

Multi-channel Circuit Metering System

BJ-MCM2401

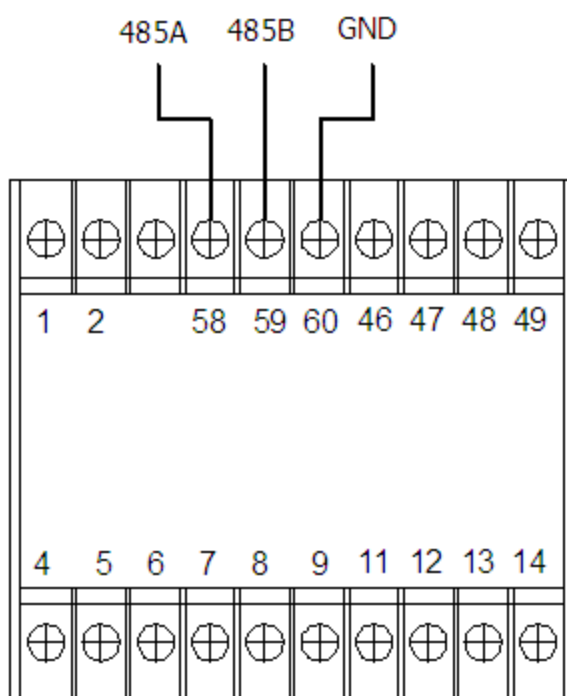
MODBUS register map

Version: 1.2

5. - COMMUNICATION PROTOCOL

5.1. - 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 1,200 m between the BJ194... and the master unit. This Bus may connect a maximum of 32 BJ194...



Note:

1. For communication with the master unit, customers can choose the RS-232 to RS-485 converter to use
2. Full range of BJ-... meter RS485 PIN number is 58,59,60
3. Due to product modifications or custom requirements, the interface pin place may be changed. For details, please refer to product label on the rear board

5.2. - MODBUS © protocol

Modbus RTU Frame Format:

| | | |
|-------------------------|---------------|--|
| Address code | 1 BYTE | <i>Slave device address 1-247</i> |
| Function code | 1 BYTE | <i>Indicates the function codes like read coils / inputs</i> |
| Data code | 4 BYTE | <i>Starting address, high byte Starting address, low byte Number of registers, high byte Number of registers, low byte</i> |
| Error Check code | 2 BYTE | <i>Cyclical Redundancy Check (CRC)</i> |

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MODBUS FUNCTIONS

| Code: | Meaning: | Description: |
|--------------------|-------------------------|---|
| FUNCTION 03 | Reading of n Words | <i>This function permits to read all the electrical parameters of the BJ194...series.</i> |
| FUNCTION 06 | Preset single Registers | <i>Write value in to the relevant register</i> |

Note: Float data follow **IEEE754**, float low bit first, high bit next. **(CD AB)**

5.3. - Register Map

5.3.1- Basic Power Data—Primary Side (Read only)

| Address | Data | Byte mode | | Instruction |
|---------|----------------|-----------|---|--|
| 0 | CH1_U | float | 2 | Channel_1 Phase to Line Voltage, Unit: V |
| 2 | CH1_I | float | 2 | Channel_1 Current, Unit: A |
| 4 | CH1_P | float | 2 | Channel_1 active power, Unit: kW |
| 6 | CH1_Q | float | 2 | Channel_1 reactive power, Unit: kVar |
| 8 | CH1_S | float | 2 | Channel_1 apparent power, Unit: kVA |
| 10 | CH1_PF | float | 2 | Channel_1 Total power factor, 0~1.000 |
| 12 | CH1_FR | float | 2 | Channel_1 Frequency, Unit:0.01Hz |
| 14 | CH1_EpZ+ | float | 2 | Channel_1 positive active energy, Unit: kWh |
| 16 | CH1_EpZ- | float | 2 | Channel_1 negative active energy, Unit: kVarh |
| 18 | CH1_EqZ+ | float | 2 | Channel_1 positive reactive energy, Unit: kVarh |
| 20 | CH1_EqZ- | float | 2 | Channel_1 negative reactive energy, Unit: kWh |
| 22-42 | CH2 parameter | float | 2 | Structure refer to Channel_1 |
| 44-64 | CH3 parameter | float | 2 | |
| | / | / | / | |
| 242-262 | CH12 parameter | float | 2 | |

5.3.2- Meter status data, Read & Write (Disabled)

| Address | Data | Byte mode | | Instruction | Status |
|---------|-----------------|-----------|---|--|--------|
| 1200 | Digital output | int | 1 | 0: without act 1: active for trig | R |
| 1202 | Alarm | int | 1 | 0: without alarm 1: Alarm triggered Bit 0~4 show Alarm_1~5 status | R |
| 1203 | DO working mode | int | 1 | 0: Remote control 1: Related to Alarm_1 2: Related to Alarm_2 3: Related to Alarm_3 4: Related to Alarm_4 5: Related to Alarm_5 6: trig to closed 7: trig to opened | R/W |
| 1204 | DO time delay | int | 1 | In alarm mode: 0.0-999.9sec In remote control mode: 0 for Level output: other value for pulse width 0.1-999.9sec | R/W |
| 1240 | Wiring mode | int | 1 | 0: 3P4W 1: 3P3W-2CT 2: 3P3W-3CT | R |
| 1241 | Voltage range | int | 1 | Unit: V | R |
| 1242 | Current range | int | 1 | Unit: mA | R |
| 1243 | PT ratio | int | 1 | Range: 1-9999 | R |
| 1244 | CT of CH1 | int | 1 | Range: 1-9999 | R |
| 1245 | CT of CH2 | int | 1 | Range: 1-9999 | R |
| 1246 | CT of CH3 | int | 1 | Range: 1-9999 | R |
| 1247 | CT of CH4 | int | 1 | Range: 1-9999 | R |

5.3.3 - Voltage harmonic (max 21th) , Read Only

| Address | Data | Byte mode | | Instruction |
|-----------|-------|-----------|---|---|
| 1300 | THDU | int | 1 | Voltage THD, unit 0.1% |
| 1301 | TOHDU | int | 1 | Voltage odd harmonic total distortion, unit 0.1% |
| 1302 | TEHDU | int | 1 | Voltage even harmonic total distortion, unit 0.1% |
| ... | / | / | / | Reserved |
| 1310-1329 | HU | int | 1 | Voltage harmonic ratio for 2 to 21th, unit 0.1% |

5.3.4 - Current harmonic (max 21th), Read Only

| Address | Data | Byte mode | | Instruction |
|-----------|---------------|-----------|----|---|
| 1400 | THDI1 | int | 1 | Channel_1 Current THD, unit 0.1% |
| 1401 | / | / | / | Reserved |
| 1402 | / | / | / | Reserved |
| 1403 | TOHDI1 | int | 1 | Channel_1 Current odd harmonic total distortion, unit 0.1% |
| 1404 | / | / | / | Reserved |
| 1405 | / | / | / | Reserved |
| 1406 | TEHDI1 | int | 1 | Channel_1 Current even harmonic total distortion, unit 0.1% |
| 1407 | / | / | / | Reserved |
| 1408 | / | / | / | Reserved |
| 1410-1429 | HI1 | int | 20 | Channel_1 Current harmonic ratio for 2 to 21th, unit 0.1% |
| 1430-1459 | CH2 Harmonic | int | 20 | Structure refer to Channel_1 |
| 1460-1489 | CH3 Harmonic | int | 20 | |
| | / | // | | |
| 1730-1759 | CH12 Harmonic | int | 20 | |

5.3.5 – Special operation (Disabled)

| Address | Data | Byte mode | | Instruction | Status |
|---------|----------------------|-----------|---|---|--------|
| 3000 | Reset energy counter | int | 1 | Send code 0x0A0A (DEC 2570) to clear all the energy counter | W |