

Standardization EnOcean Communication Profiles

June 26, 2008



REVISION HISTORY

The following major modifications and improvements have been made to the first version of this document:

No	Major Changes
V1.0	Based on "Standardization 4BS_1.02"; additional EnOcean telegram types added
V1.01	Manufacturer ID for Echoflex solutions added
V1.02	Description of DB_0.BIT_3 value extended in 4BS profile definitions Profile 0b000111 Occupancy Sensor modified: It is also allowed that a sensor only transmits "PIR on" telegrams as long as there is movement and does not transmit telegrams if there is no movement. It is not necessary to transmit "PIR off" telegrams. Profile 0b001000 Light, Temperature & Occupancy Sensor defined. Manufacturer ID for Omnio AG added
V1.03	Manufacturer ID for Hardmeier electronics AG, Regulvar, and Ad Hoc Electronics added
V1.04	New light sensor type added in profile 0b000110; error corrected in Profile 0b000 "Magnet Contact"; Manufacturer ID for Distech added; default values for reserved bits added. Profile relative humidity sensor 0b000011 removed and integrated into humidity sensor profile 0b000100. Profile 0b001001 renamed to gas sensor. Profile 0b001010 removed (integrated into 0b001001); Profile 0b111000 renamed Central Command; Profile 0b111111 renamed Universal.

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1 INTRODUCTION

This document defines the communication profiles of devices based on EnOcean radio technology. It describes the data provided via the EnOcean TCM130 API and via the serial output of a receiver/transceiver module. The data payload consists of:

ORG	Telegram type
DB_3	Data byte 3
DB_2	Data byte 2
DB_1	Data byte 1
DB_0	Data byte 0
ID_3	Byte 3 of transmitter ID
ID_2	Byte 2 of transmitter ID
ID_1	Byte 1 of transmitter ID
ID_0	Byte 0 of transmitter ID
STATUS	Status information

For a detailed description of the API and the serial interface please refer to the User Manuals of TCM130 and RCM 120.

2 RPS TELEGRAM

ORG FIELD 5

STATUS FIELD

7		0	
Reserved	T21	NU	RP_COUNTER
Reserved	(2 bit)		For future use, default value 0
T21	(1 bit)		T21=0 → telegram of type 1 T21=1 → telegram of type 2
NU	(1 bit)		NU=1 → N-message, NU=0 → U-message.
RP_COUNTER	(4 bit)		Repeater counter

2.1 Profile Definitions

Profile Light Switch

DATA BYTES

If $NU = 1$ (N-message from a PTM switch module):

DB_2..0 always = 0
DB_3 as follows:

7	0
RID	SA

RID	(2 bit)	Rocker ID, from left (A) to right (D): 0, 1, 2 and 3 (decimal)
UD	(1 bit)	UD=1 → O-button, UD=0 → I-button
PR	(1 bit)	PR=1 → Energy bow pressed, PR=0 → Energy bow released
SRID	(2 bit)	Second Rocker ID, from left to right: 0, 1, 2 and 3
SUD	(1 bit)	(Second) SUD=1 → O-button, SUD=0 → I-button
SA	(1 bit)	SA=1 → Second action (2 buttons pressed simultaneously), SA=0 → No second action

If $NU = 0$ (U-message from a PTM switch module):

DB_2..0 always = 0
DB_3 as follows:

7	0
BUTTONS	Reserved

BUTTONS	(3 bit)	Number of simultaneously pressed buttons, as following:																		
		<table> <tr> <td>PTM 100 (Type1):</td> <td>PTM200 (Type2):</td> </tr> <tr> <td>0 = 0 Buttons</td> <td>0 = 0 Button</td> </tr> <tr> <td>1 = 2 Buttons</td> <td>1 = not possible</td> </tr> <tr> <td>2 = 3 Buttons</td> <td>2 = not possible</td> </tr> <tr> <td>3 = 4 Buttons</td> <td>3 = 3 or 4 buttons</td> </tr> <tr> <td>4 = 5 Buttons</td> <td>4 = not possible</td> </tr> <tr> <td>5 = 6 Buttons</td> <td>5 = not possible</td> </tr> <tr> <td>6 = 7 Buttons</td> <td>6 = not possible</td> </tr> <tr> <td>7 = 8 Buttons</td> <td>7 = not possible</td> </tr> </table>	PTM 100 (Type1):	PTM200 (Type2):	0 = 0 Buttons	0 = 0 Button	1 = 2 Buttons	1 = not possible	2 = 3 Buttons	2 = not possible	3 = 4 Buttons	3 = 3 or 4 buttons	4 = 5 Buttons	4 = not possible	5 = 6 Buttons	5 = not possible	6 = 7 Buttons	6 = not possible	7 = 8 Buttons	7 = not possible
PTM 100 (Type1):	PTM200 (Type2):																			
0 = 0 Buttons	0 = 0 Button																			
1 = 2 Buttons	1 = not possible																			
2 = 3 Buttons	2 = not possible																			
3 = 4 Buttons	3 = 3 or 4 buttons																			
4 = 5 Buttons	4 = not possible																			
5 = 6 Buttons	5 = not possible																			
6 = 7 Buttons	6 = not possible																			
7 = 8 Buttons	7 = not possible																			
PR	(1 bit)	PR = 1 → Energy bow pressed, PR = 0 → Energy bow released																		
Reserved	(4 bit)	for future use, default value 0																		

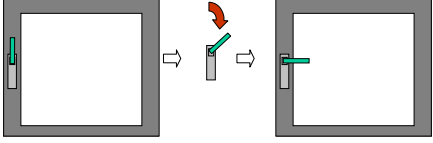
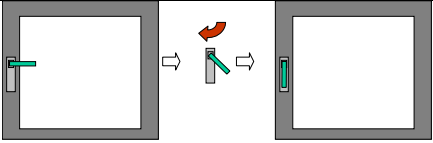
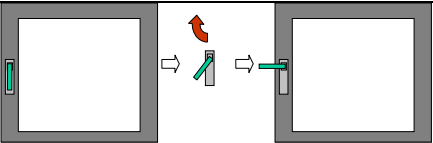
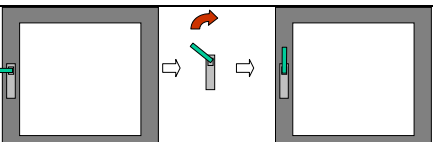
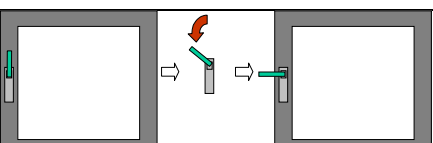
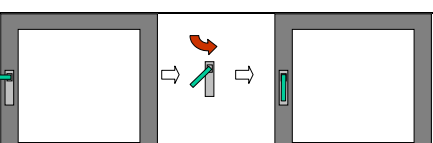
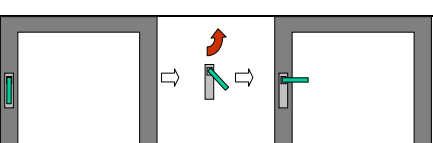
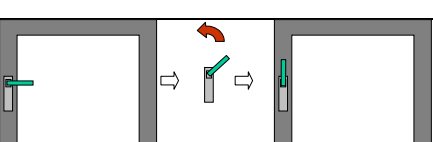
Profile Window Handle

STATUS FIELD

T21=1, NU=0

DATA BYTES

DB_2..0 always = 0

	DB_3 = 0b11X0XXXX
	DB_3 = 0b1111XXXX
	DB_3 = 0b11X0XXXX
	DB_3 = 0b1101XXXX
	DB_3 = 0b11X0XXXX
	DB_3 = 0b1111XXXX
	DB_3 = 0b11X0XXXX
	DB_3 = 0b1101XXXX

IMPORTANT NOTE:
 The bits marked with 'X' in DB_3 should not be checked. These bits can be '1' or '0' and should not be assumed to be a defined value, because both of them are allowed and not predictable!

STANDARDIZATION ENOCEAN COMMUNICATION PROFILES

3 1BS TELEGRAM

ORG FIELD 6

STATUS FIELD

7

0

Reserved	Profile	RP_COUNTER
----------	---------	------------

Reserved	(1 bit)	For future use, default value 0
Profile	(3 bit)	Communication profile
RP_COUNTER	(4 bit)	Repeater counter

3.1 Profile Definitions

Profile 0b000 Magnet Contact

DATA BYTES

DB_2..0	always = 0
DB_3.BIT_0	0 contact open 1 contact closed
DB_3.BIT_3	0 LRN Button pressed 1 LRN Button not pressed

4 4BS TELEGRAM

4.1 Introduction

In order to allow communication between sensors and actuators from different manufacturers it is intended to establish a standard for the teach-in procedure and for the exchange of data.

The receiver needs to know from which type of transmitter a message is coming. To keep the radio telegram as short as possible the transmitter will inform the receiver during the teach-in procedure about its characteristics.

Each transmitter which communicates based on the EnOcean „4BS“ telegram will transmit a special telegram containing „profile“, „device type“ and „manufacturer ID“ during the teach-in procedure. A special bit is set to distinguish it from normal telegrams. There are 6 bit for device „profiles“, 7 bit for device „types“ and 11 bit for the „manufacturer ID“.

4.2 Teach in Telegram

The teach-in telegram has the same structure as a normal 4BS telegram. The data bytes have the following meaning:

DB_3								DB_2								DB_1								DB_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
Profile								Type								Manufacturer ID								LRN Type	0	0	0	LRN	d.c	d.c	d.c

The *LRN* bit (DB_0.Bit_3) must be set „0“ to signalize a teach-in telegram.

The *LRN Type* bit (DB_0.BIT_7) signalizes whether the teach-in telegram contains information on Profile, Type and Manufacturer ID (*LRN Type* = „1“) or if normal data is sent as done in the first generation of EnOcean based products (*LRN Type* = „0“).

In case profile, type and manufacturer ID have been programmed into the STM 110 module it will automatically transmit the telegram shown above with *LRN Type* bit (DB_0.Bit_7) bit set „1“. Otherwise the STM 110 will not transmit the special teach-in telegram. If other modules are used to transmit 4BS telegrams the *LRN Type* bit must be set explicitly.

4.3 Profile Definitions

ORG FIELD 7

STATUS FIELD

7	Reserved	RP_COUNTER	0
---	----------	------------	---

Reserved (4 bit) For future use, default value 0
 RP_COUNTER (4 bit) Repeater counter

Profile 0b000010 – Temperature Sensor

DATA BYTES

Measurement range 40K

Type 0b0000001 – Measurement range -40°C to 0°C

DB_1: Temperature -40...0°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0000010 – Measurement range -30°C to +10°C

DB_1: Temperature -30...10°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0000011 – Measurement range -20°C to +20°C

DB_1: Temperature -20...20°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0000100 – Measurement range -10°C to +30°C

DB_1: Temperature -10...30°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0000101 – Measurement range 0°C to +40°C

DB_1: Temperature 0...40°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0000110 – Measurement range +10°C to +50°C

DB_1: Temperature 10...50°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0000111 – Measurement range +20°C to +60°C

DB_1: Temperature 20...60°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0001000 – Measurement range +30°C to +70°C

DB_1: Temperature 30...70°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

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Type 0b0001001 – Measurement range +40°C to +80°C

DB_1: Temperature 40...80°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0001010 – Measurement range +50°C to +90°C

DB_1: Temperature 50...90°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0001011 – Measurement range +60°C to +100°C

DB_1: Temperature 60...100°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Measurement range 80KType 0b0010000 – Measurement range -60°C to +20°C

DB_1: Temperature -60...20°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010001 – Measurement range -50°C to +30°C

DB_1: Temperature -50...30°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010010 – Measurement range -40°C to +40°C

DB_1: Temperature -40...40°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010011 – Measurement range -30°C to +50°C

DB_1: Temperature -30...50°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010100 – Measurement range -20°C to +60°C

DB_1: Temperature -20...60°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010101 – Measurement range -10°C to +70°C

DB_1: Temperature -10...70°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010110 – Measurement range 0°C to +80°C

DB_1: Temperature 0...80°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0010111 – Measurement range +10°C to +90°C

DB_1: Temperature 10...90°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

Type 0b0011000 – Measurement range +20°C to +100°C

DB_1: Temperature 20...100°C, linear n=255...0
 DB_0.BIT_3: Learn button 0 = Teach-in telegram 1 = Data telegram

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Type 0b0011001 – Measurement range +30°C to +110°C

DB_1:	Temperature	30...110°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

Type 0b0011010 – Measurement range +40°C to +120°C

DB_1:	Temperature	40...120°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

Type 0b0011011 – Measurement range +50°C to +130°C

DB_1:	Temperature	50...130°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

Profile 0b000100 – Temperature & Humidity SensorDATA BYTESType 0b0000001 – Measurement range 0°C to +40°C and 0% to 100%

DB_2:	Rel. Humidity	0...100%, linear n=0...250
DB_1:	Temperature	0...40°C, linear n=0...250
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_1:	T-Sensor	1: Temperature sensor available 0: Temperature sensor not available

Profile 0b000101 – Pressure Sensor

TBD

Profile 0b000110 – Light SensorDATA BYTESType 0b0000001 – Measurement range 300 to 30000 lx and 600 to 60000 lx

DB_3:	Supply voltage	0...5.1V (0...255)
DB_2:	Illumination	300...30000 lx (0...255)
DB_1:	Illumination	600...60000 lx (0...255)
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Range select	0 = Range acc. to DB_1 1 = Range acc. to DB_2

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Type 0b0000010 – Measurement range 0 to 510 lx and 0 to 1020 lx

DB_3:	Supply voltage	0...5.1V (0...255)
DB_2:	Illumination	0...510 lx (0...255)
DB_1:	Illumination	0...1020 lx (0...255)
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Range select	0 = Range acc. to DB_1 1 = Range acc. to DB_2

Profile 0b000111 – Occupancy SensorDATA BYTESType 0b0000001 – Occupancy Sensor 1

DB_1:	PIR off	0...127
	PIR on	128...255
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

The transmission of "PIR off" telegrams is optional.

Profile 0b001000 – Light, Temperature & Occupancy SensorDATA BYTES

DB_3:	Supply voltage	0... U_{max}	linear n=0...255
DB_2:	Illumination	0... E_{max}	linear n=0...255
DB_1:	Temperature	T_{min} ... T_{max}	linear n=0...255
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram	
DB_0.BIT_1:	PIR signal	0 = PIR on, 1 = PIR off	
DB_0.BIT_0:	Occupancy button	0 = Button pressed	

Type 0b0000001

U_{max}	5.1V
E_{max}	510 lx
T_{min}	0°C
T_{max}	51°C

E.g. for ceiling suspended sensor.

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Type 0b0000010

U_{max} 5.1V
 E_{max} 1020 lx
 T_{min} 0°C
 T_{max} 51°C

E.g. for wall mounted sensor.

Type 0b0000011

U_{max} 5.1V
 E_{max} 1530 lx
 T_{min} -30°C
 T_{max} 50°C

E.g. for outdoor sensor.

Profile 0b001001 – Gas sensorType 0b0000001 – CO Sensor

DB_3:	Concentration	0...TBD ppm (0...255)
DB_2:	Concentration	0...TBD ppm (0...255)
DB_1:	Temperature	TBD...TBD°C (0...255)
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_1:	T-Sensor	1: Temperature sensor available 0: Temperature sensor not available
DB_0.BIT_0:	Range select	0 = Range acc. to DB_2 1 = Range acc. to DB_3

Type 0b0000100 – CO2 Sensor

TBD

Type 0b0001000 – O2 Sensor

TBD

Type 0b0001100 – Propane Sensor

TBD

Profile 0b010000 – Room Operating PanelDATA BYTESType 0b0000001 – Temperature sensor, Setpoint adjustment, Turn-switch, Pushbutton

DB_3:	Turn-switch for fan speed	
	Stage Auto	210 ... 255
	Stage 0	190 ... 209
	Stage 1	165 ... 189
	Stage 2	145 ... 164
	Stage 3	0 ... 144
DB_2:	Set point	Min. - ... Max. +, linear n=0...255
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Occupancy button	0 = Button pressed

Type 0b0000010 – Temperature sensor, Setpoint adjustment, Turn-switch, Slide switch

DB_3:	Turn-switch for fan speed	
	Stage Auto	210 ... 255
	Stage 0	190 ... 209
	Stage 1	165 ... 189
	Stage 2	145 ... 164
	Stage 3	0 ... 144
DB_2:	Set point	Min. - ... Max. +, linear n=0...255
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Slide switch 0/I or Slide switch Day/Night	0 = Position „I“ 0 = Position „Night“

Type 0b0000011 – Temperature sensor, Setpoint adjustment

DB_2:	Set point	Min. - ... Max. +, linear n=0...255
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

STANDARDIZATION ENOCEAN COMMUNICATION PROFILES

Type 0b0000100 – Temperature sensor, Setpoint adjustment, Turn-switch

DB_3:	Turn-switch for Fan speed	
	Stage Auto	210 ... 255
	Stage 0	190 ... 209
	Stage 1	165 ... 189
	Stage 2	145 ... 164
	Stage 3	0 ... 144
DB_2:	Set point	Min. - ... Max. +, linear n=0...255
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

Type 0b0000101 – Temperature sensor, Setpoint adjustment, Pushbutton

DB_2:	Set point	Min. - ... Max. +, linear n=0...255
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Occupancy button	0 = Button pressed

Type 0b0000110 – Temperature sensor, Setpoint adjustment, Slide switch

DB_2:	Set point	Min. - ... Max. +, linear n=0...255
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Slide switch 0/I or Slide switch Day/Night	0 = Position „I“ 0 = Position „Night“

Type 0b0000111 – Temperature sensor, Turn-switch

DB_3:	Turn-switch for Fan speed	
	Stage Auto	210 ... 255
	Stage 0	190 ... 209
	Stage 1	165 ... 189
	Stage 2	145 ... 164
	Stage 3	0 ... 144
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

STANDARDIZATION ENOCEAN COMMUNICATION PROFILES

Type 0b0001000 – Temperature sensor, Turn-switch, Pushbutton

DB_3:	Turn-switch for Fan speed	
	Stage Auto	210 ... 255
	Stage 0	190 ... 209
	Stage 1	165 ... 189
	Stage 2	145 ... 164
	Stage 3	0 ... 144
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Occupancy button	0 = Button pressed

Type 0b0001001 – Temperature sensor, Turn-switch, Slide switch

DB_3:	Turn-switch for Fan speed	
	Stage Auto	210 ... 255
	Stage 0	190 ... 209
	Stage 1	165 ... 189
	Stage 2	145 ... 164
	Stage 3	0 ... 144
DB_1:	Temperature	0...40°C, linear n=255...0
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Slide switch 0/I or Slide switch Day/Night	0 = Position „I“ 0 = Position „Night“

Type 0b0010000 – Temperature sensor, rel. Humidity, Setpoint adjustment, Pushbutton

DB_3:	Set point	Min. - ... Max. +, linear n=0...255
DB_2:	Rel. Humidity	0...100%, linear n=0...250
DB_1:	Temperature	0...40°C, linear n=0...250
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Occupancy button	0 = Button pressed

STANDARDIZATION ENOCEAN COMMUNICATION PROFILES

Type 0b0010001 – Temperature sensor, rel. Humidity, Setpoint adjustment, Slide switch

DB_3:	Set point	Min. - ... Max. +, linear n=0...255
DB_2:	Rel. Humidity	0...100%, linear n=0...250
DB_1:	Temperature	0...40°C, linear n=0...250
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Slide switch 0/I or Slide switch Day/Night	0 = Position „I“ 0 = Position „Night“

Type 0b0010010 – Temperature sensor, rel. Humidity, Setpoint adjustment

DB_3:	Set point	Min. - ... Max. +, linear n=0...255
DB_2:	Rel. Humidity	0...100%, linear n=0...250
DB_1:	Temperature	0...40°C, linear n=0...250
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram

Type 0b0010011 – Temperature sensor, rel. Humidity, Pushbutton

DB_2:	Rel. Humidity	0...100%, linear n=0...250
DB_1:	Temperature	0...40°C, linear n=0...250
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Occupancy button	0 = Button pressed

Type 0b0010100 – Temperature sensor, rel. Humidity, Slide switch

DB_2:	Rel. Humidity	0...100%, linear n=0...250
DB_1:	Temperature	0...40°C, linear n=0...250
DB_0.BIT_3:	Learn button	0 = Teach-in telegram 1 = Data telegram
DB_0.BIT_0:	Slide switch 0/I or Slide switch Day/Night	0 = Position „I“ 0 = Position „Night“

Profile 0b110000 – Digital-Input

DATA BYTES

Type 0b0000001 – 1 x Digital Input

DB_2:	Battery voltage	121...255	Battery OK
		0.....120	Battery LOW
DB_1:	Contact closed	0...195	
	Contact open	196...255	
DB_0.BIT_3:	Learn button	0 = Teach-in telegram	
		1 = Data telegram	

Profile 0b111000 – Central Command

In the communication between Gateway and actuator the DB_3 byte is used to identify commands. Commands 0x01 to 0x7F shall be common to all types belonging to this profile. Commands 0x80 to 0xFE can be defined individually for each device type.

Command1: Switching

DB_3:	0x01	
DB_2/DB_1:	Time in $1/_{10}$ seconds.	
	No time specified	0x0000
	Time	0x0001 to 0xFFFF $1/_{10}$ seconds
DB_0.BIT_2:	Lock / Unlock	
	Unlock	0
	Lock	1 (lock for duration time if time >0, unlimited time of no time specified. Locking may be cleared with „unlock“. During lock phase no other commands will be accepted or executed.)
DB_0.BIT_1:	Delay or duration (if Time > 0)	
	Duration	0 (Execute switching command immediately and switch back after duration)
	Delay	1 (Execute switching command after delay)
DB_0.BIT_0:	Switching command	
	OFF	0
	ON	1

Command 2 - Dimming

DB_3:	0x02	
DB_2:	Dimming value (absolute [0...255] or relative [0...100])	
DB_1:	Ramping time in seconds	
	No ramping	0x00
	Seconds to 100%	0x01 to 0xFF seconds
DB_0.BIT_2:	Range	

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	Absolute values	0
	Relative values	1
DB_0.BIT_1:	Store final value	
	NO	0
	YES	1
DB_0.BIT_0:	Switching command	
	OFF	0
	ON	1

Type 0b0001000 – PHC Gateway**Profile 0b111111 – Universal**

This profile is intended for manufacturer specific applications. Every manufacturer may independently define the types within this profile.

DB_0.BIT_3:	Learn button	0 = Teach-in telegram
		1 = Data telegram

4.4 Manufacturer ID

Peha	0b000000000001
Thermokon	0b000000000010
Servodan	0b000000000011
EchoFlex Solutions	0b00000000100
Omnio AG	0b00000000101
Hardmeier electronics	0b00000000110
Regulvar Inc.	0b00000000111
Ad Hoc Electronics	0b00000001000
Distech Controls	0b00000001001

Multi user ID	0b111111111111
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