VS-ENET-EC
Ethernet Communication Expansion Card User's Guide

● **Forward**

The VS-ENET-EC Communication Expansion Card is a dual ports card. It offers an Ethernet port (with an additional non-isolated RS-485 interface) and one non-isolated RS-485 port. There is a RJ-45 jack at the top to connect with Ethernet; lower part with two RS-485 interfaces to connect with serial communication devices.
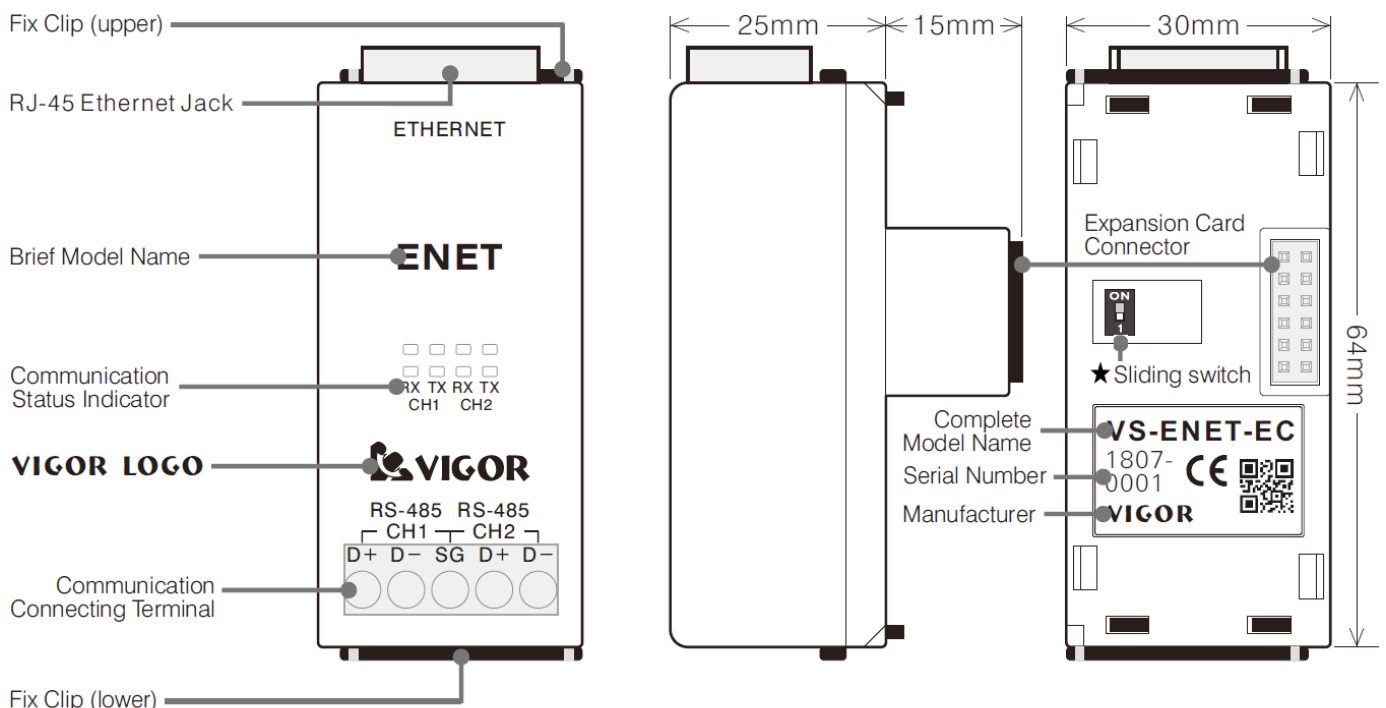When this card is in the Main Unit's EC1 socket, the Ethernet command will be converted to PLC's CP2 and the left CH1's RS-485 in parallel. Thus, the Ethernet communication can use the card to connect with PLC's CP2 also bridge with other devices at the left CH1 RS-485 indirectly. Besides, the right CH2 RS-485 is an independent communication port CP3. When the card is in the EC3 socket, its ports are CP4 / CP5 and usages are equal to the EC1. The following instructions are for the use of CP2 at EC1. The CP3 refers to the communication section of the PLC programming manual.

● **Specification**

Item		Specification
Inter-face	Ethernet	RJ-45 jack; 10 BASE-T / 100 BASE-TX, wiring length 100M Max.
	RS-485 × 2	Wiring with devices by D+ / D− / SG terminals, Half-duplex, Non-isolated, Dist. 50M
Sliding Switch		Choose the source of CH1 RS-485's direction control. CP2=Master=ON; others=OFF
Net-work	Portocol	Vigor TCP/UDP (Transparent); Modbus TCP IP Protocol. Def.: Vigor TCP
	Connection	One connection
Power Request		DC 5V 200mA (from PLC Main Unit)

● **Product Exterior**

Fix Clip (upper)
RJ-45 Ethernet Jack
ETHERNET
Brief Model Name — ENET
Communication Status Indicator — RX TX RX TX / CH1 CH2
VIGOR LOGO — VIGOR
RS-485 RS-485 / CH1 CH2 / D+ D− SG D+ D−
Communication Connecting Terminal
Fix Clip (lower)

25mm   15mm   30mm

Expansion Card Connector
ON 1
★ Sliding switch
Complete Model Name — VS-ENET-EC
Serial Number — 1807-0001   CE
Manufacturer — VIGOR
64mm

Card Weight (N.W. / G.W.): 45g / 80g

★ Switch ON only when the PLC's CP2 is the Master and the CH1's RS-485 is used.

● Indicator

Item	Description
CH1 RX	CH1 data receiving (Blink when the CP2 receiving from either Ethernet or RS-485)
CH1 TX	CH1 data sending (Blinking when the CP2 sending out to both Ethernet and RS-485)
CH2 RX	CH2 data receiving
CH2 TX	CH2 data sending
Ethernet Link	Ethernet is linked up（Green, next to the RJ-45 jack)
Ethernet Data	Ethernet data transforming（Yellow, next to the RJ-45 jack)

● Setup Software at Computer

Please go to the web site below to download the card's setup software and install it.

https://www.usriot.com/support/downloads/usr-tcp232-m4k3-setup-software.html

Open the software and place the VS-ENET-EC at the same Local Area Network (LAN), then configure the card step by step.

1. Search Device: Use the [Search Device] at the LAN, then the VS-ENET-EC (USR-K3 or USR-K7) will show in the list.

2. Select a Device: Click on one device (e.g. IP: 192.168.11.245) in the list to configure it.

3. Base Save: (Located on the lower left part of the software, there are two modes available)
   ① Statie IP (IP is assigned by user, default)   ② DHCP/Auto IP (assign by DHCP server)

   ■ Use the [Full Show +] can have more detail to set.

   ■ Click the [Base Save] to send out the setting. If success, the left corner will show ACK.

4. Port Setting: (Located on the right side of the software with title "Port1")
   a. Baudrate: Communicating rate between card's CH1 and PLC's CP2 (those must be equal)
   b. Com. Parameter: All the Vigor TCP/UDP or Modbus TCP protocol must use None, 8, 1.
   c. Flow Control: Please use the RS-485
   d. Work Mode: Can use the UDP Server, TCP Server, TCP Client or UDP Client mode
      ■ If the PLC's CP2 is a Slave, OFF the sliding switch and can not use UDP Client mode.
      ■ If the CP2 is a Master (w/ LINK or MBUS), turn ON the switch (may use UDP Client).
   e. Modbus TCP： (Default: None)
      ■ When using the Vigor protocol, here must choose None (disable the function).
      ■ When using the Modbus TCP protocol, here must choose Modbus TCP (enable the
        function) also the PLC's project for the CP2 should use Modbus Slave / RTU / 8, N, 1.
   f. Click the [Save COM1] to send out the setting. If success, the left corner will show ACK.

● **Note**

   1. That "Port1" in the right part of card's setup software, the Baudrate and the following 3
      parameters are for the communication between the VS-ENET-EC's Ethernet port (CH1)
      and PLC's CP2, therefore those must be equal. Besides, the Work Mode and the port
      number options below should match with the Master (a software or HMI) at the network.

   2. There is a connection station number at the network Master. Therefore, the station number
      of the PLC's CP2 should match with the Master. If the communication is by the Vigor
      protocol, the default station number is #0; if the MODBUS TCP protocol is used, the
      default station number is #1 and the Local Port number is #502.

   3. If the network Master has more than one Ethernet interface, please close the unnecessary
      interface, only keep the one is used to link with the VS-ENET-EC. In addition, if there is
      not having a DHCP Server on this LAN to manage IP address, all the devices at this
      network should use the Static IP, also under the same subnet mask and Getway.

   4. When the network mode of this VS-ENET-EC card is the Server, it can only be used by
      one application at the one linked Client.

● Example I

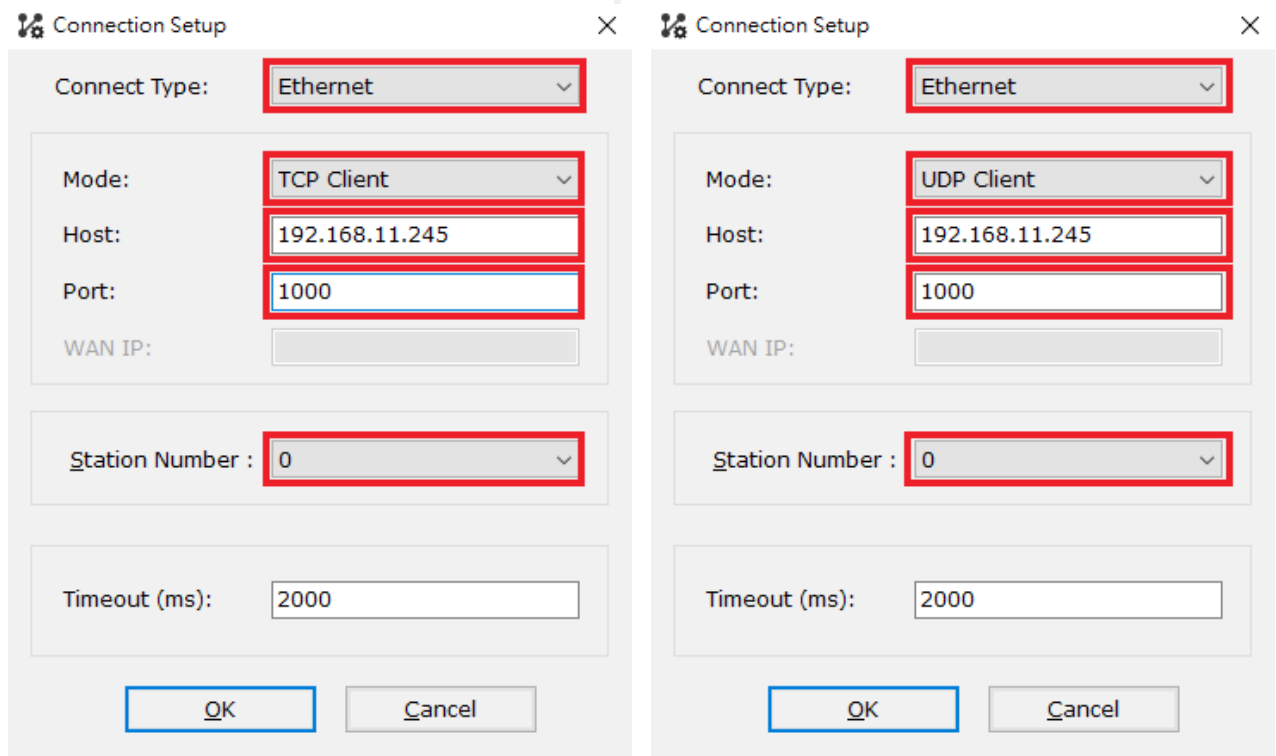Use the Ladder Master S to access the PLC (CP2, Slave) by the UDP or TCP Server network.

1. Run the "USR-TCP232-M4K3-setup-V2.3.3.97.exe" setup software of the VS-ENET-EC. Click the [Search Device] on the left to find the VS-ENET-EC and select it from the list.

2. Complete the IP related settings at the Base Save part and click the [Base Save] to load that to the VS-ENET-EC.

3. On the right side "Port1" to assign the Work Mode as UDP Server / TCP Server and give a Local Port number. Then, click the [Save COM1] to send settings to the VS-ENET-EC.

4. Run the Ladder Master S and open a project. Under the "Project" – "COM Port Setup" to assign the CP2's application as VS Computer Link Slave, then fit the Baud Rate with the VS-ENET-EC (as the picture above that is 115200 bps), also give the Station Number #0 (default). When the project is done, use a Mini USB cable to load it to the PLC.

5. Change the connecting method of the Ladder Master S under the "System" – "Connection Type Setup" from the USB to the Ethernet, then related to the VS-ENET-EC to choose the UDP Client or TCP Client mode. Also, match the Host IP and Port number with the card then use the Station Number #0 for the PLC's CP2. Click [OK] to close the page when the settings are finished.

Connection Setup	☒		Connection Setup	☒
Connect Type:	Ethernet ⌄		Connect Type:	Ethernet ⌄
Mode:	TCP Client ⌄		Mode:	UDP Client ⌄
Host:	192.168.11.245		Host:	192.168.11.245
Port:	1000		Port:	1000
WAN IP:			WAN IP:	
Station Number :	0 ⌄		Station Number :	0 ⌄
Timeout (ms):	2000		Timeout (ms):	2000
OK	Cancel		OK	Cancel

6. Unplug the Mini USB cable, then start the monitor function at the Ladder Master S. Therefore, that communication is through the Ethernet to the VS-ENET-EC at PLC's CP2. In addition, can use the same path to up/down load the PLC project. However, the setting about the CP2 in the new project should equal to the one in the PLC, otherwise the connection may be lost.

● Example II

Use a MODBUS TCP IP network emulator to access the PLC (CP2, MODBUS RTU Slave).

1. As the Example I, use the "USR-TCP232-M4K3-setup-V2.3.3.97.exe" software to search the VS-ENET-EC, then complete the IP related configuration and click the [Base Save].

2. On the right side "Port1" to assign the Flow Control as RS-485, the Work Mode as TCP Server, give a Local Port (usually #502) and open the Modbus TCP function. Then, click the [Save COM1] to send the settings to the VS-ENET-EC.

3. Run the Ladder Master S, under "Project" – "COM Port Setup" to assign the CP2 as MODBUS Slave / RTU, fit the Baud Rate (as above that is 115200 bps) and give a Station Number (usually #1). Then load it to the PLC by Mini USB.

4. The MODBUS TCP emulator can monitor the PLC through the CH1 of the VS-ENET-EC (CP2: MODBUS Slave, RTU, 8, None, 1 + matched port & station #).