

# Communication protocol

document version 1.7, firmware from version 3.3

## DALI232, DALI232e, DALInet, DALI2net



Converter types DALI – RS232 / Ethernet

ASCII protocol

MULTIMASTER support

Signalization of connection DALI bus

Various length of DALI message support

Communication protocol serves for controlling DALI232, DALI232e and DALInet converter.

## 1 Structure of messages

Communication between converter and external device is done by serial line in ASCII protocol. Converter spontaneously sends messages which are received from DALI bus and answers to the sent questions or confirms sent commands.

Every ASCII messages starts with SOH (0x01) and ends with symbol ETB (0x17). Other characters of the message (including checksum) can be only ASCII symbols which have value „0“ (0x30) - „9“ (0x39) or „A“ (0x41) - „F“ (0x46).

SOH	Data	checksum	ETB
0x01	4 – 26 ASCII characters	2 ASCII characters	0x17

Each byte of sent message is written in two ASCII characters. For example byte 0x1B is send in two characters „1“ and „B“ (0x31 and 0x42).

## 2 Checksum

Checksum is one byte inserted behind the data part. Checksum is also send in two ASCII characters like every other data parts.

The value of checksum is given by negation of sum of data bytes from part modulo (residue after whole number division) 0x100

### Example:

Data part: **0x01, 0x00, 0x10, 0xFF, 0x10**, in ASCII characters: **0x30 0x31, 0x30 0x30, 0x31, 0x30, 0x46 0x46, 0x31 0x30** (it does not play role for checksum computing).

$$\begin{aligned} \text{Checksum} &= \sim(\text{Data part} \% 0x100) = \\ &= \sim((0x01+0x00+0x10+0xFF+0x10) \% 0x100) = \\ &= \sim(0x120 \% 0x100) = \sim 0x20 = 0xFF-0x20 = \mathbf{0xDF} \end{aligned}$$

Checksum 0xDF is also written in two ASCII characters: **0x44, 0x46**.

**Final message sent on the serial line will contain 14 byte and will be in this format:**

SOH	Data part										Checksum		ETB
<b>0x01</b>	<b>0x30</b>	<b>0x31</b>	<b>0x30</b>	<b>0x30</b>	<b>0x31</b>	<b>0x30</b>	<b>0x46</b>	<b>0x46</b>	<b>0x31</b>	<b>0x30</b>	<b>0x44</b>	<b>0x46</b>	<b>0x17</b>

### 3 Communication parameters DALI232/DALI232e

#### 3.1 DALI232/DALI232e

Serial line RS232 has following parameters:

Communication speed	19200	bps
Number of data bits	8	
Parity	even	
Number of stop bits	1	
DTR signal	on	

Hardware flow control is not used. The DTR signal is used to power the unit and must therefore be switched on. If the device using the converter does not enable the DTR signal to be turned on, it is necessary to power the unit from the external source.

#### 3.2 DALInet/DALI2net

protocol	TCP/IP
Default IP address	192.168.1.241
port for bus 1	23
port for bus 2 (just DALI2net)	24

## 4 Types of messages

For communication with DALI converter serves following types of messages. In each message is in detail elaborated data part. For complete message it is necessary to convert the message to ASCII characters, add initial byte SOH, checksum and end byte ETB (which is stated in chapter „message formatting“ and „checksum“. DALInet contains buffer for 16 messages.

*Brief review of messages for communication with DALI232 converter:*

Type	Message description	direction
1	<b>Sending message on DALI bus</b> This command serves for sending any message on DALI bus. On DALI bus can be sent messages with different bit length.	master ↓ converter
11	<b>Sending message on the DALI bus with the sender differentiation</b> This command serves for sending messages to the DALI bus. Message with various bit length can be sent. Sent messages to the DALI bus are being confirmed by message type 13 or 14. This is different from the type 1 message, where the sent messages are confirmed by messages type 3 and 4 as well as messages sent to DALI by another device.	master ↓ converter
3	<b>Receiving DALI message with answer</b> This command is spontaneously sent by DALI232, if the message is received on DALI bus by any device which answered correct answer. This command is sent also in case that answer is unreadable (framing error).	master ↑ converter
13	<b>Receiving DALI message with reply and sender differentiation</b> This command is spontaneously send by the converter if a DALI message is received on which any device replied with valid answer. This command is sent even if the response is framing error. This message type is sent only if the message was sent to DALI by a type 11 message.	master ↑ converter
4	<b>Receiving DALI message without answer</b> This command is spontaneously sent by DALI232, if the message is received on DALI bus on which none of the devices answers. This command is sent also in case that received command is unreadable (framing error).	master ↑ converter
14	<b>Receiving a DALI message with no reply with sender differentiation</b> This command is being spontaneously send by converter is a message is received on a DALI bus but no device replied. This command is also being sent if framing error is received. This type of message is sent only if it has been sent by message type 11. If the message has been sent by message type 1 or if it has been sent	master ↑ converter

	by another device message type 4 is sent instead.	
6	<b>Question on DALI232 configuration</b> This command is used for reading configuration of DALI232 converter. With this command can be for example seen if the proper voltage is connected to DALI bus or serial number of DALI232.	master ↓ converter
7	<b>Return of value configuration DALI232 converter</b> This command returns information about DALI232 configuration on which the master asked.	master ↑ converter
8	<b>Change of DALI232 configuration</b> This command serves for setup of DALI232 configuration.	master ↓ converter
9	<b>Confirmation of change in DALI232 configuration</b> Command is sent by DALI232 as confirmation that it received a message for setup DALI232 converter. In the message the setup message is repeated and the sign if the setup has been correctly proceeded.	master ↑ converter
5	<b>Receiving a special message from the converter</b> This command is spontaneously send by the converter if any of the special events occurred. The external device is informed by serial line for example that DALI power supply has been disconnected.	master ↑ converter
10	<b>Sequence termination (service message)</b> This command is used to send information about the sequence termination. Between those command should not be inserted another message.	master ↓ converter
12	<b>Sending a message on a DALI bus with continuous sending (service message)</b> This command is used to send messages on the DALI bus. Messages with various bit length can be sent. If there are multiple messages in the converter buffer, they are being sent without any time delay. The time delay is necessary in the normal DALI operation and this type of message should be sent only for service purpose.	master ↓ converter
254	<b>Firmware overwrite</b> Command serves to send one line HEX file and is received only if the converter is in bootloader.	master ↓ converter
255	<b>Firmware overwrite confirmation</b> Command sends DALI232 converter as a confirmation that it has received line HEX file.	master ↑ converter

## 4.1 Sending messages on DALI bus

Command serves for sending messages on DALI bus. Messages with different bit length can be sent.

	byte	Name	Description
Data part	1.	<b>Command</b> (1byte)	<b>1</b> (message type)
	2.	<b>Priority</b> (1byte)	Priority with which the message will be send on DALI bus. It can be input 0 for automatic setting the priority with DALI net converter priority in range 1 – 5. 1 is highest priority and 5 is lowest priority.
	3.	<b>Data length</b> (1byte)	Number of bits of sent message. Length can be input in range 1 – 64 bits.
	4.-n.	<b>Data</b> (1-8byte)	Data contains DALI message. Firstly the most important bytes are sent. If the number of bits DALI message are not the multiple of 8 then the highest bits of most important byte are supplemented with zeros. For example for 17b data 1 00100011 01000101 will be on highest position supplemented seven zeros: <b>00000001</b> 00100011 01000101 and an item „Data“ will therefore contains 3 bytes 0x01, 0x23 a 0x45.

### Standard message length

8bit	answer
16 bit	standard DALI messages (control of fluorescent tubes, etc.)

After the successful sending of a DALI message a message of type 3 or 4 is send back. This message confirms, that the original message appears on the DALI bus.

### Example

setting scene 0 all fluorescent tubes (DALI message 16bit – 0xFF, 0x10)

**0x01, 0x00, 0x10, 0xFF, 0x10**

In the example is written „Data part“ of message. For sending this part must be converted to the ASCII characters and filled with SOH, checksum and ETB which is stated in the chapter „Message format“ and „Checksum“.

After receiving this message DALI232 will cue this message for DALI units to send on DALI bus.

## 4.2 Sending message on DALI bus with sender differentiation

This command server for sending message on the DALI bus. Messages with different bit length can be sent. Unlike the message type 1 it is possible to differentiate (when receiving message) which of them were sent by this converter and which by another device.

byte	Name	Description								
Data part	1.	<b>Command</b> (1byte)	<b>11</b> (message type)							
	2.	<b>Priority</b> (1byte)	Priority with which will be the message sent on the DALI bus. It can have values 0 – automatic set of priority by the converter, and values 1 (highest priority) – 5 (lowest priority).							
	3.	<b>Data length</b> (1byte)	Number of bits in sent message. Length can be in the range of 1-64 bits.							
	4.-n.	<b>Data</b> (1-8byte)	Data contain DALI message. Firstly the most significant byte is sent. If the number of bits in DALI message is not multiple of 8 then highest bits of most significant byte is completed with zeros. Example: for 17b data 1 00100011 01000101 will be completed with 7 zeros to highest position: <b>00000001</b> 00100011 01000101 and item „Data“ will therefore contain 3 bytes 0x01, 0x23 a 0x45.							
n+1.	<b>Parameter</b>	<table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px; text-align: center;">S</td> <td style="width: 20px; height: 15px; text-align: center;">2x</td> </tr> </table> <p>2x – sending message twice. Setting of the lowest bite causes the message to be sent twice in a row. S – Sequence. The flag can be set to indicate that the command is being sent in a sequence where messages from other sources should not be inserted in this message.</p>							S	2x
						S	2x			

The standard message lengths are 16 bits for command or query on luminaries and 8 bits for response. After the message is successfully sent to DALI, a 13 or 14 message type is returned that confirms that the converter sent data to the bus. If a DALI message is sent by another device, Type 3 or 4 message is used for this information.

### Example

Setting of scene 0 to all luminaries (DALI message 16bit – 0xFF, 0x10)

**0x0B, 0x00, 0x10, 0xFF, 0x10, 0x00**

In the example, the "Data part" of the message is written. For sending to the serial line, this "Data part" must be converted to ASCII characters and completed with SOH, checksum and ETB, as described in "Message format" and "Checksum". Once this message is received, the converter will assign a DALI message to the queue to send to the DALI bus.

### 4.3 Receiving a DALI message with response

The message spontaneously sends the converter if a message is received on the DALI bus which some device responded to, even if the response is corrupted. If no response is received, this message is not sent but the message "Receiving DALI message without response" is sent.

The message is not sent when message type 11 is used for sending data, and the DALI message was sent to the bus by this converter. After that it is replaced with a type 13 message.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>3</b> (message type)
	2.	<b>Data length</b> (1byte)	Bit count of received message. Received message can have 1-64 bits.
	3.-n.	<b>Data</b> (1-8byte)	Data contain DALI message. Firstly the most significant byte is sent. If the number of bits in DALI message is not multiple of 8 then highest bits of most significant byte is completed with zeros.
	n+1.	<b>Data length of response</b> (1byte)	The number of bits received. The valid standard response contains 8 bits. The zero value indicates that the received response is unreadable. This may mean that several devices responded at one time.
	n+2.	<b>Data of answer</b> (0-1byte)	Data of answer contain 8 bit DALI response if the received response is legible. If an unreadable answer is received, this byte is not sent.

#### Example

On the DALI bus the "Query lamp failure" was received on device with address 12 (DALI message 16bit - 0x19, 0x92) that responded "Yes" (DALI message 8bit – 0xFF). On the serial line the transmitter sends the message:

**0x03, 0x10, 0x19, 0x92, 0x08, 0xFF**

On the DALI a "Query lamp failure" query was received on all devices (DALI message 16bit - 0xFF, 0x92), and an unreadable response was received (multiple devices responded at the same time). On the serial line the transmitter sends the message:

**0x03, 0x10, 0xFF, 0x92, 0x00**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

#### 4.4 Receiving DALI message with a sender differentiation response

The message spontaneously sends the converter if a message is received on the DALI bus which some device responded to, even if the response is corrupt. If no response is received, this message is not sent but the message "Receiving a DALI message without response". The message is sent to RS232 only if the DALI message has been sent to the bus by this converter, and a Type 11 message is used for sending. Otherwise, a type 3 message is sent to RS232.

	byte	Name	Description
Data part	1.	<b>Command</b> (1byte)	<b>13</b> (message type)
	2.	<b>Data length</b> (1byte)	Number of bits in received message. Received message can contain 1-64bits.
	3.-n.	<b>Data</b> (1-8byte)	Data contain DALI message. Firstly the most significant byte is sent. If the number of bits in DALI message is not multiple of 8 then highest bits of most significant byte is completed with zeros.
	n+1.	<b>Data length of response</b> (1byte)	The number of bits received. The valid standard response contains 8 bits. The zero value indicates that the received response is unreadable. This may mean that several devices responded at one time.
	n+2.	<b>Response Data</b> (0-1byte)	Data of answer contain 8 bit DALI response if the received response is legible. If an unreadable answer is received, this byte is not sent.

#### Example

On the DALI „Query lamp failure“ was received with address 12 (DALI message 16bit – 0x19, 0x92), which answered „Yes“ (DALI message 8bit – 0xFF)

To the serial line a converter sends message:

**0x0D, 0x10, 0x19, 0x92, 0x08, 0xFF**

On the DALI a "Query lamp failure" query was received on all devices (DALI MESSAGE 16bit – 0xFF, 0x92), and an unreadable response was received (multiple devices responded at the same time). On the serial line the transmitter sends the message:

**0x0D, 0x10, 0xFF, 0x92, 0x00**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

## 4.5 Receiving DALI message without response

The message spontaneously sends the converter if a message is received on the DALI bus which some device responded to.

The message is not sent in the case that for data sending is used message type 11 and DALI message was sent on the bus by this converter. In this case it is replaced by message type 14.

	byte	Name	Description
Data part	1.	<b>Command</b> (1byte)	<b>4</b> (message type)
	2.	<b>Data length</b> (1byte)	Number of bits in received message. Received valid data can contain 1-64bits. Zero value indicates that received data is unreadable (framing error).
	3.-n.	<b>Data</b> (0-8byte)	Data contain DALI message. Firstly the most significant byte is sent. If the number of bits in DALI message is not multiple of 8 then highest bits of most significant byte is completed with zeros.

### Example

On the DALI „Query lamp failure“ was received with address 12 (DALI message 16bit – 0x19, 0x92), which answered „No“.

To the serial line a converter sends message:

**0x04, 0x10, 0x19, 0x92**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

#### 4.6 Receiving DALI message without response with sender differentiation

The message spontaneously sends the converter if a message is received on the DALI bus to which non of the devices responded to.

The message is sent to RS232 only if the DALI message has been sent to the bus by this converter and a type 11 message is used for sending. Otherwise, a type 4 message is sent to RS232.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>14</b> (message type)
	2.	<b>Data length</b> (1byte)	Number of bits in received message. Received valid data can contain 1-64 bits. The zero value indicates that the received data is unreadable. (framing error).
	3.-n.	<b>Data</b> (0-8byte)	Data contain DALI message. Firstly the most significant byte is sent. If the number of bits in DALI message is not multiple of 8 then highest bits of most significant byte is completed with zeros.

#### Example

On the DALI „Query lamp failure“ was received with address 12 (DALI message 16bit – 0x19, 0x92) to which it did not responded (answer “No”).

To the serial line a converter sends message:

**0x0E, 0x10, 0x19, 0x92**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

## 4.7 Query on the configuration of the converter

The command is used to read the configuration and parameters of the converter. For example, the command tells you whether the correct voltage to the DALI bus is connected or the firmware version of the converter.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>6</b> (message type)
	2.	<b>Item number</b> (1byte)	The item number specifies the parameter to which we want to ask. The parameter list is listed in the "Data area of the converter" table.

### **Example**

Converters firmware version query:

**0x06, 0x02**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

After receiving this message, the transmitter sends the queried data to the serial line using the "Return the converter configuration value" message.

## 4.8 Return the converter configuration value

The message is response to a query on the configuration of the converter. At a time when the converter wants to send this message, it can send a message to the serial line which it received on the DALI bus (these messages are being sent spontaneously). Sending started message is first and message "Return the converter configuration value" is second.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>7</b> (message type)
	2.	<b>Item number</b> (1byte)	The item number determines which parameter is being read. The parameter list is listed in the "Data area of the converter" table.
	3.-4.	<b>Data</b> (2byte)	The value of the read parameter. All parameters are 16-bit.

### **Example**

The external device sent the converter a query on the version of its firmware.

The converter sends a response to the serial line that its firmware is version 1.2.

**0x07, 0x02, 0x01, 0x02**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

## 4.9 Configuration change of the converter

The command is used to configure the converter. For example you can delete messages in the DALI send buffer.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>8</b> (message type)
	2.	<b>Item number</b> (1byte)	Item number which parameter is being set. The parameter list is listed in the "Data area of the converter" table.
	3.-4.	<b>Data</b> (2byte)	The value for setting of chosen parameter. All parameters are 16-bit.

### **Example**

Deleting messages in the DALI send buffer.

**0x08, 0x04, 0x00, 0x00**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

Once the message has been received, the transmitter sets the desired item and sends a "Confirmation of converter configuration change" over the serial line.

## 4.10 Confirmation of converter configuration change

The message sends the converter as confirmation that it has received a message for the converter setting. In this message the setting command is repeated and a flag is added which indicates if the setting change has been successful. At the time the converter wants to send this confirmation can also send a message to the serial line which it received on DALI (these messages are being sent spontaneously). Sending started message is first and message "Confirmation of the sent message to DALI" is second.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>9</b> (message type)
	2.	<b>Item number</b> (1byte)	Item number which parameter is being set. The parameter list with possible values is listed in the "Data area of the converter" table.
	3.-4.	<b>Data</b> (2byte)	Value for setting of chosen parameter. All parameters are 16-bit.
	5	<b>Index</b> (1byte)	Index which confirms setting or reason why data can not be set. 0 = data set 1 = item is read only 2 = set value is out of valid range

### Example

The converter sends a confirmation to the serial line that a command has been received to delete messages in the buffer for sending on the DALI bus.

**0x09, 0x04, 0x00, 0x00, 0x00**

In the event of an attempt to modify the DALI power status information, the converter sends information that the item is read-only.

**0x09, 0x03, 0x00, 0x02, 0x01**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

## 4.11 Receiving special message from converter

The message spontaneously sends the converter if any of the special events occurred. For example: The external device is informed on the serial that the power supply has been disconnected from the DALI bus.

	byte	Name	Description
Data part	1.	<b>Command</b> (1byte)	<b>5</b> (message type)
	2.	<b>Type</b> (1byte)	Meaning of special message converter
			0   Valid power supply connected to the DALI bus
			1   Voltage loss on the DALI bus
			2   Connected mains voltage to the DALI bus
			3   Defective power supply, or common power supply which can not be used to supply DALI bus is connected to DALI
			4   Full message buffer for sending on DALI bus
			5   Checksum error
			6   Invalid command

### Example

The DALI bus was dis

**0x05, 0x01**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

## 4.12 End of sequence (service message)

This command is used to send information about the end of the sequence commands, which should not contain another message.

Flag of message sequence can be set if messages are sent by command 11. The last message of the sequence should not have the flag set. Otherwise there is no obvious end of sequence and it is possible to use this command to end the sequence.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>10</b> (message type)
	2.	<b>Additional information</b> (1byte)	0 = end of sequence

### **Example**

Ending the sequence with a separate message if the last message in the sequence was not zero value sequence flag.

**0x0A, 0x00**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

### 4.13 Sending a message on the DALI bus with continuous send (service message)

This command is used to send a message on the DALI bus. You can send DALI messages with different bit length. If there are multiple messages in the converter buffer, they are sent without a time delay.

**Warning: The time delay is necessary under regular DALI operation and this type of message should be only used for service purposes.**

	byte	Name	Description
Data part	1.	<b>Command</b> (1byte)	<b>12</b> (message type)
	2.	<b>Priority</b> (1byte)	The priority with which the message will be sent to the DALI bus. It can be set 0 for automatic setting of priority by converter or priority in the range of 1-5. 1 = highest priority, 5 = lowest priority.
	3.	<b>Data length</b> (1byte)	Number of bits in sent message. The length can be entered in the range of 1-64bit.
	4.-n.	<b>Data</b> (1-8byte)	Data contain DALI message. Firstly the most significant byte is sent. If the number of bits in DALI message is not multiple of 8 then highest bits of most significant byte is completed with zeros. For example for 17b data 1 00100011 01000101 will be highest position completed with 7 zeros: <b>00000001</b> 00100011 01000101 and „Data“ item will therefore contain 3 bytes 0x01, 0x23 a 0x45.

#### Example

setting of scene 0 to all ballasts (DALI message 16bit – 0xFF, 0x10)

**0x0C, 0x00, 0x10, 0xFF, 0x10**

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

Once this message is received, the converter will assign the DALI message to the queue to send to the DALI bus.

#### 4.14 Firmware overwrite

In normal use is not necessary to use messages to overwrite a firmware. It is done by software DALIconfig which is downloadable for free from the [www.foxtron.eu](http://www.foxtron.eu)

The command is used to send one line of HEX file.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>254</b> (message type)
	2.-n.	<b>Data</b>	Row Intel HEX file without opening „:“ and without checksum (last 2 characters). Bytes in Intel HEX file are coded in ASCII format and therefore are being sent in the message how they are stated in the file (there is no other ASCII conversion, which is described in „Structure of messages“ part).

#### 4.15 Firmware overwrite confirmation

Message is sent by the converter as a confirmation that it received HEX file row.

	<i>byte</i>	<i>Name</i>	<i>Description</i>
<i>Data part</i>	1.	<b>Command</b> (1byte)	<b>255</b> (message type)
	2.	<b>Error code</b> (1byte)	Flag confirming receipt and write, or why data can not be written. 0 = data OK 1 = received more than 16 data bytes 2 = attempt to write out of flash size range 3 = error writing data to flash

## 5 Sending a message on the DALI bus – Example

Message description		Message "Data part" (5 byte)				
1	Adjust the light level (fluent setting is done within the time set by command 12)	0x01	0x00	0x10	All devices → 0xFE group of devices → group number (0–15) * 2 + 0x80 address → device address (0–63) * 2	0 – 254 = 0 – 100%
2	OFF (without dimming)	0x01	0x00	0x10	All devices → 0xFF group of devices → group number (0-15) * 2 + 0x81 address → device address (0-63) * 2 + 1	0x00
3	Lighting up for 200ms period at preset speed	0x01	0x00	0x10	–/–	0x01
4	Light fading for 200ms period at preset speed	0x01	0x00	0x10	–/–	0x02
5	Lighting up by one step (only if lights are on)	0x01	0x00	0x10	–/–	0x03
6	Light fading by one step (fading just to minimum level)	0x01	0x00	0x10	–/–	0x04
7	Set the level to the maximum value	0x01	0x00	0x10	–/–	0x05
8	Set the level to the minimum value	0x01	0x00	0x10	–/–	0x06
9	Lighting up by one step (if lights are off they will turn on)	0x01	0x00	0x10	–/–	0x07
10	Light fading by one step (if lights are at minimal level they will turn off)	0x01	0x00	0x10	–/–	0x08
11	Setting a scene 0 – 15	0x01	0x00	0x10	–/–	0x10 – 0x1F

### Example

In the example, the "Data part" of the message is written. The message received on the serial line will have this "data part" converted into ASCII characters and will be supplemented with SOH, checksum and ETB, as described in the "Message format" and "Checksum" chapter.

- Setting level 50% to the light with address 1  
**0x01 0x00 0x10 0x02 0x7F**
- Turning off lights in the group 2  
**0x01 0x00 0x10 0x85 0x00**
- setting scene 15 for all devices  
**0x01 0x00 0x10 0xFF 0x1F**

## 6 Data area of the converter

<i>Data position</i>	<i>Description</i>	<i>Read</i>	<i>Write</i>
1	Serial number of the converter	0 – 65536	–
2	firmware version format „upper byte. lower byte“ e.g. 258 = „1.2“	0 – 65536	–
3	Information about DALI bus power supply 0 ~ power supply is OK 1 ~ disconnected or short circuited DALI power supply 2 ~ mains voltage on the bus 3 ~ Defective power supply, or common power supply which can not be used to supply DALI bus is connected to DALI	0 – 3	–
4	Number of messages in the message buffer for DALI bus	0 – 16	0
5	HW version format „upper byte. Lower byte“ e.g. 258 = „1.2“	0 – 65536	-
253	The size of flash memory pro firmware Memory size is 128B multiple of returned value data available only in bootloader	0 – 65536	-
254	Bootloader version format „upper byte. Lower byte“ e.g. 258 = „1.2“ data available only in bootloader	0 – 65536	-
255	Switching to bootloader	-	0x424C