EnOcean Equipment Profiles

REVISION HISTORY

Ver.	Editor	Change	Date
2.6.8	NM	Last xml edition of the EEP-Specification	Dec 31, 2017

specification may be used in development of a product or service for sale without being a participant or promoter member of the EnOcean Alliance and/or joint owner of the appropriate joint IPR.

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A5-20: HVAC Components

RORG	A5	**4BS Telegram**
FUNC	20	HVAC Components
TYPE	04	Heating Radiator Valve Actuating Drive with Feed and Room Temperature Measurement, Local Set Point Control and Display (BI-DIR)

Submitter: Holter Regelarmaturen GmbH & Co. KG

Description
The following document describes the communication between a controller and an intelligent heating radiator valve actuating drive with the following features:

- Feed temperature measurement
- Room temperature measurement
- Current position feedback
- Display
- Button
- On device temperature set point selection

In order to be able to process this information and control the actuator, every command has been included in this document. Each customer can use his own controller by implementing the EEP of this document.

Data exchange
Direction: bidirectional
Addressing: unicast (ADT)
Communication trigger: event- & time-triggered
Communication interval: can be configured by the controller
Trigger event: a trigger event occurs when the button is pressed or the local set point is used
Tx delay: 550 ms is the maximum response time for Smart-Ack Devices and 1100 ms for devices which use the 4BS teach-in method
Rx timeout: just 1 message per wake-up cycle

Teach-in
Teach-in method: Smart-Ack teach-in and 4BS teach-in Variation 3

Security
Encryption supported: no
Security level format: -

Telegram Description of Direction 1 (Transmit mode / Message from the actuator to the controller)

This direction initializes the communication, shares the needed data and waits for an answer from the controller. This allows the device to work in deep sleep mode the rest of the time.

Each message from the actuator contains the following information:

- Current Position (CP)
  The current position is a feedback value from the actuator. It indicates the actual per cent position of the valve. The value 0 % means that the valve is completely closed and 100 % completely open. The controller can use this information for the room temperature regulation.

- Temperature Set Point OR Feed Temperature (FTS)*
  * This byte is shared by the Temperature Set Point and the Feed Temperature value. Only one of these values is sent in the same message. Which value is transmitted is indicated by DB0.1 (TS bit).
  The feed temperature is the water temperature in the radiator input, which can be useful for implementing several features in the home automation system.
  The temperature set point is only sent when the user specifies a new room temperature by using the local temperature set point on the device.

- Room Temperature (TMP) OR Failure Code (FC)*
  * This byte is shared by the Room Temperature and Failure Code Value. Only one of these values is sent in the same message. The value transmitted is indicated by DB0.0 (FL). By default it is the room temperature.
  The room temperature is the ambient temperature of the place in which the device is used and is measured by the actuator. This value is transmitted if no error occurred.
  The Failure Code is transmitted instead of the Room Temperature if an error occurs.

- Measurement Status (MST)
  The temperature measurements (room and feed temperature) can be deactivated in order to reduce the energy consumption. This can be specified only by the controller i.e. to implement summer mode or to replace the internal room temperature measurement of the actuator by an external one.

- Status Request (SRT)
  The status request bit can be used to ask the controller about its status. If the controller does not send back the correct reply, the actuator will start its own room temperature regulation. With this feature, a frozen actuator would not interrupt the room temperature regulation.

- Teach-in Bit (LRNB)
  For establishing the radio link between the controller and the actuator, a teachin message has to be sent from the actuator to the controller. If the binary value 0 is transmitted, the message will be identified as a teach-in one and will allow the controller to receive the EnOcean-ID of the actuator.

- Button Lock Status (BLS)
  The button lock status can be set by the controller. This enables or disables the manual room temperature selection. If locked, the manual room temperature selection on the actuator will be disabled and the user will be notified with a symbol on the display.

- Temperature Selection (TS)
  If the user specifies a temperature set point manually on the device, this will be sent to the controller and indicated on the temperature selection field (TS). It can indicate that the field FTS contains the temperature set point (binary value = 1) or the feed temperature (binary value = 0).

- Failure (FL)
  Indicates the occurrence of a failure. The room temperature value is replaced by the failure code if the bit FL has the binary value 1.

Telegram Description of Direction 2 (Receive mode / Commands from the controller to the actuator)

The messages from the controller to the actuator are sent in this direction. A message in this direction has to be sent after receiving a message from the actuator, in order to achieve a successful communication. If the controller message is not received by the actuator in a specific time after a direction 1 message, no information will be received by the actuator. The time that the actuator will wait for a reply is defined by the Smart-Ack Teach-In process. For controllers which cannot use Smart-Ack, the 4BS Teach-in Variation 3 has to be used, with a maximum response time of 1100 ms.

Each message from the controller contains the following information:

- Valve Position (POS)
  The valve position is a set point position for the valve. It indicates the per cent position of the valve, which the actuator has to reach. The value 0 % means that the valve is completely closed and 100 % completely open. The controller should be able to regulate the room temperature by adjusting this value.

- Temperature Set Point (TSP)
  The controller can send the temperature set point to the actuator in order to allow the user to see the actual specified temperature in the device display. This value does not affect room temperature regulation.

- Measurement Control (MC)
  The temperature measurements (room and feed temperature) can be deactivated in order to reduce energy consumption. This can be specified only by the controller i.e. to implement summer mode or to replace the internal room temperature measurement by the device with an external one. The measurement control bit enables the controller to activate or deactivate the measurements.

- Wake-up Cycle (WUC)
  To save energy, the actuator works in deep sleep mode the most of the time. Nevertheless it has to wake up to communicate with the controller and to reach the valve position specified by the controller. The longer the actuator remains in deep sleep mode, the more energy efficient will be your batteries. If fast response is required, the actuator has to communicate more frequently with the controller and that is why it should use a shorter wake-up cycle. If a fast room temperature control is not required, the wake-up cycle should be set by the controller as long as possible.

- Display Orientation (DSO)
  The heater valves can be installed in different directions. That is why it can be useful to have the option to choose the fitting display orientation. This feature makes reading the display easier.

- Teach-in Bit (LRNB)
  For establishing a radio link between the controller and the actuator, a teach-in telegram has to be sent from the controller to the actuator. If the binary value 0 is transmitted, the message will be identified as a teach-in one and will allow the device to receive the EnOcean-ID from the controller.

- Button Lock Control (BLS)
  The button lock status can be set by the controller. This enables or disables the manual room temperature selection. If locked, the manual room temperature selection on the actuator will be disabled and the user will be notified with a symbol on the display.

- Service Command (SER)
  In order to adapt the actuator to a new valve, the controller can order the execution of some functions of the actuator:
  - run initialisation: This function has to be executed for adapting the actuator to the length of the valve stroke.
  - open valve: To facilitate the installation or maintenance of the valve, the actuator can open the valve completely. After completely opening the valve it is necessary to run the initialisation.

DIRECTION-1

Offset	Size	Bitrange	Data	ShortCut	Description	Valid Range	Scale	Unit
0	8	DB3.7...DB3.0	Current Position	CP	Current valve position	0...100	0...100	%
8	8	DB2.7...DB2.0	Feed Temperature OR Temperature Set Point	FTS	Either current feed temperature value or temperature set point (defined by DB0.1)	0...255	20...80 or 10...30	°C
16	8	DB1.7...DB1.0	Room Temperature OR Failure Code	TMPFC	Current room temperature value (10...30°C) OR Failure Code (Enum)	Enum: 0...255: 10...30 °C 00 ... 16: Reserved 17: Measurement error 18: Battery empty 19: Reserved 20: Frost protection 21 ... 32: Reserved 33: Blocked valve 34 ... 35: Reserved 36: End point detection error 37 ... 39: Reserved 40: No valve 41 ... 48: Reserved 49: Not taught in 50 ... 52: Reserved 53: No response from controller 54: Teach-in error 55 ... 255: Reserved		
24	1	DB0.7	Measurement Status	MST	Shows if the temperature measurement (feed temperature and room temperature) is active	Enum: 0: Active 1: Inactive		
25	1	DB0.6	Status Request	STR	Request for status from the controller	Enum: 0: No change 1: Status requested		
26	2	DB0.5...DB0.4	Not Used (= 0)					
28	1	DB0.3	LRN Bit	LRNB	LRN Bit	Enum: 0: Teach-in telegram 1: Data telegram		

29	1	DB0.2	Button Lock Status	BLS	Shows if all buttons on the actuator are locked	Enum: 0: Unlocked 1: Locked
30	1	DB0.1	Temperature Selection	TS	Defines which temperature value is transmitted in DB2	Enum: 0: Feed temperature 1: Temperature set point
31	1	DB0.0	Failure	FL	A failure occurred, see DB1.7-DB1.0 for Failure Code	Enum: 0: No failure (TMP is transmitted) 1: failure (FC is transmitted)

DIRECTION-2

Offset	Size	Bitrange	Data	ShortCut	Description	Valid Range	Scale	Unit
0	8	DB3.7...DB3.0	Valve Position	POS	Valve position	0...100	0...100	%
8	8	DB2.7...DB2.0	Temperature Set Point	TSP	Temperature set point	0...255	10...30	°C
16	1	DB1.7	Not Used (= 0)					
17	1	DB1.6	Measurement Control	MC	Control the temperature measurement (feed temperature + room temperature)	Enum: 0: Enable 1: Disable		

18	6	DB1.5...DB1.0	Wake-up Cycle	WUC	Defines the cyclic wake-up time	Enum: 0: 10 sec 1: 60 sec 2: 90 sec 3: 120 sec 4: 150 sec 5: 180 sec 6: 210 sec 7: 240 sec 8: 270 sec 9: 300 sec (5 min) 10: 330 sec 11: 360 sec 12: 390 sec 13: 420 sec 14: 450 sec 15: 480 sec 16: 510 sec 17: 540 sec 18: 570 sec 19: 600 sec (10 min) 20: 630 sec 21: 660 sec 22: 690 sec 23: 720 sec 24: 750 sec

						25: 780 sec
						26: 810 sec
						27: 840 sec
						28: 870 sec
						29: 900 sec (15 min)
						30: 930 sec
						31: 960 sec
						32: 990 sec
						33: 1020 sec
						34: 1050 sec
						35: 1080 sec
						36: 1110 sec
						37: 1140 sec
						38: 1170 sec
						39: 1200 sec (20 min)
						40: 1230 sec
						41: 1260 sec
						42: 1290 sec
						43: 1320 sec
						44: 1350 sec
						45: 1380 sec
						46: 1410 sec
						47: 1440 sec
						48: 1470 sec
						49: 1500 sec (25 min)
						50: 3 hrs
						51: 6 hrs

						52: 9 hrs 53: 12 hrs 54: 15 hrs 55: 18 hrs 56: 21 hrs 57: 24 hrs
						58: 27 hrs 59: 30 hrs 60: 33 hrs 61: 36 hrs 62: 39 hrs 63: 42 hrs (max)
24	2	DB0.7...DB0.6	Not Used (= 0)			
26	2	DB0.5...DB0.4	Display Orientation	DSO	Adjusts the display orientation	Enum: 0: 0° 1: 90° 2: 180° 3: 270°
28	1	DB0.3	LRN Bit	LRNB	LRN Bit	Enum: 0: Teach-in telegram 1: Data telegram
29	1	DB0.2	Button Lock Control	BLC	Set the button lock status	Enum: 0: Unlocked 1: Locked
30	2	DB0.1...DB0.0	Service Command	SER	Initiates certain temporary service operations	Enum: 0: No change 1: Open valve 2: Run initialisation 3: Close valve