Minutes		tes, valid if NT=0 and F		М	0 to 59		min	1)		
Seconds	Time.Seco	onds, valid if NT=0 and F	-ault=0	М	0 to 59	:	s	1)		
Attributes	Bitset cont	aining status info								
- Fault	Date/Time	information ok {0} / faul	lt {1}	M	fault/ok		bool	ok		
- WD	bank day {	0} / working day {1}		0	true/false		bool	WD invalid		
- NWD	validity of	WD field invalid {1} / val	id {0}	М	true/false		bool	WD invalid		
- NY	validity of	Year field invalid {1} / va	alid {0}	М	true/false		bool	Year invalid		
- ND	validity of {1} / valid {	Month & DayofMonth fie 0}	elds invalid	М	true/false		bool	Date invalid		
- NdoW	validity of	DoW field invalid {1} / va	alid {0}	М	true/false		bool	DoW invalid		
- NT	validity of invalid {1}	Hour, Minutes, Seconds / valid {0}	fields	М	true/false		bool	Time invalid		
- SUTI	summertin	ne {1} / standardtime {0}	flag	NA	true/false		bool	Standard		
- CLQ	clock quali	ty bit: with {1} / without -	(0) external	NA	with / withou	ıt	bool	without		
Communicati				•		*				
DP Address (in the serve		IO Type(ID):	1106 (M_BREA	KERM)	Property II	D:		111		
,	,	Start-Index:	1	/	N° of elem	ents		1		
Property ac	cess:	Read only	Read	d/Write						
Exception Handling: Value after Powerup: Stored Value Act Value Default Value										
1) The Proper	ty is stored	in volatile memory. Afte	r power up tl	he initial	isation value	is 'void'	until	a valid		
		ed from the corresponding	ng Ivi-Bus de	vice, all	valid bits ar	e set to	not \	/all0		
Special Features: With this Datapoint the metering client can check if the Data Collector has up to date metering data.										
with this Data	point the me	etering client can check	it the Data C	ollector	nas up to da	te metei	ring c	ıata.		

5.7.6.7 Diagnostic data Manufacturer

FB:	M_BREA	KERM	Property Name (Se	<u>erver</u>):	Manuf	acturer			dator	y	
_	 							Opti	onal		Ш
	ription:										
			nufacturer code that		d from t	the M-Bu	is device and	shall	be st	ored	by
			installation procedu								
			e manufacturer code							3]).	
			e Manufacturer ID e								
Manu	facturer ID	is calcul	ated from the ASCII	code of m	anufact	turer ider	ntification (thr	ee up	perca	ase le	etters)
	formula d										
			urer, IdentificationNu		rsionNu	ımber an	d MeteringDe	evice	Type 1	cogeth	her
			meter identification.								
			r may have been cha							ionin	ıg
			is indicated in the mo				perty Manufa	cture	r.		
The v	alue shall	be read-o	only and shall be acc	essible by	polling	J.					
DPT:	Name	DPT_V	alue_2_Ucount	DPT ID	7.001	Dat	atype format	U ₁	6		
Field			Description			Sup.	Range	Unit		Def	fault
							full range	none	;	(0
Comi	nunicatio	n:			·	-	-		-		
DP	Address:		IO Type(ID):	110			Property ID		112		,
(in t	he server)	io Type(ib).	(M_	BREAL	KERM)	1 Toperty ID	•	112		
			Start-Index:	1			N° of eleme	nts	1		
Pro	perty acce	ess:	Read only		Read	d/Write					
Pro	tection		Read level			Write	level				
Exce	ption Han	dling:	Value after Powerup	o: Store	d Value	e 🛛 Act	Value 📗 🏻 📗	Defau	ılt Val	ue 🗌]
None	-										
Spec	ial Feature	es:									
Manu	facturer 00	000h = vc	oid value								

5.7.6.8 Diagnostic data IdentificationNumber

FB:	M_BREAK	KERM	Property Name	e (<u>Server</u>):	Ident	ificatior	Number	Mano	datory nal			
Desci	ription:				-			1 - 1				
			e current identifica									
			onNumber, Versio	nNumber ar	nd Mete	ringDev	iceType toget	ther ma	ark a wo	rldwide		
	e meter ide											
			may have been o									
			s indicated in the									
			vill be additionally	provided by	meter.	The Fab	ricationNumb	er con	tains a c	opy of		
	iginal Ident				4 D	:c: - 0	all all DOD	.1. 14 .				
			e identification nu							. ما ام		
			meter during insta	allation, then	mappe	o to a 3	2 bit counter	value a	na store	ea by		
	he Data Collector. The value shall be read-only and shall be accessible by polling.											
DPT:	Name		alue 4 Ucount	DPT ID			tatuna farmat					
Field	ivame	DPI_V		טו ואטן	12.00		tatype format	: U ₃		fault		
rieiu			Description			Sup.	Range full range			FFFFh		
Camr	nunication	\					Tull range		FEEE	FFFFII		
	nunicatior Address:	1.		11	06							
	he server)		IO Type(ID):			KEDM	Property ID:	11	3			
(111)	ile sei vei j		io Type(ID).	(10		VIXE I XIVI	r toperty ib.	' '	3			
			Start-Index:	1			N° of elemen	its 1				
Pro	perty acce	ss:	Read only		Read	l/Write						
Prof	ection		Read level			Write	level					
Exce	otion Hand	dling:	Value after Powe	rup: Store	d Value	Ac	t Value 🗌	Defaul	Value [
				-								
	al Feature											
			FFFFFh = void va					FFFFF	FFFh is	used		
for wil	dcard addr	essing a	ind is never a valid	part of the	M-Bus a	address).					

5.7.6.9 Diagnostic data VersionNumber

FB:	M_BREAK	ERM	Property Name (<u>Server</u>):	Version	Nun	nber	Mandate Optiona	· —	
Desc	ription:				<u> </u>			<u> </u>		
Version	on of the he	at mete	er that is received f	rom the M-B	us device	durii	ng commission	ing.		
The s	tructure is n	nanufa	cturer specific.							
Every	meter has	a uniqu	ue M-Bus "address	" preset by m	nanufactu	re. Al	II the Propertie	s Manufac	cturer,	
Identi	ficationNum	ber, V	ersionNumber and	MeteringDev	iceType t	toget	her mark a wo	rldwide un	ique meter	
identi	fication.									
Durin	g the installa	ation p	rocedure the version	on number in	formation	is pr	ovided by the I	M-Bus me	ter. The	
raw v	alue shall be	e store	d by the Data Colle	ector and sha	II be acce	essibl	le by polling.			
DPT:	Name	DPT_	Value_1_Ucount	DPT ID	5.010	Dat	atype format	U ₈		
Field Description Sup. Range Unit										
							full	None	0	
Com	munication				•		-	_	-	
	Address: he server)		IO Type(ID):	1106 (M BREAK	(ERM)	Р	roperty ID:	114		
	·		Start-Index:	1 ⁻	,	Ν	° of elements	1		
Pro	perty acces	ss:	Read only	\boxtimes	Read/W	/rite				
Pro	tection		Read level		\	Vrite	level			
Exce	ption Hand	ling:	Value after Powe	rup: Store	d Value 🛭	< Ac	ct Value 🔲 🛚 I	Default Va	lue 🗌	
Spec	ial Features	S:								
	The structure of the version number is completely manufacturer specific. Therefore no special features can be defined.									

5.7.6.10 Diagnostic data MeteringDeviceType

Description: 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.
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.
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.
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.
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.
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.
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.
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.
value shall be stored by the Data Collector and shall be accessible by polling.
DDT. IN anna IDDT Matanina Davida Tuna IDDT ID 100 444 IDatatuna famasat IN
DPT: Name DPT_Metering_DeviceType DPT ID 20.114 Datatype format N ₈
Field Description Sup. Range Unit Default
Metering_DeviceType KNX specific indication M {2, 32, 255} none 255
of the M-Bus device
type.
Communication:
DP Address: IO Type(ID): 1106 (M_BREAKERM) Property ID: 115
(in the server) Start-Index: 1 N° of elements 1
Property access: Read only ⊠ Read/Write □
Protection Read level Write level
Exception Handling: Value after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐
None.
Special Features:
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

FB:	M_BREAKERM		operty Name (S	erver):	Fabrication	Number		Mandatory	∑ ¹)
								Optional	
	ription:								
	meter has a uniqu								Laborat allo
	facturer, Identificat		number, version	Number	and Metering	Device Lype tog	jetne	er mark a wor	iawiae
	e meter identification IentificationNumbe		ay baya baan ab	angod i	a the motor by	the installer du	rina	oommississis	20
	addressing"). This								
	abricationNumber v								
	iginal Identification			Ovidedi	by meter. The	1 abricationi van	iibci	Contains a co	ору Оі
	M-Bus message tl			er is an I	M-Bus specific	8 digit BCD co	de.	It shall be rec	eived
	he M-Bus meter dı								
Collec			,					•	
The va	alue shall be read-	only	and shall be ac	cessible	by polling.				
DPT:	Name DPT_	Valu	ie_4_Ucount	DPT	ID 12.001	Datatype for	mat	U ₃₂	
Field	Description			Sup.	Range	Unit		Default	
					full range	none		FFFFFFF	1
Comr	nunication:								
	Address:		IO Type(ID):	1106		Property ID:		116	
(in t	he server)		. , ,	(M_BR	EAKERM)				
			Start-Index:	1		N° of elements	}	1	
	perty access:		Read only	\boxtimes	Read/V				
	ection		Read level			Write level			
	otion Handling:	Va	llue after Poweru	up: Ste	ored Value 🔀	Act Value	De	efault Value 🗌	
None.									
	al Features:								
	ationNumber FFF						FFF	FFFFFFh is us	sed for
	ord addressing and								
- 00	nditional: mandato			soft ad	aressing" in or	der to have an	una	mbiguous	
ide	entification of the m	ieter	ing data.						
	10 D! I		A						

5.7.6.12 Diagnostic data AccessNumber

e e e e e e e e e e e e e e e e e e e													
FB:	M_BREAKE	ERM	Property Name	(<u>Ser</u>	ver):	Ac	ccessNuml	ber			Manda Option	•	
Desci	ription:		-										
			umber that is ger										IS
			ed by the Data C							is	manuf	acturer	
			be read-only and										
The e	he encoding of the AccessNumber in the M-Bus Message is specified in [03].												
DPT:	Name	DPT_	Value_1_Ucount		DPT II)	5.010	Dat	atype format		U ₈ [n]		
Field Description Sup. Range							Un	iit	Defa	ult			
									0 255	No	ne.	0	
Comr	nunication:		-			-			-				
DP A	Address:		IO Type(ID):	1106		D		Property ID:			117		
(in t	he server)		io Type(ib).		(M_BR	EΑ	KERM)	FIU	perty ID.		117		
			Start-Index:		1			N°	of elements		1		
Pro	perty access	s:	Read only	\boxtimes			Read/Wri	te					
Prot	tection		Read level				V	/rite	level				
Exception Handling: Value after Powerup: Stored Value ☐ Act Value ☐ Default Value ☐													
Data i	s stored in v	olatile	memory and is v	oid a	after po	we	r up of the I	Data	Collector.				
Speci	al Features	:											
None.													

5.7.6.13 Diagnostic data DeviceStatus

FB:	M_BREAK	ERM	Pro	perty Name (<u>Se</u>	erve	<u>r</u>): Dev	riceS	itatı	us		Mandato Optional	-
Desc	ription:	<u> </u>									Ориона	
		mbined	d Sta	atus/Error-code ((bitse	et) of the	heat	t me	ter tha	at is received	from the	M-Bus
device	•			·	•	,						
The e	ncoding of the	he Dev	iceS	Status in the M-B	Bus N	Message	is sp	ecif	ied in	[03].		
The ra	he raw value shall be stored by the Data Collector and shall be accessible by polling.											
DPT:	Name	DPT_	Valu	ue_1_Ucount		DPT ID	5.01	10	Da	tatype forma	t U	3
Field			[Description				0)	Sup.	Range	Unit	Default
	full None 0											
Comr	munication:											
	Address: he server)			IO Type(ID):		06 _BREAK	ERM	Property ID:			118	
				Start-Index:	1				N° of	elements	1	
Pro	perty acces	s:		Read only	\boxtimes		R	ead	/Write			
Pro	tection			Read level					Write	level		
Exce	ption Handl	ing:	Va	lue after Poweru	ıp:	Stored \	√alu	e 🗌	Act \	/alue 🔲 🏻 🗈	efault Va	lue 🛚
None												
Spec	ial Features	:										
				am are marked i						ermanent er	ror' (bit 3) then the
Status	tatus flag 'Fault' of various metering datapoints shall be set to 'true'.											

5.7.6.14 Diagnostic data OperatingTime

FB:	M DDEAK	DM	Dranarty Nama /	2021/02/	Operating	Time		Mondote	nn/ 🔲
FD.	M_BREAKE	=KIVI	Property Name (server):	Operating	, i ime		Mandato	- =
								Optiona	<u> </u>
Desc	ription:								
Durat	ion of meter	accum	ulation of the heat	meter th	at is receive	ed from t	he M-Bus de	evice.	
The v	alue shall be	stored	d by the Data Colle	ector and	shall be ac	cessible	by polling.		
DPT:	Name	DPT_I	LongDeltaTimeSe	c DPT	ID 13.10	0 Dat	tatype forma	t V	32
Field			Description			Sup.	Range	Unit	Default
							full 1)	S	0
							≥0		
Com	munication:		<u> </u>			-			-
DP.	Address:		IO Type(ID):	1106	(M_BREAL	KERM)	Property ID):	119
(in t	he server)		Start-Index:	1			N° of eleme	ents	1
Pro	perty access	s:	Read only	\boxtimes	Rea	d/Write			
Pro	tection		Read level			Write	level		
Exce	ption Handli	ng:	Value after Powe	rup: St	ored Value	Act	Value 🔲 🔝	Default Va	alue 🛛
None	=								
Spec	ial Features:	:							
1) Er	coding on 32	2 bit sig	gned integer value	with 1 se	econd trans	port form	nat resolutior	١.	
Di	splay resoluti	ion: 1 h	n. The granularity	of the inte	ernal resolu	tion may	be higher.		
Us	sed range: 0	to ~68	years. In practice	no binary	overflow is	s thus po	ssible.		

5.7.6.15 Diagnostic data OnTime

FB:	M_BREAKE	ERM	Property Name (Se	<u>rver</u>):	OnTim	е			Mandato Optional	ry 🗌	
Desc	ription:				-						
Durat	ion of heat m	neter p	ower up that is receive	ved fron	n the M-	Bus de	evice.				
The v	alue shall be	store	d by the Data Collect	or and s	shall be	acces	sible by	y polling.			
DPT:	Name	DPT_	LongDeltaTimeSec	DPT II	D 13.1	00	Dat	atype format	V ₃₂		
Field			Description			Sı	лр.	Range	Unit	Default	
								full 1)	s	0	
								≥0			
Com	communication:										
	Address:		IO Type(ID):	1106			Prone	erty ID:	120		
(in t	he server)		TO Type(ID).	(M_BR	EAKER	M)	•	•	120		
			Start-Index:	1			N° of	elements	1		
Pro	perty access	s:	Read only		Rea	ad/Wri	te				
Pro	tection		Read level				Write	level			
Exce	ption Handli	ing:	Value after Poweru	p: Sto	red Val	ue 🗌	Act Va	alue 🔲 De	fault Valu	e 🛛	
None											
Spec	ial Features	:									
1) Er	ncoding on 32	2 bit si	gned integer value w	ith 1 se	cond tra	nsport	forma	t resolution.			
			h. The granularity of								
Us	sed range: 0	to ~68	years. In practice no	binary	overflov	v is thu	us poss	sible.			

5.7.6.16 Diagnostic data CurrentDate

FB: N	/LBRE	AKERM	Property Name (Se	erver):	CurrentD	tDate Mandatory 🖂 Optional					
Descrip	ption:				-			-			
Current	date ar	nd time in	formation of heat me	eter that i	s received	from th	e M-Bus de	vice (ti	me stamp		
			neter for the last M-E					n).			
The val	ue shall	be store	d by the Data Collec	tor and s	hall be acc						
DPT:	Name	. [OPT_DateTime	DPT IE	19.001	Data	atype forma	at	8 octet		
Field		Descripti				Sup.	Range	Unit	Default		
Year		Year info	ormation, valid if NY	= 0 and	Fault = 0	M	0 to 255		1)		
Month		Date.Mo	nth information, valid	if ND =	0 and	M	1 to 12		7)		
		Fault = 0									
DayofM	lonth	Date.Day	ofMonth information	n, valid if	ND = 0	M	1 to 31		(۱		
		and Faul	t = 0				L				
DayofW	/eek		leek information, val	id if Ndo\	W = 0 and	0	1 to 7		1)		
		Fault = 0									
Hour			ur, valid if NT = 0 an			M	0 to 23	h	1)		
Minutes	3	Time.Mir	nutes, valid if NT = 0	and Fau	It = 0	M	0 to 59	min	1)		
Second	ls	Time.Sec	conds, valid if NT = 0	and Fai	ult = 0	М	0 to 59	S	1)		
Attribute	es		ntaining status info								
Fault			ne information ok {0}		}	М	fault/ok	bool	ok		
– WD			/ {0} / working day {1			0	true/false	bool	WD invalid		
– NWD			f WD field invalid (1)			M	true/false	bool	WD invalid		
– NY		validity o	f Year field invalid {1	} / valid {	{0}	M	true/false	bool	Year invalid		
– ND			f Month & DayofMor	nth fields	invalid	M	true/false	bool	Date invalid		
		{1} / valid									
NdoW	V		f DoW field invalid {1			M	true/false	bool	DoW invalid		
– NT			f Hour, Minutes, Sec	conds fiel	ds invalid	M	true/false	bool	Time invalid		
		{1} / valid									
- SUTI			ime {1} / standardtim			NA	true/false	bool	Standard		
- CLQ			ality bit: with {1} / with	hout {0} e	external	NA	with /	bool	without		
		synchron	nization				without				
Commu											
	ddress:		IO Type(ID):		106		Property II	J.	121		
(in the	e serve	r)		(1)	M_BREAK	ERM)					
			Start-Index:	1			N° of elem	ents	1		
	erty acc		Read only		Read/\						
Except	ion Har	ndling:	Value after Poweru	лр: Sto	red Value	Act	Value 🗌	Defau	lt Value ⊠		
None.											
	Special Features:										
initia	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

FB:	M_BRE	AKERM	Property Name	(<u>Server</u>):	Error	Date		Mandatory ⊠ Optional □		
Desc	ription:				•			-		
Date	and time	information	n for an error occu	rrence in th	ne hea	t mete	r that is received fr	om the	M-Bus	
devic	e.									
			d to datapoint Erro							
		II be stored	by the Data Colle				sible by polling.			
DPT:	Name		PT_DateTime	DPT ID	19.00	1 D	atatype format	8 0	ctets	
Field		Description				Sup.	Range	Unit	Default	
Year			nation, valid if NY	= 0 and		M	0 to 255		1)	
		Fault = 0						ļ		
Month	า		h information, vali	$id\ if\ ND = 0$	and	M	1 to 12		1)	
		Fault = 0						ļ		
Dayo	fMonth		fMonth informatio	n, valid if		М	1 to 31		1)	
			d Fault = 0					ļ	1,	
Dayo	fWeek		ek information, va	alid if NdoW	/ = 0	0	1 to 7		1)	
		and Fault						<u> </u>		
Hour			, valid if NT = 0 ar			M	0 to 23	h	<u>, , , , , , , , , , , , , , , , , , , </u>	
Minut			tes, valid if NT = 0			M	0 to 59	min	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Seco			onds, valid if NT =	0 and Faul	t = 0	M	0 to 59	s		
Attrib			aining status info					l		
	ult		information ok {0	, , ,		M	fault/ok	bool	ok	
- W			0} / working day {			0	true/false	bool	WD invalid	
	ND		WD field invalid {1			M	true/false	bool	WD invalid	
- N			Year field invalid {)}	M	true/false	bool	Year invalid	
- N[)		Month & DayofMo	onth fields		М	true/false	bool	Date invalid	
١		invalid {1}						l	5 147	
	Wob		DoW field invalid {			M	true/false	bool	DoW invalid	
- N	l		Hour, Minutes, Se	conas fiela	s	М	true/false	bool	Time invalid	
	ITI	invalid {1}		(O) floor		NIA	two offers	bool	atan dard	
	<u> </u>		ne {1} / standardtii			NA.	true/false with / without	bool	standard	
- CL	_Q		ty bit: with {1} / wi nchronization	triout {0}		NA	with / without	bool	without	
Comi	municati		/IICHIOHIZALIOH		J					
	municati Address		IO Typo(ID): 1	106 (M BR	EAKE	DM	Property ID:	126		
	he serve			IOO (IVI_BR	CANE	.rxivi)	N° of elements	120		
_ •	perty ac			\overline{A}	Pos	ad/Writ		1		
	ption Ha		Value after Powe					ofoult \	/alue 🛛	
	Data shall be stored in volatile memory and shall be void after power up of the Data Collector. Special Features:									
			aram are marken	l in field 'et	atus' w	/ith 'ne	rmanent error' the	n the da	ate shall he	
							onsumption date fr			
devic			ICOLOI. TIIIS IS LIIC	idot i ciidbit	, and \	rana ot	onoumption date if	om mc	metering	
		n value is 'v	oid' until a valid M	1-Bus frame	e was i	receive	ed, all 'valid bits' ar	e set to	o 'not valid	
			C.C. Gillia Valla IV	ao ai i k		. 555.70	ca, an vana bito ai	2 22. 10		

5.7.6.18 Diagnostic data MBusRawData

FB:	M_BREAKERM	Property N	ame (<u>Se</u>	rver):	ME	BusRawl	Data		Mandatory 🖂 Optional		\boxtimes
Descr	ription:	-			<u>-</u>				<u> </u>		
	data of received M										
a Prop	perty array, the su	oported Proper	ty length	shall	be ≥	128 eler	nents	s. For furth	er detail	s see 4.	6
"Марр	Mapping of M-Bus raw data".										
DPT:	Name	DPT_Value_1	_Ucou	DPT	ID	5.010	D	atatype fo	rmat	U ₈ [n]	
		nt									
Field		Description	Sup). R	Rang	е		Unit	Default		
						None.			array length= 0		
Comr	nunication:	-		-				-	-		
DP /	Address:	IO Type(ID): 1106	(M_B	REA	KERM)	Prop	perty ID:	13	0	
(in t	he server)	Start-Index	: 1				N° c	of elements	2	iriable, ax length	ı ≥128
Pro	perty access:	Read only	\boxtimes			Read/W	rite				
Prot	ection	Read level		-			Writ	e level			
Excep	otion Handling:	Value after P	owerup:	Sto	red \	√alue 🔲	Act	Value 🗌	Defau	It Value	\boxtimes
Please	e refer to clause 4	.6 "Mapping of	M-Bus ra	aw dat	ta".						
Speci	Special Features:										
	roperty shall have can be checked t								essage.	The effe	ctive

5.7.6.19 Parameter UserText

FB:	M E	BREA	KERM	Pr	operty Name	(Server):	Ų	Jse	erTex	t		Mar	datory	
	_					,					1	Onti	onal	\square
_												Opti	Oriai	
Descr	riptio	n:												
Addition	onal i	text i	nformation	n	to the metering	device, wh	ich c	an	be en	tered on th	ne Dat	ta C	ollector b	y the
install	er du	ıring	commiss	ior	ning. See claus	e 2.								,
DPT:	N	lame	DP	Τ_	VarString_885	9_1	DP	ΤI	D	24.001	Data	type	format	A[n]
Field			Des	cri	ption		Sup	٠.	Rang	ge			Unit	Default
User	Text		Nu	l te	erminated string	g.	М		see	datatype "d	char s	et"		'00h'
Comn	nuni	catio	n:											
DP A	Addr	ess:			IO Type(ID):	1106 (M_E	BREA	ΚE	RM)	Property I	D:		160	
(in t	he se	erver	·)		Start-Index:	1				N° of elen	nents		1	
Prop	perty	acc	ess:		Read only			Re	ad/W	rite	\overline{A}			
Excep	otion	Han	dling:	٧	alue after Pow	erup: Sto	red V	/alı	ıe 🛚	Act Value		De	fault Valı	ue 🗌
None.														
Speci	al Fe	atur	es:											
None.														

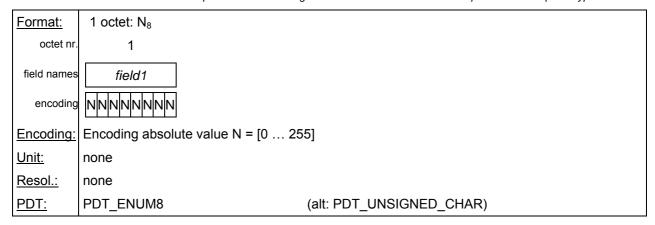
5.7.6.20 Parameter MeterReplacement

FB:	M_BREAKER	RM F	Property Name (<u>Serv</u>	<u>er</u>):	MeterRepl	aceme	nt	Mandato Optional				
Desc	ription:	•						•				
Mana	gement of met	ering	device directory in the	e Data (Collector is o	compar	ny specific an	d not part	of this			
specif	fication. The D	ata Č	ollector shall however	provide	e appropriat	e proce	dures to mar	nage and o	detect the			
replac	cement of a me	etering	device by another de	evice (v	vith different	identifi	ication numbe	er and e.g	. different			
unit/re	esolution of the	mete	ering data). See also d	lause 2	<u>.</u> .							
			nent the corresponding									
	data of the newly connected M-Bus device and M-Bus Identifiers (Manufacturer, Identification Number,											
			DeviceType, Fabricat	ionNun	nber etc) of t	the orig	inal meter are	e overwrit	ten as			
	s metering dat											
			nent it may be necessa									
			on may have changed									
			ice is replaced the Pro									
			bject and the related									
			eterReplacement flag									
` •	via the local us	er inte	erface of the Data Col	lector o	r remotely v	ıa prop	erty write usi	ng ETS or	another			
tool).	r						T_	_	_			
DPT:	Name		Bool		DPT ID	1.002	Datatype		B ₁			
Field			Description			Sup.	Range	Unit	Default			
							true/false	bool	false			
Com	munication:											
DP	Address:		II() IVDE(II)).	1106		Pro	perty ID:	161				
	he server)		, , , ,	` -	EAKERM)							
•			C ton t mid on	1			of elements	1				
	perty access:		Read only		Read/W							
	ption Handlin	g:	Value after Powerup:	Store	ed Value 🛚	Act Va	alue 📙 🏻 De	fault Valu	e 🔲 💮			
None												
	ial Features:											
None	•											
5.7.6	5.7.6.21 Parameter MeterReplacementCounter											
FB:	M BREAKER	RM I	Property Name (Serv	er):	MeterRepl	aceme	ntCounter	Mandato	rv 🔲			
	- <u>-</u>	-	(<u>3011</u>					Optional				
Daga	rintion:	-			-							

FB:	M_BI	REAK	ERM	Pı	roper	rty Nam	e (<u>Se</u>	erver):	MeterRe	eterReplacementCounter					ory 🗌
Desci	riptior):												<u> </u>	
This F	roper	ty shal	II indica	ate	the r	number	of me	eter repla	cements a	ind	shall l	be h	andled to	gether wi	th the
						e above									
The c	The counter value shall be incremented automatically each time a connected meter is replaced.														
	he Datapoint is (normally) read only, but may be reset by the installer/technician.														
The M	1eterR	eplace	ement(Col	unter	is usefu	I for a	additiona	l diagnosti	c i	nforma	tion	in the bil	ling proce	SS.
DPT:	Na	me	DPT_	_Va	alue_	1_Ucou	nt		DPT ID		5.010		Datatype	e format	U_8
Field				D)escri	ption					Sup.	Ra	nge	Unit	Default
												0 to	255	None	0
Comr	nunic	ation:								_				-	-
DP /	Addre	ss:			IO T	ype(ID):	110	06 (M_BF	REAKERM	l)	Prope	rty I	D:	162	
(in t	he se	rver)			Start	-Index:	1				N° of	elen	nents	1	
Pro	perty a	acces	s:		Read	donly			Read/	W	rite				
Exce	otion l	Handli	ing:	٧	/alue	after Po	weru	p: Stor	ed Value [X	Act Va	alue	e 🔲 De	fault Valu	e 🗌
Free r	unnin	g cour	iter wit	h c	overfl	ow 255	- > 0.								
Speci	al Fea	tures	:												
If ther	f there is no meter connected to the Interface Object the initial value shall be 0 (ex-factory). After														
conne	ection	of the	first me	ete	er, the	value is	s incr	emented	and has the	he	value	1. T	he value	shall be s	tored in
non-v	olatile	memo	rv.												

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".



Datapoint	Datapoint Types										
<u>ID:</u>	Name:	Encoding:	Range:	<u>Use:</u>							
20.1200	DPT_MBus_BreakerValve State	field1 = 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:

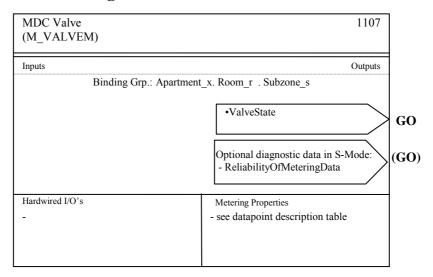
- Closed (Energy supply is active).
- Open (Energy supply is intentionally interrupted by the energy supplier).
- Released (Energy supply is still interrupted, but energy supplier released the valve, the consumer may enable service by pressing a service button on the valve).

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 °
Outputs (multicast communication)				
ValveState	153	Describing the status of the valve: Energy supply is closed or open or released.	Property: DPT_MBus_BreakerValve State / PDT_ENUM8 Standard Mode: DPT_MBus_BreakerValve	20.1200
ReliabilityOfMeteringData	128	Indicates whether metering data are up-to-date or outdated.	State Standard Mode: DPT Bool	1.002

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

Datapoint	PID	Description	Datapoint Type / PDT	DPT N °
Metering Properties (polling)				
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°
LTE Zoning Parameters				
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°
Diagnostic Properties (polling)				
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°
Diagnostic Properties (polling)				
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 ≥128 octets	DPT_Value_1_Ucount [n] PDT_UNSIGNED_CHAR[n] n ≥128	5.010

Datapoint	PID	Description	Datapoint Type / PDT	DPT N°
Parameters				
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	Exter Mo	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Inputs	none		3	32 / ,	
Outputs	ValveState	GO_b	GO	GO	NA
	StatusGO	(GO _b)	(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	0
OnTime	0
CurrentDate	M
ErrorDate	M
MBusRawData	M
UserText	0
MeterReplacement	M
MeterReplacementCounter	0

^{*} 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_VALVEN	1 Prop	perty Name (Se	erver):	ValveS	State			Man Opti	datory onal	\square
Descri	Description:										
This v	alue is recei	ved fron	n the M-Bus val	lve and c	ontains	the curr	ent state of the	valve	:.		
The va	•	a dedica	ated device or r	may be a	functio	n integra	ated in a meterir	ng de	vice, l	ike the g	as
	Name	DPT_M	Bus_BreakerV	alve_Sta	te	DPT ID	20.1200	Data	type f	ormat	N_8
Field		Descrip	tion			Sup.	Range	Unit		Default	
Break	er State	This fie	ld shall indicate	whether	the	M	0 to 2, 255	Non	е	255	
		valve is	open, closed of	or release	ed.						
Comm	nunication:										
DP Ac	ldress:		IO Type(ID):	1107 (N	/_VALV	/EM)	Property ID:	•	153		
(in the	server)		Start-Index:	1			N° of elements	•	1		
Prope	rty access:		Read only	\boxtimes	Read/	Write					
Protec	tion		Read level				Write level	-			
Excep	tion Handlin	g: Val	ue after Power	up: Sto	ored Va	lue 🔲 🛚	Act Value 🗌	Defa	ult Va	lue 🛚	
Data s	Data shall be stored in volatile memory and shall be void after power up of the Data Collector.										
Specia	al Features:										

Group Object (Standard Mode):

DP Name:	Val	lveState			Abbr.:				Manda	tory	
FB Name:	M_	_VALVEM									
Description	ı										
This value is											
read-only an		all be acce	essibl	le by polling	ı or it is s	ent sp	ontaneou	ısly in cas	e of change	of value	Э.
Datapoint T											
DPT_Name:		_	s_Bre	eakerValve_	_State						
DPT Format		-						DPT_ID:			Т
Field		escription						Supp.	Range	Unit	Default
Breaker Stat				ndicate whe	ther the	valve	is open,	M	0 to 2,	None	255
		losed or re	<u>eleas</u>	ed.					255		
Access Typ	е										
Output	l r	<u></u>									
this \rightarrow M				$1 \rightarrow 1$			1)				
Spontane	eous		OV:		Δ-Value		s 1) M	in repetition	on period:	5 min	
			yclic		Period:						
Request	4.										
Communica									N 4 =1 = 4 =		
Group Object									Mandatory	/: <u> </u>	
	roup	Address:		-							
Dynamics		10									
Power do		Save:		NI - 1-141 - 11	.e	_	D - f -	14 1			
Power up):	Value:	<u> </u>	No initialisa		_		ult value:	- 1. 6 (1)		
		T		Saved value				•	ot for input)		
Funantian I	I a .a .ll		it on	bus (only fo	r output)	: L] Read	i from bus	(only for in	out):	
Exception Handling											
Void values or faulty values shall be indicated with default value FFh.											
Special Features 1) In the M Rue valve data are transmitted periodically, typically 2 times to 9 times per hour. Therefore											
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											
			•	and that the		_					
				an update o				Jiligii. No	many recep	טווטוז טו פ	all
IVI-DUS II	10000	igo wiii tiit	agei (an upuate o	n are ord	up Oi	rjout.				

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

FB:	M_VALVE	M	Property Name	(<u>Serve</u>	<u>er</u>): N	/leteringDe	viceType	Mandato Optional	ry 🛚	
Desci	ription:				-			-		
Applie	Applied Device Type of the valve device. Supported values in M_VALVEM are:									
	3: Gas									
			aker (gas)							
_	255: void		, ,				5			
			M-Bus "address"							
		nber, ver	sionNumber and I	vieterin	gDevi	ce i ype toge	etner mark a wor	iawiae uni	que meter	
	ication.	lation nro	andura the Materi	na Maa	dium in	formation i	a arayidad by the	M Due m	otor The	
			cedure the Meteri ne Data Collector					W-Bus m	eter. The	
						20.114		. NI		
DPT:	Name		tering_DeviceTyp	De IDP			Datatype format		D - f 14	
Field			Description			Range		Unit	Default	
Meter	ing_Device		KNX specific indic		M	{3, 33, 255	5}	none	255	
		(of the M-Bus devi	ce					İ	
		t	ype.							
Comr	nunicatior) :								
DP A	ddress:		IO Type(ID):	1107 ($(M_VA$	LVEM)	Property ID:	115	1	
(in the	e server)		Start-Index:	1			N° of elements	1		
Prope	erty acces	s:	Read only	\boxtimes		Read/Writ	e 🗌			
Prote	ction		Read level		-	W	rite level			
Excep	otion Hand	lling:	Value after Power	rup: S	Stored	Value 🛛 🛚	Act Value 🗌 🏻 🗈	Default Va	ue 🗌	
None.										
	Special Features:									
Devic	e type '255	' = void (c	default value); use	ed to inc	dicate	that the FB	is not connected	to a mete	er.	

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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID					
Metering Properties (polling)								
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					
LTE-Mode Z	Coning Parameters							
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
Diagnostic Pr	·		
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
Parameters			
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	DPT_ID	
Outputs			
51	CurrentEnergyConsumption	DPT_MeteringValue	229.001
Metering Pro	perties		
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
LTE Zoning	Parameters	•	
101	Apartment	DPT_UcountValue8_Z	202.002
102	Room	DPT_UcountValue8_Z	202.002
103	Subzone	DPT_UcountValue8_Z	202.002
Diagnostic P	roperties (polling)	·	
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
Parameters	_		
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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
Outputs			
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
Metering P	roperties		
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
LTE Zoning	g Parameters		
101	Apartment	DPT UcountValue8 Z	202.002
102	Room	DPT UcountValue8 Z	202.002
103	Subzone	DPT UcountValue8 Z	202.002
Diagnostic 1	Properties (polling)		
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
Parameters			
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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID		
Metering Pro	Metering Properties (polling)				
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 Metering Value[n]	229.001		
87	HistoryEnergyConsumptionTariff3	DPT Metering Value[n]	229.001		
88	HistoryEnergyConsumptionTariff4	DPT MeteringValue[n]	229.001		
89	HistoryEnergyConsumptionTariff5	DPT Metering Value[n]	229.001		
90	HistoryEnergyConsumptionTariff6	DPT Metering Value[n]	229.001		
91	HistoryEnergyConsumptionTariff7	DPT Metering Value[n]	229.001		
92	HistoryEnergyConsumptionTariff8	DPT Metering Value[n]	229.001		

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
Metering Pro	operties (polling)		
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	
LTE Zoning Parameters				
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		
Diagnostic Pi	Diagnostic Properties (polling)				
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
Diagnostic Pr	roperties (polling)		
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		
Parameters	Parameters				
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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID
Metering Pro	operties		
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
LTE Zoning Parameters			
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
Diagnostic P	roperties (polling)	·	•
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
Parameters			
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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID	
Metering Pro	pperties (polling)			
153	BreakerState	DPT_MBus_BreakerValve_State	20.1200	
LTE Zoning	LTE Zoning Parameters			
101	Apartment	DPT_UcountValue8_Z	202.002	
102	Room	DPT_UcountValue8_Z	202.002	
103	Subzone	DPT_UcountValue8_Z	202.002	
Diagnostic Pi	Diagnostic Properties (polling)			
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
Metering Pro	operties (polling)		
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
Parameters			
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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID			
Outputs	Outputs					
153	ValveState	DPT_MBus_BreakerValve_State	20.1200			
128	ReliabilityOfMeteringData	DPT_Bool	1.002			
Metering Properties (polling)						
153	ValveState	DPT_MBus_BreakerValve_State	20.1200			
LTE Zoning Parameters						
101	Apartment	DPT UcountValue8 Z	202.002			
102	Room	DPT_UcountValue8_Z	202.002			
103	Subzone	DPT_UcountValue8_Z	202.002			
Diagnostic Pr	Diagnostic Properties (polling)					
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
Parameters			
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

Property Identifier	Datapoint Name	Datapoint Type Name	DPT_ID			
Outputs	Outputs					
51	CurrentConsumption	DPT_MeteringValue	229.001			
Metering Pro	Metering Properties					
60	HistoryStorageNumbers	DPT_Value_1_Ucount	5.010			
61	HistoryDate	DPT DateTime[n]	19.001			
62	HistoryConsumption	DPT_MeteringValue[n]	229.001			
LTE Zoning	Parameters					
101	Apartment	DPT UcountValue8 Z	202.002			
102	Room	DPT UcountValue8 Z	202.002			
103	Subzone	DPT UcountValue8 Z	202.002			
Diagnostic Pr	roperties (polling)		•			
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		
Parameters					
160	UserText	DPT_VarString_8859-1	24.001		
161	MeterReplacement	DPT_Bool	1.002		
162	MeterReplacementCounter	DPT_Value_1_Ucount	5.010		