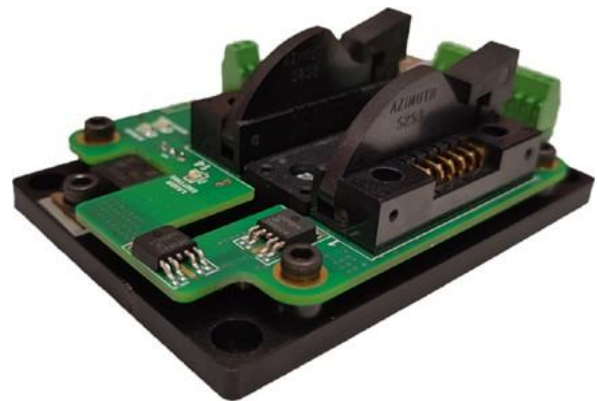


PLD-CW-2000 PLD-CW-2000-ZIF

CONSTANT CURRENT LASER DIODE DRIVER



Key Features

- Special Design for 10/14 pin Butterfly Laser Diode
- Constant Current Mode
- Output Current up to 2000 mA
- Compliance voltage up to 3 V
- Low current ripple
- High current stability
- Control interfaces USB, RS-232, CAN
- LabView compatible
- Python libraries
- Analog and Digital full current amplitude modulation
- Optical power stabilization mode
- On-Board TEC Controller
- 5Vdc Input Power
- Completed by Heatsink
- Compact Size 85 mm × 60 mm × 21 mm

PLD-CW-2000 CAN Protocol Description

Introduction

This document describes how data is received and transmitted via CAN addressed systems. This document is based on firmware version PLD—CW-2000.

CAN frame format

The device uses CAN 2.0A with 11-bit identifiers. The baud rate is 500 kBit/s.

Identifiers

Each CAN message has an identifier (ID). A base ID can be set as a parameter (default is 0x001). User can change the base ID using micro USB connection in cases when the information about base ID is lost for example. The host ID is always 0x22.

Message format

Message length is always 8 bytes, unless declared differently in the description. Message byte and bit numbering is zero based.

Table 1. Message format example

CAN format	ID	DLC	B[0]	B[1]	B[2]	B[3]	B[4]	B[5]	B[6]	B[7]
Formal description	Base ID	Data size	CMD	Sender ID	0	0	Value byte	Value byte	Value byte	Value byte
Example	0x001	0x08	0x11	0x22	0x00	0x00	0x00	0x00	0x00	0x64

Response description

Most of the commands has two types. The SET type and GET type. GET type forms from SET type CMD byte plus 0x80.

For example, if SET type CMD=0x10, then same GET type CMD+0x80 = 0x90.

If device received SET command type CMD it will send ACK response with the same CMD byte with empty value bytes.

If device received GET command type CMD+0x80, it will send ANSWER response with the same CMD+0x80 with corresponding value bytes

Command list

ALL device commands are listed in Table 2.

CMD	CMD description	Read/Write																																								
0x10	<p>ON/OFF laser emitting command</p> <p>Value:</p> <ul style="list-style-type: none"> 0 – turn laser emitting off 1 – turn laser emitting on <p>Example: Command to turn laser emitting on:</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x10</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Response ACK:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x10</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET emitting on/off state:</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x90</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x90</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Value = 1;</p>	0x001	0x08	0x10	0x00	0x00	0x00	0x00	0x00	0x00	0x01	0x022	0x08	0x10	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0x90	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x90	0x01	0x00	0x00	0x00	0x00	0x00	0x01	R/W
0x001	0x08	0x10	0x00	0x00	0x00	0x00	0x00	0x00	0x01																																	
0x022	0x08	0x10	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0x90	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x90	0x01	0x00	0x00	0x00	0x00	0x00	0x01																																	
0x11	<p>Laser diode current command</p> <p>Current value range 0..2000 mA</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET current value 1500mA, Value = 1500 * 10 = 15000 (0x3A98):</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x11</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x3A</td><td>0x98</td> </tr> </table> <p>Response ACK:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x11</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET current value 100mA:</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x91</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x91</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x03</td><td>0xE8</td> </tr> </table> <p>Value = (0x03E8) = 1000 / 10 = 100mA;</p>	0x001	0x08	0x11	0x00	0x00	0x00	0x00	0x00	0x3A	0x98	0x022	0x08	0x11	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0x91	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x91	0x01	0x00	0x00	0x00	0x00	0x03	0xE8	R/W
0x001	0x08	0x11	0x00	0x00	0x00	0x00	0x00	0x3A	0x98																																	
0x022	0x08	0x11	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0x91	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x91	0x01	0x00	0x00	0x00	0x00	0x03	0xE8																																	
0x12	<p>Laser diode temperature command</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET temperature value 25.2°C, Value = 25.2 * 10 = 252 (0xFC):</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x12</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0xFC</td> </tr> </table> <p>Response ANSWER:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x12</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET temperature value:</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x92</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x92</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0xFC</td> </tr> </table> <p>Value = (0x00FC) = 252 / 100 = 25.2°C;</p>	0x001	0x08	0x12	0x00	0x00	0x00	0x00	0x00	0x00	0xFC	0x022	0x08	0x12	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0x92	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x92	0x01	0x00	0x00	0x00	0x00	0x00	0xFC	R/W
0x001	0x08	0x12	0x00	0x00	0x00	0x00	0x00	0x00	0xFC																																	
0x022	0x08	0x12	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0x92	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x92	0x01	0x00	0x00	0x00	0x00	0x00	0xFC																																	
0x14	<p>Output power command</p> <p>Value: integer value of output power multiplied with 10</p> <p>Example: Command to GET output power value 5mW:</p> <table border="1"> <tr> <td>0x001</td><td>0x08</td><td>0x94</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1"> <tr> <td>0x022</td><td>0x08</td><td>0x94</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x32</td> </tr> </table> <p>Value = (0x32) = 50 / 10 = 5mW;</p>	0x001	0x08	0x94	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x94	0x01	0x00	0x00	0x00	0x00	0x00	0x32	R																				
0x001	0x08	0x94	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x94	0x01	0x00	0x00	0x00	0x00	0x00	0x32																																	

CMD	CMD description	Read/Write																																								
0x15	<p>Thermistor beta command</p> <p>Value: integer value of thermistor beta</p> <p>Example: Command to SET beta value of thermistor 3984 (0x0F90):</p> <table border="1" data-bbox="304 409 1139 434"> <tr> <td>0x001</td><td>0x08</td><td>0x15</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x0F</td><td>0x90</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 459 1139 483"> <tr> <td>0x022</td><td>0x08</td><td>0x15</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET beta value of thermistor:</p> <table border="1" data-bbox="304 562 1139 586"> <tr> <td>0x001</td><td>0x08</td><td>0x95</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 611 1193 636"> <tr> <td>0x022</td><td>0x08</td><td>0x95</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x0F</td><td>0x90</td> </tr> </table> <p>Value = (0x0F90) = 3984;</p>	0x001	0x08	0x15	0x00	0x00	0x00	0x00	0x00	0x0F	0x90	0x022	0x08	0x15	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0x95	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x95	0x01	0x00	0x00	0x00	0x00	0x0F	0x90	R/W
0x001	0x08	0x15	0x00	0x00	0x00	0x00	0x00	0x0F	0x90																																	
0x022	0x08	0x15	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0x95	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x95	0x01	0x00	0x00	0x00	0x00	0x0F	0x90																																	
0x16	<p>Thermistor resistance command</p> <p>Value: integer value of thermistor resistance at 25°C</p> <p>Example: Command to SET thermistor resistance value 10000Ohm (0x2710):</p> <table border="1" data-bbox="304 824 1139 848"> <tr> <td>0x001</td><td>0x08</td><td>0x16</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x27</td><td>0x10</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 873 1139 898"> <tr> <td>0x022</td><td>0x08</td><td>0x16</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET thermistor resistance value:</p> <table border="1" data-bbox="304 976 1139 1001"> <tr> <td>0x001</td><td>0x08</td><td>0x96</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1025 1193 1050"> <tr> <td>0x022</td><td>0x08</td><td>0x96</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x27</td><td>0x10</td> </tr> </table> <p>Value = (0x2710) = 10000Ohm;</p>	0x001	0x08	0x16	0x00	0x00	0x00	0x00	0x00	0x27	0x10	0x022	0x08	0x16	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0x96	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x96	0x01	0x00	0x00	0x00	0x00	0x27	0x10	R/W
0x001	0x08	0x16	0x00	0x00	0x00	0x00	0x00	0x27	0x10																																	
0x022	0x08	0x16	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0x96	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x96	0x01	0x00	0x00	0x00	0x00	0x27	0x10																																	
0x17	<p>Monitor responsivity command</p> <p>Value: integer value of monitor responsivity multiplied with 100</p> <p>Example: Command to SET monitor responsivity value 47,5uA/mW, Value = 47,5 * 100 = 4750 (0x128E):</p> <table border="1" data-bbox="304 1267 1139 1292"> <tr> <td>0x001</td><td>0x08</td><td>0x17</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x12</td><td>0x8E</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1317 1139 1341"> <tr> <td>0x022</td><td>0x08</td><td>0x17</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET monitor responsivity value 47,5uA/mW:</p> <table border="1" data-bbox="304 1420 1139 1444"> <tr> <td>0x001</td><td>0x08</td><td>0x97</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1469 1193 1494"> <tr> <td>0x022</td><td>0x08</td><td>0x97</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x12</td><td>0x8E</td> </tr> </table> <p>Value = (0x128E) = 4750 /100 = 47,5uA/mW;</p>	0x001	0x08	0x17	0x00	0x00	0x00	0x00	0x00	0x12	0x8E	0x022	0x08	0x17	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0x97	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x97	0x01	0x00	0x00	0x00	0x00	0x12	0x8E	R/W
0x001	0x08	0x17	0x00	0x00	0x00	0x00	0x00	0x12	0x8E																																	
0x022	0x08	0x17	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0x97	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x97	0x01	0x00	0x00	0x00	0x00	0x12	0x8E																																	
0x21	<p>TEC on/off command</p> <p>Value:</p> <ul style="list-style-type: none"> • 0 – turn TEC off • 1 – turn TEC on <p>Example: Command to SET TEC on:</p> <table border="1" data-bbox="304 1738 1139 1762"> <tr> <td>0x001</td><td>0x08</td><td>0x21</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1787 1139 1812"> <tr> <td>0x001</td><td>0x08</td><td>0x21</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET TEC on/off state:</p> <table border="1" data-bbox="304 1890 1139 1915"> <tr> <td>0x001</td><td>0x08</td><td>0xA1</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1939 1139 1964"> <tr> <td>0x022</td><td>0x08</td><td>0xA1</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Value = 1;</p>	0x001	0x08	0x21	0x00	0x00	0x00	0x00	0x00	0x00	0x01	0x001	0x08	0x21	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xA1	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xA1	0x01	0x00	0x00	0x00	0x00	0x00	0x01	R/W
0x001	0x08	0x21	0x00	0x00	0x00	0x00	0x00	0x00	0x01																																	
0x001	0x08	0x21	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xA1	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xA1	0x01	0x00	0x00	0x00	0x00	0x00	0x01																																	

CMD	CMD description	Read/Write																																								
0x24	<p>Laser emitting mode</p> <p>Value: integer value where:</p> <ul style="list-style-type: none"> • 0x00: Internal CW mode • 0x01: External ANALOG modulation mode mode • 0x02: External TTL <p>Example: Command to SET external ANALOG modulation mode:</p> <table border="1" data-bbox="304 506 1139 533"> <tr> <td>0x001</td><td>0x08</td><td>0x24</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 555 1139 582"> <tr> <td>0x022</td><td>0x08</td><td>0x24</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET internal CW mode value:</p> <table border="1" data-bbox="304 656 1139 683"> <tr> <td>0x001</td><td>0x08</td><td>0xA4</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 705 1139 732"> <tr> <td>0x022</td><td>0x08</td><td>0xA4</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Value = (0x00) = Internal CW mode;</p>	0x001	0x08	0x24	0x00	0x00	0x00	0x00	0x00	0x00	0x01	0x022	0x08	0x24	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xA4	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xA4	0x01	0x00	0x00	0x00	0x00	0x00	0x00	R/W
0x001	0x08	0x24	0x00	0x00	0x00	0x00	0x00	0x00	0x01																																	
0x022	0x08	0x24	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xA4	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xA4	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x25	<p>Laser diode maximum current command</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET maximum current value 1000mA, Value = 1000 * 10 = 10000 (0x2710):</p> <table border="1" data-bbox="304 918 1139 945"> <tr> <td>0x001</td><td>0x08</td><td>0x25</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x27</td><td>0x10</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 967 1139 994"> <tr> <td>0x022</td><td>0x08</td><td>0x25</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET maximum current value 1000mA:</p> <table border="1" data-bbox="304 1068 1139 1095"> <tr> <td>0x001</td><td>0x08</td><td>0xA5</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1120 1139 1146"> <tr> <td>0x022</td><td>0x08</td><td>0xA5</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x27</td><td>0x10</td> </tr> </table> <p>Value = (0x2710) = 10000 / 10 = 1000mA;</p>	0x001	0x08	0x25	0x00	0x00	0x00	0x00	0x00	0x27	0x10	0x022	0x08	0x25	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xA5	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xA5	0x01	0x00	0x00	0x00	0x00	0x27	0x10	R/W
0x001	0x08	0x25	0x00	0x00	0x00	0x00	0x00	0x27	0x10																																	
0x022	0x08	0x25	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xA5	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xA5	0x01	0x00	0x00	0x00	0x00	0x27	0x10																																	
0x26	<p>Laser diode minimum current command</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET minimum current value 10mA, Value = 10 * 10 = 100 (0x0064)</p> <table border="1" data-bbox="304 1332 1139 1359"> <tr> <td>0x001</td><td>0x08</td><td>0x26</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x64</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1382 1139 1408"> <tr> <td>0x022</td><td>0x08</td><td>0x26</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET minimum current value 10mA:</p> <table border="1" data-bbox="304 1482 1139 1509"> <tr> <td>0x001</td><td>0x08</td><td>0xA6</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1534 1139 1561"> <tr> <td>0x022</td><td>0x08</td><td>0xA6</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x64</td> </tr> </table> <p>Value = (0x0064) = 100/10 = 10mA;</p>	0x001	0x08	0x26	0x00	0x00	0x00	0x00	0x00	0x00	0x64	0x022	0x08	0x26	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xA6	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xA6	0x01	0x00	0x00	0x00	0x00	0x00	0x64	R/W
0x001	0x08	0x26	0x00	0x00	0x00	0x00	0x00	0x00	0x64																																	
0x022	0x08	0x26	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xA6	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xA6	0x01	0x00	0x00	0x00	0x00	0x00	0x64																																	
0x33	<p>Laser diode maximum TEC current command</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET maximum TEC current value 4A, Value = 4 * 10 = 40 (0x28):</p> <table border="1" data-bbox="304 1742 1139 1769"> <tr> <td>0x001</td><td>0x08</td><td>0x33</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x28</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1792 1139 1818"> <tr> <td>0x022</td><td>0x08</td><td>0x33</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET maximum TEC current value 4A:</p> <table border="1" data-bbox="304 1892 1139 1919"> <tr> <td>0x001</td><td>0x08</td><td>0xB3</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1944 1139 1971"> <tr> <td>0x022</td><td>0x08</td><td>0xB3</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x28</td> </tr> </table> <p>Value = (0x28) = 40 / 10 = 4A;</p>	0x001	0x08	0x33	0x00	0x00	0x00	0x00	0x00	0x00	0x28	0x022	0x08	0x33	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xB3	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xB3	0x01	0x00	0x00	0x00	0x00	0x00	0x28	R/W
0x001	0x08	0x33	0x00	0x00	0x00	0x00	0x00	0x00	0x28																																	
0x022	0x08	0x33	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xB3	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xB3	0x01	0x00	0x00	0x00	0x00	0x00	0x28																																	

CMD	CMD description	Read/Write																																								
0x36	<p>Minimum temperature command</p> <p>Value: integer value multiplied with 10</p> <p>Example: Command to SET minimum temperature 20,0°C, Value = 20,0 * 10 = 200 (0xC8):</p> <table border="1" data-bbox="304 434 1142 461"> <tr> <td>0x001</td><td>0x08</td><td>0x36</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0xC8</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 483 1142 510"> <tr> <td>0x022</td><td>0x08</td><td>0x36</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET minimum temperature value:</p> <table border="1" data-bbox="304 584 1142 611"> <tr> <td>0x001</td><td>0x08</td><td>0xB6</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 633 1198 660"> <tr> <td>0x022</td><td>0x08</td><td>0xB6</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0xC8</td> </tr> </table> <p>Value = (0xC8) = 200 / 10 = 20°C;</p>	0x001	0x08	0x36	0x00	0x00	0x00	0x00	0x00	0x00	0xC8	0x022	0x08	0x36	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xB6	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xB6	0x01	0x00	0x00	0x00	0x00	0x00	0xC8	R/W
0x001	0x08	0x36	0x00	0x00	0x00	0x00	0x00	0x00	0xC8																																	
0x022	0x08	0x36	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xB6	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xB6	0x01	0x00	0x00	0x00	0x00	0x00	0xC8																																	
0x37	<p>Maximum temperature command</p> <p>Value: integer value multiplied with 10</p> <p>Example: Command to SET maximum temperature 50,5°C, Value = 50,5 * 10 = 505 (0x01F9):</p> <table border="1" data-bbox="304 875 1142 902"> <tr> <td>0x001</td><td>0x08</td><td>0x37</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td><td>0xF9</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 925 1142 952"> <tr> <td>0x022</td><td>0x08</td><td>0x37</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET maximum temperature value:</p> <table border="1" data-bbox="304 1025 1142 1052"> <tr> <td>0x001</td><td>0x08</td><td>0xB7</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1075 1198 1102"> <tr> <td>0x022</td><td>0x08</td><td>0xB7</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td><td>0xF9</td> </tr> </table> <p>Value = (0x01F9) = 505 / 10 = 50,5°C;</p>	0x001	0x08	0x37	0x00	0x00	0x00	0x00	0x00	0x01	0xF9	0x022	0x08	0x37	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xB7	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xB7	0x01	0x00	0x00	0x00	0x00	0x01	0xF9	R/W
0x001	0x08	0x37	0x00	0x00	0x00	0x00	0x00	0x01	0xF9																																	
0x022	0x08	0x37	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xB7	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xB7	0x01	0x00	0x00	0x00	0x00	0x01	0xF9																																	
0x42	<p>Laser diode maximum power command</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET maximum power value 1000mW, Value = 1000 * 10 = 10000 (0x2710):</p> <table border="1" data-bbox="304 1312 1142 1339"> <tr> <td>0x001</td><td>0x08</td><td>0x42</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x27</td><td>0x10</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1361 1142 1388"> <tr> <td>0x022</td><td>0x08</td><td>0x42</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET maximum power value 1000mW:</p> <table border="1" data-bbox="304 1462 1142 1489"> <tr> <td>0x001</td><td>0x08</td><td>0xC2</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1512 1142 1538"> <tr> <td>0x022</td><td>0x08</td><td>0xC2</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x27</td><td>0x10</td> </tr> </table> <p>Value = (0x2710) = 10000 / 10 = 1000mW;</p>	0x001	0x08	0x42	0x00	0x00	0x00	0x00	0x00	0x27	0x10	0x022	0x08	0x42	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xC2	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xC2	0x01	0x00	0x00	0x00	0x00	0x27	0x10	R/W
0x001	0x08	0x42	0x00	0x00	0x00	0x00	0x00	0x27	0x10																																	
0x022	0x08	0x42	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xC2	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xC2	0x01	0x00	0x00	0x00	0x00	0x27	0x10																																	
0x43	<p>Laser diode minimum power command</p> <p>Value: integer value bytes multiplied with 10</p> <p>Example: Command to SET minimum power value 10mW, Value = 10 * 10 = 100 (0x64):</p> <table border="1" data-bbox="304 1727 1142 1753"> <tr> <td>0x001</td><td>0x08</td><td>0x43</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x64</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1776 1142 1803"> <tr> <td>0x022</td><td>0x08</td><td>0x43</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET minimum power value 10mW:</p> <table border="1" data-bbox="304 1877 1142 1904"> <tr> <td>0x001</td><td>0x08</td><td>0xC3</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1926 1142 1953"> <tr> <td>0x022</td><td>0x08</td><td>0xC3</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x64</td> </tr> </table> <p>Value = (0x64) = 100 / 10 = 10mW;</p>	0x001	0x08	0x43	0x00	0x00	0x00	0x00	0x00	0x00	0x64	0x022	0x08	0x43	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xC3	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xC3	0x01	0x00	0x00	0x00	0x00	0x00	0x64	R/W
0x001	0x08	0x43	0x00	0x00	0x00	0x00	0x00	0x00	0x64																																	
0x022	0x08	0x43	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xC3	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xC3	0x01	0x00	0x00	0x00	0x00	0x00	0x64																																	

CMD	CMD description	Read/Write																																								
0x44	<p>Coefficient P command</p> <p>Value: integer value multiplied with 10000</p> <p>Example: Command to SET coefficient P, Value = 10000,0000 * 10000 = 100000000 (0x05F5E100):</p> <table border="1" data-bbox="304 443 1145 472"> <tr> <td>0x001</td><td>0x08</td><td>0x44</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x05</td><td>0xF5</td><td>0xE1</td><td>0x00</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 501 1145 530"> <tr> <td>0x022</td><td>0x08</td><td>0x44</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET coefficient P value:</p> <table border="1" data-bbox="304 613 1145 642"> <tr> <td>0x001</td><td>0x08</td><td>0xC4</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 672 1193 701"> <tr> <td>0x022</td><td>0x08</td><td>0xC4</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x05</td><td>0xF5</td><td>0xE1</td><td>0x00</td> </tr> </table> <p>Value = (0x05F5E100) = 100000000 / 10000 = 10000;</p>	0x001	0x08	0x44	0x00	0x00	0x00	0x05	0xF5	0xE1	0x00	0x022	0x08	0x44	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xC4	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xC4	0x01	0x00	0x00	0x05	0xF5	0xE1	0x00	R/W
0x001	0x08	0x44	0x00	0x00	0x00	0x05	0xF5	0xE1	0x00																																	
0x022	0x08	0x44	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xC4	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xC4	0x01	0x00	0x00	0x05	0xF5	0xE1	0x00																																	
0x45	<p>Coefficient I command</p> <p>Value: integer value multiplied with 10000</p> <p>Example: Command to SET coefficient I, Value = 1000,0000*10000 = 10000000 (0x989680):</p> <table border="1" data-bbox="304 913 1139 943"> <tr> <td>0x001</td><td>0x08</td><td>0x45</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x98</td><td>0x96</td><td>0x80</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 972 1139 1001"> <tr> <td>0x022</td><td>0x08</td><td>0x45</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET coefficient I value:</p> <table border="1" data-bbox="304 1061 1139 1090"> <tr> <td>0x001</td><td>0x08</td><td>0xC5</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1120 1193 1149"> <tr> <td>0x022</td><td>0x08</td><td>0xC5</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x98</td><td>0x96</td><td>0x80</td> </tr> </table> <p>Value = (0x00989680) = 10000000 / 10000 = 1000;</p>	0x001	0x08	0x45	0x00	0x00	0x00	0x00	0x98	0x96	0x80	0x022	0x08	0x45	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xC5	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xC5	0x01	0x00	0x00	0x00	0x98	0x96	0x80	R/W
0x001	0x08	0x45	0x00	0x00	0x00	0x00	0x98	0x96	0x80																																	
0x022	0x08	0x45	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xC5	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xC5	0x01	0x00	0x00	0x00	0x98	0x96	0x80																																	
0x46	<p>Coefficient D command</p> <p>Value: integer value multiplied with 10000</p> <p>Example: Command to SET coefficient D, Value = 2000,0000*10000 = 20000000 (0x01312D00):</p> <table border="1" data-bbox="304 1350 1139 1379"> <tr> <td>0x001</td><td>0x08</td><td>0x46</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td><td>0x31</td><td>0x2D</td><td>0x00</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 1408 1139 1438"> <tr> <td>0x022</td><td>0x08</td><td>0x46</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET coefficient D value:</p> <table border="1" data-bbox="304 1507 1139 1536"> <tr> <td>0x001</td><td>0x08</td><td>0xC6</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1565 1193 1594"> <tr> <td>0x022</td><td>0x08</td><td>0xC6</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x01</td><td>0x31</td><td>0x2D</td><td>0x00</td> </tr> </table> <p>Value = (0x0131 2D00) = 20000000 / 10000 = 2000;</p>	0x001	0x08	0x46	0x00	0x00	0x00	0x01	0x31	0x2D	0x00	0x022	0x08	0x46	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xC6	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xC6	0x01	0x00	0x00	0x01	0x31	0x2D	0x00	R/W
0x001	0x08	0x46	0x00	0x00	0x00	0x01	0x31	0x2D	0x00																																	
0x022	0x08	0x46	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xC6	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xC6	0x01	0x00	0x00	0x01	0x31	0x2D	0x00																																	
0x50	<p>Device type command</p> <p>Value: PLD-CW-2000 device type = 0x0E</p> <p>Example: Command to GET device type:</p> <table border="1" data-bbox="304 1771 1139 1800"> <tr> <td>0x001</td><td>0x08</td><td>0xD0</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 1830 1139 1859"> <tr> <td>0x022</td><td>0x08</td><td>0xD0</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x0E</td> </tr> </table> <p>Value = (0x0E) = PLD-CW-2000;</p>	0x001	0x08	0xD0	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xD0	0x01	0x00	0x00	0x00	0x00	0x00	0x0E	R																				
0x001	0x08	0xD0	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xD0	0x01	0x00	0x00	0x00	0x00	0x00	0x0E																																	

CMD	CMD description	Read/Write																																								
0x51	<p>CAN identifier command</p> <p>Example: Command to SET base ID using BROADCAST ID, Value = 1:</p> <table border="1" data-bbox="304 376 1139 405"> <tr> <td>0x001</td><td>0x08</td><td>0x51</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 427 1139 456"> <tr> <td>0x022</td><td>0x08</td><td>0x51</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Command to GET base ID using BROADCAST ID:</p> <table border="1" data-bbox="304 528 1139 557"> <tr> <td>0x001</td><td>0x08</td><td>0xD1</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ANSWER:</p> <table border="1" data-bbox="304 580 1139 609"> <tr> <td>0x022</td><td>0x08</td><td>0xD1</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x01</td> </tr> </table> <p>Base ID = 0x01;</p>	0x001	0x08	0x51	0x00	0x00	0x00	0x00	0x00	0x00	0x01	0x022	0x08	0x51	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x001	0x08	0xD1	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0xD1	0x01	0x00	0x00	0x00	0x00	0x00	0x01	R/W
0x001	0x08	0x51	0x00	0x00	0x00	0x00	0x00	0x00	0x01																																	
0x022	0x08	0x51	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x001	0x08	0xD1	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0xD1	0x01	0x00	0x00	0x00	0x00	0x00	0x01																																	
0x52	<p>Save parameters command</p> <p>Example: Command to save parameters in FLASH memory:</p> <table border="1" data-bbox="304 736 1139 766"> <tr> <td>0x001</td><td>0x08</td><td>0x52</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table> <p>Response ACK:</p> <table border="1" data-bbox="304 788 1139 817"> <tr> <td>0x022</td><td>0x08</td><td>0x52</td><td>0x01</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td><td>0x00</td> </tr> </table>	0x001	0x08	0x52	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x022	0x08	0x52	0x01	0x00	0x00	0x00	0x00	0x00	0x00	W																				
0x001	0x08	0x52	0x00	0x00	0x00	0x00	0x00	0x00	0x00																																	
0x022	0x08	0x52	0x01	0x00	0x00	0x00	0x00	0x00	0x00																																	