CIS-N-MPPT-DALI
Memory Bank Map

Description of DALI memory banks and parameters

Version 1.3 2025-10-03

Version History

2024-11-25	v1.0	Initial Version	SK
2025-07-09	V1.1	Changed default values of base dimming and night detection level	SK
2025-08-14	V1.2	Added the custom battery settings to memory bank 3	SK
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1.0 Memory Banks

Memory banks are freely accessible memory spaces defined for e.g. identification of the control gear in a DALI system, reading and writing the specific control gear data.

All the memory banks are implemented according to the standard IEC 62386-102. Overall, 4 memory banks are implemented in the current CIS-N-MPPT-DALI version.

According to the standard each memory has maximum of 255 bytes.

1.1 Selecting Memory Bank Location

In order to select a memory bank location, a combination of memory bank number and location inside the memory bank is required. The memory bank shall be selected by setting the memory bank number in data transfer register 1 (DTR1). The location (address) in the memory bank shall be selected by the value in data transfer register 0 (DTR0).

1.2 Memory Bank Reading

A selected memory bank location can be read by sending the "READ MEMORY LOCATION" command. All implemented memory banks are readable. To read the memory bank, first set the DTR0 and DTR1 and send the "READ MEMORY LOCATION" command. After receiving the read command, the control gear will send back the data in that memory bank location and increment the DTR0 automatically to read the consecutively. In order to read specific memory bank locations, its recommended to set that specific memory location in the DTR0 and send the "READ MEMORY LOCATION" command.

1.3 Memory Bank Writing

In order to write data into the memory bank, first set the DTR0, DTR1, and then send the "ENABLE WRITE MEMORY" command to enable the "write enable state" of the control gear. After write enable state is enabled, send the "WRITE MEMORY LOCATION COMMAND (data)" to write data into the selected memory bank location. Write commands are special commands. Follow the below order to send write commands to write the memory bank location successfully:

1. Set the DTR0 and DTR1 (memory bank number and location in any order)
2. Enable the "write enable state"
3. Send the write memory location command

After receiving all the above commands, the control gear write the memory bank with selected data and send back the same data as an acknowledgement and increment the DTR0 (Address) for consecutive writing.

Note: If the above order of commands is not correct, then the control gear won't respond to the "WRITE MEMORY LOCATION COMMAND**" command. The "write enable state" will be reset automatically upon receiving any special commands except "**WRITE MEMORY LOCATION COMMAND**". So, make sure to enable the "write enable state" every time to write the data into memory location after sending any commands like selecting DTR0 and DTR1 etc.**

2.0 DALI Memory Bank Map

2.1 Memory Bank 0

Memory bank 0 contains the information about the control gear. Memory bank 0 is implemented as read only. Writing the data into this memory bank is not possible.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	Memory type	More information
0	0x00	Address of last accessible memory location	0x1A	ROM	
0	0x01	Checksum of memory bank 0			
0	0x02	Number of last accessible memory bank	0x03	ROM	Memory bank count
0	0x03	GTIN byte 0 (MSB)		ROM	These bytes contain the Global Trade Item Number
0	0x04	GTIN byte 1		ROM	
0	0x05	GTIN byte 2		ROM	
0	0x06	GTIN byte 3		ROM	
0	0x07	GTIN byte 4		ROM	
0	0x08	GTIN byte 5 (LSB)		ROM	
0	0x09	Firmware version (major)	0x0D	ROM	Firmware version of the DALI bus unit
0	0x0A	Firmware version (minor)	0x00	ROM	
0	0x0B	Identification number byte 0 (MSB)		ROM	
0	0x0C	Identification number byte 1		ROM	

0	0x0D	Identification number byte 2		ROM	Identification or serial number of the bus unit
0	0x0E	Identification number byte 3		ROM	
0	0x0F	Identification number byte 4		ROM	
0	0x10	Identification number byte 5		ROM	
0	0x11	Identification number byte 6		ROM	
0	0x12	Identification number byte 7 (LSB)		ROM	
0	0x13	Hardware version (major)	0x03	ROM	Hardware version of the DALI bus unit
0	0x14	Hardware version (minor)	0x00	ROM	
0	0x15	101 version number	0x09	ROM	IEC 62386-101 version number of the bus unit (2.1). The version number is encoded as byte in such a way that 2 is stored in bits 7 to 2 and 1 is stored in bits 1to 0 according to standard
0	0x16	102 version number	0x09	ROM	
0	0x17	103 version number	0xFF	ROM	
0	0x18	Number of logical control device units in the bus unit	0x00	ROM	
0	0x19	Number of logical control gear units in the bus unit	0x01	ROM	
0	0x1A	Index number of this logical control gear unit	0x01	ROM	Unique index number of the logical control gear unit

2.2 Memory Bank 1

Memory bank 1 contains the OEM related data. Memory bank 1 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
1	0x00	Address of last accessible memory location	0x77	0x77	ROM	
1	0x01	Checksum of memory bank 1	0x30	0x30	ROM	
1	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
1	0x03	OEM GTIN byte 0 (MSB)	0xFF	No change (contains the data that it has previously)	NVM	These bytes contain the OEM Global Trade Item Number
1	0x04	OEM GTIN byte 1	0xFF			
1	0x05	OEM GTIN byte 2	0xFF			
1	0x06	OEM GTIN byte 3	0xFF			
1	0x07	OEM GTIN byte 4	0xFF			
1	0x08	OEM GTIN byte 5 (LSB)	0xFF			
1	0x09	Identification number byte 0 (MSB)	0xFF	No change (contains the data that it has		OEM Identification or serial number
1	0x0A	Identification number byte 1	0xFF			
1	0x0B	Identification number byte 2	0xFF			

1	0x0C	Identification number byte 3	0xFF	previously)		
1	0x0D	Identification number byte 4	0xFF			
1	0x0E	Identification number byte 5	0xFF			OEM Identification or serial number
1	0x0F	Identification number byte 6	0xFF			
1	0x10	Identification number byte 7 (LSB)	0xFF			
1	0x11	Content Format ID (MSB)	0x00			
1	0x12	Content Format ID (LSB)	0x03			
1	0x13	Year of Manufacture of the Lamp	0xFF			
1	0x14	Production Calendar Week of the Lamp	0xFF			
1	0x15	Rated Input Power [W] (MSB)	0xFF	No change (contains the data that it has previously)	NVM	OEM Specific Data
1	0x16	Rated Input Power [W] (LSB)	0xFF			
1	0x17	Power at Lowest Dimming Level [W] (MSB)	0xFF			
1	0x18	Power at Lowest Dimming Level [W] (LSB)	0xFF			
1	0x19	Nominal Value of the Minimum AC Mains	0xFF			

		Voltage [V] (MSB)		No change (contains the data that it has previously)	NVM	OEM Specific Data
1	0x1A	Nominal Value of the Minimum AC Mains Voltage [V] (LSB)	0xFF			
1	0x1B	Nominal Value of the Maximum AC Mains Voltage [V] (MSB)	0xFF			
1	0x1C	Nominal Value of the Maximum AC Mains Voltage [V] (LSB)	0xFF			
1	0x1D	Nominal Luminous Flux [Lm] (MSB)	0xFF			
1	0x1E	Nominal Luminous Flux [Lm]	0xFF			
1	0x1F	Nominal Luminous Flux [Lm] (LSB)	0xFF			
1	0x20	CRI	0xFF			
1	0x21	CCT [K] [MSB]	0xFF			
1	0x22	CCT [K] [LSB]	0xFF			
1	0x23	Light Distribution Type	0xFF			
1	[0x24 – 0x3B]	Colour of the Lamp Body	0x00			
1	[0x3C – 0x77]	Lamp Identification	0x00			

2.3 Memory Bank 2

Memory bank 2 contains the charge controller data. Memory bank 2 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations. But it is not recommended to change the lock byte of this memory bank.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	Unit	More information
2	0x00	Address of last accessible memory location	0x31	0x31	ROM		
2	0x01	Checksum of memory bank 2	0x40	0x40	ROM		
2	0x02	Memory bank lock byte	0xFF	0xFF	RAM		**0xFF: read only** **0x55: read/write**
2	0x03	Serial Number (MSB)	0x00	No change	NVM	Encoded as binary coded decimal	**Example: 0x0010= serial number - 10**
2	0x04	Serial Number (LSB)	0x00				
2	0x05	Production day	0x00	No change	NVM	Encoded as binary coded decimal	**Example: 0x13 = day 13** **0x11 = month 11** **0x2024 = year 2024**
2	0x06	Production month	0x00		NVM		
2	0x07	Production year (MSB)	0x00				
2	0x08	Production year (LSB)	0x00				
2	0x09	Manufacturer ID	0x00	No change	NVM	Encoded as binary coded decimal	
2	0x0A	Charge current (MSB)	0x00	0x00		10 mA	**Example: 0x0028 = 40 * 10mA = 400mA**
2	0x0B	Charge current (LSB)	0x00	0x00			

2	0x0C	Load current (MSB)	0x00	0x00	RAM	10 mA	**Example: 0x00DB = 219 * 10mA = 2190 mA**
2	0x0D	Load current (LSB)	0x00	0x00			
2	0x0E	PV voltage (MSB)	0x00	0x00		mV	**Example: 0x2134 = 8500 mV**
2	0x0F	PV voltage (LSB)	0x00	0x00			
2	0x10	Battery voltage (MSB)	0x00	0x00		mV	**Example: 0x34E2 = 13538 mV**
2	0x11	Battery voltage (LSB)	0x00	0x00			
2	0x12	Battery voltage threshold (MSB)	0x00	0x00		mV	**Example: 0x36B0 = 14000 mV**
2	0x13	Battery voltage threshold (LSB)	0x00	0x00			
2	0x14	FIRMWARE VERSION		No change	ROM		**Example: 0x0D = 13**
2	0x15	Internal temperature	0x00	0x00	RAM	°C	**Example: 0x17 = 23°C** **Temperature data can be negative. So, it's suggested to consider the 2's compliment of the memory bank data for actual temperature value.**
2	0x16	External temperature	0x00	0x00		°C	**Example: 0x17 = 23°C**
2	0x17	LED current (MSB)	0x00	0x00		10 mA	**Example: 0x0052 = 82 * 10mA = 820mA**
2	0x18	LED current (LSB)	0x00	0x00	RAM		
2	0x19	LED voltage (MSB)	0x00	0x00		mV	**Example: 0x8AE6 = 35558 mV**
2	0x1A	LED voltage (LSB)	0x00	0x00			

2	0x1B	Battery SOC	0x00	0x00		%	**Example: 0x64 = 100%**
2	0x1C	Controller Operation Days (MSB)		No change	NVM	Days	**Example: 0x0006 = 6 Days**
2	0x1D	Controller Operation Days (LSB)					
2	0x1E	Battery Operating Time (MSB)		No change		Days	**Example: 0x0006 = 6 Days**
2	0x1F	Battery Operating Time (LSB)					
2	0x20	Battery Total Energy Input Daily (MSB)	0x00	0x00	RAM	Wh	**Example: 0x0016 = 22 Wh**
2	0x21	Battery Total Energy Input Daily (LSB)	0x00	0x00			
2	0x22	Battery Total Energy Output daily (MSB)	0x00	0x00		Wh	**Example: 0x0016 = 22 Wh**
2	0x23	Battery Total Energy Output daily (LSB)	0x00	0x00			
2	0x24	Battery Total Retained Energy daily (MSB)	0x00	0x00		Wh	**Example: 0x0016 = 22 Wh**
2	0x25	Battery Total Retained Energy daily (LSB)	0x00	0x00			
2	0x26	Average Night length (MSB)	0x00	0x00		Minutes	**Example: 0x025A = 602 Minutes**
2	0x27	Average Night length (LSB)	0x00	0x00			
2	0x28	Battery Charge Power	0x00	0x00			

		(MSB)				W	**Example: 0x012C = 300 W**
2	0x29	Battery Charge Power (LSB)	0x00	0x00			
2	0x2A	Battery Load Power (MSB)	0x00	0x00		W	**Example: 0x012C = 300 W**
2	0x2B	Battery Load Power (LSB)	0x00	0x00			
2	0x2C	LED Output Power (MSB)	0x00	0x00		W	**Example: 0x012C = 300 W**
2	0x2D	LED Output Power (LSB)	0x00	0x00			
2	0x2E	Fault/Warning Status	0x00	0x00	RAM		**Example 0x00: No fault/warning** **0x01: Battery Overvoltage** **0x02: PV overvoltage** **0x04: Controller internal temp high warning** **0x08: Charge current over** **0x10: Battery LVD** **0x20: Battery Over discharge current** **0x40: Battery Over temp warning** **0x80: Battery Under temp warning** **For multiple faults/warnings the data should be decoded**

							based on the bit masking.
2	0x2F	PV Detection	0x00	0x00			**Example 0x00: If PV voltage is not detected** **0x01: If PV voltage is detected**
2	0x30	Battery Detection	0x00	0x00			**Example 0x00: If battery is not connected** **0x01: If battery is connected**
2	0x31	LED Temperature Failure	0x00	0x00			**Example 0x00: No failure** **0x01: LED temperature sensor failure**

2.4 Memory Bank 3

Memory bank 3 contains the charge controller settings. Memory bank 3 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	Unit	More information
3	0x00	Address of last accessible memory location	0x53	0x53	ROM		
3	0x01	Checksum of memory bank 3	0x40	0x40	ROM		
3	0x02	Memory bank lock byte	0xFF	0xFF	RAM		**0xFF: read only** **0x55: read/write**
3	0x03	Full Brightness: Load Mode Nightlight or Not	0x01	No change (contains the data that it has previously)	NVM		**0 = No night light = normal mode = always on** **1 = Dusk to Dawn (D2D)** **2 = Morning and evening minutes based on Dusk and Dawn (DD)** **3 = Morning and evening minutes based on middle of the night (MN)**
3	0x04	Full Brightness: Evening Minutes (MSB)	0x00			[min]	**Example 0x0015: 21 minutes**
3	0x05	Full Brightness: Evening Minutes (LSB)	0x00			[min]	

3	0x06	Full Brightness: Morning Minutes (MSB)	0x00	No change (contains the data that it has previously)	NVM	[min]	**Example 0x0015: 21 minutes**
3	0x07	Full Brightness: Morning Minutes (LSB)	0x00			[min]	
3	0x08	DC-LOAD (Full Brightness): LVD SOC-Mode: Current (MSB)	0x2E			[mV]	**Example 0x2E7C: 11900 mV**
3	0x09	DC-LOAD (Full Brightness): LVD SOC-Mode: Current (LSB)	0x7C			[mV]	
3	0x0A	DC-LOAD (Full Brightness): LVD SOC-Mode: Voltage (MSB)	0x2A			[mV]	**Example 0x2AF8: 11000 mV**
3	0x0B	DC-LOAD (Full Brightness): LVD SOC-Mode: Voltage (LSB)	0xF8			[mV]	
3	0x0C	Dimming: Load Mode Nightlight or Not	0x02				**Example 0x02: Dusk and Dawn (DD)**
3	0x0D	Dimming: Evening Minutes	0x00			[min]	**Example 0x0015: 21 minutes**
3	0x0E	Dimming: Evening Minutes	0x00			[min]	
3	0x0F	Dimming: Morning Minutes	0x00			[min]	**Example 0x0015: 21 minutes**
3	0x10	Dimming: Morning Minutes	0x00			[min]	
3	0x11	Reserved	0x2E			[mV]	

3	0x12		0x7C			[mV]	**Example 0x2E7C: 11900 mV**
3	0x13		0x2A			[mV]	
3	0x14		0xF8			[mV]	**Example 0x2AF8: 11000 mV**
3	0x15						
3	0x16						
3	0x17						
3	0x18						
3	0x19						
3	0x1A					[mV]	
3	0x1B					[mV]	
3	0x1C			No change (contains the data that it has previously)	NVM	[mV]	**Currently these settings are not used but memory bank location is reserved for these settings**
3	0x1D					[mV]	
3	0x1E	LVD Mode	0x01				**0 = SOC Current adapted** **1 = VOLTAGE**

3	0x1F	Battery1 Type	0x02	No change (contains the data that it has previously)	NVM		**0 = GEL** **1 = LIQUID** **2 = $LiFePO_4$ (LFP)** **16 = CUSTOM_GEL** **17 = CUSTOM_LIQUID** **18 = CUSTOM_LFP**
3	0x20	Daily Boost Time	0x00			[min]	**Example 0x00: 0 Minutes** **These settings will be applicable to only custom battery types**
3	0x21	Boost Time	0x3C			[min]	**Example 0x3C: 60 Minutes** **These settings will be applicable only if the custom battery type is selected**
3	0x22	Max. Days between Equalization	0x00			[day]	**Example 0x00: 0 Days** **These settings will be applicable only if the custom battery type is selected**
3	0x23	Charge voltage Temperature compensation	0x00			[mV/K]	**Example 0x00: 0 mV/K** **These settings will be applicable only if the custom battery type is selected**
3	0x24	Nightlevel (MSB)	0x1F			[mV]	**Example 0x1F40: 8000 mV**
3	0x25	Nightlevel (LSB)	0x40			[mV]	
3	0x26	Dimming Level	0x1E			[%]	**Example 0x1E: 30%**
3	0x27	Basedimming/Full	0x1D			[%]	**Example 0x1D: 29%**

		Brightness Level		No change (contains the data that it has previously)	NVM		
3	0x28	Overvoltage (MSB)	0x39			[mV]	**Example 0x39D0: 14800 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x29	Overvoltage (LSB)	0xD0			[mV]	
3	0x2A	Deep Discharge Reconnect Voltage (MSB)	0x2A			[mV]	**Example 0x2AF8: 12200 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x2B	Deep Discharge Reconnect Voltage (LSB)	0xF8			[mV]	
3	0x2C	Equalize Voltage (MSB)	0x37			[mV]	**Example 0x3714: 14100 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x2D	Equalize Voltage (LSB)	0x14			[mV]	
3	0x2E	Boost Voltage (MSB)	0x37			[mV]	**Example 0x3714: 14100 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x2F	Boost Voltage (LSB)	0x14			[mV]	
3	0x30	Min. Temperature Compensation Voltage (MSB)	0x00			[mV]	**Example 0x0000: 0 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x31	Min. Temperature Compensation Voltage (LSB)	0x00			[mV]	

3	0x32	Float Voltage (MSB)	0x36	No change (contains the data that it has previously)	NVM	[mV]	**Example 0x36B0: 14000 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x33	Float Voltage (LSB)	0xB0			[mV]	
3	0x34	Max. Temperature Compensation Voltage (MSB)	0x00			[mV]	**Example 0x0000: 0 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x35	Max. Temperature Compensation Voltage (LSB)	0x00			[mV]	
3	0x36	Over Voltage Reconnect Voltage (MSB)	0x37			[mV]	**Example 0x37DC: 14300 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x37	Over Voltage Reconnect Voltage (LSB)	0xDC			[mV]	
3	0x38	Under Voltage (MSB)	0x29			[mV]	**Example 0x2904: 10500 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x39	Under Voltage (LSB)	0x04			[mV]	
3	0x3A	Boost Activation Voltage (MSB)	0x2E			[mV]	**Example 0x2EE0: 12000 mV** **These settings will be applicable only if the custom battery type is selected**
3	0x3B	Boost Activation Voltage (LSB)	0xE0			[mV]	
3	0x3C	Equalize Activation Voltage (MSB)	0x00			[mV]	**Example 0x0000: 12000 mV**

3	0x3D	Equalize Activation Voltage (LSB)	0x00			[mV]	**These settings will be applicable only if the custom battery type is selected**
3	0x3E					[x*50W]	**Currently these settings are not used but memory bank location is reserved for these settings**
3	0x3F	Reserved					
3	0x40	Battery Size (MSB)	0x00			[Ah]	**Example 0x0040: 64 Ah**
3	0x41	Battery Size (LSB)	0x40			[Ah]	
3	0x42	Dali Power Enable	0x00				**0 = Disable** **1 = Enable**
3	0x43	ALC Dimming Enable	0x01				**0 = Disable** **1 = Enable**
3	0x44	Grid Charger Current Rating	0x04			[A]	**Example 0x04: 4A**
3	0x45	Equalization Time [MSB]	0x00			[min]	**Example 0x0000: 0 Minutes** **These settings will be applicable only if the custom battery type is selected**
3	0x46	Equalization Time [LSB]	0x00			[min]	
		Min. Battery Charge					**Example 0x76: 118 = 118 – 128 = -10°C. Offset of 128**

3	0x47	Temperature	0x76			[°C]	**should be added to the actual value before doing temperature settings.** **Example: 0°C=0+128 =0x80** **-60°C=-60 + 128 =68=0x44** **60°C=60 + 128 =188=0xBC** **These settings will be applicable only if the custom battery type is selected**
3	0x48	Max. Battery Charge Temperature	0xB2			[°C]	**Example 0xB2: 178 = 178 – 128 = 50°C. Offset of 128 should be added to the actual value before doing temperature settings.** **Example: 0°C=0+128 =0x80** **-60°C=-60 + 128 =68=0x44** **60°C=60 + 128 =188=0xBC** **These settings will be applicable only if the custom battery type is selected**
3	0x49	Reserved					
3	0x4A	Reserved					

3	0x4B	Clear battery operating time	0x00	0x00	RAM		**If memory data set to 0, then the battery operating time will be reset to 0**
3	0x4C	Clear Ah Counter, Datalogger	0x00	0x00			**If memory data set to 0, then clear all datalogger history and accumulators except for Battery operation timer**
3	0x4D	Load default settings, and force a power reset of MCU	0x00	0x00			**0 = If memory data set to zero, then load all default settings and force a power reset of the MCU** **1 = If memory data set to 1, then force a power reset of the MCU**
3	0x4E	Reserved					
3	0x4F	Reserved					
3	0x50	Reserved					
3	0x51	Reserved					
3	0x52	Reserved					
3	0x53	Reserved					

2.5 Memory Bank 201

Memory bank 201 contains the device information about the integrated bus power supply. Memory bank 201 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xC9	0x00	Address of last accessible memory location	0x06	0x06	ROM	
0xC9	0x01	Checksum of memory bank 201	0x40	0x40	ROM	
0xC9	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xC9	0x03	Memory bank version	0x01	No change (contains the data that it has previously)	ROM	
0xC9	0x04	Guaranteed supply current of the integrated bus power supply (mA)	0x32			
0xC9	0x05	Maximum supply current of the integrated bus power supply (mA)	0x46			
0xC9	0x06	Bus power supply status	0x00		NVM	**Example 0x00: Bus power supply is off** **0x01: Bus power supply is on**

2.6 Memory Bank 202

Memory bank 202 contains the active energy and active power data related to control gear. Memory bank 202 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xCA	0x00	Address of last accessible memory location	0x0F	0x0F	ROM	
0xCA	0x01	Checksum of memory bank 202	0x40	0x40	ROM	
0xCA	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xCA	0x03	Memory bank version	0x01	No change (contains the data that it has previously)	ROM	
0xCA	0x04	Scale factor for active energy	0x00			Scaling factor for active energy values in the memory bank expressed as a power of ten. The negative scaling factors should be stored as two's compliment (for example -3 as 0xFD) For example: $\boldsymbol{Scaling\ factor} = \mathbf{10}^{scalingfactor\ for\ active\ energy * 1\ Wh}$
0xCA	0x05	Active Energy (MSB)			NVM – Read only	Example: $\mathbf{0x0000000002FD} = \mathbf{765} *$
0xCA	0x06	Active Energy				
0xCA	0x07	Active Energy				

0xCA	0x08	Active Energy	0x00			$\mathbf{10^0 = 765\ Wh}$
0xCA	0x09	Active Energy				
0xCA	0x0A	Active Energy (LSB)				
0xCA	0x0B	Scale factor for active power	0x00	No change (contains the data that it has previously)	ROM	
0xCA	0x0C	Active Power (MSB)	0x00		RAM – Read only	Example: $\mathbf{0x000002FD = 765 * 10^0 = 765\ W}$
0xCA	0x0D	Active Power				
0xCA	0x0E	Active Power				
0xCA	0x0F	Active Power (LSB)				

2.7 Memory Bank 203

Memory bank 203 contains the apparent energy and apparent power data related to control gear. Memory bank 203 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xCB	0x00	Address of last accessible memory location	0x0F	0x0F	ROM	
0xCB	0x01	Checksum of memory bank 203	0x40	0x40	ROM	
0xCB	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xCB	0x03	Memory bank version	0x01	No change (contains the data that it has previously)	ROM	
0xCB	0x04	Scale factor for apparent energy	0x00			Scaling factor for apparent energy values in the memory bank expressed as a power of ten. The negative scaling factors should be stored as two's compliment (for example -3 as 0xFD) For example: $\boldsymbol{Scaling\ factor} = \mathbf{10}^{\boldsymbol{scaling factor\ for\ apparent\ energy} * \mathbf{1}\ \boldsymbol{Wh}}$
0xCB	0x05	Apparent Energy (MSB)			NVM – Read only	Example: $\mathbf{0x0000000002FD} = \mathbf{765} *$
0xCB	0x06	Apparent Energy				
0xCB	0x07	Apparent Energy				

0xCB	0x08	Apparent Energy	0x00			$\mathbf{10^0 = 765\ Wh}$
0xCB	0x09	Apparent Energy				
0xCB	0x0A	Apparent Energy (LSB)				
0xCB	0x0B	Scale factor for apparent power	0x00	No change (contains the data that it has previously)	ROM	
0xCB	0x0C	Apparent Power (MSB)			RAM – Read only	Example: $\mathbf{0x000002FD = 765 * 10^0 = 765\ W}$
0xCB	0x0D	Apparent Power				
0xCB	0x0E	Apparent Power				
0xCB	0x0F	Apparent Power (LSB)	0x00			

2.8 Memory Bank 204

Memory bank 204 contains the load side energy and load side power data related to control gear. Memory bank 204 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xCC	0x00	Address of last accessible memory location	0x0F	0x0F	ROM	
0xCC	0x01	Checksum of memory bank 204	0x40	0x40	ROM	
0xCC	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xCC	0x03	Memory bank version	0x01	No change (contains the data that it has previously)	ROM	
0xCC	0x04	Scale factor for load side energy	0x00			Scaling factor for apparent energy values in the memory bank expressed as a power of ten. The negative scaling factors should be stored as two's compliment (for example -3 as 0xFD) For example: $\boldsymbol{Scaling\ factor} = \mathbf{10}^{\boldsymbol{scalingfactor\ for\ loadside\ energy} * \mathbf{1}\ \boldsymbol{Wh}}$
0xCC	0x05	Active Energy Load side (MSB)				Example: $\mathbf{0x0000000002FD} = \mathbf{765} *$
0xCC	0x06	Active Energy Load side				

0xCC	0x07	Active Energy Load side	0x00		NVM – Read only	$\mathbf{10^0 = 765\ Wh}$
0xCC	0x08	Active Energy Load side				
0xCC	0x09	Active Energy Load side				
0xCC	0x0A	Active Energy Load side (LSB)				
0xCC	0x0B	Scale factor for Load side power	0x00	No change (contains the data that it has previously)	ROM	
0xCC	0x0C	Active Power Load side (MSB)	0x00		RAM – Read only	Example: $\mathbf{0x000002FD = 765 * 10^0 = 765\ W}$
0xCC	0x0D	Active Power Load side				
0xCC	0x0E	Active Power Load side			RAM – Read only	
0xCC	0x0F	Active Power Load side (LSB)				

2.9 Memory Bank 205

Memory bank 205 contains the diagnostics and maintenance data related to control gear. Memory bank 205 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xCD	0x00	Address of last accessible memory location	0x1C	0x1C	ROM	
0xCD	0x01	Checksum of memory bank 205	0x40	0x40	ROM	
0xCD	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xCD	0x03	Memory bank version	0x01	No change (contains the data that it has previously)	ROM	
0xCD	0x04	Control Gear Operating Time (MSB)	0x00		NVM – Read only	Counts the operating time of the control gear in seconds when the control gear is switched on. **Example: 0x00003250 = 12880 seconds**
0xCD	0x05	Control Gear Operating Time				
0xCD	0x06	Control Gear Operating Time				
0xCD	0x07	Control Gear Operating Time (LSB)	0x00			
0xCD	0x08	Control Gear Start			NVM – Read only	Counts the number of operating

		Counter (MSB)	0x00	No change (contains the data that it has previously)		control gear start-ups induced by the voltage interruption of the external power supply.
0xCD	0x09	Control Gear Start Counter				
0xCD	0x0A	Control Gear Start Counter (LSB)				
0xCD	0x0B	Control Gear External Supply Voltage (MSB)	0x00		RAM – Read only	Scaling factor and unit: 0.1 V **Example: 0x0078 = 120 * 0.1 = 12 V**
0xCD	0x0C	Control Gear External Supply Voltage (LSB)				
0xCD	0x0D	Control Gear External Power Supply Voltage Frequency	0x00			Scaling factor and unit: 1 Hz. **Example: 0 Hz in case of pure DC voltage**
0xCD	0x0E	Control Gear Power Factor	0x64			Scaling factor and unit: 0.01. **Example: Power factor 0x64 = 100 * 0.01 = 1**
0xCD	0x0F	Control Gear Overall Failure Condition	0x00			Control gear overall failure condition indicates the status of the control gear failure. Valid range: [0 1]
0xCD	0x10	Control Gear Overall Failure Condition Counter	0x00	0x00	NVM – Read only	Counts whenever the control gear failure status changes from 0 to 1
0xCD	0x11	Control Gear External Supply Under Voltage	0x00	No change	RAM – Read only	Indicates the fault condition when the control gear external supply voltage is less than the control gear external supply under voltage threshold.

						Valid range: [0 1]
0xCD	0x12	Control Gear External Supply Under Voltage Counter	0x00	0x00	NVM – Read only	Counts whenever the control gear external supply under voltage status changes from 0 to 1
0xCD	0x13	Control Gear External Supply Over Voltage	0x00	No change	RAM – Read only	Indicates the fault condition when the control gear external supply voltage is greater than the control gear external supply over voltage threshold. Valid range: [0 1]
0xCD	0x14	Control Gear External Supply Over Voltage Counter	0x00	0x00	NVM – Read only	Counts whenever the control gear external supply over voltage status changes from 0 to 1
0xCD	0x15	Control Gear Output Power Limitation	0x00	No change	RAM – Read only	Indicates the fault condition when the control gear output power is greater than the control gear output power threshold. Valid range: [0 1]
0xCD	0x16	Control Gear Output Power Limitation Counter	0x00	0x00	NVM – Read only	Counts whenever the control gear output power limitation status changes from 0 to 1
0xCD	0x17	Control Gear Thermal Derating	0x00	No change	RAM – Read only	Indicates the fault condition when the control gear temperature is greater than the control gear thermal derating threshold. Valid range: [0 1]
		Control Gear Thermal Derating Counter				Counts whenever the control gear thermal derating status changes

0xCD	0x18		0x00	0x00	NVM – Read only	from 0 to 1
0xCD	0x19	Control Gear Thermal Shutdown	0x00	No change	RAM – Read only	Indicates the fault condition when the control gear temperature is greater than the control gear thermal shutdown threshold. Valid range: [0 1]
0xCD	0x1A	Control Gear Thermal Shutdown Counter	0x00	0x00	NVM – Read only	Counts whenever the control gear thermal shutdown status changes from 0 to 1
0xCD	0x1B	Control Gear Temperature	0x00	No change	RAM – Raed only	Scaling factor and unit: 1 °C Offset value = 60 **Example: A value of 60 means 0°C (60 - offset)**
0xCD	0x1C	Control Gear Output Current Percent	0x00	No change	RAM – Read only	Scaling factor and unit: 1 %

2.10 Memory Bank 206

Memory bank 206 contains the diagnostics and maintenance data related to the light source. Memory bank 206 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xCE	0x00	Address of last accessible memory location	0x20	0x20	ROM	
0xCE	0x01	Checksum of memory bank 206	0x40	0x40	ROM	
0xCE	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xCE	0x03	Memory bank version	0x01		ROM	
0xCE	0x04	Light Source Start Counter Resettable (MSB)	0x00		NVM	Counts up one step each time the lampoon bit transitions from 0 to 1. This value can be changed by writing different value into the memory locations using "WRITE MEMORY LOCATION" command
0xCE	0x05	Light Source Start Counter Resettable				
0xCE	0x06	Light Source Start Counter Resettable (LSB)				
0xCE	0x07	Light Source Start Counter (MSB)				Counts up one step each time the lampoon bit transitions from 0 to 1.

0xCE	0x08	Light Source Start Counter	0x00	No change (contains the data that it has previously)		These memory locations have only read access.
0xCE	0x09	Light Source Start Counter (LSB)				
0xCE	0x0A	Light Source on Time Resettable (MSB)	0x00		NVM	Counts the operating time of the light source in seconds. Counts up as long as the lampon bit = 1. This value can be changed by writing different value into the memory locations using "WRITE MEMORY LOCATION" command
0xCE	0x0B	Light Source on Time Resettable				
0xCE	0x0C	Light Source on Time Resettable				
0xCE	0x0D	Light Source on Time Resettable				
0xCE	0x0E	Light Source on Time (MSB)	0x00			Counts the operating time of the light source in seconds as long as the lampon bit = 1. These memory locations have only read access.
0xCE	0x0F	Light Source on Time				
0xCE	0x10	Light Source on Time				
0xCE	0x11	Light Source on Time (LSB)	0x00			
0xCE	0x12	Light Source Voltage (MSB)	0x00	No change	RAM – Read only	Scaling factor and unit: 0.1 V **Example: 0x0078 = 120 * 0.1 = 12 V**
0xCE	0x13	Light Source Voltage (LSB)				
0xCE	0x14	Light Source Current (MSB)	0x00	No change	RAM – Read only	Scaling factor and unit: 0.001 A **Example: 0x2EE0 = 12000 * 0.001 = 1.2 A**
0xCE	0x15	Light Source Current (LSB)				

0xCE	0x16	Light Source Overall Failure Condition	0x00	No change	RAM – Raed only	Light source overall failure condition indicates the status of the lamp failure. Valid range: [0 1]
0xCE	0x17	Light Source Overall Failure Condition Counter	0x00	0x00	NVM – Read only	Counts whenever the Light source overall failure status changes from 0 to 1
0xCE	0x18	Light Source Short Circuit	0x00	No change	RAM -Read only	Indicates the fault condition when short circuit occurs at the light source. Valid range: [0 1]
0xCE	0x19	Light Source Short Circuit Counter	0x00	0x00	NVM – Read only	Counts whenever the light source short circuit status changes from 0 to 1
0xCE	0x1A	Light Source Open Circuit	0x00	No change	RAM – Raed only	Indicates the fault condition when open circuit occurs at the light source. Valid range: [0 1]
0xCE	0x1B	Light Source Open Circuit Counter	0x00	0x00	NVM – Read only	Counts whenever the light source open circuit status changes from 0 to 1
0xCE	0x1C	Light Source Thermal Derating	0x00	No change	RAM – Read only	Indicates the fault condition when the light source temperature is greater than the light source thermal derating threshold. Valid range: [0 1]

0xCE	0x1D	Light Source Thermal Derating Counter	0x00	0x00	NVM – Read only	Counts whenever the light source thermal derating status changes from 0 to 1
0xCE	0x1E	Light Source Thermal Shutdown	0x00	No change	RAM – Read only	Indicates the fault condition when the light source temperature is greater than the light source thermal shutdown threshold. Valid range: [0 1]
0xCE	0x1F	Light Source Thermal Shutdown Counter	0x00	0x00	NVM – Read only	Counts whenever the light source thermal shutdown status changes from 0 to 1
0xCE	0x20	Light Source Temperature	0x00	No change	RAM – Raed only	Scaling factor and unit: 1 °C Offset value = 60 **Example: A value of 60 means 0°C (60 - offset)**

2.11 Memory Bank 207

Memory bank 207 contains the OEM related data. Memory bank 207 has both read and write access. Write access is disabled for the first two memory locations of this memory bank. The memory location 0x02 contains the memory bank lock byte. In order to start writing into this memory bank, the value in the 0x02 memory location should be changed to 0x55 from any other value first and then start writing into other memory locations.

Memory bank number (DTR1)	Memory bank address (DTR0)	Description	Default value	RESET value	Memory type	More information
0xCF	0x00	Address of last accessible memory location	0x07	0x07	ROM	
0xCF	0x01	Checksum of memory bank 207	0x30	0x30	ROM	
0xCF	0x02	Memory bank lock byte	0xFF	0xFF	RAM	0xFF: read only 0x55: read/write
0xCF	0x03	Memory bank version	0x01	0x01	ROM	
0xCF	0x04	Rated Median Useful Life of Luminaire	0xFF	No change	NVM – Read/Write	Rated median useful life of luminaire is the rated useful life of the luminaire including light source, control gear. Scaling factor and unit: 1000 h **Example: 0x10 = 16 * 1000 = 16000 h**
0xCF	0x05	Internal Control Gear Reference Temperature	0xFF			Scaling factor and unit: 1 °C Offset value = 60 **Example: A value of 60**

						means 0°C (60 - offset)
0xCF	0x06	Rated Median Useful Light Source Starts (MSB)	0XFF	No change	NVM – Read/Write	This parameter represents the average rated useful light source starts of the luminaire. A start is defined as a transition of lamp on bit from 0 to 1. Scaling factor and unit: 100 **Example: A value of 60 means 6000 starts**
0xCF	0x07	Rated Median Useful Light Source Starts (LSB)	0xFF			