

VB-ENET

Ethernet Communication Module

User's Manual

VIGOR ELECTRIC CORP.

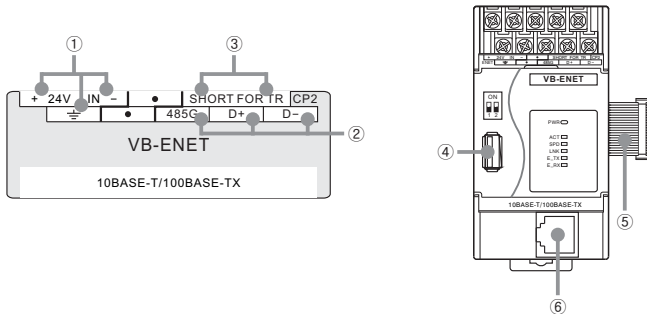
Introduction

The VB-ENET Ethernet Communication Module is provided to access PLC data or up/down load a PLC program through the Ethernet. It has a RJ-45 jack to the Ethernet, a flat PLC connecting cable to the VB/VH series Main Unit's Communication Expansion Slot (CP2), RS-485 terminals for connecting to other RS-485 devices and a RS-232 (by USB connector) setting port to a computer.

1. Specification

Item	Description	
Basic	Power Request	DC 24V ± 20%, 80mA
	Dimension	48×90×85mm. (W×L×H; not including cable and clips)
	Installation	DIN rail (35 mm.) or M4 screws (100mm. between screws)
Interface	Ethernet RJ-45 jack	10BASE-T / 100BASE-TX, the distance to a HUB up to 100 m.
	Flat PLC Connecting Cable	To PLC's Communication Expansion Slot (CP2) (must use the accessory adapter)
	RS-485 Port	For connecting to other devices; isolated, distance up to 1 km.
	RS-232 Port	To configure this module by a computer, it is a USB-A female connector for the MWPC-200 or VBUSB-200 cable
Network	Application Layer	Vigor TCP, Vigor UDP or Modbus TCP protocol
	Connecting Number	Up to 8 simultaneously

2. External Layout and Part Functions



- ① DC 24V power input and Class-3 grounding terminals.
- ② RS-485's D+, D- and the shielded cable's signal ground.
- ③ SHORT FOR TR: Short-circuit those terminals if this module is the end of a RS-485 cable.
- ④ RS-232 module setting port (using a USB-A female connector, located under the front cover).
- ⑤ Flat connecting cable (must use the adapter accessory) to a VB/VH Main Unit.
- ⑥ RJ-45 modular jack.

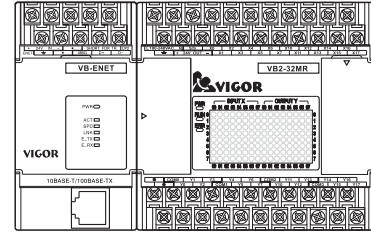
※ There are two switches under the front cover, please always keep them OFF.

3. Status LED

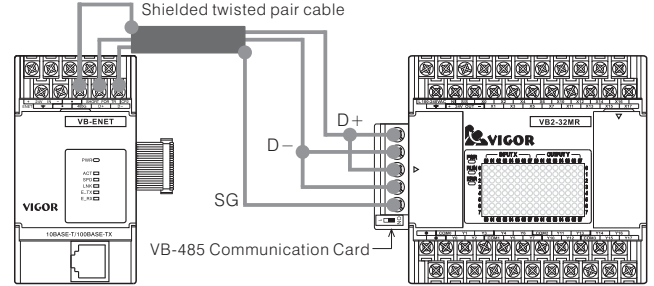
LED	Description
PWR	External DC 24V power input: ON = OK
ACT	Ethernet status: Blinking = Data packets are transmitted on the LAN
SPD	Ethernet transmission speed: ON = 100 mbps ; OFF = 10 mbps
LNK	Link to Ethernet: ON = Connected ; OFF = Unconnected
E_TX	Transferring data from the PLC connecting cable or RS-485 to Ethernet
E_RX	Transferring data from the Ethernet to PLC connecting cable or RS-485

4. Connective Methods

- Using the flat connecting cable to connect to a PLC:



- Connected by the RS-485:



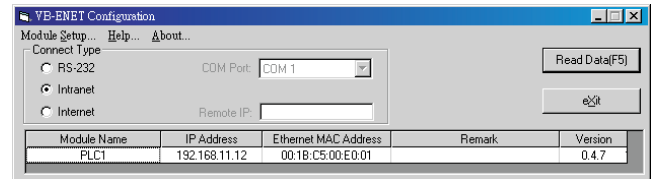
Note: The Main Unit needs a RS-485 expansion (ex. VB-485, VB-485A or VB-CADP). Must use the RS-485 shielded twisted pair cable (ex. Belden 9841). The wiring topology is as a connected series of point-to-point (multi-dropped) nodes, a line or bus (not a star, ring or multiply-connected) network. At each ends should have a terminal resistor (this module could short-circuit the "SHORT FOR TR" or parallel connection an 120Ω 1/2W resistor). However, all the wiring must follow the standard RS-485 (EIA-485) rules.

- Could use both connective methods above together and the RS-485 could connect to multiple PLCs.

5. Module Setting Software: VB-ENET Configuration

This VB-ENET Configuration program is under the Ladder Master (after V1.73.1). Go to <http://www.vigorplc.com.tw/eng/download.htm> to download and install the Ladder Master. Then, at the Windows under the "Start" / "Programs" / "Ladder Master" folder will have its shortcut.

Start the VB-ENET Configuration program:



- To Choose a Connect Type:

- A. RS-232 (refer to the layout chart ④), the USB-A female connector is under the front cover)
 - Use the MWPC-200 or VBUSB-200 cable to connect with the setting computer.
 - Select the connected COM Port of the computer, ex. COM 1.
 - Click the "Read Data(F5)" button to get the information from the module.
 - Double click the module in the list to enter the Module Setup page.

B. Intranet

- Within a LAN, its DSCP Server (ex. Router or IP sharing box) has assigned an IP address to a VB-ENET module then the VB-ENET Configuration program could ping the module.
 - Click the "Read Data(F5)" button to ping and get its information from the module.
 - Double click the module in the list to enter the Module Setup page.
- Note 1 : If need to manually assign an IP for the module, please use its RS-232 port and into the "IP Setting..."
- Note 2 : If via the LAN could not get the module's information, please use its RS-232 port.

C. Internet

- Fill the blank of Remote IP by the static Internet IP; setup the router and disable firewall.
- Click the "Read Data(F5)" button to ping and get its information from the module at the address.
- Double click the module in the list to enter the Module Setup page.

- FAQ:

- Q1: The firewall of the computer or router is enable and the module does not reply to the ping.
- A1: Temporarily disable all related firewalls or using the RS-232 to setup the module; the other way is by the Internet option and key in its IP at the LAN. Also, must disable the List Only function.
- Q2: Has connected with a DHCP Server but the LNK LED is OFF, by its RS-232 could get the IP = 0.0.0.0.
- A2: Use the mouse right button to click on the connected module (by RS-232), then change its media type to 10BASE-T.

● Module Setup:

To give a name to the VB-ENET

Indicates its assigned Ethernet IP

Application layer protocol: Vigor UDP, Vigor TCP or Modbus TCP.

To setup the port number

The communication baud rate between the module and PLC(s).

Vigor UDP / TCP is fixed (7.E.1); Modbus TCP could use 8.N.1, 8.O.1 or 8.E.1.

Allow or disallow to setup this module by the Internet.

Quit the setup.

Finish and execute the setup.

A. Open up the "IP Setting:":

- By the setting of Obtain an IP address automatically (default), this module will get a LAN IP address from its DHCP server.
- Could manually assign an IP for this module by Use the following IP address.

B. Open up the "Mode...":

- If directly and via RS-485 connected PLCs are all Slaves (without any communication instruction), please choose the Server Mode. That will allow the Master (ex. the Ladder Master) to make a connection.
- The MyLink function is under the Server Mode, it will automatically ping a Ladder Master which is at the appointed IP. Then, the Ladder Master can monitor or program the PLC via the Ethernet.
- If one and only one PLC is the Master of the Easy Link (a directly or RS-485 connected PLC has the LINK instruction), please choose the Client Mode.

B-1 The Server Mode

- Provide with the Open List Only function
- This function will only allow to transfer the particular IPs' Ethernet packet to the PLC(s).
- Enable the Open List Only function and double click on its table for edit a group of allowable IP. (10 IP groups Max.)

In the picture, if an Ethernet packet is sent from the IP between 192.168.11.20 and 192.168.11.29, then the data in the packet could transfer to the PLC(s).

B-2 The Client Mode (for the Vigor UDP protocol only)

- Actively connect with the appointed IP's Server Mode VB-ENET (with Slave PLC)
- Select the Client Mode and edit a Remote Server (IP). (up to 8 Servers can be appointed)
- By the information at Server's destination IP (or Host Name), port number and the range of connected Slave PLCs' station number, it could send a data packet to a specific Server VB-ENET

In the picture, the Master PLC's LINK instruction wants to send a communication request packet via this Client VB-ENET. Then, if the request is for the Slave #0~#9, the request will be packed and sent to the Sever VB-ENET which is at the IP: 192.168.11.19; port: 1000.

6. Setting the PLC Main Unit

The VB-ENET is for connecting with a PLC's Communication Expansion Slot (CP2). Please finish all wiring then turn on power and connect PLC's CP1 to a setting computer. Open the "Ladder Master" / "System" / "PLC 2nd COM Port Setting..." to set up the PLC's CP2.

All parameters between the CP2 and the VB-ENET must match, please refer to the table below.

Protocol of the VB-ENET	Vigor TCP or Vigor UDP	Modbus TCP
The application type of the CP2 and the communication instruction in the PLC program	Master	CP2: Computer Link or Easy Link; the Master PLC is the one and only one who uses the LINK instruction
	Slave	CP2: Modbus (RTU); a Slave PLC should not use the LINK, RS or MBUS instruction

7. Example

A. Use the Ladder Master via a VB-ENET to access a PLC:

- Connect the VB-ENET to the PLC's CP2 and LAN. Then, use the PLC's CP1 to make sure its CP2 is the default value (Computer Link, #0, 19200) and Slave (without the LINK, MBUS or RS instruction).
- Set up the VB-ENET. Host Name: "PLC1"; obtain IP automatically (192.168.11.12 by the DSCP); Server mode and disable the Open List Only function; Protocol: Vigor UDP; Port: 1000 and Serial Baud Rate: 19200.
- Open the Ladder Master to make sure it is using the station #0 then pick the "System" / "Configure Connection Type..."

If both the Ladder Master and VB-ENET are under a subnet mask, the Host Address at the Ladder Master could use the assigned name "PLC1" to substitute the 192.168.11.12. If the VB-ENET is under a registered domain name, the Host Address could use the domain name.

- The Ladder Master and VB-ENET must use the same Ethernet protocol (Vigor TCP or Vigor UDP). The Master (Ladder Master) will send request packets out so it uses the Client mode. The PLC is a Slave so the VB-ENET uses the Server mode.
- The Ladder Master could use this method to up/down load the PLC program or access its data after finish all settings.
- If the connection between the Ladder Master and PLC is by way of the Internet, must get the PLC's public IP address, disable firewalls and finish all the LAN transfer settings. Then, input the public IP to the Host Address at the Ladder Master.

B. Use the Ladder Master via the VB-ENET's MyLink function to access a PLC:

- Most of the settings are similar to the example A above but need to enable the VB-ENET's MyLink function and input the computer's IP. (Use a static IP on the Internet / LAN is recommended.)
- Must make sure the VB-ENET's MyLink packet could be routed to the Ladder Master's computer. If they are not in a same subnet mask, the MyLink will send the packet to port #60 of inputted IP. Please appoint the port #60 of the routing device to the computer.
- Please disable related firewalls.
- Open the "Ladder Master" / "System" / "Configure Connection Type..." and choose the MyLink.

- Wait a few minutes, the MyLink packet from the VB-ENET will arrive. Then, at the "System" / "MyLink", choose the VB-ENET at the list and click the "Connect".

- Could use the Ladder Master with the MyLink mode to up/down load the PLC program or access its data after finish all settings.

C. A Master (TCP Client HMI or SCADA) uses the Modbus TCP protocol to access a PLC:

- Since the PLC is a Slave, it should not use the LINK, MBUS or RS instruction. Let its CP2 become the Modbus RTU mode and match up all other parameters with the Master.
- The VB-ENET must use the Server Mode and disable the MyLink function. Use the Modbus TCP protocol and match up all other parameters with the Master.
- Recommend to use a Static IP for the Server (VB-ENET), disable firewall and finish the LAN transfer setting.
- Input the Server's parameters, IP and port number to the Master for access the PLC.

※ Please ask the network administrator, builder and equipment supplier to get the essential support.