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.

These errata may not have been subjected to an Intellectual Property review, and as such, may contain undeclared Necessary Claims.

EnOcean Alliance Inc.
2400 Camino Ramon, Suite 375
San Ramon, CA 94583
USA
Graham Martin
Chairman & CEO EnOcean Alliance

D2-01: Electronic Switches and Dimmers with Local Control

This EEP family shall be used for bidirectional actuators that control electric loads, e.g. for lightning purposes. Switching and dimming is controlled and high-resolution energy measurement is supported. Local Control, either thru a user interface or thru other measures shall be supported on the actuator. This may include other EnOcean enabled devices taught-in to a device belonging to the EEP family, e.g. a simple rocker switch or more sophisticated devices like occupancy sensors with timing control. The proposed EEP family serves up to 30 output channels and allows controlling them either individually or as a bulk. Extension of this EEP family is possible in different ways:

1. A new device with a different feature mix creates a new TYPE within this EEP family
-> new column in following table

2. An additional feature is added and a new device with a new TYPE is created
-> new column and new line in following table

3. Like 2, but EnOcean communication of the EEP family needs to be extended
-> new column and new line in following table
-> one or more additional messages need to be defined

For teach-in and teach-out UTE (Universal Uni- and Bidirectional Teach-In Procedure for EEP based Communication) shall be used.

Supported function ... of Type	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13	14	15	16
No. of output channels	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	4	8	4	2
Switching	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dimming	-	-	X	X	X	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X
Dimming configurable	-	-	-	-	X	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X
Pilot wire	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-
Local control	X	X	X	X	X	X	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Local control enable/disable	-	-	-	-	X	X	-	-	X	-	X	X	X	X	X	X	-	-	X	-	-	X	X
External Switch / Push Button Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	X	X
External Switch / Push Button Type	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	X	X
Auto OFF Timer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	X	X
Delay OFF Timer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	X	X
Taught-in devices enable/disable 2)	-	-	-	-	X	X	-	-	X	X	X	X	X	X	X	X	-	-	X	-	-	-	-
User interface day/night mode	-	-	-	-	-	X	-	-	X	-	X	X	X	X	X	X	-	-	X	-	-	X	X
Over current reporting	-	-	-	-	X	X	-	-	X	X	-	-	X	-	-	-	-	-	-	-	-	-	-
Over current configurable	-	-	-	-	X	X	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-
Energy measurement	X	-	X	-	X	X	X	-	X	X	-	X	X	-	X	-	X	-	-	-	-	-	-
Power measurement	-	-	-	-	X	X	-	-	X	X	-	X	X	-	X	-	-	-	-	-	-	-	-
Measurement Roll Over 1)	X	-	X	-	-	-	X	-	-	-	-	X	-	-	X	-	X	-	-	-	-	-	-
Measurement Auto Scaling 1)	-	-	-	-	X	X	-	-	X	X	-	-	X	-	-	-	-	-	-	-	-	-	-
Measurement configurable	-	-	-	-	-	X	-	-	X	X	-	X	X	-	X	-	-	-	-	-	-	-	-
Measurement report on query	X	-	X	-	X	X	X	-	X	X	-	X	X	-	X	-	X	-	-	-	-	X	-
Measurement auto reporting	-	-	-	-	X	X	-	-	X	X	-	X	X	-	X	-	-	-	-	-	-	-	-
Default state configurable	-	-	-	-	-	X	-	-	X	X	X	X	X	X	X	X	-	-	X	-	-	X	-
Error level reporting	-	-	-	-	-	X	-	-	X	X	-	-	X	-	-	-	-	-	-	-	-	X	-
Power Failure Detection	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-
Power Failure Detection enable/disable	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-
Maximum Dimming Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
Minimum Dimming Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X

1) A device may either support Measurement Roll Over or Measurement Auto Scaling.

2) Enable / disable only effects devices that are taught-in to a device belonging to this EEP family;
it does not effect communication between a device belonging to this EEP family and any other entity where this device has been taught-in by itself.

RORG	D2	VLD Telegram
FUNC	01	Electronic Switches and Dimmers with Local Control
TYPE	16	Type 0x16

Submitter: Menred GmbH

Description
This profile is used to adjust the incandescence of two types of lamp, an ordinary and a LED one. The principle used is dimming, linearly for an ordinary lamp and nonlinearly for the LED lamp (due to the light dimming characteristics of each kind of light). The dim value itself will be always between 0 and 100%.

The maximum and minimum values are received at the same time; the device knows whether or not the values are valid by comparing them. If an invalid value is entered, the device discards this data and no change is applied. To know the valid values please refer to the "ValidRange" section of the commands description.

Data exchange
Direction: bidirectional
Addressing: unicast (ADT) / broadcast
Communication trigger: data change-triggered / time-triggered
Communication interval: 100 ms
Trigger event: e.g.: event description, threshold/delta for observed value, downtime, heartbeat, ...
Tx delay: default 100 - 200 ms, max. 5000 ms
Rx timeout: 100 ms (minimum time between two received messages)

Teach-in
Teach-in method: RPS teach-in / 1BS teach-in / 4BS teach-in 1 / Universal teach-in (UTE)

Security

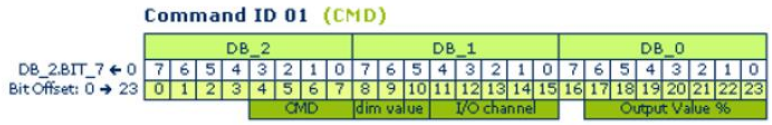
Encryption supported: no
Security level format: -

Supported command	Type 0x16
0x1 – Actuator Set Output	X
0x2 – Actuator Set Local	X
0x3 – Actuator Status Query	X
0x4 – Actuator Status Response	X
0x5 – Actuator Set Measurement	-
0x6 – Actuator Measurement Query	-
0x7 – Actuator Measurement Response	-
0x8 – Actuator Set Pilot Wire Mode	-
0x9 – Actuator Pilot Wire Mode Query	-
0xA – Actuator Pilot Wire Mode Response	-
0xF – Actuator Set Dimming Limits, Dimming Limits Query, Dimming Limits Response (= Extended commands)	X

Supported Extended command	0xF
0x0 – Actuator Set Dimming Limits	X
0x1 – Actuator Dimming Limits Query	X
0x2 – Actuator Status Query	X

CMD 0x1 - Actuator Set Output

This message is sent to an actuator. It controls switching / dimming of one or all channels of an actuator.



REMARK:
In case an Actuator Set Output message specifies a parameter that is not supported by the addressed device, such device should react as following:
- Channel not supported by device -> ignore message
- Dimming command to switching device -> no change of status
- Dimming command with non-supported speed -> dim with regular speed

RECOMMENDATION:

Dimmers should take things like phase shifting into account to provide dimming based on power consumption (results in brightness for lamps) rather than interpreting percentage values as phase angle only.

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	command identifier	Enum: 0x01: ID 01		
8	3	Dim value	DV		Enum: 0x00: Switch to new output value 0x01: Dim to new output value – dim timer 1 0x02: Dim to new output value – dim timer 2 0x03: Dim to new output value – dim timer 3 0x04: Stop dimming 0x05...0x07: not used		
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		
16	1	Not Used (= 0)					
17	7	Output value	OV		Enum: 0x00: Output value 0% or OFF 0x01...0x64: Output value 1% to 100% or ON 0x65...0x7E: Not used 0x7F: Output value not valid / not applicable		

CMD 0x2 - Actuator Set Local

This message is sent to an actuator. It configures one or all channels of an actuator.

Response Timing: None

RECOMMENDATION:
In case the device implements an internal order for dim timers, this order should be from "dim timer 1" (fast) to "dim timer 3" (slow). The configured time shall always be interpreted for a full range (0 to 100%) dimming.

Command ID 02 (CMD)

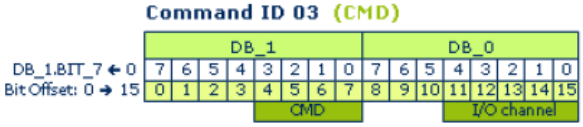
	DB_3								DB_2								DB_1								DB_0							
DB_3.BIT_7 ← 0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Bit Offset: 0 → 31	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	d/e				CMD				OC	RO	LC	I/O channel					dim timer 2				dim timer 3				d/n	PF	state		dim timer 1			
																	medium				slow					EEP2.6			fast			

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	1	Taught-in devices	d/e		Enum: 0b0: Disable taught-in devices (with different EEP) 0b1: Enable taught-in devices (with different EEP)		
1	3	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x02: ID 02		
8	1	Over current shut down	OC		Enum: 0b0: Over current shut down: static off 0b1: Over current shut down: automatic restart		
9	1	reset over current shut down	RO		Enum: 0b0: Reset over current shut down: not active 0b1: Reset over current shut down: trigger signal		
10	1	Local control	LC		Enum: 0b0: Disable local control 0b1: Enable local control		
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		
16	4	Dim timer 2	DT2		Enum: 0x00: Not used 0x01...0x0F: Dim timer 2 [0,5 ... 7,5s / steps 0,5s]		
20	4	Dim timer 3	DT3		Enum: 0x00: Not used 0x01...0x0F: Dim timer 3 [0,5 ... 7,5s / steps 0,5s]		
24	1	User interface indication	d/n		Enum: 0b0: User interface indication: day operation 0b1: User interface indication: night operation		
25	1	Power Failure	PF		Enum: 0b0: Disable Power Failure Detection 0b1: Enable Power Failure Detection		
26	2	Default state	DS		Enum: 0b00: Default state: 0% or OFF 0b01: Default state: 100% or ON 0b10: Default state: remember previous state 0b11: Not used		
28	4	Dim timer 1	DT1		Enum: 0x00: Not used 0x01...0x0F: Dim timer 1 [0,5 ... 7,5s / steps 0,5s]		

CMD 0x3 - Actuator Status Query

This message is sent to an actuator. It requests the status of one or all channels of an actuator.

Response Timing:
An Actuator Status Response message shall be received within a maximum of 300ms from the time of transmission of this message. In case no such response is received within this time frame the action shall be treated as completed without result.

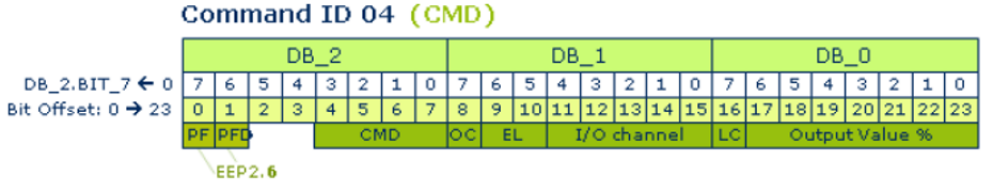


Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x03: ID 03		
8	3	Not Used (= 0)					
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		

CMD 0x4 - Actuator Status Response

This message is sent by an actuator if one of the following events occurs:
- Status of one channel has been changed locally
- Message Actuator Status Query has been received

Response Timing:
This message shall be sent within a maximum of 50ms from the time of reception of the Actuator Status Query message.



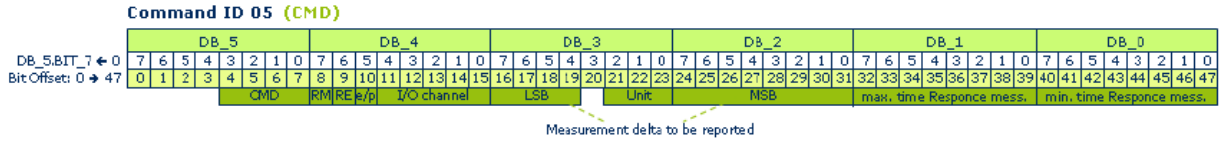
REMARK 1:
In case an Actuator Status Query message specifies a parameter that is not supported by the device being addresses, such device shall ignore the message and shall not answer using the Actuator Status Response message.
REMARK 2:
In case an Actuator Status Query message queries all output channels supported by a device being addresses, such device shall answer per each output channel by using an individual Actuator Measurement Response message.

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	1	Power Failure	PF		Enum: 0b0: Power Failure Detection disabled/not supported 0b1: Power Failure Detection enabled		
1	1	Power Failure Detection	PFD		Enum: 0b0: Power Failure not detected/not supported/disabled 0b1: Power Failure Detected		
2	2	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x04: ID 04		
8	1	Over current switch off	OC		Enum: 0b0: Over current switch off: ready / not supported 0b1: Over current switch off: executed		
9	2	Error level	EL		Enum: 0b00: Error level 0: hardware OK 0b01: Error level 1: hardware warning 0b10: Error level 2: hardware failure 0b11: Error level not supported		
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: Not applicable, do not use 0x1F: Input channel (from mains supply)		
16	1	Local control	LC		Enum: 0b0: Local control disabled / not supported 0b1: Local control enabled		
17	7	Output value	OV		Enum: 0x00: Output value 0% or OFF 0x01...0x64: Output value 1% to 100% or ON 0x65...0x7E: Not used 0x7F: output value not valid / not set		

CMD 0x5 - Actuator Set Measurement

The command defines values at offset 32 and at offset 40 which are the limits for the transmission periodicity of messages. MIT must not be set to 0, MAT >= MIT.

Response Timing: None

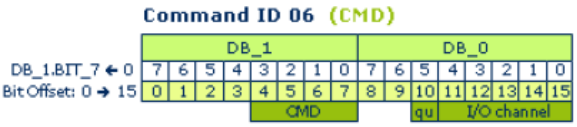


Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x05: ID 05		
8	1	Report measurement	RM		Enum: 0b0: Report measurement: query only 0b1: Report measurement: query / auto reporting		
9	1	Reset measurement	RE		Enum: 0b0: Reset measurement: not active 0b1: Reset measurement: trigger signal		
10	1	Measurement mode	e/p		Enum: 0b0: Energy measurement 0b1: Power measurement		
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		
16	4	Measurement delta to be reported (LSB)	MD_LSB		0...4095	0...4095	N/A
20	1	Not Used (= 0)					
21	3	Unit	UN		Enum: 0x00: Energy [Ws] 0x01: Energy [Wh] 0x02: Energy [KWh] 0x03: Power [W] 0x04: Power [KW] 0x05...0x07: Not used		
24	8	Measurement delta to be reported (MSB)	MD_MSB		0...4095	0...4095	N/A
32	8	Maximum time between two subsequent actuator messages	MAT	Measurement Response messages [10s]	Enum: 1...255: s 10...2550 0: Reserved		
40	8	Minimum time between two subsequent actuator messages	MIT	Measurement Response messages [s]	Enum: 1...255: s 1...255 0: Reserved		

CMD 0x6 - Actuator Measurement Query

This message is sent to an actuator. The actuator replies with an Actuator Measurement Response message.

Response Timing:
An Actuator Message Response message shall be received within a maximum of 300ms from the time of transmission of this message. In case no such response is received within this time frame the action shall be treated as completed without result.

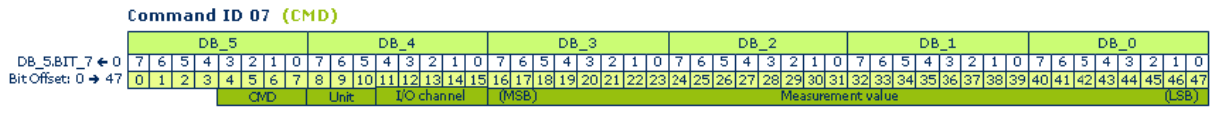


Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x06: ID 06		
8	2	Not Used (= 0)					
10	1	Query	qu		Enum: 0b0: Query energy 0b1: Query power		
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		

CMD 0x7 - Actuator Measurement Response

This message is sent by an actuator if one of the following events occurs:
- Measurement results trigger an automated transmission (see Actuator Set Measurement message)
- Message Actuator Measurement Query has been received

Response Timing:
This message shall be sent within a maximum of 50ms from the time of reception of the Actuator Measurement Query message.



REMARK 1:
In case an Actuator Measurement Query message specifies a parameter that is not supported by the device

addressed, such device shall ignore the message and shall not answer using the Actuator Measurement Response message.
REMARK 2:
In case an Actuator Measurement Query message queries all output channels supported by a device being addresses, such device shall answer per each output channel by using an individual Actuator Measurement Response message.

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x07: ID 07		
8	3	Unit	UN		Enum: 0x00: Energy [Ws] 0x01: Energy [Wh] 0x02: Energy [KWh] 0x03: Power [W] 0x04: Power [KW] 0x05...0x07: Not used		
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: Not applicable, do not use 0x1F: Input channel (from mains supply)		
16	32	Measurement value (4 bytes)	MV	DB3 = MSB / DB0 = LSB	0...4294967295	...	N/A

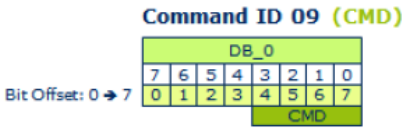
CMD 0x8 - Actuator Set Pilot Wire Mode

Command ID 08 (CMD)

Bit Offset: 0 → 15	DB_1								DB_0							
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					CMD									PM		

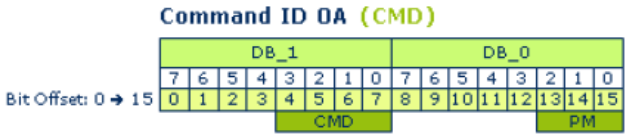
Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x08: ID 08		
8	5	Not Used (= 0)					
13	3	Pilotwire mode	PM		Enum: 0x00: Off 0x01: Comfort 0x02: Eco 0x03: Anti-freeze 0x04: Comfort-1 0x05: Comfort-2		

CMD 0x9 - Actuator Pilot Wire Mode Query



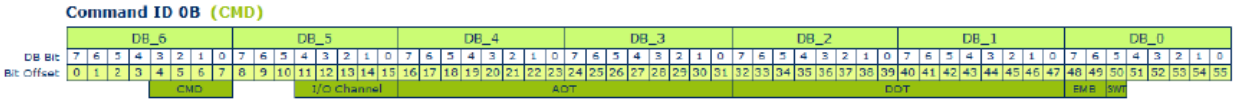
Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x09: ID 09		

CMD 0xA - Actuator Pilot Wire Mode Response



Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x0A: ID 0A		
8	5	Not Used (= 0)					
13	3	Pilotwire mode	PM		Enum: 0x00: Off 0x01: Comfort 0x02: Eco 0x03: Anti-freeze 0x04: Comfort-1 0x05: Comfort-2		

CMD 0xB - Actuator Set External Interface Settings



Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x0B: ID 0B		
8	3	Not Used (= 0)					
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		
16	16	Auto OFF Timer	AOT	Timer to automatically set OFF output channel when it is set ON	Enum: 0x0000: Timer deactivated 0x0001...0xFFFE:	0.1...6553.4	s
					0xFFFF: Does not modify saved value		
32	16	Delay OFF Timer	DOT	Delay timer before setting output channel to OFF value received by radio cmd	Enum: 0x0000: Timer deactivated 0x0001...0xFFFE:	0.1...6553.4	s
					0xFFFF: Does not modify saved value		
48	2	External Switch/Push Button	EBM	External interface mode	Enum: 0b00: Not applicable 0b01: External Switch 0b10: External Push Button 0b11: Auto detect		
50	1	2-state switch	SWT	Switching state	Enum: 0b00: Change of key state sets ON or OFF 0b01: Specific ON/OFF positions. ON when contacts are closed. OFF when contacts are open.		
51	5	Not Used (= 0)					

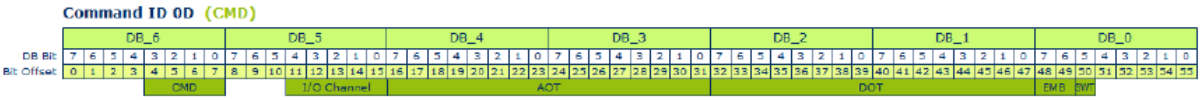
CMD 0xC - Actuator External Interface Settings Query

Command ID 0C (CMD)

	DB_1								DB_0							
DB Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Bit Offset	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					CMD							I/O Channel				

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x0C: ID 0C		
8	3	Not Used (= 0)					
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Input channel (from mains supply)		

CMD 0xD - Actuator External Interface Settings Response



Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD	Command identifier	Enum: 0x0D: ID 0D		
8	3	Not Used (= 0)					
11	5	I/O channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: Not applicable 0x1F: Input channel (from mains supply)		
16	16	Auto OFF Timer	AOT	Timer to automatically set OFF output channel when it is set ON	Enum: 0x0000: Timer deactivated 0x0001...0xFFFE:	0.1...6553.4	s
					0xFFFF: Does not modify saved value		
32	16	Delay OFF Timer	DOT	Delay timer before setting output channel to OFF value received by radio cmd	Enum: 0x0000: Timer deactivated 0x0001...0xFFFE:	0.1...6553.4	s
					0xFFFF: Does not modify saved value		
48	2	External Switch/Push Button	EBM	External interface mode	Enum: 0b00: Not applicable 0b01: External Switch 0b10: External Push Button 0b11: Auto detect		
50	1	2-state switch	SWT	Switching state	Enum: 0b00: Change of key state sets ON or OFF 0b01: Specific ON/OFF positions. ON when contacts are closed. OFF when contacts are open.		
51	5	Not Used (= 0)					

CMD 0xF / ECID 0x00 - Actuator Set Dimming Limits

This message is sent to the actuator. It controls the maximum and minimum brightness of the channel output. If the actuator receives an out of range dimming value or an error command, the following actions should be performed:

- Channel not supported by device -> ignore the message
- Set dimming minimum value is less than 0% -> The minimum value is set to 0%
- Set dimming maximum value greater than 100% -> The maximum value is set to 100%

Command ID **0xF** / Ext. CID **0x00**

Data Byte	DB_4								DB_3								DB_2								DB_1								DB_0							
DB Bit	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
Bit Offset	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Data					CMD				ECID								I/O												MAXV								MINV							

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD		Enum: 0xF: ID F		
8	8	Extended Command ID	ECID		Enum: 0x00: ID 00		
16	5	I/O Channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Reserved		
21	4	Not Used (= 0)					
25	7	Maximum Value	MAXV		Enum: 0x00: Reserved 0x01...0x64: Set maximum value 0x65...0x7F: Reserved		
32	1	Not Used (= 0)					
33	7	Minimum Value	MINV		Enum: 0x00...0x63: Set minimum value 0x64...0x7F: Reserved		

CMD 0xF / ECID 0x01 - Actuator Dimming Limits Query

Command ID **0xF** / Ext. CID **0x01**

Data Byte	DB_2								DB_1								DB_0							
DB Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Bit Offset	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Data					CMD				ECID								I/O							

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD		Enum: 0xF: ID F		
8	8	Extended Command ID	ECID		Enum: 0x01: ID 01		
16	5	I/O Channel	I/O		Enum: 0x00...0x1D: Single channel (to load) 0x1E: All output channels supported by the device 0x1F: Reserved		
21	3	Not Used (= 0)					

CMD 0xF / ECID 0x02 - Actuator Dimming Limits Response

Command ID **0xF** / Ext. CID **0x02**

Data Byte	DB_4								DB_3								DB_2								DB_1								DB_0							
DB Bit	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
Bit Offset	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Data					CMD				ECID								I/O									MAXV								MINV							

Offset	Size	Data	ShortCut	Description	Valid Range	Scale	Unit
0	4	Not Used (= 0)					
4	4	Command ID	CMD		Enum: 0xF: ID F		
8	8	Extended Command ID	ECID		Enum: 0x02: ID 02		
16	5	I/O Channel	I/O		Enum: 0x00...0x1D: Output channel (to load) 0x1E: All output channels supported by the device 0x1F: Reserved		
21	4	Not Used (= 0)					
25	7	Maximum Value	MAXV		Enum: 0x00: Reserved 0x01...0x64: Set maximum value 0x65...0x7F: Reserved		
32	1	Not Used (= 0)					
33	7	Minimum Value	MINV		Enum: 0x00...0x63: Set minimum value 0x64...0x7F: Reserved		