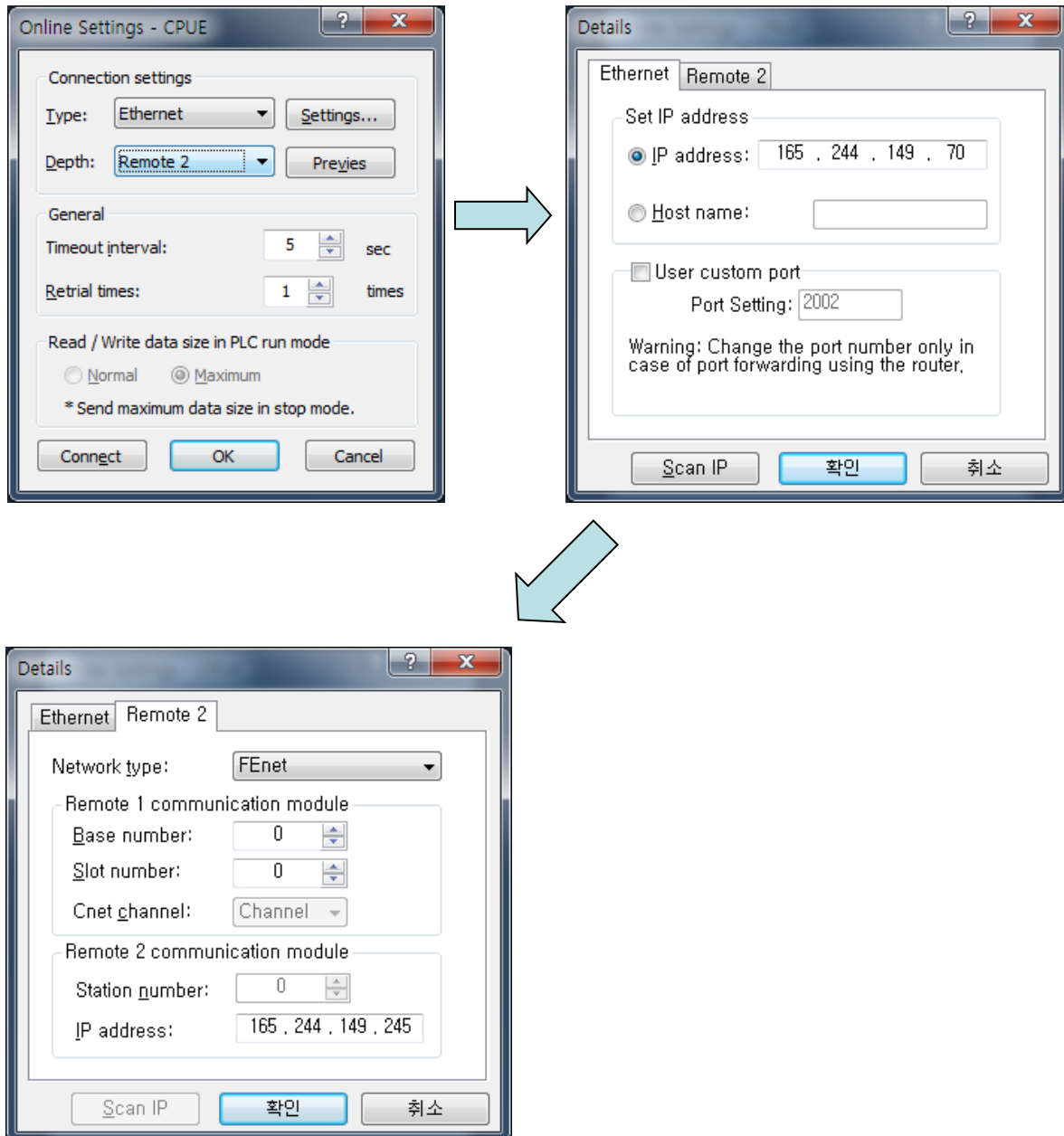## 9.2.4 Remote 2 connection directly from PC connected with Ethernet

Remote stage 2 connection is available via Ethernet if a PC where XG5000 is operating is included in one PLC Ethernet network and one Ethernet is connected with other Ethernet network. The procedures are the same as in remote 1 connection and a setting example of 'Connection Setting' is as [Fig. 9.2.7].

[Fig. 9.2.7] Remote 2 connection directly via Ethernet

Notes

(1) Precautions for operation with remote stage 1 & 2 connection
   1) The following menus are not available if the types between the project presently open in
      XG5000 and the CPU connected with stage 1 or 2 are not identical.
      A) Write program and each parameter
      B) Read program and each parameter
      C) Monitor
      D) Flash memory
      E) Set Link Enable
      F) I/O information
      G) Compulsory I/O information
      H) I/O SKIP
   2) Execute the remote connection with applicable project open of the station to connect to
      for XG5000 programming through remote stage 1 & 2 connections.
   3) Up to 2 stages only are available for the remote connection. More than that is not available
      for the remote connection.
(2) In case of remote connection via XGR redundancy
   1) In case of remote connection via XGR redundancy, service is executed. Though you
      connect to Standby, connection route is Master CPU
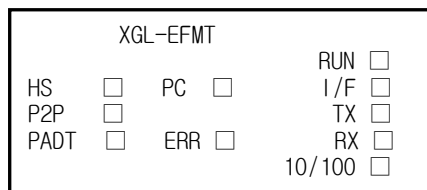
Chapter 10 Troubleshooting

This chapter is to describe various errors that may occur in system operation, their causes and actions to take against. Follow the procedures below to check for errors and error details in XGT FEnet I/F module. And take suitable actions against the abnormal module states surely through the troubleshooting in proper procedures. Discretionary repair or disassembly is not allowed. Because A/S does not have it, please be careful based on A/S rule.

10.1 Check through Communication Module LED

The status of the communication module can be checked through LED display.

10.1.1 Abnormal operation display of XGL-EFMT/EFMF

The operation status can be checked through LED in front of Ethernet module.

```
          XGL-EFMT
                          RUN  □
HS    □      PC   □       I/F  □
P2P   □                   TX   □
PADT  □      ERR  □       RX   □
                        10/100 □
```

[Fig.10.1.1] LED structure of XGL-EFMT/EFMF module

LED	Error	Action
RUN	Turned off after FEnet powered on	1) Ethernet communication module incorrectly installed - check DC 5V power supply of power module. - check the communication module if correctly installed on the base. 2) Check if communication module is correctly perceived with XG5000.
I/F	LED on or off during normal communication	1) Check the operation state of CPU module. 2) Check the communication module if correctly installed on the base. 3) Check if module information is correctly perceived with XG5000 software.
P2P	Turned off during P2P command service	1) Check if the basic parameter is downloaded correctly. 2) Check if the function block/command is edited correctly. 3) Check if the media is connected correctly. 4) Check if 'Link Enable' is enabled.

LED	Error	Action
HS	Turned off during HS link service	1) Check if the basic parameter is downloaded correctly. 2) Check HS link setting if correct. 3) Check if 'Link Enable' is enabled.
PADT	Turned off during Remote connection service	1) Check if IP address for remote (PADT) connection is normal. 2) Check if remote connection of PADT is disconnected
PC	Turned off during dedicated service	1) Check if IP address for dedicated connection is correct. 2) Check if Host table is enabled. If Host table is enabled, check if the IP address of HMI(PC) is registered in the host table. 3) Check if connection is requested from MMI (PC) device.
ERR	Turned on during normal communication	1) Check if the basic parameter is downloaded correctly. 2) Check for any error in interface with CPU.

10.1.2 Abnormal operation display of XGL-EFMTB/EFMFB

The operation status can be checked through LED in front of Ethernet module.
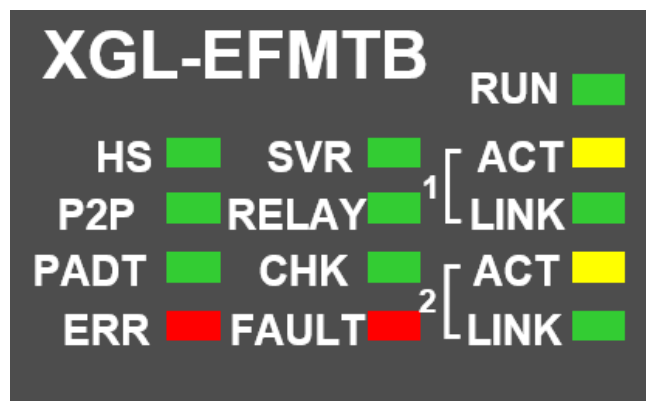
[Fig.10.1.2] LED structure of XGL-EFMTB/EFMFB module
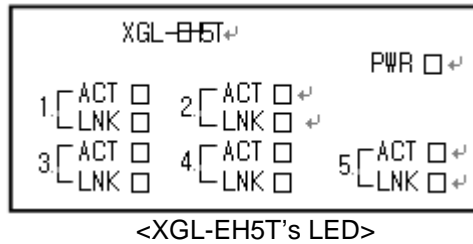
LED	Error	Action
RUN	Turned off after FEnet powered on	1) Ethernet communication module incorrectly installed - check DC 5V power supply of power module. - check the communication module if correctly installed on the base. 2) Check if communication module is correctly perceived with XG5000.

P2P	Turned off during P2P command service	1) Check if the basic parameter is downloaded correctly. 2) Check if the function block/command is edited correctly. 3) Check if the media is connected correctly. 4) Check if 'Link Enable' is enabled.
HS	Turned off during HS link service	1) Check if the basic parameter is downloaded correctly. 2) Check HS link setting if correct. 3) Check if 'Link Enable' is enabled.
PADT	Turned off during Remote connection service	1) Check if IP address for remote (PADT) connection is normal. 2) Check if remote connection of PADT is disconnected
SVR	Turned off when Ethernet I/F module is used as dedicated service	1) Check if IP address for dedicated connection is normal. 2) Check if dedicated connection table is enable and in case enable, check if IP of HMI(PC) at dedicated connection table is registered. 3) Check connection requirement is normal aat HMI(PC)
ERR	Turned on after Ethernet I/F module power on	1) In case of major failure, turn on. If LED is on again after power reset, please contact service center.
RELAY	Communication speed mismatch between relay ports	If the Relay option of the basic parameter is checked, it turns ON when the media speed of Port 1 and Port 2 is the same and the frame can be relayed. Set the same communication speed between the two ports. In V6.0 or above, Relay LED will blink if the media speed is different between the two ports even if the Relay option is checked. * Relay function is not supported at 10Mbps, so if Relay option is checked at 10Mbps, Relay LED will be off.
CHK	Flicker after turn on power	1) Check IP collision or station number collision on the same network. (V5.0) 2) Check whether same between set media type and set parameters. 3) Check the RAPIEnet slave parameters for errors. (V6.0 or above) 4) Check the RAPIEnet network for duplicated station number. (V6.0 or above)
	Flicker during communication	1) Make sure that the RAPIEnet network connection status is changed from Ring to Line.
FAULT	Flicker during communication	1) Check cable and Ethernet connector 2) Check if there is an error in contents of communication.
	LED is ON	1) Check whether RAPIEnet station number and other RAPIEnet device are duplicated. 2) Make sure that IP is duplicated on the same network.
LNK	Turned off during communication	1) Check connection status of cable(both stations)

10.1.3 Abnormal operation display of XGL-EH5T

The operation status can be checked through LED in front of Ethernet module

<XGL-EH5T's LED>

[Fig 10.1.3] LED structure of FEnet I/F module

This switch module (EH5T) doesn't need specific parameter setting and it uses power form Base. After turning on, if all LEDs except power LED flicker one time, switch module is normal.

LED	Error	Action
PWR	LED off after power on	1) Abnormal equipment of switch module - Check DC 5V power supply of power module. - check the communication module if correctly installed on the base.
ACT	ACT LED off	1) Check if cable is connected to port correctly. LED is off in the disconnection status 2) Check if data is communicated normally
LNK	LNK LED off	1) Check if cable is connected to port correctly. LED is off in the disconnection status

10.2 Module Check with XG5000

10.2.1 Error check in XG5000

XG5000 program can be used to monitor the communication module simply. Establish connection between PLC and a PC in which XG5000 is installed, and then select [Online] -> [PLC History], [PLC Error/Warning] in XG5000.
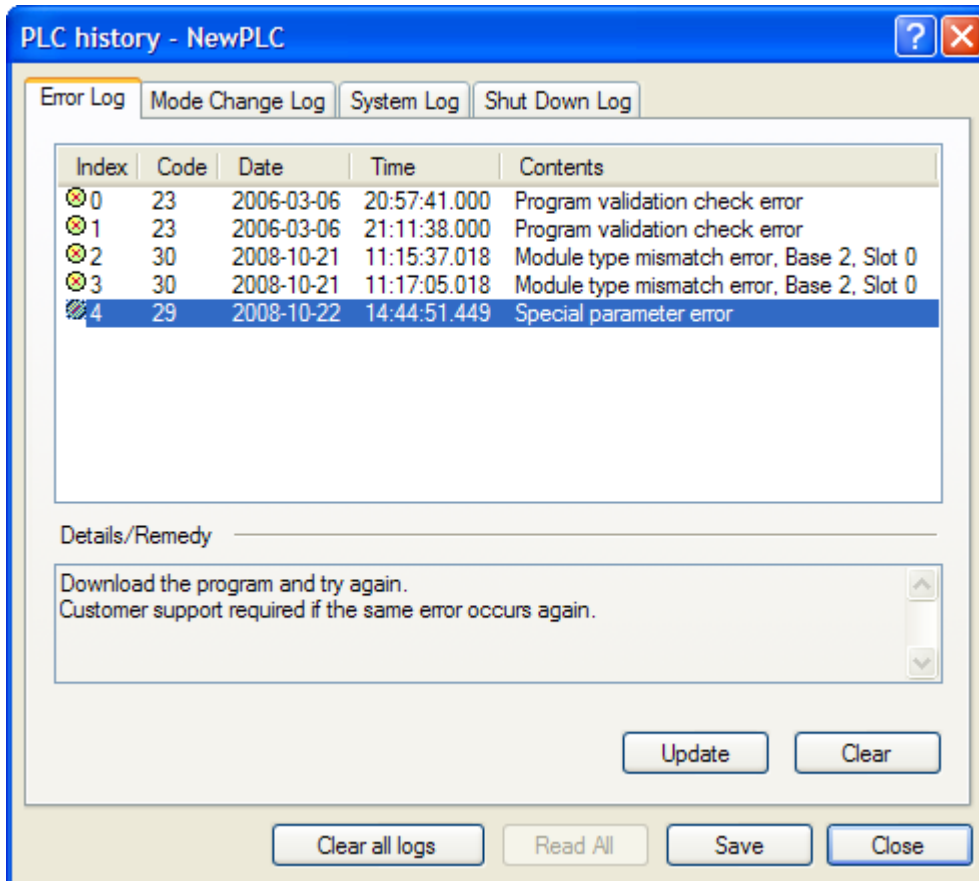
[Fig.10.2.1] PLC history

If a hardware error or a CPU interface error occurs on the module, LED of the communication module itself operates abnormally in general, whose status can be monitored simply through its dedicated program.

[Fig.10.2.1] shows error/warning information through PLC History on the XG5000 [Online] menu, which can be settled by referring to [Details and Actions].

10.2.2 Error code

It is brief and can monitor a communication module error through XG5000.
Click [Onlie] -> [Communication module setting] -> [System diagnosis]
Right click FEnet module -> [Status by service] -> [P2P Service]
When you use the E-mail service, please perform reference of E-mail error code.

Error Code	Description	What to do
0x0000	Normal	-
0x0001	P2P-Comm. error	1) (Modbus) Modbus registration error 2) (FEnet) Too many individual read/write request message block requested. Check the P2P block settings. 3) (Email) Email address error. Check the Email address.
0x0002	P2P-Comm. error	1) (Modbus) Modbus transmit size error. Check the P2P block settings 2) (FEnet) requested data type is not supported. Check the P2P block settings 3) Email) Email address book and message for transmission are not configured. Check the address and message settings
0x0003	P2P-Comm. error	1) (FEnet) requested device type is not supported. Check the P2P block settings 2) (FEnet) Connection with server is in progress. 3) (Cnet) Too many request message blocks are requested. Check P2P block settings 4) (Email) Can not connect to Email server. Check the IP address of Email server, ID and Password, or check the connected network status.
0x0004	P2P-Comm. error	1) (FEnet) Exceeded range of requested device type. Check the P2P block settings 2) (Modbus) received error message from server. Check the P2P block settings (address, size of data) 3) (Cnet) Check the size of variable from requested message
0x0005	P2P-Time out error	1) (XGT) No response within the response waiting time from the server stations. Check the communication settings 2) (FEnet) received error message from server because requested data over the maximum size(1400bytes). Check the P2P block settings. 3) (Email) Sending Email was failed. Check the network status.
0x0006	P2P-Disconnected	1) (XGT) The server does not respond. Check network settings or network connection status. 2) (FEnet) received error message from server because requested data over the maximum size(1400bytes). Check the P2P block settings.
0x0007	Dedicated Server-Data type error	1) (Cnet) requested unsupported data type from server CPU. Check the P2P block settings 2) (Email) The data downloaded with the status "Use E-mail" on E-mail setting window unchecked. Use after checking the "Use E-mail"
0x0008	Dedicated Server-Address	1) (Cnet) Address type error. Check the P2P block settings

	type error	
0x0010	P2P-XGT dedicated comm. or download error	1) (XGT) P2P parameter is now downloading. 2) (FEnet) Error in data type of request message. Check the P2P block setting
0x0011	P2P-Comm. error	1) (FEnet) Data type of request message and variable of setting are mismatch. Check the P2P block setitngs 2) (Cnet) Error in data of requested message. Check the data 3) (XGT) Check data type of the P2P block
0x0012	P2P-Comm. error	1) (FEnet) Wrong address format of request message. Check P2P block settings 2) (FEnet) Error occurs during the data transmission. Check the network connection status between the server.
0x0013	P2P-Request error	1) (XGT) Wrong P2P block request information
0x0015	P2P-Event transmit error	1) (XGT) Error occurred in internal sending logic
0x0016	P2P-Event receive error	1) (XGT) Error occurred in internal receiving logic
0x0017	P2P-Connection request error	1) (XGT) Can not connect to the server. Check the communication settings and network connection status.
0x0018	P2P-Exceeded no. of internal sending frame	1) (XGT) Exceeded number of internal sending frame. Check the communication settings and network connection status.
0x0051	P2P-Exceeded maximum number of connection	1) (XGT) The number of connections exceeded the maximum. Check the number of connections.
0x0062	P2P-Channel error	1) (XGT) Error in channel settings. Check the channel settings.
0x0075	P2P-Received XGT dedicated error reply message	1) (FEnet) The CompanyID of the header field of XGT dedicated service request message is invalid. Check settings.
0x0076	P2P-Received XGT dedicated error reply message	1) (FEnet) The size of the header field of XGT dedicated service request message is invalid. Check the settings.
0x0077	P2P-Received XGT dedicated error reply message	1) (FEnet) The checksum of the header field of XGT dedicated service request message is invalid. Check the settings.
0x0078	P2P-Received XGT dedicated error reply message	1) (FEnet) The command of the header field of XGT dedicated service request message is invalid. Check the settings.
0x0090	Dedicated Server-Monitor execution error	1) (Cnet) Error occurred in monitor execution register request. Check the settings
0x00F0	P2P-Buffer Error	1) (FEnet) Error occurred in internal buffer assignment.
0x0190	Dedicated Server-Monitor execution register number error	1) (Cnet) The monitor registration number exceeds the maximum value. Check the settings
0x0290	Dedicated Server-Monitor registration error	1) (Cnet) The monitor registration number exceeds the maximum value. Check the settings

0x1132	Dedicated Server-Device type error	1) (Cnet) requested accessing unsupported device area from server CPU. Check the settings
0x1232	Dedicated Server-Data size error	1) (Cnet) Exceeded maximum data size(120Byte) that can be requested. Check the settings
0x1234	Dedicated Server-Extra frame error	1) (Cnet) The specified data size of the server has been exceeded. Check the settings.
0x1332	Dedicated Server-Data type mismatch	1) (Cnet) Error in data type of single read/write function. Check the settings.
0x1432	Dedicated Server-HEX conversion error	1) (Cnet) Received a hex conversion error message from the server. Check the settings.
0x5D52	P2P-Email parameter download error	1) (Email) The data downloaded with the status "Use E-mail" on E-mail setting window unchecked. Use after checking the "Use E-mail"
0x7132	Dedicated Server-Excess of variable requested area error	1) (Cnet) The requested device range has been exceeded. Check the settings.
0xB001	P2P-Data type error	1) (Cnet) Check data type of the block.
0xB002	P2P-Driver type error	1) (Cnet) P2P driver type has not been set. Check if the basic parameter value is P2P and driver type of P2P channel settings.
0xB003	P2P-Command type error	1) (Cnet) Attempted P2P command is not supported by the block. Check the settings of P2P block.
0xB004	P2P-Block number error	1) (Cnet) Exceeded the configurable block number. Check the P2P parameter.
0xB005	P2P-Segment error	1) (Cnet) User defined frame parameter has an error. Check the parameter.
0xB006	P2P-Block size error	1) (Cnet) Check size setting of the block.
0xB007	P2P-Function type error	1) (Cnet) Used function code is not supported by the block. Check the settings of P2P block.
0xB008	P2P-Block station number setting error	1) (Cnet) Exceeded the maximum station number. Check the P2P parameter.
0xB025	P2P-Received incorrect response frame for the request	1) (Cnet) Incorrect response for requested frame. Check the settings of server.
0xB026	P2P-Received delayed response	1) (Cnet) Received delayed response frame. Check the Reception waiting time.
0xE001	P2P-Process error	1) (FEnet) There is a problem with the client's internal logic.
0xE004	P2P-Driver type error	1) (FEnet) P2P driver type is not configured. Check the driver type of P2P channel settings.
0xE005	P2P-Command type error	1) (FEnet) Attempted P2P command is not supported by the block. Check the settings of P2P block.
0xE006	P2P-Data type error	1) (FEnet) Check data type of the block.
0xE007	P2P-Request buffer full	1) (FEnet) Can not process the previous request data. Check the server connection status.
0xE020	P2P-User defined server transmit error	1) (User defined comm.) User defined server cannot send data unless it was connected to the others. Make connection to the other client first.

| 0xE022	P2P-Connecting	1) (FEnet/User defined comm.) The device is connecting to the server.
0xE024	P2P-XGT dedicated protocol transmit error	1) (FEnet) Error occurs during the XGT dedicated data transmission. Check the network connection status between the server.
0xE025	P2P-Modbus protocol transmit error	1) (Modbus) Error occurs during the Modbus data transmission. Check the network connection status between the server.
0xE026	P2P-User defined transmission error	1) (User defined comm.) Error occurs during the user defined data transmission. Check the network connection status between the server.
0xE027	P2P - Transmission error	1) (FEnet) Error occurred during the data transmission. Check the network status of the server.
0xE060	P2P-User defined protocol size error	1) (User defined comm.) The data size of user defined protocol is over the maximum(1024). Re-configure the data size.
0xE170	P2P-Email parameter download error	1) (Email) The data downloaded with the status "Use E-mail" on E-mail setting window unchecked. Use after checking the "Use E-mail".
0xE171	P2P-Email parameter setting error	1) (Email) The data downloaded with the status "Use E-mail" on E-mail setting window unchecked. Use after checking the "Use E-mail".
0xE172	P2P-Email address list or message download error	1) (Email) E-mail address book and message for transmission are not configured. Check the address and message setting on XG5000 and try again.
0xE173	P2P-Email receiver registration error	1) (Email) Error occurred during the registration of E-mail receivers.
0xE174	P2P-Email sender registration error	1) (Email) Error occurred during the registration of E-mail senders.
0xE175	P2P-Email initialization error	1) (Email) Error occurred during the initialization of E-mail driver.
0xE176	P2P-Email address error	1) (Email) Wrong type of Email address requested. Check the Email address and type(Group or individual).
0xE177	P2P-Email message type error	1) (Email) Wrong type of Email address requested. Check the type of Email message.
0xE178	P2P-Email server connection error	1) (Email) Can not connect to Email server. Check the IP address of Email server, ID and Password, or check the connected network status.
0xE179	P2P-Email sending error	1) (Email) Sending E-mail was failed. Check the network status.
0xFFD7	P2P-Data sending buffer full	1) (FEmet) Cannot process the requested data. Check the connection with server.
0xFFEB	P2P-Internal interlock error	1) (FEnet) There is a problem with internal logic.
0xFFFF	P2P-Error	1) (User defined comm.) Requested connection to the other device as user defined server, or error occurred on user defined transmit frame size(1024bytes) . Check the parameter again.

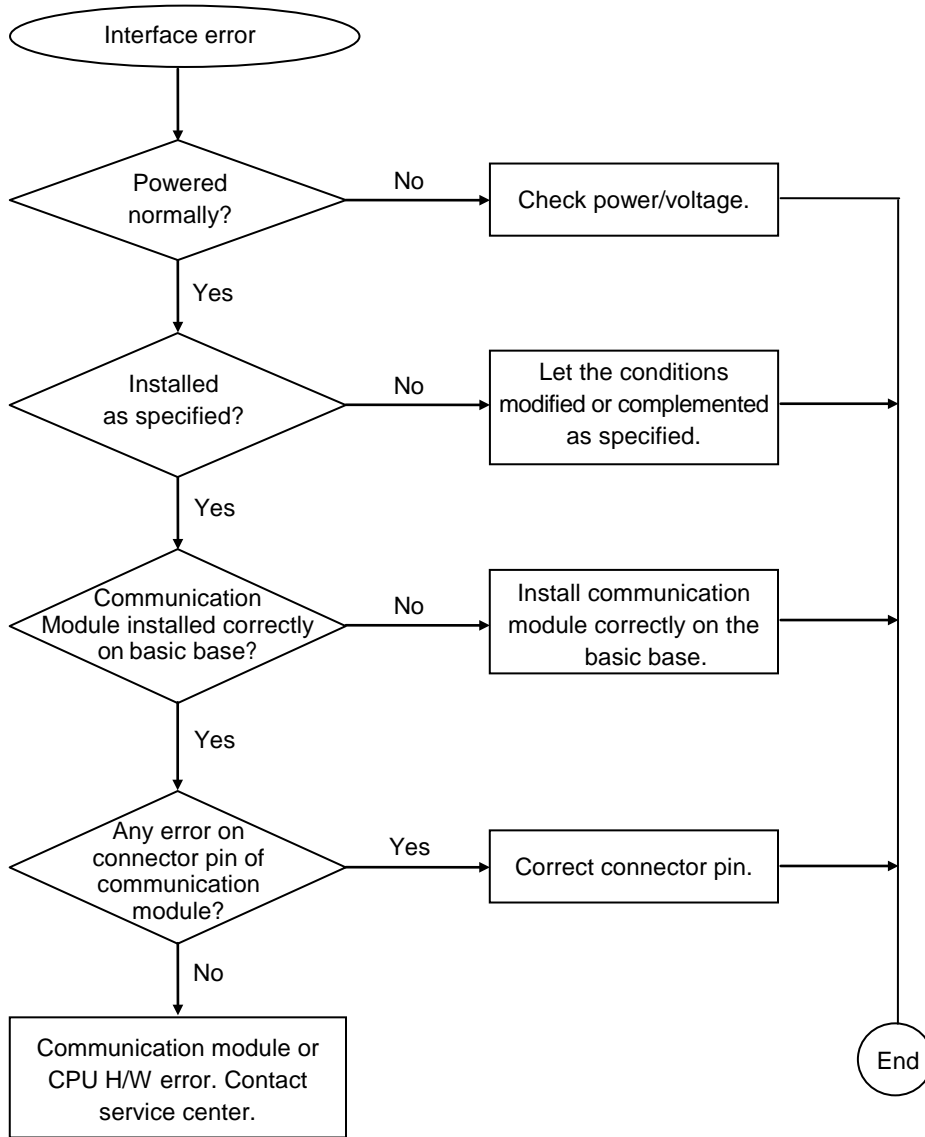## 10.3 Module Check through Error Codes

Identify the error codes of abnormal operations described. Troubleshooting will show error details and actions to take against.

10.3.1 Troubleshooting

(1) Run LED Off : H/W error
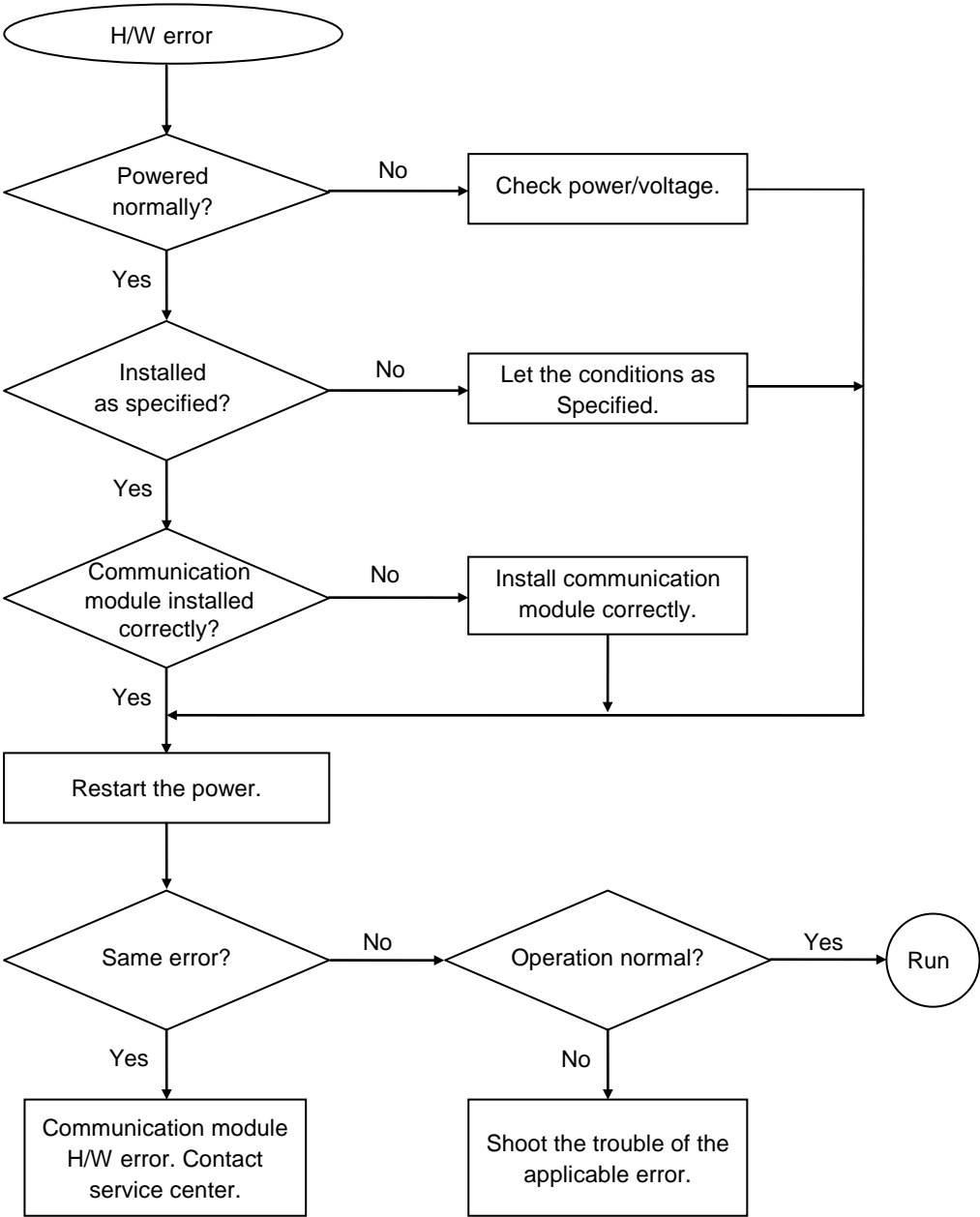
(2) I/F LED Off : Interface error

```
                        ┌─────────────────────┐
                        │    Interface error    │
                        └─────────────────────┘
                                   │
                                   ▼
                          ╱────────────╲
                         ╱   Powered     ╲        No      ┌─────────────────────┐
                         ╲   normally?    ╱─────────────▶ │  Check power/voltage. │──────┐
                          ╲──────────────╱              └─────────────────────┘        │
                                   │ Yes                                                  │
                                   ▼                                                      │
                          ╱────────────╲                 ┌─────────────────────┐        │
                         ╱  Installed    ╲       No       │   Let the conditions  │        │
                         ╲  as specified? ╱────────────▶ │ modified or complemented│──────┤
                          ╲──────────────╱               │     as specified.     │        │
                                   │ Yes                 └─────────────────────┘        │
                                   ▼                                                      │
                          ╱────────────╲                 ┌─────────────────────┐        │
                         ╱ Communication ╲      No        │ Install communication │        │
                         ╲ Module installed correctly ╱──▶│ module correctly on the│──────┤
                         ╱  on basic base?   ╲           │     basic base.       │        │
                          ╲──────────────╱               └─────────────────────┘        │
                                   │ Yes                                                  │
                                   ▼                                                      │
                          ╱────────────╲                                                  │
                         ╱  Any error on  ╲    Yes        ┌─────────────────────┐        │
                         ╲ connector pin of ╱───────────▶ │ Correct connector pin.│──────┤
                         ╱ communication    ╲            └─────────────────────┘        │
                         ╲    module?      ╱                                              │
                          ╲──────────────╱                                               │
                                   │ No                                                  │
                                   ▼                                                   ╱─────╲
                        ┌─────────────────────┐                                      │  End  │
                        │ Communication module or│                                     ╲─────╱
                        │ CPU H/W error. Contact │
                        │   service center.     │
                        └─────────────────────┘
```

10.4 Communication error code

10.4.1 Status with a communication frame

It is an error code to reply error for the request of the communication using XGT dedicated communication header such as "LSIS-XGT" or "LGIS-GLOFA".
It can check an error code in error code address.

Format Name	Header	Command	Data type	Reserved area	Error status	Error code (Hex 2 Byte)
Code(ex)	...	h'0055	h'0002	h'0000	h'FFFFor h'00FF (not '0')	h'0004

```
0000  00 e0 91 02 00 21 00 e0  91 03 12 93 08 00 45 00    .....!.. ......E.
0010  00 46 00 03 00 00 80 06  b8 96 c0 a8 00 5a c0 a8    .F...... .....Z..
0020  00 6e 07 d4 bb 52 01 91  8e e7 dc 6c 5c e3 50 18    .n...R.. ...l\.P.
0030  3e 80 3c a3 00 00 4c 53  49 53 2d 58 47 54 00 00    >.<...LS IS-XGT..
0040  01 01 a0 11 00 00 0a 00  04 1c 55 00 14 00 00 00    ........ ..U.....
0050  ff 00 04 00                                          ....
```

[picture 10.4.1] Response frame for exceed an accessible address

Error code		Details
Decimal	Hex	
1	0x0001	When requesting Single Read/Write, the number of block is larger than 16
2	0x0002	Data type which is not X,B,W,D,L is received
3	0x0003	Device not serviced is requested (XGK : P, M, L, K, R, , XGI : I, Q, M..)
4	0x0004	Exceed the device area
5	0x0005	It can read or write maximum 1400byes at once. That restriction is exceeded (Single block size)
6	0x0006	It can read or write maximum 1400byes at once. That restriction is exceeded (Total size per block)
117	0x0075	First part of frame header is wrong at dedicated service ('LSIS-GLOFA')
118	0x0076	Length of frame header is wrong at dedicated service
119	0x0077	Checksum of frame header is wrong at dedicated service
120	0x0078	Instruction is wrong at dedicated service

Notes

(1) If you check frame with frame capture tool, Data occurs byte swap.
   (Difference by endian)
   Ex) h'0054 ⇒ h'5400

Chapter 11 Compliance with EMC Specifications

11.1 Requirements Complying with EMC Specifications

EMC Directions describe "Do not emit strong electromagnetic wave to the outside: Emission" and "Do not have an influence of electromagnetic wave from the outside: Immunity", and the applicable products are requested to meet the directions. The chapter summarizes how to structure a system using XGT PLC to comply with the EMC directions. The description is the data summarized for the requirements and specifications of EMC regulation acquired by the company but it does not mean that every system manufactured according to the description meets the following specifications. The method and determination to comply with the EMC directions should be finally determined by the system manufacturer self.

11.1.1 EMC specifications

The EMC specifications affecting the PLC are as follows.

Specification	Test items	Test details	Standard value
EN50081-2	EN55011 Radiated noise *2	Measure the wave emitted from a product.	30~230 ^{MHz} QP : 50 $^{dB\mu V}$/m *1 230~1000 ^{MHz} QP : 57 $^{dB\mu V}$/m
	EN55011 conducted noise	Measure the noise that a product emits to the power line.	150~500 ^{kHz} QP : 79 ^{dB} Mean : 66 ^{dB} 500~230 ^{MHz} QP : 73 ^{dB} Mean : 60 ^{dB}
EN61131-2	EN61000-4- Electrostatic immunity	Immunity test allowing static electricity to the case of a device.	15 ^{kV} Air discharge 8 ^{kV} Contact discharge
	EN61000-4-4 Fast transient burst noise	Immunity test allowing a fast noise to power cable and signal cable.	Power line : 2 ^{kV} Digital I/O : 1 ^{kV} Analogue I/O, signal lines : 1 ^{kV}
	EN61000-4-3 Radiated field AM modulation	Immunity test injecting electric field to a product.	10Vm, 26~1000 ^{MHz} 80% AM modulation @ 1 ^{kHz}
	EN61000-4-12 Damped oscillatory wave immunity	Immunity test allowing attenuation vibration wave to power cable.	Power line : 1 ^{kV} Digital I/O(24V and higher) : 1 ^{kV}

[Table11.1.1] EMC Specifications

*1 : QP: Quasi Peak, Mean : average value

*2 : PLC is a type of open device(installed on another device) and to be installed in a panel.
    For any applicable tests, the system is tested with the system installed in a panel.

11.1.2 Panel

The PLC is a kind of open device(installed on another device) and it should be installed in a panel. It is because the installation may prevent a person from suffering from an accident due to electric shock as the person contacts with the product(XGT PLC) and the panel can attenuates the noise generating from the PLC.
In case of XGT PLC, to restrict EMI emitted from a product, it should be installed in a metallic panel. The specifications of the metallic panel are as follows.

1) Panel

The panel for PLC should be installed and manufactured as follows.

(1) The panel should be made of SPCC(Cold Rolled Mild Steel)
(2) The plate should be 1.6mm and thicker
(3) The power supplied to the panel should be protected against surge by using insulated transformer.
(4) The panel should be structured so that electric wave is not leaked outside. For instance, make the door as a box as presented below. The main frame should be also designed to be covered the door in order to restrict any radiating noise generated from the PLC.

Panel Main frame

Door

Visor
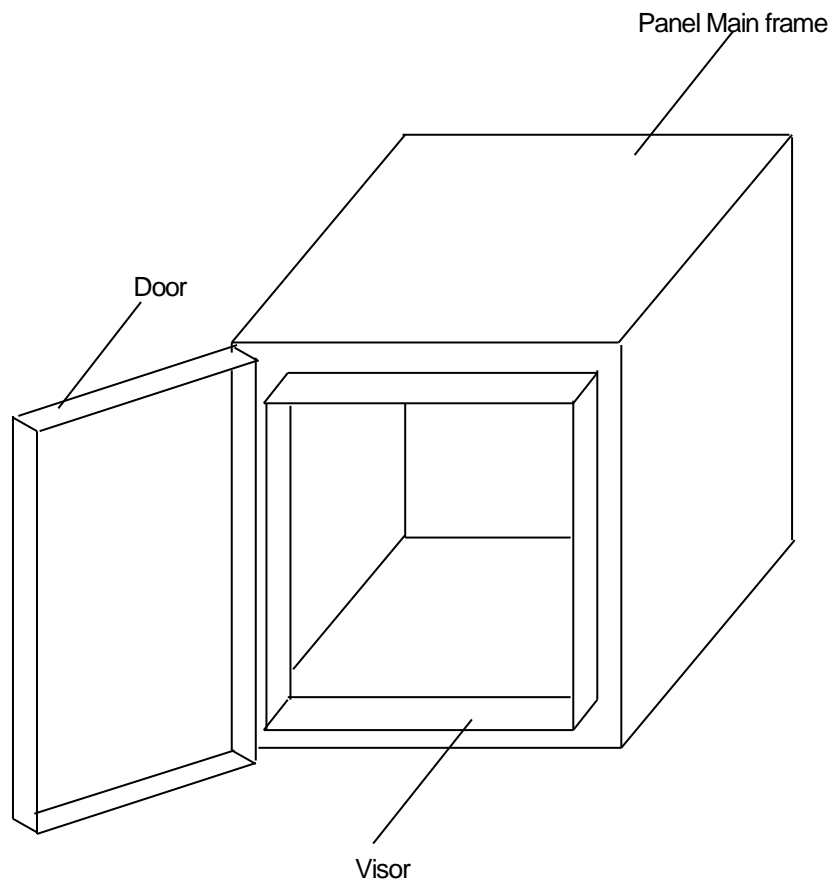
(5) The inside plate of panel should have proper conductivity with a wide surface as possible by eliminating the plating of the bolt used to be mounted on the main frame in order to secure the electric contact with the frame.

2)   Power cable and grounding cable

The grounding/power cable of PLC should be treated as follows.

(1) The panel should be grounded with a thick wire() to secure a lower impedance even in high frequency.
(2) LG(Line Ground) terminal and FG(Frame Ground) terminal functionally let the noise inside the PLC flow into the ground, so a wire of which impedance is low should be used.
(3) Since the grounding cable itself may generate noise, thick and short wiring may prevent it serving as an antenna.

11.1.3 Cable

1) Extension cable treatment
The extension cable of XGT series is with fast electric signal. Therefore, high frequency noise wave is emitted from the extension cable. To comply with the CE specifications, please attach the ferrite core on the extension cable as presented in the figure.
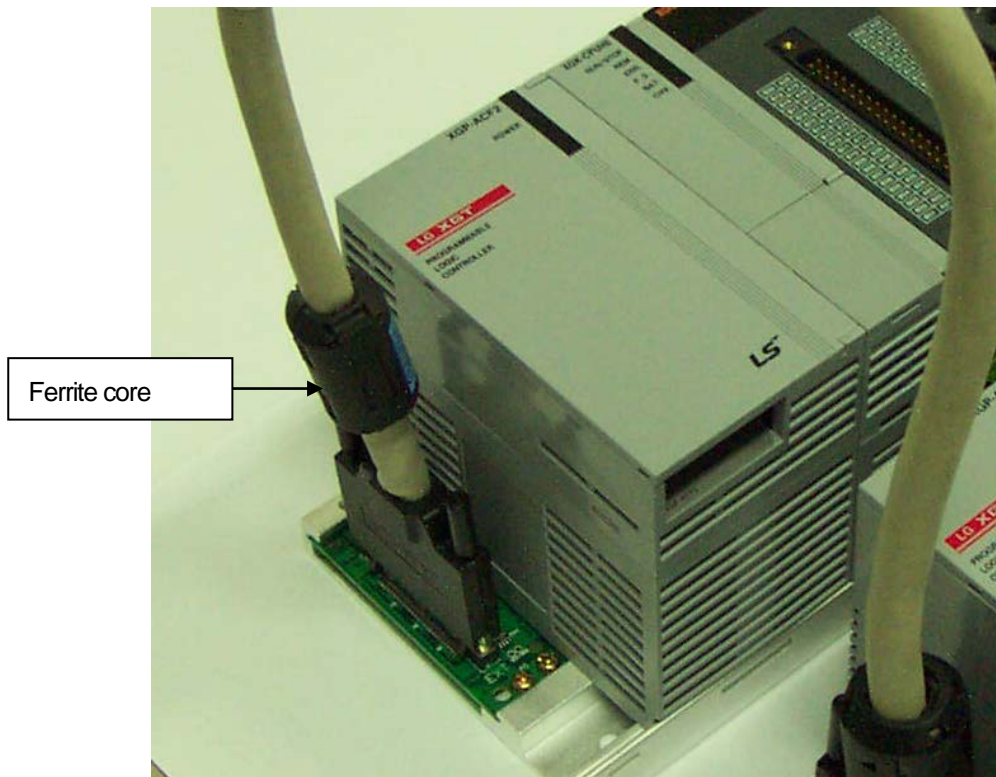
Mode	Manufacturer	Remarks
CU1330D	E Tech Electronics	-
ZCAT3035-1330	TDK	-

2) Fixing a cable in the panel
If the extension cable of XGT series is to be installed on the metallic panel, the cable should be 1cm and more away from the panel, preventing the direct contact.
The metallic plate of panel may shield noise from electromagnetic wave while it a cable as a noise source is close to the place, it can serve as an antenna. Every fast signal cable as well as the extension cable needs proper spacing from the panel.

11.2 Requirements Complying with Low Voltage Direction

The low voltage direction requires a device that operates with AC50~1000V, DC 75 ~ 1500V to have proper safety. The followings summarize the cautions for installing and wiring PLC of the XGT series to comply with the low voltage directions. The description is the data based on the applicable requirements and specifications as far as we know but it does not mean that every system manufactured according to the description meets the following specifications. The method and determination to comply with the EMC directions should be finally determined by the system manufacturer self.

11.2.1 Specifications applicable to XGT series

XGT series follow the EN6100-1(safety of the device used in measurement/control lab).
XGT series is developed in accordance with the above specifications, even for a module operating at the rated voltage higher than AC50V/DC75V.

11.2.2 Selection of XGT series PLC

(1) Power module
The power module of which rated input voltage is AC110/220V may have dangerous voltage(higher than 42.4V peak) inside it, so any CE mark compliance product is insulated between the primary and the secondary.

(2) I/O module
The I/O module of which rated voltage is AC110/220V may have dangerous voltage(higher than 42.4V peak) inside it, so any CE mark compliance product is insulated between the primary and the secondary. The I/O module lower than DC24V is not applicable to the low voltage directions.

(3) CPU Module, Base unit
The modules use DC5V, 3.3V circuits, so they are not applicable to the low voltage directions.

(4) Special module, Communication module
The modules use the rated voltage less than DC 24V, so they are not applicable to the low voltage directions.

Appendix

A.1 XGT CPU Memory Device List

For up-to-date device list of each CPU, refer to relevant CPU user manual. The following contents are based on when this user manual is written.

A.1.1 Device of XGK CPU

It is the memory addresses of CPU for the data send/receive.

Device type	Range	Size(Word)	Read/Write
P	P0 ~ P2047	2048	R/W
M	M0 ~ M2047	2048	R/W
K	K0 ~ K2047	2048	R/W
F	F0 ~ F1023	1024	R
F	F1024 ~ F2047	1024	R/W
T	T0 ~ T2047	2048	R/W
C	C0 ~ C2047	2048	R/W
U	U00.00 ~ U7F.31	4096	R/W
Z	Z0 ~ Z127	128	R/W
L	L0 ~ L11263	11264	R/W
N	N0 ~ N21503	21504	R/W
D(CPUH)	D0 ~ D32767	32768	R/W
D(CPUS)	D0 ~ D19999	20000	R/W
R	R0 ~ R32767	32768	R/W
ZR	ZR0 ~ZR65535	65536	R/W

A.1.2 Device of XGI CPU

Device type		Size	Range	Reference
memory	Symbolic variable area(A)	512K byte	%AW0~%AW262143	Max 256K byte can be set as retain-area
	Input variable(I)	16K byte	%IW0.0.0 ~ %IW127.15.3	-
	Output variable(Q)	16K byte	%QW0.0.0 ~ %QW127.15.3	-
	Direct variable — M	256K byte	%MW0~%MW131071	Max 128K byte can be set as retain-area
	Direct variable — R	64K byte * 2 blocks	%RW0~%RW32767	64K byte per one block
	Direct variable — W	128K byte	%WW0~%WW65535	-
	Flag variable — F	4K byte	%FW0~%FW2047	System flag
	Flag variable — K	16K byte	%KW0~%KW8399	PID flag
	Flag variable — L	22K byte	%LW0~%LW11263	High Speed Link flag
	Flag variable — N	42K byte	%NW0~%NW25087	P2P flag
	Flag variable — U	8K byte	%UW7.15.31	Analog refresh flag

A.1.3 Device of XGR CPU

Device type		Size	Range	Reference
Memory	Input variable(I)	16KB	%IW0.0.0 ~ %IW127.15.3	-
	Output variable(Q)	16KB	%QW0.0.0 ~ %QW127.15.3	-
	Automatic variable(A)	512KB	%AW0~%AW262143	Max 256K byte can be set as retain-area
	Direct variable — M	256KB	%MW0~%MW131071	Max 128K byte can be set as retain-area
	Direct variable — R	64KB * 2 blocks	%RW0~%RW32767	64K byte per one block
	Direct variable — W	128KB	%WW0~%WW65535	Same with R area
	Flag variable — F	4KB	%FW0~%FW2047	System flag
	Flag variable — K	18KB	%KW0~%KW8399	PID area (PID 256 loop)
	Flag variable — L	22KB	%LW0~%LW11263	HS link flag, P2P flag
	Flag variable — N	42KB	%NW0~%NW25087	P2P parameter (XG5000 setting)
	Flag variable — U	32KB	%UW31.15.31	Analog refresh area (31 base, 16 slot, 32 channel)

A.2 Terminology

A.2 explains it for the general term of the FEnet I/F module. If you want more detailed contents,
Please perform reference of an Ethernet specialized book.

1. IEEE 802.3
   IEEE 802.3 specifies standards for CSMA/CD based Ethernet. Exactly it is a LAN based on CSMA/CD (Carrier Sense Multiple Access with Collision Detection) Ethernet designed by IEEE 802.3 group, which is classified into detailed projects as specified below;

   A) IEEE P802.3 - 10G Base T study Group
   B) IEEE P802.3ah - Ethernet in the First Mile Task Force
   C) IEEE P802.3ak - 10G Base-CX4 Task Force
   ※ Ethernet and IEEE 802.3 are standardized at RFC894 and RFC1042 so each should process another frame.

2. ARP (Address Resolution Protocol)
   Protocol to search for MAC address by means of correspondent IP address on the Ethernet LAN

3. Bridge
   A device used to connect two networks so to be operated as one network. Bridge is used not only to connect two different types of networks but also to divide one big network into two small networks in order to increase the performance

4. Client
   A user of the network service, or a computer or program (mainly the one requesting services) using other computer's resource.

5. CSMA/CD(Carrier Sense Multiple Access with Collision Detection)
   Each client checks if there is any sign prior to transmission of data to the network (Carrier Sense) and then sends its data when the network is empty. At this time, all the clients have the equal right to send (Multiple Access). If two or more clients send data, collision may occur. The client who detects the collision tries to send again in a specific time.

6. DNS (Domain Name System)
   A method used to convert alphabetic Domain Name on the Internet to its identical Internet number (namely, IP address)

7. Dot Address
   Shows IP address of '100.100.100.100', where each figure is displayed in decimal with 1 byte occupied respectively for 4 bytes in total.

8. E-mail Address

The address of the user with login account for the specific machine connected via the Internet. Usually user's ID @ domain name (machine name) is assigned. In other words, it will be like hjjee@microsoft.com, where @ is called as 'at' displayed with shift+2 pressed on the keyboard. The letters at the back of @ are for the domain name of specific company (school, institute,..) connected with the Internet, and the letters in front of @ are for the user ID registered in the machine. The last letters of the domain name are for the highest level. USA generally uses the following abbreviation as specified below, and Korea uses .kr to stand for Korea. .com : usually for companies) / .edu : usually for educational organizations such as universities. / .ac(academy) is mostly used in Korea / .gov : for governmental organizations. For example, nasa.gov is for NASA (government) / .mil : military related sites. For example, af.mil is for USA air force (military)/ .org : private organizations / .au : Australia / .uk : the United Kingdom / .ca : Canada / .kr : Korea / .jp : Japan / .fr : France / .tw : Taiwan, etc.

9. Ethernet

A representative LAN connection system (IEEE 802.3) developed by Xerox, Intel and DEC of America which can send about 10Mbps and use the packet of 1.5kB. Since Ethernet can allow various types of computers to be connected as one via the network, it has been called a pronoun of LAN as a universal standard with various products available, not limited to some specific companies.

10. FTP (File Transfer Protocol)

An application program used to transfer files between computers among application programs providing TCP/IP protocol. If an account is allowed to the computer to log in, fast log in the computer is available wherever the computer is so to copy files.

11. Gateway

Software/Hardware used to translate for two different protocols to work together, which is equivalent to the gateway necessary to exchange information with the different system.

12. Header

Part of the packet including self-station Number, correspondent station Number and error checking area.

13. HTML

Hypertext Markup Language, standard language of WWW. In other words, it is a language system to prepare Hypertext documents. The document made of HTML can be viewed through the web browser

14. HTTP

Hypertext Transfer Protocol, standard protocol of WWW. It is a protocol supporting the hypermedia system.

15. ICMP (Internet Control Message Protocol)

An extended protocol of IP address used to create error messages and test packets to control the Internet.

16. IP (Internet Protocol)

Protocol of network layers for the Internet

17. IP Address
Address of respective computers on the Internet made of figures binary of 32 bits (4 bytes) to distinguish the applicable machine on the Internet. Classified into 2 sections, network distinguishing address and host distinguishing address. The network address and the host address is respectively divided into class A, B and C based on the bits allotted. IP address since it shall be unique all over the world, shall be decided not optionally but as assigned by NIC(Network Information Center) of the applicable district when joining the Internet. In Korea, KRNIC(Korea Network Information Center) is in charge of this work. Ex.) 165.244.149.190

18. ISO (International Organization for Standardization)
A subsidiary organization of UN, establishing and managing the international standards.

19. LAN (Local Area Network)
Called also as local area communication network or district information communication network, which allows lots of computers to exchange data with each other as connected though communication cable within a limited area such as in an office or a building

20. MAC (Medium Access Control)
A method used to decide which device should use the network during given time on the broadcast network

21. Node
Each computer connected with the network is called Node

22. Packet
A package of data which is the basic unit used to send through the network. Usually the package is made of several tens or hundreds of bytes with the header attached in front to which its destination and other necessary information are added

23. PORT number
Used to classify the applications on TCP/UDP.
Ex.) 21/tcp : Telet

24. PPP (Point-to-Point Protocol)
Phone communication protocol which allows packet transmission in connecting with the Internet. In other words, normal phone cable and modem can be used for the computer to connect through TCP/IP with this most general Internet protocol.
Similar to SLIP, however with modern communication protocol factors such as error detection and data compression, it demonstrates more excellent performance than SLIP.

25. Protocol
Contains regulations related with mutual information transmission method between computers connected with each other through the network. The protocol may specify detailed interface between machines in Low level (for example, which bit/byte should go out through the line) or high level of message exchange regulations as files are transferred through the Internet.

26. Router
A device used to transfer the data packet between the networks. It sends the data packet to its final destination, waits if the network is congested, or decides which LAN is good to connect to at the LAN junction. Namely, it is a special computer/software used to control the two or more networks connected.

27. Server

The side which passively responds to the client's request and shares its resources.

28. TCP (Transmission Control Protocol)

A transport layer protocol for the Internet
- Data Tx/Rx through connection
- Multiplexing
- Transmission reliable
- Emergent data transmission supported

### 29. TCP/IP (Transmission Control Protocol/Internet Protocol)

Transmission protocol used for communication among different kinds of computers, which makes the communication available between general PC and medium host, IBM PC and MAC, and medium or large-sized different types of computer. It is also used as a general term for information transmission protocol between computer networks including FTP, Telnet, SMTP, etc. TCP divides data into packets to send through IP and the packets sent will be united back together through TCP.

30) Telnet

It means remote login via Internet. To login to remote host via TELNET, account of that host is necessary. But for some hosts providing public service, you can connect without account

31) Token Ring

As short-distance network using Token to connect to network having physical ring structure, one of the Node connection methods at network. If node sending data gets Token, then node gets right to send message packet. Realistically structured examples are IEEE 802.5, ProNet-1080 and FDDI. Terms called Token is used as IEEE 802.5
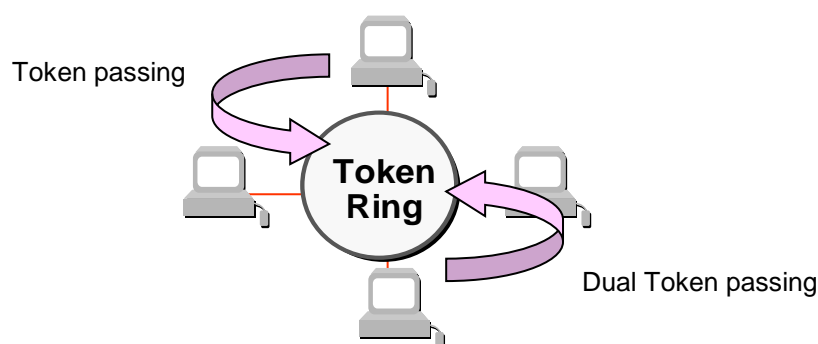
32) UDP(User Datagram Protocol)

A transport layer protocol for the Internet
- High speed communication because of communication without connection
- Multiplexing
- Lower reliability than TCP in transmission (Tough data doesn't arrive, it doesn't send data again)

33) Auto-Negotiation

Auto-negotiation is the process that Ethernet device changes information for the performance such as speed, mode (duplex)
   1. The reason discovery that connection was refused.
   2. Decide the performance that the network equipment has.
   3. Change connection speed.

34) FDDI(Fiber Distributed Data Interface)

Based on optical cable, provides 100Mbps, Shared Media Network as Dual Ring method, Token Passing is done in two-way.
Max 200Km distance for entire network, Max 2Km between Nodes, Max 500 nodes.
Generally, this used as Backbone Network.

35) Reset
   This function is used to initialize the communication module with errors
   Use XG5000 to select [Online] -> [Reset/clear] -> [PLC reset]
   PLC is reset if do PLC reset.

A.3 List of Flags

A.3.1 List of Special Relays (F)

Device 1	Device 2	Type	Variable	Function	Description
F0000	-	DWORD	_SYS_STATE	Mode & Status	PLC mode & run status displayed.
–	F00000	BIT	_RUN	RUN	RUN status.
–	F00001	BIT	_STOP	STOP	STOP status.
–	F00002	BIT	_ERROR	ERROR	ERROR status.
–	F00003	BIT	_DEBUG	DEBUG	DEBUG status.
–	F00004	BIT	_LOCAL_CON	Local control	Local control mode.
–	F00005	BIT	_MODBUS_CON	Modbus mode	Modbus control mode.
–	F00006	BIT	_REMOTE_CON	Remote mode	Remote control mode.
–	F00008	BIT	_RUN_EDIT_ST	Modification during run	Program being downloaded during run.
–	F00009	BIT	_RUN_EDIT_CHK	Modification during run	Modification in progress during run.
–	F0000A	BIT	_RUN_EDIT_DONE	Modification complete during run	Modification complete during run.
-	F0000B	BIT	_RUN_EDIT_END	Modification complete during run	Modification complete during run.
-	F0000C	BIT	_CMOD_KEY	Run Mode	Run Mode changed by key.
-	F0000D	BIT	_CMOD_LPADT	Run Mode	Run Mode changed by local PADT.
-	F0000E	BIT	_CMOD_RPADT	Run Mode	Run Mode changed by remote PADT.
-	F0000F	BIT	_CMOD_RLINK	Run Mode	Run Mode changed by remote communication module.
-	F00010	BIT	_FORCE_IN	Compulsory input	Compulsory input status.
-	F00011	BIT	_FORCE_OUT	Compulsory output	Compulsory output status.
-	F00012	BIT	_SKIP_ON	I/O SKIP	I/O SKIP being executed.
-	F00013	BIT	_EMASK_ON	Error mask	Error mask being executed.
-	F00014	BIT	_MON_ON	Monitor	Monitor being executed.
-	F00015	BIT	_USTOP_ON	STOP	Stopped by STOP function
-	F00016	BIT	_ESTOP_ON	ESTOP	Stopped by ESTOP function.
-	F00017	BIT	_CONPILE_MODE	Compiling	Compile being performed.
-	F00018	BIT	_INIT_RUN	Initializing	Initialization task being performed.
-	F0001C	BIT	_PB1	Program code 1	Program code 1 selected.
-	F0001D	BIT	_PB2	Program code 2	Program code 2 selected.

Appendix

Device 1	Device 2	Type	Variable	Function	Description
-	F0001E	BIT	_CB1	Compile code 1	Compile code 1 selected.
-	F0001F	BIT	_CB2	Compile code 2	Compile code 2 selected.
F0002	-	DWORD	_CNF_ER	System error	Serious error in system reported.
−	F00020	BIT	_CPU_ER	CPU error	CPU configuration error found.
−	F00021	BIT	_IO_TYER	Module type error	Module type not identical.
−	F00022	BIT	_IO_DEER	Module installation error	Module displaced.
−	F00023	BIT	_FUSE_ER	Fuse error	Fuse blown.
−	F00024	BIT	_IO_RWER	Module I/O error	Module I/O error found.
−	F00025	BIT	_IP_IFER	Module interface error	Error found in Special/communication module interface.
−	F00026	BIT	_ANNUM_ER	External equipment Error	Serious error detected in external equipment.
−	F00028	BIT	_BPRM_ER	Basic parameter	Basic parameter abnormal.
−	F00029	BIT	_IOPRM_ER	IO parameter	IO configuration parameter abnormal.
−	F0002A	BIT	_SPPRM_ER	Special module parameter	Special module parameter abnormal.
-	F0002B	BIT	_CPPRM_ER	Communication module parameter	Communication module parameter abnormal.
-	F0002C	BIT	_PGM_ER	Program error	Program error found.
-	F0002D	BIT	_CODE_ER	Code error	Program code error found.
-	F0002E	BIT	_SWDT_ER	System watch-dog	System watch-dog active.
-	F0002F	BIT	_BASE_POWER_ER	Power error	Base power abnormal.
-	F00030	BIT	_WDT_ER	Scan watch-dog	Scan watch-dog active.
F0004	-	DWORD	_CNF_WAR	System warning	Slight error in system reported.
−	F00040	BIT	_RTC_ER	RTC error	RTC data abnormal.
−	F00041	BIT	_DBCK_ER	Back-up error	Data back-up error found.
−	F00042	BIT	_HBCK_ER	Restart error	Hot restart unavailable.
−	F00043	BIT	_ABSD_ER	Run error stop	Stopped due to abnormal run.
−	F00044	BIT	_TASK_ER	Task impact	Task being impacted.
−	F00045	BIT	_BAT_ER	Battery error	Battery status abnormal.
−	F00046	BIT	_ANNUM_WAR	External equipment error	Slight error detected in external equipment.
−	F00047	BIT	_LOG_FULL	Memory full	Log memory full
−	F00048	BIT	_HS_WAR1	HS link 1	HS link – parameter 1 error
−	F00049	BIT	_HS_WAR2	HS link 2	HS link – parameter 2 error
-	F0004A	BIT	_HS_WAR3	HS link 3	HS link – parameter 3 error
-	F0004B	BIT	_HS_WAR4	HS link 4	HS link – parameter 4 error

Appendix

Device 1	Device 2	Type	Variable	Function	Description
–	F0004C	BIT	_HS_WAR5	HS link 5	HS link – parameter 5 error
–	F0004D	BIT	_HS_WAR6	HS link 6	HS link – parameter 6 error
–	F0004E	BIT	_HS_WAR7	HS link 7	HS link – parameter 7 error
–	F0004F	BIT	_HS_WAR8	HS link 8	HS link – parameter 8 error
–	F00050	BIT	_HS_WAR9	HS link 9	HS link – parameter 9 error
–	F00051	BIT	_HS_WAR10	HS link 10	HS link – parameter 10 error
–	F00052	BIT	_HS_WAR11	HS link 11	HS link - parameter11 error
–	F00053	BIT	_HS_WAR12	HS link 12	HS link - parameter12 error
–	F00054	BIT	_P2P_WAR1	P2P parameter 1	P2P - parameter1 error
–	F00055	BIT	_P2P_WAR2	P2P parameter 2	P2P – parameter2 error
-	F00056	BIT	_P2P_WAR3	P2P parameter 3	P2P – parameter3 error
-	F00057	BIT	_P2P_WAR4	P2P parameter 4	P2P – parameter4 error
-	F00058	BIT	_P2P_WAR5	P2P parameter 5	P2P – parameter5 error
-	F00059	BIT	_P2P_WAR6	P2P parameter 6	P2P – parameter6 error
-	F0005A	BIT	_P2P_WAR7	P2P parameter 7	P2P – parameter7 error
-	F0005B	BIT	_P2P_WAR8	P2P parameter 8	P2P – parameter8 error
-	F0005C	BIT	_CONSTANT_ER	Fixed cycle error	Fixed cycle error
F0009	-	WORD	_USER_F	User contact point	Timer available for user.
–	F00090	BIT	_T20MS	20ms	CLOCK of 20ms cycle.
–	F00091	BIT	_T100MS	100ms	CLOCK of 100ms cycle.
–	F00092	BIT	_T200MS	200ms	CLOCK of 200ms cycle.
–	F00093	BIT	_T1S	1s	CLOCK of 1s cycle.
–	F00094	BIT	_T2S	2s	CLOCK of 2s cycle.
–	F00095	BIT	_T10S	10s	CLOCK of 10s cycle.
–	F00096	BIT	_T20S	20s	CLOCK of 20s cycle.
–	F00097	BIT	_T60S	60s	CLOCK of 60s cycle.
–	F00099	BIT	_ON	Always ON	Bit always ON.
–	F0009A	BIT	_OFF	Always OFF	Bit always OFF
-	F0009B	BIT	_1ON	1 scan ON	Bit only ON for the first scan.
-	F0009C	BIT	_1OFF	1 scan OFF	Bit only OFF for the first scan.
-	F0009D	BIT	_STOG	Reverse	Every scan reversed.
F0010	-	WORD	_USER_CLK	User CLOCK	CLOCK available to set by user.
-	F00100	BIT	_USR_CLK0	Repeat specific scan	ON/OFF CLOCK 0 for specific scan
-	F00101	BIT	_USR_CLK1	Repeat specific scan	ON/OFF CLOCK 1 for specific scan

Appendix

Device 1	Device 2	Type	Variable	Function	Description
-	F00102	BIT	_USR_CLK2	Repeat specific scan	ON/OFF CLOCK 2 for specific scan
-	F00103	BIT	_USR_CLK3	Repeat specific scan	ON/OFF CLOCK 3 for specific scan
-	F00104	BIT	_USR_CLK4	Repeat specific scan	ON/OFF CLOCK 4 for specific scan
-	F00105	BIT	_USR_CLK5	Repeat specific scan	ON/OFF CLOCK 5 for specific scan
-	F00106	BIT	_USR_CLK6	Repeat specific scan	ON/OFF CLOCK 6 for specific scan
-	F00107	BIT	_USR_CLK7	Repeat specific scan	ON/OFF CLOCK 7 for specific scan
F0011	-	WORD	_LOGIC_RESULT	Logic result	Logic result displayed.
-	F00110	BIT	_LER	Calculation error	ON for 1 scan if calculation in error.
-	F00111	BIT	_ZERO	Zero flag	ON if calculation result is 0.
-	F00112	BIT	_CARRY	Carry flag	ON if Carry found during calculation.
-	F00113	BIT	_ALL_OFF	Whole output OFF	ON if all output OFF
-	F00115	BIT	_LER_LATCH	Calculation error latch	ON kept if calculation in error.
F0012	-	WORD	_CMP_RESULT	Compared result	Compared result displayed.
-	F00120	BIT	_LT	LT flag	ON if "less than"
-	F00121	BIT	_LTE	LTE flag	ON if "less than or equal"
-	F00122	BIT	_EQU	EQU flag	ON if "equal"
-	F00123	BIT	_GT	GT flag	ON if "greater than"
-	F00124	BIT	_GTE	GTE flag	ON if "greater than or equal"
-	F00125	BIT	_NEQ	NEQ flag	ON if "not equal"
F0013	－	WORD	_AC_F_CNT	Inspected power cut	Number of inspected power-cuts displayed.
F0014	－	WORD	_FALS_NUM	FALS No.	FALS No. displayed.
F0015	－	WORD	_PUTGET_ERR0	PUT/GET error 0	Main base PUT / GET error
F0016	－	WORD	_PUTGET_ERR1	PUT/GET error 1	Added base step 1 PUT / GET error
F0017	－	WORD	_PUTGET_ERR2	PUT/GET error 2	Added base step 2 PUT / GET error
F0018	－	WORD	_PUTGET_ERR3	PUT/GET error 3	Added base step 3 PUT / GET error
F0019	－	WORD	_PUTGET_ERR4	PUT/GET error 4	Added base step 4 PUT / GET error
F0020	－	WORD	_PUTGET_ERR5	PUT/GET error 5	Added base step 5 PUT / GET error
F0021	－	WORD	_PUTGET_ERR6	PUT/GET error 6	Added base step 6 PUT / GET error
F0022	－	WORD	_PUTGET_ERR7	PUT/GET error 7	Added base step 7 PUT / GET error
F0023	-	WORD	_PUTGET_NDR0	PUT/GET complete 0	Main base PUT / GET complete
F0024	-	WORD	_PUTGET_NDR1	PUT/GET complete 1	Added base step 1 PUT / GET complete
F0025	-	WORD	_PUTGET_NDR2	PUT/GET complete 2	Added base step 2 PUT / GET complete
F0026	-	WORD	_PUTGET_NDR3	PUT/GET complete 3	Added base step 3 PUT / GET complete
F0027	-	WORD	_PUTGET_NDR4	PUT/GET complete 4	Added base step 4 PUT / GET complete
F0028	-	WORD	_PUTGET_NDR5	PUT/GET complete 5	Added base step 5 PUT / GET complete

Device 1	Device 2	Type	Variable	Function	Description
F0029	–	WORD	_PUTGET_NDR6	PUT/GET complete 6	Added base step 6 PUT / GET complete
F0030	–	WORD	_PUTGET_NDR7	PUT/GET complete 7	Added base step 7 PUT / GET complete
F0044	–	WORD	_CPU_TYPE	CPU type	Information on CPU type displayed.
F0045	–	WORD	_CPU_VER	CPU version	CPU version displayed.
F0046	–	DWORD	_OS_VER	OS version	OS version displayed.
F0048	–	DWORD	_OS_DATE	OS date	OS released date displayed.
F0050	–	WORD	_SCAN_MAX	Max. scan time	Max. scan time displayed
F0051	–	WORD	_SCAN_MIN	Min. scan time	Min. scan time displayed
F0052	–	WORD	_SCAN_CUR	Present scan time	Present scan time displayed.
F0053	–	WORD	_MON_YEAR	Month / Year	PLC's time information (Month/Year)
F0054	-	WORD	_TIME_DAY	Hour / Date	PLC's time information (Hour/Date)
F0055	-	WORD	_SEC_MIN	Second / Minute	PLC's time information (Second/Minute)
F0056	-	WORD	_HUND_WK	100 years / Day	PLC's time information (100 years/Day)
F0057	-	WORD	_FPU_INFO	FPU calculation result	Floating decimal calculation result displayed.
-	F00570	BIT	_FPU_LFLAG_I	Incorrect error latch	Latched if in incorrect error.
-	F00571	BIT	_FPU_LFLAG_U	Underflow latch	Latched if underflow found.
-	F00572	BIT	_FPU_LFLAG_O	Overflow latch	Latched if overflow found.
-	F00573	BIT	_FPU_LFLAG_Z	Latch divided by 0	Latched if divided by 0.
-	F00574	BIT	_FPU_LFLAG_V	Invalid calculation latch	Latched if invalid calculation.
-	F0057A	BIT	_FPU_FLAG_I	Incorrect error	Reported if incorrect error found.
-	F0057B	BIT	_FPU_FLAG_U	Underflow	Reported if underflow found.
-	F0057C	BIT	_FPU_FLAG_O	Overflow	Reported if overflow found.
-	F0057D	BIT	_FPU_FLAG_Z	Division by 0	Reported if divided by 0.
-	F0057E	BIT	_FPU_FLAG_V	Invalid calculation	Reported if calculation invalid.
-	F0057F	BIT	_FPU_FLAG_E	Irregular value input	Reported if irregular value input.
F0058	-	DWORD	_ERR_STEP	Error step	Error step saved.
F0060	-	DWORD	_REF_COUNT	Refresh	Increased when module refresh executed.
F0062	-	DWORD	_REF_OK_CNT	Refresh OK	Increased if module refresh normal
F0064	-	DWORD	_REF_NG_CNT	Refresh NG	Increased if module refresh abnormal.
F0066	-	DWORD	_REF_LIM_CNT	Refresh LIMIT	Increased if module refresh abnormal (TIME OUT).
F0068	-	DWORD	_REF_ERR_CNT	Refresh ERROR	Increased if module refresh abnormal.
F0070	-	DWORD	_MOD_RD_ERR _CNT	Module READ ERROR	Increased if module reads 1 word abnormally.
F0072	-	DWORD	_MOD_WR_ERR _CNT	Module WRITE ERROR	Increased if module writes 1 word abnormally.

Device 1	Device 2	Type	Variable	Function	Description
F0074	−	DWORD	_CA_CNT	Block service	Increased if module's block data serviced
F0076	−	DWORD	_CA_LIM_CNT	Block service LIMIT	Increased if module's block data service abnormal.
F0078	−	DWORD	_CA_ERR_CNT	Block service ERROR	Increased if module's block data service abnormal.
F0080	−	DWORD	_BUF_FULL_CNT	Buffer FULL	Increased if CPU's internal buffer is FULL.
F0082	−	DWORD	_PUT_CNT	PUT count	Increased if PUT executed.
F0084	−	DWORD	_GET_CNT	GET count	Increased if GET executed.
F0086	−	DWORD	_KEY	Present key	Local key's present status displayed.
F0088	−	DWORD	_KEY_PREV	Previous key	Local key's previous status displayed.
F0090	−	WORD	_IO_TYER_N	Discordant slot	Slot number with discordant module type displayed.
F0091	−	WORD	_IO_DEER_N	Displaced slot	Slot number with displaced module displayed.
F0092	−	WORD	_FUSE_ER_N	Fuse blown slot	Slot number with fuse blown displayed.
F0093	−	WORD	_IO_RWER_N	RW error slot	Slot number with module Read/Write error displayed.
F0094	−	WORD	_IP_IFER_N	IF error slot	Slot number with module interface error displayed.
F0096	−	WORD	_IO_TYER0	Module type 0 error	Main base module type error.
F0097	−	WORD	_IO_TYER1	Module type 1 error	Added base step 1 module type error.
F0098	−	WORD	_IO_TYER2	Module type 2 error	Added base step 2 module type error.
F0099	−	WORD	_IO_TYER3	Module type 3 error	Added base step 3 module type error.
F0100	−	WORD	_IO_TYER4	Module type 4 error	Added base step 4 module type error.
F0101	−	WORD	_IO_TYER5	Module type 5 error	Added base step 5 module type error
F0102	−	WORD	_IO_TYER6	Module type 6 error	Added base step 6 module type error
F0103	−	WORD	_IO_TYER7	Module type 7 error	Added base step 7 module type error
F0104	−	WORD	_IO_DEER0	Module installation 0 error	Main base module installation error
F0105	−	WORD	_IO_DEER1	Module installation 1 error	Added base step 1 module installation error
F0106	−	WORD	_IO_DEER2	Module installation 2 error	Added base step 2 module installation error
F0107	−	WORD	_IO_DEER3	Module installation 3 error	Added base step 3 module installation error
F0108	−	WORD	_IO_DEER4	Module installation 4 error	Added base step 4 module installation error
F0109	−	WORD	_IO_DEER5	Module installation 5 error	Added base step 5 module installation error
F0110	−	WORD	_IO_DEER6	Module installation 6 error	Added base step 6 module installation error
F0111	−	WORD	_IO_DEER7	Module installation 7 error	Added base step 7 module installation error
F0112	−	WORD	_FUSE_ER0	Fuse blown 0 error	Main base Fuse blown error
F0113	-	WORD	_FUSE_ER1	Fuse blown 1 error	Added base step 1 Fuse blown error
F0114	-	WORD	_FUSE_ER2	Fuse blown 2 error	Added base step 2 Fuse blown error
F0115	-	WORD	_FUSE_ER3	Fuse blown 3 error	Added base step 3 Fuse blown error

Device 1	Device 2	Type	Variable	Function	Description
F0116	–	WORD	_FUSE_ER4	Fuse blown 4 error	Added base step 4 Fuse blown error
F0117	–	WORD	_FUSE_ER5	Fuse blown 5 error	Added base step 5 Fuse blown error
F0118	–	WORD	_FUSE_ER6	Fuse blown 6 error	Added base step 6 Fuse blown error
F0119	–	WORD	_FUSE_ER7	Fuse blown 7 error	Added base step 7 Fuse blown error
F0120	–	WORD	_IO_RWER0	Module RW 0 error	Main base module Read/Write error
F0121	–	WORD	_IO_RWER1	Module RW 1 error	Added base step 1 module Read/Write error
F0122	–	WORD	_IO_RWER2	Module RW 2 error	Added base step 2 module Read/Write error
F0123	–	WORD	_IO_RWER3	Module RW 3 error	Added base step 3 module Read/Write error
F0124	–	WORD	_IO_RWER4	Module RW 4 error	Added base step 4 module Read/Write error
F0125	–	WORD	_IO_RWER5	Module RW 5 error	Added base step 5 module Read/Write error
F0126	–	WORD	_IO_RWER6	Module RW 6 error	Added base step 6 module Read/Write error
F0127	–	WORD	_IO_RWER7	Module RW 7 error	Added base step 7 module Read/Write error
F0128	–	WORD	_IO_IFER_0	Module IF 0 error	Main base module interface error
F0129	–	WORD	_IO_IFER_1	Module IF 1 error	Added base step 1 module interface error
F0130	–	WORD	_IO_IFER_2	Module IF 2 error	Added base step 2 module interface error
F0131	–	WORD	_IO_IFER_3	Module IF 3 error	Added base step 3 module interface error
F0132	–	WORD	_IO_IFER_4	Module IF 4 error	Added base step 4 module interface error
F0133	–	WORD	_IO_IFER_5	Module IF 5 error	Added base step 5 module interface error
F0134	–	WORD	_IO_IFER_6	Module IF 6 error	Added base step 6 module interface error
F0135	–	WORD	_IO_IFER_7	Module IF 7 error	Added base step 7 module interface error
F0136	-	WORD	_RTC_DATE	RTC date	RTC's present date
F0137	-	WORD	_RTC_WEEK	RTC day	RTC's present day of the week
F0138	-	DWORD	_RTC_TOD	RTC time	RTC's present time (ms unit)
F0140	-	DWORD	_AC_FAIL_CNT	Power-cut times	Power-cut times saved.
F0142	-	DWORD	_ERR_HIS_CNT	Errors found	Number of found errors saved.
F0144	-	DWORD	_MOD_HIS_CNT	Mode conversion times	Mode conversion times saved.
F0146	-	DWORD	_SYS_HIS_CNT	History updated times	System's history updated times saved.

Appendix

Device 1	Device 2	Type	Variable	Function	Description
F0148	−	DWORD	_LOG_ROTATE	Log rotate	Log rotate information saved.
F0150	−	WORD	_BASE_INFO0	Slot information 0	Main base slot information
F0151	−	WORD	_BASE_INFO1	Slot information 1	Added base step 1 slot information
F0152	−	WORD	_BASE_INFO2	Slot information 2	Added base step 2 slot information
F0153	−	WORD	_BASE_INFO3	Slot information 3	Added base step 3 slot information
F0154	−	WORD	_BASE_INFO4	Slot information 4	Added base step 4 slot information
F0155	−	WORD	_BASE_INFO5	Slot information 5	Added base step 5 slot information
F0156	−	WORD	_BASE_INFO6	Slot information 6	Added base step 6 slot information
F0157	−	WORD	_BASE_INFO7	Slot information 7	Added base step 7 slot information
F0158	−	WORD	_RBANK_NUM	Used block number	Presently used block number
F0159	-	WORD	_RBLOCK_STATE	Flash status	Flash block status
F0160	-	DWORD	_RBLOCK_RD_FLAG	Flash Read	ON when reading Flash N block data.
F0162	-	DWORD	_RBLOCK_WR_FLAG	Flash Write	ON when writing Flash N block data.
F0164	-	DWORD	_RBLOCK_ER_FLAG	Flash error	Error found during Flash N block service.
F1024	-	WORD	_USER_WRITE_F	Available contact	Contact point available in program
-	F10240	BIT	_RTC_WR	RTC RW	Data Write & Read in RTC
-	F10241	BIT	_SCAN_WR	Scan WR	Scan value initialization
-	F10242	BIT	_CHK_ANC_ERR	Detect external serious error	Detection of serious error in external equipment requested.
-	F10243	BIT	_CHK_ANC_WAR	Detect external slight error	Detection of slight error in external equipment requested.
F1025	-	WORD	_USER_STAUS_F	User contact point	User contact point
-	F10250	BIT	_INIT_DONE	Initialization complete	Initialization complete displayed.
F1026	-	WORD	_ANC_ERR	External serious error information	Serious error information in external equipment displayed.
F1027	-	WORD	_ANC_WAR	External slight error information	Slight error information in external equipment displayed.
F1034	-	WORD	_MON_YEAR_DT	Month / Year	Time information data (Month/Year)
F1035	-	WORD	_TIME_DAY_DT	Hour / Date	Time information data (Hour/Date)
F1036	-	WORD	_SEC_MIN_DT	Second / Minute	Time information data (Second/Minute)
F1037	-	WORD	_HUND_WK_DT	100 years / Day	Time information data (100 years/Day)

A.3.2 List of Communication Relays (L)

1) Special register for data link

HS link No. 1 ~ 12

No.	Keyword	Type	Detail	Description
L000000	_HS1_RLINK	Bit	HS link parameter No.1's all stations normally operates	Displays all stations normally operated as specified in HS link parameter, which will be On if 1. There is no error with all stations specified in parameter in RUN mode 2. All data block is in normal communication as specified in parameter. 3. The parameter specified in each station itself is in normal communication. Run_link will be kept On if once On until stopped by disabling link.
L000001	_HS1_LTRBL	Bit	After _HS1RLINK is ON, displays abnormal status	This flag will be On if the station specified in parameter and the data block's communication status are as described below with _HSmRLINK flag On,. 1. when the station specified in parameter is not in RUN mode, 2. when the station specified in parameter is in error, 3. when data block's communication status specified in parameter is unstable, The link trouble will be On if one of those conditions 1,2 and 3 above occurs. And if such a condition is back to normal, it will be Off.
L000020 ~ L00009F	_HS1_STATE[k] (k=000~127)	Bit Array	Displays HS link parameter No.1, Block No.k's general status	Displays the general status of the communication information for the specified parameter's respective data blocks. HS1STATE[k]=HS1MOD[k]&_HS1TRX[k]&(~_HSmERR[k])
L000100 ~ L00017F	_HS1_MOD[k] (k=000~127)	Bit Array	HS link parameter No.1, Block No.k station's Run operation mode	Displays the operation mode of the station specified in parameter's data block k.
L000180 ~ L00025F	_HS1_TRX[k] (k=000~127)	Bit Array	Displays normal communication with HS link parameter No.1, Block No.k station	Displays the communication status of parameter's data block k to check if normal as specified.
L000260 ~ L00033F	_HS1_ERR[k]	Bit Array	HS link parameter No.1, Block No.k station's Run error mode	Displays the communication status of parameter's data block k to check for any error.
L000340 ~ L00041F	_HS1_SETBLOC[K]	Bit Array	Displays HS link parameter No.1, Block No.k setting	Displays the setting status of parameter's data block k.

[Table A.1] List of communication flags based on HS link number

HS link No.	L area address	Remarks
2	L000500~L00099F	Compared with HS link of 1 in [Table 1], other HS link station number's flag address will be simply calculated as follows;
3	L001000~L00149F	
4	L001500~L00199F	*Calculation formula: L area address = L000000 + 500 x (HS link
5	L002000~L00249F	No. – 1)
6	L002500~L00299F	
7	L003000~L00349F	In order to use HS link flag for program and monitoring, use the flag
8	L003500~L00399F	map registered in XG5000 for convenient application.
9	L004000~L00449F	
10	L004500~L00499F	
11	L005000~L00549F	

K as a block number is displayed through 8 words by 16 for 1 word for the information of 128 blocks from 000 to 127.
For example, block information of 16~31, 32~47, 48~63, 64~79, 80~95, 96~111, 112~127 will be displayed in L00011, L00012, L00013, L00014, L00015, L00016, L00017 from block 0 to block 15 for mode information (_HS1MOD).

P2P parameters: 1~8, P2P block: 0~63

No.	Keyword	Type	Detail	Description
L006250	_P2P1_NDR00	Bit	P2P parameter No.1, block No.00 service is completed normally	P2P parameter No.1, block No.0 service is completed normally
L006251	_P2P1_ERR00	Bit	P2P parameter No.1, block No.00 service is completed abnormally	P2P parameter No.1, block No.0 service is completed abnormally
L00626	_P2P1_STATUS00	Word	Error code if P2P parameter No.1, block No.00 service is completed abnormally	Displays Error code if P2P parameter No.1, block No.0 service is completed abnormally
L00627	_P2P1_SVCCNT00	DWord	P2P parameter No.1, block No.00 service normal execution times	Displays P2P parameter No.1, block No.0 service normal execution times
L00629	_P2P1_ERRCNT00	DWord	P2P parameter No.1, block No.00 service abnormal execution times	Displays P2P parameter No.1, block No.0 service abnormal execution times
L006310	_P2P1_NDR01	Bit	P2P parameter No.1, block No.01 service is completed normally	P2P parameter No.1, block No.1 service is completed normally
L006311	_P2P1_ERR01	Bit	P2P parameter No.1, block No.01 service is completed abnormally	P2P parameter No.1, block No.1 service is completed abnormally
L00632	_P2P1_STATUS01	Word	Error code if P2P parameter No.1, block No.01 service is completed abnormally	Displays error code if P2P parameter No.1, block No.1 service is completed abnormally
L00633	_P2P1_SVCCNT01	DWord	P2P parameter No.1, block No.01 service normal execution times	Displays P2P parameter No.1, block No.1 service normal execution times
L00635	_P2P1_ERRCNT01	DWord	P2P parameter No.1, block No.01 service abnormal execution times	Displays P2P parameter No.1, block No.1 service abnormal execution times

[Table 2] List of communication flags based on P2P service setting

2) List of link devices (N)

P2P No. : 1 ~ 8, P2P block: 0 ~ 63

No.	Keyword	Type	Detail	Description
N00000	_P1B00SN	Word	P2P parameter No.1, block No.00 destination station No.	Saves P2P parameter No.1, block No.00 destination station number
N00001 ~ N00004	_P1B00RD1	Device structure	P2P parameter No.1, block No.00 Read area device 1	Saves P2P parameter No.1, block No.00 Read area device 1
N00005	_P1B00RS1	Word	P2P parameter No.1, block No.00 Read area size 1	Saves P2P parameter No.1, block No.00 Read area size 1
N00006 ~ N00009	_P1B00RD2	Device structure	P2P parameter No.1, block No.00 Read area device 2	Saves P2P parameter No.1, block No.00 Read area device 2
N00010	_P1B00RS2	Word	P2P parameter No.1, block No.00 Read area size 2	Saves P2P parameter No.1, block No.00 Read area size 2
N00011 ~ N00014	_P1B00RD3	Device structure	P2P parameter No.1, block No.00 Read area device 3	Saves P2P parameter No.1, block No.00 Read area device 3
N00015	_P1B00RS3	Word	P2P parameter No.1, block No.00 Read area size 3	Saves P2P parameter No.1, block No.00 Read area size 3
N00016 ~ N00019	_P1B00RD4	Device structure	P2P parameter No.1, block No.00 Read area device 4	Saves P2P parameter No.1, block No.00 Read area device
N00020	_P1B00RS4	Word	P2P parameter No.1, block No.00 Read area size 4	Saves P2P parameter No.1, block No.00 area size 4 to read saved
N00021 ~ N00024	_P1B00WD1	Device structure	P2P parameter No.1, block No.00 Save area device 1	Saves P2P parameter No.1, block No.00 Save area device 1
N00025	_P1B00WS1	Word	P2P parameter No.1, block No.00 Save area size 1	Saves P2P parameter No.1, block No.00 Save area size 1
N00026 ~ N00029	_P1B00WD2	Device structure	P2P parameter No.1, block No.00 Save area device 2	Saves P2P parameter No.1, block No.00 Save area device 2
N00030	_P1B00WS2	Word	P2P parameter No.1, block No.00 Save area size 2	Saves P2P parameter No.1, block No.00 Save area size 2
N00031 ~ N00034	_P1B00WD3	Device structure	P2P parameter No.1, block No.00 Save area device 3	Saves P2P parameter No.1, block No.00 Save area device 3
N00035	_P1B00WS3	Word	P2P parameter No.1, block No.00 Save area size 3	Saves P2P parameter No.1, block No.00 Save area size 3

No.	Keyword	Type	Detail	Description
N00036 ~ N00039	_P1B00WD4	Device structure	P2P parameter No.1, block No.00 Save area device 4	Saves P2P parameter No.1, block No.00 Save area device 4
N00040	_P1B00WS4	Word	P2P parameter No.1, block No.00 Save area size 4	Saves P2P parameter No.1, block No.00 Save area size 4
N00041	_P1B01SN	Word	P2P parameter No.1, block No.01 destination station No.	Saves P2P parameter No.1, block No.01 destination station number
N00042 ~ N00045	_P1B01RD1	Device structure	P2P parameter No.1, block No.01 Read area device 1	Saves P2P parameter No.1, block No.01 Read area device 1
N00046	_P1B01RS1	Word	P2P parameter No.1, block No.01 Read area size 1	Saves P2P parameter No.1, block No.01 Read area size 1
N00047 ~ N00050	_P1B01RD2	Device structure	P2P parameter No.1, block No.01 Read area device 2	Saves P2P parameter No.1, block No.01 Read area device 1
N00051	_P1B01RS2	Word	P2P parameter No.1, block No.01 Read area size 2	Saves P2P parameter No.1, block No.01 Read area size 2
N00052 ~ N00055	_P1B01RD3	Device structure	P2P parameter No.1, block No.01 Read area device 3	Saves P2P parameter No.1, block No.01 Read area device 3
N00056	_P1B01RS3	Word	P2P parameter No.1, block No.01 Read area size 3	Saves P2P parameter No.1, block No.01 Read area size 3
N00057 ~ N00060	_P1B01RD4	Device structure	P2P parameter No.1, block No.01 Read area device 4	Saves P2P parameter No.1, block No.01 Read area device 4
N00061	_P1B01RS4	Word	P2P parameter No.1, block No.01 Read area size 4	Saves P2P parameter No.1, block No.01 Read area size 4
N00062 ~ N00065	_P1B01WD1	Device structure	P2P parameter No.1, block No.01 Save area device 1	Saves P2P parameter No.1, block No.01 Save area device 1
N00066	_P1B01WS1	Word	P2P parameter No.1, block No.01 saved area size 1	P2P parameter No.1, block No.01 saved area size 1 saved
N00067 ~ N00070	_P1B01WD2	Device structure	P2P parameter No.1, block No.01 saved area device 2	P2P parameter No.1, block No.01 saved area device 2 saved
N00071	_P1B01WS2	Word	P2P parameter No.1, block No.01 saved area size 2	P2P parameter No.1, block No.01 saved area size 2 saved
N00072 ~ N00075	_P1B01WD3	Device structure	P2P parameter No.1, block No.01 saved area device 3	P2P parameter No.1, block No.01 saved area device 3 saved

No.	Keyword	Type	Detail	Description
N00076	_P1B01W S3	Word	P2P parameter No.1, block No.01 saved area size 3	P2P parameter No.1, block No.01 saved area size 3 saved
N00077 ~ N00080	_P1B01W D4	Device structure	P2P parameter No.1, block No.01 saved area device 4	P2P parameter No.1, block No.01 saved area device 4 saved
N00081	_P1B01W S4	Word	P2P parameter No.1, block No.01 saved area size 4	P2P parameter No.1, block No.01 saved area size 4 saved

Notes

1) If P2P parameters are to be specified with XG5000 used for N area, the setting will be performed automatically. And its modification during Run is also available by P2P dedicated command.

2) Since the addresses of N area available are classified according to P2P parameter setting No. and block index No., the area not used for P2P service can be used as an internal device.

A.4 ASCII Code Table

American National Standard Code for Information Interchange

| ASCII | | Value | ASCII | | Value | ASCII | | Value | ASCII | | Value |
Hex	Dec		Hex	Dec		Hex	Dec		Hex	Dec	
00	000	NULL	40	064	@	80	128	€	C0	192	À
01	001	SOH	41	065	A	81	129	□	C1	193	Á
02	002	STX	42	066	B	82	130	‚	C2	194	Â
03	003	ETX	43	067	C	83	131	ƒ	C3	195	Ã
04	004	EQT	44	068	D	84	132	„	C4	196	Ä
05	005	ENQ	45	069	E	85	133	…	C5	197	Å
06	006	ACK	46	070	F	86	134	†	C6	198	Æ
07	007	BEL	47	071	G	87	135	‡	C7	199	Ç
08	008	BS	48	072	H	88	136	ˆ	C8	200	È
09	009	HT	49	073	I	89	137	‰	C9	201	É
0A	010	LF	4A	074	J	8A	138	Š	CA	202	Ê
0B	011	VT	4B	075	K	8B	139	‹	CB	203	Ë
0C	012	FF	4C	076	L	8C	140	Œ	CC	204	Ì
0D	013	CR	4D	077	M	8D	141	□	CD	205	Í
0E	014	SO	4E	078	N	8E	142	Ž	CE	206	Î
0F	015	SI	4F	079	O	8F	143	□	CF	207	Ï
10	016	DLE	50	080	P	90	144	□	D0	208	Ð
11	017	DC1	51	081	Q	91	145	'	D1	209	Ñ
12	018	DC2	52	082	R	92	146	'	D2	210	Ò
13	019	DC3	53	083	S	93	147	"	D3	211	Ó
14	020	DC4	54	084	T	94	148	"	D4	212	Ô
15	021	NAK	55	085	U	95	149	•	D5	213	Õ
16	022	SYN	56	086	V	96	150	–	D6	214	Ö
17	023	ETB	57	087	W	97	151	—	D7	215	×
18	024	CAN	58	088	X	98	152	˜	D8	216	Ø
19	025	EM	59	089	Y	99	153	™	D9	217	Ù
1A	026	SUB	5A	090	Z	9A	154	š	DA	218	Ú
1B	027	ESC	5B	091	[	9B	155	›	DB	219	Û

ASCII		Value	ASCII		Value	ASCII		Value	ASCII		Value
Hex	Dec		Hex	Dec		Hex	Dec		Hex	Dec	
1C	028	FS	5C	092	\	9C	156	œ	DC	220	Ü
1D	029	GS	5D	093	]	9D	157	□	DD	221	Ý
1E	030	RS	5E	094	^	9E	158	ž	DE	222	Þ
1F	031	US	5F	095	_	9F	159	Ÿ	DF	223	ß
20	032	(space)	60	096	`	A0	160		E0	224	à
21	033	!	61	097	a	A1	161	¡	E1	225	á
22	034	"	62	098	b	A2	162	¢	E2	226	â
23	035	#	63	099	c	A3	163	£	E3	227	ã
24	036	$	64	100	d	A4	164	¤	E4	228	ä
25	037	%	65	101	e	A5	165	¥	E5	229	å
26	038	&	66	102	f	A6	166	¦	E9	230	æ
27	039	'	67	103	g	A7	167	§	EA	231	ç
28	040	(	68	104	h	A8	168	¨	EB	232	è
29	041	)	69	105	i	A9	169	©	EC	233	é
2A	042	*	6A	106	j	AA	170	ª	ED	234	ê
2B	043	+	6B	107	k	AB	171	«	EE	235	ë
2C	044	`	6C	108	l	AC	172	¬	EF	236	ì
2D	045	-	6D	109	m	AD	173		F0	237	í
2E	046	.	6E	110	n	AE	174	®	F1	238	î
2F	047	/	6F	111	o	AF	175	¯	F2	239	ï
30	048	0	70	112	p	B0	176	°	F3	240	ð
31	049	1	71	113	q	B1	177	±	F4	241	ñ
32	050	2	72	114	r	B2	178	²	F5	242	ò
33	051	3	73	115	s	B3	179	³	F6	243	ó
34	052	4	74	116	t	B4	180	´	F7	244	ô
35	053	5	75	117	u	B5	181	µ	F8	245	õ
36	054	6	76	118	v	B6	182	¶	F9	246	ö
37	055	7	77	119	w	B7	183	·	FA	247	÷
38	056	8	78	120	x	B8	184	¸	FB	248	ø
39	057	9	79	121	y	B9	185	¹	FC	249	ù
3A	058	:	7A	122	z	BA	186	º	FD	250	ú

Appendix

ASCII		Value	ASCII		Value	ASCII		Value	ASCII		Value
Hex	Dec		Hex	Dec		Hex	Dec		Hex	Dec	
3B	059	;	7B	123	{	BB	187	»	FE	251	û
3C	060	<	7C	124	|	BC	188	½	FF	252	ü
3D	061	=	7D	125	}	BD	189	¾	EF	253	ý
3E	062	>	7E	126	~	BE	190	¿	EF	254	þ
3F	063	?	7F	127	□	BF	191	À	EF	255	ÿ

A.5 Comparison Table of Ethernet Technology

Technology		Speed (Mbps)	Transmission Media	Max. Distance
Token Ring		4,16	UTP	100m
Ethernet	10BASE-T	10	UTP	100m
	10BASE-F(Multi Mode)	10	Optical Cable	Max. 2km
	10BASE-F(Single Mode)	10	Optical Cable	Max.2.5km
	10BASE-5	10	Coaxial Cable	500m
	10BASE-2	10	Coaxial Cable	185m
Fast Ethernet	100BASE-T4	100	UTP	100m
	100BASE-TX	100	UTP	100m
	100BASE-FX(Multi Mode)	100	Optical Cable	412m(Half Duplex) 2km(Full Duplex)
	100BASE-FX(Single Mode)	100	Optical Cable	20km
Gigabit Ethernet	1000BASE-T	1000	UTP	100m
	100BASE-FX(Single Mode)	1000	Optical Cable	3km
	100BASE-FX(Multi Mode)	1000	Optical Cable	500m
	100BASE-T	1000	Coaxial Cable	25m
100VG-AnyLAN		100	UTP	-
ATM		155-622	UTP, Optical Cable	-
FDDI(Single Mode)		100	Optical Cable	40-60km
FDDI(Multi-Mode)		100	Optical Cable	2km

Appendix

A.6 External Dimensions

XGL-EFMT/EFMF, XGL-EH5T is equal design.
Please refer to a lower picture for the dimension.

Unit: mm
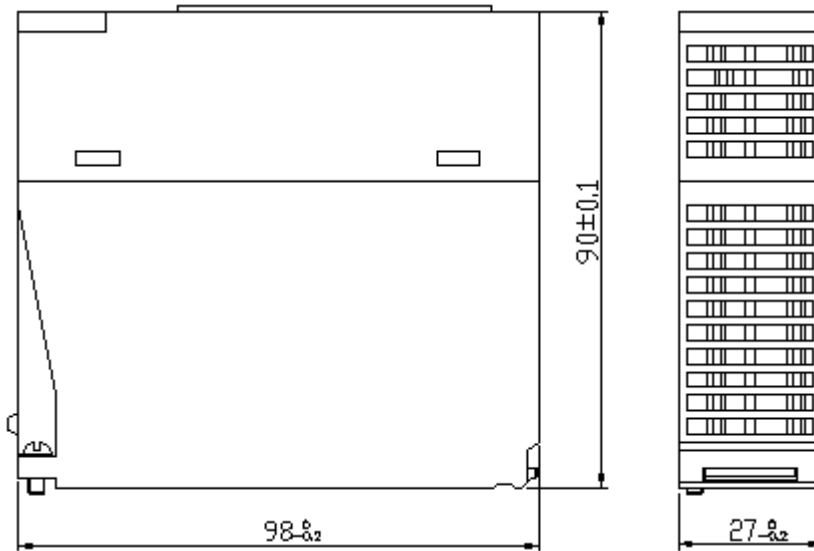
Warranty

1. Terms of warranty
   LSIS provides an 18-month warranty starting from the date of production.

2. Range of warranty
   For problems within the terms of the warranty, LSIS will replace the entire PLC or repair the defective parts free of charge except for the following cases.

   (1) Problems caused by improper conditions, environment or treatment.
   (2) Problems caused by external devices.
   (3) Problems caused by the user remodeling or repairing the PLC.
   (4) Problems caused by improper use of the product.
   (5) Problems caused by circumstances where the expectations exceed that of the science and technology level when LSIS produced the product.
   (6) Problems caused by natural disaster.

3. This warranty is limited to the PLC itself only. It is not valid for the system which the PLC is attached to.

Environmental Policy

LSIS Co., Ltd supports and observes the environmental policy as below.

Environmental Management

LSIS considers the environmental preservation as the preferential management subject and every staff of LSIS use the reasonable endeavors for the pleasurably environmental preservation of the earth.

About Disposal

LSIS PLC unit is designed to protect the environment. For the disposal, separate aluminum, iron and synthetic resin (cover) from the product as they are reusable.

Distinguished Choice, Profound Satisfaction

LSIS values every single customers.

Quality and service come first at LSIS.

Always at your service, standing for our customers.

http://www.lsis.com

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