

DCEM-7MS

8 Channels DC Energy Meter

User Manual



Version: 1.10

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Read me

When you use DCEM-7MS Dual-channel DC energy meter, be sure to read this user manual carefully, and be able to fully understand the implications, the correct guidance of operations in accordance with user manual, which will help you make better use of DCEM-7MS Dual-channel DC energy meter and help to solve the various problems at the scene.

1. Before the meter turns on the power supply, be sure that the power supplies are within the provisions of the instrument.
2. When installation, the current input terminal must be non-open; voltage input terminals must non-short circuit.
3. Be sure the instrument wiring consistent with the internal system settings.
4. When communicating with the PC, instrument communication parameters must be consistent with the PC.



- **Please read this user manual carefully**
- **Please save this document**

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1.- SUMMARIZE

DCEM-7MS meter is an advanced solution for multi-channel metering in DC system. It provides 8 channels, fully isolated for collect voltage, current, power data and energy generate & consumption data. With RS485 communication interface, DCEM-7MS can be connected to the monitoring center or on-site host. It is a high-performance automatic metering device suitable for solar plant and Telecom server room, BMS application in UPS system etc.

2.- SPECIFICATIONS

Parameters	Value
Power supply	DC 9-30V
Max. power consumption	1.5W
Current input	1mA, 20mA, 100mA, 1A, 5A, 10A DC direct access, over 10A use hall CT or Shunt (Refer the sticker of meter body)
Voltage input	75mV, 1V, 5V, 10V, 50V, 100V, 250V, 400V, 500VDC (Refer the sticker of meter body)
Frequency response	0-1000Hz
Sampling ratio	20ms, 40ms, 60ms, 80ms, 100ms, 400ms, 1000ms adjustment, default 100ms
Reference standard	Basic electricity: IEC 61557-12:2007 Active energy: IEC 62053-21:2003
Accuracy	Current: 0.2%fs (depends on CT); Voltage: 0.2%fs Active power: 0.5%fs; Energy: 0.5%fs
Load Resistance	Current: <0.15V / channel; Voltage: >2Kohm/V
Overload	Current: 1.2 times rated continuous; 50ms for 5 times the rated. Voltage: 1.5 times rated continuous;
Dielectric strength	IEC/EN 61010-1:2010; 2kV AC RMS 1 minute, between input / output / case / power supply; Lightning surge: 2KV;
Work environment	Temperature: -20°C~+70°C; Humidity: RH 20%~95% (No condensation)
Storage environment	Temperature: -25°C ~+70°C; Humidity: RH 20%~95% (No condensation)
Dimensions	W × H × D =120X110X50mm (with wiring terminal)
Protection	Panel: IP40

3.- COMMUNICATION PROTOCOL

3.1. - Connection for the RS485 BUS

The composition of the RS-485 cabling must be carried out with a meshed screen cable (minimum 3 wire), diameter of not less than 0.5mm², with a maximum distance of 1,200m between the meter and the master unit. This Bus may connect a maximum of 32 DCEM-7MS.

3.2. - Register Address Table

-. Basic Power Data

Address	Data	Byte mode		Instruction
0x00	U_1	Int	2	Voltage value from Channel_1 to Channel_8 Unsigned value in register, unit V Real Voltage data calculating formula: [Value] / [10000] * [Volt range]
0x01	U_2	Int	2	
0x02	U_3	Int	2	
0x03	U_4	Int	2	
0x04	U_5	Int	2	
0x05	U_6	Int	2	
0x06	U_7	Int	2	
0x07	U_8	Int	2	
0x08	I_1	Int	2	Current value from Channel_1 to Channel_8 Unsigned value in register, unit A Real Current data calculate formula: [Value] / [10000] * [Amp range]
0x09	I_2	Int	2	
0x0A	I_3	Int	2	
0x0B	I_4	Int	2	
0x0C	I_5	Int	2	
0x0D	I_6	Int	2	
0x0E	I_7	Int	2	
0x0F	I_8	Int	2	
0x10	P_1	Int	2	Power value from Channel_1 to Channel_8 Unsigned value in register, unit W Real Power data calculate formula: [Value] / [10000] * [Volt range] * [Amp range]
0x11	P_2	Int	2	
0x12	P_3	Int	2	
0x13	P_4	Int	2	
0x14	P_5	Int	2	
0x15	P_6	Int	2	
0x16	P_7	Int	2	
0x17	P_8	Int	2	
0x18-19	E_1+	Long	4	Energy Consumption value from Channel_1 to Channel_8
0x1A-1B	E_2+	Long	4	

0x1C-1D	E_3+	Long	4	Unsigned value in register, unit kWh
0x1E-1F	E_4+	Long	4	
0x20-21	E_5+	Long	4	
0x22-23	E_6+	Long	4	
0x24-25	E_7+	Long	4	Real Power data calculate formula: [Value] / [10000] * [Volt range] * [Amp range] / [1000*3600]
0x26-27	E_8+	Long	4	
0x28-29	E_1-	Long	4	
0x2A-2B	E_2-	Long	4	
0x2C-2D	E_3-	Long	4	Energy generate value from Channel_1 to Channel_8 Unsigned value in register, unit kvarh Real Power data calculate formula: [Value] / [10000] * [Volt range] * [Amp range] / [1000*3600]
0x2E-2F	E_4-	Long	4	
0x30-31	E_5-	Long	4	
0x32-33	E_6-	Long	4	
0x34-35	E_7-	Long	4	
0x36-37	E_8-	Long	4	

-. Supplementary data, negative value

Address	Data	Byte mode		Instruction
0x38	U_1-	Int	2	Voltage value from Channel_1 to Channel_8 Signed value in register, Negative, unit V Real Voltage data calculate formula: [Value] / [10000] * [Volt range]
0x39	U_2-	Int	2	
0x3A	U_3-	Int	2	
0x3B	U_4-	Int	2	
0x3C	U_5-	Int	2	
0x3D	U_6-	Int	2	
0x3E	U_7-	Int	2	
0x3F	U_8-	Int	2	
0x40	I_1-	Int	2	Current value from Channel_1 to Channel_8 Signed value in register, Negative, unit A Real Current data calculate formula: [Value] / [10000] * [Amp range]
0x41	I_2-	Int	2	
0x42	I_3-	Int	2	
0x43	I_4-	Int	2	
0x44	I_5-	Int	2	
0x45	I_6-	Int	2	
0x46	I_7-	Int	2	
0x47	I_8-	Int	2	

Notes: high bit first, low bit next. (AB CD)

Amp range and Volt range please refer to the meter front sticker

-. Meter status data [Write & Read]

Address	Data	Byte mode		Instruction
0x4F	Response time	int	2	0: 100ms; 1: 80ms; 2: 60ms; 3: 40ms; 4: 20ms; 5: 400ms; 6: 1000ms
0x50	Meter Addr.	int	2	1-255
0x51	Baud ratio	int	2	03: 38000bps 04: 2400bps 05: 4800bps 06: 9600bps 07: 19200bps 08: 38400bps 09: 57600bps 0A: 115200bps
0x52	Check	int	2	0: No parity; 1: Odd check; 2: Even parity 3: 2 stop bit, flag bit; 4: 2 stop bit, space bit;
0x53	Volt range	int	2	Just for indicate, default are 1
0x54	Amp range	int	2	
0x55-57	Device name	int	6	High bit first, user can re-write this for distinguish use

-. Energy record counter reset, [Write only]

Address	Data	Byte mode		Instruction
0xE0	/	int	2	Write 0 to reset all energy counter
0xE1	/	int	2	Write 0 to reset energy consumption counter
0xE2	/	int	2	Write 0 to reset energy generate counter

3.3.- RS485 configuration by hardware access

There is an 8-bit DIP switch on inside PCB for RS485 address and Baud ratio setting. If forget RS485 setting, user can use this switch to recover RS485 port.

Bit 1-6 for simulate BIN code to related RS485 address, "bit 1" for lowest bit, value from 1~63

Bit 7-8 for simulate BIN code to related Baud ratio, "bit 7" for low bit

0 for 115200bps, 1 for 9600bps, 2 for 19200bps, 3 for 38400bps

Demo photo	BIN code	Dec value	Parameter be set
	000001	1	Addr. 01
	10	2	Baud: 19200

Notes: When use this PID switch to operate RS485 port, need to short jumper **DZ01**, default setting are from register operate, please refer to next Chapter.

4.- SAFETY CONSIDERATIONS



All installation specification described at the previous chapters named:
INSTALLATION AND STARTUP, INSTALLATION MODES and SPECIFICATIONS.

Please note that with the instrument powered on, the terminals could be dangerous to touching and cover opening actions or elements removal may allow accessing dangerous parts. This instrument is factory-shipped at proper operation condition.

- ◆ The device must have a professional installation and maintenance.
- ◆ Any operation of the device, you must cut off the input signal and power.

5.- MAINTENANCE

The DCEM-7MS meter does not require any special maintenance. No adjustment, maintenance or repairing action should be done when the instrument is open and powered on, should those actions are essential, high-qualified operators must perform them.

Before any adjustment, replacement, maintenance or repairing operation is carried out, the instrument must be disconnected from any power supply source.

When any protection failure is suspected to exist, the instrument must be immediately put out of service. The instrument's design allows a quick replacement in case of any failure.

For any inquiry about the instrument performance or any failure, contact to Blue Jay's technical service.

Blue Jay - After-sales service

E-mail: tech@cqbluejay.com