



Konnex Association

# Interworking – Datapoint types



The  
World's first open  
**STANDARD**  
for  
Home and Building Control



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**KNX The World's first open STANDARD  
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Status

**Volume 3: System specifications  
Part 7: Interworking  
Chapter 2: Datapoint Types**

Summary: Datapoint Types for Interworking

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

#### Document Updates

<b>Version</b>	<b>Date</b>	<b>Description</b>
WD 0.1	1999.09.20	Initial document, based on EIB's new Interworking Descriptions, as proposed to the CSG, already processed by ConCert
WD 0.2	2000.01.05	Inserted comments from TF Interworking 1 <sup>st</sup> meeting. Word "Variable" avoided. Removed reference to 'old' EIS. Document name changed to 'Datapoint Types'. 'VT_' or 'EVT_' changed to 'DPT_' in Datapoint Type names.
WD 0.3	2000.04.18	Inserted comments from TF Interworking 2 <sup>nd</sup> meeting.
DV 0.4	2000.10.30	Inserted comments from RfV cycle.
AS 1.0	2002.01.03	Preparation of the approved standard.

Version v1.0 is the Approved Standard.

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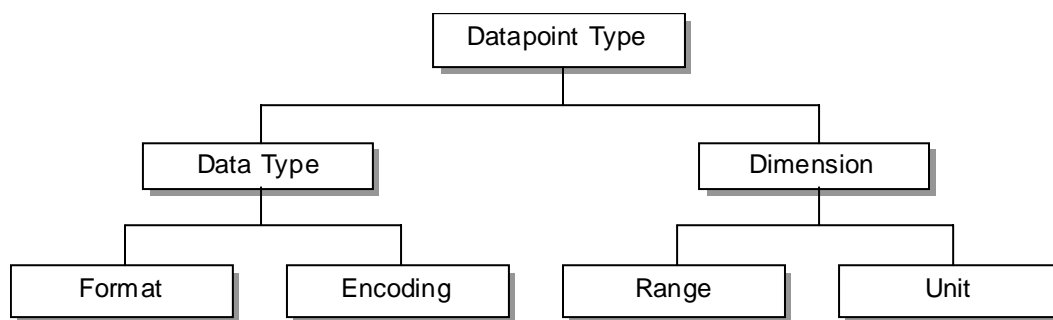
# KNX The World's first open STANDARD for Home and Building Control

Interworking – Datapoint types

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## 1 Introduction



**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 namings and identifications.

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

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

Field	Stands for
main	Format
number(left)	Encoding
sub (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 sub-number indicates a different dimension (different range and/or different unit).

In the following, the format is described MSB first (most significant byte left) and msb first (most significant bit left) inside an octet.

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.

In the tables specifying the Datapoint Types below, the column "Usage" indicates if the Datapoint Type can be used without restrictions or is limited to usage only in those Functional Blocks for which this is indicated, see Part 7/2 "Functional Blocks".



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## 2 Data Type “Boolean”<sup>1</sup>

<u>Format:</u>	1 bit			
	1			
	<div style="border: 1px solid black; display: inline-block; padding: 2px;">V</div>			
<u>Encoding:</u>	See below			
<u>Range:</u>	V = {0,1}			
<u>Unit:</u>	-			
<b>Datapoint Types</b>				
<u>ID:</u>	<u>Name:</u>	<u>Encoding:</u> V = 0	V = 1	<u>Usage:</u>
1.001	DPT_Switch	Off	On	General
1.002	DPT_Bool	False	True	General
1.003	DPT_Enable	Disable	Enable	General
1.004	DPT_Ramp	No ramp	Ramp	FB only
1.005	DPT_Alarm	No alarm	Alarm	FB only
1.006	DPT_BinaryValue	Low	High	FB only
1.007	DPT_Step	Decrease	Increase	FB only
1.008	DPT_UpDown	Up	Down	General
1.009	DPT_OpenClose	Open	Close	General
1.010	DPT_Start	Stop	Start	General
1.011	DPT_State	Inactive	Active	FB only
1.012	DPT_Invert	Not inverted	Inverted	FB only
1.013	DPT_DimSendStyle	Start/stop	Cyclically	FB only
1.014	DPT_InputSource	Fixed	Calculated	FB only

<sup>1</sup> EIS 1



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### 3 Data Type “1-Bit Controlled”<sup>2</sup>

<u>Format:</u>	2 bit																	
	1																	
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">C V</td> </tr> </table>			C V														
C V																		
<u>Encoding:</u>	See below																	
<u>Range:</u>	C = {0,1} V = {0,1}																	
<u>Unit:</u>	-																	
<b>Datapoint Types</b>																		
<u>ID:</u>	<u>Name:</u>	<u>Usage:</u>	<u>Encoding:</u>															
			C                      V															
			0 = no control      According to Type 1.xxx 1 = control															
2.001	DPT_Switch_Control	General	<table border="1" style="margin: auto;"> <thead> <tr> <th>C</th> <th>V</th> <th></th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>No control</td> </tr> <tr> <td>0</td> <td>1</td> <td>No control</td> </tr> <tr> <td>1</td> <td>0</td> <td>Control. Function value 0</td> </tr> <tr> <td>1</td> <td>1</td> <td>Control. Function value 1</td> </tr> </tbody> </table>	C	V		0	0	No control	0	1	No control	1	0	Control. Function value 0	1	1	Control. Function value 1
C	V																	
0	0	No control																
0	1	No control																
1	0	Control. Function value 0																
1	1	Control. Function value 1																
2.002	DPT_Bool_Control	General																
2.003	DPT_Enable_Control	FB only																
2.004	DPT_Ramp_Control	FB only																
2.005	DPT_Alarm_Control	FB only																
2.006	DPT_BinaryValue_Control	FB only																
2.007	DPT_Step_Control	FB only																
2.008	DPT_Direction1_Control	FB only																
2.009	DPT_Direction2_Control	FB only																
2.010	DPT_Start_Control	FB only																
2.011	DPT_State_Control	FB only																
2.012	DPT_Invert_Control	FB only																

<sup>2</sup> EIS 8



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## 4 Data Type “3-Bit Controlled”<sup>3</sup>

<u>Format:</u>	4 bits										
	1										
	C VVV										
<u>Encoding:</u>	See below										
<u>Range:</u>	C = {0,1}										
	V = See below										
<u>Unit:</u>	-										
<b>Datapoint Types</b>											
<u>ID:</u>	<u>Name:</u>	<u>Usage:</u>	<u>Encoding:</u>								
			C                      VVV								
3.007	DPT_Control_Dimming	FB only	See 1.007								
3.008	DPT_Control_Blinds	FB only	See 1.008								
3.009	DPT_Mode_Boiler	FB only	See 1.014								
			Range: [000b...111b] 001b...111b: Step 000b: Break								
			Range: {001,010,100} <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>VVV</th> <th>Active Mode</th> </tr> </thead> <tbody> <tr> <td>001</td> <td>Mode 0</td> </tr> <tr> <td>010</td> <td>Mode 1</td> </tr> <tr> <td>100</td> <td>Mode 2</td> </tr> </tbody> </table>	VVV	Active Mode	001	Mode 0	010	Mode 1	100	Mode 2
VVV	Active Mode										
001	Mode 0										
010	Mode 1										
100	Mode 2										

<sup>3</sup> EIS 2

## 5 Data Type “Character Set”<sup>4</sup>

<u>Format:</u>	8 bit																																																																																																																																																																																																																																																																																																																						
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4.001	DPT_Char_ASCII	[0...127]	See below. The most significant bit is always 0.	General																																																																																																																																																																																																																																																																																																																			
4.002	DPT_Char_8859_1	[0...255]	See below.	General																																																																																																																																																																																																																																																																																																																			
<u>Encoding:</u>																																																																																																																																																																																																																																																																																																																							
		<table border="1" style="display: inline-table;"> <tr> <td>AAAA</td> <td>AAAA</td> <td>LSN = Least Significant Nibble</td> </tr> <tr> <td>MSN</td> <td>LSN</td> <td>MSN = Most Significant Nibble</td> </tr> </table>	AAAA	AAAA	LSN = Least Significant Nibble	MSN	LSN	MSN = Most Significant Nibble																																																																																																																																																																																																																																																																																																															
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### Decoding of 00<sub>h</sub> to 1F<sub>h</sub>

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.

<sup>4</sup> EIS 13





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Interworking – Datapoint types

## 6 Data Type “8-Bit Unsigned Value”<sup>5</sup>

<u>Format:</u>	8 bit				
	1				
	UUUUUUUU				
<u>Encoding:</u>	See below				
<u>Range:</u>	U = [0...255] binary encoded				
<u>Unit:</u>	See below				
<b>Datapoint Types</b>					
<u>ID:</u>	<u>Name:</u>	<u>Range:</u>	<u>Unit:</u>	<u>Usage:</u>	<u>Encoding:</u>
		[min...max]			lsb                  msb
5.001	DPT_Scaling	[0...100]	%	General	UUUUUUUU
5.003	DPT_Angle	[0...360]	°	General	0 0 0 0 0 0 0 0 = range min. /off
5.004	DPT_RelPos_Valve	[0...255]	%	FB only	0 0 0 0 0 0 0 1 = value “low”
					: : : :
					1 1 1 1 1 1 1 1 = range max.
5.010	DPT_Value_1_Ucount <sup>6</sup>	[0...255]	cnter pulses	General	counter value binary encoded

### Examples

Datapoint Type	Encoded Value			Resolution
	50 %	100 %	255 %	
5.001	80 <sub>H</sub>	FF <sub>H</sub>	Out of encodable range.	≈ 0.4 %
5.004	32 <sub>H</sub>	64 <sub>H</sub>	FF <sub>H</sub>	1 %

<sup>5</sup> EIS 6

<sup>6</sup> EIS14 unsigned

## 7 Data Type “8-Bit Signed Value”<sup>7</sup>

<u>Format:</u>	8 bit		
	1		
	VVVVVVVV		
<u>Encoding:</u>	Two's complement notation		
<u>Range:</u>	-128...+127		
<u>Unit:</u>	See below		
<b>Datapoint Types</b>			
<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Usage:</u>
6.010	DPT_Value_1_Count	counter value	General

---

<sup>7</sup> EIS14 signed

## 8 Data Type “Status with Mode”

<u>Format:</u>	8 bit				
	1				
	<table border="1" style="margin: auto;"> <tr> <td>ABCDEF</td> </tr> <tr> <td>F</td> </tr> </table>			ABCDEF	F
ABCDEF					
F					
<u>Encoding:</u>	See below				
<u>Range:</u>	A,B,C,D,E = {0,1} FFF = {001 <sub>b</sub> ,010 <sub>b</sub> ,100 <sub>b</sub> }				
<u>Unit:</u>	-				
Datapoint Types					
<u>ID:</u>	<u>Name:</u>	<u>Encoding:</u>	<u>Usage:</u>		
6.020	DPT_Status_Mode3	A,B,C,D,E: 0 = set 1 = clear FFF 001 <sub>b</sub> = mode 0 is active 010 <sub>b</sub> = mode 1 is active 100 <sub>b</sub> = mode 2 is active	FB only		

## 9 Data Type “2-Octet Unsigned Value”<sup>8</sup>

<u>Format:</u>	2 octet		
	2 MSB	1 LSB	
	UUUUUUUU	UUUUUUUU	
<u>Encoding:</u>	Binary encoded value		
<u>Range:</u>	U = [0...65535]		
<u>Unit:</u>	-		
<b>Datapoint Types</b>			
<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Usage:</u>
7.001	DPT_Value_2_Ucount	counter pulses (16-bit unsigned value)	General
7.010	DPT_PropDataType	Identifier Interface Object Property data type. No Unit.	FB only

<sup>8</sup> EIS 10 unsigned



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## 10 Data Type “2-Octet Signed Value”<sup>9</sup>

<u>Format:</u>	2 octet		
	2 MSB	1 LSB	
	VVVVVVVV	VVVVVVVV	
<u>Encoding:</u>	Two's complement notation		
<u>Range:</u>	-32768 ... +32767		
<u>Unit:</u>	See below.		
<b>Datapoint Types</b>			
<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Usage:</u>
8.001	DPT_Value_2_Count	counter pulses	General

<sup>9</sup> EIS 10 signed



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## 11 Data Type “2-Octet Float Value”<sup>10</sup>

<u>Format:</u>	2 octet			
	2 MSB	1 LSB		
	M EEEE MMM	MMMMMMMM		
<u>Encoding:</u>	$(0.01 * M) * 2^{(E)}$ $E = [0...15]$ $M = [-2048...2047]$ , two's complement notation			
<u>Range:</u>	[-671088.64...670760.96]			
<u>Unit:</u>	See below			
<b>Datapoint Types</b>				
<u>ID:</u>	<u>Name:</u>	<u>Range:</u>	<u>Unit:</u>	<u>Usage:</u>
9.001	DPT_Value_Temp	-273...+670760	°C <sup>11</sup>	General
9.002	DPT_Value_Tempd	-670760...+670760	K	General
9.003	DPT_Value_Tempa	-670760...+670760	K/h	General
9.004	DPT_Value_Lux	0...670760	Lux	General
9.005	DPT_Value_Wsp	0...670760	m/s	General
9.006	DPT_Value_Pres	0...670760	Pa	General
9.010	DPT_Value_Time1	-670760...+670760	s	General
9.011	DPT_Value_Time2	-670760...+670760	ms	General
9.020	DPT_Value_Volt	-670760...+670760	mV	General
9.021	DPT_Value_Curr	-670760...+670760	mA	General

<sup>10</sup> EIS 5

<sup>11</sup> The KONNEX 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.



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## 12 Data Type “Time”<sup>12</sup>

<u>Format:</u>	3 octet					
	3 MSB		2		1 LSB	
	ddd hhhhh	00 mmmmmm	00 ssssss			
<u>Encoding:</u>	See below					
<u>Range:</u>	See below					
<u>Unit:</u>	See below					
<b>Datapoint Types</b>						
<u>ID:</u>	<u>Name:</u>		<u>Encoding:</u>	<u>Range:</u>	<u>Unit:</u>	<u>Usage:</u>
10.001	DPT_TimeOfDay	d	1 = Monday ... 7 = Sunday 0 = no day	[0...7]	-	General
		h	binary encoded	[0...23]	hours	
		m	Binary encoded	[0...59]	minutes	
		s	Binary encoded	[0...59]	seconds	

12 EIS 3

### 13 Data Type “Date”<sup>13</sup>

<u>Format:</u>	3 octet				
	3 MSB	2	1 LSB		
	000 DDDDD	0000 MMMM	0YYYYYYY		
<u>Encoding:</u>	Binary encoded				
<u>Range:</u>	See below				
<u>Unit:</u>	See below				
<b>Datapoint Types</b>					
<u>ID:</u>	<u>Name:</u>		<u>Range:</u>	<u>Unit:</u>	<u>Usage:</u>
11.001	DPT_Date	D	[1...31]	Day of month	General
		M	[1...12]	Month	
		Y	[0...99]	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 3<sup>rd</sup> octet:

if Octet3 contains value  $\geq 90$  : interpret as 20<sup>th</sup> century

if Octet 3 contains value  $< 90$ : interpret as 21<sup>st</sup> century

This format covers the range 1990 to 2089.

Example:

YYYYYYY = 99<sub>d</sub> equals 1999

YYYYYYY = 0<sub>d</sub> equals 2000

YYYYYYY = 4<sub>d</sub> equals 2004





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## 14 Data Type “4-Octet Unsigned Value”<sup>14</sup>

<u>Format:</u>	4 octet			
	4 MSB	3	2	1 LSB
	UUUUUUUU	UUUUUUUU	UUUUUUUU	UUUUUUUU
<u>Encoding:</u>	Binary encoded			
<u>Range:</u>	[0...4294967295]			
<u>Unit:</u>	See below			
<b>Datapoint Types</b>				
<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Usage:</u>	
12.001	DPT_Value_4_Ucount	counter pulses	General	

<sup>14</sup>EIS 11 unsigned



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## 15 Data Type “4-Octet Signed Value”<sup>15</sup>

<u>Format:</u>	4 octet			
	4 MSB	3	2	1 LSB
	VVVVVVVV	VVVVVVVV	VVVVVVVV	VVVVVVVV
<u>Encoding:</u>	Two's complement notation			
<u>Range:</u>	-2147483648 ... + 2147483647			
<u>Unit:</u>	See below			
<b>Datapoint Types</b>				
<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Usage:</u>	
13.001	DPT_Value_4_Count	counter value	General	

<sup>15</sup>EIS 11 signed

## 16 Data Type “4-Octet Float Value”<sup>16</sup>

<u>Format:</u>	4 octet
	<div style="display: flex; justify-content: space-around; align-items: center;"> <span>4 MSB</span> <span>3</span> <span>2</span> <span>1 LSB</span> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px 10px;">Seeeeeee</div> <div style="border: 1px solid black; padding: 2px 10px;">effffff</div> <div style="border: 1px solid black; padding: 2px 10px;">ffffff</div> <div style="border: 1px solid black; padding: 2px 10px;">ffffff</div> </div>
<u>Encoding:</u>	The values are encoded in the IEEE floating point format according IEEE 754.
<u>Range:</u>	S = {0,1} e = [0...255] f = [0...8388607]
<u>Unit:</u>	See below
<b>Datapoint Types</b>	

<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Comment:</u>	<u>Usage:</u>
14.000	DPT_Value_Acceleration	m s <sup>-2</sup>	acceleration	General
14.001	DPT_Value_Acceleration_Angular	rad s <sup>-2</sup>	acceleration, angular	General
14.002	DPT_Value_Activation_Energy	J mol <sup>-1</sup>	activation energy	General
14.003	DPT_Value_Activity	s <sup>-1</sup>	activity (radioactive)	General
14.004	DPT_Value_Mol	mol	amount of substance	General
14.005	DPT_Value_Amplitude	-	amplitude (unit as appropriate)	General
14.006	DPT_Value_AngleRad	rad	angle, radiant	General
14.007	DPT_Value_AngleDeg	°	angle, degree	General
14.008	DPT_Value_Angular_Momentum	J s	angular momentum	General
14.009	DPT_Value_Angular_Velocity	rad s <sup>-1</sup>	angular velocity	General
14.010	DPT_Value_Area	m <sup>2</sup>	area	General
14.011	DPT_Value_Capacitance	F	capacitance	General
14.012	DPT_Value_Charge_DensitySurface	C m <sup>-2</sup>	charge density (surface)	General
14.013	DPT_Value_Charge_DensityVolume	C m <sup>-3</sup>	charge density (volume)	General
14.014	DPT_Value_Compressibility	m <sup>2</sup> N <sup>-1</sup>	compressibility	General

<sup>16</sup> EIS 9



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<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Comment:</u>	<u>Usage:</u>
14.015	DPT_Value_Conductance	$S = \Omega^{-1}$	conductance	General
14.016	DPT_Value_Electrical_Conductivity	$S m^{-1}$	conductivity, electrical	General
14.017	DPT_Value_Density	$kg m^{-3}$	density	General
14.018	DPT_Value_Electric_Charge	C	electric charge	General
14.019	DPT_Value_Electric_Current	A	electric current	General
14.020	DPT_Value_Electric_CurrentDensity	$A m^{-2}$	electric current density	General
14.021	DPT_Value_Electric_DipoleMoment	C m	electric dipole moment	General
14.022	DPT_Value_Electric_Displacement	$C m^{-2}$	electric displacement	General
14.023	DPT_Value_Electric_FieldStrength	$V m^{-1}$	electric field strength	General
14.024	DPT_Value_Electric_Flux	c	electric flux	General
14.025	DPT_Value_Electric_FluxDensity	$C m^{-2}$	electric flux density	General
14.026	DPT_Value_Electric_Polarization	$C m^{-2}$	electric polarization	General
14.027	DPT_Value_Electric_Potential	V	electric potential	General
14.028	DPT_Value_Electric_PotentialDifference	V	electric potential difference	General
14.029	DPT_Value_ElectromagneticMMoment	$A m^2$	electromagnetic moment	General
14.030	DPT_Value_Electromotive_Force	V	electromotive force	General
14.031	DPT_Value_Energy	J	energy	General
14.032	DPT_Value_Force	N	force	General
14.033	DPT_Value_Frequency	$Hz = s^{-1}$	frequency	General
14.034	DPT_Value_Angular_Frequency	$rad s^{-1}$	frequency, angular (pulsatance)	General
14.035	DPT_Value_Heat_Capacity	$J K^{-1}$	heat capacity	General
14.036	DPT_Value_Heat_FlowRate	W	heat flow rate	General
14.037	DPT_Value_Heat_Quantity	J	heat, quantity of	General
14.038	DPT_Value_Impedance	$\Omega$	impedance	General
14.039	DPT_Value_Length	m	length	General
14.040	DPT_Value_Light_Quantity	J or $lm s$	light, quantity of	General
14.041	DPT_Value_Luminance	$cd m^{-2}$	luminance	General



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<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Comment:</u>	<u>Usage:</u>
14.042	DPT_Value_Luminous_Flux	lm	luminous flux	General
14.043	DPT_Value_Luminous_Intensity	cd	luminous intensity	General
14.044	DPT_Value_Magnetic_FieldStrength	A m <sup>-1</sup>	magnetic field strength	General
14.045	DPT_Value_Magnetic_Flux	Wb	magnetic flux	General
14.046	DPT_Value_Magnetic_FluxDensity	T	magnetic flux density	General
14.047	DPT_Value_Magnetic_Moment	A m <sup>2</sup>	magnetic moment	General
14.048	DPT_Value_Magnetic_Polarization	T	magnetic polarization	General
14.049	DPT_Value_Magnetization	A m <sup>-1</sup>	magnetization	General
14.050	DPT_Value_MagnetomotiveForce	A	magneto motive force	General
14.051	DPT_Value_Mass	kg	mass	General
14.052	DPT_Value_MassFlux	kg s <sup>-1</sup>	mass flux	General
14.053	DPT_Value_Momentum	N s <sup>-1</sup>	momentum	General
14.054	DPT_Value_Phase_AngleRad	rad	phase angle, radiant	General
14.055	DPT_Value_Phase_AngleDeg	°	phase angle, degrees	General
14.056	DPT_Value_Power	W	power	General
14.057	DPT_Value_Power_Factor	cos Φ	power factor	General
14.058	DPT_Value_Pressure	Pa = N m <sup>-2</sup>	pressure	General
14.059	DPT_Value_Reactance	Ω	reactance	General
14.060	DPT_Value_Resistance	Ω	resistance	General
14.061	DPT_Value_Resistivity	Ωm	resistivity	General
14.062	DPT_Value_SelfInductance	H	self inductance	General
14.063	DPT_Value_SolidAngle	sr	solid angle	General
14.064	DPT_Value_Sound_Intensity	W m <sup>-2</sup>	sound intensity	General
14.065	DPT_Value_Speed	m s <sup>-1</sup>	speed	General
14.066	DPT_Value_Stress	Pa = N m <sup>-2</sup>	stress	General
14.067	DPT_Value_Surface_Tension	N m <sup>-1</sup>	surface tension	General
14.068	DPT_Value_Common_Temperature	°C	temperature, common	General



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<u>ID:</u>	<u>Name:</u>	<u>Unit:</u>	<u>Comment:</u>	<u>Usage:</u>
14.069	DPT_Value_Absolute_Temperature	K	temperature (absolute)	General
14.070	DPT_Value_TemperatureDifference	K	temperature difference	General
14.071	DPT_Value_Thermal_Capacity	J K <sup>-1</sup>	thermal capacity	General
14.072	DPT_Value_Thermal_Conductivity	W m <sup>-1</sup> K <sup>-1</sup>	thermal conductivity	General
14.073	DPT_Value_ThermoelectricPower	V K <sup>-1</sup>	thermoelectric power	General
14.074	DPT_Value_Time	s	time <sup>17</sup>	General
14.075	DPT_Value_Torque	N m	torque	General
14.076	DPT_Value_Volume	m <sup>3</sup>	volume	General
14.077	DPT_Value_Volume_Flux	m <sup>3</sup> s <sup>-1</sup>	volume flux	General
14.078	DPT_Value_Weight	N	weight	General
14.079	DPT_Value_Work	J	work	General

---

<sup>17</sup> For proper usage see note!

## 17 Data Type “Access”

<u>Format:</u>	4 octet			
	4 MSB	3 MSB	2 MSB	1 MSB
	D <sub>6</sub> D <sub>6</sub> D <sub>6</sub> D <sub>6</sub> D <sub>5</sub> D <sub>5</sub> D <sub>5</sub> D <sub>5</sub>	D <sub>4</sub> D <sub>4</sub> D <sub>4</sub> D <sub>4</sub> D <sub>3</sub> D <sub>3</sub> D <sub>3</sub> D <sub>3</sub>	D <sub>2</sub> D <sub>2</sub> D <sub>2</sub> D <sub>2</sub> D <sub>1</sub> D <sub>1</sub> D <sub>1</sub> D <sub>1</sub>	EPDCNN N
<u>Encoding:</u>	D <sub>6</sub> , D <sub>5</sub> , D <sub>4</sub> , D <sub>3</sub> , D <sub>2</sub> , D <sub>1</sub> : binary encoded value N: binary encoded value E, P, D, C: See below			
<u>Range:</u>	D <sub>6</sub> , D <sub>5</sub> , D <sub>4</sub> , D <sub>3</sub> , D <sub>2</sub> , D <sub>1</sub> : [0 ... 9] N: [0 ... 15] E, P, D, C: {0, 1}			
<u>Unit:</u>	See below			
<b>Datapoint Types</b>				
<u>ID:</u>	<u>Name:</u>	<u>Encoding:</u>	<u>Usage:</u>	
15.000	DPT_Access_Data	D <sub>x</sub> 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. E Detection error = 1 (reading of access information code was not successful). P Permission (informs about the access decision made by the controlling device). 0 = not accepted 1 = accepted D Read direction (e.g. of badge) 0 = left to right 1 = right to left If not used (e.g. electronic key) set to zero. C Access information encrypted, 0 = no 1 = yes N Index of access identification code (future use)	FB only	

## 18 Data Type "String"

<u>Format:</u>	14 octet 14 MSB...1 LSB <div style="border: 1px solid black; padding: 2px; display: inline-block;">SSSSSSSS</div>		
<u>Encoding:</u>	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 paragraph 5 "Data Type "Character Set"". If the string to be transmitted is smaller than 14 octets, unused trailing octets in the character string shall be set to NULL (00h).  <u>Example:</u> 'KONNEX is OK' is encoded as follows : 4B 4F 4E 4E 45 58 20 69 73 20 4F 4B 00 00		
<u>Range:</u>	See below		
<u>Unit:</u>	-		
<b>Datapoint Types</b>			
<u>ID:</u>	<u>Name:</u>	<u>Range</u>	<u>Usage:</u>
16.000	DPT_String_ASCII	See 4.001 (DPT_Char_ASCII)	General
16.001	DPT_String_8859_1	See 4.002 (DPT_Char_8859_1)	General