YASKAWA Electric Corporation
Machine Controller MP900 Series
Ethernet 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

The system configuration of TOP and "YASKAWA Electric Corporation – MP900 Series Ethernet" is as follows:

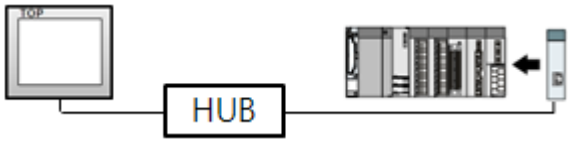
Series	CPU	Link I/F	Communication method	System setting	Cable
MP900	MP920	Ethernet Port on **218IF-01**	Ethernet(TCP/UDP)	3. TOP communication setting 4. External device setting	Twisted pair cable *Note 1)

*Note 1) Twisted pair cable

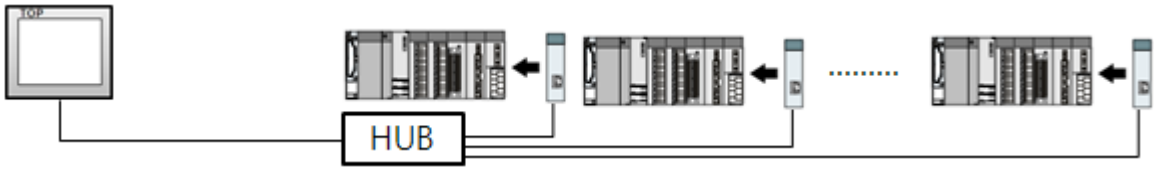
- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.
- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

■ Connectable configuration

• 1:1 connection (one TOP and one external device) connection

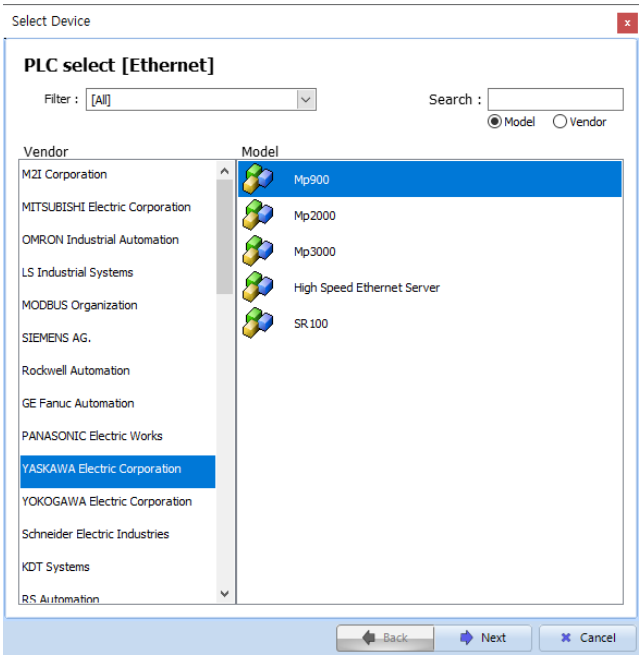


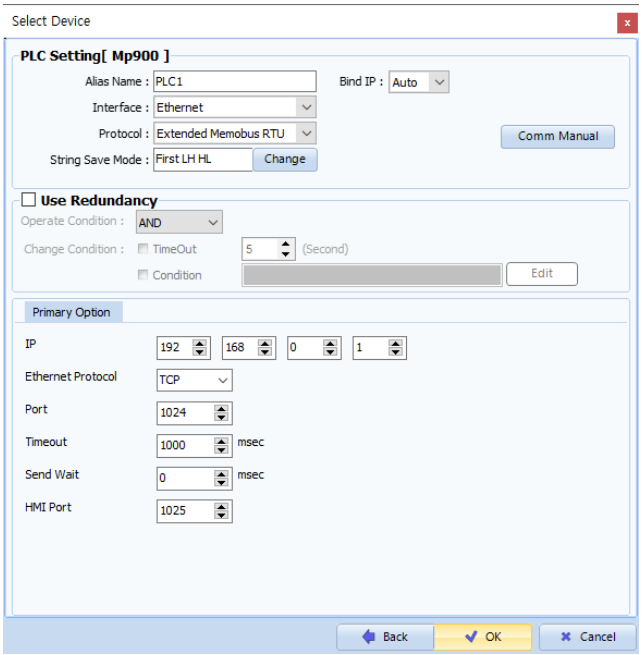
• 1:N connection (one TOP and multiple external devices) connection



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. Please select "YASKAWA Electric Corporation".
	PLC	Select the external device to be connected to the TOP.

Model	Interface	Protocol
MP900 Series	Ethernet	Set Users

Supported Protocol	
Extended MEMOBUS RTU	Extended MEMOBUS ASCII

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

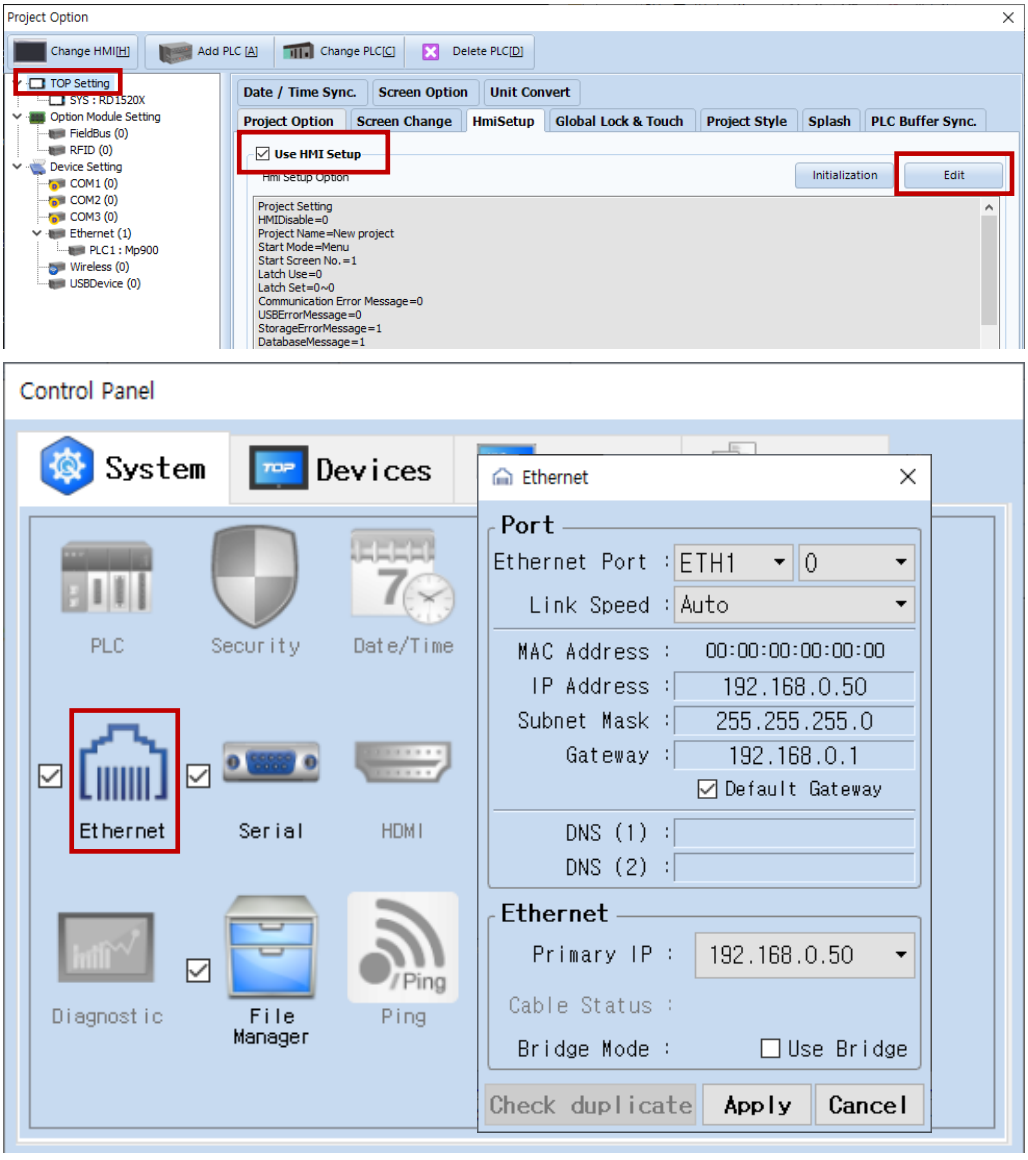
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

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

– Set the TOP communication interface in TOP Design Studio.



Items	TOP	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.50	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.

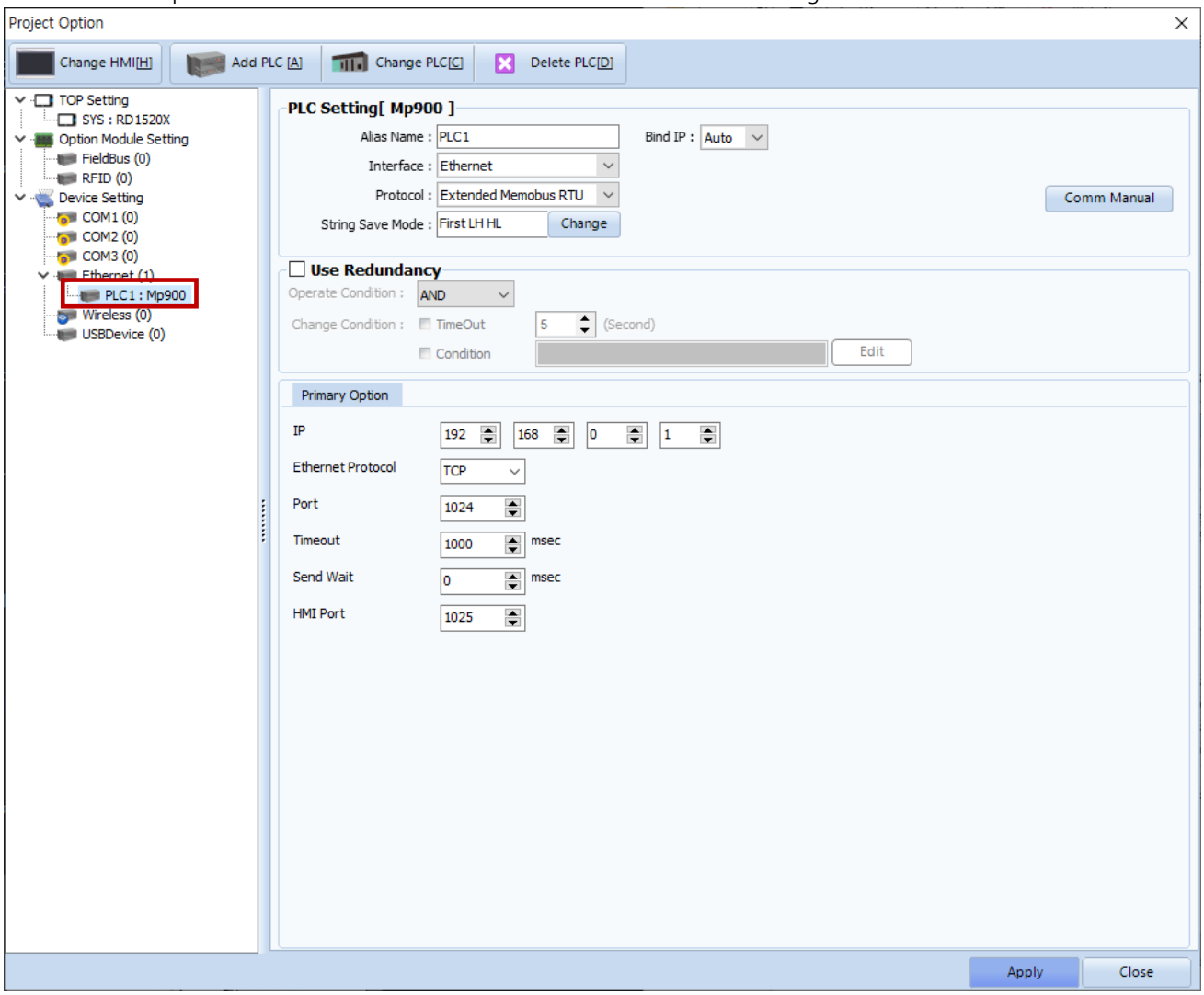
* The above settings are examples recommended by the company.

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 > PLC Settings > ETHERNET > "PLC1 : Mp900"]

– Set the options of the MP900 Series Ethernet communication driver in TOP Design Studio.



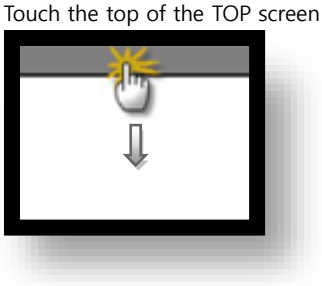
* The above settings are examples recommended by the company.

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External device selection".
Protocol	Select the communication protocol between the TOP and an external device.	
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
HMI Port	Enter the Ethernet communication port number of the TOP.	

3.2. Communication setting in TOP

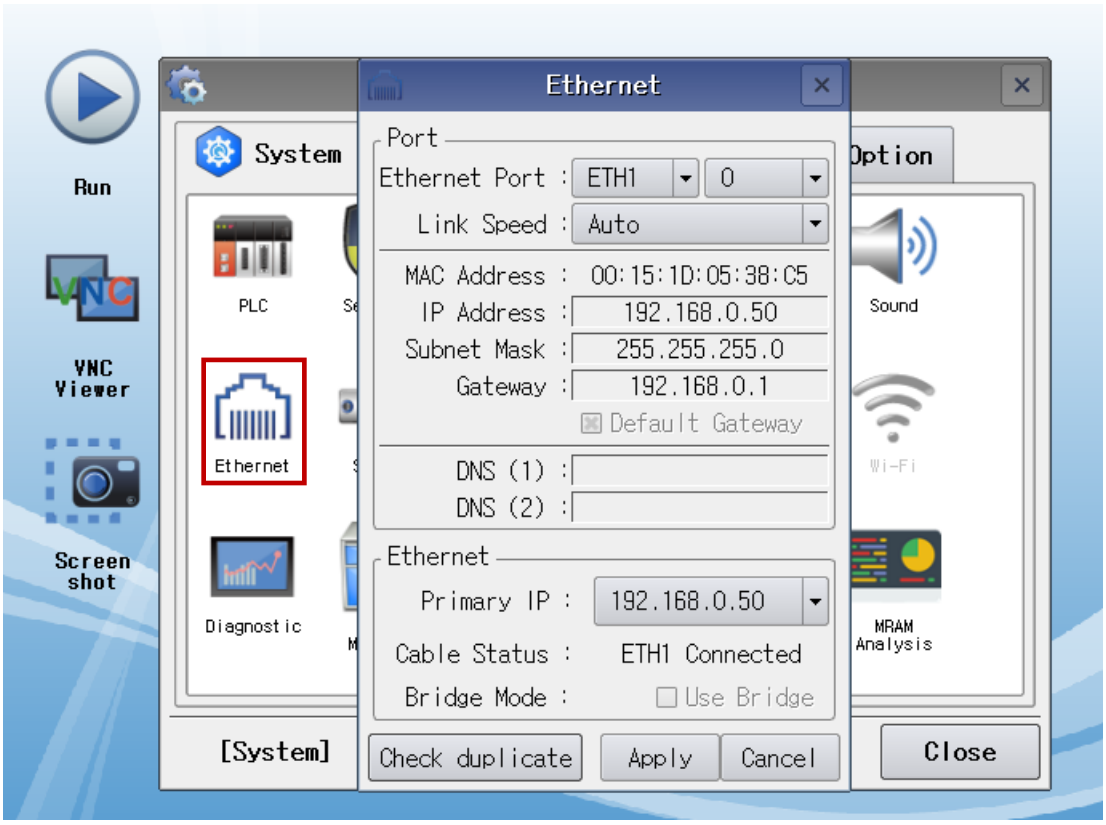
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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)	192.168.0.50	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.

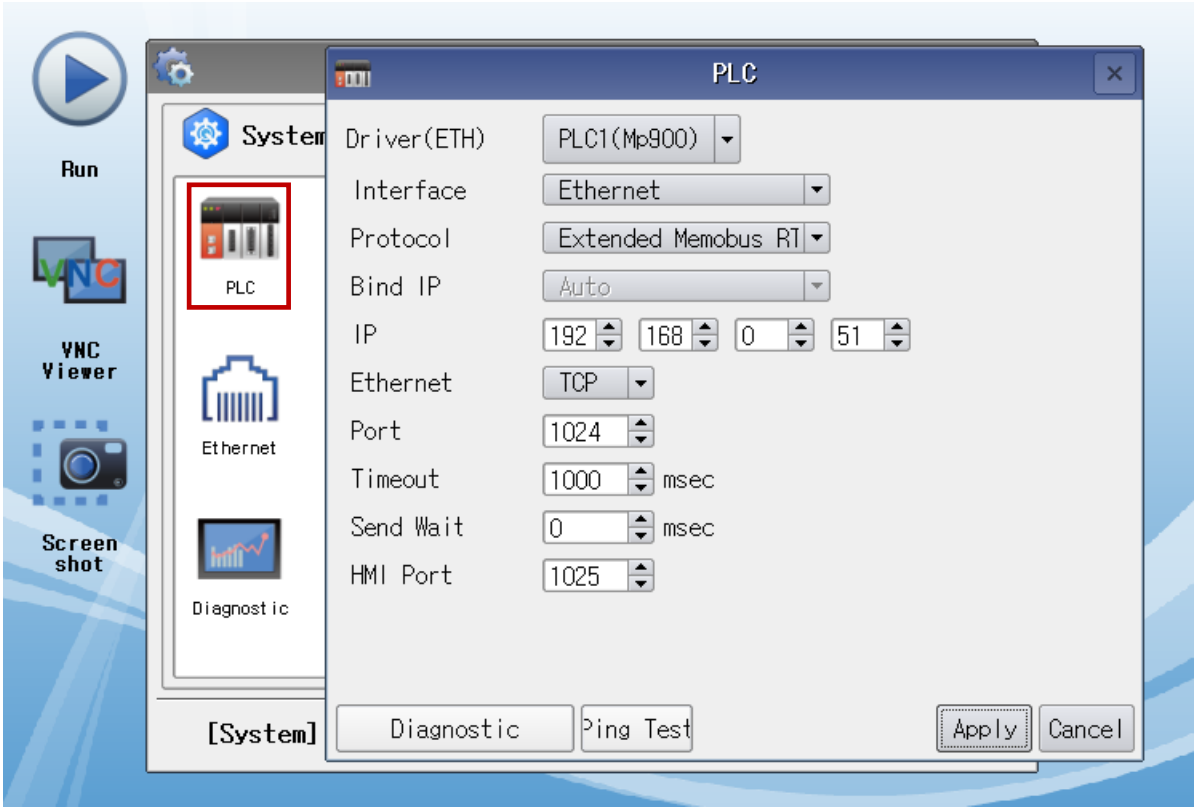
*Note 2) Do not use duplicate IP addresses over the same network.

* 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

■ [Main Screen > Control Panel > PLC]



* The above settings are examples recommended by the company.

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External device selection".
Protocol	Select the communication protocol between the TOP and an external device.	
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
HMI Port	Enter the Ethernet communication port number of the TOP.	

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

4.1 Extended MEMOBUS – 218IF-01/02

Set as below using "MP Series" Ladder Software "MPE720". For more detailed setting method than that described in this example, refer to the PLC user manual.

Do not use duplicate IP addresses over the same network.

■ **Operation Ⅰ** : "**PC and PLC connection method**" : set communications as follows(Operation Ⅱ, Operation Ⅲ), but before connect PC and PLC.

1. Run "Communication Manager" program.

(Path : Start → Program → "YE_Applications" → "Communication Manager")

2. Run "Logical Port Setting" to set the port type and details.

(Path : File → Setting...)

3. After PC and PLC are connected, save, and follow below operation.

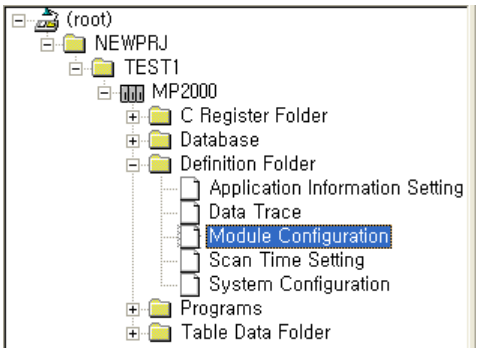
■ **Operation Ⅱ** : **"MPE720" Create Project** : (root) > [Group Folder] > [Order Folder] > [Controller Folder] Register

1. To register the device you want to use in "MPE720", follow "[Group Folder] > [Order Folder] > [Controller Folder]" path.

(Caution) In the "MPE720" left project window, Right–Click, and follow the parent path through the [New] entry.

2.Register the Controller Type for the device you wish to use in the Controller Configuration window, which appears when registering a new [Controller Folder]

3. Double-click the newly registered [Controller Folder] to bring up the [Log on to the controller] window and enter "User Name" and "Password" to form project folders as shown on the left.

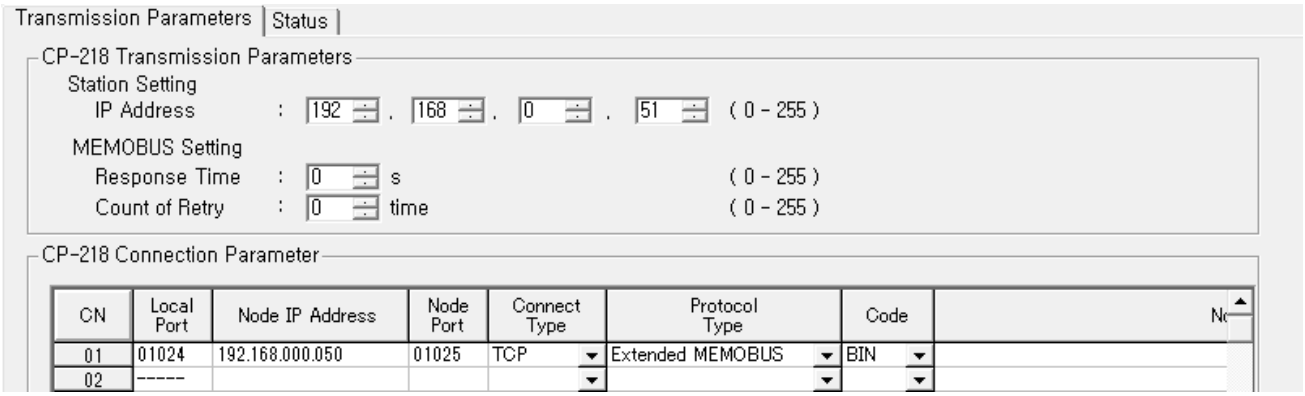


■ **Operation Ⅲ** : "**Communication Setting**" : [Engineering Manager] – [Module Configuration] window

1. [Definition Folder] – [Module Configuration] double click to bring up [Engineering Manager] – [Module Configuration] window.

2. In the Module Configuration window, register the appropriate [Rack] – [Slot] location [Module Type].

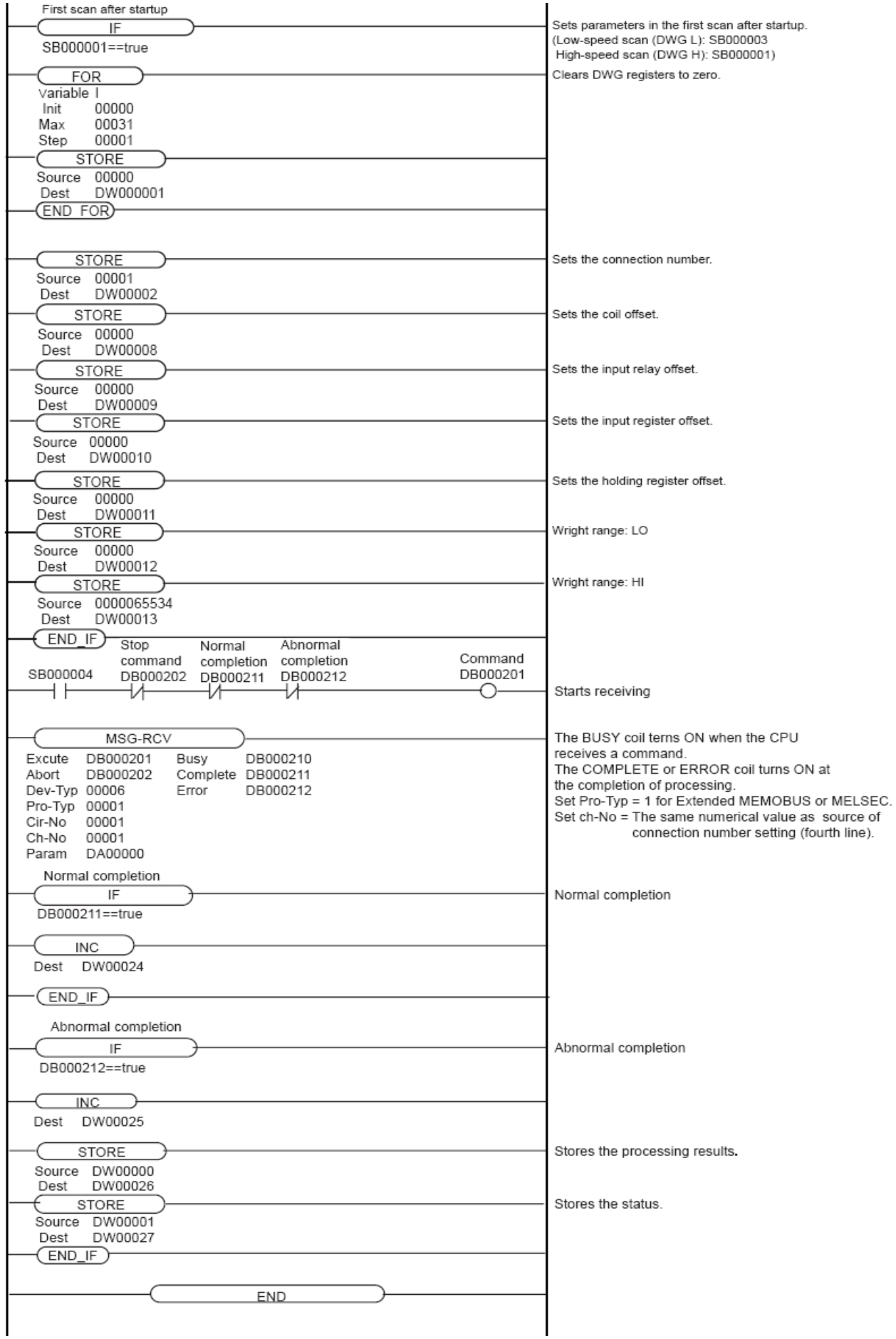
3. Double-click the appropriate [Slot Number] to display the Settings window. The information to be set is as follows.



Items		Settings	Remarks
Transmission parameter	Station Setting IP Address	192.168.0.51	PLC IP address
Connection parameter	Local Port	1024	PLC Port number
	Node IP Address	192.168.0.50	HMI IP Address
	Node Port	1025	HMI Port Number
	Connect Type	TCP	Set Users
	Protocol Type	Extended MEMOBUS	**Fixed**
	Code	BIN	**Follow protocol** **RTU : Select BIN** **ASCII: Select ASCII**

■ Operation IV : Ladder Program : MSG-RCV function

1. Register the [MSG–RCV] function ([Instruction Pallet] menu - [System] tab]) into the [Ladder Works] Software, referring to the example below. Refer to the Ladder Software manual for more information. (※Caution: Set the value of [Dev-Type] to "6" for 218IF-01 and "218IF-02 to "16".)



4.2 Extended MEMOBUS - CPU Built-in Ethernet Port

Set as below using "MP Series" Ladder Software "MPE720". For more detailed setting method than that described in this example, refer to the PLC user manual.

Do not use duplicate IP addresses over the same network.

■ **Operation Ⅰ** : "**PC and PLC connection method**" : set communications as follows(Operation Ⅱ, Operation Ⅲ), but before connect PC and PLC.

1. Run "Communication Manager" program.

(Path : Start → Program → "YE_Applications" → "Communication Manager")

2. Run "Logical Port Setting" to set the port type and details.

(Path : File → Setting...)

3. After PC and PLC are connected, save, and follow below operation.

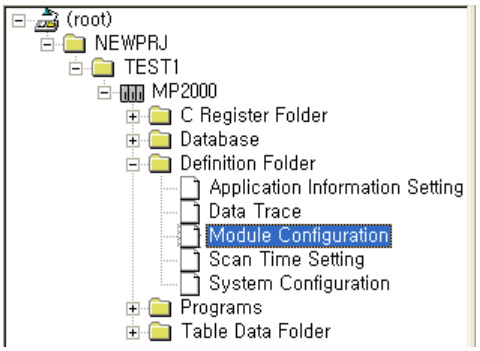
■ **Operation Ⅱ** : **"MPE720" Create Project** : (root) > [Group Folder] > [Order Folder] > [Controller Folder] Register

1. To register the device you want to use in "MPE720", follow "[Group Folder] > [Order Folder] > [Controller Folder]" path.

(Caution) In the "MPE720" left project window, Right–Click, and follow the parent path through the [New] entry.

2.Register the Controller Type for the device you wish to use in the Controller Configuration window, which appears when registering a new [Controller Folder]

3. Double-click the newly registered [Controller Folder] to bring up the [Log on to the controller] window and enter "User Name" and "Password" to form project folders as shown on the left.



■ **Operation Ⅲ** : "**Communication Setting**" : [Engineering Manager] – [Module Configuration] window

1. [Definition Folder] – [Module Configuration] double click to bring up [Engineering Manager] – [Module Configuration] window.

2. In the Module Configuration window, register the appropriate [Rack] – [Slot] location [Module Type].

3. Double-click the [Slot Number] which the Ethernet UNIT is connected to display the Settings window.[Transmission Parameter] tabsettings information is as follows.

Items	Settings	Remarks
IP Address	192.168.0.51	PLC IP address
Subnet Mask	255.255.255.0	PLC Subnet Mask

4. From [Transmission Parameter] tab – click [Easy Setting], in [Message Communication Easy Setting] window set as follows, Click "OK" to save settings information.

Items	Settings	Remarks
MP Series Port No.	1024	PLC Port number
Communication protocol Type	Extended MEMOBUS	**Fixed**
Connect type	TCP	Set Users
Code	BIN	**Follow protocol** **RTU : Select BIN** **ASCII: Select ASCII**
Node Port IP Address	192.168.0.50	HMI IP Address
Other Device Port No.	1025	HMI Port Number

5. Double-click [Setting] to set [Automatically Accepted] to "Enable" in the [Automatically Accepted Setting] window and save the settings by clicking "OK".

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.

Device		Bit Address	Word Address	32bit	Remarks
MB	Coil	MB000000 ~ MB65535F	MB00000 ~ MB65535	L/H	
IB	Discrete Input	IB00000 ~ IBFFFFF	IB0000 ~ IBFFFF		*Note 1)
IW	Input Register	-	IW0000 ~ IWFFFF		*Note 1)
MW	Holding Register	-	MW00000 ~ MW65535		

*Note 1) Cannot be written