MC100-1WT Weighing Module

User Manual

Thank you for using MC100 series PLC. 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 MC100 series PLC 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 MC100 series member:

MC100-1WT

Version Number：1.1
Revision Date：2013-9-30
BOM Code：R33010123

For detailed product information, please refer to *MC100 Series PLC User Manual*, *X-Builder Programming Software User Manual*, *MC100/MC100 Series PLC Programming Reference Manual*. For ordering the above user manuals, contact your Megmeet distributor or download from MEGMEET website (www.megmeet.com).
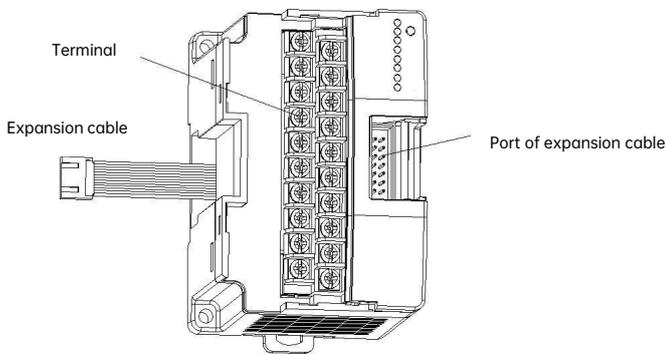
1. Outline and Component Name

Fig 1-1 Outline and component name of module

2. Installation

2.1 Installation Requirements

DIN slot installation

It can be installed with a 35mm-width DIN slot in the environment of low vibration.

Open the DIN snap-fit at the bottom of the module and fix the bottom of the module to the DIN guide rail; Rotate the module to close the DIN rail and close the snap-fit. Check carefully that the DIN snap-fit is tightly fixed to the DIN guide rail, as shown in the following：
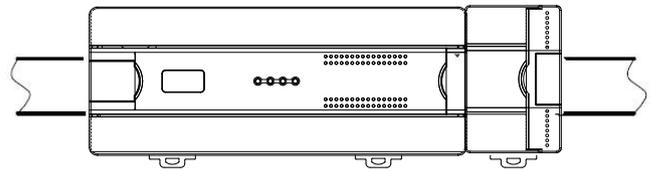
Screw installation

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 the Fig 2-2, and use the suitable screws to fix the module on the backplane.
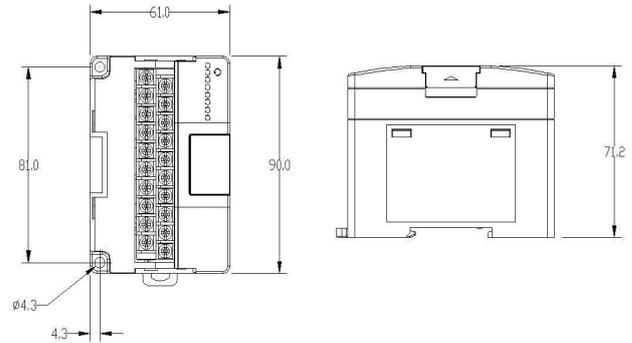

Fig 2-2 Screw installation diagram

2.2 Cable Connection and Cable Specification

Cable specification

It is recommended to use stranded copper conductors 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.

Cable	Cross-section	Cable No.	Terminal and heat shrink tube
AC power line（L、N）	1.0～2.0mm²	AWG12、18	H1.5/14 tube-type prefabricated insulated terminal or wire end tinning
Ground（⏚）	2.0mm²	AWG12	H2.0/14tube-type prefabricated insulated terminal or wire end tinning
Signal input line（X）	0.8～1.0mm²	AWG18、20	UT1-3 or OT1-3 Cold pressed terminal, Φ3 or Φ4 heat shrink tube
Signal output line (Y)	0.8～1.0mm²	AWG18、20	

Fix the finished cable end on the PLC terminal by the screw in a correct position with 0.5～0.8Nm tightening torque, to ensure reliable connection without damaging the screw.
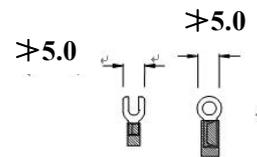
Figure 2-3 shows the recommended cable preparation.

Fig 2-3 Cable diagram

2.3 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:

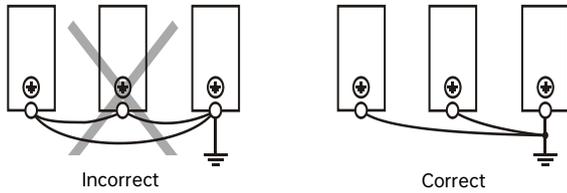Incorrect   Correct

Fig 2-4 Controller grounding diagram

Wiring requirements for terminals:

1. It is recommended to use a shielded twisted-pair cable, keeping far away from the power line or expansion cable(that may cause electrical interference);

2. Connect the shielded end of the sensor signal output line to the shielded line access terminal to improve the anti-interference ability;

3. Fasten the cover of the module after the line is connected;

4. The analog power supply can use the 24Vdc power supply of the main module, or other power supplies that meet the requirements.

5. The ground terminal⏚ is well connected;

6. Do not use the empty pin of terminal.
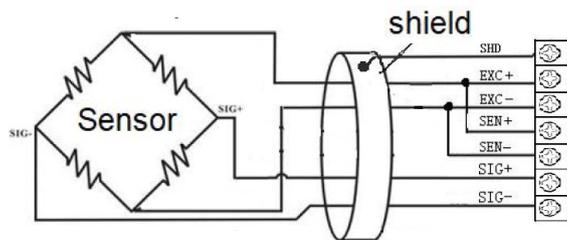
2.4 Sensor Wiring Diagram
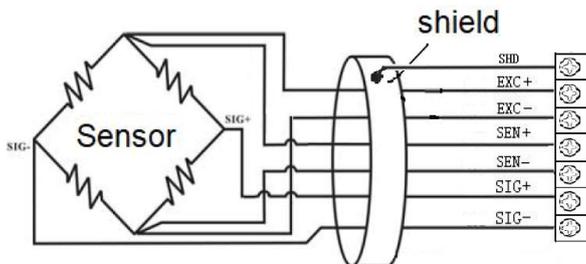

Fig 2-5 Four-line sensor wiring diagram

Fig 2-6 Six-line sensor wiring diagram

Please pay attention to the power supply when connecting with the system for the reason that excessive load may cause unstable system operation.

3. Technical Specification

3. 1 Environment Index

◆ Environment temperature range of PLC: -5℃ ~ 55℃ . When the temperature exceeds 55°C for a long time, a well-ventilated place should be selected.PLC

◆ 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	Specification
Input signal range	±39mV DC
Excitation source	+5V DC ±5%
Load of excitation source	≥100 Ω
Impedance of signal input	≥20MΩ
Signal gain	128 times
Internal AD resolution	24Bit
Linear error	≤0.005%FS
Temperature coefficient	≤0.003%/℃
Signal acquisition frequency	120/S
Applicable sensor	Four-line and six-line type
Filter level	5 levels can be adjustable
Isolation	The analog circuit and the digital circuit are isolated by photoelectric coupler. The analog circuit is internally isolated from the module input 24 VDC power supply. Analog channels are not isolated from each other.
Analog power supply	24VDC（-15%~20%）；Max. allowed ripple voltage: 5%，200mA（from main module or external power supply）
Digital power supply	5VDC 50mA（from Main module）

4. Terminal

4.1 Terminal Definition

Table 4-1 describes the definition of MC100-1WT terminals:

Table 4-1 MC100-1WT terminal definition table

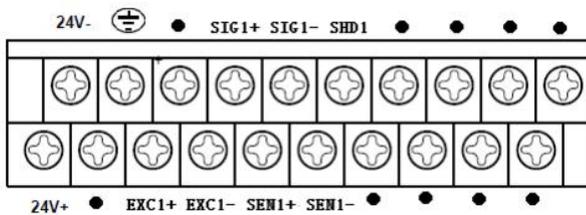| Terminal	Description	Terminal	Description
24V+	Analog power supply 24V+	24V-	Analog power supply 24V-
●	Empty pin	⏚	Ground
EXC1+	Sensor excitation+ of CH1	●	Empty pin
EXC1-	Sensor excitation- of CH1	SIG1+	Signal input+ of CH1
SEN1+	Excitation feedback+ of CH1	SIG1-	Signal input- of CH1
SEN1-	Excitation feedback- of CH1	SHD1	Frame ground of CH1
●	Empty pin	●	Empty pin
●	Empty pin	●	Empty pin
●	Empty pin	●	Empty pin
●	Empty pin	●	Empty pin

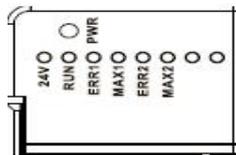Fig 4-1 MC100-1WT terminal diagram

4.2 Indicator Description

Fig 4-2 MC100-1WT indicator diagram

Table 4-2 MC100-1WT indicator description

Indicator	Description
PWR	CPU module power-on indicator
24V	24V PWR indicator
RUN	RUN operation indicator: Fast flash: operation in normal Slow flash: error reporting
ERR1	CH1: This indicator is ON when the channel is not connected to a sensor
MAX1	CH1: This indicator is ON when the measured weight exceeds the full range

5. Parameter Description

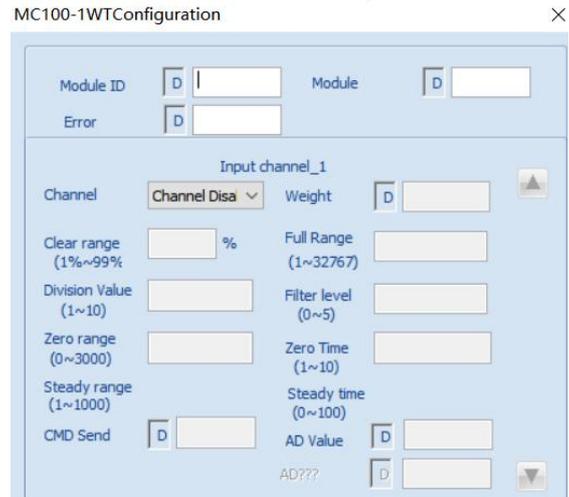### 5.1 Parameter Configuration Diagram

Fig 5-1 MC100-1WT parameter configuration diagram

5.2 Parameter Explanation

1. Identification code: The identification of this module is 0X7011;

2. Version No.: Software version of this module;

3. Module Status:

Table 5-1 Module status description

Bit	Definition	ON（1）	OFF（0）
B0	Error	Sensor wiring error	No error
B1	Error	Weight exceeds full range error	No error
B2	Hardware in failure	AD converter failure or other hardware failure	Hardware in normal
B3	Power in failure	24V power input error	Power in normal
B4	Weight status	Weight exceeds the clear range	Weight is in the clear range
B5	Instruction execution flag	Instruction execution complete	Access new instruction
B6	Net/gross weight	The weight value is net weight	The weight value is gross weight
B7	Weight steady	Stable	Unstable
B8~B15	Reserved		

3. Channel status: You can set the measurement to be ON or OFF. If it is OFF, the channel will not be measured.

4. Weight value: Mean the actual measured weight value, ranging from -32768 to 32767, with the same unit as the weight unit set during the linear calibration of the channel. For example, the module outputs weight value in grams if the linear calibration inputs 10000 grams weight value;

5. Clear range: Range: 1 ~ 99% full range and the default is 20%. The peeling range is equal to the clear range. For example, the module can perform weight clearing and peeling instructions when the weight value is from -20%

to +20% if the clear range is set to 20%. The clear range is based on the weight value minus the calibrated zero as the comparison value, and the peeling range is based on the weight value minus the current zero as the comparison value.

6．**Full range:** Range: 1 ~ 32767. Default: 30000. The unit is the same as the weight value.

7．**Division value:** Mean weight display division value, ranging from 1 to 10d. Default: 1.

8．**Filter level:** Filter depth of weight, the level of 0 to 5 can be set and the default value is 2. When it is set to 0, there is no filtering processing. The larger the filter coefficient, the more stable the weight value;

9．**Zero range and zero time:** Zero range can be set from 0 to 3000d and the default is 0. Zero time ranges from 1 to 10S and the default is 1S. If the current weight is within the zero range in the zero time, the zero function is performed. When the zero range is 0, the module does not perform zeroing.

10．**Steady range and steady time:** The steady range can be set from 1 to 1000d and the default is 1. The steady time ranges from 1 to 100 hundred ms and the default is 300 hundred ms. If the weight continues to change within the steady range in the steady time, the module will determine that the weight value is stable, and the weight steady marker is 1;

11．**CMD Send:** When 0 is written into the D element, the channel instruction completion flag BIT5 of the module status is cleared; When 1 is written, and the measured weight is within the zero range, a zero action is started; When 2 is written, and the measured weight is within the zero range, a peeling action is started and the net weight/gross weight flag bit is set; When 3 is written, the zero calibration performs; When the value ranging from 4 to 32767, is written to D element, the linear calibration performs; The module does not act when other value is written into it. **Note: It must be ensured that the instruction completion flag of the module status is 0 before sending instructions. When the flag is 1, the channel will not accept new instructions. The instruction completion flag is set to 1 after each zeroing, peeling, zero calibration, or linear calibration operation.**

12．**AD Value (D-word)**: Read the 24-bit AD measurement value of the module channel.

6. Example

For example, the address of the MC100-1WT module is 1 (for the addressing method of special modules, refer to *MC100 Series Programmable Logic Controller User Manual*). Figure 6-1 and figure 6-2 show how to set the system block.

Fig 6-1 MC100-1WT property setting

Fig 6-2　Channel characteristic setting

Fig 6-3 Instruction sending routine

7. Routine Inspection

1．Check that the wiring of analog input meets the requirements;

2．Check that the expansion cable of MC100-1WT is properly inserted in expansion cable interface;

3. Check the overload condition of 5V and 24V power supplies.(**Note**: Power for the MC100-1WT digital portion is supplied from the main module via an expansion cable.)

4. Check the application to ensure that the correct operation method and parameter range are selected in the application.

5. Set the MC100 main module to the RUN status.

8. Fault Inspection

In case of abnormality, check the following items:

● The status of the POWER indicator;

ON: connection correctly

OFF: check the connection and main module condition

● The condition of sensor wiring;

● The condition of wight calibration;

● The status of 24V indicator;

ON: 24V power supply in normal

OFF:24V power supply failure or the MC100-1WT failure

● The status of the RUN indicator;

Flash quickly: MC100-1WT in normal operation;

Flash slowly or OFF: Check the information in the error status column on the MC100-1WT configuration page in X-Builder.