

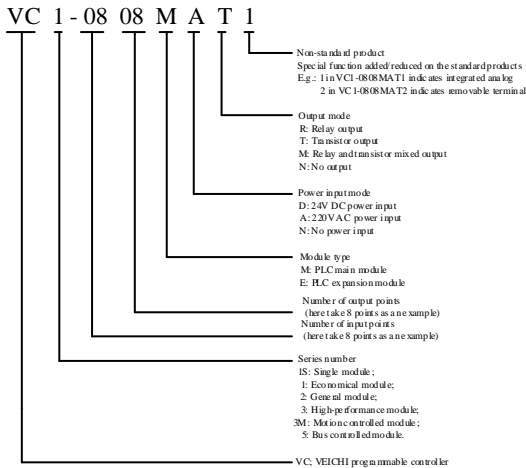
# VC1-0808MAT1 PLC Quick Reference Manual

This manual provides a quick on-site access for users to the information of the design, installation, connection and maintenance of the VC1-0808MAT1 series PLC. It briefly describes the hardware specifications, features and usage of the VC1-0808MAT1 Series PLC, as well as the associated accessories, answers to the frequently asked questions, and other information for easy reference. For more detailed product information, please refer to the "VC Series Programmable Controller Manual" and "AutoStudio Programming Software Manual" issued by VEICHI. Please consult with the supplier if needed. Users can also download PLC related technical information or give feedback on PLC related questions on <https://www.veichi.com>.

## 1 Production Introduction

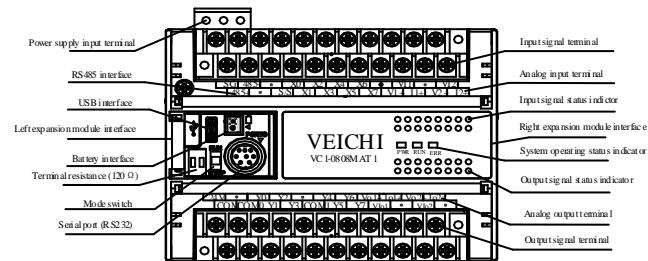
### 1.1 Module Description

Module description is shown below:



### 1.2 Appearance and Structure

The appearance and structure of VC1-0808MAT1 is shown below:

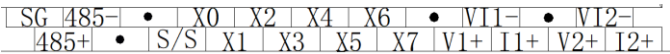


VC1-0808MAT1 adopts RS232 and Mini DIN8 socket, 1 channel of RS485 and Type-C USB interface. The right expansion module interface is used to connect the expansion module, the left one is used to connect the expansion communication module. There are two options for the mode switch, ON/OFF, and one RS485 terminal resistor with a resistance of 120 Ω (DIP No. 1).

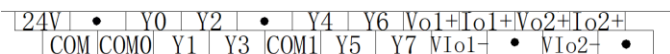
### 1.3 Terminal Introduction

#### Terminal Arrangement

Input terminal:



Output terminal:



Input	Description	Output	Description
SG	485 signal ground	24V	Analog power supply 24V positive
485+	485 signal positive	COM	Analog power supply 24V negative
485-	485 signal negative	COM0	Y-point common ground 1
S/S	Common terminal for input signal	Y0	Channel1 signal output terminal
X0	Channel1 signal input terminal	Y1	Channel2 signal output terminal
X1	Channel2 signal input terminal	Y2	Channel3 signal output terminal
X2	Channel3 signal input terminal	Y3	Channel4 signal output terminal
X3	Channel4 signal input terminal	COM1	Y-point common ground 2
X4	Channel5 signal input terminal	Y4	Channel5 signal output terminal
X5	Channel6 signal input terminal	Y5	Channel6 signal output terminal
X6	Channel7 signal input terminal	Y6	Channel7 signal output terminal
X7	Channel8 signal input terminal	Y7	Channel8 signal output terminal
V1+	Channel1 voltage input signal positive	Vo1+	Channel1 voltage signal output terminal
I1+	Channel1 current input signal positive	Io1+	Channel1 current signal output terminal
VI1-	Channel1 AI common ground	VIo1-	Channel1 AO common ground
V2+	Channel2 voltage input signal positive	Vo2+	Channel2 voltage signal output terminal
I2+	Channel2 current input signal positive	Io2+	Channel2 current signal output terminal
VI2-	Channel2 analog signal common ground	VIo2-	Channel2 AO common ground

## 2 Power Supply Specification

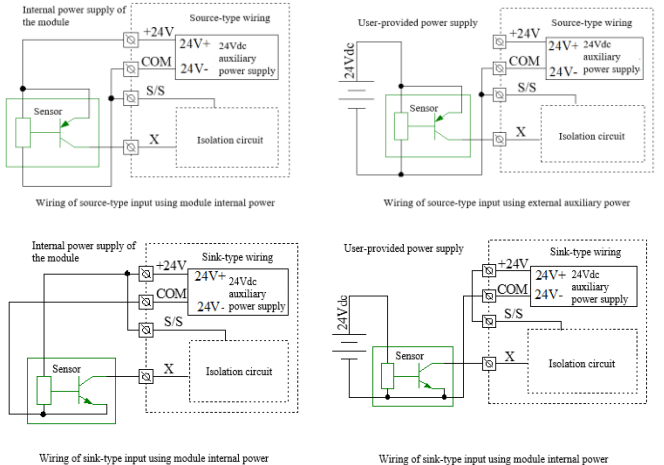
The specifications of the built-in power supply of the main module and those that the main module can supply to expansion modules are shown as below.

Item	Unit	Min.	Typ.	Max.	Description
Input voltage range	Vac	120	220	264	Voltage range for proper start and operation
Input current	A	/	/	1.5	120Vac input, full-load output
Rated output current	5V/GND	mA	/	1500	The sum power of 5V/GND and 24V/GND shall not exceed 26W.
	+15V/ GND	mA	/	100	
	-15V/ GND	mA	/	100	
	24V/GND	mA	/	/	
	24V/COM	mA	/	/	

## 3 Switch Input and Output Characteristics

### 3.1 Input Characteristics and Signal Specifications

The PLC provides the "S/S" port for selecting the signal input mode, which can be set as source-type or sink-type mode. Connecting "S/S" to "+24V" means users select the sink-type mode, and then an NPN-type sensor can be connected.



The following figure shows the connection between the VC1-0808MAT1 main module and the VC-0808ENR expansion module, and the user signals can be distributed among the X0 to X7 input terminals.

## 4.2 AO Wiring Instruction

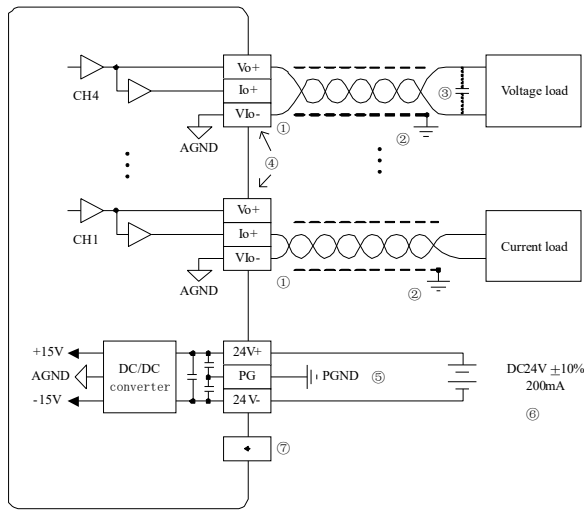


Figure 4-3 Wiring of user terminals

The wiring requirements of user terminals are shown in the figure. For wiring, please pay attention to the 7 notes:

1. It is recommended to connect the analog outputs via twisted shielded cables. Lines should be routed away from power cables or other wires that may cause electrical disturbance.
2. Adopt a single-point grounding on the load end of the output cable.
3. Connect a smoothing capacitor (0.1μF~0.47μF/25V) if there's any electrical noise or voltage fluctuations.
4. The VC-4DA may be damaged if the voltage output is short-circuited or if a current load is connected to the voltage output.
5. Ground the module's ground terminal PG well.
6. The analog power supply can adopt the 24Vdc auxiliary power supply output by the main module, or any other power supplies that meets the requirements.
7. Do not use the NC on the user terminal.

Table 4-4 Performance indicator

Item	Description
Occupied I/O points	None
Conversion speed	2ms per channel (the number of channels that used in changing does not change the conversion speed)
AO	
Voltage output	-10~10Vdc (external load impedance of not less than 2kΩ)
Current output	0~20mA (external load impedance of 500Ω or less)

Item	Indicator
AO mode	Digital quantity
Channel closed	
Output range (-10V~10V)	-10000~10000
Output range (0mA~20mA)	0~2000
Output range (4mA~20mA)	0~2000

Item	Description
DI	Default setting: -10000~10000; Allowed range: -10000~10000
Resolution	
Voltage output	1mV (10V/10000)
Current output	2μA (20mA/10000)
Overall accuracy	±1% (for full range of 10V) ±1% (for full range of 20mA)
Isolation	The analog and digital circuits are isolated by optocouplers. The analog circuit power supply and the external power supply are isolated by DC/DC. Analog channels are not isolated from each other.

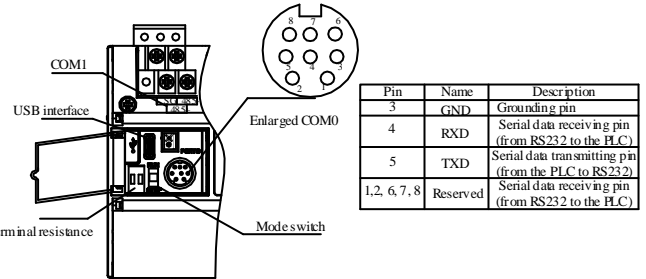
## 4.3 Integrated Analog Setting and Readout

Address	Name	R/W	Default
SD67	AD Channel 0 mode word	R/W	Default to 0
SD68	AD Channel 0 sampling times	R/W	1~1000, default to 8
SD69	AD Channel 0 sampling average	R	-10000~10000
SD70	AD Channel 1 mode word	R/W	0 by default
SD71	AD Channel 1 sampling times	R/W	1~1000, default to 8
SD72	AD Channel 1 sampling average	R	-10000~10000
SD79	DA Channel 0 mode word	R/W	Default to 0
SD80	DA Channel 0 output	R/W	-10000~10000
SD81	DA Channel 1 mode word	R/W	Default to 0
SD82	DA Channel 1 output	R/W	-10000~10000

Analog channel x mode word	AD	DA
0	Channel closed	Channel closed
1	-10V~10V (-10000~10000)	-10V~10V (-10000~10000)
2	-20~20mA (-2000~+2000)	0~20mA (0~2000)
3	4mA~20mA (0~2000)	4mA~20mA (0~2000)

## 5 Communication

The VC1 series PLC main module provides 2 asynchronous serial communication ports, namely COM0 and COM1 which support the baud rates of 115200, 57600, 38400, 19200, 9600, 4800, 2400, and 1200 bps. The communication protocol for COM0 is determined by the mode switch as below.



As a dedicated interface for user programming, COM0 can be forcefully switched to the programming protocol via the mode switch. The relationship between PLC operation status and COM0 usage protocol is shown in the table below.

Mode switch position	Status	COM0 operating protocol
ON	RUN	It can be programming protocol, or Modbus protocol as determined by user program and system configuration.
OFF	STOP	If the system configuration of user program is Modbus protocol, it converts to programming protocol automatically after stop. Otherwise, the system protocol keeps unchanged.

The COM1 port is ideal for connection with communication-supported production equipment (such as drives). With Modbus protocol or RS485 free protocol, a drive can control multiple devices through the network. Its terminals are fixed with screws. Communication signal cables are at users' discretion. It is recommended to use a twisted shielded pair as the signal cable to connect communication ports.

The USB is Type-C interface. The supported functions include upload, download, online upgrade firmware and monitoring.

## 6 Installation

The PLC is applicable to Installation Category II, Pollution degree 2.

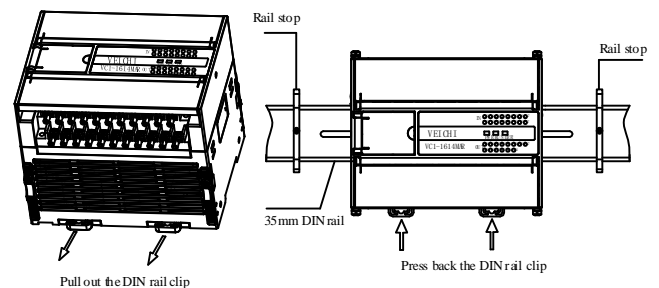
### 6.1 Dimensions

Model	Length	Width	Height
VC1-0808MAT1	115mm	90mm	92.7mm

### 6.2 Installation Instruction

#### Use DIN rail

Generally, the PLC can be mounted onto a 35mm-wide rail (DIN), as shown in the following figure.



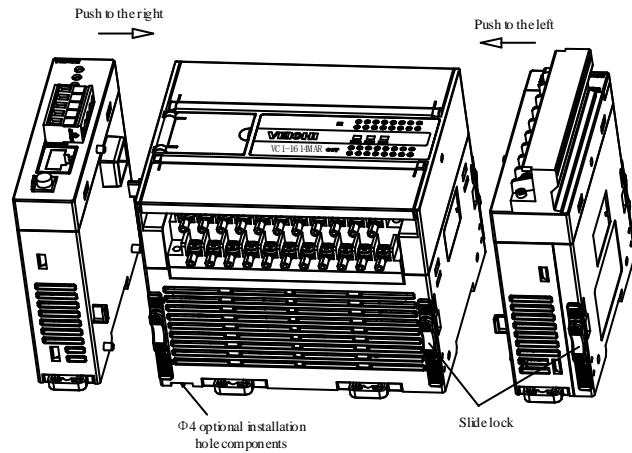
The specific installation steps are as follows:

1. Fix the DIN rail horizontally on the mounting backplane.
2. Pull out the DIN rail buckle under the bottom of the module.
3. Hang the module on the DIN.
4. Press the buckle back to its original position to lock the module.
5. Finally, fixed both ends of the module with DIN rail clips to avoid sliding.

Other VC1 series PLCs can be mounted on DIN rail according to the above.

## Use screws

For applications with large oscillations, the main module can be installed with screws. When installing the expansion module, first pull the slide lock up to the top, align it and push it toward the main module. After that, pull it down to the end to complete the fixation. This is shown in the figure below. (Note: The main module requires optional accessories for screw installation, and the expansion module does not support screw installation.)

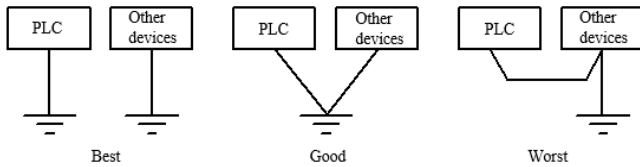


## 6.3 Cable Connection and Specification

For power and grounding cable connection, it is recommended to add an air switch and fuses to the PLC power input to protect the circuit.

Reliable grounding cables can enhance equipment safety and improve the PLC's electromagnetic immunity. Please connect the power supply  $\oplus$  end of the PLC to the earthing conductor during installation. It is recommended to use connection wires of AWG12 to AWG16 and shorten the wires as much as possible.

An independent grounding device is also recommended to set. Keep the grounding cables away from those of other devices (especially the devices cause strong disturbance), as shown below.



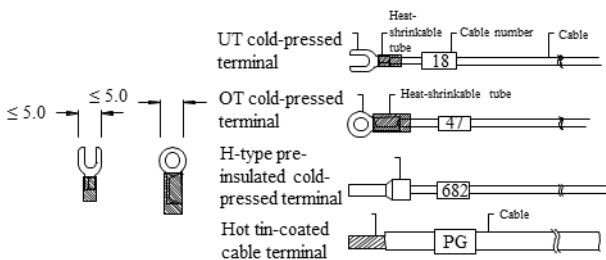
## Cable specification

For the wiring of the PLC, it is recommended to use multi-strand copper wire and ready-made insulated terminals to ensure the wiring quality. The recommended cross-sectional areas and models of the cable are shown in the following table.

Cable	Cross-sectional area	Recommendation	Compatible wiring terminal and heat-shrinkable tube
AC power cable (L, N)	1.0~2.0mm <sup>2</sup>	AWG12, 18	H1.5/14 pre-insulated tube-like terminal, or hot tin-coated cable terminal
Grounding cable ( $\oplus$ )	2.0mm <sup>2</sup>	AWG12	H2.0/14 pre-insulated tube-like terminal, or hot tin-coated cable terminal
Input signal cable (X)	0.8~1.0mm <sup>2</sup>	AWG18, 20	UT1-3 or OT1-3 cold-pressed terminal
Output signal cable (Y)	0.8~1.0mm <sup>2</sup>	AWG18, 20	Φ3 or Φ4 heat-shrinkable tube

Fix the processed cable terminals onto the wiring terminals of PLC by screws. Pay attention to the positions of the screws. The tightening torque for the screws is 0.5 to 0.8 Nm, which ensures complete reliable connection without damaging the screws.

The recommended cable processing-method is shown in the following figure.



## 7 Power-up for Operation and Routine Maintenance

### 7.1 Power-up for Operation

After the wiring is complete, check all the connections. Ensure that no foreign matters have dropped inside the housing and heat dissipation is in good conditions.

1. Power on the PLC. The PWR indicator of the PLC is on.
2. Start the AutoStation software on the PC and download the compiled user program to the PLC.

3. After the program is downloaded and verified, set the mode switch to ON. The RUN indicator is on. If the ERR indicator is on, it indicates that errors occur on the user program or the system. In this case, rectify the errors by referring to the instructions in the "VC Series Small-sized PLC Programming Manual".

4. Power on the PLC external system to perform commissioning on the system.

### 7.2 Routine Maintenance

Pay attention to the following notes for routine maintenance and inspection:

1. Ensure that the PLC operates in a clean environment, preventing foreign matters or dust from dropping into the machine.
2. Keep the PLC in good ventilation and heat dissipation conditions.
3. Ensure that the wiring is properly performed and all the wiring terminals are well fastened.



### Warning

1. Never connect the transistor output to an AC circuit (like 220VAC). The design of the output circuit must abide by the requirements of electric parameters, and no overvoltage or overcurrent is allowed.
2. Use the relay contacts only when necessary, because the use life of relay contacts depends largely on its action times.
3. The relay contacts can support loads smaller than 2A. To support larger loads, use external contacts or mid-relay.
4. The relay may fail to connect when the current of its contact is smaller than 5mA.

### User Notice

1. The warranty covers only the PLC machine.
2. The warranty period is eighteen months. VEICHI provides free-of-charge maintenance for the product if it is faulty or damaged in normal use within the warranty period.
3. The warranty period starts from the factory date of the product. The machine code is the only basis for determining whether the product is in the warranty period. An equipment without the machine code is deemed as out of warranty.
4. Maintenance and repair services are charged in the following scenarios even the product is within the warranty period:
  - Faults are caused by not complying with the user manual;
  - The damage caused by fire, flood, or voltage anomalies;
  - The PLC is damaged by the unsupported functions.
5. The service charge will be calculated based on actual cost, and if there is a contract, the provisions stated in the contract prevail.
6. Please make sure that you keep this card and present it to the service unit at the time of warranty.
7. Please contact the agent or VEICHI directly if there's any questions.

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User name		Tel	
Address		Postal code	
Product name & model		Installation date	
Machine code			
Appearance or structure			
Performance			
Package			
Materials			
Quality in use			
Comments or suggestions			

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China Customer Service Center

Address: No.1000 of Songjia Road, Wuzhong, Suzhou, Jiangsu, China

Tel: 0512-66171988 Fax: 0512-6617-361

Service hotline: 400-600-0303 Website: [www.veichi.com](http://www.veichi.com)

Version V1.0 Archived 2021-05-25

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