System Specifications

3

7

2

Interworking

Datapoint Types

Summary:

This Chapter specifies the KNX Datapoint Types for Interworking

This Chapter describes the general usable and Functional Block specific, standard Datapoint Types that are to be used for transmission of data on the bus.

Version 1.07.00 is a KNX Approved Standard.

Document updates

Version	Date	Description
v1.0 AS	2002.01.03	Preparation of the approved standard.
		The DPTs of the following documents are integrated. – Chapter 7/1/3 (S12) “Logical Functional Blocks” – Chapter 7/20 (S12) “Lighting” – Chapter 7/50 (S12) “Shutters and Blinds” – Supplement 11 “HVAC Datapoint Types” – Supplement 12 “Channel Codes” – Supplement 14 “DPT_DateTime” – AN004 “Additional HVAC data types” – AN006 “Update of Supplement 14 DPT_DateTime” – AN027 “TFI approved Datapoint Types for general usage” – AN035 “DPT_Version” – AN079 “TFI Accepted DPTs 05.03” Preparation of the Draft Proposal.
		Editorial correction of DPT_TempFlowWaterDemAbs (DPT_ID = 210.100): V_{15} → V_{16} and B_8 → B_{16} in detailed specification, acc. resolution of comments to AN096 v01. Inclusion of resolution of comments from Final Voting. Preparation of the Approved Standard.
v1.3 AS	2007.03.14	– DPT_Length_mm (7.011) added. – DPT_Rotation_Angle (8.011) added. – DPT_MBus_Address (230.1000) PDT corrected from PDT_GENERIC_09 to PDT_GENERIC_08.
v1.4 AS	2007.03.20	– AN050 “AN to Supplement 12” integrated.
	2007.10.03	– AN051 “New channels” integrated.
	2007.10.05	– AN087 “New channels 2005.02” integrated.
	2007.10.19	Integrated conclusion of WGI meeting of 2007.09.26 about use of DPT_Power and DPT_Value_Power.
	2007.12.14	– AN057 “System B” integrated (DPT_ErrorClass_System extension)
	2008.03.13	– AN096 “WGI accepted DPTs 06.01” started and completed integration. – AN098 “Unicode” started and completed integration.
	2008.03.14	– AN066 “cEMI adaptations”: extension of DPT_CommMode.
	2008.04.28	– PART_Logical, PART_Invert and PART_Input_Connected added (AN050)
	2008.05.19	– AN097 “Eberle Status Byte”: integration started and completed.
	2008.06.04	– Coding of DPT_CommMode replaced by reference to PID_COMM_MODE in 3/6/3.
	2008.11.05	– AN105 to AN110: removed TP0 and PL132 from possible values of DPT_Media
	2009.02.03	– Editorial update for inclusion in the KNX Specifications v2.0.
	2009.04.10	– 7/1/5 “General Purpose I/O”: added DPTs used in that specification.
v1.4 AS	2009.06.25	– Editorial update in view of inclusion in the KNX Specifications v2.0.
v1.4.01 AS	2009.11.10	– Correction of range of DPT_ErrorClass_System.
v1.5.00 AS	2009.11.18	– **AN120 “WGI approved DPTs 07.01”** integrated.
	2010.04.14	– **AN128 “WGI approved DPTs 09.01”** integrated.
v1.5.01 AS	2010.11.26	– DPT_Trigger: added indication that both values 0 and 1 shall have the same effect.
	2011.01.04	– Added “KNX IP” to the enumeration of DPT_Media.
v1.5.02 AS	2011.02.12	– [WGI00052]: Indicated that DPT_HVACModeNext is generally usable, not only on LTE, but also in Standard Mode and not only for HVAC. – Numerous instances of “Z_8” with font Arial 10 are replaced by appropriate formatting without specific font.

Version	Date	Description
v1.5.03 AS	2011.05.06	– **AN131 "DPT Prioritised Mode Control"** integrated. – DPT_RegionCodeAlpha2_ASCII and DPT_Locale_ASCII: ZZ can be used for "no region". – Usage of DPT_ScalingSpeed more free.
v1.6.01 AS	2011.09.14	– [WGI00072] Update with the DPTs of the FB ADA: DPT_FlowRate_m3/h, DPT_StatusAct, DPT_FlowRate_m3/h_Z, DPT_Percent_V16_Z, DPT_DamperMode, DPT_ADAType, DPT_BackupMode and DPT_StartSynchronization.
v1.07.00 AS	2012.03.13	– DPTs of Chapter 7/20/3 "DALI Proxy Basic" integrated.
	2012.03.19	– **AN141 "Lighting Sensors – LTE extensions"** integrated. – **AN142 "Lighting actuators – LTE extensions"** integrated. – **AN143 "Shutters and blinds Sensors – LTE extensions"** integrated. – **AN144 "Shutters and blinds actuators – LTE extensions"** integrated. – DPT_BlinkingMode (20.603) of Chapter 7/1/5 integrated.
	2012.04.26	– **AN130 "Realisation of Submetering application with tariff"** integrated. Coding of validity bits in DPT_Tariff_ActiveEnergy adjusted according WGI agreement.

References

[01] Chapter 3/6/3 "External Message Interface"

[02] Chapter 3/7/3 "Standard Identifier Tables"

[03] Volume 7 "Application Descriptions"

Filename: 03_07_02 Datapoint Types v1.07.00 AS.docx

Version: 1.07.00

Status: Approved Standard

Savedate: 2012.04.26

Number of pages: 182

Contents

1 Introduction 9
1.1 Classification and identification of Datapoint Types 9
1.2 Subtype ranges for Datapoint Type Identifiers 10
1.3 Datapoint Type specification style 11
1.3.1 Notations and format 11
1.3.2 Property Datatype 11
1.3.3 Use 12
1.4 The transmission of DPT encoded data on the bus 12

2 Overview 13

3 Datapoint Types for common use 20
3.1 Datapoint Types B_1 20
3.2 Datapoint Types B_2 22
3.3 Datapoint Types B_1U_3 23
3.3.1 DPT_Control_Dimming 23
3.3.2 DPT_Control_Blinds 24
3.4 Datapoint Types Character Set” 25
3.5 Datapoint Types “8-Bit Unsigned Value” 26
3.5.1 Scaled values 26
3.5.2 Non-scaled values 27
3.6 Datapoint Types V_8 28
3.6.1 Signed Relative Value 28
3.7 Datapoint Type “Status with Mode” 28
3.8 Datapoint Types “2-Octet Unsigned Value” 29
3.8.1 2-octet unsigned counter value 29
3.8.2 Time Period 29
3.8.3 Other U_{16} Datapoint Types 30
3.9 Datapoint Types “2-Octet Signed Value” 31
3.9.1 2-octet signed counter value 31
3.9.2 Delta Time 31
3.9.3 Other V_{16} Datapoint Types 32
3.10 Datapoint Types “2-Octet Float Value” 32
3.11 Datapoint Type “Time” 34
3.12 Datapoint Type “Date” 34
3.13 Datapoint Types “4-Octet Unsigned Value” 35
3.14 Datapoint Types “4-Octet Signed Value” 35
3.14.1 4 Octet signed counter value 35
3.14.2 DPTs for electrical energy 36
3.14.3 4 Octet signed time period 36
3.15 Datapoint Types “4-Octet Float Value” 37
3.16 Datapoint Type DPT_Access_Data 39
3.17 Datapoint Types "String" 41
3.18 Datapoint Type Scene Number 41
3.19 Datapoint Type DPT_SceneControl 42
3.20 Datapoint Type DPT_DateTime 43
3.20.1 Notes 44
3.21 Datapoint Types N_8 46
3.22 Datapoint Type B_8 50
3.22.1 Datapoint Type “General Status” 50
3.22.2 Datapoint Type “Device Control” 51

3.23 Datapoint Types N_2 52
3.24 Datapoint Type DPT_VarString_8859_1 53
3.25 Datapoint Type DPT_SceneInfo 54
3.26 Datatype B_{32} 55
3.26.1 Datapoint Type “Combined Info On Off” 55
3.27 Datapoint Type Unicode UTF-8 String A[n] 58
3.27.1 DPT_UTF-8 58
3.28 Datapoint Types V_{64} 60
3.28.1 DPTs for electrical energy 60
3.29 Datapoint Type DPT_AlarmInfo 61
3.30 Datapoint Type DPT_SerNum 64
3.31 Datapoint Types “Unsigned Relative Value” 64
3.32 Datapoint Types “Unsigned Counter Value” 65
3.33 Datapoint Types “Time Period..._Z” 66
3.34 Datapoint Types “Unsigned Flow Rate l/h” 67
3.35 Datapoint Types “Unsigned Counter Value” 67
3.36 Datapoint Types “Unsigned Electric Current µA” 68
3.37 Datapoint Types “Power in kW” 68
3.38 Datapoint Type “Atmospheric Pressure with Status/Command” 69
3.38.1 Datapoint Type “DPT_PercentU16_Z” 70
3.39 Datapoint Types “Signed Relative Value” 70
3.40 Datapoint Type “DeltaTime...Z” 71
3.41 Datapoint Type “16 bit Signed Relative Value_Z” 72
3.42 Datapoint Type DPT_Version 73
3.43 Datatype $V_{32}Z_8$ 74
3.43.1 Datapoint Type “Volume in Liter” 74
3.43.2 Datapoint Type “Flow Rate in m3/h_Z” 75
3.44 Datatype $U_{16}U_8$ 75
3.44.1 Datapoint Type “Scaling speed” 75
3.44.2 Datapoint Type “Scaling step time” 77
3.44.3 DPT_TariffNext 78
3.45 Datatype $V_{32}N_8Z_8$ 78
3.45.1 Datapoint Type “MeteringValue” 78
3.46 Datatypes $A_8A_8A_8A_8$ 80
3.47 Datapoint Types A_8A_8 81
3.47.2 Datapoint Type DPT_RegionCodeAlpha2_ASCII 83
3.48 DPT_Tariff_ActiveEnergy 87
3.49 DPT_Prioritised_Mode_Control 88
3.49.1 Terms and abbreviations 88
3.49.2 Definition 88
3.49.3 Functional description 88
3.49.4 Use cases 91
3.50 Datapoint Types B_2U_6 92
3.50.1 DPT_SceneConfig 92
3.51 Datapoint Types $U_8r_7B_1$ 93
3.51.1 DPT_FlaggedScaling 93

4 Datapoint Types for HVAC 94
4.1 Simple Datapoint Types with STATUS/COMMAND Z_8 field 94
4.1.1 Introduction 94
4.1.2 Datatype format 95
4.1.3 OutOfService mechanism for a parameter 99

4.1.4 OutOfService mechanism for a runtime Datapoint (actual value) 100
4.1.5 Override mechanism 100
4.1.6 Alarming mechanism 102
4.2 Datapoint Types B_1 102
4.3 Datapoint Types N_8 103
4.4 Data Type “8-Bit Set” 106
4.4.1 Datapoint Type “Forcing Signal” 106
4.4.2 Datapoint Type “Forcing Signal Cool” 107
4.4.3 Datapoint Type “Room Heating Controller Status” 108
4.4.4 Datapoint Type “Solar DHW Controller Status” 109
4.4.5 Datapoint Type “Fuel Type Set” 110
4.4.6 Datapoint Type “Room Cooling Controller Status” 111
4.4.7 Datapoint Type “Ventilation Controller Status” 112
4.5 Data Type “16-Bit Set” 113
4.5.1 Datapoint Type “DHW Controller Status” 113
4.5.2 Datapoint Type “RHCC Status” 114
4.6 Datapoint Types N_2 116
4.7 Datapoint Types N_3 117
4.7.1 Datapoint Type DPT_PB_Action_HVAC_Extended 117
4.8 Data Type “Boolean with Status/Command” 118
4.8.1 Datapoint Type “Heat/Cool_Z” 118
4.8.2 Datapoint Type “DPT_BinaryValue_Z” 118
4.9 Data Type “8-Bit Enum with Status/Command” 119
4.9.1 Datapoint Type “HVAC Operating Mode” 119
4.9.2 Datapoint Type “DHW Mode” 120
4.9.3 Datapoint Type “HVAC Controlling Mode” 121
4.9.4 Datapoint Type “Enable Heat/Cool Stage” 122
4.9.5 Datapoint Type “Building Mode” 122
4.9.6 Datapoint Type “Occupancy Mode” 123
4.9.7 Datapoint Type “HVAC Emergency Mode” 124
4.10 Data Type “16-Bit Unsigned Value with Status/Command” 125
4.10.1 Datapoint Type “HVAC Air Quality” 125
4.10.2 Datapoint Type “Wind Speed with Status/Command” 126
4.10.3 Datapoint Type “Sun Intensity with Status/Command” 126
4.10.4 Datapoint Type “HVAC Air Flow Absolute Value” 127
4.11 Data Type “16-Bit Signed Value with Status/Command” 128
4.11.1 Datapoint Type “HVAC absolute Temperature” 128
4.11.2 Datapoint Type “HVAC relative Temperature” 129
4.11.3 Datapoint Type “HVAC Air Flow Relative Value” 129
4.12 Data Type “16-Bit Unsigned Value & 8-Bit Enum” 130
4.12.1 Datapoint Type “HVAC Mode & Time delay” 130
4.12.2 Datapoint Type “DHW Mode & Time delay” 131
4.12.3 Datapoint Type “Occupancy Mode & Time delay” 132
4.12.4 Datapoint Type “Building Mode & Time delay” 133
4.13 Data Type “8-Bit Unsigned Value & 8-Bit Set” 134
4.13.1 Datapoint Type “Status Burner Controller” 134
4.13.2 Datapoint Type “Locking Signal” 135
4.13.3 Datapoint Type “Boiler Controller Demand Signal” 135
4.13.4 Datapoint Type “Actuator Position Demand” 136
4.13.5 Datapoint Type “Actuator Position Status” 137
4.14 Data Type “16-Bit Signed Value & 8-Bit Set” 138

4.14.1 Datapoint Type “Heat Producer Manager Status” 138
4.14.2 Datapoint Type “Room Temperature Demand” 139
4.14.3 Datapoint Type “Cold Water Producer Manager Status” 140
4.14.4 Datapoint Type “Water Temperature Controller Status” 141
4.15 Data Type “16-Bit Signed Value & 16-Bit Set” 142
4.15.1 Datapoint Type “Consumer Flow Temperature Demand” 142
4.16 Data Type “8-Bit Unsigned Value & 8-Bit Enum” 143
4.16.1 Datapoint Type “EnergyDemWater” 143
4.17 Data Type “3x 16-Bit Signed Value ” 144
4.17.1 Datapoint Type “3x set of RoomTemperature Setpoint Shift values” 144
4.17.2 Datapoint Type “3x set of RoomTemperature Absolute Setpoint values” 145
4.18 Data Type “4x 16-Bit Signed Value ” 146
4.18.1 Datapoint Type “4x set of RoomTemperature setpoints ” 146
4.18.2 Datapoint Type “4x set of DHWTemperature setpoints ” 147
4.18.3 Datapoint Type “4x set of RoomTemperature setpoint shift values ” 148
4.19 Data Type “16-Bit Signed & 8-Bit Unsigned Value & 8-Bit Set” 148
4.19.1 Datapoint Type “Heat Prod. Manager Demand Signal” 148
4.19.2 Datapoint Type “Cold Water Prod. Manager Demand Signal” 149
4.20 Data Type “ $V_{16}U_8B_{16}$” 150
4.20.1 Datapoint Type “Status Boiler Controller” 150
4.20.2 Datapoint Type “Status Chiller Controller” 152
4.21 Data Type “$U_{16}U_8N_8B_8$” 153
4.21.1 Datapoint Type “Heat Producer Specification” 153
4.22 Data Type “16-Bit Unsigned Value & 16-Bit Signed Value” 154
4.22.1 Datapoint Type “Next Temperature & Time Delay” 154
4.23 Data Type “3x 16-Float Value” 155
4.23.1 Datapoint Type “3x set of RoomTemperature Setpoint Values ” 155
4.23.2 Datapoint Type “3x set of RoomTemperature Setpoint Shift Values ” 156
4.24 Data Type $V_8N_8N_8$ 157
4.24.1 Datapoint Type “EnergyDemAir” 157
4.25 Data Type $V_{16}V_{16}N_8N_8$ 158
4.25.1 Datapoint Type “TempSupplyAirSetpSet” 158

5 Datapoint Types for Load Management 160

6 Datapoint Types for Lighting 161
6.1 Datapoint Types N_8 161
6.2 Datapoint Types B_8 164
6.2.1 Datapoint Type “Lighting Actuator Error Information” 164
6.3 Datapoint Types U_8B_8 165
6.3.1 Datapoint Type “Status Lighting Actuator” 165
6.4 Datapoint Types $U_8U_8U_8$ 166
6.4.1 DPT_Colour_RGB 166
6.5 Datapoint Types $B_{10}U_6$ 166
6.5.1 DPT_DALI_Control_Gear_Diagnostics 166
6.6 Datapoint Types B_2U_6 168
6.6.1 DPT_DALI_Diagnostics 168

7 Datapoint Types for shutters and blinds 169
7.1 Datapoint Types N_8 169
7.2 Datapoint Types $U_8U_8B_8$ 171
7.2.1 Datapoint Type “Combined Position” 171
7.3 Datapoint Types $U_8U_8B_{16}$ 172

7.3.1 Status Shutter & Sunblind Actuator 172

8 Datapoint Types for System 173
8.1 Datapoint Types N_8 173
8.2 Datapoint Types B_8 174
8.2.1 Datapoint Type “RF Communication Mode Info” 174
8.2.2 Datapoint Type “cEMI Server Supported RF Filtering Modes” 175
8.2.3 Datapoint Type “Channel Activation for 8 channels” 176
8.3 Datatype B_{16} 176
8.3.1 Datapoint Type “Media” 176
8.3.2 Datapoint Type “Channel Activation for 16 channels” 177
8.4 Datatype U_4U_4 178
8.5 Datapoint Types B_{24} 178
8.5.1 Datapoint Type “Channel Activation for 24 channels” 178
8.6 Datapoint Type “MBus Address” 179

9 Parameter Types 180

1 Introduction

1.1 Classification and identification of Datapoint Types

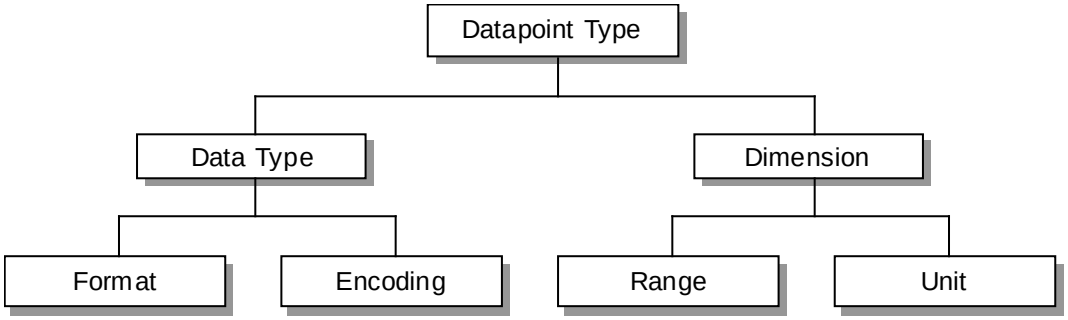


Figure 1 - Structure of Datapoint Types

The Datapoint Types are defined as a combination of a data type and a dimension. It has been preferred not to define the data types separately from any dimension. This only leads to more abstract naming and identifications.

Any Datapoint Type thus standardizes one combination of format, encoding, range and unit. The Datapoint Types will be used to describe further KNX Interworking Standards.

The Datapoint Types are identified by a 16 bit main number separated by a dot from a 16-bit subnumber, e.g. "7.002". The coding is as follows:

Field	Stands for
main number(left)	Format Encoding
subnumber (right)	Range Unit

Datapoint Types with the same main number thus have the same format and encoding.

Datapoint Types with the same main number have the same data type. A different subnumber indicates a different dimension (different range and/or different unit).

1.2 Subtype ranges for Datapoint Type Identifiers

The assignment of Datapoint Type identifiers by KNX Association is done in a systematic way according the scheme below.

<table>
<tr><th rowspan="2">Application Domain</th><th rowspan="2">Subnumber</th><th colspan="4">MAIN number</th></tr>
<tr><th>0 … 199
mainly unstructured</th><th>200 … 299
structured</th><th>300 … 59 999</th><th>≥ 60 000</th></tr>
<tr><td>Common use</td><td>0 to 99</td><td>DPT is
• standard
• mainly unstructured
• common use</td><td>DPT is
• standardised
• structured
• common use</td><td rowspan="8">reserved for future use

managed by WGI</td><td rowspan="8">Reserved. These DPT-IDs shall not be used.</td></tr>
<tr><td>HVAC</td><td>100 to 499</td><td>DPT is
• standardised
• unstructured
• HVAC specific use</td><td>DPT is
• standardised
• structured
• HVAC LTE only</td></tr>
<tr><td>Load Management</td><td>500 to 599</td><td>DPT is
• standardised
• unstructured
• LMM specific usage</td><td>DPT is
• standardised
• structured</td></tr>
<tr><td>Lighting</td><td>600 to 799</td><td>DPT is
• standardised
• unstructured
• lighting</td><td>DPT is
• standardised
• structured
• lighting</td></tr>
<tr><td>Shutters and blinds</td><td>800 to 999</td><td>DPT is
• standardised
• unstructured
• shutters and blinds</td><td>DPT is
• standardised
• structured
• shutters and blinds</td></tr>
<tr><td>System</td><td>1 000 to 1 199</td><td>DPT is
• standardised
• unstructured
• system</td><td>DPT is
• standardised
• structured
• system</td></tr>
<tr><td>Reserved</td><td>1 200 to 50 999</td><td colspan="2">reserved for other applications (managed by WGI)</td></tr>
<tr><td>Manufacturer specific</td><td>≥ 60 000</td><td colspan="2">manufacturer specific extensions [a]</td><td>manufacturer specific extensions [a]</td></tr>
<tr><td colspan="6">[a] For interpretation of these Datapoint Types the device type needs to be known.</td></tr>
</table>

These ranges are defined for DPTs for given application areas. Entire ranges of 500 entries are assigned in one go.

Subtype range		Application area
From	To	
100	499	HVAC
500	599	Load Management
600	999	Lighting
1 000	1 199	System
1 200	50 999	Reserved for other application domains

1.3 Datapoint Type specification style

1.3.1 Notations and format

Symbol	Field
A	Character
A[n]	String of n characters
B	Boolean / Bit set
C	Control
E	Exponent
F	Floating point value
M	Mantissa
N	eNumeration
r	Reserved bit or field
S	Sign
U	Unsigned value
V	2's Complement signed value
Z_8	Standardised Status/Command B_8. Encoding as in DPT_StatusGen

Numbers in suffix denote the length of a field in bit.

EXAMPLE 1 U_{16} indicates a 16 bit unsigned integer.

In the following, the format is described MSB first (most significant octet left) and msb first (most significant bit left) inside an octet. Please refer as well to clause 1.4.

Datapoint Types shorter than 1 octet are transmitted in the data-field of the frame on the lower bit positions. The preceding bits shall be 0.

1.3.2 Property Datatype

Property values can be encoded according the DPTs specified in this document. Therefore, this document specifies a mandatory Property Datatype for every DPT. In each clause of this document, this Property Datatype is specified:

- for all DPTs in that clause in general, or
- for each DPT in that clause individually.

If the Property Value is an array, then all elements of that array shall be encoded according this specified DPT.

Please refer to [02] for the specification of the Property Datatypes.

Interface Object Servers may encode the Property Datatypes on 5 bit or on 6 bit. This influences the Property Datatype that shall be used as specified below.

Property Datatype supported by the device		Property Datatype that shall be used
Size	Range	
5 bit	00h to 1Fh	The alternative Property Datatype as specified behind “(Alt.: …)” in the DPT definition.
6 bit	00h to 3Fh	The Property Datatype as specified in the DPT definition.

1.3.3 Use

Some DPTs can be used without any restriction. Other DPTs can only be used where this is allowed explicitly. This is specified in the DPT definitions. The following applies.

Abbreviation	Meaning	Explanation
G	General	This Datapoint Type can be used without any restrictions.
FB	Functional Block	This Datapoint Type shall not be used in general. This Datapoint Type shall only be used for implementations of standard Functional Blocks where this DPT is used. This Datapoint Type is not allowed for any other purpose.
HVAC HWH TU …	Application Domains	This Datapoint Type shall not be used in general. This Datapoint Type may only be used within the specified application domain. This Datapoint Type is not allowed for any other purpose.

1.4 The transmission of DPT encoded data on the bus

Data encoded according a DPT that is transmitted on the KNX system shall be transmitted with the most significant octet first in the frame and the least significant octet last. An example is shown in Figure 2.

Octet 6								Octet 7								Octet 8								Octet 9								Octet 10							
						APCI										r	r	r	Day					r	r	r	r	Month				r	Year						
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
						APCI	APCI	APCI	APCI																														
						0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0
																			18									12					2006						

Figure 2 – December 12, 2006 encoded according DPT_Date in an A_GroupValue_Write-frame (example on TP1)

NOTE 1 The transmission order of the bits within an octet depends on the medium and may be “most significant bit” (msb) first or “least significant bit” (lsb) first.

2 Overview

DPT_ID	Format	DPT_Name
1.001	B_1	DPT_Switch
1.002	B_1	DPT_Bool
1.003	B_1	DPT_Enable
1.004	B_1	DPT_Ramp
1.005	B_1	DPT_Alarm
1.006	B_1	DPT_BinaryValue
1.007	B_1	DPT_Step
1.008	B_1	DPT_UpDown
1.009	B_1	DPT_OpenClose
1.010	B_1	DPT_Start
1.011	B_1	DPT_State
1.012	B_1	DPT_Invert
1.013	B_1	DPT_DimSendStyle
1.014	B_1	DPT_InputSource
1.015	B_1	DPT_Reset
1.016	B_1	DPT_Ack
1.017	B_1	DPT_Trigger
1.018	B_1	DPT_Occupancy
1.019	B_1	DPT_Window_Door
1.021	B_1	DPT_LogicalFunction
1.022	B_1	DPT_Scene_AB
1.023	B_1	DPT_ShutterBlinds_Mode
1.100	B_1	DPT_Heat/Cool
2.001	B_2	DPT_Switch_Control
2.002	B_2	DPT_Bool_Control
2.003	B_2	DPT_Enable_Control
2.004	B_2	DPT_Ramp_Control
2.005	B_2	DPT_Alarm_Control
2.006	B_2	DPT_BinaryValue_Control
2.007	B_2	DPT_Step_Control
2.008	B_2	DPT_Direction1_Control
2.009	B_2	DPT_Direction2_Control
2.010	B_2	DPT_Start_Control
2.011	B_2	DPT_State_Control
2.012	B_2	DPT_Invert_Control
3.007	B_1U_3	DPT_Control_Dimming
3.008	B_1U_3	DPT_Control_Blinds
4.001	A_8	DPT_Char_ASCII
4.002	A_8	DPT_Char_8859_1
5.001	U_8	DPT_Scaling
5.003	U_8	DPT_Angle
5.004	U_8	DPT_Percent_U8
5.005	U_8	DPT_DecimalFactor
5.006	U_8	DPT_Tariff
5.010	U_8	DPT_Value_1_Ucount
6.001	V_8	DPT_Percent_V8
6.010	V_8	DPT_Value_1_Count
6.020	B_5N_3	DPT_Status_Mode3
7.001	U_{16}	DPT_Value_2_Ucount
7.002	U_{16}	DPT_TimePeriodMsec
7.003	U_{16}	DPT_TimePeriod10MSec
7.004	U_{16}	DPT_TimePeriod100MSec

DPT_ID	Format	DPT_Name
7.005	U_{16}	DPT_TimePeriodSec
7.006	U_{16}	DPT_TimePeriodMin
7.007	U_{16}	DPT_TimePeriodHrs
7.010	U_{16}	DPT_PropDataType
7.011	U_{16}	DPT_Length_mm
7.012	U_{16}	DPT_UElCurrentmA
7.013	U_{16}	DPT_Brightness
8.001	V_{16}	DPT_Value_2_Count
8.002	V_{16}	DPT_DeltaTimeMsec
8.003	V_{16}	DPT_DeltaTime10MSec
8.004	V_{16}	DPT_DeltaTime100MSec
8.005	V_{16}	DPT_DeltaTimeSec
8.006	V_{16}	DPT_DeltaTimeMin
8.007	V_{16}	DPT_DeltaTimeHrs
8.010	V_{16}	DPT_Percent_V_{16}
8.011	V_{16}	DPT_Rotation_Angle
9.001	F_{16}	DPT_Value_Temp
9.002	F_{16}	DPT_Value_Tempd
9.003	F_{16}	DPT_Value_Tempa
9.004	F_{16}	DPT_Value_Lux
9.005	F_{16}	DPT_Value_Wsp
9.006	F_{16}	DPT_Value_Pres
9.007	F_{16}	DPT_Value_Humidity
9.008	F_{16}	DPT_Value_AirQuality
9.010	F_{16}	DPT_Value_Time1
9.011	F_{16}	DPT_Value_Time2
9.020	F_{16}	DPT_Value_Volt
9.021	F_{16}	DPT_Value_Curr
9.022	F_{16}	DPT_PowerDensity
9.023	F_{16}	DPT_KelvinPerPercent
9.024	F_{16}	DPT_Power
9.025	F_{16}	DPT_Value_Volume_Flow
9.026	F_{16}	DPT_Rain_Amount
9.027	F_{16}	DPT_Value_Temp_F
9.028	F_{16}	DPT_Value_Wsp_kmh
10.001	$N_3N_5r_2N_6r_2N_6$	DPT_TimeOfDay
11.001	$r_3N_5r_4N_4r_1U_7$	DPT_Date
12.001	U_{32}	DPT_Value_4_Ucount
13.001	V_{32}	DPT_Value_4_Count
13.002	V_{32}	DPT_FlowRate_m3/h
13.010	V_{32}	DPT_ActiveEnergy
13.011	V_{32}	DPT_ApparantEnergy
13.012	V_{32}	DPT_ReactiveEnergy
13.013	V_{32}	DPT_ActiveEnergy_kWh
13.014	V_{32}	DPT_ApparantEnergy_kVAh
13.015	V_{32}	DPT_ReactiveEnergy_kVARh
13.100	V_{32}	DPT_LongDeltaTimeSec
14.000	F_{32}	DPT_Value_Acceleration
14.001	F_{32}	DPT_Value_Acceleration_Angular
14.002	F_{32}	DPT_Value_Activation_Energy
14.003	F_{32}	DPT_Value_Activity
14.004	F_{32}	DPT_Value_Mol
14.005	F_{32}	DPT_Value_Amplitude
14.006	F_{32}	DPT_Value_AngleRad

DPT_ID	Format	DPT_Name
14.007	F_{32}	DPT_Value_AngleDeg
14.008	F_{32}	DPT_Value_Angular_Momentum
14.009	F_{32}	DPT_Value_Angular_Velocity
14.010	F_{32}	DPT_Value_Area
14.011	F_{32}	DPT_Value_Capacitance
14.012	F_{32}	DPT_Value_Charge_DensitySurface
14.013	F_{32}	DPT_Value_Charge_DensityVolume
14.014	F_{32}	DPT_Value_Compressibility
14.015	F_{32}	DPT_Value_Conductance
14.016	F_{32}	DPT_Value_Electrical_Conductivity
14.017	F_{32}	DPT_Value_Density
14.018	F_{32}	DPT_Value_Electric_Charge
14.019	F_{32}	DPT_Value_Electric_Current
14.020	F_{32}	DPT_Value_Electric_CurrentDensity
14.021	F_{32}	DPT_Value_Electric_DipoleMoment
14.022	F_{32}	DPT_Value_Electric_Displacement
14.023	F_{32}	DPT_Value_Electric_FieldStrength
14.024	F_{32}	DPT_Value_Electric_Flux
14.025	F_{32}	DPT_Value_Electric_FluxDensity
14.026	F_{32}	DPT_Value_Electric_Polarization
14.027	F_{32}	DPT_Value_Electric_Potential
14.028	F_{32}	DPT_Value_Electric_PotentialDifference
14.029	F_{32}	DPT_Value_ElectromagneticMoment
14.030	F_{32}	DPT_Value_Electromotive_Force
14.031	F_{32}	DPT_Value_Energy
14.032	F_{32}	DPT_Value_Force
14.033	F_{32}	DPT_Value_Frequency
14.034	F_{32}	DPT_Value_Angular_Frequency
14.035	F_{32}	DPT_Value_Heat_Capacity
14.036	F_{32}	DPT_Value_Heat_FlowRate
14.037	F_{32}	DPT_Value_Heat_Quantity
14.038	F_{32}	DPT_Value_Impedance
14.039	F_{32}	DPT_Value_Length
14.040	F_{32}	DPT_Value_Light_Quantity
14.041	F_{32}	DPT_Value_Luminance
14.042	F_{32}	DPT_Value_Luminous_Flux
14.043	F_{32}	DPT_Value_Luminous_Intensity
14.044	F_{32}	DPT_Value_Magnetic_FieldStrength
14.045	F_{32}	DPT_Value_Magnetic_Flux
14.046	F_{32}	DPT_Value_Magnetic_FluxDensity
14.047	F_{32}	DPT_Value_Magnetic_Moment
14.048	F_{32}	DPT_Value_Magnetic_Polarization
14.049	F_{32}	DPT_Value_Magnetization
14.050	F_{32}	DPT_Value_MagnetomotiveForce
14.051	F_{32}	DPT_Value_Mass
14.052	F_{32}	DPT_Value_MassFlux
14.053	F_{32}	DPT_Value_Momentum
14.054	F_{32}	DPT_Value_Phase_AngleRad
14.055	F_{32}	DPT_Value_Phase_AngleDeg
14.056	F_{32}	DPT_Value_Power
14.057	F_{32}	DPT_Value_Power_Factor
14.058	F_{32}	DPT_Value_Pressure
14.059	F_{32}	DPT_Value_Reactance
14.060	F_{32}	DPT_Value_Resistance

DPT_ID	Format	DPT_Name
14.061	F_{32}	DPT_Value_Resistivity
14.062	F_{32}	DPT_Value_SelfInductance
14.063	F_{32}	DPT_Value_SolidAngle
14.064	F_{32}	DPT_Value_Sound_Intensity
14.065	F_{32}	DPT_Value_Speed
14.066	F_{32}	DPT_Value_Stress
14.067	F_{32}	DPT_Value_Surface_Tension
14.068	F_{32}	DPT_Value_Common_Temperature
14.069	F_{32}	DPT_Value_Absolute_Temperature
14.070	F_{32}	DPT_Value_TemperatureDifference
14.071	F_{32}	DPT_Value_Thermal_Capacity
14.072	F_{32}	DPT_Value_Thermal_Conductivity
14.073	F_{32}	DPT_Value_ThermoelectricPower
14.074	F_{32}	DPT_Value_Time
14.075	F_{32}	DPT_Value_Torque
14.076	F_{32}	DPT_Value_Volume
14.077	F_{32}	DPT_Value_Volume_Flux
14.078	F_{32}	DPT_Value_Weight
14.079	F_{32}	DPT_Value_Work
15.000	$U_4U_4U_4U_4U_4U_4B_4N_4$	DPT_Access_Data
16.000	A_{112}	DPT_String_ASCII
16.001	A_{112}	DPT_String_8859_1
17.001	r_2U_6	DPT_SceneNumber
18.001	$B_1r_1U_6$	DPT_SceneControl
19.001	$U_8[r_4U_4][r_3U_5][U_3U_5][r_2U_6][r_2U_6]B_{16}$	DPT_DateTime
20.001	N_8	DPT_SCLOMode
20.002	N_8	DPT_BuildingMode
20.003	N_8	DPT_OccMode
20.004	N_8	DPT_Priority
20.005	N_8	DPT_LightApplicationMode
20.006	N_8	DPT_ApplicationArea
20.007	N_8	DPT_AlarmClassType
20.008	N_8	DPT_PSUMode
20.011	N_8	DPT_ErrorClass_System
20.012	N_8	DPT_ErrorClass_HVAC
20.013	N_8	DPT_Time_Delay
20.014	N_8	DPT_Beaufort_Wind_Force_Scale
20.017	N_8	DPT_SensorSelect
20.020	N_8	DPT_ActuatorConnectType
20.100	N_8	DPT_FuelType
20.101	N_8	DPT_BurnerType
20.102	N_8	DPT_HVACMode
20.103	N_8	DPT_DHWMode
20.104	N_8	DPT_LoadPriority
20.105	N_8	DPT_HVACContrMode
20.106	N_8	DPT_HVACEmergMode
20.107	N_8	DPT_ChangeoverMode
20.108	N_8	DPT_ValveMode
20.109	N_8	DPT_DamperMode
20.110	N_8	DPT_HeaterMode
20.111	N_8	DPT_FanMode
20.112	N_8	DPT_MasterSlaveMode
20.113	N_8	DPT_StatusRoomSetp
20.120	N_8	DPT_ADAType

DPT_ID	Format	DPT_Name
20.121	N_8	DPT_BackupMode
20.122	N_8	DPT_StartSynchronization
20.600	N_8	DPT_Behaviour_Lock_Unlock
20.601	N_8	DPT_Behaviour_Bus_Power_Up_Down
20.602	N_8	DPT_DALI_Fade_Time
20.603	N_8	DPT_BlinkingMode
20.604	N_8	DPT_LightControlMode
20.605	N_8	DPT_SwitchPBModel
20.606	N_8	DPT_PBAction
20.607	N_8	DPT_DimmPBModel
20.608	N_8	DPT_SwitchOnMode
20.609	N_8	DPT_LoadTypeSet
20.610	N_8	DPT_LoadTypeDetected
20.801	N_8	DPT_SABExceptBehaviour
20.802	N_8	DPT_SABBehaviour_Lock_Unlock
20.803	N_8	DPT_SSSBMode
20.804	N_8	DPT_BlindsControlMode
20.1000	N_8	DPT_CommMode
20.1001	N_8	DPT_AddInfoTypes
20.1002	N_8	DPT_RF_ModeSelect
20.1003	N_8	DPT_RF_FilterSelect
21.001	B_8	DPT_StatusGen
21.002	B_8	DPT_Device_Control
21.100	B_8	DPT_ForceSign
21.101	B_8	DPT_ForceSignCool
21.102	B_8	DPT_StatusRHC
21.103	B_8	DPT_StatusSDHWC
21.104	B_8	DPT_FuelTypeSet
21.105	B_8	DPT_StatusRCC
21.106	B_8	DPT_StatusAHU
21.601	B_8	DPT_LightActuatorErrorInfo
21.1000	B_8	DPT_RF_ModeInfo
21.1001	B_8	DPT_RF_FilterInfo
21.1010	B_8	DPT_Channel_Activation_8
22.100	B_{16}	DPT_StatusDHWC
22.101	B_{16}	DPT_StatusRHCC
22.1000	B_{16}	DPT_Media
22.1010	B_{16}	DPT_Channel_Activation_16
23.001	N_2	DPT_OnOff_Action
23.002	N_2	DPT_Alarm_Reaction
23.003	N_2	DPT_UpDown_Action
23.102	N_2	DPT_HVAC_PB_Action
24.001	A[n]	DPT_VarString_8859_1
25.1000	U_4U_4	DPT_DoubleNibble
26.001	$r_1b_1U_6$	DPT_SceneInfo
27.001	B_{32}	DPT_CombinedInfoOnOff
28.001	A[n]	DPT_UTF-8
29.010	V_{64}	DPT_ActiveEnergy_V64
29.011	V_{64}	DPT_ApparantEnergy_V64
29.012	V_{64}	DPT_ReactiveEnergy_V64
30.1010	B_{24}	DPT_Channel_Activation_24
31.101	N_3	DPT_PB_Action_HVAC_Extended
200.100	B_1Z_8	DPT_Heat/Cool_Z
200.101	B_1Z_8	DPT_BinaryValue_Z

DPT_ID	Format	DPT_Name
201.100	N_8Z_8	DPT_HVACMode_Z
201.102	N_8Z_8	DPT_DHWMode_Z
201.104	N_8Z_8	DPT_HVACContrMode_Z
201.105	N_8Z_8	DPT_EnablH/Cstage_Z DPT_EnablH/CStage
201.107	N_8Z_8	DPT_BuildingMode_Z
201.108	N_8Z_8	DPT_OccMode_Z
201.109	N_8Z_8	DPT_HVACEmergMode_Z
202.001	U_8Z_8	DPT_RelValue_Z
202.002	U_8Z_8	DPT_UCountValue8_Z
203.002	$U_{16}Z_8$	DPT_TimePeriodMsec_Z
203.003	$U_{16}Z_8$	DPT_TimePeriod10Msec_Z
203.004	$U_{16}Z_8$	DPT_TimePeriod100Msec_Z
203.005	$U_{16}Z_8$	DPT_TimePeriodSec_Z
203.006	$U_{16}Z_8$	DPT_TimePeriodMin_Z
203.007	$U_{16}Z_8$	DPT_TimePeriodHrs_Z
203.011	$U_{16}Z_8$	DPT_UFlowRateLiter/h_Z
203.012	$U_{16}Z_8$	DPT_UCountValue16_Z
203.013	$U_{16}Z_8$	DPT_UElCurrentµA_Z
203.014	$U_{16}Z_8$	DPT_PowerKW_Z
203.015	$U_{16}Z_8$	DPT_AtmPressureAbs_Z
203.017	$U_{16}Z_8$	DPT_PercentU16_Z
203.100	$U_{16}Z_8$	DPT_HVACAirQual_Z
203.101	$U_{16}Z_8$	DPT_WindSpeed_Z DPT_WindSpeed
203.102	$U_{16}Z_8$	DPT_SunIntensity_Z
203.104	$U_{16}Z_8$	DPT_HVACAirFlowAbs_Z
204.001	V_8Z_8	DPT_RelSignedValue_Z
205.002	$V_{16}Z_8$	DPT_DeltaTimeMsec_Z
205.003	$V_{16}Z_8$	DPT_DeltaTime10Msec_Z
205.004	$V_{16}Z_8$	DPT_DeltaTime100Msec_Z
205.005	$V_{16}Z_8$	DPT_DeltaTimeSec_Z
205.006	$V_{16}Z_8$	DPT_DeltaTimeMin_Z
205.007	$V_{16}Z_8$	DPT_DeltaTimeHrs_Z
205.017	$V_{16}Z_8$	DPT_Percent_V16_Z
205.100	$V_{16}Z_8$	DPT_TempHVACAbs_Z
205.101	$V_{16}Z_8$	DPT_TempHVACRel_Z
205.102	$V_{16}Z_8$	DPT_HVACAirFlowRel_Z
206.100	$U_{16}N_8$	DPT_HVACModeNext
206.102	$U_{16}N_8$	DPT_DHWModeNext
206.104	$U_{16}N_8$	DPT_OccModeNext
206.105	$U_{16}N_8$	DPT_BuildingModeNext
207.100	U_8B_8	DPT_StatusBUC
207.101	U_8B_8	DPT_LockSign
207.102	U_8B_8	DPT_ValueDemBOC
207.104	U_8B_8	DPT_ActPosDemAbs
207.105	U_8B_8	DPT_StatusAct
207.600	U_8B_8	DPT_StatusLightingActuator
209.100	$V_{16}B_8$	DPT_StatusHPM
209.101	$V_{16}B_8$	DPT_TempRoomDemAbs
209.102	$V_{16}B_8$	DPT_StatusCPM
209.103	$V_{16}B_8$	DPT_StatusWTC
210.100	$V_{16}B_{16}$	DPT_TempFlowWaterDemAbs
211.100	U_8N_8	DPT_EnergyDemWater
212.100	$V_{16}V_{16}V_{16}$	DPT_TempRoomSetpSetShift[3]
212.101	$V_{16}V_{16}V_{16}$	DPT_TempRoomSetpSet[3]

DPT_ID	Format	DPT_Name
213.100	$V_{16}V_{16}V_{16}V_{16}$	DPT_TempRoomSetpSet[4]
213.101	$V_{16}V_{16}V_{16}V_{16}$	DPT_TempDHWSetpSet[4]
213.102	$V_{16}V_{16}V_{16}V_{16}$	DPT_TempRoomSetpSetShift[4]
214.100	$V_{16}U_8B_8$	DPT_PowerFlowWaterDemHPM
214.101	$V_{16}U_8B_8$	DPT_PowerFlowWaterDemCPM
215.100	$V_{16}U_8B_{16}$	DPT_StatusBOC
215.101	$V_{16}U_8B_{16}$	DPT_StatusCC
216.100	$U_{16}U_8N_8B_8$	DPT_SpecHeatProd
217.001	$U_5U_5U_6$	DPT_Version
218.001	$V_{32}Z_8$	DPT_VolumeLiter_Z
218.002	$V_{32}Z_8$	DPT_FlowRate_m3/h_Z
219.001	$U_8N_8N_8N_8B_8B_8$	DPT_AlarmInfo
220.100	$U_{16}V_{16}$	DPT_TempHVACAbsNext
221.001	$N_{16}U_{32}$	DPT_SerNum
222.100	$F_{16}F_{16}F_{16}$	DPT_TempRoomSetpSetF16[3]
222.101	$F_{16}F_{16}F_{16}$	DPT_TempRoomSetpSetShiftF16[3]
223.100	$V_8N_8N_8$	DPT_EnergyDemAir
224.100	$V_{16}V_{16}N_8N_8$	DPT_TempSupply AirSetpSet
225.001	$U_{16}U_8$	DPT_ScalingSpeed
225.002	$U_{16}U_8$	DPT_Scaling_Step_Time
225.003	$U_{16}U_8$	DPT_TariffNext
229.001	$V_{32}N_8Z_8$	DPT_MeteringValue
230.1000	$U_{16}U_{32}U_8N_8$	DPT_MBus_Address
231.001	$A_8A_8A_8A_8$	DPT_Locale_ASCII
232.600	$U_8U_8U_8$	DPT_Colour_RGB
234.001	A_8A_8	DPT_LanguageCodeAlpha2_ASCII
234.002	A_8A_8	DPT_RegionCodeAlpha2_ASCII
235.001	$V_{32}U_8B_8$	DPT_Tariff_ActiveEnergy
236.001	$B_1N_3N_4$	DPT_Prioritised_Mode_Control
237.600	$B_{10}U_6$	DPT_DALI_Control_Gear_Diagnostic
238.001	B_2U_6	DPT_SceneConfig
238.600	B_2U_6	DPT_DALI_Diagnostics
239.001	$U_8r_7B_1$	DPT_FlaggedScaling
240.800	$U_8U_8B_8$	DPT_CombinedPosition
241.800	$U_8U_8B_{16}$	DPT_StatusSAB

3 Datapoint Types for common use

3.1 Datapoint Types B_1

NOTE 2 These single bit DPTs are defined in a most generic way, as much as possibly independently of any application. This allows for the best possible re-use of the DPT in various FBs and Application Domains, though keeping a common interpretation. For the use case specific interpretation of the DPT, it is thus recommended to consult the application descriptions in [03].

EXAMPLE 2 For DPT_Step (1.007) the interpretation of “increase” and “decrease” as “step-down” respectively “step-up” is only clear from the FB specifications of Shutters and Blinds.

Format:	1 bit: B_1
octet nr	1
field names	b
encoding	B
Range:	b = {0,1}
Unit:	None.
Resol.:	(not applicable)
PDT:	PDT_BINARY_INFORMATION (alt: PDT_UNSIGNED_CHAR)

Datapoint Types

ID:	Name:	Encoding: b	Use:
1.001	DPT_Switch	0 = Off 1 = On	G
1.002	DPT_Bool	0 = False 1 = True	G
1.003	DPT_Enable	0 = Disable 1 = Enable	G
1.004	DPT_Ramp	0 = No ramp 1 = Ramp	FB
1.005	DPT_Alarm	0 = No alarm 1 = Alarm	FB
1.006	DPT_BinaryValue	0 = Low 1 = High	FB
1.007	DPT_Step	0 = Decrease (See EXAMPLE 2) 1 = Increase	FB
1.008	DPT_UpDown	0 = Up 1 = Down	G
1.009	DPT_OpenClose	0 = Open 1 = Close	G
1.010	DPT_Start	0 = Stop 1 = Start	G
1.011	DPT_State	0 = Inactive 1 = Active	FB
1.012	DPT_Invert	0 = Not inverted 1 = Inverted	FB
1.013	DPT_DimSendStyle	0 = Start/stop 1 = Cyclically	FB
1.014	DPT_InputSource	0 = Fixed 1 = Calculated	FB
1.015	DPT_Reset	0 = no action (dummy) 1 = reset command (trigger)	G

Format:	1 bit: B_1
octet nr	1
field names	b
encoding	B
Range:	b = {0,1}
Unit:	None.
Resol.:	(not applicable)
PDT:	PDT_BINARY_INFORMATION (alt: PDT_UNSIGNED_CHAR)

Datapoint Types

ID:	Name:	Encoding: b	Use:
1.016	DPT_Ack	0 = no action (dummy) 1 = acknowledge command (trigger), e.g. for alarming	G
1.017	DPT_Trigger	0, 1 = trigger [1)]	G
1.018	DPT_Occupancy	0 = not occupied 1 = occupied	G
1.019	DPT_Window_Door	0 = closed 1 = open	G
1.021	DPT_LogicalFunction	0 = logical function OR 1 = logical function AND	FB
1.022	DPT_Scene_AB [2)]	0 = scene A 1 = scene B	FB
1.023	DPT_ShutterBlinds_Mode	0 = only move Up/Down mode (shutter) 1 = move Up/Down + StepStop mode (blind)	FB

1) For DPT_Trigger, both values 0 and 1 shall have the same effect and shall not be differentiated in sender or receiver.

2) DPT_Scene_AB allows numbering the scenes with 0 and 1. KNX Association recommends displaying these scene numbers in ETS™, other software and controllers as 1 and 2, this is, with an offset of 1 compared to the actual transmitted value.

3.2 Datapoint Types B_2

Format:	2 bit: B_2
octet nr	1
field names	c v
encoding	B B
Range:	c = {0,1} v = {0,1}
Unit:	None
Resol.:	(not applicable)
PDT:	PDT_GENERIC_01

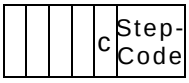
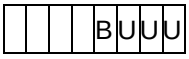
Datapoint Types

ID:	Name:	Use:	Encoding:	
			c	v
			0 = no control 1 = control	According to Type 1.xxx
2.001	DPT_Switch_Control	G		
2.002	DPT_Bool_Control	G		
2.003	DPT_Enable_Control	FB		
2.004	DPT_Ramp_Control	FB		
2.005	DPT_Alarm_Control	FB		
2.006	DPT_BinaryValue_Control	FB		
2.007	DPT_Step_Control	FB		
2.008	DPT_Direction1_Control	FB		
2.009	DPT_Direction2_Control	FB		
2.010	DPT_Start_Control	FB		
2.011	DPT_State_Control	FB		
2.012	DPT_Invert_Control	FB		

c	v	
0	0	No control
0	1	No control
1	0	Control. Function value 0
1	1	Control. Function value 1

3.3 Datapoint Types B_1U_3

3.3.1 DPT_Control_Dimming

Format:	4 bit: B_1U_3
octet nr	1
field names	
encoding	
Range:	c = {0,1} StepCode = [000b…111b]
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_GENERIC_01

Datapoint Types		
ID:	Name:	Use:
3.007	DPT_Control_Dimming	FB

Data fields	Description	Encoding
c	Increase or decrease the brightness.	See 1.007 0 = Decrease (See EXAMPLE 2) 1 = Increase
StepCode	The amount of intervals into which the range of 0 % … 100 % is subdivided, or the break indication.	- 001b…111b: Step Number of intervals = $2^{(stepcode-1)}$ - 000b: Break

3.3.2 DPT_Control_Blinds

Format:	4 bit: B_1U_3
octet nr	1
field names	c | Step-Code
encoding	B | U U U
Range:	c = {0,1} StepCode = [000b…111b]
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_GENERIC_01

Datapoint Types		
ID:	Name:	Use:
3.008	DPT_Control_Blinds	FB

Data fields	Description	Encoding
c	Move up or down.	See 1.008 0 = Up 1 = Down
StepCode	The amount of intervals into which the range of 0 % … 100 % is subdivided, or the break indication.	- 001b…111b: Step Number of intervals = $2^{(stepcode-1)}$ - 000b: Break

NOTE This DPT can be used both for the relative positioning of the vertical blinds positions as well as for the relative positioning of the angle of the slats.

3.4 Datapoint Types Character Set”

Format:	8 bit: A_8
octet nr	1
field names	Character
encoding	AAAAAAAA
Unit:	None
Resol.:	(not applicable)

Datapoint Types

ID:	Name:	Range:	Encoding:	PDT:	Use:
4.001	DPT_Char_ASCII	[0...127]	See below. The most significant bit shall always be 0.	PDT_GENERIC_01 (alt: PDT_UNSIGNED_CHAR)	G
4.002	DPT_Char_8859_1	[0...255]	See below.	PDT_UNSIGNED_CHAR	G

Encoding:

4.001 DPT_Char_ASCII

4.002 DPT_Char_8859_1

AAAA	AAAA
MSN	LSN

LSN = Least Significant Nibble

MSN = Most Significant Nibble

MSN	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LSN																
0	NUL	DLE		0	@	P	`	p				°	À	Ð	à	ð
1	SOH	DC1	!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2	STX	DC2	"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3	ETX	DC3	#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4	EOT	DC4	$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5	ENQ	NAK	%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6	ACK	SYN	&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7	BEL	ETB	'	7	G	W	g	w			§	·	Ç	×	ç	÷
8	BS	CAN	(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9	HT	EM	)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A	LF	SUB	*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B	VT	ESC	+	;	K	[	k	{			«	»	Ë	Û	ë	û
C	FF	FS	,	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D	CR	GS	-	=	M	]	m	}			-	½	Í	Ý	í	ý
E	SO	RS	.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F	SI	US	/	?	O	_	o				¯	¿	Ï	ß	ï	ÿ

Decoding of 00h to 1Fh

The support of the control characters in the range 00h to 1Fh is not mandatory. The receiver shall not react on reception of an unsupported value in this range. If the receiver supports any of the encoded controls (like backspace, clear screen ...) the encoding shall however be as indicated above.

3.5 Datapoint Types “8-Bit Unsigned Value”

3.5.1 Scaled values

Format: 8 bit: U_8

octet nr: 1

field names: Unsigned Value

encoding: U U U U U U U U

Encoding: binary encoded

msb							lsb	
U	U	U	U	U	U	U	U	
0	0	0	0	0	0	0	0	= range min. /off
0	0	0	0	0	0	0	1	= value “low”
⋮				⋮			⋮	
1	1	1	1	1	1	1	1	= range max.

Range: U = [0…255]

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	PDT:	Use:
5.001	DPT_Scaling	[0…100]	%	≈ 0,4 %	PDT_SCALING (alt.: PDT_UNISIGNED_CHAR)	G
5.003	DPT_Angle	[0…360]	°	≈ 1,4°	PDT_UNSIGNED_CHAR	G
5.004	DPT_Percent_U8 3)	[0…255]	%	1 %	PDT_UNSIGNED_CHAR	FB
	NOTE 3Differences between DPT_Scaling (5.001) and DPT_Percent_U8 (5.004)					

Datapoint Type	Encoded Value			Resolution
	50 %	100 %	255 %	
5.001	80h	FFh	Out of encodable range.	≈ 0,4 %
5.004	32h	64h	FFh	1 %

5.005	DPT_DecimalFactor		ratio		PDT_UNSIGNED_CHAR	

3) This DPT was previously named “DPT_RelPos_Valve”.

3.5.2 Non-scaled values

3.5.2.1 DPT_Value_1_Ucount

Format:	8 bit: U_8
octet nr	1
field names	Unsigned Value
encoding	U U U U U U U U
Encoding:	binary encoded
Range:	UnsignedValue = [0…255]
PDT:	PDT_UNSIGNED_CHAR

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
5.010	DPT_Value_1_Ucount	[0…255]	counter pulses	1 counter pulse	G

3.5.2.2 DPT for tariff information

Format:	8 bit: U_8
octet nr.	1
field names	Unsigned Value
encoding	U U U U U U U U
Encoding:	0: no tariff available 1 to 254: current or desired value 255: reserved; shall not be used (This value shall not be transmitted. On reception, the message with this value shall be ignored.)
Range::	UnsignedValue = [0 … 254]
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_UNSIGNED_CHAR

Datapoint Types

ID:	Name:	Use:
5.006	DPT_Tariff	G
	Usage This DPT shall be used for reading and setting tariff information. A large number of different tariffs are defined and these are specific to the country and even to the supplier. Therefore, the mapping between a tariff and this DPT is not standardised. For usability and interpretability of the tariff information by the end user, the product description should give clear information about this mapping	

3.6 Datapoint Types V_8

3.6.1 Signed Relative Value

Format:	8 bit
octet nr	1
field names	RelSigned Value
encoding	V V V V V V V V
Encoding:	Two's complement notation
Range:	-128 … 127
PDT:	PDT_CHAR

Datapoint Types

ID:	Name:	Range:	Unit:	Resolution	Use:
6.001	DPT_Percent_V8	-128 % … 127 %	%	1 %	G
6.010	DPT_Value_1_Count	-128 … 127	counter pulses	1 counter pulse	G

3.7 Datapoint Type “Status with Mode”

Format:	8 bit: B_5N_3
octet nr	1
field names	a b c d e f
encoding	B B B B B N N N
Range:	a, b, c, d, e = {0,1} f = {001b,010b,100b}
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_GENERIC_01

Datapoint Types

ID:	Name:	Encoding:	Use:
6.020	DPT_Status_Mode3	A,B,C,D,E: 0 = set 1 = clear FFF 001b = mode 0 is active 010b = mode 1 is active 100b = mode 2 is active	FB

3.8 Datapoint Types "2-Octet Unsigned Value"

3.8.1 2-octet unsigned counter value

Format:	2 octets: U_{16}
octet nr	2 MSB 1 LSB
field names	UnsignedValue
encoding	UUUUUUUU UUUUUUUU
Encoding:	Binary encoded value
Range:	UnsignedValue = [0…65535]
PDT	PDT_UNSIGNED_INT

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
7.001	DPT_Value_2_Ucount	[0…65 535]	pulses	1 pulse	G
7.010	DPT_PropDataType	Identifier Interface Object Property data type. No Unit.	n.a. 4)	n.a. 5)	FB

3.8.2 Time Period

Format:	2 octets: U_{16}
octet nr	2 MSB 1 LSB
field names	TimePeriod
encoding	UUUUUUUU UUUUUUUU
Encoding:	Binary encoded value
Range:	UnsignedValue = [0…65535]
PDT	PDT_UNSIGNED_INT

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
7.002	DPT_TimePeriodMsec	0 ms … 6 5535 ms	ms	1 ms	G
7.003	DPT_TimePeriod10Msec	0 s … 655,35 s	ms	10 ms	G 6)
7.004	DPT_TimePeriod100Msec	0 s … 6 553,5 s	ms	100 ms	G 6)
7.005	DPT_TimePeriodSec	0 s … 65 535 s (≅ 18,2 hours)	s	1 s	G
7.006	DPT_TimePeriodMin	0 min … 65 535 min (≅ 45,5 days)	min	1 min	G 6)
7.007	DPT_TimePeriodHrs	0 h … 65 535 h (≅ 7,4 years)	h	1 h	G

4) n.a. : not applicable

5) n.a. : not applicable

6) Not allowed for runtime communication. This DPT shall only be used for parameters and diagnostic data or if specified as such in a FB specification!

3.8.3 Other U_{16} Datapoint Types

Format:	2 octets: U_{16}
octet nr.	2_{MSB} 1_{LSB}
field names	UnsignedValue
encoding	U U U U U U U U U U U U U U U U
Encoding:	See below
Range:	UnsignedValue = [0 … 65 535]
Unit:	See below.
Resol.:	see below.
PDT:	PDT_UNSIGNED_INT

Datapoint Types

ID:	Name:	Range, encoding	Unit:	Resol.:	Use:
7.011	DPT_Length_mm	0 mm … 65 535 mm	mm	1 mm	FB SAB
7.012	DPT_UElCurrentmA	0 = no bus power supply functionality available	none	not applicable	FB
		1 … 65 535 = value binary encoded	mA	1 mA	
7.013	DPT_Brightness	0 lux … 65 535 lux value binary encoded	lux	1 lux	FB [7)]

7) DPT_Brightness shall solely be used for the encoding of the approved E-Mode parameters. For run-time communication, DPT_Value_Lux (F_{16}) shall be used.

3.9 Datapoint Types “2-Octet Signed Value”

3.9.1 2-octet signed counter value

Format:	2 octet: V_{16}
octet nr	2 MSB 1 LSB
field names	SignedValue
encoding	VVVVVVVV VVVVVVVV
Encoding:	Two’s complement notation
Range:	SignedValue = [-32 768 … 32 768]
PDT	PDT_INT

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
8.001	DPT_Value_2_Count	[-32 768 … 32 767] a)	pulses	1 pulse	G
8.010	DPT_Percent_V16	-327,68 % ... 327,67 %	%	0,01 %	G

a) Only for DPT_Value_2_Ucount, the value 7FFFh *can* be used to denote invalid data.
b) For DPT_Percent_, the value 7FFFh *shall* be used to denote invalid data.

3.9.2 Delta Time

Format:	2 octet: V_{16}
octet nr	2 MSB 1 LSB
field names	DeltaTime
encoding	VVVVVVVV VVVVVVVV
Encoding:	Two’s complement notation
Range:	SignedValue = [-32 768 … 32 768]
PDT	PDT_INT

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
8.002	DPT_DeltaTimeMsec	-32 768 ms … 32 767 ms	ms	1 ms	G
8.003	DPT_DeltaTime10Msec	-327,68 s … 327,67 s	ms	10 ms	G a)
8.004	DPT_DeltaTime100Msec	-3 276,8 s … 3 276,7 s	ms	100 ms	G a)
8.005	DPT_DeltaTimeSec	-32 768 s … 32 767 s (≅ 9,1 h)	s	1 s	G
8.006	DPT_DeltaTimeMin	-32 768 min … 32 767 min (≅ 22,7 d)	min	1 min	G a)
8.007	DPT_DeltaTimeHrs	-32 768 h … 32 767 h (≅ 3,7 y)	h	1 h	G

a) Not allowed for run-time communication. This DPT shall only be used for parameters and diagnostic data or if specified as such in a FB specification.

3.9.3 Other V_{16} Datapoint Types

Format:	2 octets: V_{16}
octet nr.	2_{MSB} 1_{LSB}
field names	SignedValue
encoding	V V V V V V V V V V V V V V V V
Encoding:	Two's complement notation.
Range:	SignedValue = [-32 768 … 32 768]
Unit:	See below
Resol.:	See below
PDT:	PDT_INT

Datapoint Types					
ID:	Name:	Range:	Unit:	Resol.:	Use:
8.011	DPT_Rotation_Angle	[-32 768°… 32 768°]	°	1°	FB SAB

3.10 Datapoint Types "2-Octet Float Value"

Format:	2 octets: F_{16}
octet nr	2_{MSB} 1_{LSB}
field names	FloatValue
encoding	M E E E E M M M M M M M M M M M
Encoding:	FloatValue = $(0{,}01*M)*2^{(E)}$ E = [0 … 15] M = [-2 048 … 2 047], two's complement notation For all Datapoint Types 9.xxx, the encoded value 7FFFh shall always be used to denote invalid data.
Range:	[-671 088,64 … 670 760,96]
PDT:	PDT_KNX_FLOAT

Datapoint Types					
ID:	Name:	Range:	Unit:	Resol.:	Use:
9.001	DPT_Value_Temp	-273 °C … 670 760 °C	°C [8)]	0,01 °C	G
9.002	DPT_Value_Tempd	-670 760 K … 670 760 K	K	0,01 K	G
9.003	DPT_Value_Tempa	-670 760 K/h … 670 760 K/h	K/h	0,01 K/h	G
9.004	DPT_Value_Lux	0 Lux … 670 760 Lux	Lux	0,01 Lux	G
9.005	DPT_Value_Wsp	0 m/s … 670 760 m/s	m/s	0,01 m/s	G
9.006	DPT_Value_Pres	0 Pa … 670 760 Pa	Pa	0,01 Pa	G

8) KNX Association strongly recommends full implementation of this Datapoint Type in objects with actuator functionality (i.e. receiving values from the bus). However, it is allowed for objects sending on or receiving temperature values from the bus to only support this Datapoint Type with a fixed exponent of 3. In this case, an appropriate warning shall be made to the installer in the manufacturer's product instruction sheet.

<table>
<tr><th colspan="6">Datapoint Types</th></tr>
<tr><th>ID:</th><th>Name:</th><th>Range:</th><th>Unit:</th><th>Resol.:</th><th>Use:</th></tr>
<tr><td>9.007</td><td>DPT_Value_Humidity [9)]</td><td>0 % … 670 760 %</td><td>%</td><td>0,01 %</td><td>G</td></tr>
<tr><td>9.008</td><td>DPT_Value_AirQuality</td><td>0 ppm … 670 760 ppm</td><td>ppm</td><td>0,01 ppm</td><td>G</td></tr>
<tr><td>9.010</td><td>DPT_Value_Time1</td><td>-670 760 s … 670 760 s</td><td>s</td><td>0,01 s</td><td>G</td></tr>
<tr><td>9.011</td><td>DPT_Value_Time2</td><td>-670 760 ms … 670 760 ms</td><td>ms</td><td>0,01 ms</td><td>G</td></tr>
<tr><td>9.020</td><td>DPT_Value_Volt</td><td>-670 760 mV… 670 760 mV</td><td>mV</td><td>0,01 mV</td><td>G</td></tr>
<tr><td>9.021</td><td>DPT_Value_Curr</td><td>-670 760 mA … 670 760 mA</td><td>mA</td><td>0,01 mA</td><td>G</td></tr>
<tr><td>9.022</td><td>DPT_PowerDensity</td><td>-670 760 W/m^2 … 670 760 W/m^2</td><td>W/m^2</td><td>0,01 W/m^2</td><td>FB</td></tr>
<tr><td>9.023</td><td>DPT_KelvinPerPercent</td><td>-670 760 K/% … 670 760 K/%</td><td>K/%</td><td>0,01 K/%</td><td>FB</td></tr>
<tr><td>9.024</td><td>DPT_Power</td><td>-670 760 kW … 670 760 kW</td><td>kW</td><td>0,01 kW</td><td>FB</td></tr>
<tr><td></td><td colspan="5">NOTE 4 – DPTs for power
Two DPTs are specified for encoding electrical power. The DPT shall be chosen appropriately in function of the accuracy and range that shall be covered by the application.
Table 1 – DPTs for power
<table>
<tr><th>ID</th><th>Name</th><th>Range</th><th>Resolution</th></tr>
<tr><td>9.024</td><td>DPT_Power</td><td>-671 088,64 kW to 670 760,96 kW
-671 088 640 W to 670 760 960 W</td><td>0,01 kW</td></tr>
<tr><td>14.056</td><td>DPT_Value_Power</td><td>± ~10$^{-44,85}$ to ~10^{38,53}</td><td>1 W</td></tr>
</table></td></tr>
<tr><td>9.025</td><td>DPT_Value_Volume_Flow</td><td>-670 760 l/h … 670 760 l/h</td><td>l/h</td><td>0,01 l/h</td><td>FB</td></tr>
<tr><td>9.026</td><td>DPT_Rain_Amount</td><td>-671 088,64 l/m^2 to 670 760,96 l/m^2</td><td>l/m^2</td><td>0,01 l/m^2</td><td>G</td></tr>
<tr><td>9.027</td><td>DPT_Value_Temp_F</td><td>-459,6 °F to 670 760,96 °F</td><td>°F</td><td>0,01 °F</td><td>G</td></tr>
<tr><td></td><td colspan="5">DPT_Value_Temp_F may be implemented only as extra DP next to a DP with DPT_Value_Temp (9.001). This applies both for Inputs as well as for Outputs. It shall be possible through a parameter to select the DP or its format; the default setting for this parameter shall enable DPT_Value_Temp (9.001).</td></tr>
<tr><td>9.028</td><td>DPT_Value_Wsp_kmh</td><td>0 km/h … 670 760,96 km/h</td><td>km/h</td><td>0,01 km/h</td><td>G</td></tr>
<tr><td></td><td colspan="5">DPT_Value_Wsp_kmh may be implemented only as extra DP next to a DP with DPT_Value_Wsp (9.005). This applies both for Inputs as well as for Outputs. It shall be possible through a parameter to select the DP or its format; the default setting for this parameter shall be DPT_Value_Wsp (9.005).</td></tr>
</table>

9) This DPT is only used in case of universal I/O modules which can provide any sensor value in 2 octet float format.

3.11 Datapoint Type “Time”

Format:	3 octets: $N_3U_5r_2U_6r_2U_6$
octet nr.	3 MSB 2 1 LSB
field names	Day Hour | 0 0 Minutes | 0 0 Seconds
encoding	N N N U U U U U | r r U U U U U U | r r U U U U U U
Encoding:	binary encoded
PDT:	PDT_TIME

Datapoint Types

ID:	Name:	Field:	Encoding:	Range:	Unit:	Resol.:	Use:
10.001	DPT_TimeOfDay	Day	1 = Monday … 7 = Sunday 0 = no day	[0…7]	none	none	G
		Hour	binary encoded	[0…23]	hours	h	
		Minutes	binary encoded	[0…59]	minutes	min	
		Seconds	binary encoded	[0…59]	seconds	s	

3.12 Datapoint Type “Date”

Format:	3 octets: $r_3U_5r_4U_4r_1U_7$
octet nr.	3 MSB 2 1 LSB
field names	0 0 0 Day | 0 0 0 0 Month | 0 Year
encoding	r r r U U U U U | r r r r U U U U | r U U U U U U U
Encoding:	All values binary encoded.
PDT:	PDT_DATE

Datapoint Types

ID:	Name:	Field:	Range:	Unit:	Resol.:	Use:
11.001	DPT_Date	Day	[1…31]	Day of month	1 day	G
		Month	[1…12]	Month	1 month	
		Year	[0…99]	Year	1 year	

Century Encoding

The following interpretation shall be carried out by devices receiving the Datapoint Type 11.001 and carrying out calculations on the basis of the entire 3rd octet:

if Octet 3 contains value ≥ 90 : interpret as 20th century

if Octet 3 contains value < 90: interpret as 21st century

This format covers the range 1990 to 2089.

EXAMPLE 3 YYYYYYY = 99_d equals 1999

YYYYYYY = 0_d equals 2000

YYYYYYY = 4_d equals 2004

3.13 Datapoint Types “4-Octet Unsigned Value”

Format:	4 octets: U_{32}
octet nr	4 MSB 3 2 1 LSB
field names	UnsignedValue
encoding	UUUUUUUU UUUUUUUU UUUUUUUU UUUUUUUU
Encoding:	Binary encoded
Range:	UnsignedValue = [0…4 294 967 295]
PDT	PDT_UNSIGNED_LONG

Datapoint Types

ID:	Name:	Unit:	Resol.:	Usage:
12.001	DPT_Value_4_Ucount	counter pulses	1 pulse	G

3.14 Datapoint Types “4-Octet Signed Value”

3.14.1 4 Octet signed counter value

Format:	4 octets: V_{32}
octet nr	4 MSB 3 2 1 LSB
field names	SignedValue
encoding	VVVVVVVV VVVVVVVV VVVVVVVV VVVVVVVV
Encoding:	Two’s complement notation
Range:	SignedValue = [-2 147 483 648 … 2 147 483 647]
PDT	PDT_LONG

Datapoint Types

ID:	Name:	Unit:	Resol.:	Use:
13.001	DPT_Value_4_Count	counter pulses	1 pulse	G
13.002	DPT_FlowRate_m3/h	Flow Rate in m^3/h with high resolution	0,0001 m^3/h	G

3.14.2 DPTs for electrical energy

Format:	4 octets: V_{32}
octet nr.	4 MSB 3 2 1 LSB
field names	SignedValue
encoding	VVVVVVVV VVVVVVVV VVVVVVVV VVVVVVVV
Encoding:	Two's complement notation.
Range:	SignedValue = [-2 147 483 648 … 2 147 483 647]
PDT:	PDT_LONG

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
13.010	DPT_ActiveEnergy	[-2 147 483 648 … 2 147 483 647] Wh	Wh	1 Wh	G
13.011	DPT_ApparantEnergy	[-2 147 483 648 … 2 147 483 647] VAh	VAh	1 VAh	G
13.012	DPT_ReactiveEnergy	[-2 147 483 648 … 2 147 483 647] VARh	VARh	1 VARh	G
13.013	DPT_ActiveEnergy_kWh	[-2 147 483 648 … 2 147 483 647] kWh	kWh	1 kWh	G
13.014	DPT_ApparantEnergy_kVAh	[-2 147 483 648 … 2 147 483 647] kVAh	kVAh	1 kVAh	G
13.015	DPT_ReactiveEnergy_kVARh	[-2 147 483 648 … 2 147 483 647] kVARh	kVARh	1 kVARh	G

NOTE 5 For electrical power, DPT_Power (9.024) or DPT_Value_Power (14.056) shall be used according NOTE 4.

3.14.3 4 Octet signed time period

Format:	4 octets: V_{32}
octet nr	4 MSB 3 2 1 LSB
field names	SignedValue
encoding	VVVVVVVV VVVVVVVV VVVVVVVV VVVVVVVV
Encoding:	Two's complement notation
PDT	PDT_LONG

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
13.100	DPT_LongDeltaTimeSec	-2 147 483 648 s … 2 147 483 647 s [a]	s	1 s	G [b]

[a] This is approximately 68 years. Thanks to this large possible range, no binary overflow will be possible in practice.

[b] This DPT shall however only be used for diagnostic data, like operating hours. It shall not be used for run time communication (inputs and outputs) nor for parameters.

3.15 Datapoint Types “4-Octet Float Value”

Format:	4 octets: F_{32}
octet nr.	4 MSB 3 2 1 LSB
field names	S Exponent Fraction
encoding	F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F F
Encoding:	The values are encoded in the IEEE floating point format according IEEE 754.
Range:	S (Sign) = {0,1} Exponent = [0 … 255] Fraction = [0 … 8 388 607]
PDT:	PDT_FLOAT

Datapoint Types					
ID:	Name:	Unit:	Resol.:	Comment:	Use:
14.000	DPT_Value_Acceleration	ms^{-2}	1 ms^{-2}	acceleration	G
14.001	DPT_Value_Acceleration_Angular	rad s^{-2}	1 rad s^{-2}	acceleration, angular	G
14.002	DPT_Value_Activation_Energy	J mol^{-1}	1 J mol^{-1}	activation energy	G
14.003	DPT_Value_Activity	s^{-1}	1 s^{-1}	activity (radioactive)	G
14.004	DPT_Value_Mol	mol	1 mol	amount of substance	G
14.005	DPT_Value_Amplitude	-	-	amplitude (unit as appropriate)	G
14.006	DPT_Value_AngleRad	rad	1 rad	angle, radiant	G
14.007	DPT_Value_AngleDeg	°	1 °	angle, degree	G
14.008	DPT_Value_Angular_Momentum	J s	1 J s	angular momentum	G
14.009	DPT_Value_Angular_Velocity	rad s^{-1}	1 rad s^{-1}	angular velocity	G
14.010	DPT_Value_Area	m^2	1 m^2	area	G
14.011	DPT_Value_Capacitance	F	1 F	capacitance	G
14.012	DPT_Value_Charge_DensitySurface	C m^{-2}	1 C m^{-2}	charge density (surface)	G
14.013	DPT_Value_Charge_DensityVolume	C m^{-3}	1 C m^{-3}	charge density (volume)	G
14.014	DPT_Value_Compressibility	m^2 N-1	1 m^2 N^{-1}	compressibility	G
14.015	DPT_Value_Conductance	S = Ω^{-1}	1 S	conductance	G
14.016	DPT_Value_Electrical_Conductivity	S m^{-1}	1 S m^{-1}	conductivity, electrical	G
14.017	DPT_Value_Density	kg m^{-3}	1 kg m^{-3}	density	G
14.018	DPT_Value_Electric_Charge	C	1 C	electric charge	G
14.019	DPT_Value_Electric_Current	A	1 A	electric current	G
14.020	DPT_Value_Electric_CurrentDensity	A m^{-2}	1 A m^{-2}	electric current density	G
14.021	DPT_Value_Electric_DipoleMoment	C m	1 C m	electric dipole moment	G
14.022	DPT_Value_Electric_Displacement	C m^{-2}	1 C m^{-2}	electric displacement	G
14.023	DPT_Value_Electric_FieldStrength	V m^{-1}	1 V m^{-1}	electric field strength	G
14.024	DPT_Value_Electric_Flux	c	1 c	electric flux	G
14.025	DPT_Value_Electric_FluxDensity	C m^{-2}	1 C m^{-2}	electric flux density	G
14.026	DPT_Value_Electric_Polarization	C m^{-2}	1 C m^{-2}	electric polarization	G
14.027	DPT_Value_Electric_Potential	V	1 V	electric potential	G

Datapoint Types					
ID:	Name:	Unit:	Resol.:	Comment:	Use:
14.028	DPT_Value_Electric_PotentialDifference	V	1 V	electric potential difference	G
14.029	DPT_Value_ElectromagneticMoment	A m^2	1 A m^2	electromagnetic moment	G
14.030	DPT_Value_Electromotive_Force	V	1 V	electromotive force	G
14.031	DPT_Value_Energy	J	1 J	energy	G
14.032	DPT_Value_Force	N	1 N	force	G
14.033	DPT_Value_Frequency	Hz = s^{-1}	1 Hz	frequency	G
14.034	DPT_Value_Angular_Frequency	rad s^{-1}	1 rad s^{-1}	frequency, angular (pulsatance)	G
14.035	DPT_Value_Heat_Capacity	J K^{-1}	1 J K^{-1}	heat capacity	G
14.036	DPT_Value_Heat_FlowRate	W	1 W	heat flow rate	G
14.037	DPT_Value_Heat_Quantity	J	1 J	heat, quantity of	G
14.038	DPT_Value_Impedance	Ω	1 Ω	impedance	G
14.039	DPT_Value_Length	m	1 m	length	G
14.040	DPT_Value_Light_Quantity	J or lm s	1 J	light, quantity of	G
14.041	DPT_Value_Luminance	cd m^{-2}	1 cd m^{-2}	luminance	G
14.042	DPT_Value_Luminous_Flux	lm	1 lm	luminous flux	G
14.043	DPT_Value_Luminous_Intensity	cd	1 cd	luminous intensity	G
14.044	DPT_Value_Magnetic_FieldStrength	A m^{-1}	1 A m^{-1}	magnetic field strength	G
14.045	DPT_Value_Magnetic_Flux	Wb	1 Wb	magnetic flux	G
14.046	DPT_Value_Magnetic_FluxDensity	T	1 T	magnetic flux density	G
14.047	DPT_Value_Magnetic_Moment	A m^2	1 A m^2	magnetic moment	G
14.048	DPT_Value_Magnetic_Polarization	T	1 T	magnetic polarization	G
14.049	DPT_Value_Magnetization	A m^{-1}	1 A m^{-1}	magnetization	G
14.050	DPT_Value_MagnetomotiveForce	A	1 A	magneto motive force	G
14.051	DPT_Value_Mass	kg	1 kg	mass	G
14.052	DPT_Value_MassFlux	kg s^{-1}	1 kg s^{-1}	mass flux	G
14.053	DPT_Value_Momentum	N s^{-1}	1 N s^{-1}	momentum	G
14.054	DPT_Value_Phase_AngleRad	rad	1 rad	phase angle, radiant	G
14.055	DPT_Value_Phase_AngleDeg	°	1°	phase angle, degrees	G
14.056	DPT_Value_Power [10)]	W	1 W	power	G
14.057	DPT_Value_Power_Factor	cos Φ	1 cos Φ	power factor	G
14.058	DPT_Value_Pressure	Pa = N m^{-2}	1 Pa	pressure	G
14.059	DPT_Value_Reactance	Ω	1 Ω	reactance	G
14.060	DPT_Value_Resistance	Ω	1 Ω	resistance	G
14.061	DPT_Value_Resistivity	Ωm	1 Ωm	resistivity	G
14.062	DPT_Value_SelfInductance	H	1 H	self inductance	G

[10)] Concerning the selection of the appropriate DPT for encoding electrical power, NOTE 2 shall be observed.

Datapoint Types					
ID:	Name:	Unit:	Resol.:	Comment:	Use:
14.063	DPT_Value_SolidAngle	sr	1 sr	solid angle	G
14.064	DPT_Value_Sound_Intensity	W m^{-2}	1 W m-2	sound intensity	G
14.065	DPT_Value_Speed	m s^{-1}	1 m s-1	speed	G
14.066	DPT_Value_Stress	Pa = N m^{-2}	1 Pa	stress	G
14.067	DPT_Value_Surface_Tension	Nm^{-1}	1 Nm-1	surface tension	G
14.068	DPT_Value_Common_Temperature	°C	1°C	temperature, common	G
14.069	DPT_Value_Absolute_Temperature	K	vK	temperature (absolute)	G
14.070	DPT_Value_TemperatureDifference	K	1 K	temperature difference	G
14.071	DPT_Value_Thermal_Capacity	JK^{-1}	1 J K-1	thermal capacity	G
14.072	DPT_Value_Thermal_Conductivity	W m^{-1} K^{-1}	1 W m^{-1} K^{-1}	thermal conductivity	G
14.073	DPT_Value_ThermoelectricPower	V K^{-1}	1 V K^{-1}	thermoelectric power	G
14.074	DPT_Value_Time	s	1 s	time [11)]	G
14.075	DPT_Value_Torque	Nm	1 Nm	torque	G
14.076	DPT_Value_Volume	m^3	1 m^3	volume	G
14.077	DPT_Value_Volume_Flux	$m^3 s^{-1}$	1 $m^3 s^{-1}$	volume flux	G
14.078	DPT_Value_Weight	N	1 N	weight	G
14.079	DPT_Value_Work	J	1 J	work	G

3.16 Datapoint Type DPT_Access_Data

Format: 4 octets: $U_4U_4U_4U_4U_4U_4B_4N_4$

octet nr.	4 MSB		3		2		1 LSB							
field names	D_6	D_5	D_4	D_3	D_2	D_1	E	P	D	C	Index			
encoding	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	b	b	b	b	N	N	N	N

Encoding: D_6, D_5, D_4, D_3, D_2, D_1: binary encoded value
N: binary encoded value
E, P, D, C: See below

Unit: Not applicable.

Resol.: Not applicable.

PDT: PDT_GENERIC_04

Datapoint Types		
ID:	Name:	Use:
15.000	DPT_Access_Data	FB

[11)] For proper usage see note!

Field	Description	Encoding	Range
D_6, D_5, D_4, D_3, D_2, D_1	digit x (1…6) of access identification code. Only a card or key number should be used. System number, version number, country code, etc are not necessary. Ciphered access information code should be possible in principle. If 24 bits are not necessary, the most significant positions shall be set to zero.	Values binary encoded.	[0 … 9]
E	Detection error	0 = no error 1 = reading of access information code was not successful).	{0,1}
P	Permission (informs about the access decision made by the controlling device)	0 = not accepted 1 = accepted	{0,1}
D	Read direction (e.g. of badge) If not used (e.g. electronic key) set to zero.	0 = left to right 1 = right to left	{0,1}
C	Encryption of access information.	0 = no 1 = yes	{0,1}
Index	Index of access identification code (future use)	Value binary encoded.	[0 … 15]

EXAMPLE 1 Transmission of the access identification code “123456”, without error indication, permission accepted, badge read from left to right, no encryption and index 13.

Octet 6								Octet 7								Octet 8								Octet 9								Octet 10								Octet 11							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
						APCI		r	r	r	r	r	r			D_6				D_5				D_4				D_3				D_2				D_1				E	P	D	C	Index			
						0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	0	0	0	1	0	1	0	1	1	0	0	1	0	0	1	1	0	1
																1				2				3				4				5				6								13			

EXAMPLE 2 Transmission of the access identification code “6789”, without error indication, permission not accepted, badge read from left to right, no encryption and index 14.

Octet 6								Octet 7								Octet 8								Octet 9								Octet 10								Octet 11							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
						APCI		r	r	r	r	r	r			D_6				D_5				D_4				D_3				D_2				D_1				E	P	D	C	Index			
						0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0
																0				0				6				7				8				9								14			

3.17 Datapoint Types "String"

Format:	14 octets: A_{112}
octet nr.	14 MSB … 1 LSB
field names	Character 1 … Character 14
encoding	A A A A A A A … A A A A A A A A
Encoding:	These Datapoint Types are used to transmit strings of textual characters. The length is fixed to 14 octets. The contents are filled starting from the most significant octet. Each octet shall be encoded as specified for the chosen character set, as defined in clause 0. If the string to be transmitted is smaller then 14 octets, unused trailing octets in the character string shall be set to NULL (00h). Example: 'KNX is OK' is encoded as follows : 4B 4E 58 20 69 73 20 4F 4B 00 00 00 00 00
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_GENERIC_14

Datapoint Types

ID:	Name:	Range:	Use:
16.000	DPT_String_ASCII	See 4.001 (DPT_Char_ASCII)	G
16.001	DPT_String_8859_1	See 4.002 (DPT_Char_8859_1)	G

3.18 Datapoint Type Scene Number

Format:	1 octet: r_2U_6
octet nr.	1
field names	r r SceneNumber
encoding	0 0 U U U U U U
PDT:	PDT_GENERIC_01

Datapoint Types

ID:	Name:	Encoding:		Resol:	Range:	Use:
17.001	DPT_SceneNumber	SceneNumber	Value binary encoded	1	[0 … 63]	G

3.19 Datapoint Type DPT_SceneControl

Format:	1 octet: $B_1r_1U_6$
octet nr.	1
field names	C R Scene-Number
encoding	B r U U U U U U
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_GENERIC_01

Datapoint Types

ID:	Name:	Encoding:		Range:	Use:
18.001	DPT_SceneControl	C	0 = activate the scene corresponding to the field Scene Number 1 = learn the scene corresponding to the field Scene Number	[0, 1]	G
		R	Reserved (0)	{0}	
		Scene-Number	Scene number	[0 … 63]	

NOTE 6 DPT_SceneControl allows numbering the scene from 0 to 63. KNX Association recommends displaying these scene numbers in ETS™, other software and controllers numbered from 1 to 64, this is, with an offset of 1 compared to the actual transmitted value.

3.20 Datapoint Type 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 0 DayOfMonth	DayOf-Week HourOfDay
encoding	U U U U U U U U	r r r r U U U U	r r r U U U U U	U U U U U U U U
octet nr.	4	3	2	1 LSB
field names	0 0 Minutes	0 0 Seconds	F WD NWD NY ND NDoW NT SUTI	CLQ 0 0 0 0 0 0 0
encoding	r r U U U U U U	r r U U U U U U	B B B B B B B B	B r r r r r r r

PDT: PDT_DATE_TIME

Datapoint Types		
ID:	Name:	Use:
19.001	DPT_DateTime	G

Field	Description	Encoding	Range	Unit	Resol.:
Year	Year	Value binary encoded, offset 1900 0 = 1900 255 = 2155	[0…255]	year	1 year
Month	Month	Value binary encoded 1 = January … 12 = December	[1…12]	Month	1 month
DayOfMonth	D	Value binary encoded 1 = 1st day 31 = 31st day	[1…31]	none	none
DayOfWeek	Day of week	Value binary encoded 0 = any day 1 = Monday … 7 = Sunday	[0…7]	none	none
HourOfDay	Hour of day	Value binary encoded.	[0…24]	h	1 h
Minutes	Minutes	Value binary encoded.	[0…59]	min	1 min
Seconds	Seconds	Value binary encoded.	[0…59]	s	1 s
F	Fault	0 = Normal (No fault) 1 = Fault	{0,1}	none	none
WD	Working Day	0 = Bank day (No working day) 1 = Working day	{0,1}	none	none
NWD	No WD	0 = WD field valid 1 = WD field not valid	{0,1}	none	none
NY	No Year	0 = Year field valid 1 = Year field not valid	{0,1}	none	none
ND	No Date	0 = Month and Day of Month fields valid 1 = Month and Day of Month fields not valid	{0,1}	none	none

Field	Description	Encoding	Range	Unit	Resol.:
NDOW	No Day of Week	0 = Day of week field valid 1 = Day of week field not valid	{0,1}	none	none
NT	No Time	0 = Hour of day, Minutes and Seconds fields valid 1 = Hour of day, Minutes and Seconds fields not valid	{0,1}	none	none
SUTI	Standard Summer Time	0 = Time = UT+X 1 = Time = UT+X+1	{0,1}	none	none
CLQ	Quality of Clock	0 = clock without ext. sync signal 1 = clock with ext. sync signal	{0,1}	none	none

3.20.1 Notes

Note 7

The year is encoded on 8 bits instead as on 7 bits as in DPT_Date. This encoding is taken from the BACnet standard.

Note 8

The encoding of the hour is within the range [0…24] instead of [0…23].

When the hour is set to "24", the values of octet 3 (Minutes) and 2 (Seconds) have to be set to zero. Messages with invalid values ("Hour = 24", Minutes and Seconds not zero) have to be ignored by the receiver.

Explanation: for normal clock information the range 0 … 23 would certainly be sufficient. But this Datapoint Type will also be used to encode e.g. schedule programs. In daily schedule programs usually "end of day" is encoded as 24:00:00 and not 23:59:59; otherwise there would be a 1 s "break" at midnight.

Example: comfort temperature level from 07:00 ... 24:00.

Without the value 24:00:00 there is a problem to differentiate between a full 24 h period and a 0 h period.

Examples:

- A daily program with 24 h comfort level is encoded as "start comfort: 00:00:00" and "end of comfort: 24:00:00".
- A daily program with 0 h comfort level (⇒ all day economy level) is encoded as "start comfort: 00:00:00" and "end of comfort: 00:00:00".

Note 9

"Fault" is set if one ore more supported fields of the Date&Time information are **corrupted.** This is not the same as when the NY, ND, NW etc. attributes would be set (in this case the corresponding fields are not supported).

"Fault" is set e.g.

- after power-down, if battery backup of the clock was not sufficient
- after 1st start-up of the device (clock unconfigured)
- radio-clock (DCF 77) had no reception for a very long time

"Fault" is usually cleared automatically by the device (producer) if the local clock is set or clock data is refreshed by other means (e.g. by reception of system clock message, reception of DCF 77 radio message etc.).

The receiver (e.g. a room unit, MMI) will interpret Date&Time with "Fault" as corrupted and will either ignore the message or show --:--:-- or blinking 00:00:00 (as known from Video recorders after power-up).

Note 10

SUTI is only an attribute for information / visualisation. In the hour field, summer-time correction is already considered. Therefore no hour offset shall be added by the receiver if SUTI is set.

SUTI = 0	standard time
SUTI = 1	summer daylight saving time

Note 11

NDoW = 1	means that the “Day of Week”-field ddd is invalid and the ddd information shall be ignored. A Clock not supporting Day of Week information shall set NdoW = 1.
NDoW = 0 and ddd = 0	means that the ddd-field is valid and that ddd is a wildcard. This encoding feature is thought for use in for instance scheduling information.

Note 12

Bit 7 of the octet 1 is used for “Quality of Clock” bit (CLQ). The other bits of this octet are reserved for future extensions. Their values shall be 0. If this Datapoint Type is used for transmitting data, transmitters shall set the lower 7 bits to 0. Receivers shall check these bits to be 0.

This bit is called “Quality of Clock” (CLQ).

Encoding

0: *Clock without an external synchronisation signal.*

The device sending date&time information has a local clock, which can be inaccurate !

1: *Clock with an external synchronisation signal (like DCF77, videotext, etc.).*

The device sending date & time information sends signals which are synchronised (time to time) with external date & time information.

The default value is 0.

Also an externally synchronised clock should send CLQ = 0 after start-up (until reception of first synchronisation signal) or after a synchronisation timeout.

The “Quality of Clock” bit (CLQ) is used in datagrams transmitting date&time information during *runtime*.

In the FB System Clock, CLQ information is used for resolution of system clock master conflicts: a system clock master sending CLQ = 1 displaces a system clock master sending CLQ = 0 (for further information see Chapter 7/1/1 "FB System Clock".

If the Datapoint Type DPT_DateTime is used for *parameters* like scheduler information, use of this information bit makes no sense, CLQ bit should be set to 0.

3.21 Datapoint Types N_8

Format:	1 octet: N_8
octet nr.	1
field names	*field1*
encoding	N N N N N N N N
Encoding:	Encoding absolute value N = [0 … 255]
Unit:	none
Resol.:	none
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.001	DPT_SCLOMode	*field1* = SCLOMode 0 : autonomous 1 : slave 2 : master 3 to 255 : not used; reserved	[0 to 3]	FB
20.002	DPT_BuildingMode [12)]	*field1* = BuildingMode 0 : Building in use 1 : Building not used 2 : Building protection 3 to 255 : reserved, shall not be used	[0 to 2]	G
20.003	DPT_OccMode [13)]	*field1* = OccMode 0 : occupied 1 : standby 2 : not occupied 3 to 255 : not used; reserved	[0 to 2]	G
20.004	DPT_Priority [14)]	*field1* = Priority 0 is highest priority 0 : High 1 : Medium 2 : Low 3 : ‘void’ 4 to 255 : not used; reserved	[0 to 3]	FB
20.005	DPT_LightApplicationMode	field1 = Application Mode 0 : normal 1 : presence simulation 2 : night round 3 to 16 : reserved 17 to 255 : manufacturer specific	[0 to 2]	FB

12) Same as DPT_BuildingMode_Z (201.107), but without Status/Command field.

13) Same as DPT_OccMode_Z (201.108), but without Z_8 field.

14) This Datapoint Type is used for parameters, not for runtime interworking. It is used e.g. to define the alarm priority of a configurable digital alarm input in a device.

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.006	DPT_ApplicationArea [15)]	*field1* = ApplicationArea 0 : no fault 1 : system and functions of common interest 2 … 9 : reserved 10 : HVAC general FBs 11 : HVAC Hot Water Heating 12 : HVAC Direct Electrical Heating 13 : HVAC Terminal Units 14 : HVAC VAC 15 … 19 : reserved (HVAC) 20 : Lighting 21 … 29 : reserved (Lighting) 30 : Security 31 … 39 : reserved (Security) 40 : Load Management 41 … 49 : reserved (Load Management) 50 : Shutters and blinds other values : reserved, shall not be used	{0, 1, 10, 11, 12, 13, 14}	FB
20.007	DPT_AlarmClassType	*field1* = AlarmClassType 0 : reserved (not used) 1 : simple alarm 2 : basic alarm 3 : extended alarm 4 to 255 : reserved, shall not be used	[0 to 3]	FB
20.008	DPT_PSUMode	*field1* = PSUMode 0 : disabled (PSU/DPSU fixed off) 1 : enabled (PSU/DPSU fixed on) 2 : auto (PSU/DPSU automatic on/off) 3 to 255 : reserved, shall not be used	[0 to 2]	System

15) This coding corresponds to the numbering of parts in Volume 7 of KNX System Specification.

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.011	DPT_ErrorClass_System [16)]	*field1* = ErrorClass_System 0 : no fault 1 : general device fault (e.g. RAM, EEPROM, UI, watchdog, …) 2 : communication fault 3 : configuration fault 4 : hardware fault 5 : software fault 6 : insufficient non volatile memory 7 : insufficient volatile memory 8 : memory allocation command with size 0 received 9 : CRC-error 10 : watchdog reset detected 11 : invalid opcode detected 12 : general protection fault 13 : maximal table length exceeded 14 : undefined load command received 15 : Group Address Table is not sorted 16 : invalid connection number (TSAP) 17 : invalid Group Object number (ASAP) 18 : Group Object Type exceeds (PID_MAX_APDU_LENGTH – 2) 19 to 255 : reserved, shall not be used	[0 to 18]	FB
20.012	DPT_ErrorClass_HVAC [17)]	*field1* = AlarmClass_HVAC 0 : no fault 1 : sensor fault 2 : process fault / controller fault 3 : actuator fault 4 : other fault 5 to 255 : reserved, shall not be used	[0 to 4]	FB

16) This encoding is already used in FB Technical Alarm.

17) This encoding is already used in FB Technical Alarm.

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.013	DPT_Time_Delay (from PART_Time_Delay)	*field1* = TimeDelay 0 : not active 1 : 1 s 2 : 2 s 3 : 3 s 4 : 5 s 5 : 10 s 6 : 15 s 7 : 20 s 8 : 30 s 9 : 45 s 10 : 1 min 11 : 1,25 min 12 : 1,5 min 13 : 2 min 14 : 2,5 min 15 : 3 min 16 : 5 min 17 : 15 min 18 : 20 min 19 : 30 min 20 : 1 h 21 : 2 h 22 : 3 h 23 : 5 h 24 : 12 h 25 : 24 h 26 to 255 : reserved, shall not be used	[0 to 25]	FB
20.014	DPT_Beaufort_Wind_Force_Scale	*field1* = Wind Force Scale 0 : calm (no wind) 1 : light air 2 : light breeze 3 : gentle breeze 4 : moderate breeze 5 : fresh breeze 6 : strong breeze 7 : near gale / moderate gale 8 : fresh gale 9 : strong gale 10 : whole gale / storm 11 : violent storm 12 : hurricane 13 to 255 : reserved, shall not be used	[0 to 12]	G

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.017	DPT_SensorSelect	*field1* = SensorSelect 0 : inactive 1 : digital input not inverted 2 : digital input inverted 3 : analog input -> 0 % to 100% 4 : temperature sensor input 5 to 255 : resered, shall not be used	[0 to 4]	G
20.020	DPT_ActuatorConnectType	*field1* = *ActuatorConnectType* 0 : reserved 1 : SensorConnection 2 : ControllerConnection 3 to 255 : reserved, shall not be used	[1 to 2]	G

3.22 Datapoint Type B_8

3.22.1 Datapoint Type "General Status"

Format:	1 octet: Z_8			
octet nr.	1			
field names	Attributes			
	$b_7b_6b_5b_4b_3b_2b_1b_0$			
encoding	b b b b b b b b			
Resol.:	(not applicable)			
PDT:	PDT_BITSET8	(alt: PDT_GENERIC_01)		
Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
21.001	DPT_StatusGen	See below	See below	G

Data fields	Description		Encoding	Unit	Range
Attributes	Bit				
- OutOfService	b_0	corresponding Datapoint value is out of service	0 = false 1 = true	none	{0,1}
- Fault	b_1	corresponding Datapoint Main value is corrupted due to a failure	0 = false 1 = true	none	{0,1}
- Overridden	b_2	corresponding Datapoint Main value is overridden	0 = false 1 = true	none	{0,1}
- InAlarm	b_3	corresponding Datapoint is in alarm	0 = false 1 = true	none	{0,1}
- AlarmUnAck	b_4	alarm status of corresponding Datapoint is not acknowledged	0 = false 1 = true	none	{0,1}
- reserved	b_5, b_6, b_7	reserved, set 0	NA	NA	NA

Standard mode: This DPT represents the STATUS information of the LTE Z_8 information.

In the LTE model, the Z_8 field is always combined with a Datapoint main value (together thus building a compound structure). If in Standard Mode DPT_StatusGen is used, the corresponding Datapoint is **always additional information to another Datapoint that represents the main value**.

EXAMPLE

Datapoint 1: temperature sensor value with DPT_Value_Temp

Datapoint 2: additional status of Datapoint 1 with DPT_StatusGen

The 2 Datapoints Main value and Status value cannot be transmitted simultaneously. Therefore inconsistencies between the Main value and the Status information may occur. The Status information is mainly used for visualisation.

Restriction: Only the STATUS part of the Z_8 information can be transmitted. Execution of the Z_8 COMMAND feature is not possible in Standard Mode.

Please refer as well to the description of STATUS/COMMAND Z_8 in clause 4.1.

3.22.2 Datapoint Type "Device Control"

Format:	1 octet: B_8
octet nr.	1
field names	DeviceControl
	$b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0$
encoding	b b b b b b b b
Encoding:	See below
Range::	See below
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types			
ID:	Name:	Encoding, range:	Use:
21.002	DPT_Device_Control	See below	System: PID_DEVICE_CONTROL

Bit	Data fields	Description	Encoding	Unit	Range
b_0	- UserStopped	The user application is stopped.	0 = false 1 = true	none	{0,1}
b_1	- OwnIA	A datagram with the own Individual Address as Source Address has been received	0 = false 1 = true	none	{0,1}
b_2	- VerifyMode	Verify Mode is on.	0 = false 1 = true	none	{0,1}
$b_3 \ldots b_7$	- Reserved	reserved, set 0	NA	NA	NA

3.23 Datapoint Types N_2

Format:	2 bit: N_2
octet nr	1
field names	s
encoding	N N
Unit:	None
Resol.:	(not applicable)
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types				
ID:	Name:	Range:	Use:	Encoding:
23.001	DPT_OnOffAction	[00b…11b]	FB	s 00b = off 01b = on 10b = off/on 11b = on/off
23.002	DPT_Alarm_Reaction	[00b…10b]	FB	s 00b = no alarm is used 01b = alarm position is UP 10b = alarm position is DOWN (11b = reserved; shall not be used)
23.003	DPT_UpDown_Action	[00b…11b]	FB	s 00b = Up 01b = Down 10b = UpDown 11b = DownUp

3.24 Datapoint Type DPT_VarString_8859_1

Format:	variable length: A[n] N MSB ... 1 LSB A … 00
Encoding:	This Datapoint Type shall be used to transmit strings of textual characters. The length is *not fixed*, but *variable*; the string shall be terminated by a single character NULL (00h). No length information shall be transmitted in the APDU [a]. Handling non-supported lengths: - Data Link Layer: *neglect* the frame - Application Layer: *cut* to the maximum supported length, keeping the characters at the beginning, i.e. starting with the MSB. - Interface Object Server The implicit array strucure of a property value of an Interface Object property can be used to store multiple strings. Every array element shall contain exactly one string. These array elements can have a different length. The APDU's used to read/write these strings shall only contain entire strings; exactly one NULL-character shall appear between string elements and at the end of the last string [18]. This means that strings that do not fit in the supported array length shall not be cut off. If a property value is read which would lead to an APDU longer than the length supported by the server, the server shall respond with a negative response; i.e. the APDU shall not be limited to the number of elements that *does* fit it, but instead contain no property value data. The client can then read a smaller number of array elements. Each character shall be encoded according ISO 8859-1. Example: 'KNX is OK' is encoded as follows : 4Bh 4Eh 58h 20h 69h 73h 20h 4Fh 4Bh 00h Example: 'This format allows transmission of very long strings!' is encoded as follows : 54h 68h 69h 73h 20h 66h 6Fh 72h 6Dh 61h 74h 20h 61h 6Ch 6Ch 6Fh 77h 73h 20h 74h 72h 61h 6Eh 73h 6Dh 69h 73h 73h 69h 6Fh 6Eh 20h 6Fh 66h 20h 76h 65h 72h 79h 20h 6Ch 6Fh 6Eh 67h 20 73h 74h 72h 69h 6Eh 67h 73h 21h 00h
Unit:	Not applicable.
PDT:	

Datapoint Types

ID:	Name:	Range	Usage:
24.001	DPT_VarString_8859_1	Acc. DPT 4.002 (DPT_Char_8859_1)	General

[a] Length information is implicitly in the frame (by the Data Link Layer)

[18] The NULL character is actually part of the DPT_VarString_8859_1 format.

3.25 Datapoint Type DPT_SceneInfo

Format:	1 octet: $r_1B_1U_6$
octet nr.	1
field names	R B Scene-Number
encoding	0 b U U U U U U
Encoding:	All values binary encoded.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_GENERIC_01

Datapoint Types

ID:	Name:	Encoding:		Range:	Use:
26.001	DPT_SceneInfo	r	Reserved (0)	none	G
		B	info: 0 = scene is active 1 = scene is inactive	[0, 1]	
		SceneNumber	Scene number	[0 … 63]	

NOTE 13 DPT_SceneInfo allows numbering the scene from 0 to 63. KNX Association recommends displaying these scene numbers in ETS™, other software and controllers numbered from 1 to 64, this is, with an offset of 1 compared to the actual transmitted value.

3.26 Datatype B_{32}

3.26.1 Datapoint Type "Combined Info On Off"

Format:	4 octets: B_{32}
octet nr.	4 MSB 3 2 1 LSB
field names	m15 m14 m13 m12 m11 m10 m9 m8 m7 m6 m5 m4 m3 m2 m1 m0 s15 s14 s13 s12 s11 s10 s9 s8 s7 s6 s5 s4 s3 s2 s1 s0
encoding	B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B
Encoding:	Value of all fields binary coded
Range:	All fields: {0, 1}
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_GENERIC_04

Datapoint Types		
ID:	Name:	Use:
27.001	DPT_CombinedInfoOnOff	General [a)]

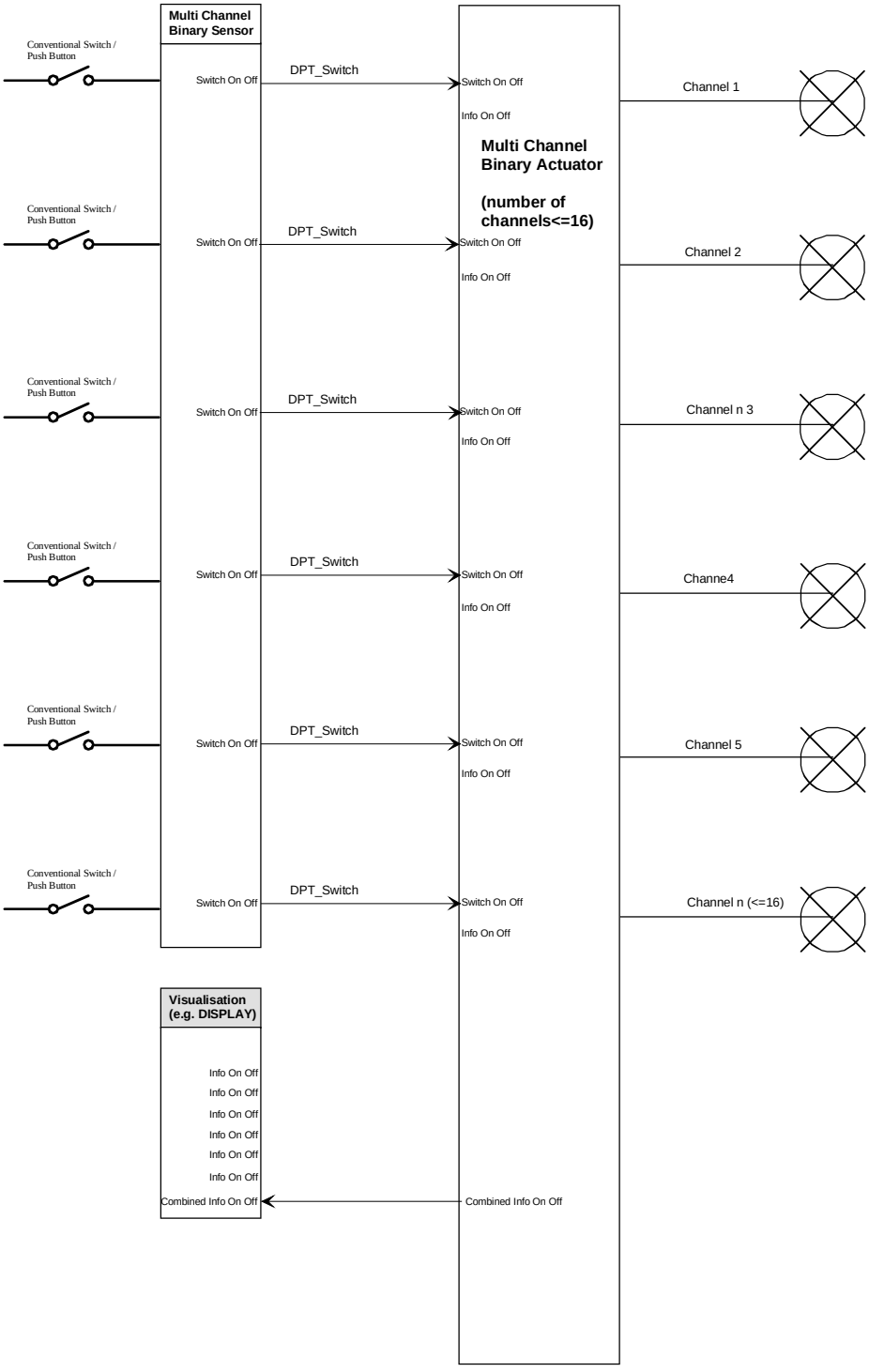
[a)] This DPT shall only be used for status outputs.

Datafields	Bit #	Description	Encoding
s0	0	Info On Off Output 1	0 = output state is Off 1 = output state is On
s1	1	Info On Off Output 2	0 = output state is Off 1 = output state is On
s2	2	Info On Off Output 3	0 = output state is Off 1 = output state is On
s3	3	Info On Off Output 4	0 = output state is Off 1 = output state is On
s4	4	Info On Off Output 5	0 = output state is Off 1 = output state is On
s5	5	Info On Off Output 6	0 = output state is Off 1 = output state is On
s6	6	Info On Off Output 7	0 = output state is Off 1 = output state is On
s7	7	Info On Off Output 8	0 = output state is Off 1 = output state is On
s8	8	Info On Off Output 9	0 = output state is Off 1 = output state is On
s9	9	Info On Off Output 10	0 = output state is Off 1 = output state is On
s10	10	Info On Off Output 11	0 = output state is Off 1 = output state is On
s11	11	Info On Off Output 12	0 = output state is Off 1 = output state is On
s12	12	Info On Off Output 13	0 = output state is Off 1 = output state is On
s13	13	Info On Off Output 14	0 = output state is Off 1 = output state is On
s14	14	Info On Off Output 15	0 = output state is Off 1 = output state is On
s15	15	Info On Off Output 16	0 = output state is Off 1 = output state is On

Datafields	Bit #	Description	Encoding
m0	16	Mask Bit Info On Off Output 1	0 = output state is not valid 1 = output state is valid
m1	17	Mask Bit Info On Off Output 2	0 = output state is not valid 1 = output state is valid
m2	18	Mask Bit Info On Off Output 3	0 = output state is not valid 1 = output state is valid
m3	19	Mask Bit Info On Off Output 4	0 = output state is not valid 1 = output state is valid
m4	20	Mask Bit Info On Off Output 5	0 = output state is not valid 1 = output state is valid
m5	21	Mask Bit Info On Off Output 6	0 = output state is not valid 1 = output state is valid
m6	22	Mask Bit Info On Off Output 7	0 = output state is not valid 1 = output state is valid
m7	23	Mask Bit Info On Off Output 8	0 = output state is not valid 1 = output state is valid
m8	24	Mask Bit Info On Off Output 9	0 = output state is not valid 1 = output state is valid
m9	25	Mask Bit Info On Off Output 10	0 = output state is not valid 1 = output state is valid
m10	26	Mask Bit Info On Off Output 11	0 = output state is not valid 1 = output state is valid
m11	27	Mask Bit Info On Off Output 12	0 = output state is not valid 1 = output state is valid
m12	28	Mask Bit Info On Off Output 13	0 = output state is not valid 1 = output state is valid
m13	29	Mask Bit Info On Off Output 14	0 = output state is not valid 1 = output state is valid
m14	30	Mask Bit Info On Off Output 15	0 = output state is not valid 1 = output state is valid
m15	31	Mask Bit Info On Off Output 16	0 = output state is not valid 1 = output state is valid
If one or more output bits are not used or the output states are not valid then the assigned mask bits of this outputs shall be set to the value = 0.			

Usage requirements

This DPT may only be used for encoding the combined binary output information of a multiple channel binary actuator. It avoids the bus load that is caused by individual single bit state outputs, certainly in case of simultaneous changes (e.g. “all off”).



3.27 Datapoint Type Unicode UTF-8 String A[n]

3.27.1 DPT_UTF-8

Format: A[n]

N_{MSB}	...	1_{LSB}
A	…	00

Encoding: This Datapoint Type shall be used to transmit Unicode strings, whereas the UTF-8 encoding scheme shall be used for Unicode Transformation to data contents for transmission.

The data length for one character is variable from 1 octet to 4 octets. Each character shall be encoded according Unicode Transformation Format UTF-8:

Char. number range (hexadecimal)	UTF-8 octet sequence (binary)	Remark
U+0000 – U+007F	0xxxxxxx	ASCII equivalent range; octet begins with zero
U+0080 – U+07FF	110xxxxx 10xxxxxx	1st octet begins with 110, the second octet begins with 10.
U+0800 – U+FFFF	1110xxxx 10xxxxxx 10xxxxxx	1st octet begins with 1110, the following octets begin with 10.
U+10000 – U+10FFFF	11110xxx 10xxxxxx 10xxxxxx 10xxxxxx	1st octet begins with 11110, the following octets begin with 10.

For more information about Unicode please refer to www.unicode.org. The code charts are listed there under http://www.unicode.org/charts/. For more information about UTF-8 please refer to www.ietf.org / http://www.ietf.org/rfc/rfc3629.txt.

Using UTF-8 the data length for a string (multiple characters) is also *not fixed*, but *variable*. The string shall be terminated by the NULL- character (00h). No length information shall be transmitted in the APDU [a.]

Handling of non-supported lengths:

- Data Link Layer: *neglect* the frame
- Application Layer: *cut* to the maximum supported length, keeping the characters at the beginning, i.e. starting with the MSB.
- Interface Object Server

The implicit array structure of a Property Value of an Interface Object Property can be used to store multiple strings. Every array element shall contain exactly one string. These array elements can have a different length. The APDUs used to read/write these strings shall only contain entire strings; exactly one NULL character shall appear between string elements and at the end of the last string. This means that strings that do not fit in the supported array length shall not be cut off. If a Property Value is read that would lead to an APDU longer than the length supported by the server, the server shall respond with a negative response; i.e. the APDU shall not be limited to the number of elements that *does* fit it, but instead contain no Property Value data. The client can then read a smaller number of array elements.

Range: U+000000 … U+10FFFF ($2^{20}+2^{16}$)

Unit: None

[a] Length information is implicitly in the frame (by the Data Link Layer)

[b] When writing about a Unicode character, it is normal to write "U+" followed by a hexadecimal number indicating the character's code point. For code points in the Basic Multilingual Plane (BMP), four digits are used; for code points outside the BMP, five or six digits are used, as required.

Datapoint Types			
ID:	Name:	Range	Usage:
28.001	DPT_UTF-8	U+0000 … U+10FFFF ($2^{20}+2^{16}$)	General

UTF-8

UTF-8 stands for **U**nicode **T**ransformation **F**ormat-**8**. It is an octet (8 bit) lossless encoding of Unicode characters.

UTF-8 is standardized as RFC 3629 / STD 63 (2003), which establishes UTF-8 as a standard Internet Protocol element.

UTF-8 uses one to four octets per character, depending on the Unicode symbol. Only one octet is needed to encode the 128 US-ASCII characters (Unicode range U+0000 to U+007F). Two octets are needed for Latin letters with diacritics, combining diacritics and for Greek, Cyrillic, Armenian, Hebrew, Arabic, Syriac and Thanna (Unicode range U+0080-U+07FF). Three octets are needed for the rest of the Basic multilingual plane (which contains virtually all characters in common use). Four octets are needed for characters in other planes of Unicode. Four octets may seem like a lot for one character (code point). However code points outside the Basic Multilingual Plane are generally very rare. Furthermore, UTF-16 (the main alternative to UTF-8) also needs four octets for these code points. Whether UTF-8 or UTF-16 is more efficient depends on the range of code points being used.

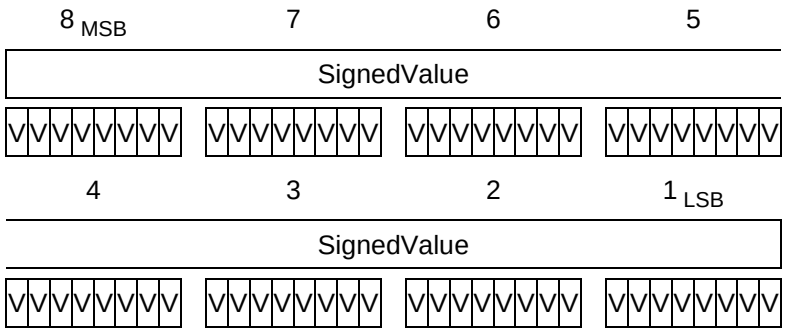
In UTF-8, characters from the range U+0000 to U+10FFFF (the UTF-16 accessible range) are encoded using sequences of 1 to 4 octets. The only octet of a "sequence" of one has the higher-order bit set to 0, the remaining 7 bits being used to encode the character number. In a sequence of n octets, n > 1, the initial octet has the n higher-order bits set to 1, followed by a bit set to 0. The remaining bit(s) of that octet contain bits from the number of the character to be encoded. The following octet(s) all have the higher-order bit set to 1 and the following bit set to 0, leaving 6 bit in each to contain bits from the character to be encoded.

The table below summarizes the format of these different octet types. The letter x indicates bits available for encoding bits of the character number.

Char. number range (hexadecimal)	UTF-8 octet sequence (binary)
U+0000 – U+007F	0xxxxxxx
U+0080 – U+07FF	110xxxxx 10xxxxxx
U+0800 – U+FFFF	1110xxxx 10xxxxxx 10xxxxxx
U+10000 – U+10FFFF	11110xxx 10xxxxxx 10xxxxxx 10xxxxxx

3.28 Datapoint Types V_{64}

3.28.1 DPTs for electrical energy

Format:	8 octets: V_{64}
	
Encoding:	Two's complement notation
Range:	SignedValue = [9 223 372 036 854 775 808 to 9 223 372 036 854 775 807]
PDT	PDT_GENERIC_08

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
29.010	DPT_ActiveEnergy_V64	-9 223 372 036 854 775 808 Wh to 9 223 372 036 854 775 807 Wh	Wh	1 Wh	G a
29.011	DPT_ApparantEnergy_V64	-9 223 372 036 854 775 808 VAh to 9 223 372 036 854 775 807 VAh	VAh	1 VAh	G a
29.012	DPT_ReactiveEnergy_V64	-9 223 372 036 854 775 808 VARh to 9 223 372 036 854 775 807 VARh	VARh	1 VARh	G a

[a] Any Datapoint shall only be encoded with format V_{64} according either DPT_ActiveEnergy_V64, DPT_ApparantEnergy_V64 or DPT_ ReactiveEnergy_V64 if also a Datapoint with the V_{32} encoding according either DPT_ActiveEnergy, or DPT_ApparantEnergy or DPT_ReactiveEnergy respectively is implemented. No DPT with encoding V_{64} shall be encoded unless also a DP with the V_{32} and same unit and resolution is encoded.

3.29 Datapoint Type DPT_AlarmInfo

Format:	6 octets: $U_8N_8N_8N_8B_8B_8$
octet nr.	6 MSB | 5 | 4 | 3 | 2
field names	LogNumber | AlarmPriority | Application-Area | ErrorClass | Attributes
encoding	UUUUUUUU | NNNNNNNN | NNNNNNNN | NNNNNNNN | 00BBBBBB
octet nr.	1 LSB
field names	AlarmStatus-Attributes
octet nr.	00000BBB
Encoding:	binary encoded values
Unit:	not applicable
Resol.:	not applicable
PDT:	PDT_ALARM_INFO (alt: PDT_GENERIC_06)

Datapoint Types

ID:	Name:	Encoding:		Range:	Use:
219.001	DPT_AlarmInfo	LogNumber: U_8	Log Number	[0 … 255]	FB´s Alarm Source, Alarm Sink
		AlarmPriority: N_8	Alarm Priority See DPT_Priority. 3 priorities 0 = highest priority; for “no priority”, ‘03h is used (=’void’)	[0 … 2]	
		ApplicationArea: N_8	Application Area	see Note 4	
		ErrorClass: N_8	Error Class	see Note 5	
		Attributes: B_8	attributes:	Boolean	
		- B0: Ack_Sup	0 = False, 1 = True	{0, 1}	
		- B1: TimeStamp_Sup	0 = False, 1 = True	{0, 1}	
		- B2: AlarmText_Sup	0 = False, 1 = True	{0, 1}	
		- B3: ErrorCode_Sup	0 = False, 1 = True	{0, 1}	
		- B4 … B7: reserved	Fixed to 0	-	
		AlarmStatusAttributes: B_8	Alarm Status (attributes)		
		- B0: InAlarm	0 = False, 1 = True	{0, 1}	
		- B1: AlarmUnAck	0 = False, 1 = True	{0, 1}	
		- B2: Locked	0 = False, 1 = True	{0, 1}	
		- B3 … B7: reserved	Fixed to 0	-	

Note 1

Alarm messages contain an ‘Application area’ information to allow filtering of alarm messages in subsystems. Coding of ‘Application Areas’ see Note 4.

Note 2

Examples of (HVAC) Alarm messages of different companies showed that many alarm informations are company specific and only more neutral „error classes“ can be standardised.

Company specific additional information (if necessary) is possible, e.g. in additional Datapoints. Examples of such additional Datapoints are ‘timestamp’ and ‘AlarmText_Log’ in this specification document.

Note 3

B0 in attributes field (*Ack_Sup)* indicates whether the alarm is a simple error which can never be acknowledged (0) or an alarm with acknowledge and/or ‘alarm reset’ mechanism (1).

If it is a simple error without acknowledge:

- the alarm source sends ‘acknowledged’ (bit ‘*AlarmUnAck*’ = 0) as status information in the alarm state attributes.

Note 4

Coding of ‘Application Area’ (Enumeration):

Code [a)]	Application Area
0	no fault
1	System & functions of common interest
2 … 9	reserved
10	HVAC General FB´s
11	HVAC Hot Water Heating
12	HVAC Direct Electrical Heating
13	HVAC Terminal Units
14	HVAC VAC
15 … 19	reserved (HVAC)
20	Lighting
21 ..29	reserved (Lighting)
30	Security
31 … 39	reserved (Security)
50	Shutters & Blinds
…	…
… 255	not used
a) This coding corresponds to the numbering of parts in Volume 7 of KNX System Specification.	

Faults in functions of common interest (Functional Blocks according to Part 7/1) shall be mapped to the application area ‘System’, e.g. a multiple system clock master conflict is a ‘configuration fault’ (see error class coding in Note 6) within application area ‘system’.

KNX Association Working Group Interworking is responsible for definition of additional ‘application area’ codes.

Note 5

Responsibility for Definition of ‘Error Class’ Codes within the Application Areas is in the scope of the KNX Association Application Specification Groups. KNX Association Working Group Interworking is responsible for definition of the ‘Error Class’ Codes within the Application Area ‘System’.

Note 6 of this document contains the error class coding within application area ‘system’ as a proposal to the HVAC ASG.

Note 7 of this document contains an error class coding within ‘HVAC’ as a proposal to the HVAC ASG.

Note 6- Technical Alarm Error Class Coding within Application Area 'System'

Code	Error Class
0	no fault
1	general device fault (e.g. RAM, EEPROM, UI, Watchdog, …)
2	communication fault
3	configuration fault
4	HW fault
5	SW fault
6	not used
…	not used
255	not used

Faults in functions of common interest (Functional Blocks according to Part 7/1) should be mapped to the application area 'System', e.g. a multiple system clock master conflict is a 'configuration fault'.

KNX Association Working Group Interworking is responsible for definition of additional error class codes within application area 'system'.

Examples:

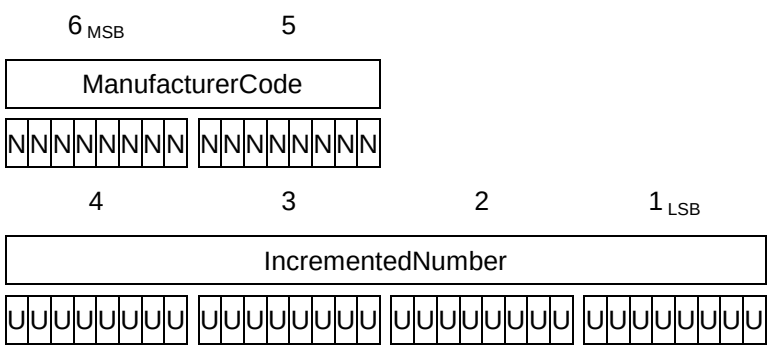
- Detection of 'two devices with same individual address' causes a *configuration fault.*
- Detection of a 'multiple system clock master conflict' (without automatic resolution) causes a *configuration fault.*
- Detection of failure of a (formerly present) communication partner causes a *communication faul.t*
- Timeout detection on the System Clock Signal (heartbeat) causes a *communication fault.*

Note 7 - Technical Alarm Error Class Coding within 'HVAC' Application Area(s)

Code	Error Class
0	no fault
1	sensor fault
2	process fault /controller fault
3	actuator fault
4	other faults
5	not used
…	not used
255	not used

The coding above is a proposal and has to be approved by the HVAC Application Specification Group. The 'HVAC' ASG is also responsible for definition of additional error class codes within 'HVAC' application area(s).

3.30 Datapoint Type DPT_SerNum

Format:	6 octets: $N_{16}U_{32}$
	
Encoding:	ManufacturerCode, IncrementedNumber: binary encoded
Range:	ManufacturerCode: [0 … 65 535] IncrementedNumber: [0 … 4 294 967 295]
Unit:	none
Resol.:	not applicable
PDT:	PDT_GENERIC_06

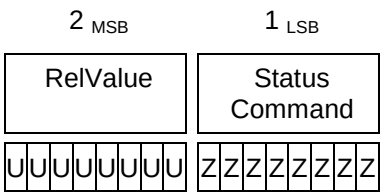
Datapoint Types					
ID:	Name:	Range:	Unit:	Resol.:	Use:
221.001	DPT_SerNum	See above.	See above.	See above.	G

IncrementedNumber shall be incremented with each BAU.

The owner of the microcontroller shall ensure the global uniqueness of the leading 4 octets within the specific manufacturer's code space.

3.31 Datapoint Types "Unsigned Relative Value"

LTE: compound structure

Format:	2 octets: U_8Z_8
	
PDT:	PDT_GENERIC_02

Datapoint Types		
ID:	Name:	Use:
202.001	DPT_RelValue_Z	G

Data fields	**Description**	**Encoding**	**Unit**	**Range**	**Resol.**
RelValue	Unsigned relative value	U_8	%	0 % … 255 %	1 %
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

Datapoint Type 202.001 shall in Standard Mode be encoded as a percentage value without the Z_8 field. The actually used DPT depends on the Datapoint and shall be defined in the Datapoint specification in the Functional Block.

Multiple solutions are possible. Solution B) is preferred because there is no mapping of the % value.

A) DPT_Scaling (5.001)

Encoding: 0 %…100 %. Full Datapoint Type value: 0 … 255, i.e. 1 % = value 255/100 !

To be used for valve position control in order to be backwards compatible with EIB valves.

B) DPT_Percent_U8 (5.004)

Encoding: 0 %…255 %. Full Datapoint Type value: 0 … 255, i.e. 1 % = value 1.

To be used for % energy demand etc.

C) DPT_Value_Humidity (9.0xx) float F_{16} encoding

To be used for air humidity only.

3.32 Datapoint Types "Unsigned Counter Value"

LTE: compound structure

Format:	2 octets: U_8Z_8															
octet nr	2 MSB								1 LSB							
field names	CounterValue								Status Command							
encoding	U	U	U	U	U	U	U	U	Z	Z	Z	Z	Z	Z	Z	Z
PDT:	PDT_GENERIC_02															

Datapoint Types		
ID:	Name:	Use:
202.002	DPT_UCountValue8_Z	G

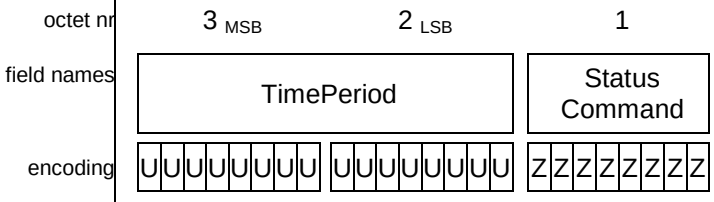
Data fields	Description	Encoding	Unit	Range	Resol.
CounterValue	Unsigned counter value	U_8	none	0 … 255	1
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Value_1_Ucount (DPT_ID = 5.010), this is, only the field CounterValue without the Z_8 field.

3.33 Datapoint Types “Time Period..._Z”

Format: 3 octets: $U_{16}Z_8$



Encoding: TimePeriod: Values shall be binary coded.
Status/Command: Z_8

PDT: PDT_GENERIC_03

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
203.002	DPT_TimePeriodMsec_Z	0 ms … 65 535 ms	ms	1 ms	G
203.003	DPT_TimePeriod10Msec_Z	0 s … 655,35 s	ms	10 ms	G
203.004	DPT_TimePeriod100Msec_Z	0 s … 6 553,5 s	ms	100 ms	G
203.005	DPT_TimePeriodSec_Z	0 s … 65 535 s (≅ 18,2 hours)	s	1 s	G
203.006	DPT_TimePeriodMin_Z	0 min … 65 535 min (≅ 45,5 days)	min	1 min	G
203.007	DPT_TimePeriodHrs_Z	0 h … 65 535 h (≅ 7,4 years)	h	1 h	G

Data fields	Description
TimePeriod	Unsigned time value
Status/Command	standard Status/Command

Standard Mode

DPT_TimePeriod... (7.002 ... 7.007), only TimePeriod without Z_8 field.

3.34 Datapoint Types “Unsigned Flow Rate l/h”

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	FlowRate | Status Command
encoding	U U U U U U U U | U U U U U U U U | Z Z Z Z Z Z Z Z
Encoding:	FlowRate: U_{16} (Values shall be binary coded). Status/Command: Z_8
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
203.011	DPT_UFlowRateLiter/h_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
FlowRate	flow rate	U_{16}	l/h	0 l/h … 655,35 l/h	0,01 l/h
Status/Command	standard Status/Command	Z_8	none	none	none

In case of a detected sensor failure the Status Flag ‘Fault’ shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of ‘Fault’ may be encoded in the ‘FlowRate’ field (optional feature): see standard Z_8 mechanism in 4.1.2.

Standard Mode

DPT_Value_Volume_Flux (14.077), without Z_8 field.

3.35 Datapoint Types “Unsigned Counter Value”

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	CounterValue | Status Command
encoding	U U U U U U U U | U U U U U U U U | Z Z Z Z Z Z Z Z
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
203.012	DPT_UCountValue16_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.:
RelValue	Unsigned counter value	value binary encoded	none	0 … 65 535	1
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Value_2_Ucount (7.001), only CounterValue without Z_8 field.

3.36 Datapoint Types "Unsigned Electric Current µA"

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	ElCurrent | Status Command
encoding	UUUUUUUU UUUUUUUU ZZZZZZZZ
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
203.013	DPT_UElCurrentµA_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
ElCurrent	electric current value	U_{16}	µA	0 µA … 655,35 µA	0,01 µA
Status/Command	standard Status/Command	Z_8	none	none	none

In case of a detected sensor failure the Status Flag 'Fault' shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of 'Fault' may be encoded in the 'ElCurrent' field (optional feature): see standard Z_8 mechanism in 4.1.2.

Standard Mode

DPT_Value_Electric_Current (DPT_ID = 14.019), without Z_8 field.

3.37 Datapoint Types "Power in kW"

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	Power | Status Command
encoding	UUUUUUUU UUUUUUUU ZZZZZZZZ
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
203.014	DPT_PowerKW_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
Power	Electrical power	U_{16}	kW	0 kW …65535 kW	1 kW
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Power (DPT_ID = 9.024, format: F_{16}) shall be used.

3.38 Datapoint Type "Atmospheric Pressure with Status/Command"

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	AtmPressure | Status Command
encoding	U U U U U U U U | U U U U U U U U | Z Z Z Z Z Z Z Z
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
203.015	DPT_AtmPressureAbs_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
AtmosphericPressure	Atmospheric Pressure absolute value mbar	U_{16}	mbar	0 mbar to 1200 mbar (and more)	0,05 mbar *)
Status/Command	standard Status/Command	Z_8	none	none	none

In case of a detected sensor failure the Status Flag 'Fault' shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of 'Fault' may be encoded in the 'AtmosphericPressure' field (optional feature): see standard Z_8 mechanism

Standard Mode

DPT_Value_Pres (9.006), unit Pa; only pressure value without Z_8 field

*) NOTE
1 Pa = 0,01 mbar = 0,000001 bar = 1 Nm^{-2}
100 Pa = 1 hPa = 1 mbar

3.38.1 Datapoint Type “DPT_PercentU16_Z”

LTE: compound structure

Format:	3 octet: $U_{16}Z_8$ 3 MSB PercentValue: UUUUUUUU 2 LSB PercentValue: UUUUUUUU 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
203.017	DPT_PercentU16_Z	See below	See below	FOCI

Data fields	Description	Unit / Range
PercentValue		$U_{16,}$ 0,01 % resolution 0 % to 655,35 %
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_Scaling (5.001), percent value with ~04 % resolution; without Z_8 field.

3.39 Datapoint Types “Signed Relative Value”

LTE: compound structure

Format:	2 octets: V_8Z_8 octet nr: 2 MSB, 1 LSB field names: RelSigned Value, Status Command encoding: V V V V V V V V, Z Z Z Z Z Z Z Z		
PDT:	PDT_GENERIC_02		
Datapoint Types			
ID:	Name:		Use:
204.001	DPT_RelSignedValue_Z		G

Data fields	Description	Encoding	Unit	Range	Resol.
RelSignedValue	Relative signed value %	V_8	%	-100 % … 100 %	1 %
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Percent_V8 (6.001); only RelSignedValue without Z_8 field.

3.40 Datapoint Type “DeltaTime...Z”

LTE: compound structure

Format:	3 octets: $V_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	DeltaTime | Status Command
encoding	V V V V V V V V | V V V V V V V V | Z Z Z Z Z Z Z Z
Encoding:	DeltaTime: V_{16} Status/Command: Z_8
PDT:	PDT_GENERIC_03

Datapoint Types

ID:	Name:	Range:	Unit:	Resol.:	Use:
205.002	DPT_DeltaTimeMsec_Z	-32 768 ms … 32 767 ms	ms	1 ms	G
205.003	DPT_DeltaTime10Msec_Z	-327,68 s … 327,67 s	ms	10 ms	G
205.004	DPT_DeltaTime100Msec_Z	-3 276,8 s … 3 276,7 s	ms	100 ms	G
205.005	DPT_DeltaTimeSec_Z	-32 768 s … 32 767 s (≅ ± 9,1 hours)	s	1 s	G
205.006	DPT_DeltaTimeMin_Z	-32 768 min ... 32 767 min(≅ ± 22,7 da	min	1 min	G
205.007	DPT_DeltaTimeHrs_Z	-32 768 h ... 32 767 h (≅ ± 3,7 years)	h	1 h	G

Data fields	Description	Unit / Range
DeltaTime	signed delta time value, two’s complement encoding	V_{16}, see above
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_DeltaTime...(DPT 8.002 ... 8.007), without Z_8 field.

3.41 Datapoint Type “16 bit Signed Relative Value_Z”

LTE: compound structure

Format:	3 octets: $V_{16}Z_8$
octet nr	3 MSB 2 LSB 1
field names	RelSignedValue | Status Command
encoding	V V V V V V V V | V V V V V V V V | Z Z Z Z Z Z Z Z
Encoding:	DeltaTime: V_{16} Status/Command: Z_8
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
205.017	DPT_Percent_V16_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
RelSignedValue	Relative signed value with high resolution	V_{16}	%	-327,68% … +327,67%	0,01 %
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Percent_V16 (8.010), without Z_8 field.

3.42 Datapoint Type DPT_Version

Format:	2 octet: $U_5U_5U_6$
octet nr.	2 MSB 1 LSB
field names	Magic Number | Version Number | Revision Number
encoding	UUUUUUUU UUUUUUUU
Encoding:	All values binary encoded.
Unit:	none
PDT:	PDT_VERSION(alt: PDT_GENERIC_02)

Datapoint Types

ID:	Name:	Use:
217.001	DPT_Version	G

Field	Description	Encoding	Range	Resol.:
Magic Number	An increment of the Magic Number means an incompatible change: ⇒ no forward or backwards compatibility. This field of the version information is used for compatibility checks but it is normally not displayed (invisible). If the Magic Number is incremented the Version Number shall also be “incremented” (i.e. higher number). Recommendation: Start with 0.	U_5	0 … 31	1
Version Number	Version Number is “incremented” (i.e. higher number) if a new version has new features. **Usage:** If the Magic Number is incremented, the Version Number shall be incremented as well. This shall denote an incompatible change. If the Magic Number is not incremented and the Version Number is incremented, this shall denote a backwards compatible extension. Recommendation: Start with 1.	U_5	0 … 31	1
Revision Number	Revision Number is “incremented” (i.e. higher number) because of minor changes without effects on forward and backward functional compatibility between newer and older version. Recommendation: Start with 0.	U_6	0 … 63	1

DPT_Version is the standardised encoding format of version information e.g. used for software version, hardware version, data-interface version etc. DPT_Version supports encoding of Version.Revision information and of a compatibility identifier called ‘Magic Number’.

In practice the available encoding range of M.V.R 0.0.0 ... 31.31.63 is sufficient.

EXAMPLES

M.V.R. previous version	M.V.R. new version	Meaning
0.1.0	0.1.1	minor modification without effect on compatibility
0.1.1	0.2.0	backwards compatible change
0.2.0	1.3.0	incompatible change

Encoding of invalid version information

If the version information that is transferred using DPT_Version is invalid, void or undefined, this shall be indicated by setting the values of each individual field to its maximum encodable value. Invalid version information shall thus be encoded as M.V.R. = 31.31.63.

Compatibility rules

Table 2 below specifies the compatibility rules.

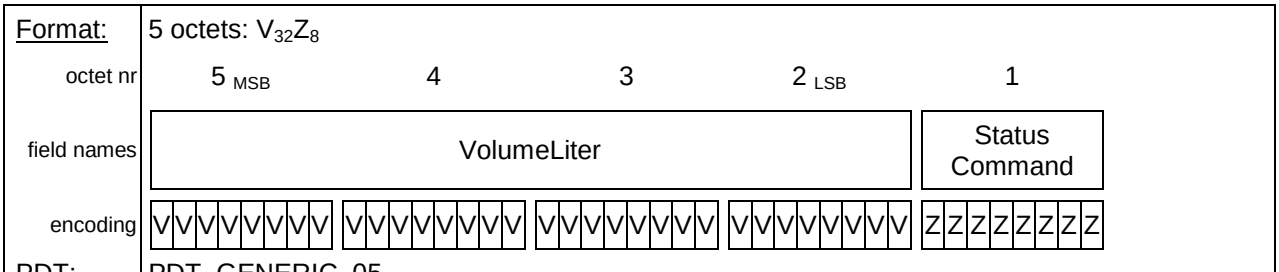
Table 2 – Compatibility rules

M	V	R	Compatibility
=	=	=	compatible version
=	=	>	minor changes without effects on forward and backward functional compatibility between previous and new version
=	>	any value	new version has new features but is still backwards compatible to the previous version (all old features are supported)
>	=	any value	combination is not allowed: in case of change of the magic number also the version number shall be incremented
>	>	any value	no forward or backwards compatibility
Legend > This field has been incremented compared to the previous version. = This field did not change compared to the previous version.			

3.43 Datatype $V_{32}Z_8$

3.43.1 Datapoint Type "Volume in Liter"

LTE: compound structure



Datapoint Types		
ID:	Name:	Use:
218.001	DPT_VolumeLiter_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
VolumeLiter	volume in liter	V_{32}	l	-2 147 483 648 l … 2 147 483 647 l	1 l
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Value_Volume (14.076), float value without Z_8 field.

3.43.2 Datapoint Type "Flow Rate in m3/h_Z"

LTE: compound structure

Format:	5 octets: $V_{32}Z_8$
octet nr	5 MSB, 4, 3, 2 LSB, 1
field names	FlowRate (octets 5–2), Status Command (octet 1)
encoding	VVVVVVVV VVVVVVVV VVVVVVVV VVVVVVVV ZZZZZZZZ
PDT:	PDT_GENERIC_05

Datapoint Types

ID:	Name:	Use:
218.002	DPT_FlowRate_m3/h_Z	G

Data fields	Description	Encoding	Unit	Range	Resol.
FlowRate	Flow Rate in m^3/h with high resolution	V_{32}	m^3/h	- 214'748,3648 m^3/h … +214'748,3647 m^3/h	0,0001 m^3/h
Status/Command	standard Status/Command	Z_8	none	none	none

Standard Mode

DPT_Value_Volume_Flux (14.077), float value without Z_8 field.

3.44 Datatype $U_{16}U_8$

3.44.1 Datapoint Type "Scaling speed"

Format:	3 octets: $U_{16}U_8$
octet nr.	3 MSB, 2, 1 LSB
field names	TimePeriod (octets 3–2), Percent (octet 1)
encoding	UUUUUUUU UUUUUUUU UUUUUUUU
Encoding:	value of all fields binary encoded.
Range::	See below.
Unit:	See below.
Resol.:	See below.
PDT:	PDT_GENERIC_03

Datapoint Types

ID:	Name:	Use:
225.001	DPT_ScalingSpeed	Lighting a)

a) This DPT shall only be used in the lighting application and only for the functionality as specified in the FB specifications.

Data Fields	Description	Range	Unit	Resol.
TimePeriod	Unsigned time-value for calculating speed. (see also DPT_TimePeriod100Msec; DPT_ID = 7.004)	[1…65535]	100 ms	100 ms
Percent	Unsigned percent value for calculating speed. (see also DPT_Scaling; DPT_ID = ID 5.001)	[0,4…100]	%	0,4 %

Examples

a. Only a single Datapoint of type DPT_ScalingSpeed is used.

The speed for changing the value of a Datapoint of type DPT_Scaling is constant over the whole range of DPT_Scaling.

3 MSB	2	1 LSB	Encoded value
00h	28h	FFh	25 %/s

b. Two Datapoints DP0 and DP1 of type DPT_ScalingSpeed are used for two different speeds in two subranges:

Rule in the FB:

subrange0: 0 % … DP0.percentvalue
speed in subrange0: DP0.percentvalue/DP0.timevalue
subrange1: DP0.percentvalue … DP1.percentvalue
speed in subrange1: (DP1.percentvalue – DP0.percentvalue) / DP1.timevalue

Encoded values

DP0			
3 MSB	2	1 LSB	subrange0: 0 % … 75 %
00h	78h	COh	speed0: 6,25 %/s

DP1			
3 MSB	2	1 LSB	subrange1: 75 % … 100 %
00h	14h	FFh	speed1: 12,5 %/s

3.44.2 Datapoint Type “Scaling step time”

Format:	3 octets: $U_{16}U_8$
octet nr.	3 MSB 2 1 LSB
field names	TimePeriod Percent
encoding	UU U U U U U U U U U U U U U U U U U U U U U U
Encoding:	value of all fields binary encoded.
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
225.002	DPT_Scaling_Step_Time	General a)

a) Not allowed for run-time communication. This DPT shall only be used for parameters and diagnostic data or if specified as such in a FB specification.

Data Fields	Description	Range	Unit	Resol.
TimePeriod	Unsigned time-value (time needed for changing data point of Type DPT_Scaling by its resolution) (see also DPT_TimePeriodMsec; DPT_ID = 7.002)	[1…65535]	ms	1 ms
Percent	Range in within time-value is valid (see also DPT_Scaling; DPT_ID = ID 5.001)	[0,4…100]	%	0,4 %

Examples

a. Only a single Datapoint of type DPT_Scaling_Step_Time is used.

The speed for changing the value of a Datapoint of type DPT_Scaling is constant over the whole range of DPT_Scaling.

3 MSB	2	1 LSB
00h	0Fh	FFh

Encoded value

15 ms/step

b. Two Datapoints DP0 and DP1 of type DPT_Scaling_Step_Time are used for two different time values in two subranges:

Rule in the FB:

subrange0: 0 % … DP0.percentvalue
time per step in subrange0: DP0.timevalue
subrange1: DP0.percentvalue … DP1.percentvalue
time per step in subrange1: DP1.timevalue

Encoded values

DP0		
3 MSB	2	1 LSB
00h	3Eh	COh

subrange0: 0 % … 75 %
time0: 62 ms/step

DP1		
3 MSB	2	1 LSB
00h	1Fh	FFh

subrange1: 75 % … 100 %
time1: 31 ms/step

3.44.3 DPT_TariffNext

Format:	3 octets: $U_{16}U_8$
octet nr	3 MSB 2 1 LSB
field names	Delay Time / Tariff
encoding	UUUUUUUU UUUUUUUU UUUUUUUU
PDT:	PDT_GENERIC_03

Datapoint Types		
ID:	Name:	Use:
225.003	DPT_TariffNext	G

Fields	Description	Enoding	Unit	Unit / Range	Resolution
Delay Time	Delay time until next change of tariff	U_{16}, value binary encoded	min	0 = undefined delay time 1 min to 65 535 min	1 min
Tariff	The next active Tariff after expiration of the delay time	U_8, value binary encoded	none	0 to 254	1

If the two fields Tariff and Delay Time are cleared (zero) then this shall be interpreted as that the next tariff is unspecified.

3.45 Datatype $V_{32}N_8Z_8$

3.45.1 Datapoint Type "MeteringValue"

Format:	6 octets: $V_{32}N_8Z_8$
octet nr.	6 MSB 5 4 3
field names	CountVal
encoding	VVVVVVVV VVVVVVVV VVVVVVVV VVVVVVVV
octet nr.	2 1 LSB
field names	ValInfField / Status/Command
encoding	NNNNNNNN ZZZZZZZZ
PDT:	PDT_GENERIC_06

Datapoint Types		
ID:	Name:	Use:
229.001	DPT_MeteringValue	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 mapped to: 80h, 81h 88h, 89h A8h, A9h B0h, B1h encoding see table below
Status/Command	Standard Status/Command.	Z_8

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 in EN13757-3. ValInfField vales ≥ 80h contain the mapping of VIFE range for GWh, GJ, MW and MJ/h.

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

3.46 Datatypes $A_8A_8A_8A_8$

3.46.1 DPT_Locale_ASCII

Format:	4 octets: $A_8A_8A_8A_8$
octet nr	4 MSB 3 2 1 LSB
field names	Language (Character 4, Character 3) / Region (Character 2, Character 1)
encoding	A A A A A A A A A A A A A A A A / A A A A A A A A A A A A A A A A
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_GENERIC_04

Datapoint Types					
ID:	Name:	Encoding:		Range:	Use:
231.001	DPT_Locale_ASCII	$A_8A_8A_8A_8$	Datapoint Type is used to transmit a locale • Octet 4 and octet 3 Language as in DPT_Language-CodeAlpha2_ASCII (234.001) this is ISO 639-1 alpha-2 • Octet 2 and octet 1 Region as in DPT_RegionCode-Alpha2_ASCII (234.002) this is ISO 3166-1 alpha-2 NOTE 14 “ZZ” shall be used for “no region”. The length is fixed to 4 octets (2 characters in ASCII for the location/language and 2 characters in ASCII for the location/region). The encoding is not case sensitive. The contents are filled from the most significant octet EXAMPLE 4: de-DE “German (GERMANY)”: 64h 65h 44h 45h EXAMPLE 5: en-GB “English (UNITED KINGDOM)”: 65h 6Eh 47h 42h	Language acc. to ISO 639-1 alpha-2 Region acc. to ISO 3166-1 alpha-2	G

3.47 Datapoint Types A_8A_8

3.47.1 DPT_LanguageCodeAlpha2_ASCII

Format:	2 octets: A_8A_8 octet nr. 2 MSB 1 LSB field names Character 1 | Character 2 encoding AAAAAAAA AAAAAAAA	
Encoding:	Both Characters shall be ASCII-coded. This coding shall not be case sensitive.	
Range:	For every Character: as in DPT_Char_ASCII (4.001)	
Unit:	not applicable	
Resol.:	not applicable	
PDT:	PDT_GENERIC_02	
Datapoint Types		
ID:	Name:	Use:
234.001	DPT_LanguageCodeAlpha2_ASCII	G

EXAMPLE 6 German “de shall be encoded as 6465h.

EXAMPLE 7 English “en” shall be encoded as 656Eh.

The languages shall be encoded according ISO 639-1, of which the definitions are given in Table 3.

Table 3 – ISO 639-1 language codes

ISO 639-1 language code	Language name
aa	Afar
ab	Abkhazian
ae	Avestan
af	Afrikaans
ak	Akan
am	Amharic
an	Aragonese
ar	Arabic
as	Assamese
av	Avaric
ay	Aymara
az	Azerbaijani
ba	Bashkir
be	Belarusian
bg	Bulgarian
bh	Bihari
bi	Bislama
bm	Bambara
bn	Bengali

ISO 639-1 language code	Language name
bo	Tibetan
br	Breton
bs	Bosnian
ca	Catalan
ce	Chechen
ch	Chamorro
co	Corsican
cr	Cree
cs	Czech
cu	Church Slavic
cv	Chuvash
cy	Welsh
da	Danish
de	German
dv	Divehi
dz	Dzongkha
ee	Ewe
el	Greek
en	English

ISO 639-1 language code	Language name
eo	Esperanto
es	Spanish
et	Estonian
eu	Basque
fa	Persian
ff	Fulah
fi	Finnish
fj	Fijian
fo	Faroese
fr	French
fy	Western Frisian
ga	Irish
gd	Scottish Gaelic
gl	Galician
gn	Guaraní
gu	Gujarati
gv	Manx
ha	Hausa
he	Hebrew

ISO 639-1 language code	Language name
hi	Hindi
ho	Hiri Motu
hr	Croatian
ht	Haitian
hu	Hungarian
hy	Armenian
hz	Herero
ia	Interlingua (International Auxiliary Language Association)
id	Indonesian
ie	Interlingue
ig	Igbo
ii	Sichuan Yi
ik	Inupiaq
in	Indonesian
io	Ido
is	Icelandic
it	Italian
iu	Inuktitut
iw	Hebrew
ja	Japanese
ji	Yiddish
jv	Javanese
ka	Georgian
kg	Kongo
ki	Kikuyu
kj	Kwanyama
kk	Kazakh
kl	Kalaallisut
km	Khmer
kn	Kannada
ko	Korean
kr	Kanuri
ks	Kashmiri
ku	Kurdish
kv	Komi
kw	Cornish
ky	Kirghiz
la	Latin
lb	Luxembourgish
lg	Ganda

ISO 639-1 language code	Language name
li	Limburgish
ln	Lingala
lo	Lao
lt	Lithuanian
lu	Luba-Katanga
lv	Latvian
mg	Malagasy
mh	Marshallese
mi	Māori
mk	Macedonian
ml	Malayalam
mn	Mongolian
mo	Moldavian
mr	Marathi
ms	Malay
mt	Maltese
my	Burmese
na	Nauru
nb	Norwegian Bokmål
nd	North Ndebele
ne	Nepali
ng	Ndonga
nl	Dutch
nn	Norwegian Nynorsk
no	Norwegian
nr	South Ndebele
nv	Navajo
ny	Chichewa
oc	Occitan
oj	Ojibwa
om	Oromo
or	Oriya
os	Ossetian
pa	Panjabi
pi	Pāli
pl	Polish
ps	Pashto
pt	Portuguese
qu	Quechua
rm	Raeto-Romance
rn	Kirundi
ro	Romanian

ISO 639-1 language code	Language name
ru	Russian
rw	Kinyarwanda
sa	Sanskrit
sc	Sardinian
sd	Sindhi
se	Northern Sami
sg	Sango
sh	Serbo-Croatian [19)]
si	Sinhalese
sk	Slovak
sl	Slovenian
sm	Samoan
sn	Shona
so	Somali
sq	Albanian
sr	Serbian
ss	Swati
st	Sotho
su	Sundanese
sv	Swedish
sw	Swahili
ta	Tamil
te	Telugu
tg	Tajik
th	Thai
ti	Tigrinya
tk	Turkmen
tl	Tagalog
tn	Tswana
to	Tonga
tr	Turkish
ts	Tsonga
tt	Tatar
tw	Twi
ty	Tahitian
ug	Uighur
uk	Ukrainian
ur	Urdu
uz	Uzbek
ve	Venda
vi	Vietnamese

[19)] depricated

ISO 639-1 language code	Language name
vo	Volapük
wa	Walloon
wo	Wolof
xh	Xhosa
yi	Yiddish

ISO 639-1 language code	Language name
yo	Yoruba
za	Zhuang
zh	Chinese
zu	Zulu

3.47.2 Datapoint Type DPT_RegionCodeAlpha2_ASCII

Format:	2 octets: A_8A_8
octet nr	2 MSB 1 LSB
field names	Character 1 | Character 2
encoding	A A A A A A A A | A A A A A A A A
Unit:	None
Resol.:	(not applicable)
PDT:	PDT_GENERIC_02

Datapoint Types					
ID:	Name:	Encoding:		Range:	Use:
234.002	DPT_RegionCode-Alpha2_ASCII	A_8A_8	Datapoint Type is used to transmit a region via ISO 3166-1 alpha-2 code. The length is fixed to 2 octets for the location/region. The encoding is not case sensitive. The contents are filled from the most significant octet EXAMPLE 1: DE (Germany): 44h 45h EXAMPLE 2: GB (United Kingdom)": 47h 42h	ISO 3166-1 alpha-2	G

The regions shall be encoded according ISO 3166-1, of which the definitions are given in Table 4.

Table 4 – ISO 3166-1 region codes

ISO 3166-1 region code	Country name
AD	ANDORRA
AE	UNITED ARAB EMIRATES
AF	AFGHANISTAN
AG	ANTIGUA AND BARBUDA
AI	ANGUILLA
AL	ALBANIA
AM	ARMENIA
AN	NETHERLANDS ANTILLES
AO	ANGOLA
AQ	ANTARCTICA
AR	ARGENTINA

ISO 3166-1 region code	Country name
AS	AMERICAN SAMOA
AT	AUSTRIA
AU	AUSTRALIA
AW	ARUBA
AX	ÅLAND ISLANDS
AZ	AZERBAIJAN
BA	BOSNIA AND HERZEGOVINA
BB	BARBADOS
BD	BANGLADESH
BE	BELGIUM
BF	BURKINA FASO

ISO 3166-1 region code	Country name
BG	BULGARIA
BH	BAHRAIN
BI	BURUNDI
BJ	BENIN
BL	SAINT BARTHÉLEMY
BM	BERMUDA
BN	BRUNEI DARUSSALAM
BO	BOLIVIA
BR	BRAZIL
BS	BAHAMAS
BT	BHUTAN
BV	BOUVET ISLAND
BW	BOTSWANA
BY	BELARUS
BZ	BELIZE
CA	CANADA
CC	COCOS (KEELING) ISLANDS
CD	CONGO, THE DEMOCRATIC REPUBLIC OF THE
CF	CENTRAL AFRICAN REPUBLIC
CG	CONGO
CH	SWITZERLAND
CI	CÔTE D'IVOIRE
CK	COOK ISLANDS
CL	CHILE
CM	CAMEROON
CN	CHINA
CO	COLOMBIA
CR	COSTA RICA
CS	SERBIA AND MONTENEGRO (TRANSITIONALLY RESERVED)
CU	CUBA
CV	CAPE VERDE
CX	CHRISTMAS ISLAND
CY	CYPRUS
CZ	CZECH REPUBLIC
DE	GERMANY
DJ	DJIBOUTI
DK	DENMARK
DM	DOMINICA
DO	DOMINICAN REPUBLIC
DZ	ALGERIA
EC	ECUADOR
EE	ESTONIA

ISO 3166-1 region code	Country name
EG	EGYPT
EH	WESTERN SAHARA
ER	ERITREA
ES	SPAIN
ET	ETHIOPIA
FI	FINLAND
FJ	FIJI
FK	FALKLAND ISLANDS (MALVINAS)
FM	MICRONESIA, FEDERATED STATES OF
FO	FAROE ISLANDS
FR	FRANCE
GA	GABON
GB	UNITED KINGDOM
GD	GRENADA
GE	GEORGIA
GF	FRENCH GUIANA
GG	GUERNSEY
GH	GHANA
GI	GIBRALTAR
GL	GREENLAND
GM	GAMBIA
GN	GUINEA
GP	GUADELOUPE
GQ	EQUATORIAL GUINEA
GR	GREECE
GS	SOUTH GEORGIA AND THE SOUTH SANDWICH ISLANDS
GT	GUATEMALA
GU	GUAM
GW	GUINEA-BISSAU
GY	GUYANA
HK	HONG KONG
HM	HEARD ISLAND AND MCDONALD ISLANDS
HN	HONDURAS
HR	CROATIA
HT	HAITI
HU	HUNGARY
ID	INDONESIA
IE	IRELAND
IL	ISRAEL
IM	ISLE OF MAN

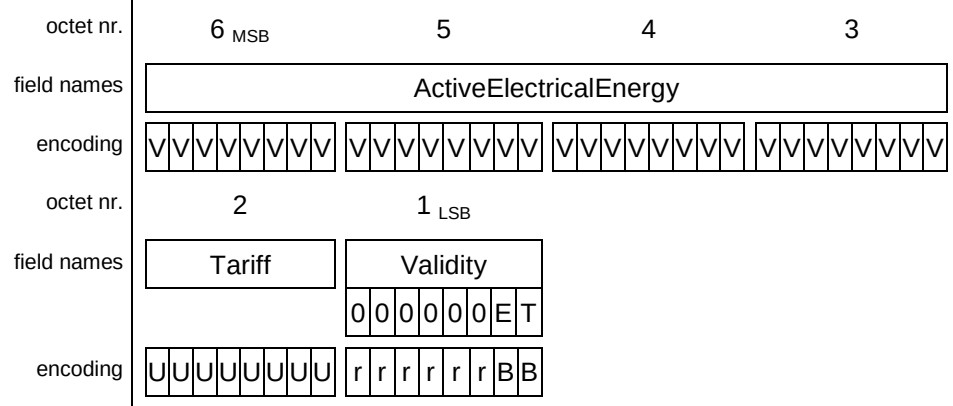
ISO 3166-1 region code	Country name
IN	INDIA
IO	BRITISH INDIAN OCEAN TERRITORY
IQ	IRAQ
IR	IRAN, ISLAMIC REPUBLIC OF
IS	ICELAND
IT	ITALY
JE	JERSEY
JM	JAMAICA
JO	JORDAN
JP	JAPAN
JE	JERSEY
JM	JAMAICA
JO	JORDAN
JP	JAPAN
KE	KENYA
KG	KYRGYZSTAN
KH	CAMBODIA
KI	KIRIBATI
KM	COMOROS
KN	SAINT KITTS AND NEVIS
KP	KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF
KR	KOREA, REPUBLIC OF
KW	KUWAIT
KY	CAYMAN ISLANDS
KZ	KAZAKHSTAN
LA	LAO PEOPLE'S DEMOCRATIC REPUBLIC
LB	LEBANON
LC	SAINT LUCIA
LI	LIECHTENSTEIN
LK	SRI LANKA
LR	LIBERIA
LS	LESOTHO
LT	LITHUANIA
LU	LUXEMBOURG
LV	LATVIA
LY	LIBYAN ARAB JAMAHIRIYA
MA	MOROCCO
MC	MONACO
MD	MOLDOVA, REPUBLIC OF
ME	MONTENEGRO
MF	SAINT MARTIN
MG	MADAGASCAR

ISO 3166-1 region code	Country name
MH	MARSHALL ISLANDS
MK	MACEDONIA, THE FORMER YUGOSLAV REPUBLIC OF
ML	MALI
MM	MYANMAR
MN	MONGOLIA
MO	MACAO
MP	NORTHERN MARIANA ISLANDS
MQ	MARTINIQUE
MR	MAURITANIA
MS	MONTSERRAT
MT	MALTA
MU	MAURITIUS
MV	MALDIVES
MW	MALAWI
MX	MEXICO
MY	MALAYSIA
MZ	MOZAMBIQUE
NA	NAMIBIA
NC	NEW CALEDONIA
NE	NIGER
NF	NORFOLK ISLAND
NG	NIGERIA
NI	NICARAGUA
NL	NETHERLANDS
NO	NORWAY
NP	NEPAL
NR	NAURU
NU	NIUE
NZ	NEW ZEALAND
OM	OMAN
PA	PANAMA
PE	PERU
PF	FRENCH POLYNESIA
PG	PAPUA NEW GUINEA
PH	PHILIPPINES
PK	PAKISTAN
PL	POLAND
PM	SAINT PIERRE AND MIQUELON
PN	PITCAIRN
PR	PUERTO RICO
PS	PALESTINIAN TERRITORY, OCCUPIED
PT	PORTUGAL

ISO 3166-1 region code	Country name
PW	PALAU
PY	PARAGUAY
QA	QATAR
RE	RÉUNION
RO	ROMANIA
RS	SERBIA
RU	RUSSIAN FEDERATION
RW	RWANDA
SA	SAUDI ARABIA
SB	SOLOMON ISLANDS
SC	SEYCHELLES
SD	SUDAN
SE	SWEDEN
SG	SINGAPORE
SH	SAINT HELENA
SI	SLOVENIA
SJ	SVALBARD AND JAN MAYEN
SK	SLOVAKIA
SL	SIERRA LEONE
SM	SAN MARINO
SN	SENEGAL
SO	SOMALIA
SR	SURINAME
ST	SAO TOME AND PRINCIPE
SV	EL SALVADOR
SY	SYRIAN ARAB REPUBLIC
SZ	SWAZILAND
TC	TURKS AND CAICOS ISLANDS
TD	CHAD
TF	FRENCH SOUTHERN TERRITORIES
TG	TOGO
TH	THAILAND
TJ	TAJIKISTAN
TK	TOKELAU
TL	TIMOR-LESTE
TM	TURKMENISTAN
TN	TUNISIA
TO	TONGA
TR	TURKEY
TT	TRINIDAD AND TOBAGO
TV	TUVALU
TW	TAIWAN, PROVINCE OF CHINA
TZ	TANZANIA, UNITED REPUBLIC OF
UA	UKRAINE
UG	UGANDA
UM	UNITED STATES MINOR OUTLYING ISLANDS
US	UNITED STATES
UY	URUGUAY
UZ	UZBEKISTAN
VA	HOLY SEE (VATICAN CITY STATE)
VC	SAINT VINCENT AND THE GRENADINES
VE	VENEZUELA
VG	VIRGIN ISLANDS, BRITISH
VI	VIRGIN ISLANDS, U.S.
VN	VIET NAM
VU	VANUATU
WF	WALLIS AND FUTUNA
WS	SAMOA
YE	YEMEN
YT	MAYOTTE
ZA	SOUTH AFRICA
ZM	ZAMBIA
ZW	ZIMBABWE
ZZ	No region

3.48 DPT_Tariff_ActiveEnergy

Format:	6 octets: $V_{32}U_8B_8$



PDT:	PDT_GENERIC_06

Datapoint Types		
ID:	Name:	Use:
235.001	DPT_Tariff_ActiveEnergy	G

Field	Description		Encoding	Unit	Range	Resol.
ActiveElectricalEnergy	Active energy measured in the tariff indicated in the field *Tariff* (13.010)		See DPT_ActiveEnergy (DPT_ID = 13.010)	Wh	[-2 147 483 648 … 2 147 483 647] Wh	1 Wh
Tariff	Tariff associated to the energy indicated in the field ActiveElectricalEnergy		See DPT_Tariff (DPT_ID = 5.006)	none	[0 … 254]	1
Validity	Bitset used for the validity of other data.					
- validity of the Tariff data	b_0	T	0: valid 1: not valid	none	{0, 1}	none
- validity of the ActiveElectrical-Energy data	b_1	E	0: valid 1: not valid	none	{0, 1}	none
- reserved	b_2 to b_7	reserved	shall be 0	none	{0}	none

3.49 DPT_Prioritised_Mode_Control

3.49.1 Terms and abbreviations

Abbreviation	Description
CMU	Central Management Unit
LCU	Local Control Unit
MDT	MoDe Threshold

3.49.2 Definition

Format:	8 bit: $B_1N_3N_4$
octet nr.	1
field names	d | p | m
encoding	B | N | N | N | N | N | N | N
Encoding:	binary encoded
PDT:	PDT_GENERIC_01

Datapoint Types

ID:	Name:				Use:
236.001	DPT_Prioritised_Mode_Control				G
Field	Format	Description	Encoding	Range	Unit
d	B_1	deactivation of priority	0: activation of priority 1: deactivation of priority	{0,1}	none
p	N_3	priority level	Value binary encoded. 000b: Level 0 … 111b: Level 7	[0 … 7]	none
m	N_4	mode level	Value binary encoded. 0000b: Level 0 … 1111b: Level 15	[0 … 15]	none

3.49.3 Functional description

Objective

Up to 8 Central Management Units (CMU) send data encoded according this DPT in order to affect the behaviour of Local Control Units (LCUs). These LCUs may control a wide range of applications.

Examples for LCUs and their affects in behaviour:

- EXAMPLE 1 Lighting control appliances: reducing the max. brightness level
- EXAMPLE 2 Shutter control appliances: moving to a predefined position
- EXAMPLE 3 Room temperature controllers: increasing the temperature setpoint value

Structure of the DPT

The DPT shall be divided into two parts.

1 Fields d and p shall define a priority control between two or more CMUs.

2 Field m (mode level) shall define how the behaviour of the LCU shall be affected by the CMU.

Functionality of the fields d and p

These fields are only relevant in the case that more than one CMU exists. For this case the field p defines the priority of a CMU compared to the other CMUs. The field d shall activate and deactivate the priority control.

A priority level p shall be assigned to each CMU via a Parameter or an Interface Object. p = 0 shall be the lowest priority; p = 7 shall be the highest priority.

EXAMPLE 8

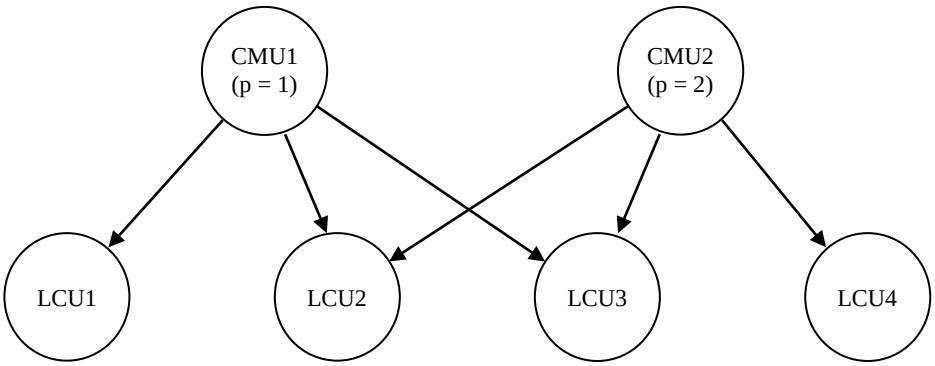


Figure 3 – Usage example for DPT_Prioritised_Mode_Control

In Figure 3 CMU1 sends the value 0001xxxxb (d = 0, p = 1) to LCU1, LCU2 and LCU3. LCU1 to 3 will react accordingly. After that, CMU2 sends the value 0010xxxxb (d = 0, p = 2) to LCU2, LCU3 and LCU4. Since the priority of CMU2 is higher, LCU2, LCU3 and LCU4 will react accordingly.

It shall be possible to activate (d = 0) and deactivate (d = 1) each priority level. An LCU shall follow the mode level as defined in the highest activated priority level. If the highest activated priority level becomes deactivated, then the LCU shall follow the mode level of the next lower activated priority level.

This implies that an LCU has to store for each supported priority level

a. the mode level

b. the activation state.

EXAMPLE 9 (continued from EXAMPLE 8 above)

CMU1 sends the value 0001xxxxb (d = 0, p = 1). LCU1 shall react accordingly while LCU2 and LCU3 shall only store this new information, because they are still under control of CMU2.

Then CMU2 sends the value 1010xxxxb (d = 1, p = 2). LCU2 and LCU3 shall thus return to the behaviour according to the latest information from CMU1. LCU4 shall return to its “normal” behaviour.

Functionality of the field m

The mode level m shall define the way in which an LCU shall be affected by a CMU. If the mode level is smaller than a defined “Mode Threshold” (MDT), the appliance shall be unaffected, i.e. it shall have its “normal behaviour”.

In the LCU, for each implemented priority level at least one threshold value MDT shall be defined via a Parameter or Group Object or Interface Object or a combination of them.

For each MDT, the behaviour of the LCU shall be defined via one or more Parameters or Group Objects or Interface Objects or a combination of them. Alternatively, the behaviour may be predefined.

The functionality shall be as follows.

- If the value of the mode level exceeds (≥) the MDT, then the LCU shall follow the definitions or the predefined behaviour.
- If the value of the mode level falls below (<) the MDT, then the device shall return to its "normal" behaviour.

If more than one MDT is defined, then the LCU shall follow the greatest threshold value being smaller than or equal to the mode level.

EXAMPLE 10

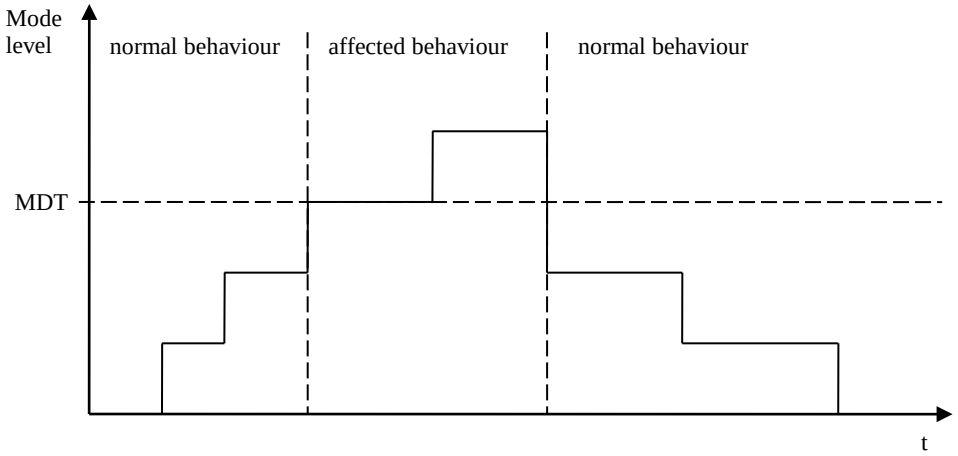


Figure 4 – Functionality of m

Once the mode level reaches the MDT, the behaviour of the LCU shall be affected according to the definitions.

Cyclic monitoring (heartbeat)

A CMU shall be able to send the DPT cyclically on the bus. The time period of the cyclic sending shall be set by a parameter.

An LCU may monitor a CMU by a cyclic monitoring of the reception of this DPT. For this, the CMU may be able to update the DPT cyclically on the bus and a “monitoring period” may be defined in the LCU by a parameter.

As soon as the LCU does not receive an update for longer than the monitoring period the LCU shall assume a failure of the CMU or in the connecting medium. The reaction of the LCU may be implementation specific, while there shall be at least the option in the LCU that it deactivates the priority level that is assigned to the failed CMU.

Power-Up and Power-Down behaviour

During supply voltage failure (“Power-Down”) the behaviour of the LCU and CMU is implementation specific.

On supply voltage recovery (“Power-Up”) the LCU may read out the state of the DPT via the bus. This will only work if there is only one CMU present.

In case of more than one CMU, it is recommended, that all CMUs send their values cyclically on the bus in order to update an LCU automatically after Power-Up.

It is recommended that CMU provide the possibility of a sending delay after power up defined by a parameter. This would allow CMUs with higher priority to update the DPT earlier than CMUs with lower priority.

Further definitions

The mode level 0 is predefined as the “normal behaviour”. The allowed value range of the MDT shall thus be [1…15].

The implemented number of priority levels in a CMU is implementation specific. In this case, the allowed priority levels shall start from 0 upwards. If an implementation has only one priority level, the priority level shall be set to 0.

If an LCU receives a DP with d = 1, then the information of the field mode level m shall have no effect (masked out).

The implemented number of priority levels in an LCU is implementation specific. In this case, the allowed priority levels must start from 0 upwards. If an implementation has only one priority level, the priority level shall be set to 0. If the LCU receives a DP value with a priority level that is not implemented, the received DP value shall be ignored.

If no priority level is activated, the LCU shall work in its “normal behaviour”.

NOTE 15 The priority level of a CMU should be unique, i.e. two CMUs should not send a DP with the same priority level to the same LCU.

3.49.4 Use cases

3.49.4.1 First use case

The Central Management Unit (CMU) may monitor the current energy tariff and other information, like power or energy consumption, time, weather, etc., in order realise an optimum building operation.

As soon as the result of the CMUs optimisation algorithm requires a reduction of the power or energy consumption, the value of the mode level is incremented from 0 to 1. Local Control Units of low importance (MDT = 1) can now reduce their consumption by switching off their outputs or manipulating their setpoint values or reducing the variance of operation (or any other action).

The DPT value will be increased further, if further reduction of power/energy consumption becomes necessary.

When decreasing the DPT value, the restrictions will be reduced accordingly.

3.49.4.2 Second use case

The CMU may control the reaction on a strategy of escalation in a security or safety application. The value of the DPT corresponds to the escalation level of a security/safety system, so that the building automation is able to react.

Example for escalation levels:

0: Normal Operation

1: Warning

2: Pre-Alarm

3: Alarm

4: Evacuation

5: Emergency shutdown

The priority level of this application is typically or higher than in use case 1.

3.50 Datapoint Types B_2U_6

3.50.1 DPT_SceneConfig

Format:	1 octet: B_2U_6
octet nr.	1
	b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
field names	S SA SN
encoding	B B U_6
PDT:	PDT_GENERIC_01

Datapoint Types		
ID:	Name:	Use:
238.001	DPT_SceneConfig	FB

Bit	Abbr.	Field name	Encoding	Range	Unit	Resol.
b_0 to b_5	SN	Scene Number	U_6	0 to 63	none	1
		This shall be the number of the scene for which the DPT-value contains the configuration information.				
b_6	SA	Scene Activation	0: active 1: inactive	{0,1}	none	n/a
		The field Scent Activation shall indicate whether the scene with scene number SN is active or not. NOTE 16 Please note the specific encoding of the field S in the specification of the DPT_SceneConfig. This encoding is the inverse coding of the standard DPT_Enable (1.003).				
b_7	S	Storage function	0: enable 1: disable	{0,1}	none	na
		The field Storage function shall indicate whether the set value(s) for the scene number SN can be modified at runtime through DPT_SceneControl or not. NOTE 17 Please note the specific encoding of the field SA in the specification of the DPT_SceneConfig. This encoding is the inverse coding of the standard DPT_State (1.011).				

3.51 Datapoint Types $U_8r_7B_1$

3.51.1 DPT_FlaggedScaling

Format:	2 octets: $U_8r_7B_1$															
octet nr.	2 MSB								1 LSB							
	b_{15}	b_{14}	b_{13}	b_{12}	b_{11}	b_{10}	b_9	b_8	b_7	b_6	b_5	b_4	b_3	b_2	b_1	b_0
field names	Setvalue															CA
encoding	U_8								r	r	r	r	r	r	r	B

PDT:	PDT_GENERIC_20	
Datapoint Types		
ID:	Name:	Use:
239.001	DPT_FlaggedScaling	FB

Bit	Abbr.	Field name	Encoding	Range	Unit	Resol.
b_{15} to b_8	none	Setvalue	U_8	0 % to 100 %	%	≅ 0,4 %
		This field shall contain the Setvalue for the Channel.				
b_7 to b_1	-	These fields are reserved and shall be 0.				
b_0	CA	Channel Activation	0: Inactive 1: Active	{0, 1}	none	n/a
		This field shall indicate whether the Channel for which this DPT encodes is active or not.				

4 Datapoint Types for HVAC

4.1 Simple Datapoint Types with STATUS/COMMAND Z_8 field

4.1.1 Introduction

This clause gives a general introduction to the subject of extended Datapoint Types used in HVAC applications including a standardised Z_8 **field with STATUS / COMMAND** information besides the main data value.

The Datapoint Types containing a Z_8 field always have the structure MZ_8. This is, one main value (M) is followed by the Z_8 field.

Datapoint Types with a Z_8 field have the **naming format** DPT_....._**Z**.

These Datapoint Types are based on a more object oriented approach. This is the following.

- If such a Datapoint is accessed using the **A_PropertyValue_Read**-service [20] the response shall contain the Z_8 field that is interpreted as a generic **STATUS** information that contains attributes of the Datapoint;
- If such a Datapoint is distributed using the service **A_GroupPropertyValue_InfoReport** [20], the Z_8 field shall be interpreted as a generic **STATUS** information that contains attributes of the Datapoint (same as Response);
- If such a Datapoint is accessed using the services **A_PropertyValue_Write** [20] or **A_GroupPropertyValue_Write** [20], the additional field shall be interpreted as a **COMMAND** that contains methods to be executed on the Datapoint.

STATUS - field

For many HVAC objects a status information must be provided in addition to the main value for Read-access or InfoReport service.

EXAMPLES

sensor fault ⇒ value is invalid

Datapoint is not used by the application (out of service) ⇒ value is invalid

sensor value is overridden

sensor alarm level is exceeded

etc.

This Status information shall be transmitted together with the main value in the same A_PropertyValue_-Response-PDU, A_GroupPropertyValue_Response-PDU or A_GroupPropertyValue_InfoReport-PDU (no different Datapoints or properties) for reasons of data consistency, support of generic Datapoint descriptions and minimised bus load.

The KNX protocol does not offer the possibility to read different Datapoints in the same Application Layer PDU therefore structured DPT are used.

[20] The services A_PropertyValue_Read (A_PropertyValue_Read-PDU, A_PropertyValue_Response-PDU) or the service A_PropertyValue_Write (A_PropertyValue_Write-PDU) using point-to-point connectionless or connection-oriented communication mode or the LTE services A_GroupPropertyValue_Read (A_GroupPropertyValue_Read-PDU, A_GroupPropertyValue_Response-PDU), A_GroupPropertyValue_InfoReport, A_GroupPropertyValue_Write.

COMMAND field

On the other hand, execution of specific commands using the Application Layer services A_PropertyValue_Write and A_GroupPropertyValue_Write to change the status and behaviour of a Datapoint is often required.

EXAMPLES

set Datapoint out of service
normal write of a parameter
override sensor value
acknowledge alarm
etc.

This Command shall also be transmitted together with the main value in the same A_PropertyValue_Write-PDU or A_GroupPropertyValue_Write-PDU (no different Datapoints or properties) for reasons of data consistency, generic Datapoint descriptions and minimal bus load.

The KNX protocol does not offer specific Application Layer services to execute these different write commands. It is also not possible to write different Datapoints in the same Application Layer PDU.

Therefore additional datatypes are proposed to allow transmission of the Z_8 STATUS/COMMAND field in the same PDU.

4.1.2 Datatype format

Table 5 summarizes the general structure of new elementary datatypes with **STATUS/COMMAND** field in data octet 1.

Table 5 – Interpretation of the Z_8-field in function of the Application Layer service

Property Access	Application Layer Service PDU	data octet n..2	data octet 1 Z_8
point-to-point addressing	A_PropertyValue_Response-PDU	elementary datatype	STATUS
	A_PropertyValue_Write-PDU		COMMAND
LTE	A_GroupPropertyValue_InfoReport-PDU		STATUS
	A_GroupPropertyValue_Response-PDU		STATUS
	A_GroupPropertyValue_Write-PDU		COMMAND

Constraint

The Z_8 datatype format is not applicable to the Shared Variable model or standard Group Objects because the Shared Variable model does not differentiate between InfoReport and Write service. The A_GroupValue_Write service is used for reporting of information (e.g. sensor values) and writing of information (e.g. write a actuator setpoint). Therefore the interpretation of the Z_8 field would be ambiguous.

STATUS field: Z_8 contains a 8 bit bitset (also following TC247 'Field Level Objects' status) in case of InfoReport or Read/Response service

Bit #	Function	Main value		Remark
		Valid	Invalid	
Bit 0	**OutOfService**			Typical usage: - optional sensor is not connected (out of service), sensor data is invalid - configuration parameter is void (function disabled)
	0: false	X*		Datapoint is accessible and the main value is valid
	1: true		X	Datapoint is accessible but out of service, i.e. the main value is void and **may contain <u>any value</u>.** **The sender shall support the 'OutOfService' flag if the main value may be out of service.** **The receiver shall detect that the main value is invalid due to OutOfService condition**
Bit 1	**Fault**			Typical usage: - sensor value is corrupted due to a hardware problem, data is invalid - a database value is corrupted, e.g. due to loss off backup power, erased EEPROM etc.
	0: false	X		Datapoint main value is valid ⇒ no failure
	1: true		X	Datapoint main value is corrupted due to failure. **The sender shall support the 'Fault' flag if the main value may be corrupted.** **The receiver shall detect that the main value is corrupted due to fault condition.** The main value field contains failure information instead of the data value if 'Fault' = true: **main value failure information** = 0 : general fault (unspecified) = 1 : sensor open circuit (optional detection) = 2 : sensor short circuit (optional detection) all other values are reserved **The sender shall set the main value = 0 if the reason for the fault cannot be specified.**
Bit 2	**Overridden**			Typical usage: - sensor value is temporarily overridden for service - actuator setpoint is temporarily overridden for service
	0: false	X*		normal operation of the Datapoint, actual value
	1: true	X*		actual Datapoint value is overridden
Bit 3	**InAlarm**			Usage: for Datapoints with Alarming capability only
	0: false	X*		Datapoint not in alarm status
	1: true	X*		some alarm condition for this Datapoint occurred
Bit 4	**AlarmUnAck**			Usage: for Datapoints with Alarming capability only
	0: acknowledged	X*		alarm is acknowledged by operator
	1: unacknowledged	X*		alarm is not yet acknowledged by operator
Bit 5-7	reserved			set to 0,0,0
X validity of Datapoint value depends on other STATUS attributes*				

Combination of Status bits

STATUS Bits				Main value	Remarks
OutOfService	Fault	Overridden	InAlarm; AlarmUnAck		
false	false	false	X	**valid**	Normal case
false	false	true	X	**valid**	value is overridden
false	true	false	X	**failure info**	Datapoint failure, main value contains a failure information
false	true	true	X	**! valid !** *)	Datapoint failure but e.g. a corrupted (sensor-) value is overridden. 'Overridden' has priority over 'Fault'. The main value is valid.
true	false	false	X	**invalid**	- actual (sensor-) value not available - parameter out of service
true	**true**	X	X	**-----**	**illegal combination:** if a Datapoint is out of service there is no reason for a 'Fault' because also failure detection is out of service
true	X	**true**	X	**-----**	**illegal combination:** if a Datapoint is out of service there is no possibility to override it

Remarks

- Setting of the Status flags '**OutOfService**' and '**Fault**' is **mutually exclusive**. If a Datapoint is out of service (i.e. void, function disabled), a fault condition cannot arise and vice versa.
- Currently the flags 'InAlarm' and 'AlarmUnAck' are not used (i.e. 0, 0) in all Datapoints except simple AlarmInfo Datapoint (⇒ see FB Technical Alarm) because Alarms are generated at device level but not at Datapoint level. But the STATUS enables Alarm generation and acknowledgement at Datapoint level in future applications.
- Depending on the features of a property only a subset of STATUS flags may be supported. The other flags are set to 0 (default)
  ⇒ Features to be defined in the Datapoint description.
- *) Support of this combination of 'Fault' and 'Overridden' is optional. It is allowed that the override of the Datapoint value automatically clears the 'Fault' attribute, see also clause 4.1.5
  ⇒ 'Fault' = false / 'Overridden' = true
  After execution of the COMMAND 'Release', the 'Overridden' attribute is cleared and the 'Fault' attribute is set again if the failure still persists.

COMMAND field: Z_8 contains a 8 bit enumeration value in case of a write service.

enum value	COMMAND	Main value		Remark	Typical support in		
		Valid	don't care		LTE Write Client [1]	LTE Write Server [2]	Property Write
=0	NormalWrite	X		Typical usage: - normal write of a setpoint, parameter, configuration value - not applicable for sensor values ! → no change of the STATUS flags	X	X	X
=1	Override	X		Typical usage: - temporary override of a sensor value for service - temporary override of a actuator setpoint for service → sets STATUS 'Overridden' → may clear STATUS 'Fault' (optional, see above)	-	X	X
=2	Release		X	Typical usage: together with 'Override'. Undo 'Override', leads to normal operation of the Datapoint using the actual value → resets STATUS 'Overridden'	-	X	X
=3	SetOSV		X	Typical usage: disable functionality of a Datapoint - configuration parameter is void (function disabled) - sensor is disabled SetOSV ⇒ data object is unused, function disabled → sets STATUS 'OutOfService'	-	(X)	X
=4	ResetOSV	X		Typical usage: together with 'SetOSV' The main value field is valid but may be ignored by the receiver (e.g. sensor) → resets STATUS 'OutOfService'	-	(X)	X
=5	AlarmAck		X	Usage: for Datapoints with Alarming capability only Acknowledgement of Alarm STATUS → resets STATUS 'AlarmUnAck'	-	-	X
=6	SetToDefault		X	Typical usage: parameters Sets the main value to the default value	-	X	X
=7-255	reserved						

[1] LTE runtime interworking Write Output, e.g. a HVAC zone controller valve setpoint output
[2] LTE runtime interworking Write Input, e.g. a Valve setpoint input
[3] Property (parameter in a device, server) accessible by a tool (client)
X: usage possible and useful; support to be decided for each Datapoint individually
(X): very limited usage in practice.

Remarks

The usage of the Commands '**NormalWrite**' and '**Override**'/ **'Release'** is usually but not always **mutually exclusive**. E.g. a parameter may be written but an override of a parameter does not make sense.

EXCEPTION EXAMPLE

The valve setpoint is a LTE write input on the valve. A HVAC controller sends the valve setpoint periodically to the valve using the 'NormalWrite' Command. A tool could execute an override to the setpoint on the valve. The valve uses from then on the override value and not the value from the HVAC controller.

Reception of a COMMAND in the Datapoint server may change the STATUS of the Datapoint in the database. The Command itself is not stored in the database.

COMMAND features except 'NormalWrite' are mainly applicable for properties with Write access in client/server mode with point-to-point addressing.
The Sender (i.e. Datapoint client) using A_PropertyValue_Write is normally a (Service-) Tool.

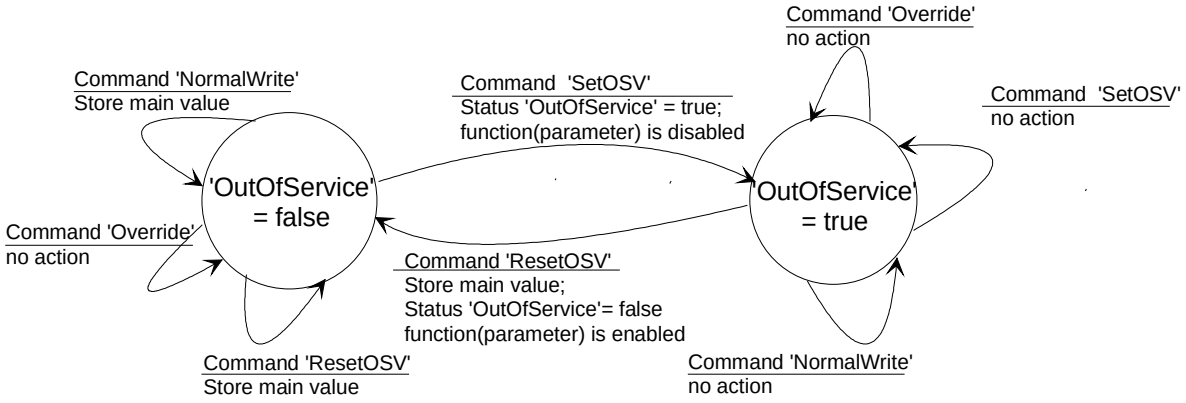
During runtime communication the sender (i.e. a process device) of a LTE A_GroupPropValue_Write-PDU will usually have the COMMAND field fixed to 'NormalWrite' (=0) because most other commands have no practical usage for process data communication. A tool will use A_PropertyValue_Write and point-to-point addressing, see above.

Depending on the features of a property only a small subset of COMMANDS may be supported in the Datapoint server.
⇒ Features to be defined in the Datapoint description.

4.1.3 OutOfService mechanism for a parameter

A parameter and the functionality behind the parameter can be disabled using the 'SetOSV' command.

EXAMPLE



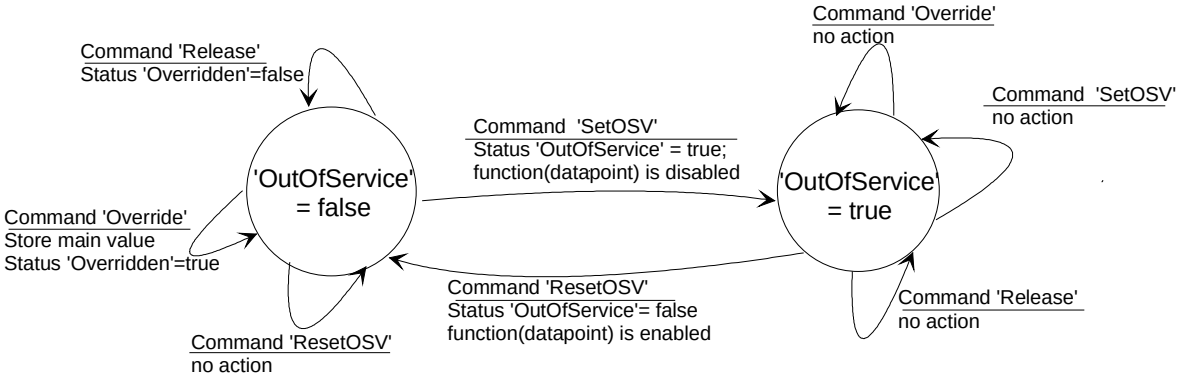
- The parameter is changed using 'NormalWrite' Command.
- The Command 'ResetOSV' resets the Status 'OutOfService' to false and the main value is written to the parameter.
- 'Override' Command and Status 'Overridden' are not supported on parameter Datapoints.

4.1.4 OutOfService mechanism for a runtime Datapoint (actual value)

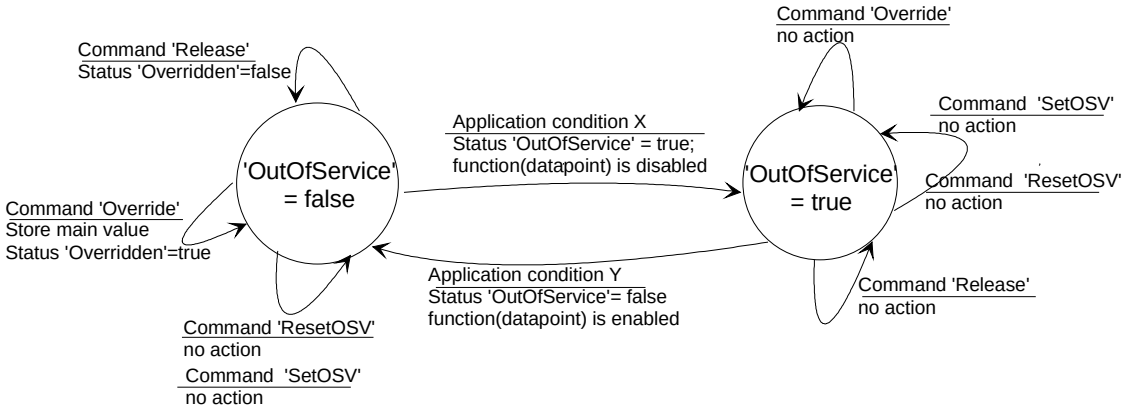
A runtime Datapoint (e.g. a sensor value) and the functionality behind the Datapoint may be automatically disabled by the application program for various reasons (e.g. an optional sensor is not connected). This is indicated by the Status ‘OutOfService’.

The Datapoint value may be overridden only if ‘OutOfService’ = false.
If ‘OutOfService’ = true, the Override feature is inhibited.

EXAMPLE 1 Commands ‘SetOSV’ and ‘Reset OSV’ are supported, i.e. the actual value can be set out of service by a tool.

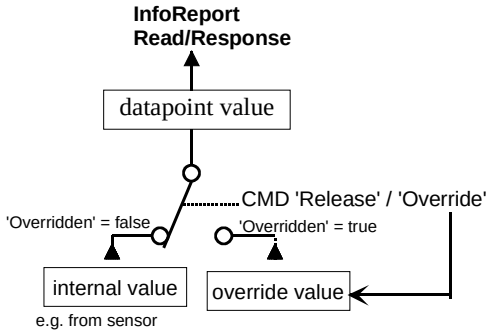


EXAMPLE 2 The application program changes the ‘OutOfService’ Status automatically depending on local application conditions. E.g. an optional sensor is not connected to a HVAC controller ⇒ Status ‘OutOfService’ = true (and not ‘Fault’ = true)
Property Write Commands ‘SetOSV’ and ‘ResetOSV’ sent via bus are not supported on such Datapoints.



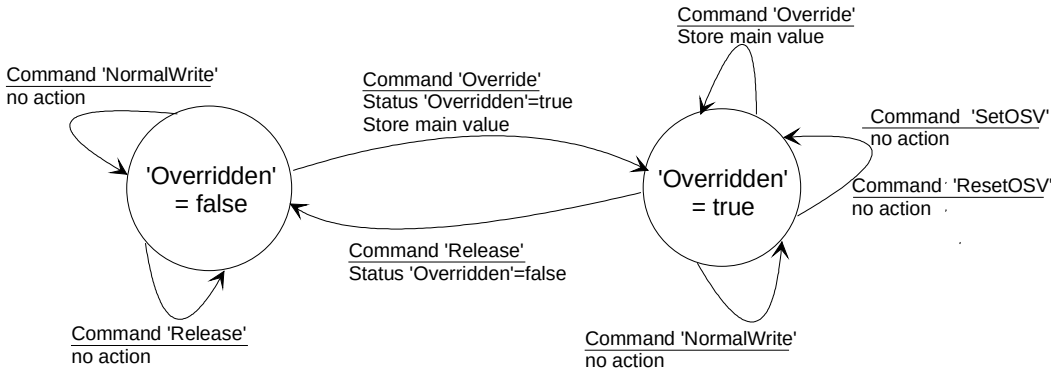
4.1.5 Override mechanism

‘Override’ is used for a temporary service operation on device level or system level. Usually sensor values or actuator setpoints may support the override feature.



NOTE In case of a sensor failure (STATUS 'Fault') it may be useful to override the sensor value temporarily for service reasons. Execution of the COMMAND 'Override' disconnects the data flow from the sensor to the Datapoint value and the override value is used instead. Since the actual sensor value is no more considered, it is allowed for the implementation of the Datapoint to clear the STATUS 'Fault' when 'Overridden' is set. See also clause 4.1.2

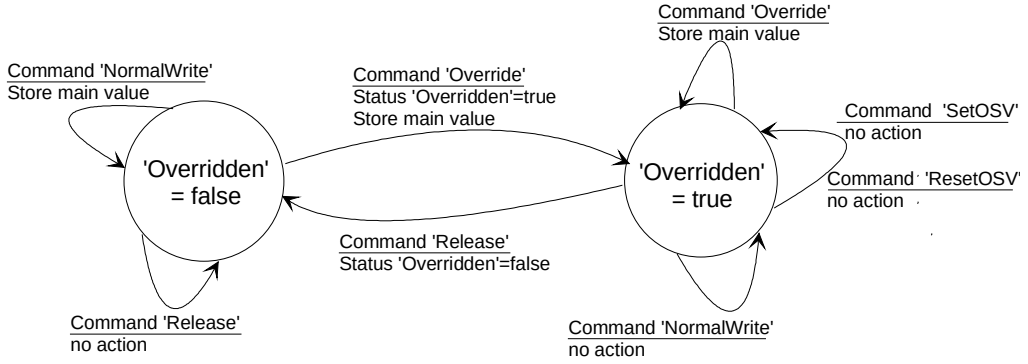
EXAMPLE 1 Override of a sensor value, e.g. the LTE InfoReport sensor output (Datapoint server); local override of the output by a tool using Property Write service (individual addressing).



In the state ‘Overridden’ = true the actual value of the sensor is replaced by the override value, which is distributed in the system using LTE InfoReport service.

In the state ‘Overridden’ = true the Commands ‘SetOSV / ‘ResetOSV’ have no effect (Override has in this case higher priority).

EXAMPLE 2 Override of a valve setpoint on the valve, i.e. a LTE Write input (Datapoint server) on the valve is overridden from a tool by using LTE Write service or Property Write service.



In state ‘Overridden’ = true the override value is used and the received value (LTE Write service) with Command ‘NormalWrite’ is ignored.

After the ‘Release’ Command the actual value of the Datapoint is undefined until the reception of the next ‘NormalWrite’ LTE Write update (the valve will use either a default value or keeps the override value).

Override Timeout: ‘Overridden’ status shall be self clearing based on a timeout,
because the override condition shall not remain forever if the operator / installer forgets to ‘Release’ the overridden Datapoint.

The implementation of the timeout is company specific, e.g.
- individual timeout per Datapoint
- or automatic ‘Release’ of all Datapoints in a device at midnight
- or re-trigger a common timeout for all Datapoints after reception of each ‘Override’ Command
  ⇒ timeout executes a ‘Release’ on all Datapoints.

Power-up condition will normally reset the ‘Overridden’ attribute (manufacturer specific solution).

4.1.6 Alarming mechanism

An Alarm at Datapoint level indicates that a serious fault condition occurred or still occurs on the Datapoint.

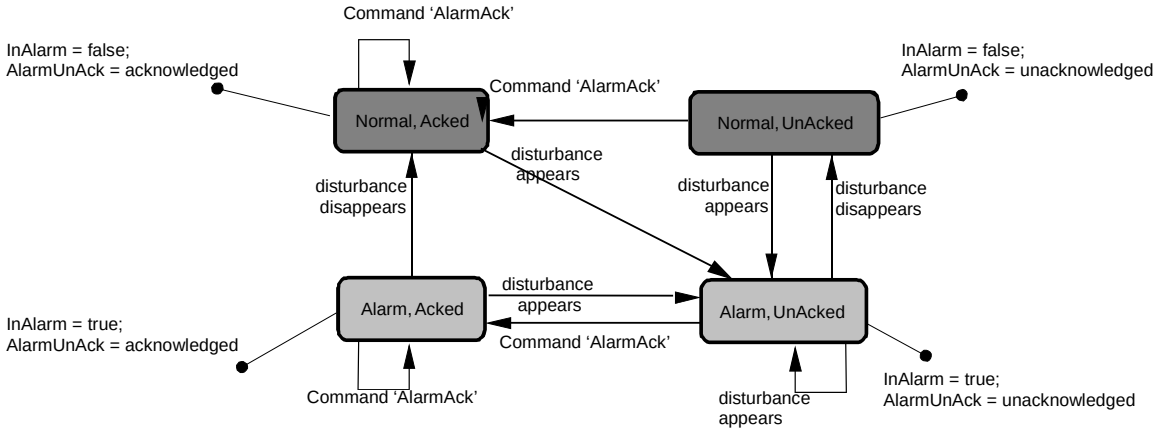
EXAMPLES

transient error event (e.g. critical sensor level exceeded)

persistent error state (e.g. sensor fault; corrupted memory value)

Alarms can be acknowledged by an operator (write service to a property). Datapoints with Alarm feature therefore therefore a corresponding 2 bit state machine in the Status field (InAlarm / AlarmUnAck).

Alarm State Machine



NOTE Currently Alarm messages are provided for the system only on device-level (not on functional or Datapoint level) using the AlarmInfo Datapoint (⇒ see FB Technical Alarm). I.e. individual Datapoints except the device alarm Datapoint AlarmInfo do not support this feature.

4.2 Datapoint Types B_1

Format:	1 bit: B_1
octet nr	1
field names	b
encoding	B
Encoding:	See below
Range:	b = {0,1}
Unit:	See below
Resol.:	(not applicable)
PDT:	PDT_BINARY_INFORMATION (alt: PDT_UNSIGNED_CHAR)

Datapoint Types

ID:	Name:	Encoding: b	Use:
1.100	DPT_Heat/Cool	0 = cooling 1 = heating	FB

4.3 Datapoint Types N_8

Format:	1 octet: N_8
octet nr.	1
field names	*field1*
encoding	N N N N N N N N
Encoding:	Encoding absolute value N = [0 … 255]
Unit:	none
Resol.:	none
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.100	DPT_FuelType	field1 = FuelType 0 = auto 1 = oil 2 = gas 3 = solid state fuel 4 … 255 = not used, reserved	[0 … 3]	HWH
20.101	DPT_BurnerType	field1 = BurnerType 0 = reserved 1 = 1 stage 2 = 2 stage 3 = modulating 4 … 255 = reserved	[0 … 3]	HWH
20.102	DPT_HVACMode	field1 = HVACMode 0 = Auto 1 = Comfort 2 = Standby 3 = Economy 4 = Building Protection 5 … 255 = reserved	[0 … 4]	HVAC
	NOTE 18 DPT_HVACMode is the same as DPT_HVACMode_Z (201.100), but without Z_8 field. In HVAC Room Controllers in KNX Standard Mode, DPT_HVACMode shall be used to set the HVAC Mode. The HVAC Room controller may have *in addition* to the DPT_HVACMode individual Datapoints of 1 bit to set the HVAC Mode. (This means that additional HVAC Mode via individual 1 bit DPs is allowed.) For reporting the currently set HVAC Mode by means of a status/diagnostic Datapoint, the HVAC Room controllers shall use DPT_StatusRHCC or possibly DPT_HVACStatus (see Appendix A).			
20.103	DPT_DHWMode [21)]	field1 = DHWMode 0 = Auto 1 = LegioProtect 2 = Normal 3 = Reduced 4 = Off/FrostProtect 5 … 255 = reserved	[0 … 4]	HWH

[21)] Same as DPT_DHWMode_Z (201.102), but without Z_8 field.

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.104	DPT_LoadPriority	field1 = LoadPriority 0 = None 1 = Shift load priority 2 = Absolute load priority 3 … 255 = reserved	[0 … 2]	HVAC
20.105	DPT_HVACContrMode [22)]	field1 = HVACContrMode 0 = Auto 1 = Heat 2 = Morning Warmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = Emergency Heat 9 = Fan only 10 = Free Cool 11 = Ice 12 = Maximum Heating Mode 13 = Economic Heat/Cool Mode 14 = Dehumidification 15 = Calibration Mode 16 = Emergency Cool Mode 17 = Emergency Steam Mode 18 … 19 = reserved 20 = NoDem 21 … 255= reserved	{[0 … 17], 20}	HVAC
20.106	DPT_HVACEmergMode [23)]	field1 = HVACEmergMode 0 = Normal 1 = EmergPressure 2 = EmergDepressure 3 = EmergPurge 4 = EmergShutdown 5 = EmergFire 6 … 255 = reserved	[0 … 5]	HVAC
20.107	DPT_ChangeoverMode	field1 = ChangeoverMode 0 = Auto 1 = CoolingOnly 2 = HeatingOnly 3 … 255 = reserved	[0 … 2]	HVAC

22) Same as DPT_HVACContrMode_Z (201.104), but without Z_8 field.

23) Same as DPT_HVACEmergMode_Z (201.109), but without Z8 field.

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.108	DPT_ValveMode	field1 = ValveMode 0 = reserved 1 = Heat stage A for normal heating 2 = Heat stage B for heating with two stages (A + B) 3 = Cool stage A for normal cooling 4 = Cool stage B for cooling with two stages (A + B) 5 = Heat/Cool for changeover applications 6 … 255 = reserved	[1 … 5]	HVAC
20.109	DPT_DamperMode	field1 = DamperMode 0 = reserved 1 = Fresh air, e.g. for fancoils 2 = Supply Air. e.g. for VAV 3 = Extract Air e.g. for VAV 4 = Extract Air e.g. for VAV 5 … 255 = reserved	[1 … 4]	HVAC
20.110	DPT_HeaterMode	field1 = HeaterMode 0 = reserved 1 = Heat Stage A On/Off 2 = Heat Stage A Proportional 3 = Heat Stage B Proportional 4 … 255 = reserved	[1 … 3]	HVAC
20.111	DPT_FanMode	field1 = FanMode 0 = not running 1 = permanently running 2 = running in intervals 3 … 255 = reserved	[0 … 2]	TU
20.112	DPT_MasterSlaveMode	field1 = MasterSlaveMode 0 = autonomous 1 = master 2 = slave 3 … 255 = reserved	[0 … 2]	TU
20.113	DPT_StatusRoomSetp	field1 = StatusRoomSetp 0 = normal setpoint 1 = alternative setpoint 2 = building protection setpoint 3 … 255 = reserved	[0 … 2]	TU DEH
20.120	DPT_ADAType	field1 = ADAType 0 = not used, reserved 1 = Air Damper 2 = VAV 3 … 255 = not used, reserved	[1 … 2]	HVAC
20.121	DPT_BackupMode	field1 = BackupMode 0 = Backup Value 1 = Keep Last State 2 … 255 = reserved	[0 … 1]	HVAC

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.122	DPT_StartSynchronization	field1 = StartSynchronization 0 = Position unchanged 1 = Single close 2 = Single open 3 … 255 = reserved	[0 … 2]	HVAC

4.4 Data Type "8-Bit Set"

4.4.1 Datapoint Type "Forcing Signal"

LTE: compound structure

Format:	1 octet: B_8
octet nr.	1
field names	Attributes
encoding	B B B B B B B B
Encoding:	See below.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
21.100	DPT_ForceSign	See below	See below	HWH

Data fields	Description		Range
Attributes	Bit #		Bitset $B_{8,}$
- ForceRequest	0	indicates if forced power consumption is necessary (validity of the remaining attributes)	true / false
- Protection	1	'Protection' indicates that a critical overheat condition occurs (e.g. too high boiler temp.). The interpretation of the attributes 'DHWNorm', 'DHWLegio', 'RoomHComf' and 'RoomHMax' depends on the type of overheat: the addressed heat consumers shall consume energy	true / false
- Oversupply	2	'Oversupply' indicates that an uncritical overheat condition occurs (e.g. boiler temperature is much higher than requested by heat demand). The interpretation of the attributes 'DHWNorm', 'DHWLegio', 'RoomHComf' and 'RoomHMax' depends on the type of overheat: the addressed heat consumers may consume energy	true / false

Data fields	Description		Range
Attributes	Bit #		Bitset $B_{8,}$
- Overrun	3	indicates that remaining energy is available (e.g. in the boiler after load shutdown). All heat consumers which were active immediately before the overrun condition occurred continue their energy consumption with their last setpoint. This attribute is completely independent from the attributes 'Protection', 'Oversupply', 'DHWNorm', 'DHWLegio', 'RoomHComf' and 'RoomHMax'	true / false
- DHWNorm	4	Load DHW to 'Normal' Level in case of overheat: additional info about the type of overheat is contained in the 'Protection' and 'Oversupply' attributes	true / false
- DHWLegio	5	Load DHW to 'LegioProtect' Level in case of overheat ('Protection' or 'Oversupply')	true / false
- RoomHComf	6	Load Room Heating to 'Comfort' Level in case of overheat ('Protection' or 'Oversupply')	true / false
- RoomHMax	7	Load Room Heating with maximum flow temperature in case of overheat ('Protection' or 'Oversupply')	true / false

Depending on the usage of this DPT in a given Datapoint, some bit-fields may be unused and set to '0' by the sender and will be ignored by the receiver

Standard Mode

The information of this DPT is not available in Standard Mode.

4.4.2 Datapoint Type "Forcing Signal Cool"

LTE: compound structure

Format:	1 octet: B_8
octet nr.	1
field names	Attributes
encoding	B B B B B B B B
Encoding:	See below.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
21.101	DPT_ForceSignCool	See below.	See below.	VAC

Data fields	Description		Unit / Range
Attributes	Bit #		Bitset B_8
- ForceRequest	0	indicates if forced power consumption is necessary (validity of the remaining attributes)	true / false
reserved	1 to 7		default 0

Standard Mode

The information of this DPT is not available in Standard Mode.

4.4.3 Datapoint Type “Room Heating Controller Status”

LTE: structured DPT

Format:	1 octet: B_8
octet nr.	1
field names	Attributes
encoding	B B B B B B B B
Encoding:	See below.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
21.102	DPT_StatusRHC	See below.	See below.	HWH

Data fields	Description		Unit / Range
Attributes	Bit #		Bitset B_8
- Fault	0	Room Heating Controller as a failure (mainly for monitoring)	true / false
- StatusECO	1	ECO status; temporary energy saving mode; e.g. due to high room temperature or high outside temperature	true / false
- TempFlowLimit	2	Flow temperature limitation active	true / false
- TempReturnLimit	3	Return temperature limitation active	true / false
- StatusMorningBoost	4	morning boost active	true / false
- StatusStartOptim	5	start optimization active	true / false
- StatusStopOptim	6	stop optimization active	true / false
- SummerMode	7	room heating is disabled due to local summer/winter mode	true / false

Depending on the usage of this DPT in a given Datapoint, some bit-fields may be unused and set to ‘0’ by the sender and will be ignored by the receiver

Standard Mode

Separate Boolean DPs.

4.4.4 Datapoint Type “Solar DHW Controller Status”

LTE: structured DPT

Format:	1 octet: B_8
octet nr.	1
field names	Attributes
encoding	0 0 0 0 0 B B B
Encoding:	See below.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
21.103	DPT_StatusSDHWC	See below.	See below.	DHW control

Data fields	Description		Unit / Range
Attributes	Bit #		Bitset B_8
- Fault	0	SDHWC has a failure	1 = fault 0 = ok
- SDHWLoadActive	1	SDHW load currently active, solar pump is running	true / false
- SolarLoadSufficient	2	enough solar energy available for DHW load to reach the DHW temperature setpoint	true / false
- reserved	3 to 7		default 0

Standard Mode

Separate Boolean DPs.

4.4.5 Datapoint Type “Fuel Type Set”

LTE: structured DPT

Format:	1 octet: B_8
octet nr.	1
field names	Fuel Type Set
encoding	0 0 0 0 0 B B B
Encoding:	See below.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
21.104	DPT_FuelTypeSet	See below.	See below.	HWH

Data fields	Description		Unit / Range
FuelType	Bit #		Bitset B_8
- Oil	0	oil fuel supported	true / false
- Gas	1	gas fuel supported	true / false
- SolidState	2	solid state fuel supported	true / false
reserved	3 to 7		default 0

Standard Mode

The information of this DPT is not available in Standard Mode.

4.4.6 Datapoint Type “Room Cooling Controller Status”

LTE: structured DPT

Format:	1 octet: B_8
octet nr.	1
field names	Attributes
encoding	0 0 0 0 0 0 0 B
Encoding:	See below.
Range:	See below.
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
21.105	DPT_StatusRCC	See below.	See below.	VAC

Data fields	**Description**		**Unit / Range**
Attributes	Bit #		Bitset B_8
- Fault	0	Room Cooling Controller has a failure (mainly for monitoring)	true / false
reserved	1 to 7	for features implemented in the future	default 0

Standard Mode

Separate Boolean DPs.

4.4.7 Datapoint Type “Ventilation Controller Status”

LTE: structured DPT

Format:	1 octet: B_8			
octet nr.	1			
field names	Attributes			
encoding	0 0 0 0 B B B B			
Encoding:	See below.			
Range:	See below.			
Unit:	Not applicable.			
Resol.:	Not applicable.			
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)			
Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
21.106	DPT_StatusAHU	See below	See below	VAC

Data fields	Description		Unit / Range
Attributes	Bit #		Bitset B_8
- Fault	0	Ventilation Controller has a failure (mainly for monitoring)	true / false
- FanActive	1	Supply and / or exhaust air fans are operating	true / false
- Heat	2	Ventilation Controller is in heating mode	true / false
- Cool	3	Ventilation Controller is in cooling mode	true / false
reserved	4 to 7	for features implemented in the future	default 0

Standard Mode

Separate Boolean DPs.

4.5 Data Type “16-Bit Set”

4.5.1 Datapoint Type “DHW Controller Status”

LTE: compound structure

Format:	2 octets: B_{16}
octet nr.	2_{MSB} 1_{LSB}
field names	Attributes
encoding	0 0 0 0 0 0 0 B B B B B B B B
Encoding:	
Range:	
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET16 (alt: PDT_GENERIC_02)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
22.100	DPT_StatusDHWC	See below	See below	DHW control

Data fields	Description		Unit / Range
Attributes	Bit #		Bitset B_{16}
- Fault	0	DHWC has a failure	true / false
- DHWLoadActive	1	DHW load currently active	true / false
- LegioProtActive	2	legionella protection procedure active (load & hold)	true / false
- DHWPushActive	3	true during DHW load triggered by a ‘DHWPush’ command	true / false
- OtherEnergySourceActive	4	load by DHWC is disabled due to other active energy source (e.g. electrical)	true / false
- SolarEnergyOnly	5	load by DHWC is disabled due to sufficient solar energy	true / false
- SolarEnergySupport	6	DHW load is partly done by solar energy	true / false
- TempOptimShiftActive	7	actual DHW temp setpoint is influenced by TempDHWSetpOptimShift ≠ 0	true / false
reserved	8 to 15	reserved	default 0

Standard Mode

Separate Boolean DPs.

4.5.2 Datapoint Type “RHCC Status”

LTE

Not available.

Standard Mode

Format:	2 octets: B_{16}
octet nr.	2_{MSB} | 1_{LSB}
field names	Attributes
	0 | b_{14} | b_{13} | b_{12} | b_{11} | b_{10} | b_9 | b_8 | b_7 | b_6 | b_5 | b_4 | b_3 | b_2 | b_1 | b_0
encoding	r | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B
Range:	all fields: {0,1}
Unit:	Not applicable.
Resol.:	Not applicable.
PDT:	PDT_BITSET16 (alt: PDT_GENERIC_02)

Datapoint Types		
ID:	Name:	Use:
22.101	DPT_StatusRHCC	HVAC

Data fields		Description	Sup	Encoding
Bit #	Attributes			Bitset B_{16}
0	Fault	Room Temperature Controller has a failure. This is a status information, mainly for monitoring.	M	0 = false 1 = true
1	StatusEcoH	ECO status of the room heating temperature controller; If true, the heating controller is temporary in energy saving mode and there is no heat demand although the controller is in heating mode (HeatCoolMode=heating) e.g. due to high room temperature because of internal or solar heat gains or due to high outside temperature	O	0 = false 1 = true
2	TempFlowLimit	Flow temperature limitation is active. E.g. max. flow temperature limitation for floor heating protection	O	0 = false 1 = true
3	TempReturnLimit	Return temperature limitation is active e.g. min return temperature is maintained for boiler protection	O	0 = false 1 = true
4	StatusMorningBoostH	Heating morning boost is active, plant is operated at maximum heating output	O	0 = false 1 = true
5	StatusStartOptim	optimum early start control in the morning is active in order to reach the comfort setpoint according to schedule	O	0 = false 1 = true
6	StatusStopOptim	optimum early shutdown control in the evenig is active in order to maintain the comfort setpoint until the end of the comfort schedule period	O	0 = false 1 = true

Data fields		Description	Sup	Encoding
7	HeatingDisabled	room heating is disabled due to local summer/winter mode. E.g. heating is disabled if - the attenuated outside temperature is above a threshold - current date is in programmed summer-period	O	0 = false 1 = true
8	HeatCoolMode	HeatCoolMode of the controller default: heating	M	0 = cooling 1 = heating
9	StatusEcoC	ECO status of the room cooling temperature controller; If true, the cooling controller is temporary in energy saving mode and there is no cooling demand although the controller is in cooling mode (HeatCoolMode=cooling) e.g. due to energy savings regulations cooling is not allowed if the room temperature is below a defined limit.	O	0 = false 1 = true
10	StatusPreCool	Pre cooling mode in the morning, , plant is operated at maximum cooling output	O	0 = false 1 = true
11	CoolingDisabled	Cooling is disabled due to (examples) - calendar regulations: current date is out of cooling period - the attenuated outside temperature is below a threshold	O	0 = false 1 = true
12	DewPointStatus	DewPointStatus of the controller	O	0 = no alarm 1 = alarm
13	FrostAlarm	Frost alarm status of the controller: in alarm if the room temperature drops below a critical threshold	O	0 = no alarm 1 = alarm
14	OverheatAlarm	Overheat alarm status of the controller: in alarm if the room temperature exceeds a critical threshold	O	0 = no alarm 1 = alarm
15	reserved		--	default 0

Usage requirements

DPT_StatusRHCC shall be used by an HVAC Room controller to report the currently set HVAC Mode by means of a status/diagnostic Datapoint.

NOTE 19 An alternative coding is allowed to report the currently set HVAC Mode. For the description and the usage conditions, please refer to the description of DPT_HVACStatus in Appendix A.

Encoding

Most of the status fields are optional. The coding of the optional fields is defined so that the default value ‘0’ represents the normal case and ‘1’ represents the exception. Displays will usually only indicate the exception but not the normal case. Therefore depending on the usage of this DPT in a given Datapoint, some bit-fields may be unused and set to ‘0’ by the sender and will be ignored by the receiver.

Remarks

- DPT_StatusRHCC is derived from DPT_StatusRHC (21.102) and the “Eberle Status Octet” and extended by some additional attributes
- DPT_StatusRHC is extended to 16 bit and the information of DPT_StatusRHC is a subset of DPT_StatusRHCC
- Except HVAC mode information, all relevant attributes of the “Eberle Status Octet” are included
- The actual HVAC mode of the controller is encoded as enum value in a separate Datapoint.

- The cooling control sequence of the controller is active if
  - HeatCoolMode = cooling
  - CoolingDisabled = false
- The heating control sequence of the controller is active if
  - HeatCoolMode = heating
  - HeatingDisabled = false
- The controller is neither heating nor cooling if
  - HeatCoolMode = don't care
  - CoolingDisabled = true
  - HeatingDisabled = true

4.6 Datapoint Types N_2

Format:	2 bit: N_2
octet nr	1
field names	s
encoding	N N
Unit:	None
Resol.:	(not applicable)
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types

ID:	Name:	Range:	Use:	Encoding:
23.102	DPT_HVAC_PB_Action	[00b…11b]	FB	s 00b = Comfort/Economy 01b = Comfort/Nothing 10b = Economy/Nothing 11b = Building prot/Auto

4.7 Datapoint Types N_3

4.7.1 Datapoint Type DPT_PB_Action_HVAC_Extended

Format:	3 bit: N_3
octet nr	1
field names	s
encoding	N N N
Unit:	None
Resol.:	(not applicable)
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types

ID:	Name:	Range:	Use:	Encoding:
31.101	Name: DPT_PB_Action_HVAC_Extended Range: [000b to 111b] Use: CH_PB_HVAC_Mode_1 Encoding: s			

This DPT shall not be used for runtime communication.

This DPT shall only be used for encoding Parameter values in CH_PB_HVAC_Mode_1. For the proper interpretation, please refer to the specification of this Channel in the E-Mode specifications.

This DPT allows designing a switch to control the HVAC Mode with an Output “HVAC Mode” (DPT_HVACMode, 20.102). This DPT_PB_Action_HVAC_Extended encodes a parameter value to configure which HVAC Mode shall be activated on press of the switch and which HVAC Mode shall be activated on release of the switch.

Value of DPT_PB_Action_-HVAC_Extended	**Value transmitted on the Output HVAC Mode when the switch is**	
	pressed	**released**
000b	Comfort	Economy
001b	Comfort	(no transmission)
010b	Economy	(no transmission)
011b	Building prot.	Auto
100b	Building prot.	(no transmission)
101b	Auto	(no transmission)
110b	Standby	(no transmission)
111b	Comfort	Standby

4.8 Data Type “Boolean with Status/Command”

4.8.1 Datapoint Type “Heat/Cool_Z”

LTE: compound structure

Format:	2 octets: B_1Z_8 2 Heat/Cool: 0000000B 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
200.100	DPT_Heat/Cool_Z	See below	See below	HVAC

Data fields	Description		Unit / Range
Heat/Cool	Bit #		Bitset B_8
- Heat/Cool	0		0= cooling 1= heating
Status/Command	standard Status/Command		Z_8

Standard Mode

DPT_Heat/Cool (01.100); without Z_8 field

4.8.2 Datapoint Type “DPT_BinaryValue_Z”

LTE: compound structure

Format:	2 octets: B_1Z_8 2 BinaryValue: 0000000B 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
200.101	DPT_BinaryValue_Z	See below	See below	FOCI

Data fields	Description		Unit / Range
BinaryValue	Bit #		Bitset B_8
- Low/High	0		0 = low 1 =high
Status/Command	standard Status/Command		Z_8

Standard Mode

DPT_BinaryValue (1.006) without Z_8 field/

4.9 Data Type "8-Bit Enum with Status/Command"

4.9.1 Datapoint Type "HVAC Operating Mode"

LTE: compound structure

Format:	2 octets: N_8Z_8
octet nr.	2 1
field names	HVACMode | Status/ Command
encoding	NNNNNNNN | ZZZZZZZZ
Resol.:	none
PDT:	PDT_GENERIC_02

Datapoint Types

ID:	Name:	Encoding:	Range:	Unit:	Use:
201.100	DPT_HVACMode_Z	See below	See below	See below	HVAC

DPT_HVACMode_Z

Data fields	Description	Unit / Range
HVACMode	HVAC operating mode Depending on the type of Datapoint the value 'Auto' is allowed or not ⇒ to be defined per Datapoint	enum. N_8 Encoding absolute value N = {0, 255} **0 = Auto** 1 = Comfort 2 = Standby 3 = Economy 4 = Bldg.Prot 5-255: reserved
Status/Command	standard Status/Command	Z_8

Standard Mode

DTP_HVACMode (20.102), without Z_8 field.

4.9.2 Datapoint Type “DHW Mode”

LTE: compound structure

Format:	2 octet N_8Z_8 2 DHWMode: NNNNNNNN 1 Status/Command: ZZZZZZZZ
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
201.102	DPT_DHWMode_Z	See below	See below	HWH

DPT_DHWMode_Z:

Data fields	Description	Unit / Range
DHWMode	DHW operating mode Depending on the type of Datapoint the value ‘Auto’ is allowed or not ⇒ to be defined per Datapoint	enum. N_8 Encoding absolute value N = {0, 255} **0 = Auto** 1 = LegioProtect 2 = Normal 3 = Reduced 4 = Off/FrostProtect 5 to 255: reserved
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_DHWMode (20.103) without Z_8 field.

4.9.3 Datapoint Type “HVAC Controlling Mode”

LTE: compound structure

Format:	2 octets: N_8Z_8
octet nr.	2 1
field names	HVACContr-Mode | Status-/Command
encoding	N N N N N N N N | Z Z Z Z Z Z Z Z
PDT:	PDT_GENERIC_02

Datapoint Types

ID:	Name:	Encoding:	Unit:	Range:	Resol.:	Use:
201.104	DPT_HVACContrMode_Z	See below.	See below.	See below.	See below.	TU

Data fields	Description	Unit / Range
HVACContrMode		enum.: N_8 Encoding absolute value N = {0, 255} 0 = Auto 1 = Heat 2 = Morning Warmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = Emergency Heat 9 = Fan only 10 = Free Cool 11 = Ice 12 = Maximum Heating Mode 13 = Economic Heat/Cool Mode 14 = Dehumidification 15 = Calibration Mode 16 = Emergency Cool Mode 17 = Emergency Steam Mode 18 to 19 = reserved 20 = NoDem 21 to 255 = reserved
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_HVACContrMode (20.105), without Z_8 field.

4.9.4 Datapoint Type “Enable Heat/Cool Stage”

LTE: compound structure

Format:	2 octets: N_8Z_8													
octet nr.	2							1						
field names	EnableH/C-Stage							Status-/Command						
encoding	N	N	N	N	N	N	N	N	Z	Z	Z	Z	Z	Z	Z	Z
Unit:	none													
Resol.:	none													
PDT:	PDT_GENERIC_02													

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
201.105	DPT_EnableH/Cstage_Z	See below.	See below.	HVAC

Data fields	Description	Unit / Range
EnableH/CStage		enum.: N_8 Encoding absolute value N = {0, 255} 0 = disabled 1 = enable stage A 2 = enable stage B 3 = enable both stages
Status/Command	standard Status/Command	Z_8

Standard Mode

Not available.

4.9.5 Datapoint Type “Building Mode”

LTE: compound structure

Format:	2 octets: N_8Z_8								
	2							1	
	BuildingMode							Status/ Command	
	N	N	N	N	N	N	N	N	Z	Z	Z	Z	Z	Z	Z	Z
Encoding:	See below								
Range:	See below								
Unit:	See below								

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
201.107	DPT_BuildingMode_Z	See below	See below	general

Data fields	Description	Unit / Range
BuildingMode		enum. N_8 Encoding absolute value N = {0, 255} 0 = Building in use 1 = Building not used 2 = Building Protection
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_BuildingMode (20.002), without Z_8 field.

4.9.6 Datapoint Type "Occupancy Mode"

LTE: compound structure

Format:	2 octets: N_8Z_8 2 OccMode | 1 Status/ Command NNNNNNNN | ZZZZZZZZ
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
201.108	DPT_OccMode_Z	See below	See below	HVAC

Data fields	Description	Unit / Range
OccMode		enum. N_8 Encoding absolute value N = {0, 255} 0 = Occupied 1 = Standby 2 = Not occupied
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_OccMode (20.003) without Z_8 field.

4.9.7 Datapoint Type “HVAC Emergency Mode”

LTE: compound structure

Format:	2 octets: N_8Z_8 2 HVACEmerg Mode: NNNNNNNN 1 Status/ Command: ZZZZZZZZ
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
201.109	DPT_HVACEmergMode_Z	See below	See below	HVAC

Data fields	Description	Unit / Range
HVACEmergMode		enum. N_8 Encoding absolute value N = {0, 255} 0 = Normal 1 = EmergPressure 2 = EmergDepressure 3 = EmergPurge 4 = EmergShutdown 5 = EmergFire 6 to 255: reserved
Status/Command	standard Status/Command	Z_8

Standard Mode

HVACEmergMode (20.106), without Z_8 field

4.10 Data Type “16-Bit Unsigned Value with Status/Command”

4.10.1 Datapoint Type “HVAC Air Quality”

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$ 3 MSB HVACAirQual: UUUUUUUU 2 LSB HVACAirQual: UUUUUUUU 1 Status Command: ZZZZZZZZ
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
203.100	DPT_ HVACAirQual_Z	See below	See below	TU, VAC

Data fields	Description	Unit / Range
HVACAirQual		U_{16}, 1ppm resolution 0 ppm to 65535 ppm
Status/Command	standard Status/Command	Z_8

In case of a detected sensor failure the Status Flag ‘Fault’ shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of ‘Fault’ may be encoded in the ‘HVACAirQual’ field (optional feature): see standard Z_8 mechanism in 4.1.2.

Standard Mode

DPT_Value_AirQuality (9.008), only HVACAirQual without Z_8 field.

4.10.2 Datapoint Type "Wind Speed with Status/Command"

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$ 3 MSB WindSpeed: UUUUUUUU 2 LSB WindSpeed: UUUUUUUU 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
203.101	DPT_WindSpeed_Z	See below	See below	HVAC

Data fields	Description	Unit / Range
WindSpeed	wind speed absolute value m/s	$U_{16,}$ 0,01 m/s resolution 0 km/h … 200 km/h (and more)
Status/Command	standard Status/Command	Z_8

In case of a detected sensor failure the Status Flag 'Fault' shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of 'Fault' may be encoded in the 'WindSpeed' field (optional feature): see standard Z_8 mechanism in 4.1.2.

Standard Mode

DPT_Value_Wsp (9.005), only WindSpeed without Z_8 field.

4.10.3 Datapoint Type "Sun Intensity with Status/Command"

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$ 3 MSB SunIntensity: UUUUUUUU 2 LSB SunIntensity: UUUUUUUU 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
203.102	DPT_SunIntensity_Z	See below	See below	HVAC

Data fields	Description	Unit / Range
SunIntensity	Sun intensity W/m^2	$U_{16,}$ 0,05 W/m^2 resolution 0 W/m^2 … 1400 W/m^2 (theoretical max. sun intensity)
Status/Command	standard Status/Command	Z_8

In case of a detected sensor failure the Status Flag 'Fault' shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of 'Fault' may be encoded in the 'SunIntensity' field (optional feature): see standard Z_8 mechanism in 4.1.2.

Standard Mode

DPT_PowerDensity (9.022); only SunIntensity without Z_8 field.

4.10.4 Datapoint Type "HVAC Air Flow Absolute Value"

LTE: compound structure

Format:	3 octets: $U_{16}Z_8$ 3 MSB HVACAirFlow | 2 LSB HVACAirFlow | 1 Status Command UUUUUUUU | UUUUUUUU | ZZZZZZZZ
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
203.104	DPT_HVACAirFlowAbs_Z	See below	See below	TU

Data fields	Description	Unit / Range
HVACAirFlow		$U_{16,}$ 1m³/h resolution 0 m³/h to 65535 m³/h
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_Value_AirFlow (9.009) in m^3/h, only HVACAirFlow without Z_8 field.

4.11 Data Type “16-Bit Signed Value with Status/Command”

4.11.1 Datapoint Type “HVAC absolute Temperature”

LTE: compound structure

Format:	3 octets: $V_{16}Z_8$ 3 MSB Temp: VVVVVVVV 2 LSB Temp: VVVVVVVV 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
205.100	DPT_TempHVACAbs_Z	See below	See below	HVAC

DPT_TempHVACAbs_Z

Data fields	Description	Unit / Range
Temp	temperature **absolute value** °C	$V_{16,}$ 0,02°C resolution –273°C to 655,34 °C
Status/Command	standard Status/Command	Z_8

Exception handling

In case of a detected sensor failure the Status Flag ‘Fault’ shall be set. This is a mandatory feature of this DPT.

In this case in addition the reason of ‘Fault’ may be encoded in the ‘Temp’ field (optional feature): see standard Z_8 mechanism in 4.1.2.

Standard Mode

DPT_Value_Temp (9.001), without Z8 field.

4.11.2 Datapoint Type "HVAC relative Temperature"

LTE: compound structure

Format:	3 octets: $V_{16}Z_8$ 3 MSB Temp: VVVVVVVV 2 LSB Temp: VVVVVVVV 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
205.101	DPT_TempHVACRel_Z	See below	See below	HVAC

DPT_TempHVACRel_Z

Data fields	Description	Unit / Range
Temp	temperature **relative value** / offset K	$V_{16,}$ 0,02 K resolution –273 K to 655,34 K
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_Value_Tempd (9.002), without Z_8 field.

4.11.3 Datapoint Type "HVAC Air Flow Relative Value"

LTE: compound structure

Format:	3 octets: $V_{16}Z_8$ 3 MSB HVACAirFlow: VVVVVVVV 2 LSB HVACAirFlow: VVVVVVVV 1 Status Command: ZZZZZZZZ			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
205.102	DPT_HVACAirFlowRel_Z	See below	See below	TU

Data fields	Description	Unit / Range
HVACAirFlow		$V_{16,}$ 1m³/h resolution –32768 m+/h to 32767 m³/h
Status/Command	standard Status/Command	Z_8

Standard Mode

DPT_Value_AirFlow (9.009) in m3/h, only HVACAirFlow without Z8 field

4.12 Data Type "16-Bit Unsigned Value & 8-Bit Enum"

4.12.1 Datapoint Type "HVAC Mode & Time delay"

LTE and Standard Mode: compound structure

Format:	3 octets: $U_{16}N_8$ 3 MSB Delay Time: UUUUUUUU 2 LSB Delay Time: UUUUUUUU 1 HVACMode: NNNNNNNN			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
206.100	DPT_HVACModeNext	See below	See below	G

DPT_HVACModeNext:

Data fields	Description	Unit / Range
Time	delay time	$U_{16,}$ 1 min resolution 1 min to 65 535 min 0 = undefined delay time *)
HVACMode	This DPT can be used to encode: - the next active HVACMode after expiration of the delay time - the currently active HVACMode which will be active during the delay time	enum. N_8 Encoding absolute value N = {0, 255} 0 = Undefined*) 1 = Comfort 2 = Standby 3 = Economy 4 = Bldg.Prot 5 to 255: reserved

*) The following combinations are in principle possible:

Time	HVACMode	
= 0 (Undefined)	= 0 (Undefined)	the content of the Datapoint is void / undefined
= 0 (Undefined)	= {1..4}	defined and valid HVACMode but the delay time is undefined (unknown)
> 0	= 0 (Undefined)	undefined (unknown) HVACMode during a defined delay time ⇒ in practice this combination is normally useless
> 0	= {1..4}	defined and valid HVACMode and delay time

Allowed combinations and their usage/interpretation are defined at the level of Datapoint specifications

4.12.2 Datapoint Type "DHW Mode & Time delay"

LTE: compound structure

Format:	3 octets: $U_{16}N_8$ 3 MSB Delay Time: UUUUUUUU 2 LSB Delay Time: UUUUUUUU 1 DHWMode: NNNNNNNN
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
206.102	DPT_DHWModeNext	See below	See below	DHW control

DPT_DHWModeNext:

Data fields	Description	Unit / Range
Time	delay time	$U_{16,}$ 1 min resolution 1 min … 65535 min 0 = undefined delay time *)
DHWMode	This DPT can be used to encode: - the next active DHWMode after expiration of the delay time - the currently active DHWMode which will be active during the delay time	enum. N_8 Encoding absolute value N = {0, 255} 0 = Undefined*) 1 = LegioProtect 2 = Normal 3 = Reduced 4 = Off/FrostProtect 5-255: reserved

*) The following combinations are in principle possible:

Time	DHWMode	
= 0 (Undefined)	= 0 (Undefined)	the content of the Datapoint is void / undefined
= 0 (Undefined)	= {1..4}	defined and valid DHWMode but the delay time is undefined (unknown)
> 0	= 0 (Undefined)	undefined (unknown) DHWMode during a defined delay time ⇒ in practice this combination is normally useless
> 0	= {1..4}	defined and valid DHWMode and delay time

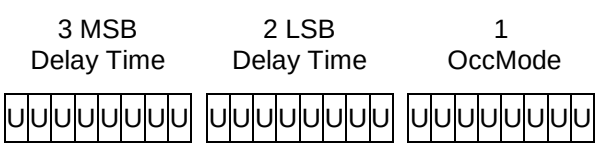
Allowed combinations and their usage/interpretation are defined at the level of Datapoint specifications

Standard Mode

The information of this DPT is not available in Standard Mode.

4.12.3 Datapoint Type "Occupancy Mode & Time delay"

LTE: compound structure

Format:	3 octets: $U_{16}N_8$ 
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
206.104	DPT_OccModeNext	See below	See below	TU

DPT_OccModeNext:

Data fields	Description	Unit / Range
Time	delay time	$U_{16,}$ 1 Min resolution 1 min … 65535 min 0 = next mode not available
OccMode		enum. N_8 Encoding absolute value N = {0, 255} 0 = Occupied 1 = Standby 2 = Not occupied 3-255: reserved

Standard Mode

Not available.

4.12.4 Datapoint Type “Building Mode & Time delay”

LTE: compound structure

Format:	3 octets: N_8U_{16} 3 MSB Delay Time: UUUUUUUU 2 LSB Delay Time: UUUUUUUU 1 BuildingMode: NNNNNNNN			
Encoding:	See below			
Range:	See below			
Unit:	See below			
Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
206.105	DPT_BuildingModeNext	See below	See below	TU

DPT_BuildingModeNext:

Data fields	Description	Unit / Range
Time	delay time	$U_{16,}$ 1 Min resolution 1 min … 65535 min 0 = next mode not available
BuildingMode		enum. N_8 Encoding absolute value N = {0, 255} 0 = Building in use 1 = Building not used 2 = Building Protection 3-255: reserved

Standard Mode

Not available.

4.13 Data Type “8-Bit Unsigned Value & 8-Bit Set”

4.13.1 Datapoint Type “Status Burner Controller”

LTE: compound structure

Format:	2 octets: U_8B_8 2 PrelBurner: UUUUUUUU 1 Attributes: 00BBBBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
207.100	DPT_StatusBUC	See below	See below	HWH

Data fields	**Description**		**Unit / Range**
PrelBurner	Actual relative power %		$U_{8,}$ 0..100%, 1% resolution
Attributes	Bit #		Bitset B_8
- PrelBurnerValid	0	validity of PrelBurnerField	true / false
- Fault	1	burner failure	true / false
- StatusStage1	2	stage 1 or base stage active	on / off
- StatusStage2	3	stage 2 / modulation active	on / off
reserved	4-7		default 0

Standard Mode

6 separate Datapoints

- PrelBurner: DPT_RelPos_Valve (5.004)
- Fault: DPT_Bool (1.002)
- StatusStage1, StatusStage2: DPT_Switch (1.001)

4.13.2 Datapoint Type “Locking Signal”

LTE: compound structure

Format:	2 octets: U_8B_8 2 PwrReduction: UUUUUUUU 1 Attributes: 000000BB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
207.101	DPT_LockSign	See below	See below	HVAC

Data fields	Description		Unit / Range
PwrReduction	Requested power reduction – 0 % no reduction – 100 % max. reduction		$U_{8,}$ 0 % … 100 %, 1 % resolution
Attributes	Bit #		Bitset $B_{8,}$
- LockRequest	0	indicates if power reduction is necessary (validity of PwrReduction)	true / false
- Type	1	indicates whether overload is critical (e.g. too low boiler temp.) or uncritical (e.g. requested boiler temperature can not be provided but boiler temperature is above critical lower limit)	1= critical 0= uncritical
reserved	2-7		default 0

Standard Mode

Not available.

4.13.3 Datapoint Type “Boiler Controller Demand Signal”

LTE: compound structure

Format:	2 octets: U_8B_8 2 RelBurnerDem: UUUUUUUU 1 Attributes: 000000BB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
207.102	DPT_ValueDemBOC	See below	See below	Burner control

Data fields	Description		Unit / Range
RelBurnerDem	Relative demand %: for modulating burner		$U_{8,}$ 0 % … 100 %, 1 % resolution
Attributes	Bit #		Bitset $B_{8,}$
- Stage1Control	0	controls operation of stage 1 or base stage	1= on / 0= off
- Stage2Control	1	controls stage 2 for two stage burner	1= on / 0= off
reserved	2-7		default 0

Standard Mode

The information of this DPT is not available in Standard Mode.

4.13.4 Datapoint Type "Actuator Position Demand"

LTE: compound structure

Format:	2 octets: U_8B_8 2 ActPosDem: UUUUUUUU 1 Attributes: 0000BBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
207.104	DPT_ActPosDemAbs	See below	See below	HVAC

Data fields	Description		Unit / Range
ActPosDe□mAbs	Absolute actuator position demand (setpoint, valve linearized)		$U_{8,}$ 0 % … 100 %, 1 % resolution
Attributes	Bit #		Bitset $B_{8,}$
- DemValid	0	Validity of ActPosDem 'false' means also 'no demand'	true / false
- AbsLoadPriority	1	absolute load priority	true / false
- ShiftLoadPriority	2	shift load priority	true / false
- EmergDem	3	emergency demand (heating or cooling) for room frost protection or de-icing	true / false
reserved	4-7		default 0

Remark: depending on the usage of this DPT per Datapoint, some of the attributes (except DemValid) may not be supported and shall then be set to false (=0)

Standard Mode: % value, without attributes

The DPT in standard mode is depending on the Datapoint and is defined in the Datapoint specification. Two solutions are possible. Solution B) is preferred because there is no mapping of the % value.

A) DPT_Scaling (5.001) Encoding 0 % … 100 % full datatype value 0...255, i.e. 1 % = value 255/100!
To be used in heating individual room control systems for backwards compatibility with actuator position demand in the EIB HWH ObIS.

B) DPT_Percent_U8 (5.004) Encoding 0 % …255 % full datatype value 0 … 255, i.e. 1 % = value 1 To be used in ventilation and cooling applications.

4.13.5 Datapoint Type "Actuator Position Status"

LTE: compound structure

Format:	2 octets: U_8B_8 2 ActPos | 1 Attributes UUUUUUUU | 0000BBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
207.105	DPT_StatusAct	See below	See below	HVAC

Data fields	Description		Unit / Range
ActPos	actual actuator position		$U_{8,}$ 0 %… 100 %, 1 % resolution
Attributes	Bit #		Bitset $B_{8,}$
- Failure	0	actuator has a failure	true/false
- ManualOverride	1	actuator position is manually overridden	true/false
- CalibrationMode	2	actuator is currently in calibration mode	0: inactive 1: active
- ValveKick	3	valve is currently executing a valve kick	0: inactive 1: active
- SynchronizationMode	4	SynchronizationMode indicates that the actuator is currently executing a synchronization of the stroke model	0: inactive 1: active
reserved	5-7		default 0

Standard Mode

6 separate Datapoints

- ActPosition: DPT_Scaling (5.001)
- ActStatus: 5 individual Boolean Datapoints

4.14 Data Type “16-Bit Signed Value & 8-Bit Set”

4.14.1 Datapoint Type “Heat Producer Manager Status”

LTE: compound structure

Format:	3 octets: $V_{16}B_8$ 3 MSB TempFlow ProdSegmH | 2 LSB TempFlow ProdSegmH | 1 Attributes VVVVVVVV | VVVVVVVV | 000BBBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
209.100	DPT_StatusHPM	See below	See below	HWH

Data fields	Description		Unit / Range
TempFlowProdSegmH	common flow temperature of ProdSegmH		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
Attributes	Bit #		Bitset B_8
- TempFlowValid	0	validity of TempFlowProdSegmH field	true / false
- Fault	1	some failure in boiler sequence: HPM itself or boiler(s) have a failure (mainly used for monitoring)	true / false
- SummerMode	2	boiler sequence switched off due to local summer/winter mode (mainly used for monitoring)	true / false
- OffPerm	3	boiler sequence is permanently off (manual switch or failure)	true / false
- NoHeatAvailable	4	boiler sequence is temporary not producing heat	true / false
reserved	5-7		default 0

Standard Mode

Separate Datapoints

- TempFlowWaterProdSegmH: DPT_Value_Temp (9.001)
- Fault: DPT_Bool (1.002)
- SummerMode: DPT_Bool (1.002)
- OffPerm: DPT_Bool (1.002)
- NoHeatAvailable: DPT_Bool (1.002)

4.14.2 Datapoint Type "Room Temperature Demand"

LTE: compound structure

Format:	3 octets: $V_{16}B_8$ 3 MSB TempRoom Dem | 2 LSB TempRoom Dem | 1 Attributes VVVVVVVV | VVVVVVVV | 0000BBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
209.101	DPT_TempRoomDemAbs	See below	See below	HWH

Data fields	**Description**		**Unit / Range**
TempRoomDem	requested room temperature setpoint		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
Attributes	Bit #		Bitset B_8
- DemValid	0	Validity of TempRoomDem 'false' means also 'no demand'	true / false
- AbsLoadPriority	1	absolute load priority	true / false
- ShiftLoadPriority	2	shift load priority	true / false
- EmergDem	3	emergency demand (heating or cooling) for room frost protection or de-icing	true / false
reserved	4-7		default 0

Remark: depending on the usage of this DPT per Datapoint, some of the attributes (except DemValid) may not be supported and shall then be set to false (=0)

Standard Mode

TempRoomDem only: DPT_Value_Temp (9.001).
No support of load priority functionality.

4.14.3 Datapoint Type “Cold Water Producer Manager Status”

LTE: compound structure

Format:	3 octets: $V_{16}B_8$ 3 MSB TempFlow ProdSegmC | 2 LSB TempFlow ProdSegmC | 1 Attributes VVVVVVVV | VVVVVVVV | 0000BBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
209.102	DPT_StatusCPM	See below	See below	VAC

Data fields	**Description**		**Unit / Range**
TempFlowProdSegmC	chilled water flow temperature in the cooling production segment		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
Attributes	Bit #		Bitset B_8
- TempFlowValid	0	validity of TempFlowProdSegmH field	true / false
- Fault	1	some failure in the chiller	true / false
- OffPerm	2	permanently off (manual switch or failure)	true / false
- NoCoolAvailable	3	temporarily no cooling in the production segment available	true / false
reserved	4-7		default 0

Standard Mode: separate Datapoints

- TempFlowWaterProdSegmC: DPT_Value_Temp (9.001)
- Fault: DPT_Bool (1.002)
- OffPerm: DPT_Bool (1.002)
- NoCoolAvailable: DPT_Bool (1.002)

4.14.4 Datapoint Type “Water Temperature Controller Status”

LTE: compound structure

Format:	3 octets: $V_{16}B_8$ 3 MSB TempWater: VVVVVVVV 2 LSB TempWater: VVVVVVVV 1 Attributes: 00000BBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
209.103	DPT_StatusWTC	See below	See below	HVAC

Data fields	**Description**		**Unit / Range**
TempWater	actual temperature (flow or return) of the water temperature controller		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
Attributes	Bit #		Bitset B_8
- TempWaterValid	0	validity of TempWater field	true / false
- Fault	1	some failure in the water temperature controller	true / false
- CtrlStatus	2	Controller status on: controller is working (default if not supported) off: controller is stopped; no control of water temperature	on / off
reserved	3-7		default 0

Standard Mode: separate Datapoints

- TempWater: DPT_Value_Temp (9.001)
- Fault: DPT_Bool (1.002)
- CtrlStatus: DPT_Switch (1.001)

4.15 Data Type “16-Bit Signed Value & 16-Bit Set”

4.15.1 Datapoint Type “Consumer Flow Temperature Demand”

LTE: compound structure

Format:	4 octet; $V_{16}B_{16}$
	4 MSB TempFlowDem: VVVVVVVV; 3 LSB TempFlowDem: VVVVVVVV; 2 MSB Attributes: 0000BBBB; 1 LSB Attributes: BBBBBBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
210.100	DPT_TempFlowWaterDemAbs	See below	See below	HVAC

Data fields	**Description**		**Unit / Range**
TempFlowDem	flow temperature demand (setpoint)		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
Attributes	Bit #		Bitset B_{16}
- DemValid	0	Validity of TempFlowDem ‘false’ means also ‘no demand’	true / false
- AbsLoadPriority	1	absolute load priority	true / false
- ShiftLoadPriority	2	shift load priority	true / false
- MaxTempLimit	3	TempFlowDem contains max. temperature limit	true / false
- MinTempLimit	4	TempFlowDem contains min. temperature limit	true / false
- DHWReq	5	Heat demand from DHW ⇒ for DHW preparation during summer (room heating off)	true / false
- RoomCtrlReq	6	demand from Room Heating or Cooling	true / false
- VentReq	7	demand from Ventilation (Heating or Cooling)	true / false
- AuxAllSeasonReq	8	demand from auxiliary heat or cool consumer; all season	true / false
- SystemPumpReq	9	request for water circulation in the primary distribution segment (common system pump on)	true / false
- EmergDem	10	emergency demand (heating or cooling) for room frost protection or de-icing	true / false
- DHWLegioReq	11	demand from DHW while legionella function is active (can only be ‘true’ if DHWReq = ‘true’)	true / false
reserved	12-15		default 0

Remark: depending on the usage of this DPT per Datapoint, some of the attributes (except DemValid) may not be supported and shall then be set to false (=0)

Standard Mode

The information of this DPT is not available in Standard Mode.

4.16 Data Type “8-Bit Unsigned Value & 8-Bit Enum”

4.16.1 Datapoint Type “EnergyDemWater”

LTE: compound structure

Format:	2 octets: U_8N_8 2 EnergyDem: UUUUUUUU 1 VACContr Mod: NNNNNNNN
Encoding:	see below
Range:	see below
Unit:	see below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
211.100	DPT_EnergyDemWater	see below	see below	HVAC

Data fields	Description	Unit / Range
EnergyDem	Energy demand of terminal unit controller	U_8, 0 %..100 % 1 % resolution
ContrModeAct	Actual controller Mode	enum. N_8 Encoding absolute value N = {0, 255} 0: Auto 1: Heat 2: Morning Warmup 3: Cool 4: Night Purge 5: Precool 6: Off 7: Test 8: Emergency Heat 9: Fan only 10: Free Cool 11: Ice 12 to 19: reserved 20: NoDem 21-255: reserved

Standard Mode

Splitting in 2 separate Datapoints:

DPT_Percent_U8 (5.004)

DPT_HVACContrMode (20.105)

4.17 Data Type “3x 16-Bit Signed Value ”

4.17.1 Datapoint Type “3x set of RoomTemperature Setpoint Shift values”

LTE: compound structure

Format:	6 octet; $V_{16}V_{16}V_{16}$
	6 MSB TempSetp ShiftComf | 5 LSB TempSetp ShiftComf | 4 MSB TempSetp ShiftStdby | 3 LSB TempSetp ShiftStdby
	VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV
	2 MSB TempSetp ShiftEco | 1 LSB TempSetp ShiftEco
	VVVVVVVV | VVVVVVVV
Encoding:	see below
Range:	see below
Unit:	K

Datapoint Types

ID:	Name:	Range:	Unit:	Usage:
212.100	DPT_TempRoomSetpSetShift[3]	see below	see below	HVAC

Data fields	Description	Unit / Range
TempSetpShiftComf	room temperature setpoint shift comfort (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02°C resolution
TempSetpShiftStdby	room temperature setpoint shift standby (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02°C resolution
TempSetpShiftEco	room temperature setpoint shift economy (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02°C resolution

Standard Mode

DPT_TempRoomSetpSetShiftF16[3] (222.101), float encoding.

4.17.2 Datapoint Type “3x set of RoomTemperature Absolute Setpoint values”

LTE: compound structure

Format:	6 octets: $V_{16}V_{16}V_{16}$			
	6 MSB TempSetp Comf	5 LSB TempSetp Comf	4 MSB TempSetp Stdby	3 LSB TempSetp Stdby
	VVVVVVVV	VVVVVVVV	VVVVVVVV	VVVVVVVV
	2 MSB TempSetp Eco	1 LSB TempSetp Eco		
	VVVVVVVV	VVVVVVVV		
Unit:	°C			
Datapoint Types				
ID:	Name:			Usage:
212.101	DPT_TempRoomSetpSet[3]			HVAC

Data fields	Description	Unit / Range
TempSetpComf	room temperature setpoint comfort	$V_{16,}$ –273°C to 655,34 °C 0,02°C resolution
TempSetpStdby	room temperature setpoint standby	$V_{16,}$ –273°C to 655,34 °C 0,02°C resolution
TempSetpEco	room temperature setpoint economy	$V_{16,}$ –273°C to 655,34 °C 0,02°C resolution

Standard Mode

DPT_TempRoomSetpSetF16[3] (222.100), float encoding

4.18 Data Type “4x 16-Bit Signed Value ”

4.18.1 Datapoint Type “4x set of RoomTemperature setpoints ”

LTE: compound structure

Format:	8 octet; $V_{16}V_{16}V_{16}V_{16}$
	8 MSB TempSetp Comf | 7 LSB TempSetp Comf | 6 MSB TempSetp Stdby | 5 LSB TempSetp Stdby
	VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV
	4 MSB TempSetp Eco | 3 LSB TempSetp Eco | 2 MSB TempSetp BProt | 1 LSB TempSetp BProt
	VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV
Encoding:	see below
Range:	see below
Unit:	°C

Datapoint Types

ID:	Name:	Range:	Unit:	Usage:
213.100	DPT_TempRoomSetpSet[4]	see below	see below	HVAC

Data fields	Description	Unit / Range
TempSetpComf	room temperature setpoint comfort	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpStdby	room temperature setpoint standby	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpEco	room temperature setpoint economy	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpBProt	room temperature setpoint building protection	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution

Standard Mode

The information of this DPT is not available in Standard Mode.

4.18.2 Datapoint Type “4x set of DHWTemperature setpoints ”

LTE: compound structure

Format:	8 octet; $V_{16}V_{16}V_{16}V_{16}$ 8 MSB TempSetp LegioProtect | 7 LSB TempSetp LegioProtect | 6 MSB TempSetp Normal | 5 LSB TempSetp Normal VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV 4 MSB TempSetp Reduced | 3 LSB TempSetp Reduced | 2 MSB TempSetpOff/ FrostProtect | 1 LSB TempSetpOff/ FrostProtect VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV
Encoding:	see below
Range:	see below
Unit:	°C

Datapoint Types

ID:	Name:	Range:	Unit:	Usage:
213.101	DPT_TempDHWSetpSet[4]	see below	see below	HVAC DHW

Data fields	Description	Unit / Range
TempSetpLegio Protect	DHW temperature setpoint for LegioProtect operating mode	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpNormal	DHW temperature setpoint for Normal operating mode	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpReduced	DHW temperature setpoint for Reduced operating mode	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpOff/ FrostProtect	DHW temperature setpoint for Off/FrostProtect operating mode	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution

Standard Mode

The information of this DPT is not available in Standard Mode.

4.18.3 Datapoint Type “4x set of RoomTemperature setpoint shift values ”

LTE: compound structure

Format:	8 octets: $V_{16}V_{16}V_{16}V_{16}$ 8 MSB TempSetp ShiftComf | 7 LSB TempSetp ShiftComf | 6 MSB TempSetp ShiftStdby | 5 LSB TempSetp ShiftStdby VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV 4 MSB TempSetp ShiftEco | 3 LSB TempSetp ShiftEco | 2 MSB TempSetp ShiftBProt | 1 LSB TempSetp ShiftBProt VVVVVVVV | VVVVVVVV | VVVVVVVV | VVVVVVVV
Unit:	K

Datapoint Types		
ID:	Name:	Usage:
213.102	DPT_TempRoomSetpSetShift[4]	HVAC

Data fields	Description	Unit / Range
TempSetpShiftComf	room temperature setpoint shift comfort (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02 K resolution
TempSetpShiftStdby	room temperature setpoint shift standby (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02 K resolution
TempSetpShiftEco	room temperature setpoint shift economy (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02 K resolution
TempSetpShiftBProt	room temperature setpoint shift building protection (delta value)	$V_{16,}$ –655,34 K to 655,34 K 0,02 K resolution

Standard Mode

The information of this DPT is not available in Standard Mode.

4.19 Data Type “16-Bit Signed & 8-Bit Unsigned Value & 8-Bit Set”

4.19.1 Datapoint Type “Heat Prod. Manager Demand Signal”

LTE: compound structure

Format:	4 octet; $V_{16}U_8B_8$ 4 MSB TempFlowDem | 3 LSB TempFlowDem | 2 RelDemLimit | 1 Attributes VVVVVVVV | VVVVVVVV | UUUUUUUU | 00BBBBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
214.100	DPT_PowerFlowWaterDemHPM	See below	See below	HWH

Data fields	Description		Unit / Range
TempFlowDem	flow temperature demand / requested boiler temperature		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
RelDemLimit	Relative demand %: max. limitation for modulating burner, used in boiler		$U_{8,}$ 0 % to 100 % 1 % resolution
Attributes	Bit #		Bitset B_8
- TempFlowDemValid	0	Validity of TempFlowDem 'false' means also 'no demand'	true / false
- Stage1Enabled	1	if enabled, stage 1 can be activated by the BoC ⇒ forced or auto	1= Enabled 0= Disabled
- Stage1Forced	2	- if forced: stage 1 is generally on - if auto: stage 1 is activated if necessary according to boiler temperture	1= Forced 0= Auto
- Stage2Enable	3	stage 2 control: see stage 1	1= Enabled 0= Disabled
- Stage2Forced	4	stage 2 control: see stage 1	1= Forced 0= Auto
- BoilerEnable	5	boiler pump is on (water flow) must be enabled before burner is turned on	1= Enabled 0= Disabled
reserved	6-7		default 0

Standard Mode

The information of this DPT is not available in Standard Mode.

4.19.2 Datapoint Type "Cold Water Prod. Manager Demand Signal"

LTE: compound structure

Format:	4 octet; $V_{16}U_8B_8$
	4 MSB TempFlowDem: VVVVVVVV 3 LSB TempFlowDem: VVVVVVVV 2 RelDemLimit: UUUUUUUU 1 Attributes: 00000BBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types

ID:	Name:	Range:	Unit:	Usage:
214.101	DPT_PowerFlowWaterDemCPM	See below	See below	VAC

Data fields	Description		Unit / Range
TempFlowDem	chilled water flow temperature demand		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
RelDemLimit	This value sets the relative demand limit in percent, used in chiller sequences controlled by the Cold Water Production Manager CPM (0% = no stages, 100% = all stages)		$U_{8,}$ 0 % … 100 %, 1 % resolution
Attributes	Bit #		Bitset B_8
–TempFlowDemValid	0	validity of chilled water flow temperature ‘false’ means also ‘no demand’	true / false
– RelDemLimitValid	1	validity of relative demand limit	true / false
– Chiller Enable	2	chilled water pump enabled (must be enabled before chiller compressor is started, only applicable when chilled water pump available)	true / false
reserved	3-7		default 0

Standard Mode

The information of this DPT is not available in Standard Mode.

4.20 Data Type “ $V_{16}U_8B_{16}$”

4.20.1 Datapoint Type “Status Boiler Controller”

LTE: compound structure

Format:	5 octet; $V_{16}U_8B_{16}$				
	5 MSB TempBoiler	4 LSB TempBoiler	3 PrelBurner	2 MSB Attributes	1 LSB Attributes
	VVVVVVVV	VVVVVVVV	UUUUUUUU	0000BBBB	BBBBBBBB
Encoding:	See below				
Range:	See below				
Unit:	See below				

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
215.100	DPT_StatusBOC	See below	See below	HWH

Data fields	Description		Unit / Range
TempBoiler	Boiler temperature		$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
PrelBurner	Actual relative power of the burner		$U_{8,}$ 0 % to 100 % 1 % resolution
Attributes	Bit #		Bitset B_{16}
– TempBoilerValid	0	validity of TempBoiler field	true / false
– PrelBurnerValid	1	validity of PrelBurner field	true / false
– Fault	2	boiler failure	true /false
– SummerMode	3	boiler switched off due to local summer/winter mode	true / false
– OffPerm	4	permanently off (manual switch or failure)	true / false
– NoHeatAvailable	5	boiler is temporary not providing heat	true / false
– StatusBurnerStage1Enable	6	stage 1 or base stage enabled	enable (=1) / disable (=0)
– StatusBurnerStage2Enable	7	stage 2 / modulation enabled	enable / disable
– ReqNextStage	8	for boiler with two stage burner: power limit of stage 1 is reached, HPM is requested to enable stage 2	true / false
– ReqNextBoiler	9	power limit of boiler is reached, HPM is requested to enable next boiler in cascade	true / false
– ReducedAvailability	10	boiler is in principle available but other boilers should be used with preference	true / false
– ChimneySweep	11	ChimneySweep function active	true / false
reserved	12-15		default 0

Standard Mode

The information of this Datapoint Type is in Standard Mode available through DPs with different DPTs as follows.

- TempBoiler: DPT_Value_Temp (9.001)
- PrelBurner: DPT_RelPos_Valve (5.004)
- Fault: DPT_Bool (1.002)
- StatusBurnerStage1Enable: DPT_Enable (1.003)
- StatusBurnerStage2Enable: DPT_Enable (1.003)

4.20.2 Datapoint Type "Status Chiller Controller"

LTE: compound structure

Format:	5 octet; $V_{16}U_8B_{16}$
	5 MSB TempChiller: VVVVVVVV; 4 LSB TempChiller: VVVVVVVV; 3 PrelChiller: UUUUUUUU; 2 MSB Attributes: 00000000; 1 LSB Attributes: BBBBBBBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
215.101	DPT_StatusCC	See below	See below	VAC

Data fields	**Description**		**Unit / Range**
TempChiller	chilled water flow temperature		$V_{16,}$ –273 to 655,34°C 0,02°C resolution
PrelChiller	Actual relative power of the chiller (stages in percent)		$U_{8,}$ 0 % … 100 %, 1 % resolution
Attributes	Bit #	Bitset containing status info	Bitset B_{16}
– TempChillerValid	0	validity of TempChiller field	true / false
– PrelChillerValid	1	validity of PrelChiller field	true / false
– Status	2	chiller running status	true /false
– Fault	3	chiller failure	true / false
– OffPerm	4	permanently off (manual switch of failure)	true / false
– ReqNextStage	5	power limit of current stage is reached, next stage required	true / false
– ReqNextChiller	6	power limit of chiller is reached, next chiller required	true / false
– ReducedAvailability	7	reduce availability, chiller is in principle available, but preferably an other chiller is used	true / false
reserved	8-15		default 0

Standard Mode

The information of this Datapoint Type is in Standard Mode available through DPs with different DPTs as follows.

- TempChiller: DPT_Value_Temp (9.001)
- PrelChiller: DPT_RelPos_Valve (5.004)
- Fault: DPT_Bool (1.002)
- StatusChiller: DPT_Bool (1.002)

4.21 Data Type "$U_{16}U_8N_8B_8$"

4.21.1 Datapoint Type "Heat Producer Specification"

LTE: compound structure

Format:	5 octet; $U_{16}U_8N_8B_8$
	5 MSB Pnom | 4 LSB Pnom | 3 BstageLimit | 2 BurnerType | 1 FuelType
	UUUUUUUU | UUUUUUUU | UUUUUUUU | NNNNNNNN | 00000BBB
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
216.100	DPT_SpecHeatProd	See below	See below	HWH

Data fields	**Description**		**Unit / Range**
Pnom	Nominal power of burner/boiler		U_{16}, 0 kW to 65535 kW resolution 1 kW
BstageLimit	relative power limit % of stage 1 resp. base stage void (value 100%) for 1stage burner		U_8, 0 % to 100 %, 1 % resolution
BurnerType	1 stage, 2 stage, modulating burner		enum. N_8 Encoding absolute value N = {0, 255} 0: reserved 1: 1 stage 2: 2 stage 3: modulating 4 to 255: reserved
FuelType	Bit #		Bitset B_8
- Oil	0	oil fuel supported	true / false
- Gas	1	gas fuel supported	true / false
- SolidState	2	solid state fuel supported	true / false
reserved	3-7		default 0

Standard Mode

The information of this DPT is not available in Standard Mode.

4.22 Data Type “16-Bit Unsigned Value & 16-Bit Signed Value”

4.22.1 Datapoint Type “Next Temperature & Time Delay”

LTE: compound structure

Format:	4 octet; $U_{16}V_{16}$ 4 MSB Delay Time | 3 LSB Delay Time | 2 MSB Temp | 1 LSB Temp UUUUUUUU | UUUUUUUU | VVVVVVVV | VVVVVVVV
Encoding:	See below
Range:	See below
Unit:	See below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
220.100	DPT_TempHVACAbsNext	See below	See below	TU, DEH

Data fields	Description	Unit / Range
DelayTime	Time delay	$U_{16,}$ 1Min resolution 1 min to 65535 min 0: next temperature value not available
Temp	absolute temperature value	$V_{16,}$ 0,02°C resolution -273°C to 655,34°C

Standard Mode

The information of this DPT is not available in Standard Mode.

4.23 Data Type “3x 16-Float Value”

4.23.1 Datapoint Type “3x set of RoomTemperature Setpoint Values ”

Format:	6 octet; $F_{16}F_{16}F_{16}$ 6 MSB TempSetp Comf | 5 LSB TempSetp Comf | 4 MSB TempSetp Stdby | 3 LSB TempSetp Stdby FFFFFFFF | FFFFFFFF | FFFFFFFF | FFFFFFFF 2 MSB TempSetp Eco | 1 LSB TempSetp Eco FFFFFFFF | FFFFFFFF
Encoding:	see below For all fields “Comfort”, “Standby” and “Economy”, only the value 7FFFh *shall* be used to denote invalid data.
Range:	see below
Unit:	°C

Datapoint Types

ID:	Name:	Range:	Unit:	Usage:
222.100	DPT_TempRoomSetpSetF16[3]	see below	see below	HVAC

Data fields	Description	Unit / Range
TempSetpComf	room temperature setpoint comfort	-273°C to 670 760°C
TempSetpStdby	room temperature setpoint standby	-273°C to 670 760°C
TempSetpEco	room temperature setpoint economy	-273°C to 670 760°C

Similar to DPT_TempRoomSetpSet[4] (213.100) but only 3 values with float encoding

4.23.2 Datapoint Type “3x set of RoomTemperature Setpoint Shift Values ”

Format:	6 octet; $F_{16}F_{16}F_{16}$ 6 MSB TempSetp ShiftComf | 5 LSB TempSetp ShiftComf | 4 MSB TempSetp ShiftStdby | 3 LSB TempSetp ShiftStdby FFFFFFFF | FFFFFFFF | FFFFFFFF | FFFFFFFF 2 MSB TempSetp ShiftEco | 1 LSB TempSetp ShiftEco FFFFFFFF | FFFFFFFF
Encoding:	see below For all fields “Comfort”, “Standby” and “Economy”, only the value 7FFFh *shall* be used to denote invalid data.
Range:	see below
Unit:	K

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
222.101	DPT_TempRoomSetpSetShiftF16[3]	see below	see below	HVAC

Data fields	Description	Unit / Range
TempSetpShiftComf	room temperature setpoint shift comfort (delta value)	-670 760 K…670 760 K
TempSetpShiftStdby	room temperature setpoint shift standby (delta value)	-670 760 K…670 760 K
TempSetpShiftEco	room temperature setpoint shift economy (delta value)	-670 760 K…670 760 K

Same as DPT_TempRoomSetpSetShift[3] (212.100) but with float encoding

4.24 Data Type $V_8N_8N_8$

4.24.1 Datapoint Type "EnergyDemAir"

LTE: compound structure

Format:	3 octets: $V_8N_8N_8$ 3 EnergyDem | 2 HVACContr Mod | 1 HVACEmerg Mode VVVVVVVV | NNNNNNNN | NNNNNNNN
Encoding:	see below
Range:	see below
Unit:	see below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
223.100	DPT_EnergyDemAir	see below	see below	HVAC

Data fields	Description	Unit / Range
EnergyDem	Energy demand of terminal unit controller - 100 %: full heating demand 100 %: full cooling demand	V_8, -100 % to 100 % 1 % resolution
ContrModeAct	Actual controller Mode	enum. N_8 Encoding absolute value N = {0, 255} 0: Auto 1: Heat 2: Morning Warmup 3: Cool 4: Night Purge 5: Precool 6: Off 7: Test 8: Emergency Heat 9: Fan only 10: Free Cool 11: Ice 12 to 19: reserved 20: NoDem 21 to 255: reserved
HVACEmergMode	Acutal HVAC Emergency Mode	enum. N_8 Encoding absolute value N = {0, 255} 0: Normal 1: EmergPressure 2: EmergDepressure 3: EmergPurge 4: EmergShutdown 5: EmergFire 6 to 255: reserved

Standard Mode

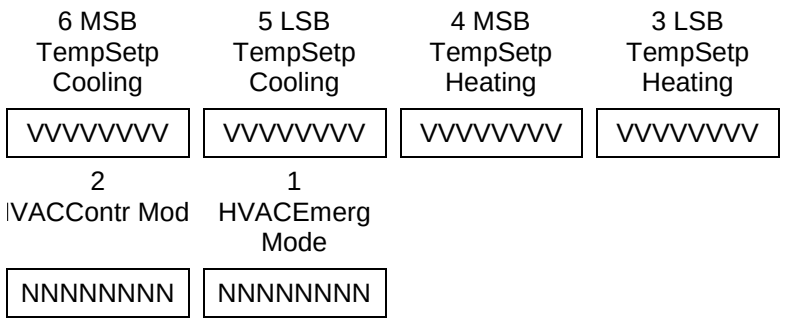
Splitting in 3 separate Datapoints:

- DPT_Percent_V8 (6.001)
- DPT_HVACContrMode (20.105)
- DPT_HVACEmergMode (20.106)

4.25 Data Type $V_{16}V_{16}N_8N_8$

4.25.1 Datapoint Type "TempSupplyAirSetpSet"

LTE: compound structure

Format:	6 octet; $V_{16}V_{16}N_8N_8$ 
Encoding:	see below
Range:	see below
Unit:	see below

Datapoint Types				
ID:	Name:	Range:	Unit:	Usage:
224.100	DPT_TempSupplyAirSetpSet	see below	see below	HVAC

Data fields	Description	Unit / Range
TempSetpCooling	Supply air temperature cooling setpoint	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution
TempSetpHeating	Supply air temperature heating setpoint	$V_{16,}$ –273°C to 655,34°C 0,02°C resolution

Data fields	Description	Unit / Range
ContrModeAct	Actual controller Mode	enum. N_8 Encoding absolute value N = {0, 255} 0: Auto 1: Heat 2: Morning Warmup 3: Cool 4: Night Purge 5: Precool 6: Off 7: Test 8: Emergency Heat 9: Fan only 10: Free Cool 11: Ice 12 to 19: reserved 20: NoDem 21 to 255: reserved
HVACEmergMode	Acutal HVAC Emergency Mode	enum. N_8 Encoding absolute value N = {0, 255} 0: Normal 1: EmergPressure 2: EmergDepressure 3: EmergPurge 4: EmergShutdown 5: EmergFire 6 to 255: reserved

Standard Mode

The information of this DPT is not available in Standard Mode.

5 Datapoint Types for Load Management

No Datapoint Types for Load Management have been specified so far. This clause is a placeholder.

6 Datapoint Types for Lighting

6.1 Datapoint Types N_8

Format:	1 octet: N_8
octet nr.	1
field names	*field1*
encoding	N N N N N N N N
Encoding:	Encoding absolute value N = [0 … 255]
Unit:	none
Resol.:	none
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.600	DPT_Behaviour_Lock_-Unlock	*field1* = Behaviour_Lock_Unlock 0 : off 1 : on 2 : no change 3 : value according additional parameter 4 : memory function value 5 : updated value 6 : value before locking 7 … 255 : reserved	[0 to 6]	FB
20.601	DPT_Behaviour_Bus_-Power_Up_Down	*field1* = Behaviour_Bus_Power_Up_Down 0 : off 1 : on 2 : no change 3 : value according additional parameter 4 : last (value before bus power down) 5 … 255 : reserved	[0 to 4]	FB

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.602	DPT_DALI_Fade_Time	*field1* = FadeTime 0 : 0 s (no fade) 1 : 0,7 s 2 : 1,0 s 3 : 1,4 s 4 : 2,0 s 5 : 2,8 s 6 : 4,0 s 7 : 5,7 s 8 : 8,0 s 9 : 11,3 s 10 : 16,0 s 11 : 22,6 s 12 : 32,0 s 13 : 45,3 s 14 : 64,0 s 15 : 90,5 s 16 to 255 : reserved	[0 to 15]	FB
20.603	DPT_BlinkingMode	*field1* = BlinkingMode 0 : BlinkingDisabled 1 : WithoutAcknowledge 2 : BlinkingWithAcknowledge 3 to 255 : reserved	[0 to 2]	FB
20.604	DPT_LightControlMode	*field1* = LightControlMode 0 : automatic light control 1 : manual light control 2 to 255 : reserved	[0 to 1]	Lighting
20.605	DPT_SwitchPBModel	*field1* = SwitchPBModel 0 : reserved 1 : one PB/binary input mode 2 : two PBs/binary inputs mode 3 to 255 : reserved	[1 to 2]	Lighting
20.606	DPT_PBAction	*field1* = SwitchPBAction 0 : inactive (no message sent) 1 : SwitchOff message sent 2 : SwitchOn message sent 3 : inverse value of InfoOnOff is sent 4 to 255 : reserved	[0 to 3]	Lighting
20.607	DPT_DimmPBModel	*field1* = LDSBMode 0 : reserved 1 : one PB/binary input; SwitchOnOff inverts on each transmission 2 : one PB/binary input, On / DimUp message sent 3 : one PB/binary input, Off / DimDown message sent 4 : two PBs/binary inputs mode 5 to 255 : reserved	[1 to 4]	Lighting

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.608	DPT_SwitchOnMode	*field1* = SwitchOnMode 0 : last actual value 1 : value according additional parameter 2 : last received absolute setvalue 3 to 255 : reserved	[0 to 2]	Lighting
20.609	DPT_LoadTypeSet	*field1* = LoadTypeSet 0 : automatic 1 : leading edge (inductive load) 2 : trailing edge (capacitive load) 3 to 255 : reserved	[0 to 2]	Lighting
20.610	DPT_LoadTypeDetected	*field1* = LoadTypeDetected 0 : undefined 1 : leading edge (inductive load) 2 : trailing edge (capacitive load) 3 : detection not possible or error 4 to 255 : reserved	[0 to 3]	Lighting

6.2 Datapoint Types B_8

6.2.1 Datapoint Type "Lighting Actuator Error Information"

Format:	1 octets: B_8 1 Attributes BBBBBBBB
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types		
ID:	Name:	Usage:
21.601	DPT_LightActuatorErrorInfo	Lighting

Data fields	**Description**		**Unit / Range**
Attributes	Bit No.		Bitset B_8
- LoadDetectionError	0 (lsb)	Load detection failed / wrong load type	0: false 1: true
- Undervoltage	1	Undervoltage of mains supply	0: false 1: true
- Overcurrent	2	Overcurrent / short circuit on load side	0: false 1: true
- Underload	3	Underload / no load on load side	0: false 1: true
- DefectiveLoad	4	Overvoltage / overcurrent pulses on load side	0: false 1: true
- LampFailure	5	General failure of the lamp	0: false 1: true
- Overheat	6	Thermal overload of the actuator	0: false 1: true
- reserved	7 (msb)		

6.3 Datapoint Types U_8B_8

6.3.1 Datapoint Type "Status Lighting Actuator"

Format:	2 octets: U_8B_8 2 ActualValue: UUUUUUUU 1 Attributes: BBBBBBBB	
PDT:	PDT_ENUM8	(alt: PDT_UNSIGNED_CHAR)
Datapoint Types		
ID:	Name:	Usage:
207.600	DPT_StatusLightingActuator	Lighting *)

Data fields	Description		Unit / Range
ActualValue	Current lighting level in %. In case of a switching actuator LSAB the range is limited to the discrete values 0 % and 100 %.		U_8, 0 % to 100 % ~ 0,4 % resolution
Attributes	Bit No.		Bitset B_8
- ValidActualValue	0 (lsb)	Validity of field ActualValue	0: false 1: true
- Locked	1	true ⇒ actuator is locked, e.g. via input LockDevice.	0: false 1: true
- Forced	2	true ⇒ forced on/off control is active, e.g. via input SwitchedOnOffForced	0: false 1: true
- NightModeActive	3	true ⇒ night mode is active e.g. via input NightMode; the actuator will autonomously switch off the light after a defined time period.	0: false 1: true
- StaircaseLighting Function	4	true ⇒ staircase lighting function is active; e.g. via input TimedStartStop.	0: false 1: true
- Dimming	5	true ⇒ actuator is in state DIMMING false ⇒ actuator is not in state DIMMING Not applicable for switching actuator LSAB.	0: false 1: true
- LocalOverride	6	true ⇒ actuator setvalue is locally overridden, e.g. via a local user interface.	0: false 1: true
- Failure	7 (msb)	General actuator failure	0: false 1: true

*) Lighting actuators may provide two types of status information.
- Basic information contains the current lighting level (mandatory).
- Extended information contains the current lighting level and additional status attributes (optional).

Extended actuator status information fits more for the use with a Lighting Controller.
Whether basic or extended status information is activated can be defined by ETS or via configuration parameters in the LTE-Mode model.

6.4 Datapoint Types $U_8U_8U_8$

6.4.1 DPT_Colour_RGB

Format:	3 octets: $U_8U_8U_8$
octet nr.	3 MSB 2 1 LSB
field names	R G B
encoding	U U U U U U U U U U U U U U U U U U U U U U U U
Encoding:	All values binary encoded.
Range::	R, G, B: 0 to 255
Unit:	None
Resol.:	1
PDT:	PDT_GENERIC_03

Datapoint Types

ID:	Name:	Range:	Resol.:	Use:
232.600	DPT_Colour_RGB	R: 0 to 255 G: 0 to 255 B: 0 to 255	R: 1 G: 1 B: 1	G

NOTE 20 This is useful for simple colour control.

NOTE 21 Because of the device dependent interpretation of RGB, this coding is only suitable for point-to-point communication, this is, if there is only a single receiver.

NOTE 22 This DPT specification does not tend to give a definition of RGB. Aspects as linearity and influence on brightness are the scope of the specification of a distributed application or a FB specification. For a definition of RGB, please refer to ISO/IEC 8632-1 Information technology — Computer graphics — Metafile for the storage and transfer of picture description information — Part 1: Functional specification

6.5 Datapoint Types $B_{10}U_6$

6.5.1 DPT_DALI_Control_Gear_Diagnostics

Format:	2 octets: $B_{10}U_6$
octet nr.	2 MSB 1 LSB
	b_{15} b_{14} b_{13} b_{12} b_{11} b_{10} b_9 b_8 b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
field names	r r r r r CE BF LF RR AI Addr
encoding	B B B B B B B B B B U_6
PDT:	PDT_GENERIC_02

Datapoint Types

ID:	Name:	Use:
237.600	DPT_DALI_Control_Gear_Diagnostic	Lighting

Bit	Abbr.	Field name	Encoding	Range	Unit	Resol.
b_0 to b_5	Addr	AI = 0: DALI Device Address	U_6	0 to 63	none	1
		AI = 1: DALI Group Address	U_6	0 to 15	none	1
		This shall contain the DALI Device Address or the DALI Group Address, according the value of the field AI, for which the diagnostic information is given.				
b_6	AI	Address Indicator	0: Device Address 1: Group Address	{0,1}	none	n/a
		This field shall indicate whether the address contained in the field Addr contains a DALI Device Address (1) or a DALI Group Address (0).				
b_7	RR	Read or Response	0: Response or spontaneous sending 1: Read	{0,1}	none	n/a
		This field shall indicate whether this data is - a response to a read request or a spontaneous sending (output), or - a read request (input)				
b_8	LF	Lamp Failure	0: no error 1: error	{0,1}	none	n/a
		This shall signal whether or not there is a failure of the connected lamp.				
b_9	BF	Ballast Failure	0: no error 1: error	{0,1}	none	na
		This shall signal whether or not there is an internal device failure in the DALI control gear.				
b_{10}	CE	Convertor Error [24)]	0: no error 1: error	{0,1}	none	na
		This field shall indicate whether or not there is a convertor error.				
b_{11} to b_{15}	r	These bits are reserved for future use and shall be 0.				

[24)] The bit CE (converter error) is reserved for the application ‘emergency lighting’.

6.6 Datapoint Types B_2U_6

6.6.1 DPT_DALI_Diagnostics

Format:	1 octet: B_2U_6
octet nr.	1
	b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
field names	BF LF Addr
encoding	B B U_6
Unit:	none
Resol.:	none
PDT:	PDT_GENERIC_01

Datapoint Types		
ID:	Name:	Use:
238.600	DPT_DALI_Diagnostics	Lighting

Bit	Abbr.	Field name	Encoding	Range	Unit	Resol.
b_0 to b_5	Addr	Device Address	U_6	0 to 63	none	1
		This shall contain the Device Address of the DALI device for which the diagnostic information is given.				
b_6	LF	Lamp Failure	0: no error 1: error	{0,1}	none	n/a
		This shall signal whether or not there is a failure of the connected lamp.				
b_7	BF	Ballast Failure	0: no error 1: error	{0,1}	none	na
		This shall signal whether or not there is an internal device failure in the DALI control gear.				

7 Datapoint Types for shutters and blinds

7.1 Datapoint Types N_8

Format:	1 octet: N_8
octet nr.	1
field names	*field1*
encoding	N N N N N N N N
Encoding:	Encoding absolute value N = [0 to 255]
Unit:	none
Resol.:	none
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.801	DPT_SABExcept-Behaviour	*field1* = SABExceptBehaviour 0 : up 1 : down 2 : no change 3 : value according additional parameter 4 : stop 5 to 255 : reserved	[0 to 4]	Shutter & Blinds
20.802	DPT_SABBehaviour_Lock_Unlock	*field1* = SABBehaviour_Lock_Unlock 0 : up 1 : down 2 : no change 3 : value according additional parameter 4 : stop 5 : updated value 6 : value before locking 7 to 255 : reserved	[0 to 6]	Shutter & Blinds

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.803	DPT_SSSBMode	*field1* 1 : one push button/binary input; *MoveUpDown inverts on each transmission => poor usability, not recommended* 2 : one push button/binary input, MoveUp / StepUp message sent 3 : one push button/binary input, MoveDown / StepDown message sent 4 : two push buttons/binary inputs mode 5 to 255 : reserved, shall not be used.	[1 to 4]	Shutter & Blinds
20.804	DPT_BlindsControlMode	*field1* 0: Automatic Control 1: Manual Control 2 to 255: reserved, shall not be used.	[0 to 1]	Shutter & Blinds

7.2 Datapoint Types $U_8U_8B_8$

7.2.1 Datapoint Type "Combined Position"

Format:	2 octets: $U_8U_8B_8$		
octet nr.	3 (MSB)	2	1 (LSB)
field names	HeightPosition	SlatsPosition	Attributes
encoding	UUUUUUUU	UUUUUUUU	000000BB
PDT:	PDT_ENUM8		(alt: PDT_UNSIGNED_CHAR)

Datapoint Types		
ID:	Name:	Usage:
240.800	DPT_CombinedPosition	Shutter & Blinds

Data fields	**Description**		**Unit / Range**
HeightPosition	Height position of the blinds in percent		$U_{8,}$ 0 % to 100 % ~ 0,4% resolution
SlatsPosition	Angle position of the slats in percent		$U_{8,}$ 0 % to 100 % ~ 0,4% resolution
Attributes	Bit #		Bitset B_8
- ValidHeightPos	0	Validity of field HeightPosition: 0: false ⇒ value of HeightPosition is void 1: true ⇒ value of HeightPosition is valid	true / false
- ValidSlatsPos	1	Validity of field SlatsPosition: 0: false ⇒ value of SlatsPosition is void 1: true ⇒ value of SlatsPosition is valid	true / false
- reserved	2 to 7	reserved, shall be 0.	Reserved bits shall be set to 0

7.3 Datapoint Types $U_8U_8B_{16}$

7.3.1 Status Shutter & Sunblind Actuator

Format:	4 octets: $U_8U_8B_{16}$																							
octet nr.	4 (MSB)								3								2							1 (LSB)
field names	HeightPos								SlatsPos								p	o	n	m	l	k	j	i	h	g	f	e	d	c	b	a
encoding	u	u	u	u	u	u	u	u	u	u	u	u	u	u	u	u	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

PDT:	PDT_GENERIC4	
Datapoint Types		
ID:	Name:	Usage:
241.800	DPT_StatusSAB	Shutter & Blinds

Data fields	Description		Unit / Range
HeightPosition	Height position of the blinds in percent		0 % to 100 % ~0,4 % resolution
SlatsPosition	Angle position of the slats in percent		0 % to 100 % ~0,4 % resolution
Attributes	Bit No.		Bitset
- UpperEndPos	0 (a)	Upper end position reached	0: false 1: true
- LowerEndPos	1 (b)	Lower end position reached	0: false 1: true
- LowerPredefPos	2 (c)	Lower predefined position reached typically height 100 %, slats-angle < 100 %	0: false 1: true
- DriveState	3 (d)	Indicates whether the target position is reached or the drive is moving	0: drive is moving 1: target position is reached
- TargetHPosRestrict	4 (e)	Restriction of target height position. Position can not be reached	0: false 1: true
- TargetSPosRestrict	5 (e)	Restriction of target slats position. Position can not be reached	0: false 1: true
- WeatherAlarm	6 (g)	At least one of the inputs Wind-/Rain-/Frost-Alarm is 'in alarm'	0: false 1: true
- Forced	7 (h)	up/down position is forced by MoveUpDownForced input	0: false 1: true
- Locked	8 (i)	movement is locked, e.g. by DeviceLocked input	0: false 1: true
- LocalOverride	9 (j)	true ⇒ actuator setvalue is locally overridden, e.g. via a local user interface	0: false 1: true
- Failure	10 (k)	General failure of the actuator or the drive	0: false 1: true
- reserved	11 (l)	shall be 0.	0
- reserved	12(m)	shall be 0.	0
- reserved	13 (n)	shall be 0.	0
- ValidHeightPos	14 (o)	Validity of field HeightPosition	0: false 1: true
- ValidSlatsPos	15 (p)	Validity of field SlatsPosition	0: false 1: true

NOTE 23 The definition of DPT_StatusSAB reuses parts of the non-standard "Griesser-Statusobject".

8 Datapoint Types for System

8.1 Datapoint Types N_8

Format:	1 octet: N_8
octet nr.	1
field names	*field1*
encoding	N N N N N N N N
Encoding:	Encoding absolute value N = [0 … 255]
Unit:	none
Resol.:	none
PDT:	PDT_ENUM8 (alt: PDT_UNSIGNED_CHAR)

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.1000	DPT_CommMode	*field1* = CommMode *Reference: DPT_CommMode shall be encoded according the specification of PID_COMM_MODE in* [01].	See reference	System
20.1001	DPT_AddInfoTypes	*field1* = AddInfoType 00h = reserved 01h = PL medium Domain Address 02h = RF Control Octet and Serial Number or DoA 03h = Busmonitor Error Flags 04h = Relative timestamp 05h = Time delay 06h = Extended Relative Timestamp 07h = BiBat information 08h … FEh = reserved, shall not be used FFh = reserved for future system extensions (ESC code)		System
20.1002	DPT_RF_ModeSelect	*field1* = RF_ModeSelect 00h = asynchronous 01h = asynchronous + BiBat Master 02h = asynchronous + BiBat Slave 03h … FFh = reserved, shall not be used	[00h … 02h]	System

Datapoint Types				
ID:	Name:	Encoding:	Range:	Use:
20.1003	DPT_RF_FilterSelect	*field1* = RF_FilterSelect 00h = no filtering, all supported received frames shall be passed to the cEMI client using L_Data.ind 01h = filtering by Domain Address 02h = filtering by KNX Serial Number table 03h = filtering by Domain Address and by Serial number table 04h … FFh = reserved, shall not be used	[00h … 03h]	System

8.2 Datapoint Types B_8

8.2.1 Datapoint Type "RF Communication Mode Info"

Format:	1 octet: B_8
octet nr.	1
field names	RFCommInfo
	$b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0$
encoding	b b b b b b b b
Encoding:	See below
Range::	See below
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types			
ID:	Name:	Encoding, range:	Use:
21.1000	DPT_RF_ModeInfo	See below	System

Bit	Data fields	Description	Encoding	Unit	Range
b_0	Asynchronous	asynchronous mode support	(0 = value not allowed) 1 = true	none	{0,1}
b_1	BiBat Master	BiBat Master mode supported	0 = false 1 = true	none	{0,1}
b_2	BiBat Slave	BiBat Slave mode supported	0 = false 1 = true	none	{0,1}
$b_3 \ldots b_7$	reserved	reserved, set to 0	not applicable	n.a.	n.a.

8.2.2 Datapoint Type “cEMI Server Supported RF Filtering Modes”

Format:	1 octet: B_8
octet nr.	1
field names	RFFilterInfo
	$b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0$
encoding	b b b b b b b b
Encoding:	See below
Range::	See below
Unit:	none
Resol.:	(not applicable)
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding, range:	Use:
21.1001	DPT_RF_FilterInfo	See below	System

Bit	Data fields	Description	Encoding	Unit	Range
b_0	DoA	Filtering by Domain Address supported	0 = false 1 = true	none	{0,1}
b_1	KNX SN	Filtering by KNX Serial Number supported	0 = false 1 = true	none	{0,1}
b_2	DoA and KNX SN	Filtering by Domain Address and KNX Serial Number supported	0 = false 1 = true	none	{0,1}
$b_3 \ldots b_7$	reserved	reserved, set to 0	not applicable	n.a.	n.a.

8.2.3 Datapoint Type “Channel Activation for 8 channels”

Format:	1 octet: B_8
octet nr.	1
field names	Channel Activation
	b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
encoding	b b b b b b b b
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding, range:	Use:
21.1010	DPT_Channel_Activation_8	See below	System

Bit	Data fields	Description	Encoding	Unit	Range
b_n (n = 0 to 7)	Activation state of channel n+1.	Indicates the activation state of this channel n+1	0 = The visual effect of channel n+1 is inactive. 1 = The visual effect of channel n+1 is active.	none	{0,1}

8.3 Datatype B_{16}

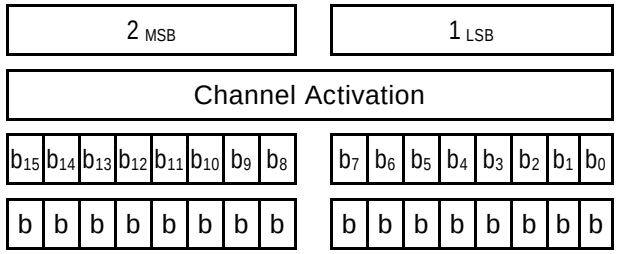
8.3.1 Datapoint Type “Media”

Format:	2 octets: B_{16}
octet nr.	2 MSB 1 LSB
field names	Media
	b_{15} b_{14} b_{13} b_{12} b_{11} b_{10} b_9 b_8 b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
encoding	b b b b b b b b b b b b b b b b
Unit:	none
Resol.:	not applicable
PDT:	PDT_BITSET16 (alt: PDT_GENERIC_02)

Datapoint Types						
ID:	Name:	Bit	Name:	Meaning	Coding:	Use:
22.1000	DPT_Media	b_0	(reserved)	reserved	0	System
		b_1	TP1	TP1 is supported	0 = false 1 = true	
		b_2	PL110	PL110 is supported	0 = false 1 = true	
		b_3	(reserved)	reserved	0	
		b_4	RF	RF is supported	0 = false 1 = true	
		b_5	KNX IP	KNX IP is supported	0 = false 1 = true	
		b_6 … b_{15}	none	reserved	default 0	

8.3.2 Datapoint Type “Channel Activation for 16 channels”

Format:	2 octets: B_{16}



PDT:	PDT_BITSET16	(alt: PDT_GENERIC_02)

Datapoint Types			
ID:	Name:	Encoding, range:	Use:
22.1010	DPT_Channel_Activation_16	See below	System

Bit	Data fields	Description	Encoding	Unit	Range
b_n (n = 0 to 15)	Activation state of channel n+1.	Indicates the activation state of this channel n+1	0 = The visual effect of channel n+1 is inactive. 1 = The visual effect of channel n+1 is active.	none	{0,1}

8.4 Datatype U_4U_4

Format:	1 octet: U_4U_4
octet nr.	1
field names	Busy | Nak
encoding	U U U U U U U U
Encoding:	All field values binary encoded.
Range:	See below.
Unit:	none
Resol.:	not applicable
PDT:	PDT_GENERIC_01

Datapoint Types

ID:	Name:	Field:	Description	Range:	Use:
25.1000	DPT_DoubleNibble	Busy	Number of busy repetitions.	[0 … 3]	System
		Nak	Number of inack repetitions.	[0 … 3]	

8.5 Datapoint Types B_{24}

8.5.1 Datapoint Type "Channel Activation for 24 channels"

Format:	3 octets: B_{24}
octet nr.	3 MSB | 2 | 1 LSB
field names	Channel Activation
	b_{23} b_{22} b_{21} b_{20} b_{19} b_{18} b_{17} b_{16} | b_{15} b_{14} b_{13} b_{12} b_{11} b_{10} b_9 b_8 | b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
encoding	b b b b b b b b | b b b b b b b b | b b b b b b b b
PDT:	PDT_GENERIC_03

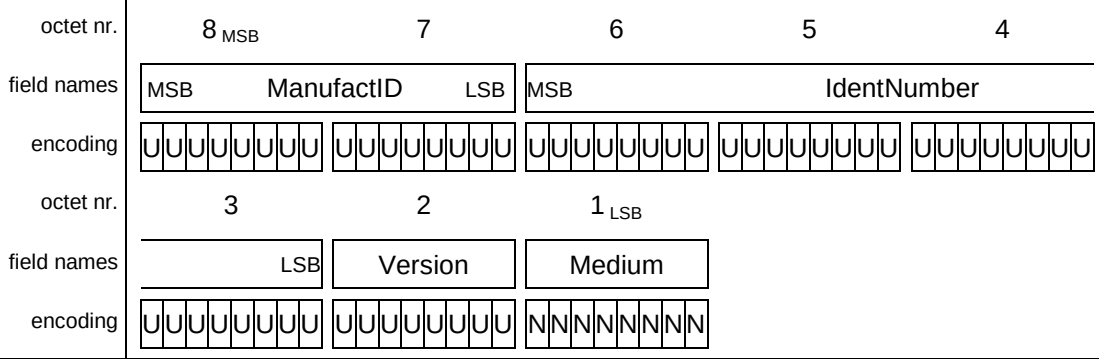
Datapoint Types

ID:	Name:	Encoding, range:	Use:
30.1010	DPT_Channel_Activation_24	See below	System

Bit	Data fields	Description	Encoding	Unit	Range
b_n (n = 0 to 23)	Activation state of channel n+1.	Indicates the activation state of this channel n+1	0 = The visual effect of channel n+1 is inactive. 1 = The visual effect of channel n+1 is active.	none	{0,1}

8.6 Datapoint Type “MBus Address”

Format:	8 octets: $U_{16}U_{32}U_8N_8$
Encoding:	All values binary encoded.
PDT:	PDT_GENERIC_08



Datapoint Types		
ID:	Name:	Use:
230.1000	• DPT_MBus_Address	8.6.1 Metering

Data fields	Description	Unit / Range
ManufactID	Manufacturer identification	According to M-Bus manufacturer codes.
IdentNumber	Identification number	Full range, encoding is manufacturer specific.
Version	Device Version	Full range, manufacturer specific.
Medium	Measured medium	Enum according to MBus, See EN 13757-3 and Table 1 “Supported physical media” in Part 10/3 “RF metering protocol”.

9 Parameter Types

Name	Size	Coding		Range
PART_Switch_Value	1 bit	DPT_Switch	(1.001)	As in DPT.
PART_Boolean	1 bit	DPT_Bool	(1.002)	As in DPT.
PART_UpDown_Action	1 bit	DPT_UpDown	(1.008)	As in DPT.
PART_Invert	1 bit	DPT_Invert	(1.012)	As in DPT.
PART_Logical	1 bit	DPT_LogicalFunction	(1.021)	As in DPT.
PART_Scene_Value	1 bit	DPT_Scene_AB	(1.022)	As in DPT.
PART_Blind_Mode	1 bit	DPT_ShutterBlinds_Mode	(1.023)	As in DPT.
PART_OnOff_Action	2 bit	DPT_OnOffAction	(23.001)	As in DPT.
PART_Alarm_Reaction	2 bit	DPT_Alarm_Reaction	(23.002)	As in DPT.
PART_Scene_Number	6 bit	DPT_SceneNumber	(17.001)	[0 … 7]
PART_Byte_Value	1 octet	Value		
PART_COV_Lux	2 octets	DPT_Value_Lux	(9.004)	As in DPT.
PART_Cycle_Time	1 octet	DPT_Time_Delay	(20.013)	{5, 8, 9, 10, 13, 15}
PART_Time_Delay	1 octet	DPT_Time_Delay	(20.013)	As in DPT.
PART_Prewarning_Delay	1 octet	DPT_Time_Delay	(20.013)	{0, 6, 8, 10}
PART_Adaptive_Selection	1 octet	DPT_Adaptive_Selection	(228.1000)	Prio: As in DPT. Size: {001b, 010b, 011b}
PART_Adjustable_Selection	1 octet	DPT_Value_1_Ucount	(5.010)	As in DPT. 0 = none
PART_Light_Value	2 octets	DPT_Brightness	(7.013)	As in DPT.
PART_Render_Value	2 octets	DPT_Value_2_Ucount	(7.001)	As in DPT.
PART_Date_Time	8 octets	DPT_DateTime	(19.001)	As in DPT.
PART_UpDown_Switch_Action	2 bit	DPT_UpDown_Action	(23.003)	As in DPT.
PART_PB_Action_HVAC	2 bit	DPT_HVAC_PB_Action	(23.102)	As in DPT.
PART_PB_Action_HVAC_-Extended	3 bit	DPT_HVAC_PB_Action_Extended		As in DPT.
PART_Dimming_Value	8 bit	DPT_Scaling	(5.001)	As in DPT.
PART_Input_Connected	4 bit	No DPT is defined. Coding: for bit 0 (lsb) to bit 3 bit n = 0: Input n is not connected bit n = 1: Input n is connected		All 4 bits {0,1}

Appendix A

(normative)

DPT_HVACStatus

DPT_HVACStatus is a non-standard DPT that is used by an HVAC Room controller to report the currently set HVAC Mode by means of a status/diagnostic Datapoint.

The use of the possible DPTs to this purpose shall comply with Table 6.

Table 6 – Use conditions of DPT_HVACStatus and DPT_StatusRHCC

DPT	Until April 2010	After April 2010
DPT_HVACStatus (Eberle status octet)	may [a)]	may
DPT_StatusRHCC	may [a)]	shall
[a)] At least one of DPT_HVACStatus or DPT_StatusRHCC shall be used.		

It may use the following non-standardised but common coding, sometimes referred to as 'the Eberle status octet' (but only until April 2010, if this DPT is the only status/diagnostic Datapoint included in the respective application for this purpose).

Format:	1 octet: B_8
octet nr.	1
field names	Attributes
	b_7 b_6 b_5 b_4 b_3 b_2 b_1 b_0
encoding	b b b b b b b b
Resol.:	not applicable
PDT:	PDT_BITSET8 (alt: PDT_GENERIC_01)

Datapoint Types

ID:	Name:	Encoding:	Range:	Use:
--	DPT_HVACStatus	See below	See below	HVAC

Data fields		Description	Encoding	Unit	Range
Bit	Attributes				
b_0	Comfort	Indicates whether comfort mode is active or not	0 = false 1 = true	none	{0,1}
b_1	Standby	Indicates whether standby mode is active or not	0 = false 1 = true	none	{0,1}
b_2	Night	Indicates whether night mode is active or not	0 = false 1 = true	none	{0,1}
b_3	Frost/Heat protection	Indicates whether frost/heat protection is active or not	0 = false 1 = true	none	{0,1}
b_4	Dew Point	Indicates whether dew point mode is active or not	0 = false 1 = true	none	{0,1}
b_5	Heat/Cool	Indicates whether the controller is heating or cooling	0 = cooling 1 = heating	none	{0,1}

Data fields		Description	Encoding	Unit	Range
b_6	Controller Status	Indicates whether the controller is active or inactive	0 = active 1 = inactive	none	{0,1}
b_7	Frost alarm	Indicates whether the frost alarm is active	0 = inactive 1 = active	none	{0,1}