

VC-4AD Analog Input Module User's Manual

Thank you for purchasing the VC-4AD analog input module developed and manufactured by Suzhou VEICHI Electric Technology Co. Before using our VC series PLC products, please read this manual carefully, so that you can grasp the characteristics of the product more clearly and install and use it correctly. You can make full use of the rich functions of this product for safer application.

Tip:

Before starting to use, please read the operation instructions, precautions carefully to reduce the occurrence of accidents. Personnel responsible for the installation and operation of the product must be strictly trained to comply with the safety codes of the relevant industry, strictly observe the relevant equipment precautions and special safety instructions provided in this manual, and perform all operations of the equipment in accordance with the correct operating methods

1 Interface Description

1.1 Interface Description

The VC-4AD has a cover for both the expansion interface and the user terminal, and the appearance is shown in Figure 1-1.

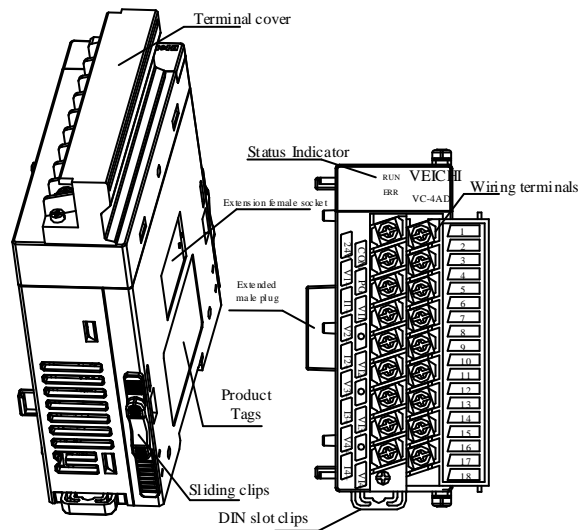


Figure 1-1 Appearance of the module interface

1.2 Model description

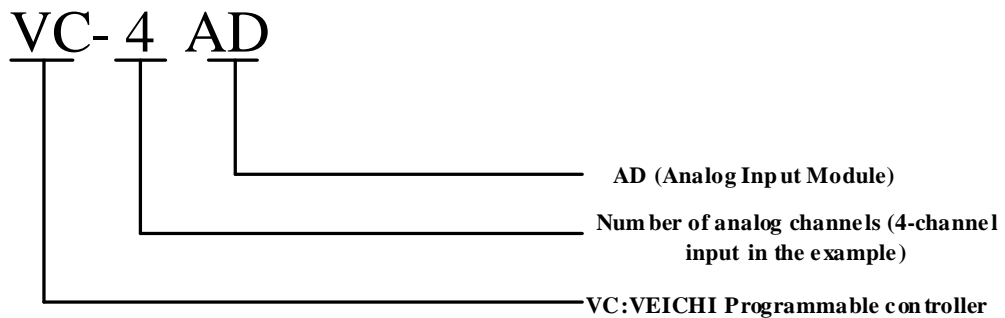


Figure 1-2 Illustrative diagram of the product model

1.3 Definition of terminals

No	Marking	Instructions	No	Marking	Instructions
01	24V	Analogue power supply 24V positive	02	COM	Analogue power supply 24V negative
03	V1+	Voltage signal input for channel 1	04	PG	Grounded terminal
05	I1+	Channel 1 current signal input	06	VI1-	Channel 1 common ground end
07	V2+	Channel 2 voltage signal input	08	●	Reserved
09	I2+	2nd channel current signal input	10	VI2-	Channel 2 common ground end
11	V3+	Voltage signal input for channel 3	12	●	Reserved
13	I3+	Channel 3 current signal input	14	VI3-	Channel 3 common ground end
15	V4+	Channel 4 voltage signal input	16	●	Reserved
17	I4+	Channel 4 current signal input	18	VI4-	Channel 4 common ground end

1-3 Terminal definition table

Note: For each channel, voltage and current signals cannot be input at the same time. When measuring current signals, please short the channel voltage signal input to the current signal input.

1.4 Access systems

The expansion interface allows the VC-4AD to be connected to a main module of the VC series PLC or to other expansion modules. The expansion interface can also be used to connect other expansion modules of the same or different models of the VC series. This is shown in Figure 1-4.

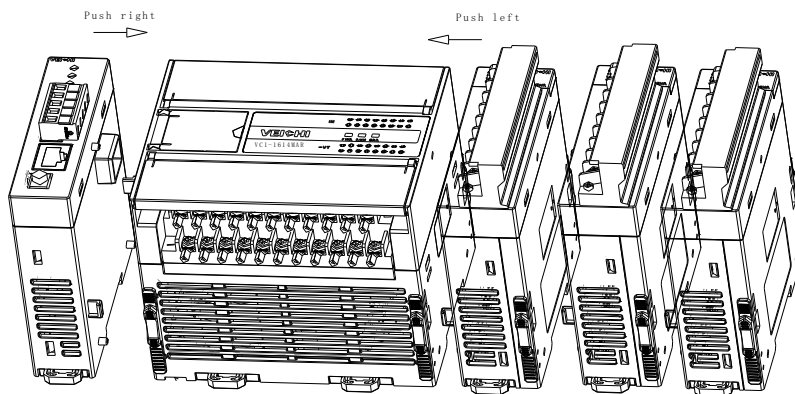


Figure 1-4 Schematic diagram of the connection to the main module and other expansion modules

1.5 Wiring instructions

User terminal wiring requirements, as shown in Figure 1-5.

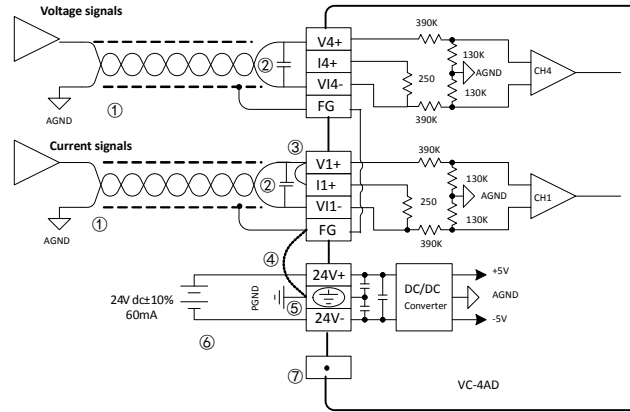


Figure 1-5 Diagram of user terminal wiring

The diagrams ① to ⑦ indicate the seven aspects that must be taken into account when wiring.

1. It is recommended that the analogue input is connected via a twisted shielded cable. The cable should be routed away from power cables or other wires that may cause electrical interference.
2. If there are fluctuations in the input signal, or if there is electrical interference in the external wiring, it is recommended to connect a smoothing capacitor (0.1µF to 0.47µF/25V).
3. If the current channel uses the current input, short the voltage input and the current input for that channel.
4. If there is excessive electrical interference, connect the shielding ground FG to the module earth terminal PG.
5. Ground the module's earth terminal PG well.
6. The analogue power supply can use the 24 Vdc power supply from the main module output, or any other power supply that meets the requirements.
7. Do not use the empty pins on the user terminals.

2 Instructions for use

2.1 Power indicators

Table 2-1 Power supply indicators

Projects	Description
Analog circuits	24Vdc (-10% to +10%), maximum allowable ripple voltage 2%, 50mA (from mains module or external power supply)
Digital Circuits	5Vdc, 70mA (from the main module)

2.2 Performance indicators

Table 2-2 Performance indicators

Projects		Indicators	
Conversion speed		2ms/channel	
Analogue input range	Voltage input	-10Vdc to +10Vdc, input impedance 1M Ω	4 channels can be used simultaneously.
	Current input	-20mA to +20mA, input impedance 250 Ω	
Digital output		Current setting range: -2000 to +2000 Voltage setting range: -10000 to +10000	
Ultimate voltage		$\pm 12V$	
Ultimate current		$\pm 24mA$	
Resolution	Voltage input	1mV	
	Current input	10 μA	
Precision		$\pm 0.5%$ of full scale	
Isolation		The analogue circuitry is isolated from the digital circuitry by an opto-coupler. The analogue circuitry is internally isolated from the module input 24Vdc supply. No isolation between analogue channels	

2.3 Indicator light description

Projects	Description
Signal indicator	RUN status indicator, blinking when normal ERR error status indicator, illuminated on failure
Expansion module rear stage interface	Connection of rear modules, hot-swappable not supported
Expansion module front interface	Connection of front-end modules, hot-swappable not supported

3 Characteristic settings

The input channel characteristics of the VC-4AD are the linear relationship between the channel analogue input quantity A and the channel digital output quantity D, which can be set by the user. Each channel can be understood as the model shown in Figure 3-1, and since it is a linear characteristic, the characteristics of the channel can be determined by determining two points P0 (A0, D0) and P1 (A1, D1), where D0 indicates that when the analogue input is A0 D0 indicates the channel output digital quantity when the analogue input is A0 and D1 indicates the channel output digital quantity when the analogue input is A1.

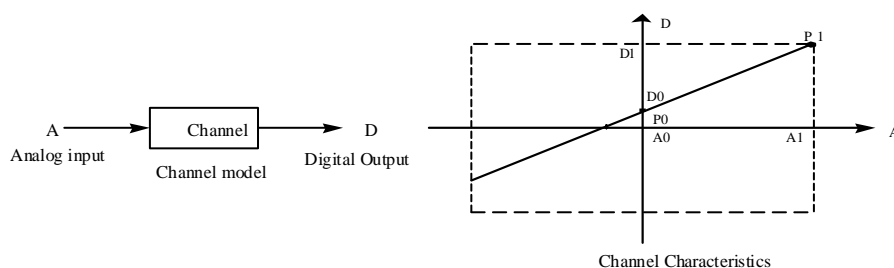


Figure 3-1 Schematic diagram of the channel characteristics of the VC-4AD

In consideration of the user's ease of use and without affecting the realization of the function, in the current mode, A0 and A1 correspond to [Actual Value 1] and [Actual Value 2] respectively, and D0 and D1 correspond to [Standard Value 1] and [Standard Value 2] respectively, as shown in Figure 3-1, the user can change the channel characteristics by adjusting (A0,D0) and (A1,D1), the factory default (A0,D0) is the external The factory default (A0,D0) is the 0 value of the external analogue input, (A1,D1) is the maximum value of the external analogue input. This is shown in Figure 3-2.

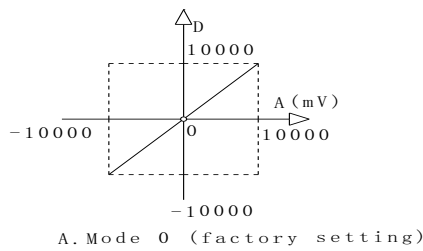
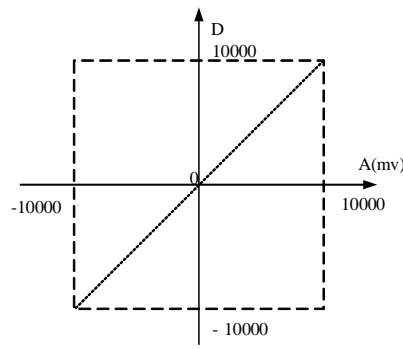


Figure 3-2 Channel characteristic change for VC-4AD

If you change the value of D0 and D1 of the channel, you can change the channel characteristics, D0 and D1 can be set anywhere between -10000 and +10000, if the set value is out of this range, VC-4AD will not receive and keep the original valid setting, Figure 3-3 shows the example of characteristics change, please refer to it.



A.Mode 0 , D0=0,D1=10000
 Input 10V, corresponding to digital 10000
 Input 0V, corresponding to digital quantity 0
 Input -10V, corresponding to digital quantity -10000

Figure 3-3 Example of a feature change

4 Programming examples

4.1 Programming example for VC series + VC-4AD module

Example: VC-4AD module address is 1, use its 1st channel input voltage signal (-10V to +10V), 2nd channel input current signal (-20mA to +20mA), close the 3rd channel, set the average number of points to 8, and use data registers D0 and D2 to receive the average conversion result.

1) Create a new project and configure the hardware for the project, as shown below

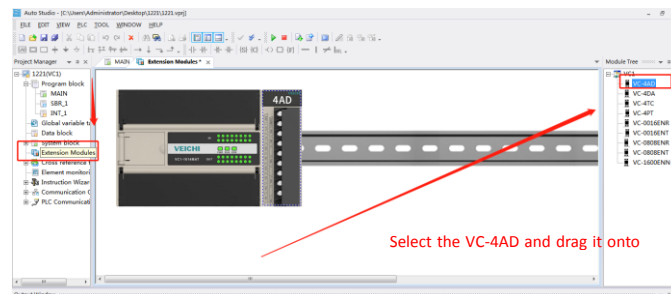
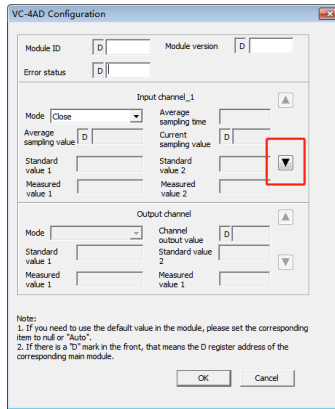


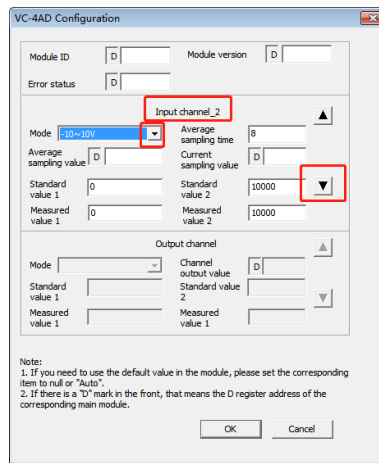
Figure 4-1 Hardware configuration

2) Double click on the "VC-4AD" module on the rail to enter the 4AD configuration parameters.



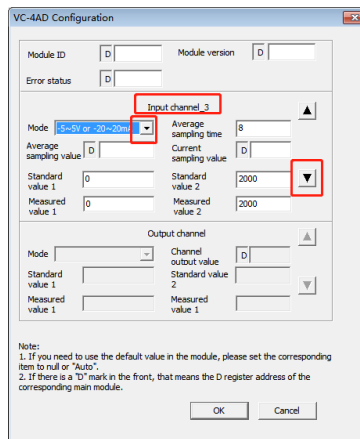
4-2 Basic application channel one setup

3) Click on "▼" to configure the second channel mode



4-3 Basic Application Channel 2 Setup

4) Click on "▼" to configure the third channel mode and click on "Confirm" when finished.



4-4 Basic application channel three setup

5 Installation

5.1 Size specification

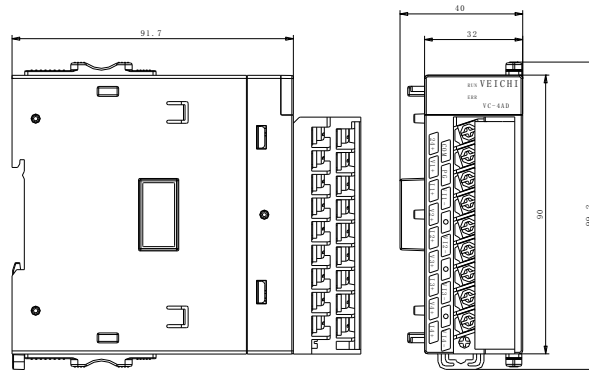


Figure 5-1 External dimensions and mounting hole dimensions (unit: mm)

5.2 Installation method

The installation method is the same as that for the main module, please refer to the VC Series Programmable Controllers User Manual for details. An illustration of the installation is shown in Figure 5-2

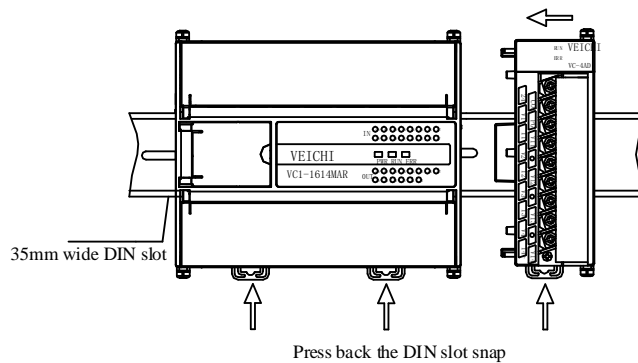


Figure 5-2 Fixing with DIN slot

6 Operational checks

6.1 Routine checks

1. Check that the analogue input wiring meets the requirements (see 1.5 Wiring instructions).
2. Check that the VC-4AD expansion connector is reliably plugged into the expansion connector.
3. Check that the 5V and 24V power supplies are not overloaded. Note: The power supply for the digital part of the VC-4AD comes from the main module and is supplied via the expansion interface.
4. Check the application to ensure that the correct operating method and parameter range has been selected for the application.
5. Set the VC main module to RUN.

6.2 Fault checking

If the VC-4AD is not running properly, check the following items.

- Checking the status of the main module "ERR" indicator.

blinking: check whether the expansion module is connected and whether the configuration model of the special module is the same as the actual connected module model.

extinguished: the extension interface is correctly connected.

- Check the analogue wiring.

Confirm that the wiring is accurate and can be wired as shown in Figure 1-5. •Check the status of the module's "ERR" indicator
Lit: 24Vdc power supply may be faulty; if 24Vdc power supply is normal, the VC-4AD is faulty.

Off: 24Vdc power supply is normal.

●Check the status of the "RUN" indicator

blinking: the VC-4AD is operating normally.

Information for users

1. The scope of the warranty refers to the programmable controller body.
2. The warranty period is eighteen months. If the product fails or is damaged during the warranty period under normal use, we will repair it free of charge.
3. The start of the warranty period is the date of manufacture of the product, the machine code is the only basis for determining the warranty period, equipment without the machine code is treated as out of warranty.
4. Even within the warranty period, a repair fee will be charged for the following cases.
failure of the machine due to non-operation in accordance with the user manual.
Damage to the machine caused by fire, flooding, abnormal voltage, etc..
Damage caused when using the programmable controller for a function other than its normal function.
5. The service charge will be calculated on the basis of the actual cost, and if there is another contract, the contract will take precedence.
6. Please make sure that you keep this card and present it to the service unit at the time of warranty.
7. If you have questions, you can contact the agent or contact us directly.

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VEICHI Product Warranty Card

Customer Information	Unit address.	
	Name of unit.	Contact person.
		Contact number.
Product information	Product type.	
	Fuselage barcode.	
	Name of agent.	
Fault information	Repair time and content.	
	Maintenance people:	
Mailing Address	Suzhou VEICHI Electric Technology Co. Address: No. 1000, Songjia Road, Wuzhong Economic and Technological Development Zone	