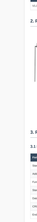
DCC Charger Controller Modbus Protocol V1.0

1. Revision History

Version	Update Date	Update Content
V1.0	2025.08.04	Initial Release (Content for DCC and AC Assembly)

2. Pin Definitions



- ① +5V (Power positive, load capacity not less than 200mA)
- ② A (RS485 A+ bus signal)
- ③ B (RS485 B- bus signal)
- ④ GND (Power ground/communication ground)
- ⑤ NC (Not connected, not allowed for other functions)
- ⑥ CAN_H (CAN bus signal)
- ⑦ NC (Not connected, not allowed for other functions)
- ⑧ CAN_L (CAN bus signal)

Notes:

- RS485 initial baud rate: 9600bps
- CAN initial baud rate: 500kbps
- RS485 and CAN can be combined into a single physical interface in separated into two physical interfaces
- Products without CAN interface requirements may ignore CAN pin definitions

3. Protocol Definition

3.1 Format

Field	Length	Description
Start Defense	>10ms	
Address Code	1 BYTE	Range: 01H ~ FFH (1 ~ 255), 00H broadcast address, FFH universal address
Function Code	1 BYTE	03H/06H/10H/78H
Starting Address	2 BYTE	Register address
Data Length	2 BYTE	Read/write data length
CRC Check	2 BYTE	CRC checksum for address code, function code, and data
End Defender	>10ms	

3.2 Specifications

- **Start Defender**: >10ms
- **Address Code**: 1 byte, range: 01H ~ FFH (decimal 1 ~ 247), 00H is broadcast address (all slaves respond but don't return commands), FFH is universal address code (all slaves respond and return acknowledgment). The universal address code FFH functions the same as the device's current Device ID.
- **Function Code**: 1 byte

Important Notes:

1. Data addresses and data are 2 bytes, with high byte sent first, then low byte, whereas CRC is sent with low byte first, then high byte.
2. Error code for server frames data errors; client returns error exception response function code. Error code = Function code | 80H
3. Exception code description:
   - 01H – Unsupported function code
   - 02H – Incorrect PDU starting address or PDU starting address + data length exceeds legal range
   - 03H – Data for reading registers or writing registers is too long
   - 04H – Client failed to read or write registers
   - 05H – Incorrect checksum in server data

- **Starting Address**: 2 bytes
- **Data Length**: 2 bytes
- **CRC Check**: 2 bytes, CRC checksum of address code, function code, and data bytes
- **End Defender**: >10ms

Command Name	Data Access Type	Function Code	Error Code
Read single or multiple word registers	MOMO	03H	83H
Write single word register	MOMO	06H	86H
Write continuous N word registers	MOMO	10H	90H
Restore factory defaults	No byte access	78H	F8H
Clear battery records	No byte access	79H	F9H

3.3 Examples

1) Reading Registers

Request:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	03H
Starting address	WORD	0000H ~ FFFFH
Number of words to read	WORD	0001H ~ 007DH
Checksum	WORD	CRC checksum of all above bytes

Normal Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	03H
Data length	BYTE	Read data length N
Data content	WORD	Read data high byte first, then low byte
	WORD	Read data high byte first, then low byte
Checksum	WORD	CRC checksum of all above bytes

Exception Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Error code	BYTE	83H
Exception code	BYTE	0.01, 0.2, 0.3, 0.4
Checksum	WORD	CRC checksum of all above bytes

2) Writing Single Register

Request:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	06H
Starting address	WORD	0000H ~FFFFH
Write data	WORD	0000H ~FFFFH
Checksum	WORD	CRC checksum of all above bytes

Normal Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	06H
Starting address	WORD	0000H ~FFFFH
Write data	WORD	0000H ~FFFFH
Checksum	WORD	CRC checksum of all above bytes

Exception Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Error code	BYTE	86H
Exception code	BYTE	0.01, 0.2, 0.3, 0.4
Checksum	WORD	CRC checksum of all above bytes

3) Writing Continuous N Registers

Request:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	10H
Starting address	WORD	0000H ~FFFFH
Number of bytes to write	WORD	0001H ~ 007DH
Quantity of words	BYTE	2 x number of words
Data content	WORD	Write data high byte first, then low byte
	WORD	Write data high byte first, then low byte
Checksum	WORD	CRC checksum of all above bytes

Normal Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	10H
Starting address	WORD	0000H ~FFFFH
Number of bytes to write	WORD	0001H ~ 007DH
Checksum	WORD	CRC checksum of all above bytes

Exception Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Error code	BYTE	90H
Exception code	BYTE	0.01, 0.2, 0.3, 0.4
Checksum	WORD	CRC checksum of all above bytes

4) Restore Factory Defaults

Request:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	78H
Padding data	WORD	0000H
Padding data	WORD	0000H
Checksum	WORD	CRC checksum of all above bytes

Normal Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	78H
Padding data	WORD	0000H
Padding data	WORD	0000H
Checksum	WORD	CRC checksum of all above bytes

Exception Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Error code	BYTE	F8H
Exception code	BYTE	0.01, 0.2, 0.3, 0.4
Checksum	WORD	CRC checksum of all above bytes

5) Clear History Records

Request:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	79H
Padding data	WORD	0000H
Padding data	WORD	0000H
Checksum	WORD	CRC checksum of all above bytes

Normal Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Function code	BYTE	79H
Padding data	WORD	0000H
Padding data	WORD	0000H
Checksum	WORD	CRC checksum of all above bytes

Exception Response:

Description	Bytes	Command
Device address	BYTE	01H ~ FFH
Error code	BYTE	F9H
Exception code	BYTE	0.01, 0.2, 0.3, 0.4
Checksum	WORD	CRC checksum of all above bytes

4. PDU Address Allocation Table

System information

PDU Address	Bytes	R/W	Description	Size/Range	Meaning	Unit	Remarks
0x1A00	2	R	Current/Device address	0 ~ 247	0 means factory default, 1 ~ 247 is current address		Use it only

Dynamic Data information

PDU Address	Bytes	R/W	Description	Data/Range	Meaning	Unit	Remarks
0100H	2	R	Battery Battery SOC	0 ~ 100	Current battery capacity percentage	%	
0101H	2	R	Battery voltage		Voltage	0.1V	
0102H	2	R	Total charging current		Solar + generator combined charging current to battery	0.01A	Solar + Generator
0104H	2	R	Generator voltage		Voltage	0.1V	
0105H	2	R	Generator charging current		Current	0.01A	
0106H	2	R	Generator charging power		Actual value	W	
0107H	2	R	Solar panel voltage		Voltage	0.1V	
0108H	2	R	Solar panel current		Current	0.01A	
0109H	2	R	Solar charging power		Actual value	W	
010BH	2	R	Daily minimum backup battery voltage		Voltage	0.1V	
010CH	2	R	Daily maximum backup battery voltage		Voltage	0.1V	
010DH	2	R	Daily maximum charging current		Current	0.01A	Solar + Generator
010FH	2	R	Daily maximum charging power		Actual value	W	Solar + Generator
0111H	2	R	Daily charging amp-hours		Actual value	AH	Solar + Generator
0113H	2	R	Daily power generation		Actual value	0.1KWH	Solar + Generator
0115H	2	R	Total operation days		Actual value	days	
0116H	2	R	Total backup battery over-discharge times		Actual value		
0117H	2	R	Total backup battery fully charged times		Actual value		
0118H	4	R	Total backup battery charging amp-hours		Actual value	AH	Solar + Generator
011BH	4	R	Cumulative power generation		Actual value	0.1KWH	Solar + Generator
011EH	2	R	Light Load, Maximum Line 8 Bit: Charging status Charge Equipment		Bit0: Charging not started 0/1: Reserved Bit2-3: Charging mode (00/01: Equipment charging mode (Solar/Generator) 10/11: Reserved) Bit4: Fault Bit5: Charging 0/1: Not charging/Charging Bit6-7: Reserved Bit8: Light load 0/1: Not overload/Overload Bit9: Controller temperature overheating 0/1: Reserved Bit10: Backup battery current limiting protection Bit11: Battery battery low voltage protection Bit12: Backup battery over-discharge Bit13: Backup battery over-voltage Bit14: Reserved Bit15: Reserved	Bit = 1 indicates fault, Bit = 0 indicates normal. Returns 0000000000 when no faults.
011FH	2	R	Light Load, Maximum Line 8 Bit: Charging status Charge Equipment		Bit0-1: Reserved Bit2: Backup battery low temperature 0/1: Load short circuit protection Bit3: Load overload protection Bit4: PV input terminal overvoltage Bit5: Reserved Bit7: PV input power too large Bit8: Backup battery temperature overheating Bit9: Controller internal overheating 1 Bit10: Reserved Bit11: Backup battery reverse connection protection Bit12: Backup battery undervoltage warning Bit13: Backup battery low voltage Bit14: Backup battery over-discharge	Bit = 1 indicates fault, Bit = 0 indicates normal. Returns 0000000000 when no faults.
0120H	2	R	Actual charging power of charger output		Actual value	W	
0128H	2	R	Charging status monitoring		0: Standby 1: Starting battery forward charging 2: Battery forward charging 3: Ending battery reverse charging 4: Reserved 5: Solar only forward charging 6: Reserved 7: Solar and starting battery joint forward charging 8: Ending battery reverse charging 9-255: Reserved	
0129H	2	R	System signal line status		0: system signal line not connected 1: system signal line connected	

Parameter Settings

PDU Address	Bytes	R/W	Description	Data/Range	Meaning	Unit	Remarks
0300H	2	R/W	High-End, System Voltage Level, Low-End Voltage	12 ~ 48	Not configurable	V	
0304H	2	R/W	Battery battery type	0 ~ 4	0:Custom, 1:Open, 2:Sealed, 3:Gel, 4:LiFePo4		
0305H	2	R/W	Overvoltage threshold	9 ~ 17	Setting range: 17.1V Example: To set 17.0V, multiply by 10: 17.0×10=170, get hex 00AAH, write to register	V	
0306H	2	R/W	Charging limit voltage	9 ~ 17		V	
0307H	2	R/W	Equalization charging voltage	9 ~ 17		V	
0308H	2	R/W	Boost charging return voltage	9 ~ 17		V	
0309H	2	R/W	Float charging voltage	9 ~ 17		V	
030AH	2	R/W	Boost charging return voltage	9 ~ 17		V	
030BH	2	R/W	Over-discharge return voltage	9 ~ 17		V	
030CH	2	R/W	Undervoltage warning voltage	9 ~ 17		V	
030DH	2	R/W	Over-discharge voltage	9 ~ 17		V	
030EH	2	R/W	Discharge limit voltage	9 ~ 17		V	
0310H	2	R/W	Over-discharge delay time	0 ~ 120		S	
0311H	2	R/W	Equalization charging time	0 ~ 300		Min	
0312H	2	R/W	Boost charging time	10 ~ 300		Min	
0313H	2	R/W	Equalization charging interval	0 ~ 255	0: Disabled	day	
0314H	1	R/W	Temperature compensation coefficient	0 ~ 9	0: No compensation	mV/ °C/2V	
0315H	2	R/W	Reverse charging threshold current	15 ~ 75	After fixing battery to 48V, charger start supplying power to starting battery. When starting battery voltage reaches 52V, charger stops charging to starting battery.	0.1A	Default 21.7A
0316H	2	R/W	Solar low-power cutoff current	0 ~ 100	1. Users can set solar cutoff current value in 0.01A/0.1A/0.2A/0.5A/1A increments. 2. Shutdown range: 0.1A/0.2A/0.5A/1A, can be adjusted up or down.	A	Default 1A

Historical Data Records

PDU Address	Bytes	R/W	Description	Data Structure	Remarks
0xF000	2	R	Current day historical data	Block size 32 bytes (16 WORDs)	Returns data in sequence: Historical daily maximum battery voltage (16-bit, high byte first); Historical daily minimum battery voltage (16-bit, high byte first); Historical daily maximum charging current (16-bit, high byte first); Historical daily maximum charging power (16-bit, high byte first); Historical daily maximum load current (16-bit, high byte first); Historical daily maximum load power (16-bit, high byte first); Historical daily discharge AH (32-bit, high byte first); Historical daily charge AH (32-bit, high byte first); Reserved (32-bit, high byte first)
0xF001	2	R	1 day ago data	Block size 32 bytes	Same as 0xF000 but 1 day ago data. Returns data block from 2000H~2FFFH range. Block size 32 bytes, each data occupies 16 bits.
0xF800	2	R	Current day historical data with timestamp	Block size 36 bytes (18 WORDs)	Returns data in sequence: Historical daily maximum battery voltage (16-bit, high byte first); Month (8 bits, high byte first); Day (8 bits, high byte first); Historical daily minimum battery voltage (16-bit, high byte first); Month (8 bits, high byte first); Day (8 bits, high byte first); Historical daily maximum charging current (16-bit, high byte first); Month (8 bits, high byte first); Day (8 bits, high byte first); Historical daily maximum charging power (16-bit, high byte first); Month (8 bits, high byte first); Day (8 bits, high byte first); Historical daily maximum load current (16-bit, high byte first); Month (8 bits, high byte first); Day (8 bits, high byte first); Historical daily maximum load power (16-bit, high byte first); Month (8 bits, high byte first); Day (8 bits, high byte first); Historical daily discharge AH (32-bit, high byte first); Historical daily charge AH (32-bit, high byte first); Reserved (32-bit, high byte first)
0xF801	2	R	1 day ago data with timestamp	Block size 36 bytes	Same as 0xF800, but 1 day ago data, 0xF800 reads 0xF000 data, 0xF801 reads 0xF001 data. Returns data block from 2000H~2FFFH range. Block size 32 bytes.

Communication Examples for DC Assembly Historical Data with Timestamp

Reading Historical Data with Timestamp

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Read 1 day ago data with timestamp:
Send: 7F 03 20 01 00 24 1E 1C
Receive: 7F 03 24 27 19 05 1B 00 00 00
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