VM-0808ETN Module

Manual

Version V1.1

Archived Date 2023-03-07

Veichi Electric Co., Ltd. provides customers with a full range of technical support, so users can reach the nearest Veichi Electric Co., Ltd. office or customer service center, or the company headquarters directly.

Veichi Electric Co.

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Veichi Electric Co.

Address: 3rd Floor, Chunsheng, Linoya Industrial Park, Tangtou 1 Road, Tangtou Community,

Shiyan, Baoan District, Shenzhen, China.

Service hotline: 400-600-0303

Company website: www.veichi.com

Preface

■ Profile

VM-0808ETN series digital input/output expansion module, the product has 8-channel digital inputs and 8-channel digital outputs, the digital inputs are drain inputs and the numerical outputs are transistor NPN outputs. It can be used with VM series master and VM series VM-RTU-ECT or VM-RTU-PN interface modules.

Other Files

File	Content
VM-RTU-ECT	Introduction of product installation, wiring, use and other details
VM-RTU-PN	Introduction of product installation, wiring, use and other details
VM500/600/800	Introduction of product installation, wiring, use and other details

■ Version Change Log

Revision date	Version	Content
2023-3	A1.1	Minor error correction
2022-11	A1.0	First release of the manual

■ Manual Access

This manual is not shipped with the product, so users can get its PDF version in the following way:

- Log on to the official website of Veichi Electric (www.veichi.com), "Service and Support-Download", type in keywords and download
- Scan the QR code on the product body to get the manual with mobile phone

■ Warranty Statement

If malfunctions or damage occur on the product under normal use, Veichi Electric offers 18-month warranty (from the date of shipment from the factory, subject to the bar code on the body, and in accordance with the agreements between parties if there are some). Customers will be charged if it exceeds 18 months while damages caused by the following conditions will be charged if it is within 18 months.

- Product damage caused by wrong methods against this manual
- Product damage caused by fire, flood, or abnormal voltage
- Product damage caused for abnormal functions against this manual
- Product damage caused for unspecified purposes against this manual
- Secondary damage to the product caused by force majeure (natural disasters, earthquakes, lightning strikes) factors

The relevant service costs are calculated according to the manufacturer's standards, and if there is a

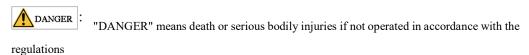
contract, the contract will be handled on a priority basis. Please refer to the Product Warranty Card for detailed warranty description

Safety Precaution

■ Safety Statement

- Read and follow these safety precautions before installing, operating, and maintaining the product
- Follow all safety precautions stated on the product's labeling and in the manual when installing, operating, and maintaining the product for personal and equipment safety
- The "CAUTION", "WARNING" and "DANGER" items in this manual do not mean all safety precautions to be observed, but are only supplementary to safety precautions
- This product shall be used in an environment that complies with the design specifications, otherwise
 it may cause malfunction, and malfunction or damage to parts caused by failure to comply with the
 relevant regulations are not covered by the product warranty terms
- Veichi will not take on any legal responsibility for personal safety accidents, property damage, etc.,
 caused by unauthorized operation of the product

■ Safety Level Definition



**WARNING" means death or serious bodily injuries if not operated in accordance with the regulations.

""CAUTION" means minor bodily injuries or damage to the equipment if not operated in accordance with the regulations.

Keep this guide in a safe place in case it is needed, and be sure to give this manual to the end user

During Control System Design



- > Be sure to design safety circuits so that the control system will still work safely when the external power supply drops out or the programmable controller malfunctions;
- ➤ If the rated load current is exceeded or the load is short-circuited, etc., resulting in prolonged overcurrent, the module may smoke or is on fire, so safety devices such as fuses or circuit breakers shall be installed externally



Be sure to provide emergency brake circuits, protection circuits, interlock circuits for forward and reverse operation, and upper and lower position interlock switches to prevent damage to the machine in the external circuits of the programmable controller;

- > Design external protection circuits and safety mechanisms for output signals related to major accidents for safe operation of the equipment;
- The programmable controller CPU may stop all output when it detects an abnormality in its own system; when some of the controller's circuits fail, output may turn uncontrolled. Please design suitable external control circuits in order to ensure normal operation;
- Damage to output units such as relays and transistors of programmable controllers will cause their output uncontrolled to the ON or OFF state;
- The programmable controller is designed to be used in indoor, overvoltage class II electrical environments, and its power supply system should be equipped with lightning protection to ensure that lightning overvoltage is not added to the programmable controller's power input or signal input, control output and others, so as to avoid damage to the equipment.

Installation



- > Only maintenance professionals with adequate electrical knowledge and training related to electrical equipment should carry on installation work;
- When removing or installing a module, the external power supply to the system must be completely disconnected beforehand. Failure to fully disconnect the power supply may result in electric shock or module malfunction and misoperation;
- Do not use the programmable controller in the following places: places with dust, grease, conductive dust, corrosive gases, flammable gases; places exposed to high temperature, condensation, wind and rain; and places subject to vibration and shock. Electric shock, fire, and misuse can also cause damage and deterioration to the product;
- Programmable controllers are open type devices, please install them in control cabinets with door locks (protection of the control cabinet housing > IP20), and only operators who have been trained with sufficient electrical knowledge about equipment shall open the control cabinets

CAUTION:

- Avoid metal shavings and wire ends falling into the ventilation holes of the controller during installation, which may cause fire, malfunction, and misoperation;
- Ensure that there is no foreign matter on its ventilation surface after installation, otherwise it may lead to poor heat dissipation, which may cause fire, malfunction, and misoperation;
- Connect the modules tightly to their respective connectors and lock the module connection hooks securely. Improper installation of the module may result in malfunction, malfunction and disconnection

Wiring



- Wiring of this product should only be carried out by specialized maintenance personnel with adequate electrical knowledge and training related to electrical equipment;
- During wiring, the external supply power to the system must be fully disconnected in advance. Failure to do so may result in electric shock or equipment failure or malfunction;
- The terminal cover supplied with the product must be installed before power-up and operation. Failure to install the terminal cover may result in electric shock;
- > The cable terminals should be well insulated to ensure that the insulation distance between the cables is not reduced after the cables are installed in the terminal block. Failure to do so may result in electric shock or equipment damage.



- > To avoid electric shock, disconnect the power supply before connecting the power supply to this product;
- The input power supply of this product is DC24V, if the supplied power is not within ±20% of DC24V, this product will be seriously damaged. Therefore, please check whether the DC power supply provided by the switching power supply is stable or not regularly

Maintenance



- > Only specialized maintenance personnel with adequate electrical knowledge and training related to electrical equipment shall carry out the operational maintenance of the product;
- When cleaning the module or re-tightening the bolts on the terminal strip or connectors, the external power supply to the system must be completely disconnected. Failure to do so may result in electric shock;
- When disassembling a module or making connections to or removing communication cables, the external supply power to the system must first be completely disconnected. Failure to fully disconnect may result in electric shock or malfunction;

Safety Recommendations

- Please consider the manual installation or other spare methods that are separate from PLC to stop or start the system when there are mechanical parts that will be touched directly by operators like position of loading/unloading tools or parts with auto running function.
- > If it's necessary to modify the programs while operating, please consider to add locks or other safeguards to ensure that only authorized personnel can make the necessary modifications.

Scrapping

CAUTION:

- ➤ Dispose of this product as industrial waste, and the batteries should be handled separately in accordance with local laws and regulations;
- Dispose of equipment and products in accordance with industrial waste disposal standards to avoid environmental pollution.

1 Product Information

1.1 Naming Rules and Nameplate Description

 $\underline{VM} - \underline{08} \ \underline{08} \ \underline{E} \ \underline{TN}$

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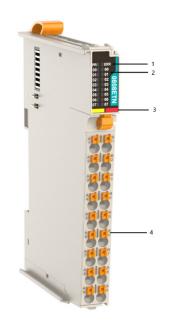
- Product information
- VM: Veichi Flexible Series IO Module
- ① IO input channel
- 08: 8 channels
- ② IO output channel
- 08: 8 channels
- 3 Module type
- E: Logic IO expansion module
- ④ Output type
- R: Relay output
- TP: Transistor output (source type)
- TN: Transistor output (drain type)



The relevant ordering data for this product is shown in the table below based on the above naming rules and nameplate information:

Model	Description	Machine code	Application
VM-	VM Series 8 Digital Inputs 8		VM-series PLC, VM-series
0808ETN	Digital Outputs		coupler

1.2 Component Description



No.	Interface	Function definition			
1	Signal	PR	Power and	On (green)	Module is working
	indicator	(POWER+RUN)	Run indicator		properly.
				Off	Module is abnormal.
				Flashing	Module is in ready or
				(green)	stop state.
		ERR	Error indicator	On (red)	Module is in error
					state.
2	IO signal	The left side (00~07) indicators correspond to 8 inputs respectively, and the			
	indicator	input valid indicator is lit;			
		The right side (00~07) indicator lamps correspond to 8 outputs respectively,			
		and the output valid indicator lamps are lit.			
3	Color	Yel	low: IO input		Red: IO output
		Green: analog input Blue: analog output			Blue: analog output

		Orange: temperature measurement input	
4	User	See the terminal definition section for	
	terminal	details.	

1.3 Specification

1.3.1 Power Specification

Item	Specification
Rated voltage of terminal input voltage	24V DC (20.4V DC~28.8V DC)
Rated current of terminal input power	2A (typical at 24V)
Rated voltage of bus input power	5V DC (4.75V DC~5.25V DC)
Rated current of bus input power	85mA (typical at 5V)
Power isolation	Relative isolation between 24V and V5
Rated voltage of terminal output power	None
Rated current of terminal output power	None
Module hot-swap function	Not available

1.3.2 Input Specification

Item	Specification
Input Type	digital input
input method	Drain type
input channel	8
Input Voltage Rating	24V DC±10%(21.6V DC-26.4V DC)
Input Current (Typical)	4mA (typical at 24V)
ON voltage	>15V DC
OFF voltage	<5V DC
Hardware response time ON/OFF	100uS/100uS
Software filtering time	support
Input Impedance	Reference value 5.3k~5.6k
Isolated or not	Isolated

Input Motion Display	Input indicator lights when input is driven (software controlled)
Input Derating	75% derating at 55°C operation (no more than 12 input points
	ON at the same time), or 10°C derating at full ON of input
	points.
	(no more than 12 inputs ON at the same time), or 10°C derating
	when inputs are all ON

1.3.3 Output Specification

Item	Specification
Output type	Digital output, transistor output
Output method	Drain type
Output channel	8
Output voltage level	24V DC±10% (21.6V DC~26.4V DC)
Output load (resistive load)	0.5A/terminal, 2A/module
Output load (inductive load)	7.2W/ terminal, 12W/ module
Output load (lamp load)	5W/ terminal, 18W/ module
Hardware response time ON/OFF	100us/100us
OFF leakage current	10uA
Switch frequency	Resistive load 100Hz, inductive load 0.5Hz, lamp
	load 10Hz
Isolated or not	Isolated
Output action display	Output indicator lights up when the output is on
	(software controlled)
Output derating	50% derating at 55°C (output current not exceeding
	1A while ON), or 10°C derating when output
	terminals are all ON
Protection	Short circuit protection, overcurrent protection

1.3.4 Software Specification

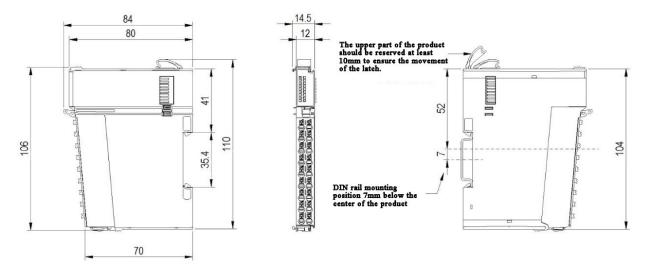
Item	Specification
Software input filtering time	0.25ms*N (N=0~255) One group per 8 channels,
	one filter parameter is shared within the group
Input port anomaly detection and indication	None
Input channel logic level configuration	No support
Fail-Stop Output State Mode	Clear zero, keep current value, output according to
	preset value
Fail-Stop Output Preset	0 or 1
Output port anomaly detection and indication	No
Output channel logic level configuration	Not Supported
Independent channel enable configuration	Not Supported
Diagnostic reporting function configuration	Not supported
Downtime Mode	Outputs are not refreshed, inputs are refreshed in
	safeop support
IO mapping	Support per-bit access, per-byte access, per-word
	access, three IO mapping methods

2 Mechanical Installation

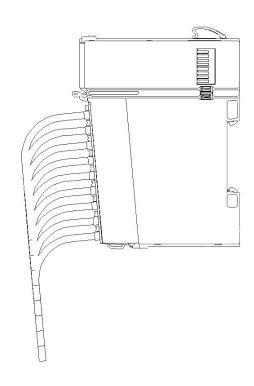
2.1 Mounting Dimensions

2.1.1 Module

Mounting dimension information is shown below in (mm).:



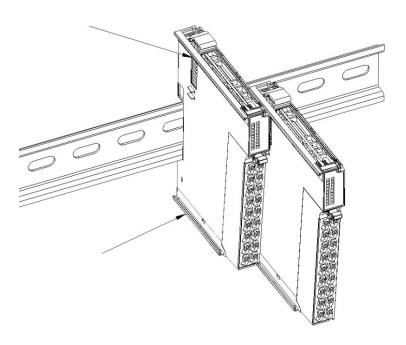
2.1.2 Connection Cables



2.2 Installation

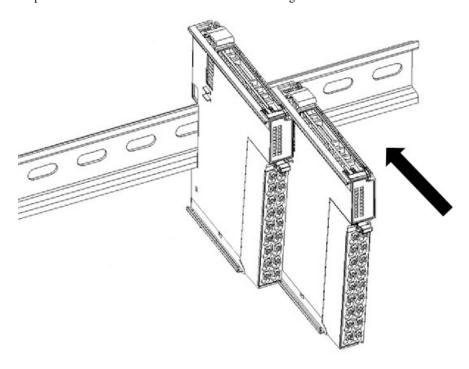
2.2.1 Inter-module Installation

Inter-module assemblies are slide-mounted via the top and bottom rails



2.2.2 Rail Installation

DIN rail mounting is adopted here. When installing, align the module with the DIN rail and press the snap until there is a clear click sound. As shown in the figure below

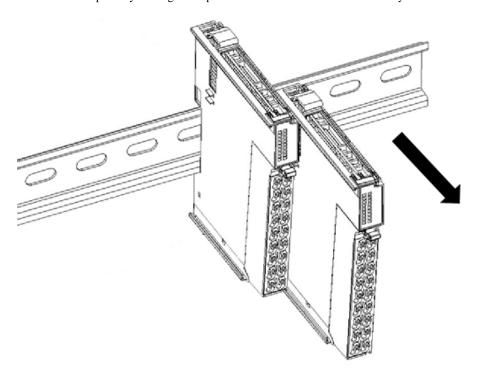


Note: Push the rail snaps first to open state, place the module onto the DIN rail, press down the top

of the snaps with your hand until it is in place. Install a DIN rail clamp at each end of the main unit or module and when install them, hook the bottom of the DIN rail clamp to the bottom of the DIN rail and then rotate the DIN rail clamp so that the top end of the DIN rail clamp is hooked to the top end of the DIN rail, and then finally tighten the screws to lock the DIN rail clamp

2.2.3 Disassembly

Push the rail snap with your finger and pull the module out in the direction away from the DIN rail



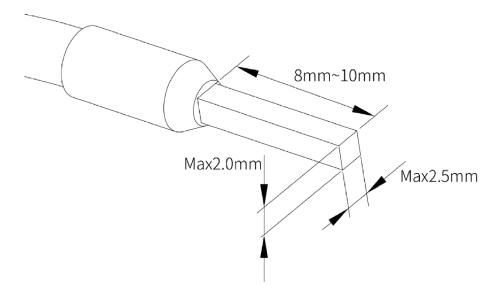
3 Electrical Installation

3.1 Cable Selection

The wire lug diameters in the following table are for reference only, and can be adjusted according to reasonable calculations based on practical use.

Material name	Wire diameter			
	PRC standard /mm2	American standard (US) /AWG		
Tube lug	0.3	22		
	0.5	20		
	0.75	18		
	1.0	18		
	1.5	16		

If other tube lugs are used, crimp them to the stranded wire, shape and size are required as shown below.



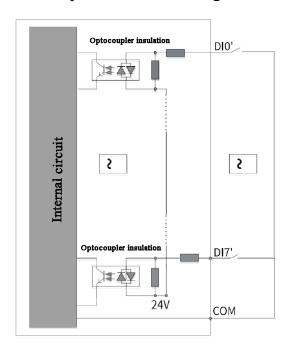
3.2 Terminal Definition



Left indicator	Left signal	Left terminal	Right	Right signal	Right
			terminal		indicator
00	X0	A1	B1	Y0	00
01	X1	A2	B2	Y1	01
02	X2	A3	В3	Y2	02
03	X3	A4	B4	Y3	03
04	X4	A5	B5	Y4	04
05	X5	A6	В6	Y5	05
06	X6	A7	В7	Y6	06
07	X7	A8	В8	Y7	07
/	24V	A9	В9	COM	/

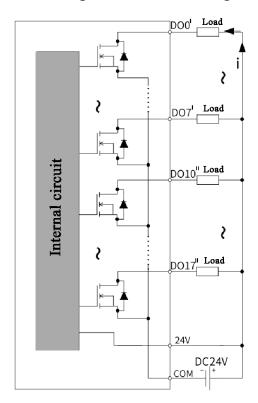
3.3 Terminal Wiring

3.3.1 Input Terminal Wiring



Note: The input method of VM-0808ETN module fixed to drain type.

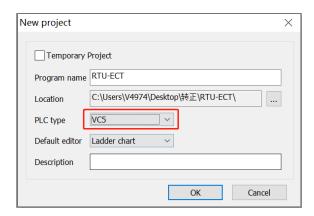
3.3.2 Output Terminal Wiring



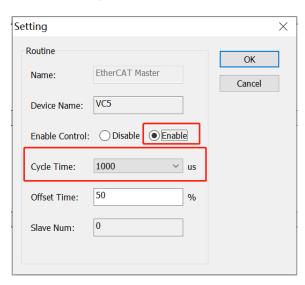
4 Module Programming Example

4.1 Veichi Auto Studio with VC5

4.1.1 Create A New Project

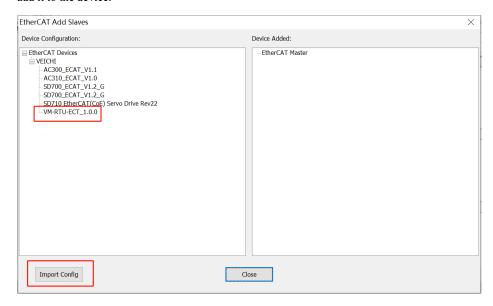


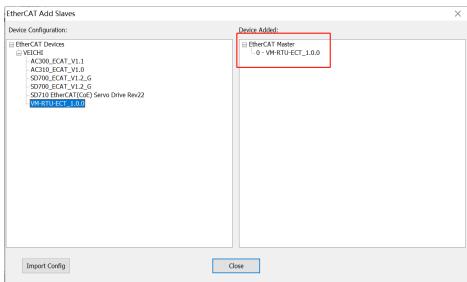
4.1.2 Configure EtherCAT Task



4.1.3 Import the xml File

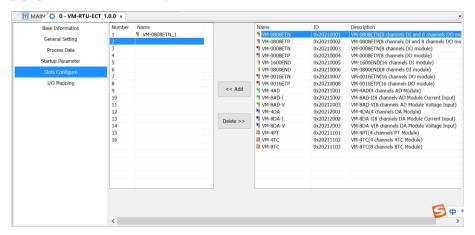
Import the current latest version of VM-RTU-ECT $_1.0.0.xml$ description file and double click to add it to the device:





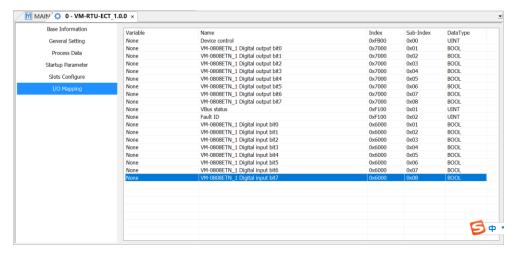
4.1.4 Slot Configuration

Currently, VC5 requires slot configuration of the device first, and the configuration of the expansion modules and the order must be consistent with the physical object, otherwise an alarm will pop up to indicate that the configuration does not match what is connected



4.1.5 IO Mapping

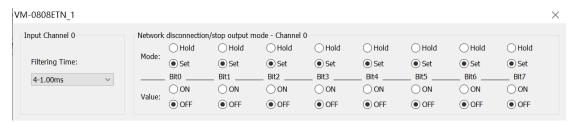
VC5 default setting is no mapping, so it is necessary to map the registers that will be controlled and monitored to the soft components before actual use, otherwise users can not operate on them



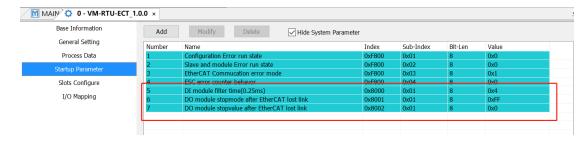
4.1.6 Set Parameters

- 1. filtertime: Digital input filter parameter (index number in EtherCAT application: 0x8000+0x40*slot number), unit 0.25ms, setting range $0\sim255$, that is, 0.25ms*N (N=0 ~255).
- 2. stopmode: abnormal stop output mode (index number in EtherCAT application: 0x8001+0x40*slot number), each channel corresponds to 1 bit respectively, 0 is hold, 1 is preset value corresponding to output stopvalue.
 - 3. Stopvalue: Abnormal stop output preset value (index number in EtherCAT application:

0x8002+0x40*slot number), each channel corresponds to 1 bit of value respectively.



or



4.1.7 Write User Programs

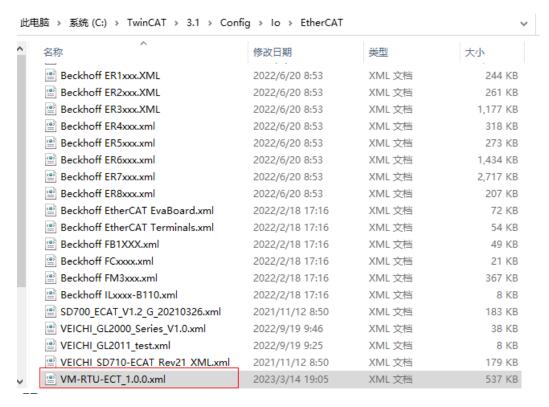
4.1.8 Compile, Download and Run

If there are no errors during compiling, download and run it.

4.2 Simple Commissioning with Beckhoff TwinCAT

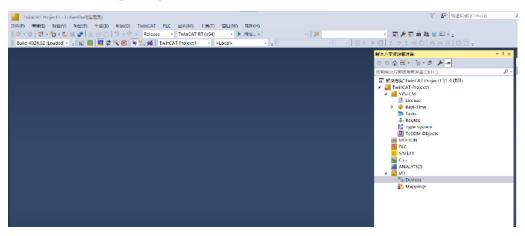
4.2.1 Import the xml File

 $Copy the current latest version of the description file VM-RTU-ECT_1.0.0.xml to the TwinCAT installation directory under TwinCAT \lambda 1.\Config \Io \Ether CAT \lambda 1.\Config \Io \Ether \lambda 1.\Config \Io \Lambda 1.$



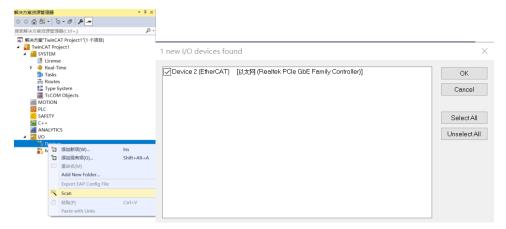
4.2.2 Create A New TwinCAT Project

Open the TwinCAT software to create a new TwinCAT project, connect the VM-RTU-ECT to the VM-0008ETN and power up and connect it to the Ethernet interface of the PC



4.2.3 Scan the Devices

Ensure that the VM-RTU-ECT and VM-0808ETN are connected for device scanning, and follow the pop-up window to confirm that it is running to the OP.



Note: A new installation of TwinCAT software requires the installation of the real-time NIC driver before this step

4.2.4 IO Monitoring and Commissioning

As shown in the figure below, scan to a 0008ETN expansion module under the device VM-RTU-ECT coupler for IO monitoring and debugging its input and output.

