# CIS-N-MPPT-DALI
# Communication Protocol

## Description of RS485 communication protocol and parameters

Version 2.1 2025-10-03

## Version History

| | | | |
|---|---|---|---|
| 2025-03-20 | v1.0 | Initial Version | SK |
| 2025-07-09 | v1.1 | System settings bytes are swapped. MSB of the system settings is stored first in EEPROM | SK |
| 2025-08-14 | v1.2 | Custom battery settings are added to the EEPROM. H and M commands are updated | SK |
| 2025-09-29 | v2.0 | Label reserved addresses as such, some cleanup | DG |
| 2025-10-03 | V2.1 | Updated for public release | DG |

**Phocos GmbH**

Phocos GmbH, Magirus-Deutz Str 12, 89077 Ulm, Germany
Tel +49(731) 938 06 88-0 • Fax +49(731) 938 06 88-50
info@phocos.com

www.phocos.com

# Contents


**1.0 RS485 interface ..... 4**

**2.0 Data protocol ..... 4**

2.1 One – Byte Commands ..... 4

2.1.1 Space Command ..... 4

2.1.2 Carriage Return (CR) ..... 8

2.1.3 Exclamation Mark ('!') ..... 8

2.2 Multi Byte Commands ..... 8

2.2.1 Example ..... 8

2.2.2 &G - Command ..... 9

2.2.3 H … M – Commands ..... 9

2.3 SETTINGS AND DATALOG EEPROM MAP ..... 13

2.4 Legend & Abbreviations ..... 28

2.5 Recommendation ..... 28

# 1.0 RS485 interface

Communication via RS485 takes place with the following settings (19200, 8, n ,1):

Data rate: 19200 Baud

Data length: 8 Bit

Parity: no

Stop Bit: 1

Each character is echoed by the charge controller.

Each Byte is an ASCII character.

Wrong characters are echoed followed by a "?"

Using "&" as first character of multi byte commands, sending of the next Byte is only allowed after the echo of the previous Byte was received.

Using "%" as first character instead, the whole command (max 8 bytes) can be sent at once and will only be echoed by "%" after the complete command.

# 2.0 Data protocol

## 2.1 One – Byte Commands

### 2.1.1 Space Command

When the ASCII character "space" (SP, 0x20) is sent to the charge controller, it will answer with a string of ASCII characters, starting with echoing the sent space character:

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEX: | 20 | 30 | 30 | 30 | 30 | 35 | B3 | ... | 3B | 30 | 31 | 33 | 30 | 39 | 35 | 3B |
| ASCII: [SP] | 0 | 0 | 0 | 0 | 5 | ; | ... | ; | 0 | 1 | 3 | 0 | 9 | 5 | ; | |

Example: (leftmost character before the first "0" is a space)

00005;00002;00488;01412;00000;009523;013095;00027;00003;002;000;00009;00000;032;13985;14000;100;+18;+17;+25;1;1;08194;
00000;00000;00599;60994;13200;00012;0;1;00004;00004;0012;0016;0000;0015;0000;0035;1;1;1;00005;00005;

Their meaning is:

| Element number | Data name | length (characters) | Unit | Example | Meaning | Remarks |
|---|---|---|---|---|---|---|
| 1 | Charge current | 5 | 10 mA | 00004 | 40 mA | Battery Charge Current in mA: 40mA (Battery is full) |
| 2 | Load current | 5 | 10 mA | 00002 | 20 mA | Load Current in mA: 20mA (no Load current, LED Lamp is OFF (daytime) |
| 3 | Daylength | 5 | Minutes | 00600 | 600 min | Current length of the day since dawn |
| 4 | Reserved | 5 | - | | Internal Use Only | |
| 5 | Reserved | 5 | - | | Internal Use Only | |
| 6 | PV Voltage | 6 | mV | 009438 | 9438 mV | (= 9.438 V) Current value of the PV voltage |
| 7 | PV Voltage Target | 6 | mV | 013120 | 13120 mV | (= 13.120 V) Aimed voltage for MPP or voltage regulation |
| 8 | Reserved | 5 | - | | Internal Use Only | |
| 9 | Reserved | 5 | - | | Internal Use Only | |
| 10 | Reserved | 3 | - | | Internal Use Only | |
| 11 | Reserved | 3 | - | | Internal Use Only | |
| 12 | Firmware Version | 3 | - | 00009 | v9 | Version 9 |
| 13 | Reserved | 5 | - | | Internal Use Only | |
| 14 | Reserved | 3 | - | | Internal Use Only | |
| 15 | Battery Voltage | 5 | mV | 13982 | 13982 mV | (= 13.982 V) Current battery voltage |
| 16 | Battery Voltage Threshold | 5 | mV | 14000 | 14000 mV | (= 14.000 V) Battery voltage regulation goal |
| 17 | Battery SOC | 3 | % | 100 | 100% | fully charged battery |
| 18 | Internal Temperature | 3 | °C | +16 | +16°C | controller PCBA has +16°C |
| 19 | External Temperature | 3 | °C | +15 | +15°C | ambient temperature is +15°C |
| 20 | LED Temperature | 3 | °C | +25 | +25°C | LED driver temperature is +20°C |
| 21 | MPP State | 1 | - | 1 | Current State of the MPP charge controller<br>0: Inactive (night)<br>1: MPP-tracking is active (day)<br>2: No MPP-tracking, but voltage regulation<br>3: MPP-Stop (due to error e.g. Overtemperature, …)<br>n: other values possible | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22 | HVD active | 1 | - | 0 | Current State of battery voltage regulation<br>0: Voltage regulation inactive (MPP-tracking is active)<br>1: Voltage regulation active (battery voltage regulation)<br>3: Too high battery voltage | |
| 23 | Reserved | 5 | - | | Internal Use Only | |
| 24 | Reserved | 5 | - | | Internal Use Only | |
| 25 | Nightlength | 5 | Minutes | 00000 | 0 min | current duration between dusk and dawn |
| 26 | Average Nightlength | 5 | Minutes | 00602 | 602 min | average (several days) duration between dusk and dawn (~10h) |
| 27 | Runtime counter | 5 | Minutes | 59671 | 59671 min | Total Controller runtime in minutes |
| 28 | LED Voltage | 5 | mV | 25000 | 25000mV | Actual LED Voltage |
| 29 | LED Current | 5 | 10 mA | 00030 | 300 mA | Actual LED Current |
| 30 | LED Status | 1 | - | 0 | 0: LED is normal<br>1: LED is short<br>2: LED is open | |
| 31 | DALI active flag | 1 | - | 0 | 0: DALI is inactive<br>1: DALI is active | |
| 32 | Controller Operation Days | 5 | Days | 00005 | Days recorded in the datalogger. Resets if datalogger cleared. | |
| 33 | Battery Operating Time | 5 | Days | 00004 | Days since the Battery Operating Time was last reset. | |
| 34 | Battery Total Energy Input Daily | 4 | Wh | 0023 | Yesterday Total calculated charge energy | |
| 35 | Battery Total Energy Output daily | 4 | Wh | 0015 | Yesterday Total calculated load energy | |
| 36 | Battery Total Retained Energy daily | 4 | Wh | 0008 | Yesterday Total energy remaining in the battery at Dawn | |
| 37 | Battery Charge Power | 3 | W | 006 | Calculated total battery charge power | |
| 38 | Battery Load Power | 3 | W | 003 | Calculated battery load power | |
| 39 | LED Output Power | 3 | W | 025 | Calculated LED output power | |
| 40 | Fault/Warning Status | 3 | - | 016 | 0: No fault/warning<br>1: Battery Overvoltage<br>2: PV overvoltage | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 4: Controller internal temp high warning<br>8: Charge current over<br>16: Battery LVD<br>32: Battery Over discharge current<br>64: Battery Over temp warning<br>128: Battery Under temp warning<br>For multiple faults/warnings, the received data should be decoded based lon the bit masking. | |
| 41 | PV Detection | 1 | - | 1 | 0: PV voltage below the threshold (4 V)<br>1: PV voltage above the threshold (4.5 V) | |
| 42 | Battery Detection | 1 | - | 0 | 0: If battery is not connected<br>1: If battery is connected | |
| 43 | LED Temperature Fault Status | 1 | - | 0 | 0: No error<br>1: LED temperature sensor open/short | |
| 44 | Phase1 Current | 5 | 10 mA | 00005 | 50 mA: Buck converter phase1 current | |
| 45 | Phase2 Current | 5 | 10 mA | 00005 | 50 mA: Buck converter phase2 current | |
| 46 | Separator to next string | 2 | - | \r\n | return & newline | after this, a new string of data starts |

### 2.1.2 Carriage Return (CR)

When the ASCII character "CR" (0x0D) is sent to the charge controller, it will answer with a 0 (zero) or a one (1), starting with echoing the sent CR-character.

0 = Initializing not finished

1 = Initializing finished

### 2.1.3 Exclamation Mark ('!')

When the ASCII character "!" (0x21) is sent to the charge controller, it will send an EEPROM-Dump (readout), starting with echoing the sent "!" character, following a string of data characters (EEPROM content) starting from Address 0x000 (start of EEPROM) to 0x800 (end of EEPROM), separated by ';' characters.

This command is normally used to read out the Datalogger Data, which starts at address 0x080.

## 2.2 Multi Byte Commands

### 2.2.1 Example

Set Nightlevel to 8000 mV (0x1F40)

1. Enable EEPROM programming for 5 sec
   ASCII: & G A A 0 5 0 0
   HEX: 26 47 41 41 30 35 30 30

2. Send Nightlevel: 0x1F40
   ASCII: & M 2 1 1 F 4 0
   HEX: 26 4D 32 31 31 46 34 30

### 2.2.2 &G - Command

| | Command a)<br>1 ASCII | Command b)<br>2 ASCII | Value 1<br>2 ASCII | Value 2<br>2 ASCII | Default | |
|---|---|---|---|---|---|---|
| & | G | AA | Time | xx | | Programming of EEPROM enabled for x seconds is necessary for all H-Commands (see below) |

### 2.2.3 H … M – Commands

| | Command a)<br>1 ASCII | Command b)<br>2 ASCII | Value 1<br>2 ASCII | Value 2<br>2 ASCII | Default | H-Commands: Programming of 1 Byte to EEPROM:<br>Always send the G-Command to enable EEPROM programming, first! |
|---|---|---|---|---|---|---|
| & | H | 00 | Data | xx | 00 | Night Mode<br>0 = No night light normal mode always on<br>1 = Dusk to Dawn<br>2 = Morning and evening minutes based on Dusk and Dawn<br>3 = Morning and evening minutes based on middle of the night |
| & | H | 09 | Data | xx | 00 | Night Mode Load 2 / Dimming<br>0 = No night light normal mode always on<br>1 = Dusk to Dawn<br>2 = Morning and evening minutes based on Dusk and Dawn<br>3 = Morning and evening minutes based on middle of the night |
| & | H | 23 | Data | xx | 30 | Dimming value in % |
| & | H | 24 | Data | xx | 29 | Base Dimming value in %. Maximum LED current. |
| & | H | 1B | Data | xx | | LVD-mode: 0 = SOC; 1 = VOLTAGE |
| & | H | 1C | Data | xx | 00 | Battery1 Type1: 0 = GEL; 1 = LIQUID; 2 = $LiFePO_4$ (LFP)<br>16 = CUSTOM_GEL; 17 = CUSTOM_LIQUID; 17 = CUSTOM_LFP |

| | | | | | | |
|---|---|---|---|---|---|---|
| & | H | 3F | Data | xx | 0 | Dali Power Supply Enable<br>0: Dali Power Supply disabled<br>1: Dali Power Supply enabled |
| & | H | 40 | Data | xx | 1 | ALC Dimming Enable<br>0: ALC Dimming disabled<br>1: ALC Dimming enabled |
| & | H | 1D | Data | xx | 00 | Daily boost time value in minutes (Custom battery setting) |
| & | H | 1E | Data | xx | 60 | Boost time value in minutes (Custom battery setting) |
| & | H | 1F | Data | xx | 00 | Equalization days value (Custom battery setting) |
| & | H | 20 | Data | xx | 00 | Charge voltage temperature compensation value in mV/K (Custom battery setting) |
| & | H | 41 | Data | xx | 04 | Grid Charger Current in A |
| & | H | 44 | Data | xx | 118 | Minimum battery charge temperature value in °C (Custom battery setting)<br>Offset of 128 should be added to the actual value before doing temperature settings.<br>**Example:**<br>**0°C = 0 + 128 = 128**<br>**-10°C = -10 + 128 = 118**<br>**50°C = 50 + 128 = 178** |
| & | H | 45 | Data | xx | 178 | Maximum battery charge temperature value in °C (Custom battery setting)<br>Offset of 128 should be added to the actual value before doing temperature settings.<br>**Example:**<br>**0°C = 0 + 128 = 128**<br>**-10°C = -10 + 128 = 118**<br>**50°C = 50 + 128 = 178** |
| & | I | ADDRESS HIGH-BYTE | ADDRESS LOW-BYTE | xx | | Read data from ADDRESS up to ADDRESS +15<br>EEPROM: 0x0000 – 0x0800<br>example: &I078000 read address 0x780-0x78F<br>Items are separated by ';' |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | **Parameters for H and M commands start at 0x1022** |
| & | J | ADR | DATA | xx | | Write data to EEPROM address (0×70- 0×7F) only possible after G-Command<br>example: &J753700 write data 0x37 to address 0x75 |
| & | K | 56 | DIM% | xx | | Override internal night light control by given dimming value in %, temporarily. Resets to nightlight settings after delay of 120s. |
| & | K | AD | 00 | xx | | Clear Ah Counter, Datalogger |
| & | K | AE | 00 | xx | | Clear battery operating time |
| & | L | DD | 00 | xx | | Load Default and Reset after G-Command |
| & | L | DD | 01 | xx | | Reset after program enable (&G) |
| | | | | | | **M-Commands: Programming of 2 Bytes to EEPROM:**<br>**Always send the G-Command to enable EEPROM programming, first!** |
| & | M | 01 | Data LSB | MSB | 0 | Evening minutes |
| & | M | 03 | Data LSB | MSB | 0 | Morning minutes |
| & | M | 05 | Data LSB | MSB | 11900 | DC-LOAD: Noload Voltage (current dependent) [mV] |
| & | M | 07 | Data LSB | MSB | 11000 | DC-LOAD: LVD Voltage (voltage dependent) [mV] |
| & | M | 0A | Data LSB | MSB | 0 | Evening minutes Dimming |
| & | M | 0D | Data LSB | MSB | 0 | Morning minutes Dimming |
| & | M | 21 | Data LSB | MSB | 8000 | Nightlevel [mV] |
| & | M | 3D | Data LSB | MSB | 64 | Battery Size in [Ah] |
| & | M | 25 | Data LSB | MSB | 14800 | Battery Over Voltage [mV] (Custom battery setting) |
| & | M | 27 | Data LSB | MSB | 12200 | Battery LVD Reconnect Voltage [mV] (Custom battery setting) |
| & | M | 29 | Data LSB | MSB | 14100 | Battery Equalization Voltage [mV] (Custom battery setting) |
| & | M | 2B | Data LSB | MSB | 14100 | Battery Boost Voltage [mV] (Custom battery setting) |

| | | | | | | |
|---|---|---|---|---|---|---|
| & | M | 2D | Data LSB | MSB | 0 | Battery Minimal Temperature Compensation Voltage [mV] (Custom battery setting) |
| & | M | 2F | Data LSB | MSB | 14000 | Battery Float Voltage [mV] (Custom battery setting) |
| & | M | 31 | Data LSB | MSB | 0 | Battery Maximal Temperature Compensation Voltage [mV] (Custom battery setting) |
| & | M | 33 | Data LSB | MSB | 14300 | Battery Over Voltage Reconnect Voltage [mV] (Custom battery setting) |
| & | M | 35 | Data LSB | MSB | 10500 | Battery Under Voltage [mV] (Custom battery setting) |
| & | M | 37 | Data LSB | MSB | 12000 | Battery Boost Activation Voltage [mV] (Custom battery setting) |
| & | M | 39 | Data LSB | MSB | 0 | Battery Equalization Activation Voltage [mV] (Custom battery setting) |
| & | M | 42 | Data LSB | MSB | 0 | Battery Equalization Time [Minutes] (Custom battery setting) |

## 2.3 SETTINGS AND DATALOG EEPROM MAP

Settings

| Address (hex) | Offset | Value | DEFINE OFFSET | LSB/MSB | Unit | Details | Remarks |
|---|---|---|---|---|---|---|---|
| 22 | 34 | Load 1: Load Mode Nightlight or Not | FIRSTCUVALUE | | | 0 = No night light = normal mode = always on<br>1 = Dusk to Dawn (D2D)<br>2 = Morning and evening minutes based on Dusk and Dawn (DD)<br>3 = Morning and evening minutes based on middle of the night (MN) | |
| 23 | 35 | Load 1: Evening Minutes | | [XXFF] | [min] | | |
| 24 | 36 | Load 1: Evening Minutes | | [FFXX] | [min] | | |
| 25 | 37 | Load 1: Morning Minutes | | [XXFF] | [min] | | |
| 26 | 38 | Load 1: Morning Minutes | | [FFXX] | [min] | | |
| 27 | 39 | DC-LOAD (Load 1): LVD SOC-Mode: Current | | [XXFF] | [mV] | | |
| 28 | 40 | DC-LOAD (Load 1): LVD SOC-Mode: Current | | [FFXX] | [mV] | | |
| 29 | 41 | DC-LOAD (Load 1): LVD SOC-Mode: Voltage | | [XXFF] | [mV] | | |
| 2A | 42 | DC-LOAD (Load 1): LVD SOC-Mode: Voltage | | [FFXX] | [mV] | | |
| 2B | 43 | Dimming: Load Mode Nightlight or Not | | | | | |
| 2C | 44 | Dimming: Evening Minutes | | | | | |
| 2D | 45 | Dimming: Evening Minutes | | | | | |
| 2E | 46 | Dimming: Morning Minutes | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2F | 47 | Dimming: Morning Minutes | | | | | |
| 30 | 48 | DC-LOAD (Dimming): LVD SOC-Mode: Current | | | | | |
| 31 | 49 | DC-LOAD (Dimming): LVD SOC-Mode: Current | | | | | |
| 32 | 50 | DC-LOAD (Dimming): LVD SOC-Mode: Voltage | | | | | |
| 33 | 51 | DC-LOAD (Dimming): LVD SOC-Mode: Voltage | | | | | |
| 34 | 52 | Reserved | | | | | |
| 35 | 53 | | | | | | |
| 36 | 54 | | | | | | |
| 37 | 55 | | | | | | |
| 38 | 56 | | | | | | |
| 39 | 57 | | | | | | |
| 3A | 58 | | | | | | |
| 3B | 59 | | | | | | |
| 3C | 60 | | | | | | |
| 3D | 61 | LVD Mode | | [FF] | | 0 = SOC / Current adjusted<br>1 = VOLTAGE | |
| 3E | 62 | Battery1 Type | | [FF] | | 0 = GEL<br>1 = LIQUID; 2 = $LiFePO_4$ (LFP) | |
| 3F | 63 | Daily Boost Time | | [FF] | [min] | | Custom Battery Settings |
| 40 | 64 | Boost Time | | [FF] | [min] | | |
| 41 | 65 | Max. Days between Equalisation | | [FF] | [day] | | |
| 42 | 66 | Charge voltage Temperature compensation | | [FF] | [mV] | | |
| 43 | 67 | Nightlevel | | [XXFF] | [mV] | | |
| 44 | 68 | Nightlevel | | [FFXX] | [mV] | | |
| 45 | 69 | dimming | | [FF] | [%] | | |
| 46 | 70 | maxdimming / basedimming | | [FF] | [%] | | |
| 47 | 71 | Overvoltage | | [XXFF] | [mV] | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 48 | 72 | Overvoltage | | [FFXX] | [mV] | | Custom Battery Settings |
| 49 | 73 | Deepdischarge Reconnect Voltage | | [XXFF] | [mV] | | |
| 4A | 74 | Deepdischarge Reconnect Voltage | | [FFXX] | [mV] | | |
| 4B | 75 | Equalize Voltage | | [XXFF] | [mV] | | |
| 4C | 76 | Equalize Voltage | | [FFXX] | [mV] | | |
| 4D | 77 | Boost Voltage | | [XXFF] | [mV] | | |
| 4E | 78 | Boost Voltage | | [FFXX] | [mV] | | |
| 4F | 79 | Min.temperature compensation voltage | | [XXFF] | [mV] | | |
| 50 | 80 | Min.temperature compensation voltage | | [FFXX] | [mV] | | |
| 51 | 81 | Float Voltage | | [XXFF] | [mV] | | |
| 52 | 82 | Float Voltage | | [FFXX] | [mV] | | |
| 53 | 83 | Max.temperature compensation voltage | | [XXFF] | [mV] | | |
| 54 | 84 | Max.temperature compensation voltage | | [FFXX] | [mV] | | |
| 55 | 85 | Reconnect Voltage | | [XXFF] | [mV] | | |
| 56 | 86 | Reconnect Voltage | | [FFXX] | [mV] | | |
| 57 | 87 | Under Voltage | | [XXFF] | [mV] | | |
| 58 | 88 | Under Voltage | | [FFXX] | [mV] | | |
| 59 | 89 | Boost Activation Voltage | | [XXFF] | [mV] | | |
| 5A | 90 | Boost Activation Voltage | | [FFXX] | [mV] | | |
| 5B | 91 | Equalize Activation Voltage | | [XXFF] | [mV] | | |
| 5C | 92 | Equalize Activation Voltage | | [FFXX] | [mV] | | |
| 5D | 93 | Reserved | | | | | |
| 5E | 94 | | | | | | |
| 5F | 95 | Battery Size | | [XXFF] | [Ah] | | |
| 60 | 96 | Battery Size | | [FFXX] | [Ah] | | |
| 61 | 97 | Dali Power Enable | | [FF] | | 0 = Disable<br>1 = Enable | |
| 62 | 98 | ALC Dimming Enable | | [FF] | | 0 = Disable<br>1 = Enable | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 63 | 99 | Grid Charger Current rating | | [FF] | [A] | | |
| 64 | 100 | Equalization duration | | [XXFF] | [min] | | |
| 65 | 101 | Equalization duration | | [FFXX] | [min] | | |
| 66 | 102 | Min.charge temperature | | [FF] | [°C] | Offset by 128 | |
| 67 | 103 | Max.charge temperature | LASTCUVALUE | [FF] | [°C] | 0ffset by 128 | |
| 68 | 104 | Reserved | | | | | |
| 69 | 105 | | | | | | |
| 6A | 106 | | | | | | |
| 6B | 107 | | | | | | |
| 6C | 108 | | | | | | |
| 6D | 109 | | | | | | |
| 6E | 110 | Battery Operating Time | | [FFXX] | [day] | | |
| 6F | 111 | Battery Operating Time | | [XXFF] | [day] | | |
| | | | | | | | |
| 70 | 112 | Serial number | SERIALNOLSB | [FFXX] | BCD | | |
| 71 | 113 | Serial number | SERIALNOMSB | [XXFF] | BCD | | |
| 72 | 114 | Production Day | MANUFACTDATEDD | [FF] / [10] | BCD | | System Data |
| 73 | 115 | Production Month | MANUFACTDATEMM | [FF] / [06] | BCD | | |
| 74 | 116 | Production Year | MANUFACTDATEYYLSB | [FFXX] / [18XX] | BCD | | |
| 75 | 117 | Production Year | MANUFACTDATEYYMSB | [XXFF] / [XX20] | BCD | | |
| 76 | 118 | Manufacturer ID | MANUFACTMM | | BCD | | |
| 77 | 119 | Reserved for identification | REVISIONRR | | BCD | Legacy revision number | |
| 78 | 120 | Device Identifier | DEVICEIDENTIFIERLSB | [FFXX] | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 79 | 121 | Device Identifier | DEVICEIDENTIFIERMSB | [XXFF] | | | |
| 7A | 122 | Reserved for identification | | | | | |
| 7B | 123 | Reserved for identification | | | | | |
| 7C | 124 | Reserved for identification | | | | | |
| 7D | 125 | Reserved for identification | | | | | |
| 7E | 126 | Reserved for identification | | | | | |
| 7F | 127 | Reserved for identification | | | | | |

Datalog

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 80 | 128 | Number of days with LVD | EEPROMSTART-DATALOG/SOS | [FFXX] | [days] | | |
| 81 | 129 | Number of days with LVD | | [XXFF] | [days] | | |
| 82 | 130 | Number of months without full charge | | [FF] | [months | | |
| 83 | 131 | Datalog Type | | | | | |
| 84 | 132 | Sum of morning SOCs | | [FFXX] | [6,6 %] | To get the average morning SOC, divide this number by „Number of Days“ (Offset: 142, 143) | Datalogger summary Read Only ! |
| 85 | 133 | Sum of morning SOCs | | [XXFF] | [6,6 %] | | |
| 86 | 134 | Ah Charge | | [FFXXXXXX] | [100mAh] | | |
| 87 | 135 | Ah Charge | | [XXFFXXXX] | [100mAh] | | |
| 88 | 136 | Ah Charge | | [XXXXFFXX] | [100mAh] | | |
| 89 | 137 | Ah Charge | | [XXXXXXFF] | [100mAh] | | |
| 8A | 138 | Ah Load | | [FFXXXXXX] | [100mAh] | | |
| 8B | 139 | Ah Load | | [XXFFXXXX] | [100mAh] | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8C | 140 | Ah Load | | [XXXXFFXX] | [100mAh] | | |
| 8D | 141 | Ah Load | | [XXXXXXFF] | [100mAh] | | |
| 8E | 142 | Number of days | | [FFXX] | [day] | | |
| 8F | 143 | Number of days | | [XXFF] | [day] | | |
| 90 | 144 | Umax Battery1 (Day1) | EEPROMSTARTDAY | [FF] | [100mV] | 30 of these 16 byte-blocks build the daily datalogger | Daily Datalogger Read Only ! |
| 91 | 145 | Umin Battery1 (Day1) | | [FF] | [100mV] | | |
| 92 | 146 | Input Battery1 (Day1) | | [FFXX] | [100mAh] | | |
| 93 | 147 | Input Battery1 (Day1) | | [XXFF] | [100mAh] | | |
| 94 | 148 | Output Battery1 / Input Battery2 CXNUP2B (Day1) | | [FFXX] | [100mAh] | | |
| 95 | 149 | Output Battery1 / Input Battery2 CXNUP2B (Day1) | | [XXFF] | [100mAh] | | |
| 96 | 150 | Umax PV / Umax Battery2 (Day1) | | [FF] | [500mV] / [100mV] | | |
| 97 | 151 | Umin PV / Umin Battery2 (Day1) | | [FF] | [500mV] / [100mV] | | |
| 98 | 152 | Imax Load / SOC Battery2 (Day1) | | [FF] | [500mA] / [6,6 %] | | |
| 99 | 153 | Imax PV (Day1) | | [FF] | [500mA] | | |
| 9A | 154 | SOC Battery1 (Day1) | | [FF] | [6,6 %] | | |
| 9B | 155 | External Temperatur Max (Day1) | | [FF] | [°C] signed | | |
| 9C | 156 | External Temperatur Min (Day1) | | [FF] | [°C] signed | | |
| 9D | 157 | Nightlength (Day1) | | [FF] | [10Min] | | |
| 9E | 158 | State (Day1) | | [FFXX] | | | |
| 9F | 159 | State (Day1) | | [XXFF] | | | |
| … | … | | | | | | |
| 270 | 624 | Umax Battery1 (Month1) | EEPROMSTARTMONTH | [FF] | [100mV] | 24 blocks of 16 bytes build the monthly datalogger until | Monthly Datalogger Read Only ! |
| 271 | 625 | Umin Battery1 (Month1) | | [FF] | [100mV] | | |
| 272 | 626 | Input Battery1 (Month1) | | [FFXX] | [1Ah] | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 273 | 627 | Input Battery1 (Month1) | | [XXFF] | [1Ah] | the end of the EEPROM (equals 2 years of monthly datalogger blocks) | |
| 274 | 628 | Output Battery1 / Input Battery2 CXNup-2B (Month1) | | [FFXX] | [1Ah] | | |
| 275 | 629 | Output Battery1 / Input Battery2 CXNup-2B (Month1) | | [XXFF] | [1Ah] | | |
| 276 | 630 | Umax PV / Umax Battery2 (Month1) | | [FF] | [500mV] / [100mV] | | |
| 277 | 631 | Umin PV / Umin Battery2 (Month1) | | [FF] | [500mV] / [100mV] | | |
| 278 | 632 | Imax Load / SOC Battery2 (Month1) | | [FF] | [500mA] / [%] | | |
| 279 | 633 | Imax PV (Month1) | | [FF] | [500mA] | | |
| 27A | 634 | SOC Battery1 (Month1) | | [FF] | [%] | | |
| 27B | 635 | External Temperature Max (Month1) | | [FF] | [°C] signed | | |
| 27C | 636 | External Temperature Min (Month1) | | [FF] | [°C] signed | | |
| 27D | 637 | Nightlength (Month1) | | [FF] | [10 min] | | |
| 27E | 638 | State (Month1) | | [FFXX] | | | |
| 27F | 639 | State (Month1) | | [XXFF] | | | |
| … | … | | | | | | |
| 400 | 1024 | DALI_EEPROM_VERIFICATION_VARIABLE1 | EEPROMSTARTDALI | [FF] | 'T' | | DALI EEPROM verification data |
| 401 | 1025 | DALI_EEPROM_VERIFICATION_VARIABLE2 | | [FF] | 'G' | | |
| 402 | 1026 | DALI_EEPROM_VERIFICATION_VARIABLE3 | | [FF] | 0x08 | | |
| 403 | 1027 | DALI_EEPROM_VERIFICATION_VARIABLE4 | | [FF] | 0x00 | | |
| 404 | 1028 | DALIREG_POWER_ON_LEVEL | | [FF] | | | |
| 405 | 1029 | DALIREG_SYSTEM_FAILURE_LEVEL | | [FF] | | | |
| 406 | 1030 | DALIREG_MIN_LEVEL | | [FF] | | | |
| 407 | 1031 | DALIREG_MAX_LEVEL | | [FF] | | | |
| 408 | 1032 | DALIREG_FADE_RATE | | [FF] | | | |
| 409 | 1033 | DALIREG_FADE_TIME | | [FF] | | | |
| 40A | 1034 | DALIREG_SHORT_ADDRESS | | [FF] | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 40B | 1035 | DALIREG_RANDOM_ADDRESS (MSB) | | [XXXXFF] | | | |
| 40C | 1036 | DALIREG_RANDOM_ADDRESS | | [XXFFXX] | | | DALI data that can read and write by sending the DALI commands |
| 40D | 1037 | DALIREG_RANDOM_ADDRESS (LSB) | | [FFXXXX] | | | |
| 40E | 1038 | DALIREG_GROUP_0_7 | | [XXFF] | | | |
| 40F | 1039 | DALIREG_GROUP_8_15 | | [FFXX] | | | |
| 410 | 1040 | DALIREG_SCENE1 | | [FF] | | | |
| 411 | 1041 | DALIREG_SCENE2 | | [FF] | | | |
| 412 | 1042 | DALIREG_SCENE3 | | [FF] | | | |
| 413 | 1043 | DALIREG_SCENE4 | | [FF] | | | |
| 414 | 1044 | DALIREG_SCENE5 | | [FF] | | | |
| 415 | 1045 | DALIREG_SCENE6 | | [FF] | | | |
| 416 | 1046 | DALIREG_SCENE7 | | [FF] | | | |
| 417 | 1047 | DALIREG_SCENE8 | | [FF] | | | |
| 418 | 1048 | DALIREG_SCENE9 | | [FF] | | | |
| 419 | 1049 | DALIREG_SCENE10 | | [FF] | | | |
| 41A | 1050 | DALIREG_SCENE11 | | [FF] | | | |
| 41B | 1051 | DALIREG_SCENE12 | | [FF] | | | |
| 41C | 1052 | DALIREG_SCENE13 | | [FF] | | | |
| 41D | 1053 | DALIREG_SCENE14 | | [FF] | | | |
| 41E | 1054 | DALIREG_SCENE15 | | [FF] | | | |
| 41F | 1055 | DALIREG_SCENE16 | | [FF] | | | DALI data that can read and write by sending the DALI commands |
| 420 | 1056 | DALIREG_EXTENDED_FADE_TIME_BASE | | [FF] | | | |
| 421 | 1057 | DALIREG_EXTENDED_FADE_TIME_MULTIPLIER | | [FF] | | | |
| 422 | 1058 | DALIREG_FAST_FADE_TIME | | [FF] | | | |
| 423 | 1059 | Reserved for DALI | | | | | |
| 424 | 1060 | Reserved for DALI | | | | | |
| 425 | 1061 | Reserved for DALI | | | | | |
| 426 | 1062 | Reserved for DALI | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 427 | 1063 | Reserved for DALI | | | | | |
| 428 | 1064 | Reserved for DALI | | | | | |
| 429 | 1065 | Reserved for DALI | | | | | |
| 42A | 1066 | Reserved for DALI | | | | | |
| 42B | 1067 | Reserved for DALI | | | | | |
| 42C | 1068 | Reserved for DALI | | | | | |
| 42D | 1069 | Reserved for DALI | | | | | |
| 42E | 1070 | Reserved for DALI | | | | | |
| 42F | 1071 | Reserved for DALI | | | | | |
| … | … | | | | | | |
| 430 | 1072 | DALI memory bank 1 checksum | EEPROM DALI MEMORY BANK1 START | [FF] | | | |
| 431 | 1073 | OEM GTIN byte 0 (MSB) | | [FF] | | | |
| 432 | 1074 | OEM GTIN byte 1 | | [FF] | | | |
| 433 | 1075 | OEM GTIN byte 2 | | [FF] | | | |
| 434 | 1076 | OEM GTIN byte 3 | | [FF] | | | |
| 435 | 1077 | OEM GTIN byte 4 | | [FF] | | | |
| 436 | 1078 | OEM GTIN byte 5 (LSB) | | [FF] | | | |
| 437 | 1079 | OEM identification number byte 0 (MSB) | | [FF] | | | |
| 438 | 1080 | OEM identification number byte 1 | | [FF] | | | |
| 439 | 1081 | OEM identification number byte 2 | | [FF] | | | OEM specific DALI memory bank data |
| 43A | 1082 | OEM identification number byte 3 | | [FF] | | | |
| 43B | 1083 | OEM identification number byte 4 | | [FF] | | | |
| 43C | 1084 | OEM identification number byte 5 | | [FF] | | | |
| 43D | 1085 | OEM identification number byte 6 | | [FF] | | | |
| 43E | 1086 | OEM identification number byte 7 (LSB) | | [FF] | | | |
| 43F | 1087 | Content Format ID (MSB) | | [FF] | | | |
| 440 | 1088 | Content Format ID (LSB) | | [FF] | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 441 | 1089 | Year of Manufacture of the Lamp | | [FF] | | | |
| 442 | 1090 | Production Calendar Week of the Lamp | | [FF] | | | |
| 443 | 1091 | Rated Input Power | | [FF] | [W] | | |
| 444 | 1092 | Nominal Input Power | | [FF] | [W] | | |
| 445 | 1093 | Power at Lowest Dimming Level (MSB) | | [FF] | [W] | | |
| 446 | 1094 | Power at Lowest Dimming Level (LSB) | | [FF] | [W] | | |
| 447 | 1095 | Nominal Value of the Minimum AC Mains Voltage (MSB) | | [FF] | [V] | | |
| 448 | 1096 | Nominal Value of the Minimum AC Mains Voltage (LSB) | | [FF] | [V] | | |
| 449 | 1097 | Nominal Value of the Maximum AC Mains Voltage (MSB) | | [FF] | [V] | | |
| 44A | 1098 | Nominal Value of the Maximum AC Mains Voltage (LSB) | | [FF] | [V] | | |
| 44B | 1099 | Nominal Luminous Flux (MSB) | | [FF] | [Lm] | | |
| 44C | 1100 | Nominal Luminous Flux | | [FF] | [Lm] | | |
| 44D | 1101 | Nominal Luminous Flux (LSB) | | [FF] | [Lm] | | |
| 44E | 1102 | CRI | | [FF] | | | |
| 44F | 1103 | CCT [K] [MSB] | | [FF] | | | |
| 450 | 1104 | CCT [K] [LSB] | | [FF] | | | |
| 451 | 1105 | Light Distribution Type | | [FF] | | | OEM specific DALI memory bank data |
| 452 | 1106 | Colour of the Lamp Body | | [FF] | | | |
| 453 | 1107 | Colour of the Lamp Body | | [FF] | | | |
| 454 | 1108 | Colour of the Lamp Body | | [FF] | | | |
| 455 | 1109 | Colour of the Lamp Body | | [FF] | | | |
| 456 | 1110 | Colour of the Lamp Body | | [FF] | | | |
| 457 | 1111 | Colour of the Lamp Body | | [FF] | | | |
| 458 | 1112 | Colour of the Lamp Body | | [FF] | | | |
| 459 | 1113 | Colour of the Lamp Body | | [FF] | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 45A | 1114 | Colour of the Lamp Body | | [FF] | | |
| 45B | 1115 | Colour of the Lamp Body | | [FF] | | |
| 45C | 1116 | Colour of the Lamp Body | | [FF] | | |
| 45D | 1117 | Colour of the Lamp Body | | [FF] | | |
| 45E | 1118 | Colour of the Lamp Body | | [FF] | | |
| 45F | 1119 | Colour of the Lamp Body | | [FF] | | |
| 460 | 1120 | Colour of the Lamp Body | | [FF] | | |
| 461 | 1121 | Colour of the Lamp Body | | [FF] | | |
| 462 | 1122 | Colour of the Lamp Body | | [FF] | | |
| 463 | 1123 | Colour of the Lamp Body | | [FF] | | |
| 464 | 1124 | Colour of the Lamp Body | | [FF] | | |
| 465 | 1125 | Colour of the Lamp Body | | [FF] | | |
| 466 | 1126 | Colour of the Lamp Body | | [FF] | | |
| 467 | 1127 | Colour of the Lamp Body | | [FF] | | |
| 468 | 1128 | Colour of the Lamp Body | | [FF] | | |
| 469 | 1129 | Colour of the Lamp Body | | [FF] | | |
| 46A | 1130 | Lamp Identification | | [FF] | | |
| 46B | 1131 | Lamp Identification | | [FF] | | |
| 46C | 1132 | Lamp Identification | | [FF] | | |
| 46D | 1133 | Lamp Identification | | [FF] | | |
| 46E | 1134 | Lamp Identification | | [FF] | | |
| 46F | 1135 | Lamp Identification | | [FF] | | |
| 470 | 1136 | Lamp Identification | | [FF] | | |
| 471 | 1137 | Lamp Identification | | [FF] | | |
| 472 | 1138 | Lamp Identification | | [FF] | | |
| 473 | 1139 | Lamp Identification | | [FF] | | |
| 474 | 1140 | Lamp Identification | | [FF] | | |
| 475 | 1141 | Lamp Identification | | [FF] | | |
| 476 | 1142 | Lamp Identification | | [FF] | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 477 | 1143 | Lamp Identification | | [FF] | | |
| 478 | 1144 | Lamp Identification | | [FF] | | |
| 479 | 1145 | Lamp Identification | | [FF] | | |
| 47A | 1146 | Lamp Identification | | [FF] | | |
| 47B | 1147 | Lamp Identification | | [FF] | | |
| 47C | 1148 | Lamp Identification | | [FF] | | |
| 47D | 1149 | Lamp Identification | | [FF] | | |
| 47E | 1150 | Lamp Identification | | [FF] | | |
| 47F | 1151 | Lamp Identification | | [FF] | | |
| 480 | 1152 | Lamp Identification | | [FF] | | |
| 481 | 1153 | Lamp Identification | | [FF] | | |
| 482 | 1154 | Lamp Identification | | [FF] | | |
| 483 | 1155 | Lamp Identification | | [FF] | | |
| 484 | 1156 | Lamp Identification | | [FF] | | |
| 485 | 1157 | Lamp Identification | | [FF] | | |
| 486 | 1158 | Lamp Identification | | [FF] | | |
| 487 | 1159 | Lamp Identification | | [FF] | | |
| 488 | 1160 | Lamp Identification | | [FF] | | |
| 489 | 1161 | Lamp Identification | | [FF] | | |
| 48A | 1162 | Lamp Identification | | [FF] | | |
| 48B | 1163 | Lamp Identification | | [FF] | | |
| 48C | 1164 | Lamp Identification | | [FF] | | |
| 48D | 1165 | Lamp Identification | | [FF] | | |
| 48E | 1166 | Lamp Identification | | [FF] | | |
| 48F | 1167 | Lamp Identification | | [FF] | | |
| 490 | 1168 | Lamp Identification | | [FF] | | |
| 491 | 1169 | Lamp Identification | | [FF] | | |
| 492 | 1170 | Lamp Identification | | [FF] | | |
| 493 | 1171 | Lamp Identification | | [FF] | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 494 | 1172 | Lamp Identification | | [FF] | | | |
| 495 | 1173 | Lamp Identification | | [FF] | | | |
| 496 | 1174 | Lamp Identification | | [FF] | | | |
| 497 | 1175 | Lamp Identification | | [FF] | | | |
| 498 | 1176 | Lamp Identification | | [FF] | | | |
| 499 | 1177 | Lamp Identification | | [FF] | | | |
| 49A | 1178 | Lamp Identification | | [FF] | | | |
| 49B | 1179 | Lamp Identification | | [FF] | | | |
| 49C | 1180 | Lamp Identification | | [FF] | | | |
| 49D | 1181 | Lamp Identification | | [FF] | | | |
| 49E | 1182 | Lamp Identification | | [FF] | | | |
| 49F | 1183 | Lamp Identification | | [FF] | | | |
| 4A0 | 1184 | Lamp Identification | | [FF] | | | |
| 4A1 | 1185 | Lamp Identification | | [FF] | | | |
| 4A2 | 1186 | Lamp Identification | | [FF] | | | |
| 4A3 | 1187 | Lamp Identification | | [FF] | | | |
| 4A4 | 1188 | Lamp Identification | | [FF] | | | |
| 4A5 | 1189 | Lamp Identification | | [FF] | | | |
| 4A6 | 1190 | Lamp Identification | | [FF] | | | |
| 4A7 | 1191 | reserved for memory bank 1 | | [FF] | | | |
| 4A8 | 1192 | reserved for memory bank 1 | | [FF] | | | |
| 4A9 | 1193 | reserved for memory bank 1 | | [FF] | | | |
| 4AA | 1194 | reserved for memory bank 1 | | [FF] | | | |
| 4AB | 1195 | Memory bank 207 checksum | EEPROM DALI MEMORY BANK207 START | [FF] | | | |
| 4AC | 1196 | Rated Median Useful Life of Luminare | | [FF] | | | |
| 4AD | 1197 | Internal Control Gear Reference Temperature | | [FF] | | | |
| 4AE | 1198 | Rated Median Useful Light Source Start (MSB) | | [FF] | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4AF | 1199 | Rated Median Useful Light Source Start (LSB) | | [FF] | | | |
| 4B0 | 1200 | Active Energy (MSB) | EEPROM DALI MEMORY BANK 202 and 204 START | [FF] | | | |
| 4B1 | 1201 | Active Energy | | [FF] | | | |
| 4B2 | 1202 | Active Energy | | [FF] | | | |
| 4B3 | 1203 | Active Energy (LSB) | | [FF] | | | |
| 4B4 | 1204 | Active Energy Load Side (MSB) | | [FF] | | | |
| 4B5 | 1205 | Active Energy Load Side | | [FF] | | | |
| 4B6 | 1206 | Active Energy Load Side | | [FF] | | | |
| 4B7 | 1207 | Active Energy Load Side (LSB) | | [FF] | | | |
| 4B8 | 1208 | Control Gear Operating Time (MSB) | EEPROM DALI MEMORY BANK 205 START | [FF] | | | |
| 4B9 | 1209 | Control Gear Operating Time | | [FF] | | | |
| 4BA | 1210 | Control Gear Operating Time | | [FF] | | | |
| 4BB | 1211 | Control Gear Operating Time (LSB) | | [FF] | | | |
| 4BC | 1212 | Control Gear Overall Failure Condition Counter | | [FF] | | | |
| 4BD | 1213 | Control Gear External Supply Under Voltage Counter | | [FF] | | | |
| 4BE | 1214 | Control Gear External Supply Over Voltage Counter | | [FF] | | | |
| 4BF | 1215 | Control Gear Output Power Limitation Counter | | [FF] | | | |
| 4C0 | 1216 | Control Gear Thermal Derating Counter | | [FF] | | | |
| 4C1 | 1217 | Control Gear Thermal Shutdown Counter | | [FF] | | | |
| 4C2 | 1218 | Control Gear Start Counter (MSB) | | [FF] | | | |
| 4C3 | 1219 | Control Gear Start Counter | | [FF] | | | |
| 4C4 | 1220 | Control Gear Start Counter (LSB) | | [FF] | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4C5 | 1221 | Light Source Start Counter Resettable (MSB) | | [FF] | | | |
| 4C6 | 1222 | Light Source Start Counter Resettable | | [FF] | | | |
| 4C7 | 1223 | Light Source Start Counter Resettable (LSB) | | [FF] | | | |
| 4C8 | 1224 | Light Source Start Counter (MSB) | | [FF] | | | |
| 4C9 | 1225 | Light Source Start Counter | | [FF] | | | |
| 4CA | 1226 | Light Source Start Counter (LSB) | | [FF] | | | |
| 4CB | 1227 | Light Source on Time Resettable (MSB) | EEPROM DALI MEMORY BANK 206 START | [FF] | | | |
| 4CC | 1228 | Light Source on Time Resettable | | [FF] | | | |
| 4CD | 1229 | Light Source on Time Resettable | | [FF] | | | |
| 4CE | 1230 | Light Source on Time Resettable (LSB) | | [FF] | | | |
| 4CF | 1231 | Light Source on Time (MSB) | | [FF] | | | |
| 4D0 | 1232 | Light Source on Time | | [FF] | | | |
| 4D1 | 1233 | Light Source on Time | | [FF] | | | |
| 4D2 | 1234 | Light Source on Time (LSB) | | [FF] | | | |
| 4D3 | 1235 | Light Source Overall Failure Condition Counter | | [FF] | | | |
| 4D4 | 1236 | Light Source Short Circuit Counter | | [FF] | | | |
| 4D5 | 1237 | Light Source Open Circuit Counter | | [FF] | | | |
| 4D6 | 1238 | Light Source Thermal Derating Counter | | [FF] | | | |
| 4D7 | 1239 | Light Source Thermal Shutdown Counter | | [FF] | | | |
| … | … | | | | | | |
| 800 | 2047 | | | | | last Address of 2 Kbyte EEPROM | |

## 2.4 Legend & Abbreviations

FF value (one unsigned byte → 0 .. 255)

XX other Byte of complete value

[XXFF] 16 Bit value, LSB (lowest significant byte)

[FFXX] 16 Bit value, MSB (most significant byte)

[FFXXXX] 24 Bit value, MSB (most significant byte)

[XXFFXX] …

[XXXXFF] 24 Bit value, LSB (least significant byte)

[FFXXXXXX] 32 Bit value, MSB (most significant byte)

[XXFFXXXX] …

[XXXXFFXX] …

[XXXXXXFF] 32 Bit value, LSB (least significant byte)

## 2.5 Recommendation

In case of problems, it might be advantageous to use the Phocos Link PC program and a serial to RS-485 adapter and a serial sniffer program to analyze the data which is communicated between the PC Phocos Link PC program and the CIS-N-MPPT-DALI Controller.