HYOSUNG
MODBUS Slave
MODBUS-TCP Driver

Supported version   TOP Design Studio   V1.0 or higher

CONTENTS

We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

1. System configuration

This driver is the "Serial Slave Driver" among the "MODBUS Protocol" of "HYOSUNG".

Depending on the external device (MODBUS Slave Protocol supported), you may set the "command code", "protocol frame format" etc., of the driver separately. In this case, set the detailed settings according to the external device side based on the communication method.

The system configuration with an external device supported by this driver is as follows:

Series	CPU	Link I/F	Communication method	System setting	Cable
	MODBUS Slave Device		Ethernet (TCP / UDP)	3. TOP communication setting 4. External device setting	Twisted pair cable*Note 1)

*Note 1) Twisted pair cable

- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.

- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

■ Connectable configuration

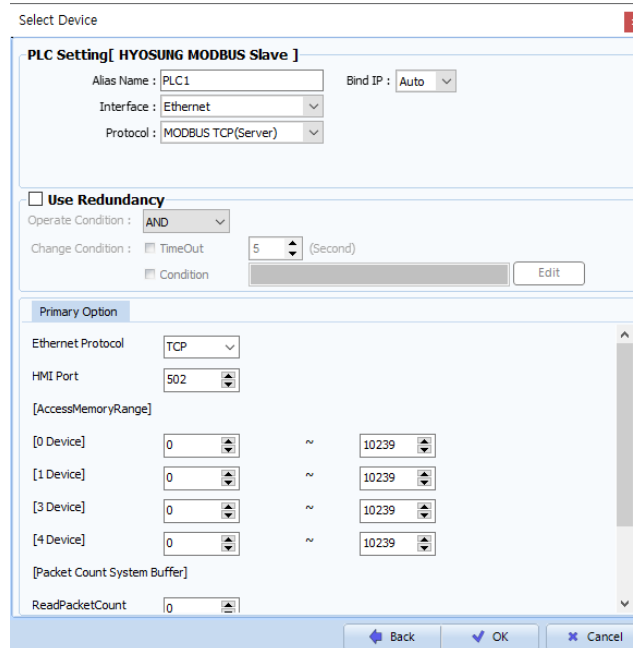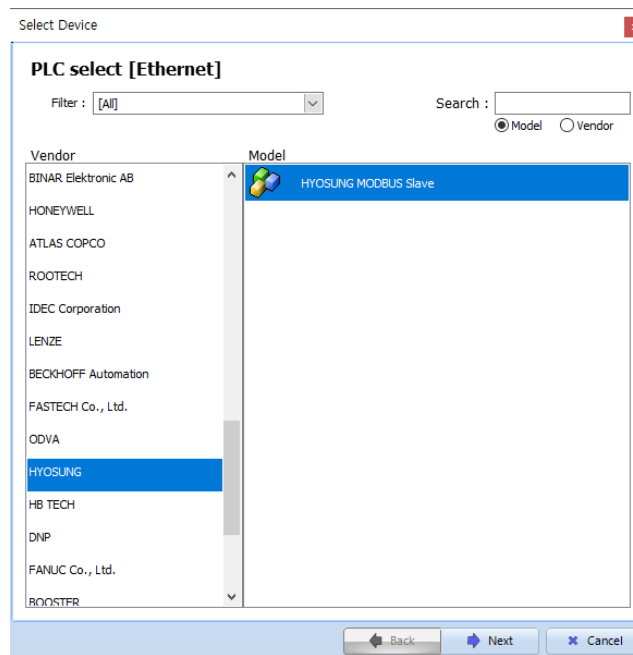·1:1 connection (one TOP and one external device) connection
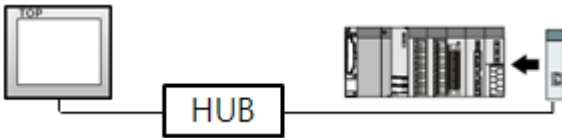
·1:N connection (one TOP and multiple external devices) connection
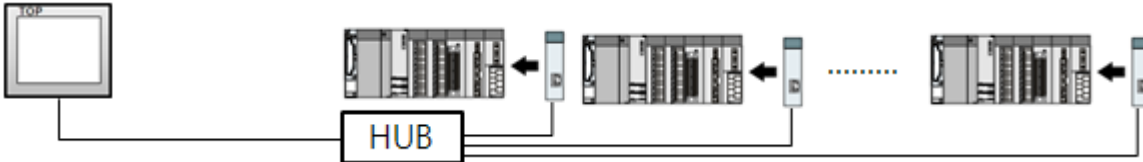
2. External device selection

■ Select a TOP model and a port, and then select an external device.

| Settings		Contents
TOP	Model	Check the TOP display and process to select the touch model.
External device	Vendor	Select the vendor of the external device to be connected to TOP. Select "HYOSUNG".
	PLC	Select an external device to connect to TOP. | Model	Interface	Protocol
HYOSUNG MODBUS Slave	Ethernet	Set Users | Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.

3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project > Project Property > TOP Setting] → [Project Option > "Use HMI Setup" Check > Edit > Ethernet]

– Set the TOP communication interface in TOP Design Studio.
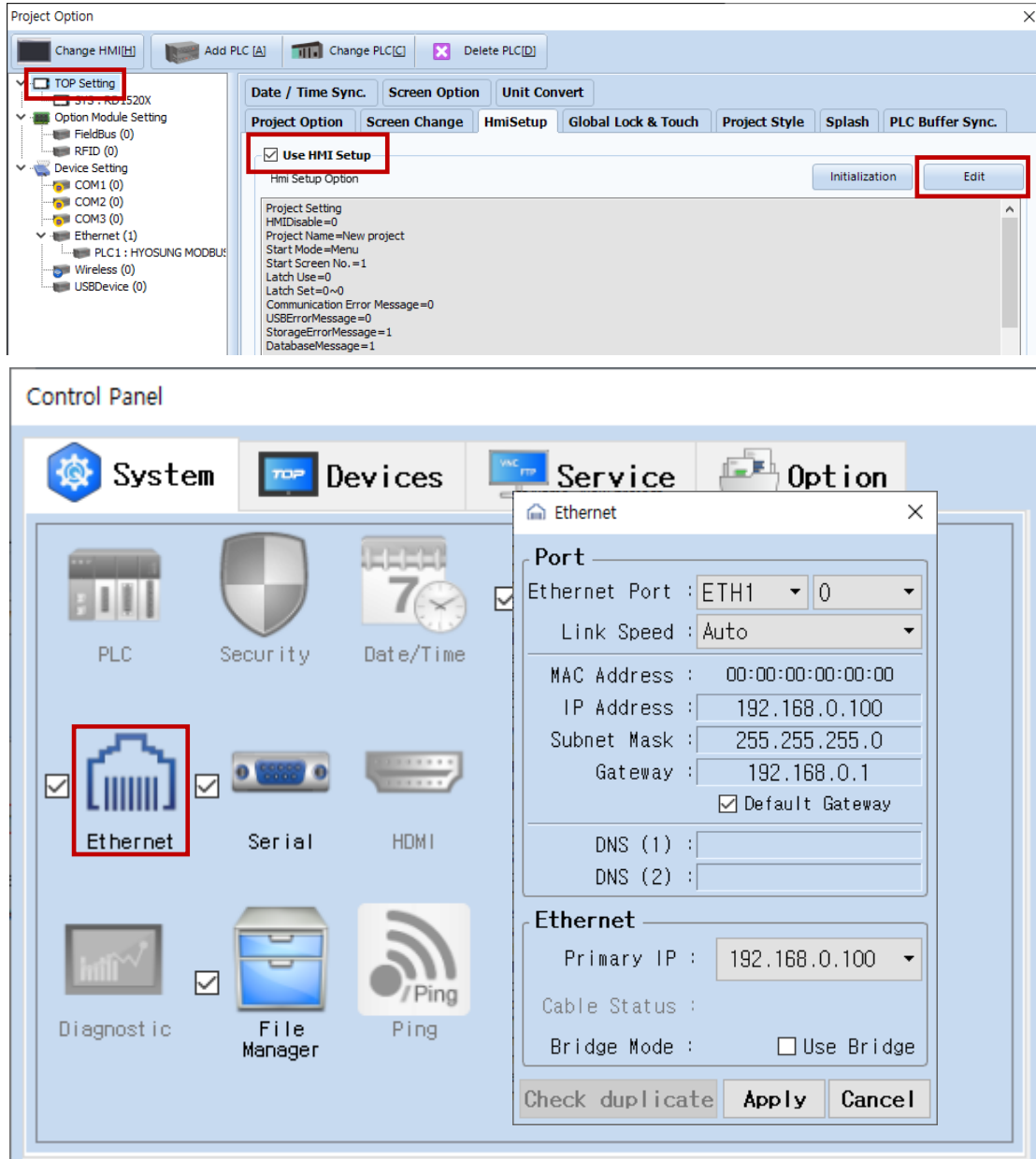
* The above settings are examples recommended by the company.

Items	TOP	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

*Note 2) Do not use duplicate IP addresses over the same network.

* The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

(2) Communication option setting

■ [Project > Project Property > Device Setting > Ethernet > "PLC1 : HOYSUNG MODBUS Slave"]

– Set the options of the HOYSUNG MODBUS Serial Slave driver in TOP Design Studio.
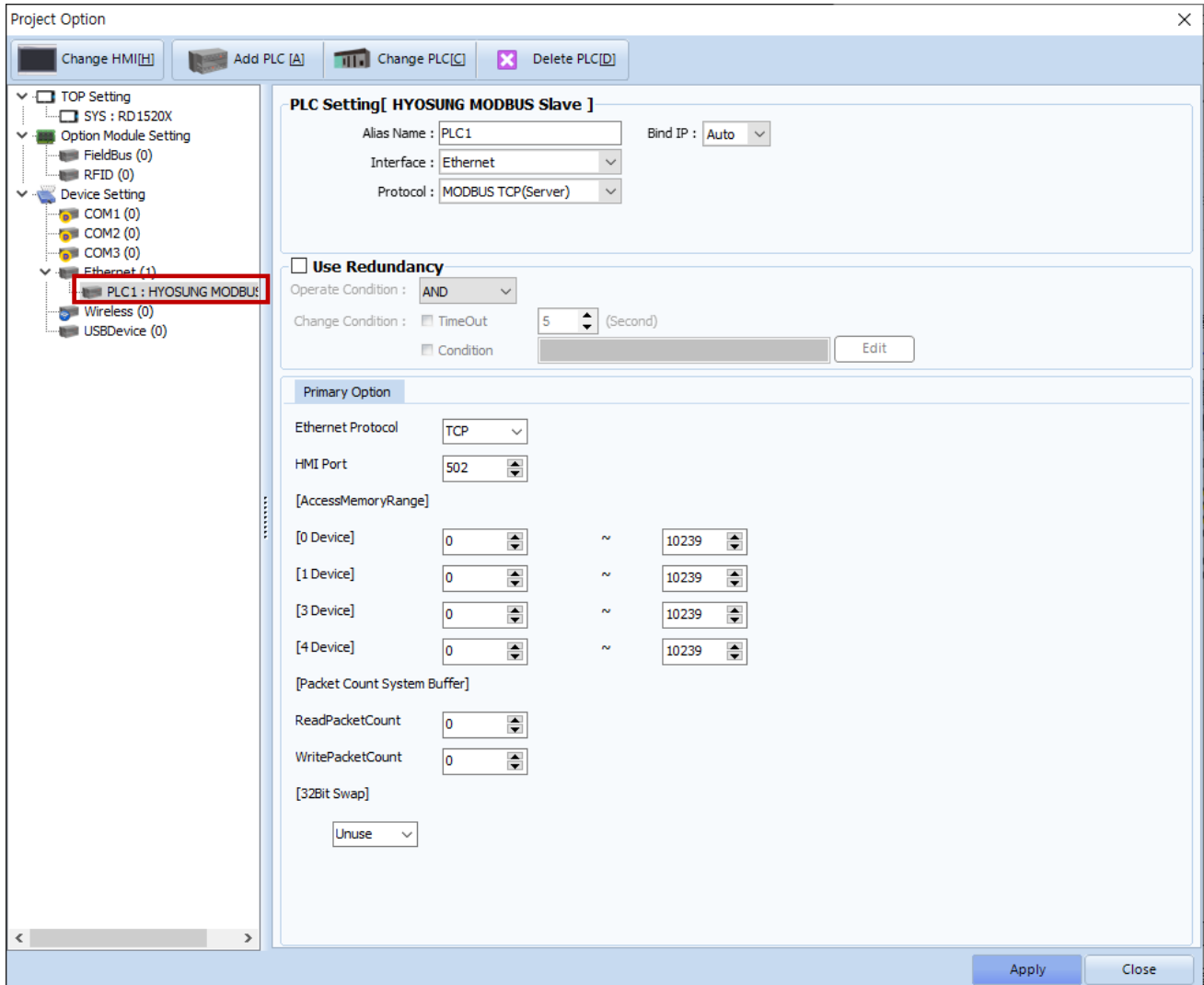
Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External device selection".
Protocol	Select the communication protocol between the TOP and an external device.	
Ethernet Protocol	TCP,UDP	
LisenPort	Port no	

AccessMemoryRange		
0 Device	0 Device ADDRESS range setting	
1 Device	1 Device ADDRESS range setting	
3 Device	3 Device ADDRESS range setting	
4 Device	4 Device ADDRESS range setting	
PacketCountSystemBuffer		
ReadPacketCount	ReadPacket Count	
WritePacketCount	WritPacket Count	
[32BIT SWAP]	Unuse, Use	

[32BIT SWAP] Switching from Unuse to Use activates the following option.
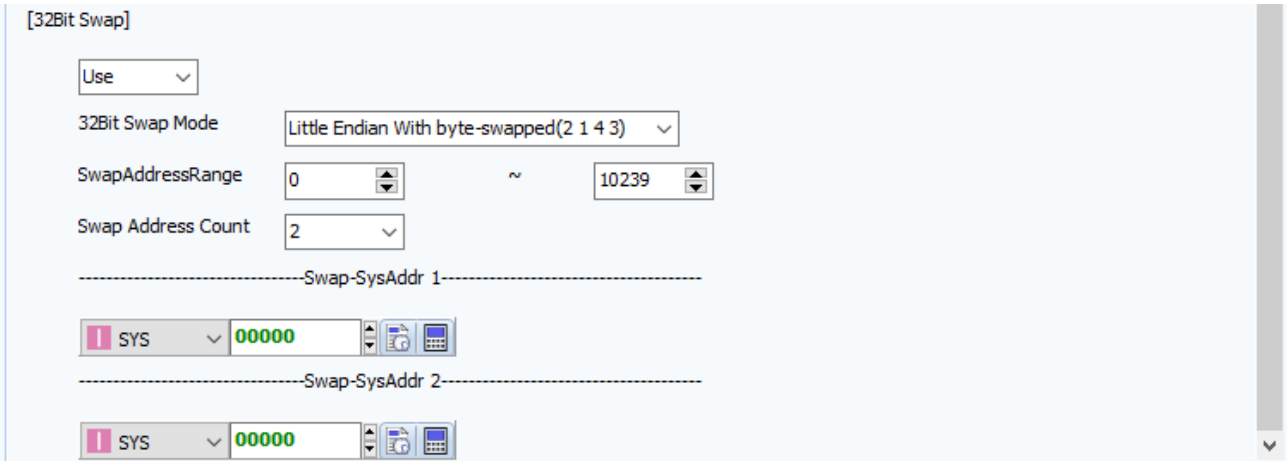
- 32 BIT SWAP MODE

    Big Endian Format(4 3 2 1)

    Big Endian With byte-swapped(3 4 1 2)

    Little Endian Format(1 2 3 4)

    Little Endian With byte-swapped(2 1 4 3)

    Uploads data to the master using the above 4 types, with a default value of Little Endian With byte-swapped(2 1 4 3).

- SwapAddressRange

   The allowed range for swapping systembuffer. Set range to 1–0 to disable.

- SwapAddressCount

    Can be selected individually. Choose between 1–9.
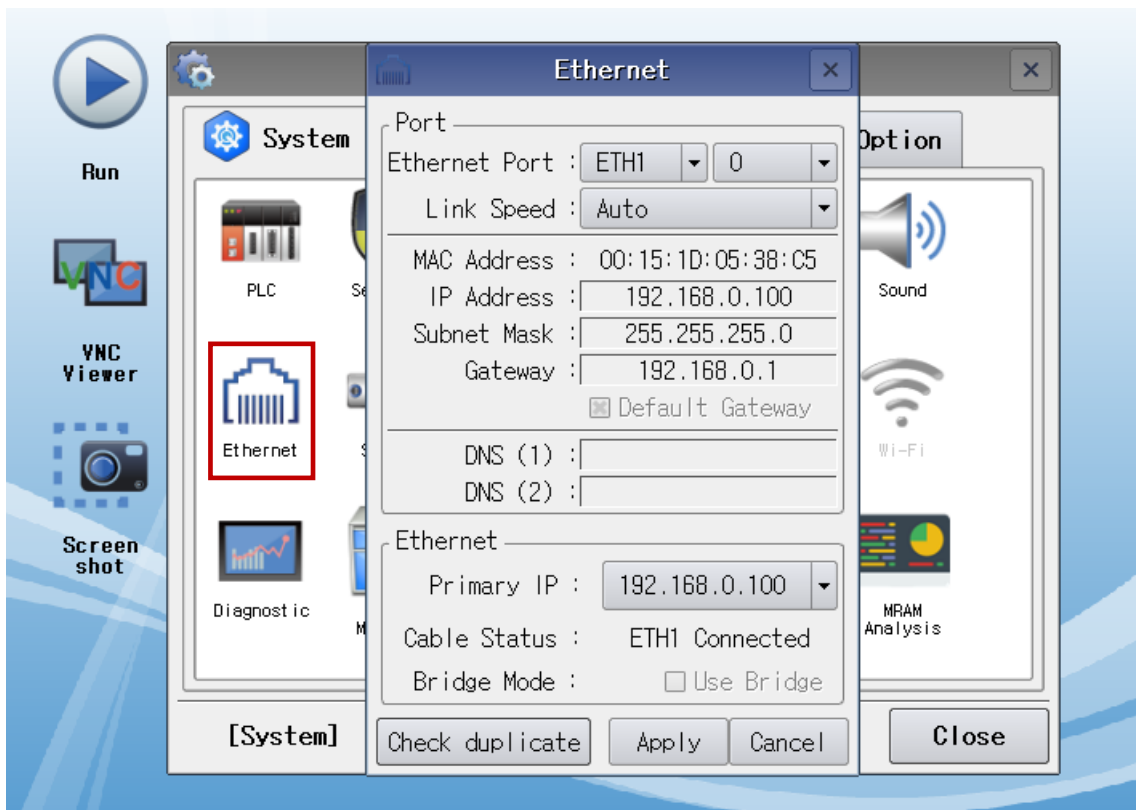
3.2. Communication setting in TOP

* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
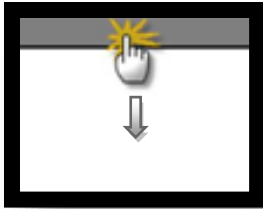
(1) Communication interface setting

■ [Main Screen > Control Panel > Ethernet]

Items	TOP	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, 192 . 168 . 0 . 0) should match.

*Note 2) Do not use duplicate IP addresses over the same network.

  * The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

3.3 Communication diagnostics

■ Check the interface setting status between the TOP and an external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.

- Check if the port (ETH1/ETH2) settings you want to use in [Control Panel > Ethernet] are the same as those of the external device.

■ Diagnosis of whether the port communication is normal or not

- Touch "Communication diagnostics" in [Control Panel > PLC].

- The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

OK	Communication setting normal
Time Out Error	Communication setting abnormal
	- Check the cable, TOP, and external device setting status. **(Reference: Communication diagnostics sheet)**

■ Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents		Check		Remarks
System configuration	How to connect the system		OK	NG	1. System configuration
	Connection cable name		OK	NG	
TOP	Version information		OK	NG	2. External device selection 3. Communication setting
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	
		Communication diagnostics	OK	NG	
	Ethernet port setting	IP Address	OK	NG	
		Subnet Mask	OK	NG	
		Gateway	OK	NG	
External device	CPU name		OK	NG	4. External device setting
	Communication port name (module name)		OK	NG	
	Protocol (mode)		OK	NG	
	Setup Prefix		OK	NG	
	Other detailed settings		OK	NG	
	Ethernet port setting	IP Address	OK	NG	
		Subnet Mask	OK	NG	
		Gateway	OK	NG	
	Check address range		OK	NG	5. Supported addresses (For details, please refer to the PLC vendor's manual.)

4. External device setting

Refer to the user manual of the external device to set "HYOSUNG MODBUS-TCP Slave (Server) Driver" in the external device I/F.

⚠	- Do not use duplicate IP addresses over the same network.
	- Check the contents of the address map on the external device side and use the communication address according to its contents.

5. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

	Bit Address	Word Address	32 bits	Remarks
Coil	00000.00 – 10239.15	00000 – 10239		
Discrete Input	00000.00 – 10239.15	00000 – 10239	L/H	*Note 1)
Input Register	00000.00 – 10239.15	00000 – 10239		*Note 1)
Holding Register	00000.00 – 10239.15	00000 – 10239		

***Note 1)** Cannot be written (Read-only)

Maximum SYSTEM BUFFER is 10239.

■ Summary of "HOYSUNG MODBUS Slave Driver" Support Command (Fnction)

Descriptions	Code	Descriptions	Code	Descriptions	Code
Read Coils	01	Diagnostics (Unimplemented)	08	Write File Record (Unimplemented)	15
Read Discrete Inputs	02	Get Comm Event Counter (Unimplemented)	0B	Mask Write Register (Unimplemented)	16
Read Holding Registers	03	Get Comm Event Log (Unimplemented)	0C	Read/Write Multiple registers (Unimplemented)	17
Read Input Registers	04	Write Multiple Coils	0F	Read FIFO Queue (Unimplemented)	18
Write Single Coil	05	Write Multiple registers	10	Encapsulated I/F Transport (Unimplemented)	2B
Write Single Register	06	Report Slave ID (Unimplemented)	11		
Read Exception Status (Unimplemented)	07	Read File Record (Unimplemented)	14		