

MU200-4DA Analog Output Module

User Quick Start Manual

Thank you for using MU200-4DA analog quantity output module independently developed and produced by MEGMEET, which is mainly combined with MU200 series main module to complete the 4-channel analog quantity output function. Before using the product, please carefully read this manual so as to better understand it, fully use it, and ensure safety. This quick start manual is to offer you a quick guide to the design, installation, connection and maintenance of MU200-4DA for the convenience of users to access the required information on site, and provide a brief introduction to relevant accessories, FAQs, etc.

This manual is suitable for the following MU200 series members:

MU200-4DA 4-channel analog quantity output module

Version Number: A00

Date: 2022-10-14

BOM Code: R33010832

For detailed product information, please refer to *MU200 Series PLC User Manual*, *MU200 Series PLC Programming Reference Manual*. For ordering the above user manuals, contact your Megmeet distributor or download from MEGMEET website (www.megmeet.com).

1. Outline and Component Name

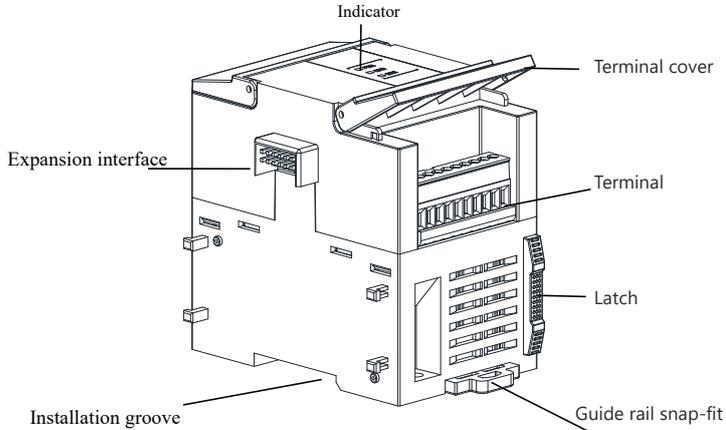


Fig 1-1 Outline structure diagram of expansion module

2. Installation

2.1 Standard 35mm DIN slot installation

- ◆ Fixed installation guide rails;
- ◆ Open the DIN snap-fit at the bottom of the module and fix the bottom of the module to the DIN rail;
- ◆ Insert the module into the expansion socket of the front module one by one;
- ◆ Push up the side latch to fix with the front module, and fix the module to the guide rail by pushing up the latch.

*Checking carefully that the DIN snap-fit is tightly fixed to the DIN rail, as shown in Figure 2-1.

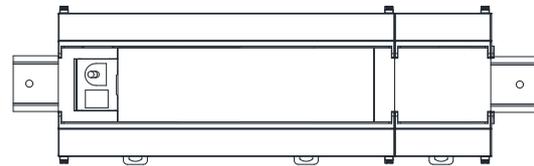


Fig 2-1 Installation diagram

2.2 Panel installation

The screws(M3 optional), must be used to fix the module in situations with high vibration. Positioning and drilling the installation holes according to the dimensions shown in Figure 2-2, and use the suitable screws to fix the module on the backplane.

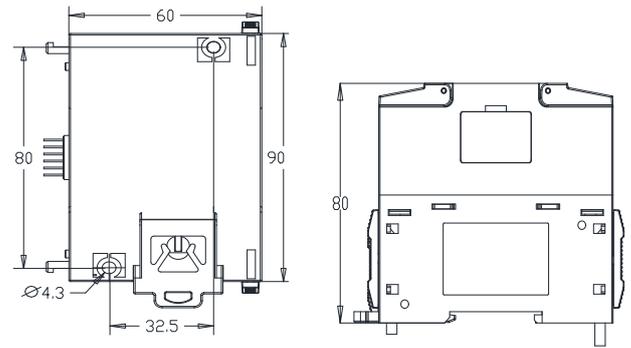


Fig 2-2 Screw installation diagram

2.3 Cable connection and specification

It is recommended to use shielded twisted-pair cables and prefabricate insulated terminal ends to ensure the quality of the wiring. The following table lists the cross-section and models of the recommended cables.

Table 2-1 Recommended model of cable

Cable	Cross-section	Cable No.	Terminal and heat shrink tube
Power	1.0 ~ 2.0mm ²	AWG12、18	H1.5/14 Tube-type prefabricated insulated terminal or wire end tinning
Ground	2.0mm ²	AWG12	H2.0/14 Tube-type prefabricated insulated terminal or wire end tinning
Signal	0.8 ~ 1.0mm ²	AWG18、20	H1.5/14 Tube-type prefabricated insulated terminal Φ 3 or Φ 4 heat shrink tube

Fix the finished cable end on the PLC terminal by the screw in a correct position and 0.5 ~ 0.8Nm tightening torque, to ensure reliable connection without damaging the screw.

2.4 Wiring requirement

For the safety (to prevent electric shock and fire accidents) and lower noise, the ground terminal of the controller should be connected in accordance with the requirements from national electrical regulations, and the ground resistance should be less than 100 Ω . Single point grounding should be used when wiring multiple controllers, and the ground wire cannot form a loop. As shown in the diagram below:

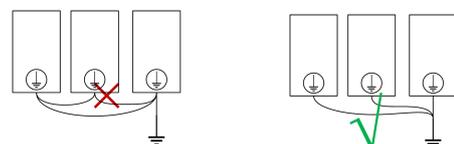


Fig 2-3 Controller grounding diagram

Figure 2-4 shows the wiring requirements for terminals. ① ~ ⑤ indicates the notice when wiring:

- ① It is recommended to use a shielded twisted-pair cable, keeping far away from the power line;
- ② **Do not occur short-circuit between voltage terminals and current terminals in any mode.**
- ③ The power supply can use the auxiliary output DC24V power supply of the main module, and can also use other power supplies.
- ④ The ground terminal is well connected;
- ⑤ Do not use the empty pin of terminal.

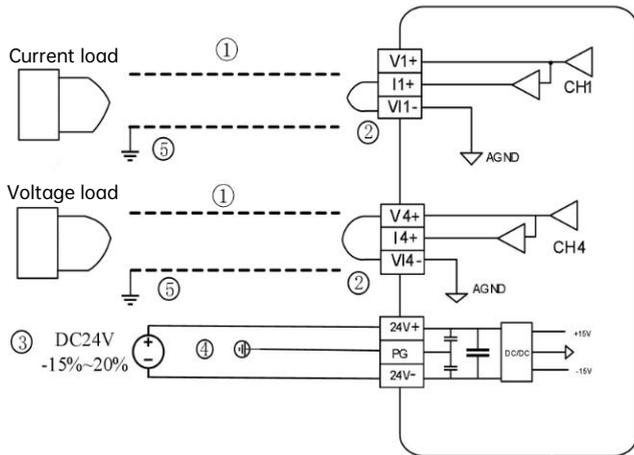


Fig 2-4 MU200-4DA terminal wiring diagram

It is necessary to calculate the sum of the current consumed by all power supplies of expansion modules before the connection operation to ensure that the current of all power supplies is less than the output current provided by the corresponding power supply of the main module.

3. Technical Specification

3.1 Environment index

- ◆ Environment temperature range of PLC: -5°C ~ 55°C. When the temperature exceeds 55°C for a long time, a well-ventilated place should be selected.
- ◆ Place without corrosion, flammable and explosive gas and liquid.
- ◆ Solid place without vibration.
- ◆ This controller is designed for II standard installation environment and 2-level pollution occasions.

3.2 Performance specification

Table 3-1 Performance specification

Item	Technical specification	
Number of Analog quantity output	4 points	
Range of Analog quantity output	Voltage: -10 ~ +10V Current: 0 ~ 20mA 0 ~ 10V 4 ~ 20mA (0 ~ 10V and 0 ~ 20mA are synchronous) (Scale is switched by upper machine)	
Resolution	Voltage	5mV
	Current	10uA
Conversion speed	2ms/ channel	
Conversion precision	±1% (full scale)	

Load impedance	Voltage	1KΩ (Min.)
	Current	500Ω (Max.)
Isolation	The analog circuit and digital circuit are separated with a photoelectric coupler and the analog channels are not separated with each other.	
Analog power	DC24V (-15% ~ 20%), allowed ripple voltage 5% (Max.) 50mA (come from the basic module or external power supply)	
24V power consumption (Bus)	20mA	

4. Terminal

Table 4-1 shows the terminal layout of the MU200-4DA, as shown in the following:

Table 4-1 Terminal definition of MU2000-4DA

Terminal	Signal name	Terminal	Signal name
V1+	voltage output+ of CH1	V3+	voltage output+ of CH3
I1+	current output+ of CH1	I3+	current output+ of CH3
V1-	voltage¤t output-of CH1	V13-	voltage¤t output-of CH3
V2+	voltage output+ of CH2	V4+	voltage output+ of CH4
I2+	current output+ of CH2	I4+	current output+ of CH4
V12-	voltage¤t output-of CH2	V14-	voltage¤t output-of CH4
●	NC	●	NC
24+	Analog power supply 24+	●	NC
24-	Analog power supply 24-	●	NC
PG	Protection Ground	●	NC

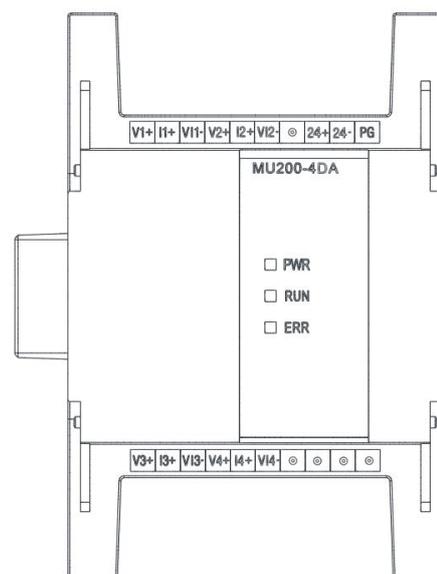


Fig 4-1 Terminal diagram of MU200-4DA

5. Characteristic and Function

5.1 Panel status indicator

Table 5-1 Panel indicator and function

Item	Function
PWR indicator	Connection status between expansion module and main module ON: connection succeed OFF: connection fail
RUN indicator	Mainly for fault of expansion module Fast flash(10Hz): operation in normal Slow flash(1Hz): module fault and operation error
ERR alarm indicator	Mainly for the application layer Normal: OFF Faulty: ON (parameter configuration error, out of limit) Flash (communication error with main module)

5.2 Calibration Function

This module supports voltage (non-differential) and current output modes, of which the default digital quantity ranges -10000 to 10000 respectively. Users can set the digital quantity range to other numbers by using this function. For the calculation method, see Formula 5-1.

$$D = \frac{S_U - S_L}{U_U - U_L} \times (U_0 - U_L) + S_L \quad (5-1)$$

Among that, D = Output digital value corresponding to voltage or current

U_0 = Actual output voltage or current value

U_U = Upper range

U_L = Lower range

S_U = Upper calibration

S_L = Lower calibration

Note 1: Table 5-2 Upper/lower limit of range in different mode

Mode	±10	0-10V	0-20mA	4-20mA
U_U	10V	10V	20mA	20mA
U_L	-10V	0	0mA	4mA

Note 2: The default scaling limit is -10000 to 10000. The full output range in 4~20mA mode is 20mA or 4mA if the upper and lower limit of the scaling are set based on the default ±10000, as shown in the following.

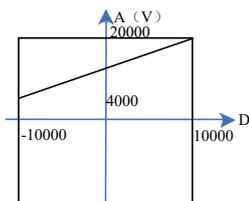


Fig 5-1 Scaling correspondence

6. Application Example

Example: Set channel 1 to 4mA~20mA, scale to the digital quantity of -8000 to 8000, and close other channels and output 10mA in channel 1.

System setting mode: Click Configuration on the home page under Program Management → Unit configuration, and configuration interface will pop up; Click on the Expansion module column, select the basic module and drag it to the configuration interface, and then select MU200-4DA in Special module, and place it on the Unit Configuration interface, as shown in Figure 6-1. In this case, you can set the parameters in the expansion module properties column.

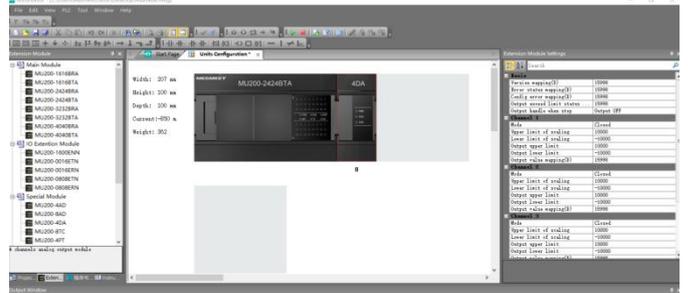


Fig 6-1 Configuration interface

Set the basic parameter register mapping and parameter register of channel 1, as shown below. Other channels are closed by default.

Table 6-1 Module Configuration

Basic	
Version mapping (D)	100
Error status mapping (D)	101
Configuration error mapping (D)	102
Output exceed limit status mapping (D)	103
Output handle when stop (D)	Output 0
Input channel 1	
Mode	4~20mA
Upper limit of scaling	8000
Lower limit of scaling	-8000
Output upper limit	10000
Output lower limit	-10000
Output value mapping (D)	10300

When output the voltage of 10mA though channel 1, then: $U_0 = 10\text{mA}$; $U_U = 20\text{mA}$; $U_L = 4\text{mA}$; $S_U = 8000$; $S_L = -8000$; It is shown by formula 5-1:

$$D = \frac{S_U - S_L}{U_U - U_L} \times (U_0 - U_L) + S_L$$

$$= \frac{8000 - (-8000)}{20 - 4} \times (10 - 4) + (-8000) = -2000$$

When D104 is assigned to -2000, the channel 1 outputs 10mA voltage.

Description:

1. Set the Version mapping register. Table 6-2 shows the version information.

Table 6-2 Version information

Register name	Description
Version information (16Bit)	BIT0~3: MCU software version BIT4~7: FPGA software version BIT8~11: Hardware version BIT12~13: Reserved BIT14: 0 : Common module 1 : Custom module BIT15 : 0 : Release version 1 : Test version

2. Set the error status mapping register. Table 6-3 shows the error status.

Table 6-2 Error status

Register name	Description
Module error status (16Bit)	Error when each bit is 1, normal when it is 0: BIT0: Module error and RUN flashes slowly BIT1: Error parameter setting BIT11: Output over-limit

3. Set the configuration error mapping register, which stores the ID of the wrong parameter when the parameter is incorrectly configured. Default: 0(Normal). Other: Error ID.

4. Set the output exceed limit status mapping register. Table 6-4 shows the channel correspondence.

Table 6-4 Output exceed limit status mapping register

Register name	Description
Output exceed limit status mapping register (16Bit)	BIT0: Exceed limit flag of CH1 output BIT1: Exceed limit flag of CH2 output BIT2: Exceed limit flag of CH3 output BIT3: Exceed limit flag of CH4 output BIT8~15: Reserved

5. The output status when the PLC stops running. Output retention: keep at the last output value; Output 0: related to the mode, 0 ~ 10V is 0V, 4 ~ 20mA is 4mA, other modes are 0V or 0mA.

6. It is necessary to set the output range limits of the expansion module (after calibrating). When the output range limit occurs, the flag bit of the output exceed limit status mapping register will be set.

7. Routine Inspection

1. Check that the wiring of analog output meets the requirements;
2. Check that the expansion interface of MU200-4DA is properly inserted in expansion jack;
3. Check whether MU200-4DA is normally connected to the analog 24V power supply.
4. Check the application for making sure the operation method and parameter range are correct;
5. Check that the PWR indicator of MU200-4DA is ON and the RUN indicator blinks normally (10Hz) when set the MU200 basic module to RUN state.

8. Fault Inspection

In case of abnormality, check the following items:

- The status of the PWR indicator:

ON: connection correctly;

OFF: check the connection and basic module condition.

- The status of the RUN indicator:

Flash quickly(10Hz): MU200-4DA in normal operation;

Flash slowly(1Hz) or OFF: check the information of module status in element monitoring table by software.

- The status of the ERR indicator:

ON : check the parameter configuration, output value and other conditions;

Flash: check the expansion connection and restart;

OFF: Normal.

Notice

1. The warranty range is confined to the PLC only.
2. Warranty period is 18 months, within which period Megmeet conducts free maintenance and repairing to the PLC that has any fault or damage under the normal operation conditions.
3. The start time of warranty period is the delivery date of the product, of which the product SN is the sole basis of judgment. PLC without a product SN shall be regarded as out of warranty.
4. Even within 18 months, maintenance will also be charged in the following situations:
 - Damages incurred to the PLC due to mis-operations, which are not in compliance with the User Manual;
 - Damages incurred to the PLC due to fire, flood, abnormal voltage, etc;
 - Damages incurred to the PLC due to the improper use of PLC functions.
 - Remove the PLC personally.
5. The service fee will be charged according to the actual costs. If there is any contract, the contract prevails.
6. If you have any question, please contact the distributor or our company directly.

Shenzhen Megmeet Electrical Co.,Ltd

Add: 5th Floor, Block B Unisplendour Information Harbor, Langshan Road, Shenzhen, 518057, China

Tel: 400-666-2163 (+86) 0755-86600500

Fax: (+86)0755-86600999

Zip: 518067

Website: www.megmeet.com