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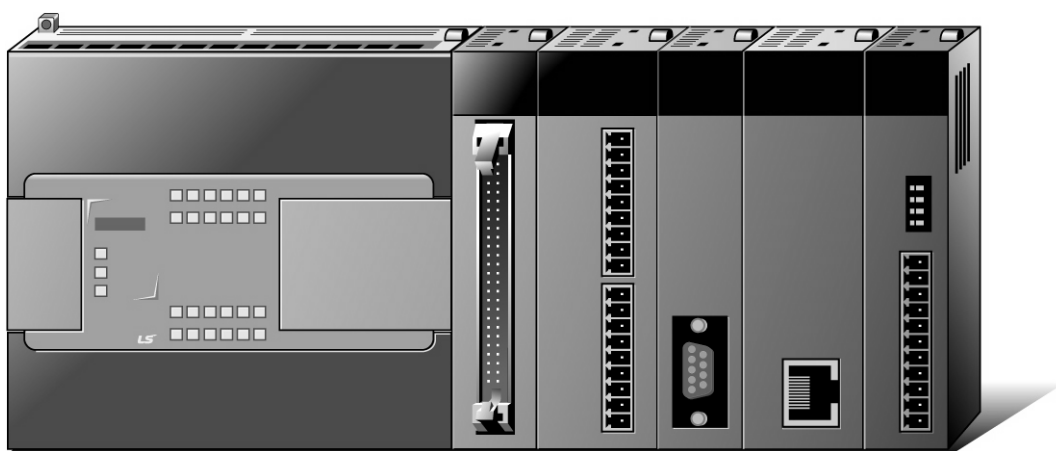
Programmable Logic Controller

XGB Ethernet/IP IF Module

XGT Series

User's Manual

XBL-EIPT



Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.

LS Industrial Systems

<http://eng.lsis.biz>

Before using the product ...

For your safety and effective operation, please read the safety instructions thoroughly before using the product.

- ▶ Safety Instructions should always be observed in order to prevent accident or risk with the safe and proper use the product.
- ▶ Instructions are divided into "Warning" and "Caution", and the meaning of the terms is as follows.

 **Warning** This symbol indicates the possibility of serious injury or death if some applicable instruction is violated

 **Caution** This symbol indicates the possibility of severe or slight injury, and property damages if some applicable instruction is violated

Moreover, even classified events under its caution category may develop into serious accidents relying on situations. Therefore we strongly advise users to observe all precautions properly just like warnings.

- ▶ The marks displayed on the product and in the user's manual have the following meanings.

 Be careful! Danger may be expected.

 Be careful! Electric shock may occur.

- ▶ The user's manual even after read shall be kept available and accessible to any user of the product.

Safety Instructions for design process

Warning

- ▶ **Please install a protection circuit on the exterior of PLC so that the whole system may operate safely regardless of failures from external power or PLC.** Any abnormal output or operation from PLC may cause serious problems to safety in whole system.
 - Install protection units on the exterior of PLC like an interlock circuit that deals with opposite operations such as emergency stop, protection circuit, and forward/reverse rotation or install an interlock circuit that deals with high/low limit under its position controls.
 - If any system error (watch-dog timer error, module installation error, etc.) is detected during CPU operation in PLC, all output signals are designed to be turned off and stopped for safety. However, there are cases when output signals remain active due to device failures in Relay and TR which can't be detected. Thus, you are recommended to install an addition circuit to monitor the output status for those critical outputs which may cause significant problems.
- ▶ **Never overload more than rated current of output module nor allow to have a short circuit.** Over current for a long period time may cause a fire .
- ▶ **Never let the external power of the output circuit to be on earlier than PLC power,** which may cause accidents from abnormal output operation.
- ▶ **Please install interlock circuits in the sequence program for safe operations in the system when exchange data with PLC or modify operation modes using a computer or other external equipments** Read specific instructions thoroughly when conducting control operations with PLC.

Safety Instructions for design process

Caution

- ▶ **I/O signal or communication line shall be wired at least 100mm away from a high-voltage cable or power line.** Fail to follow this

Safety Instructions on installation process

Caution

- ▶ **Use PLC only in the environment specified in PLC manual or general standard of data sheet.** If not, electric shock, fire, abnormal operation of the product may be caused.
- ▶ **Before install or remove the module, be sure PLC power is off.** If not, electric shock or damage on the product may be caused.
- ▶ **Be sure that every module is securely attached after adding a module or an extension connector.** If the product is installed loosely or incorrectly, abnormal operation, error or dropping may be caused. In addition, contact failures under poor cable installation will be causing malfunctions as well.
- ▶ **Be sure that screws get tighten securely under vibrating environments.** Fail to do so will put the product under direct vibrations which will cause electric shock, fire and abnormal operation.
- ▶ **Do not come in contact with conducting parts in each module,** which may cause electric shock, malfunctions or abnormal operation.

Safety Instructions for wiring process

Warning

- ▶ **Prior to wiring works, make sure that every power is turned off.** If not, electric shock or damage on the product may be caused.
- ▶ **After wiring process is done, make sure that terminal covers are installed properly before its use.** Fail to install the cover may cause electric shocks.

Caution

- ▶ **Check rated voltages and terminal arrangements in each product prior to its wiring process.** Applying incorrect voltages other than rated voltages and misarrangement among terminals may cause fire or malfunctions.
- ▶ **Secure terminal screws tightly applying with specified torque.** If the screws get loose, short circuit, fire or abnormal operation may be caused. Securing screws too tightly will cause damages to the module or malfunctions, short circuit, and dropping.
- ▶ **Be sure to earth to the ground using Class 3 wires for FG terminals which is exclusively used for PLC.** If the terminals not grounded correctly, abnormal operation or electric shock may be caused.
- ▶ **Don't let any foreign materials such as wiring waste inside the module while wiring,** which may cause fire, damage on the product or abnormal operation.
- ▶ **Make sure that pressed terminals get tighten following the specified torque. External connector type shall be pressed or soldered using proper equipments.**

Safety Instructions for test-operation and maintenance

Warning

- ▶ **Don't touch the terminal when powered.** Electric shock or abnormal operation may occur.
- ▶ **Prior to cleaning or tightening the terminal screws, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- ▶ **Don't let the battery recharged, disassembled, heated, short or soldered.** Heat, explosion or ignition may cause injuries or fire.

Caution

- ▶ **Do not make modifications or disassemble each module.** Fire, electric shock or abnormal operation may occur.
- ▶ **Prior to installing or disassembling the module, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- ▶ **Keep any wireless equipment such as walkie-talkie or cell phones at least 30cm away from PLC.** If not, abnormal operation may be caused.
- ▶ **When making a modification on programs or using run to modify functions under PLC operations, read and comprehend all contents in the manual fully.** Mismanagement will cause damages to products and accidents.
- ▶ **Avoid any physical impact to the battery and prevent it from dropping as well.** Damages to battery may cause leakage from its fluid. When battery was dropped or exposed under strong impact, never reuse the battery again. Moreover skilled workers are needed when exchanging batteries.

Safety Instructions for waste disposal



Caution

- ▶ **Product or battery waste shall be processed as industrial waste.** The waste may discharge toxic materials or explode itself.

Revision History

Version	Date	Contents	Revised position
V 1.0	'10.11	First edition	-

※ The number of User's manual is indicated right part of the back cover.

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About User's Manual

Congratulations on purchasing PLC of LS Industrial System Co., Ltd.

Before use, make sure to carefully read and understand the User's Manual about the functions, performances, installation and programming of the product you purchased in order for correct use and importantly, let the end user and maintenance administrator to be provided with the User's Manual.

The User's Manual describes the product. If necessary, you may refer to the following description and order accordingly. In addition, you may connect our website (<http://eng.lsis.biz/>) and download the information as a PDF file.

Relevant User's Manuals

Title	Description	No. of User's Manual
XG5000 User's Manual	It describes how to use XG5000 software especially about online functions such as programming, printing, monitoring and debugging by using XGT series products.	10310000512
XGK/XGB Series Instruction & Programming	It describes how to use the instructions for programming using XGK/XGB series.	10310000510
XGB Hardware User's Manual	It describes how to use the specification of power/input/output/expansion modules, system configuration and built-in High-speed counter for XGB basic unit.	10310000926
XGB Analog User's Manual	It describes how to use the specification of analog input/analog output/temperature input module, system configuration and built-in PID control for XGB basic unit.	10310000920
XGB Position User's Manual	It describes how to use built-in positioning function for XGB unit.	10310000927
XGB Cnet I/F User's Manual	It describes how to use built-in communication function for XGB basic unit and external Cnet I/F module.	10310000816
XGB Fast Ethernet I/F User's Manual	It describes how to use XGB FEnet I/F module.	10310000873

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Chapter 1 Overview

1.1 Overview

This user guide is made out to describe EtherNet/IP I/F module (Referred to as “EIP Module”) among XGB PLC system networks. EtherNet/IP is the protocols where Common Industrial Protocol (CIP: industrial protocols used in common, such as Device Net, ControlNet, CompoNet, etc) has been laid on an upper layer of open protocol Ethernet. Thus, EtherNet/IP allows DeviceNet, ControlNet, and CompoNet developers to secure the interoperability between multi-band and lower network devices by applying the same objects and profiles. EIP module provides two Ethernet Ports (Ethernet Port) and the switch function required for the existing STAR system is built in and it is the module for transmitting data between PCCs or between PLC and EtherNet/IP I/F IO module.

Make a program in reference with these following user guides

- XG5000 user manual
- XGK/XGB instruction
- XGB user manual

Be careful of these configuration items when you constitute XGB EIP module system.

- XGT PLC XG5000 Programming Tool: Over V3.6
- XG-PD: Over V3.6
- XBC CPU: Over V2.0 (XBC-xxxH)

1.2 Features

XGB EtherNet/IP I/F Module have the following features.

- (1) Communication Methods: Extensive Client Messaging Support
 - ▶ Encapsulated Messages, UCMM Explicit Messaging
 - ▶ Class 3 Connected Explicit Messaging(Server Only)
 - ▶ Class 1 Connected Implicit(IO) Messaging(Cyclic I/O Service Only)
- (2) Compatibility: XGT EtherNet/IP I/F meet EtherNet/IP Conformance Test Suite Version 2.10
- (3) 100BASE-TX media is provided and 100Mbps/ (Full Duplex) are supported.
- (4) It is possible to be equipped with 24 units per CPU and installation to basic base and extension base is available.
However, only installation to base is possible in XGR system.
- (5) With the built - in switch, there is no need to install a separate switch and hub and wiring is saved and flexibility in installation is provided.
- (6) As Auto Cross Over- function is provided, cabling job is convenient.
- (7) A variety of diagnose functions, the states information of modules and networks are provided.
 - ▶ The state of a communication module
 - ▶ The state of a communication service(EIP, Non-circular server)
 - ▶ Auto Scan-function providing an information of own corporation's and other corporations' modules connected into network
 - ▶ The kinds of packets and the quantity of data received by communication module (Network load – prediction is available)
 - ▶ The diagnosis function through network is available

1.3 Product Components

1.3.1 Indication of Type Names

Components of XGB EtherNet/IP I/F module product are described.

Type Name	Components	Remarks
XBL-EIPT	Electric 2 –port EtherNet/IP Module	More than category 5

1.4 Software for Using Products

The following explains main programming tools and other production software for using EIP module. For more exact application of programs and communication, refer to the contents below and apply it to systems.

1.4.1 Confirms for Software

Segment	Component Products	Communication Set-up Tool
XBL-EIPT	Communication Module for XGB	XG-PD

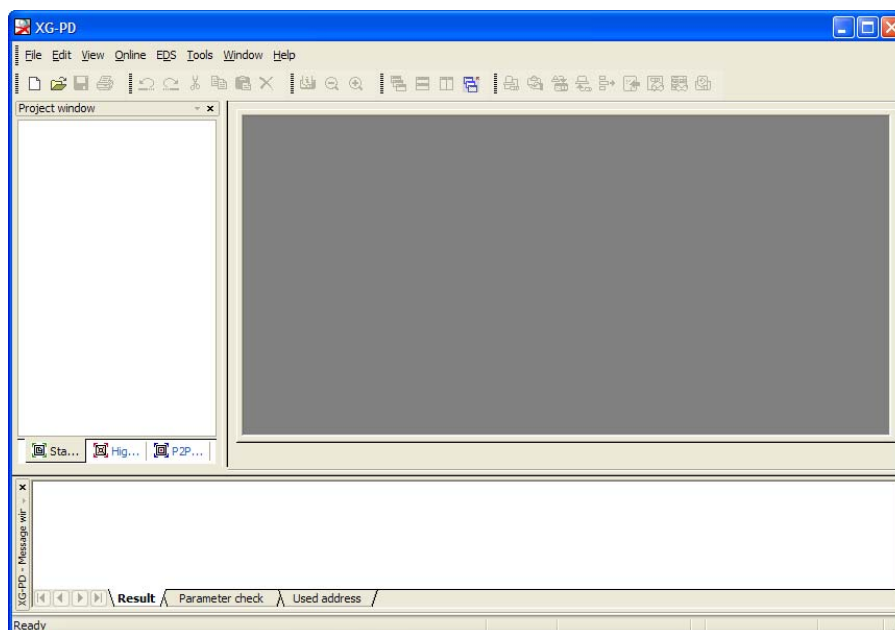
Notice

- 1) To use the above program, download from the current website you are visiting. In case you can not use the internet, visit near agencies and ask for CD-ROM for installation.
Internet Web - address : <http://www.eng.lsis.biz>
- 2) To program XG5000 and XG-PD, use RS-232C port and USB of CUP module. For cable, refer to the XGT catalogue. (USB-301A, K1C-050A)

1.4.2 XG-PD

XG-PD is the software for dedicatedly using all communication modules including XGnet I/F module for basic parameter set-up, frame make-up, module and network diagnosis.

The following illustration shows the initial screen of XG-PD.



[Illustration 1.4.1] XG-PD – Initial Screen

1.4.3 Confirmation of Versions

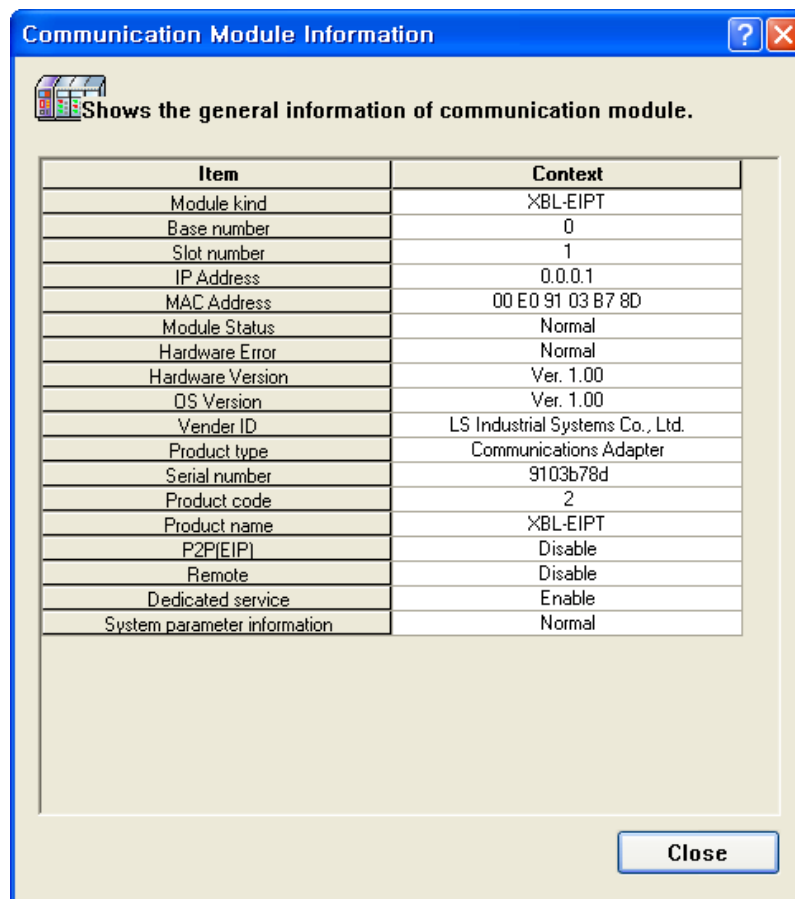
Check out the version of the module before using XGB EtherNet/IP I/F.

1) Confirmation through XG-PD

To read the information of a communication module, access to the communication module.

If interface is normally maintained with CPU, the information like the following illustration can be got.

- (1) Execute XG-PD.
- (2) Connect with CPU via access through [Online]-[Connect] on menu.
- (3) When connected with CPU, execute the diagnosis of XG-PD.
- (4) Locate the mouse to the communication module in system diagnosis screen of online menu.
- (5) Double-click the communication module or click right button of mouse and select Detailed Module Information.



[Illustration 1.4.2] Confirmation of Versions through XG-PD

2) Confirmation of Versions through Case Label of Products

In each module, the information of the module product is attached to the exterior case.

In case there is no connector with PC and it is impossible to check out online, confirmation is available after you remove the module in case. The label attached to the backside of a product and the type name and the version information is marked.

Chapter 2 Specification

2.1 General Specification

The general specification of XGT series is as follows.

No.	Items	Specifications				Related standards	
1	Ambient temperature	0 ~ 55 °C					
2	Storage temperature	-25 ~ +70 °C					
3	Ambient humidity	5 ~ 95%RH (Non-condensing)					
4	Storage humidity	5 ~ 95%RH (Non-condensing)					
5	Vibration resistance	Occasional vibration			-	IEC61131-2	
		Frequency	Acceleration	Amplitude	How many times		
		10 ≤ f < 57Hz	-	0.075mm	10 times each directions (X, Y and Z)		
		57 ≤ f ≤ 150Hz	9.8m/s ² (1G)	-			
		Continuous vibration					
		Frequency	Acceleration	Amplitude			
		10 ≤ f < 57Hz	-	0.035mm			
		57 ≤ f ≤ 150Hz	4.9m/s ² (0.5G)	-			
6	Shock resistance	• Peak acceleration: 147 m/s ² (15G) • Duration: 11ms • Half-sine, 3 times each direction per each axis				IEC61131-2	
7	Noise resistance	Square wave Impulse noise		±1,500 V		LSIS standard	
		Electrostatic discharge		4kV (Contact discharge)		IEC61131-2 IEC61000-1-2	
		Radiated electromagnetic field noise		80 ~ 1,000 MHz, 10V/m		IEC61131-2, IEC61000-1-3	
		Fast transient/burst noise	Segment	Power supply module	Digital/analog input/output communication interface		IEC61131-2 IEC61000-1-4
			Voltage	2kV	1kV		
8	Environment	Free from corrosive gasses and excessive dust					
9	Altitude	Up to 2,000 ms					
10	Pollution degree	Less than equal to 2					
11	Cooling	Air-cooling					

Note

1) IEC (International Electrotechnical Commission):

An international nongovernmental organization which promotes internationally cooperated standardization in electric/electronic field, publishes international standards and manages applicable estimation system related with.

2) Pollution degree:

An index indicating pollution degree of the operating environment which decides insulation performance of the devices. For instance, Pollution degree 2 indicates the state generally that only non-conductive pollution occurs. However, this state contains temporary conduction due to dew produced.

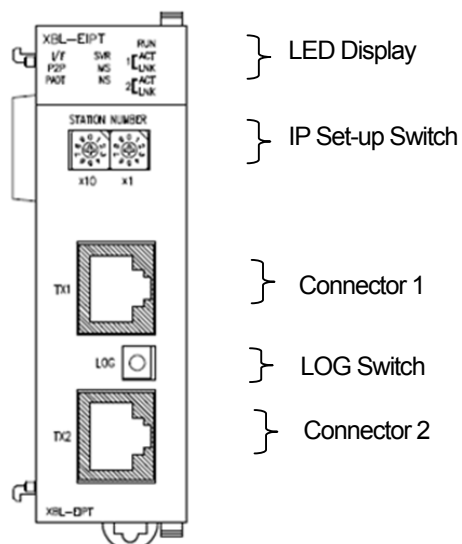
2.2 Performance Specification

The following table describes the specification of system configuration in accordance with EtherNet/IP I/F module's media. When you configure systems, refer to the below table.

Item		Standard
Transmission Standard	Transmission Speed	100Mbps
	Transmission Method	Base Band
	Maximum Extension Distance between Nodes	100m
	Communication Zone Excess Method	CSMA/CD
	Frame Error – Checking Method	$CRC\ 32 = X^{32} + X^{26} + X^{23} + \dots + X^2 + X + 1$
Topology		Line , Star
Diagnosis Function		Module Information , Service State , Media Information , Auto Scan, Ping Test
Service	Periodic Client	Implicit IO Client
	Aperiodic Client	UCMM Client
	Periodic Server	Implicit IO Server
The Number of Connections (Client/Server)	TCP	16/32
	CIP(IO Communication)	32/64
The Number of Maximum Services (P2P count)		2
The Number of Maximum Installments		2
Max. setting data size per block	Periodic client	500 byte
	Aperiodic client	512 byte
Media		UTP/STP Category 5
Basic Standards	Dimension (mm)	90(H) X 27(W) X 60(D)
	Consumption Current (mA)	290
	Weight (g)	102

2.3 Name of Each Part

The name in each module is as follows.



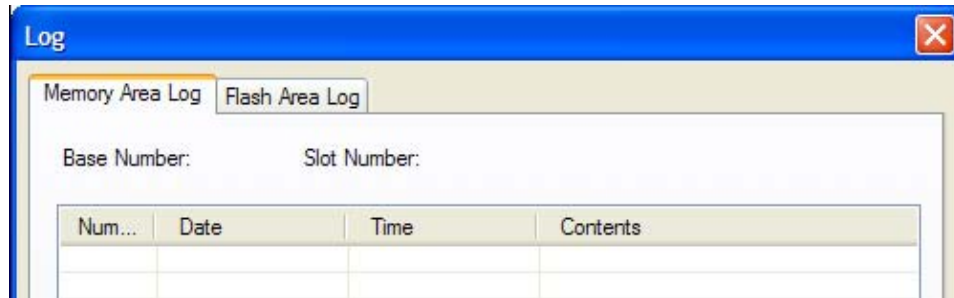
[Illustration 2.3.1] The Front View for Module PLC

► LED Names and Contents

Silk Mark	LED State	Contents
RUN	ON	Power -on and Process normally operating
	OFF	Power -off and Process abnormally operating
I/F	OFF	I/F operating normally with CPU
	Flicker/OFF	I/F operating abnormally with CPU
P2P	ON	In case of setting up P2P Service
	OFF	In case of canceling P2P Service
PADT	ON	XG5000 being connected via remote control
	OFF	XG5000 remote connection has been released
SVR	ON	When exterior client has been connected, Light ON
	OFF	When there is no exterior client connection, Light OFF
MS	Green Light ON	When normal operating
	Green Light flickers	When configuration for device is not over
	Red Light flickers	In case of wrong set-up or restorable errors happened
	Red Light ON	When errors which are impossible to restore have been made
	Red Green Light flickers	When self-diagnosis is proceeding
NS	Green Light flickers	When there is no connection of a device
	Green Light ON	When there is connection more than 1 with a device at least
	Red Light flickers	When Timeout with a device more than 1 unit happened
	Red Light ON	When repeated IP address has been detected
	Red / Green Light flickers	When self-diagnosis is preceding
nACT	Flicker	In case of frame – transmitted and received (n=1,2)
nLNK	ON	When network link has been formed (n=1,2)
	OFF	When network link has not been formed (n=1,2)

► Log Switch

In case of reading Log in communication module and needing to store the Log, if you push it for more than 1 second, it is stored into Flash area from Memory area. The Log in the memory area is the one erased when power is supplied again and the Log in Flash area is the one which is maintained when power is supplied again.



► IP Set-up Switch (1~90, 94~99)

When IP address has not been inserted via XG-PD within 10 seconds after power was supplied, IP is set up as '192.168.250.switch value'.

► IP Set-up Switch (90~98)

This switch is designed for setting up the inside of communication. If you change it arbitrary, it may cause problems.

► IP Set-up Switch (99)

This switch functions to configure the system into a ring form and when set-up is not finished, normal operation is impossible. It is possible to form a ring system in terms of appearance by supporting 2 connectors but actual ring system is not supported.

2.4 Cable Standards

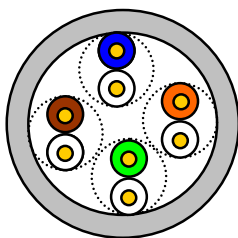
2.4.1 UTP Cable

UTP cable is classified into the 3 types according to the following standards.

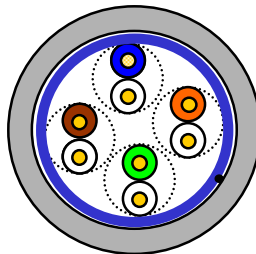
- ▶ With or without Shield: 3 Types (UTP, FTP, STP)
- ▶ Used - frequency Band: 7 Categories (Category 1 ~ Category 7)
- ▶ Inflammable Grade: 4 Grades (CMX, CM, CMR, CMP)

1) Kinds of Cables with or without Shield

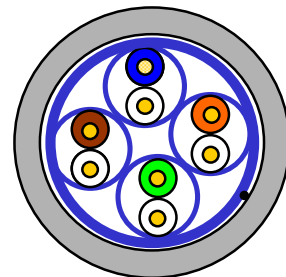
Classification	Details	Use
UTP(or U.UTP)	Unshielded Cables for High Speed – Signals	Maximum 200MHz Voice +Information (Data)+ Low grade Video Signal
FTP(or S.UTP)	1 Layer Shield, Cable Core only shielded * Shield Materials: AL/Plastic Complex Foil Or Copper Braid	Maximum 100MHz Electro Magnetic Interference (EMI) and Electric Stability is considered Voice + Information (Data) + Low grade Video Signal
STP(or S.STP)	Dual - shielded Construction, Pair Shielded Cables or Core Shielded Cables * Pair - shielded Materials : AL/Plastic Complex Foil * Core - shielded Materials : AL/Plastic Complex Foil or Copper Braid	Maximum 500MHz Voice + Information (Data)+ Video Signal An Alternative to 75Ω – Coaxial Cable



UTP



FTP



STP

Notice

1) UTP : Unshielded Twisted Paired Copper Cable

FTP : (Overall) Foiled Twisted Paired Copper Cable

STP : (Overall) Shielded(and Shielded Individually Pair)Twisted Paired Copper Cable

2) Patch Cable(or Patch Cord)

Instead of Solid Conductors, Stranded Conductors may be used for the purpose of improving the Flexibility of a UTP 4Pair Cable. The materials and sizes of strands used are regulated in accordance with UL444, and representative sizes and materials are Un-coated AWG 24 (7/0203A).

In other words, diameter of unshielded wire is 0.203mm and wires are stranded in 1+6 structure. The materials are annealed coopers.

Chapter 2 Specification

2) Classification by Frequencies used

Classification	Frequency used (MHz)	Transmission Speed(Mbps)	Uses
Category 1	Voice Frequency	1	Telephone Network (2 Pair)
Category 2	4	4	Multi- Pair Communication Cable
Category 3	16	16	Telephone Network + Computation Network
Category 4	20	20	1) Computation Network – Transmission Speed Up 2) Low-loss Communication Cable
Category 5 and Enhanced Category 5	100	100	1) Digital Telephone Network + Computation Network 2) Low Loss, Wideband Cable

Notice

- 1) The classification currently applied at home and abroad is Category 3, 5, Enhanced Category 5, and Category 6. Category 4 is not now used as Category 5 appears. Category 7 is in STP structure and it is at a development stage over the world.

3) Classification by Non-flammable Grades(Base on UL Certification)

Segment	Induced Calorie	Induced Time	Combustion Length	Smoke Regulation	Remarks
CMP	88(kW)	20 minutes	Less than 73m/min	Regulated	• For Installing ceilings without duct • Plenum Cable • UL 910 (Plenum Test)
CMR	150(kW)	30 minutes	Less than 3.6m	Not Regulated	• Vertical Installation Type • Non-Plenum Cable • UL 1666(Riser Test)
CM	21(kW)	20 minutes	Less than 2.4m	Not regulated	• General Type • Non-Plenum Cable • UL 1581(VTFT Test)
CMX	1(kW)	1 minute	Less than 0.5m	Not regulated	• Restrictive Use • Non-Plenum Cable • UL 1581 (VW-1 Test)

Notice

- 1) CMG is located in the middle grade between CM and CMR, but generally it is not applied to LAN Cable such as UTP Cable.
 Example) CMG: CAS FT4 (VTFT Test), similar to CM of UL 1581.
 → Burner Angle (Horizontal → 45 degree – Upward) and Sample Conditions (1/2 interval arrangement
 → A Bundle of 6 ones x 6 units) are different.

4) An Example (CTP-LAN5) of Category - 5 Twisted Pair Cable(UTP)

Items	Units		Values
Conductor Resistance (Maximum)	Ω/km		93.5
Insulation Resistance (Minimum)	$\text{M}\Omega/\text{km}$		2500
Anti- voltage	V/minute		AC 500
Characteristic Impedance	$\Omega(1\sim 100\text{MHz})$		100 ± 15
Attenuation	Less than dB/100m	10MHz	6.5
		16MHz	8.2
		20MHz	9.3
Near End Cross-talk Attenuation	Less than dB/100m	10MHz	47
		16MHz	44
		20MHz	42

Chapter 3 Installation and Trial- Run

3.1 Installation Environment

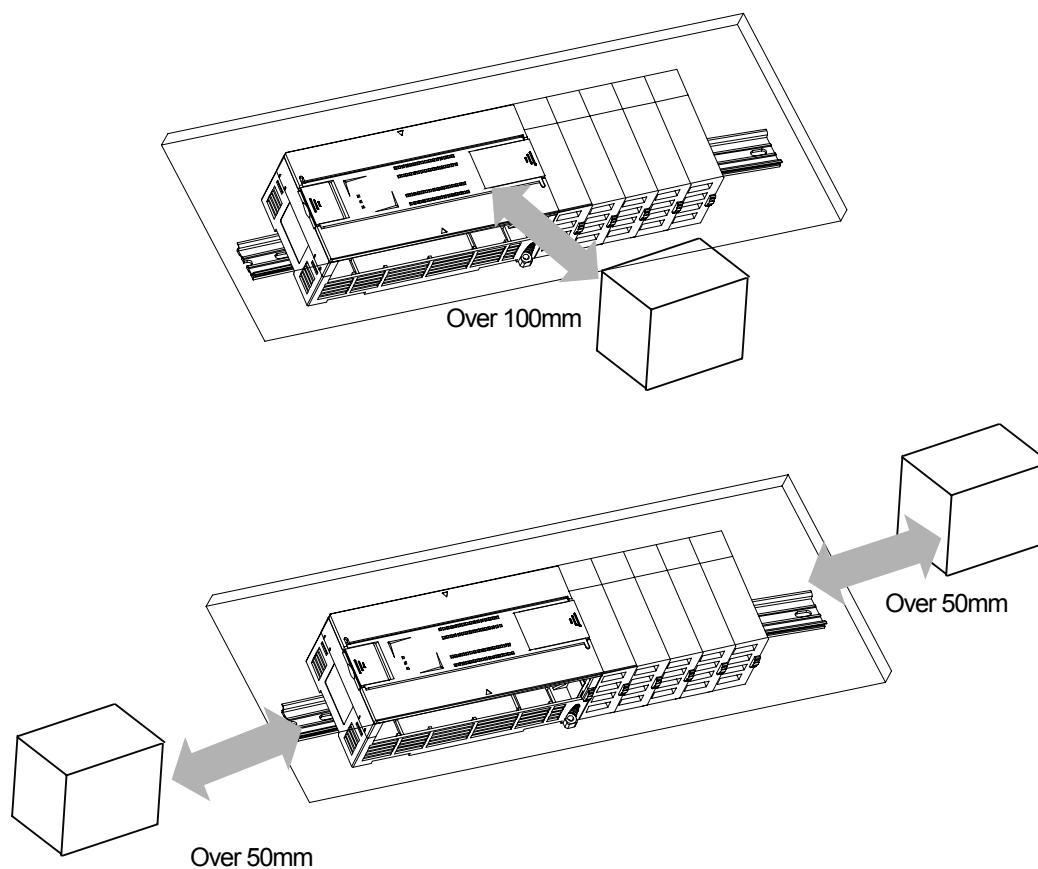
This product is very reliable regardless of installation environments, but to guaranty the reliability and stability of the system, pay attention to the following items.

1) Environment Conditions

- (1) Install in the control board where waterproof and dustproof are possible.
- (2) The places where constant impacts or vibrations are imposed.
- (3) The places where direct rays are not directly exposed .
- (4) The places where dew is not formed by the rapid change in temperature.
- (5) The places where surrounding temperature is maintained to be at 0-55℃.

2) Installation Constructions

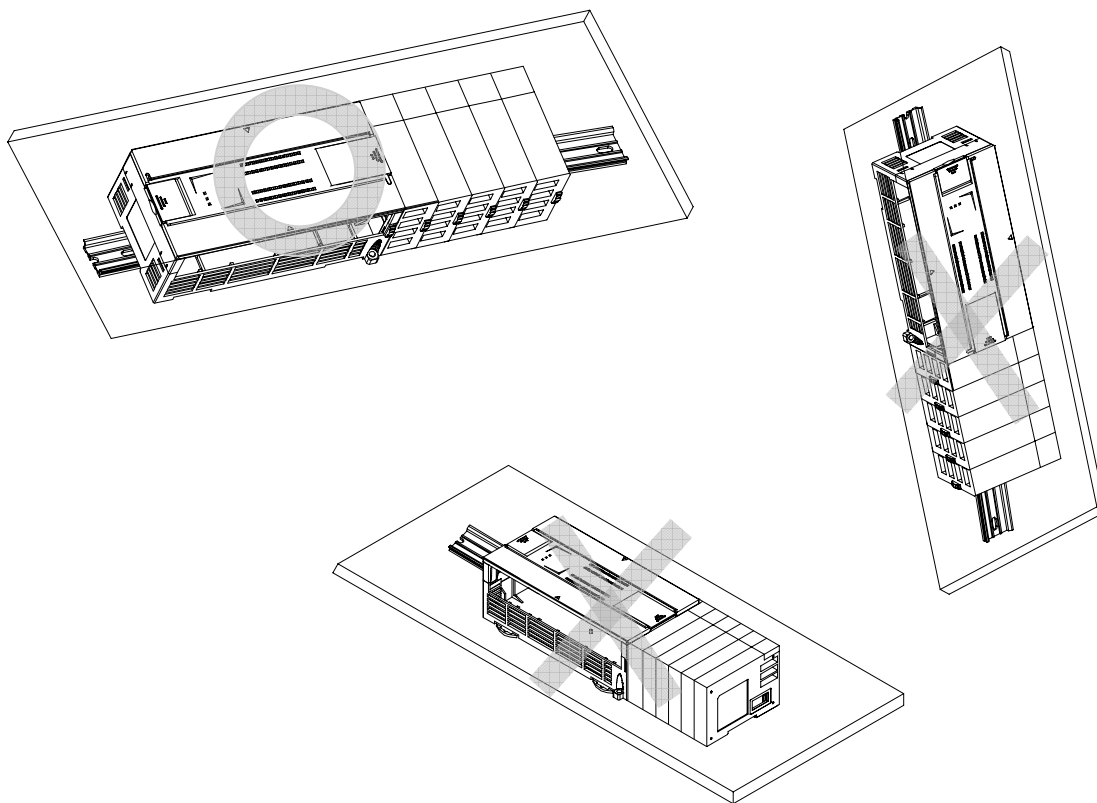
- (1) Make sure wiring leavings are not inserted inside the PLC when you process screw holes or do wiring jobs.
- (2) Install the places where it is easy to control.
- (3) Do not install into the same panel as high press machine.
- (4) Make sure the distance to the duct and the surrounding module is maintained to be more than 50mm.
- (5) Put to earth where surrounding noise environment is good.



3.2 Cautions when Handling

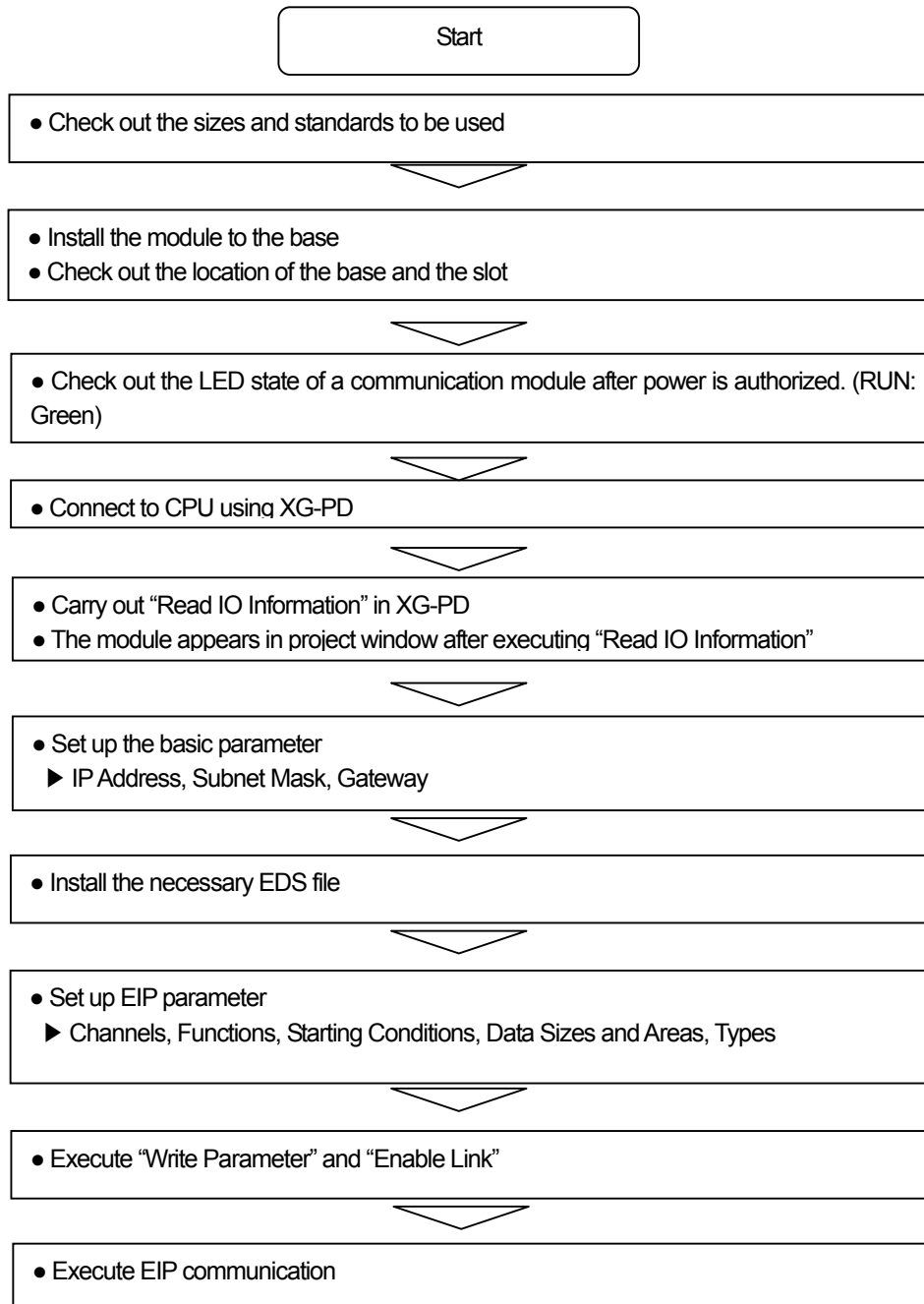
Observe the following directions when you configure the system using EtherNet/IP I/F module.

- 1) Do not drop or impose strong impact.
- 2) Do not separate PCB from the case. It may cause malfunctions.
- 3) Make sure foreign objects are not put into the upper area of the module while you do wiring jobs.
- 4) If foreign objects are entered, remove them.
- 5) Do not remove the module when light is ON.
- 6) Use standard cables and install within maximum distance.
- 7) Make sure communication lines are not affected by surges and inductive noises that may occur from alternating current or current parts.
- 8) In case the machinery or the substances that may generate high temperature are nearby you or when wires directly come into contact oil and other things for a long time when you do wiring jobs, it may cause a short cut, damage, or malfunctions.
- 9) When you do wirings during pipe arrangement, it is necessary to put to earth to pipes.



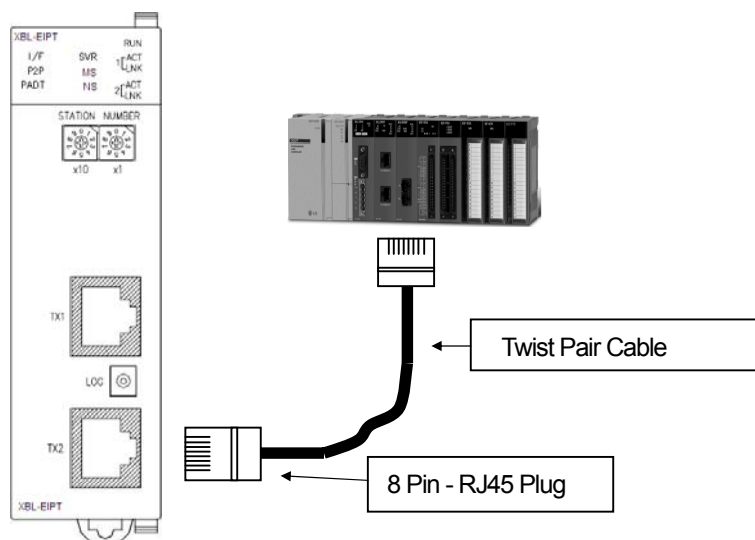
3.3 The Order for Setting up Products till Running

The following describes the order of installing or setting up products. Install the system and setting up the parameter so that they can operate in order.



3.4 Installation of Products

3.4.1 Installation of XGL-EIPT



[Illustration 3.6.1] How to Install 100BASE-TX

The maximum segment distance of 100BASE-TX reaches 100m. (The distance between modules)

Straight cables and cross cables are used.

If a cross cable is used when connected between these communication modules, the time for connecting links can be shortened.

This module doesn't support a ring system.

When configuring a ring form, IP address switch of a module – front view must be set up at '99.'

Then, a ring system is formed in external aspect, but the service for a ring system will not be supported.

If IP address switch is not set up at 99'after formed in a ring, data burst may happen and modules can not execute normal actions.

Pin NO.	Signal	Straight Cable between Cables	1:1 Cross Cable
1	TD+	1-1	1-3
2	TD -	2-2	2-6
3	RD+	3-3	3-1
6	RD-	6-6	6-2
4,5,7,8	Not used	-	-

Notice

- 1) 100BASE-TX cable is designed to be weak in cable structure, so only if cables are twisted (Two wires are stranded) after No.1 (TD+) and No. 2 (TD-) wires are twisted and No. 3 and No. 6 are twisted with each other. wiring will be strong in strength.
- 2) For cable terminal treatment and manufacture, consult with professional providers to install

1) How to Install UTP

- (1) For reliable transmission of 100Mbps signal using UTP cables, Patch Cord, Line Cord, Patch Panel, DVO(Data Voice Outlet), etc must meet 5 spec (Category 5 Spec.- EIA/TIA-568A).
- (2) Make sure the length of patch code will be over 7m in cross-connect, If the length exceeds 7m, the length corresponding to 90m, as much as the allowable value in Horizontal Distribution System, must be deducted.
- (3) Make sure the length of line cord does not exceed 3m in line cord length. If the length exceeds 3m, as much as the length corresponding to 90m, the allowable value in Horizontal Distribution System, must be deducted.
- (4) Make sure the loose of paired pitch of UIP cable in case of disconnection to patch panel and DVD does not exceed the following dimension.
- (5) Maximum Paired Pitch – Loose : Category 5 : 13mm, Category 3 : 26mm
- (6) Use jumper wires in DC cross-connect system. Then, also the loose of paired pitch must not exceed the above standards. Especially, in case of seriously bending cables, pay attention so that damage or separation between pairs does not happen.
- (7) Maximum Curvature Diameter : 4 Pair Cable : 4 times the Diameter
Cable more than 25 Pair: 10 times the Diameter
- (8) Make sure the maximum tensile force while using does not exceed 110N (11.3Kgf) based on 4 Pair
- (9) Make sure jumper cables and patch codes are loosely disconnected. When tightly connected, the features of category 5 may lower. When using Tie-wrap, make sure cables are not stressed.
- (10) Make sure proper distance is maintained between EMI source and UTP cable when installing cables.

The proper distance in each case is as follows.

Conditions	Minimum Separation Distance		
	Less than 2.0KVA	2.5 KVA	More than 5.0KVA
In case unshielded power lines or electric facilities are open and are in the state of being closely located nearby non-metal pipes	127mm	305mm	610mm
In case unshielded power lines or electric facilities are in the state of being located nearby buried metal pipes	64mm	152mm	305mm
In case buried metal pipes the power line (or the same shields)are in the state of being located nearby buried metal pipes	-	76mm	152mm

Notice

- 1) In case voltage reaches 480V and electric power source reaches more than 5KVA, separated calculation is required.

3.5 Trial- Run

3.5.1 Directions when Configuring Systems

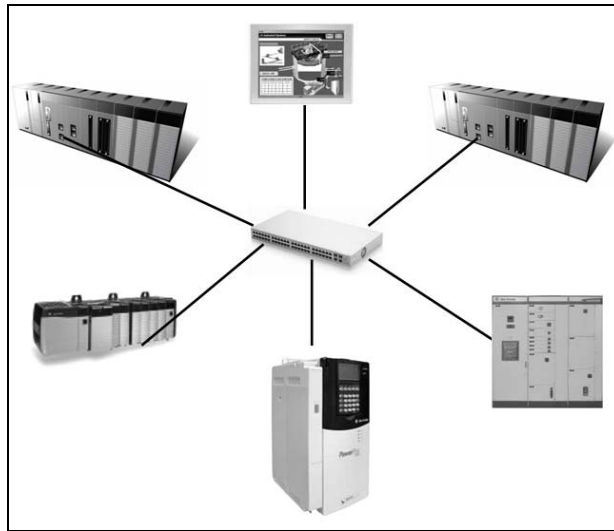
- 1) To use P2P service including this module, make sure IP Addresses of all stations are different from IP addresses of all other stations.
- 2) To use communication cables, select the ones in designated sizes. Using cables that have not been designated may cause serious communication obstacles.
- 3) Check out whether cables are disconnected or short-circuited before installing communication cables.
- 4) Completely tighten the connectors of communication cables so that cable connections can be fixed.
- 5) Incomplete cable connections may cause serious obstacles to communication.
- 6) In case of connecting communication cables to a long distance, make sure cables are not separated from power lines or inductive noises.
- 7) Coaxial cables are low in flexibility, so they must be re-branched lowering down at least more than 30 cm from the connector in communication module, and if cables are bent on the square and forcibly transformed, it may cause the destruction of the connector located in the communication module.
- 8) In case LED does not normally operate, refer to 'Chapter 10 Troubleshooting' and check out causes. If something is wrong even if actions have been taken, contact Warranty Service Center.

Chapter 4 System Configuration

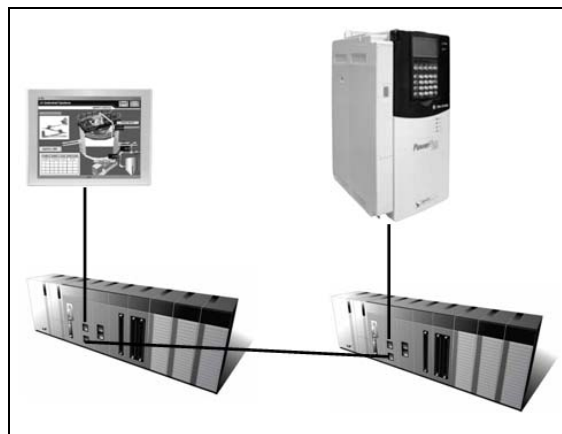
XGB EtherNet/IP I/F modules can be installed on the XBC CPU modules. The number of maximum installments reaches 2 . It is possible for the communication system using this module to be applied to a variety of configurations. This chapter describes the examples of the cases when system configuration is available and unavailable by applications.

4.1 Configuration of a Usable System

4.1.1 System Configuration using a Switch



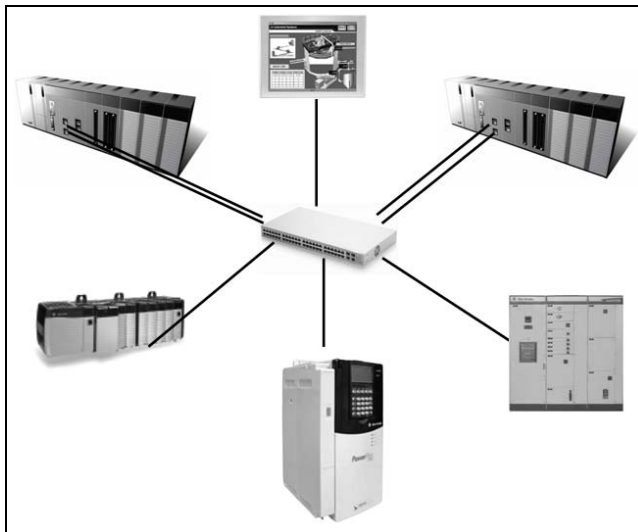
4.1.2 System Configuration not using a Switch



4.2 Configuration of an unusable System

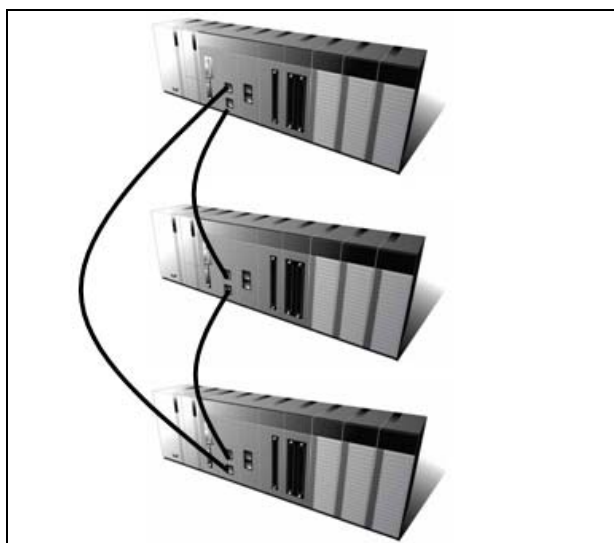
4.2.1 System Configuration using a Switch

It is impossible for EtherNet/IP I/F module to normally operate as data burst happens when each module is connected to each switch of 2 communication ports.



4.2.2 Configuration of a Ring System (Configuration of a XBL-EIPT Ring)

EtherNet/IP I/F does not support a ring system. When you configure a ring form, it is necessary to set up the IP address switch of the module – front view at '99.' Then, it is configured into a ring system in external aspect, but the service on an actual ring system is not supported. In case IP address switch is not set up at NO. '99' after configured into a ring, data burst happens and the module does not normally execute operations.



Chapter 5 Installation of Software and Communication Parameters

5.1 How to Register Communication Modules

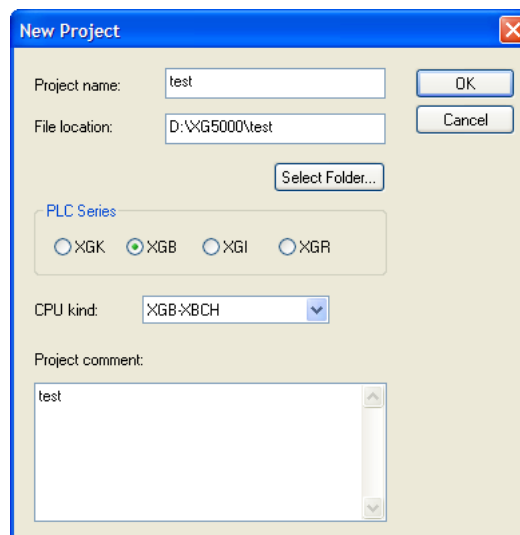
To use XGB Ethernet/IP I/F module, communication parameter must be made up in XG-PD and to set up the system on XGB Ethernet/IP I/F module, the module must be registered to XG-PD.

How to register XGB Ethernet/IP I/F module located at discretion is as follows in accordance with the state of on/off line.

5.1.1 In case of Offline

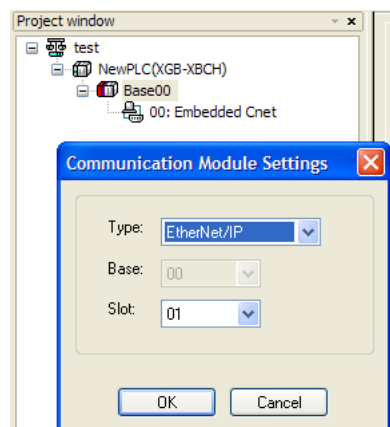
This is the way used in setting up communication modules and making up communication related parameters in the state of not connected with PLC. The execution method is as follows.

- 1) After execute XG-PD, select 'File-> 'New File 'or click ().
- 2) Create the projects that you will store in the project name, and select the names of the projects to be stored and the CPU types of PLC that you selected.



New Project

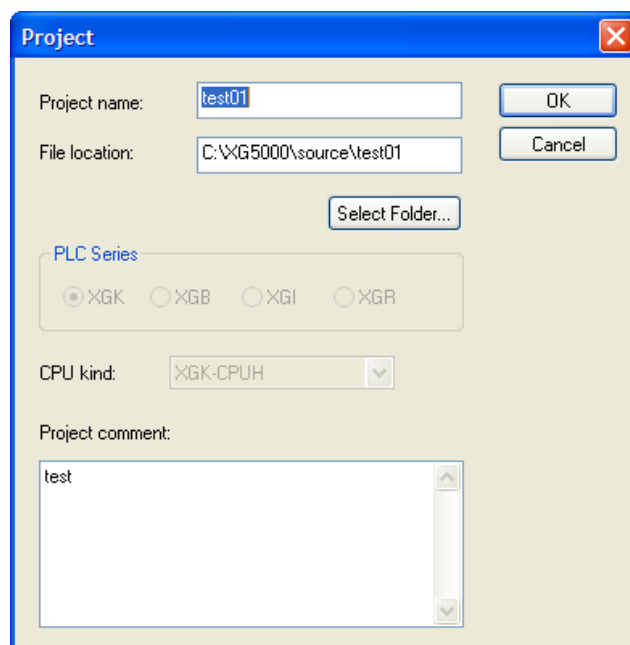
- 3) After selecting the base where you will register EtherNet/IP I/F module in 'Basic Set-up Screen" of XG-PD, click the right mouse and set up slots and communication modules



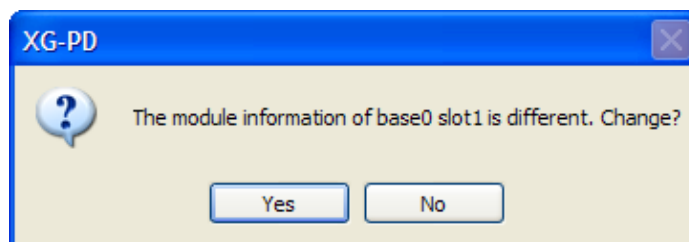
5.1.2 In case of Online

To register the communication module in online state, using XG-PD, the methods in NO. 1 and NO. 2 are the same as the one in registering modules of EtherNet/IP I/F in offline state. The execution order afterwards is as follows.

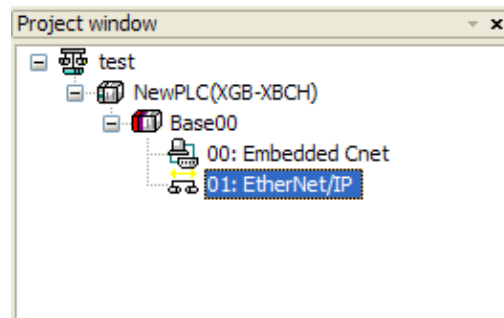
- 1) Create Project Name you will store and select 'PLC Series' type applied to PLC series and PLC CPU type for CPU.
- 2) If not connected, check out the state of connection with PLC or select 'Online' -> 'Connection Setting,' or select the connection method by clicking icon . As a connection method, there is a method using RS-232C, a method using USB cables, and a method using Ethernet module and EtherNet/IP module. As for a connection depth, select Local in case of directly connecting with PLC. The remote connection steps will be described in 7.3 remote connection.



- 3) When normally connected, the lower menus of online menus are activated.
- 4) To check out the modules installed to the current base, select 'Online' -> 'Read IO Information' or click icon , communication modules are automatically searched for and the information of installation modules appears on the project window. In case the module registered in offline state are different from the information of PLC currently connected or kinds of communication modules, check out whether they have changed or not with the above message.



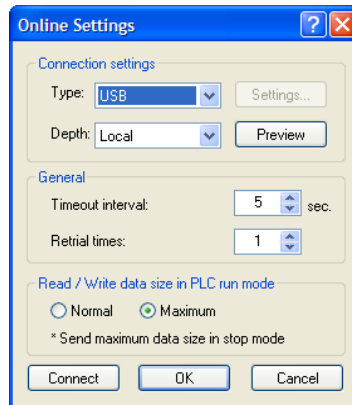
5) The list of the communication module installed to a product is created on “Project Window.”



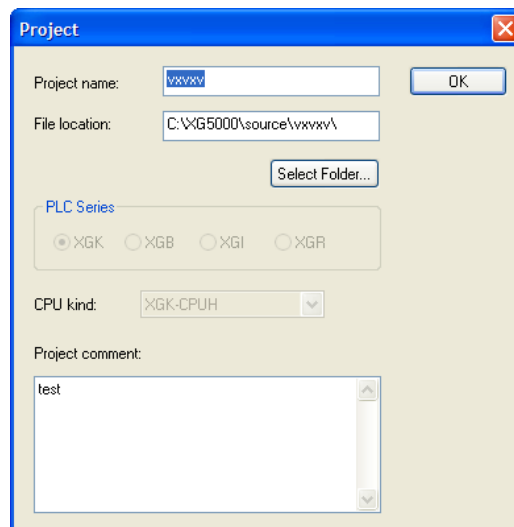
5.1.3 In case of Reading Parameter stored in PLC

The method for reading the basic set-up values for the communication module stored in PLC and for reading P2P set-up values are in the below order.

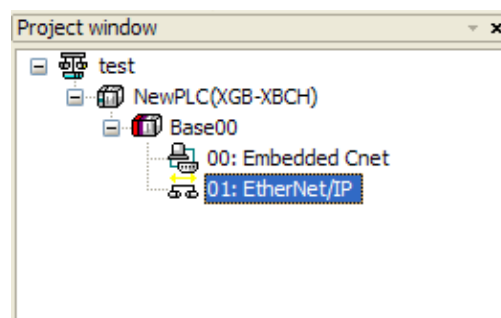
- 1) Select "Open from PLC" in the File.



- 2) Click "Connection" or "Ok" after setting up connection type and connection depth



- 3) Enter the name of the project you will store and click "Ok" after entering the storing location of the file.
- 4) It is possible to check out the basic set-up values and PSP set-up values stored in PLC.



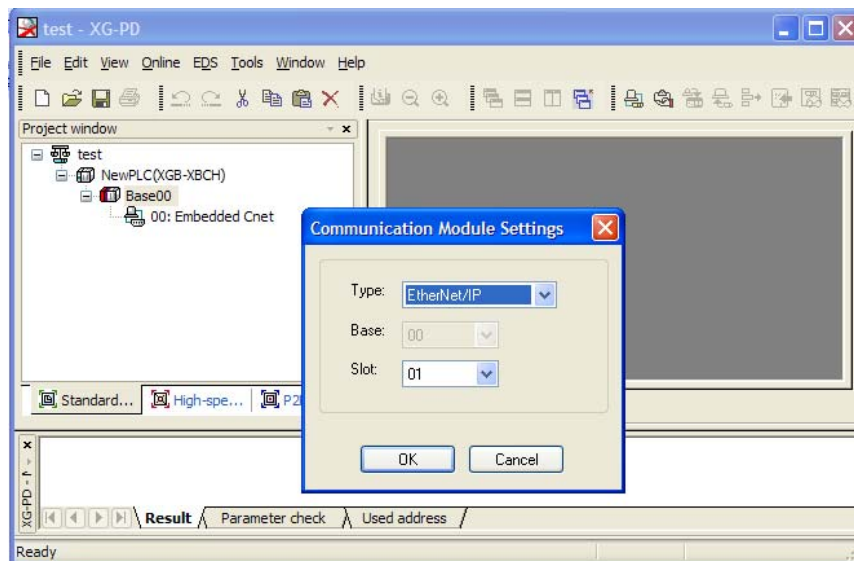
5.1.4 How to Set-up Modules

To operate EtherNet/IP I/F modules, set up in the following order.

1) Execution Order

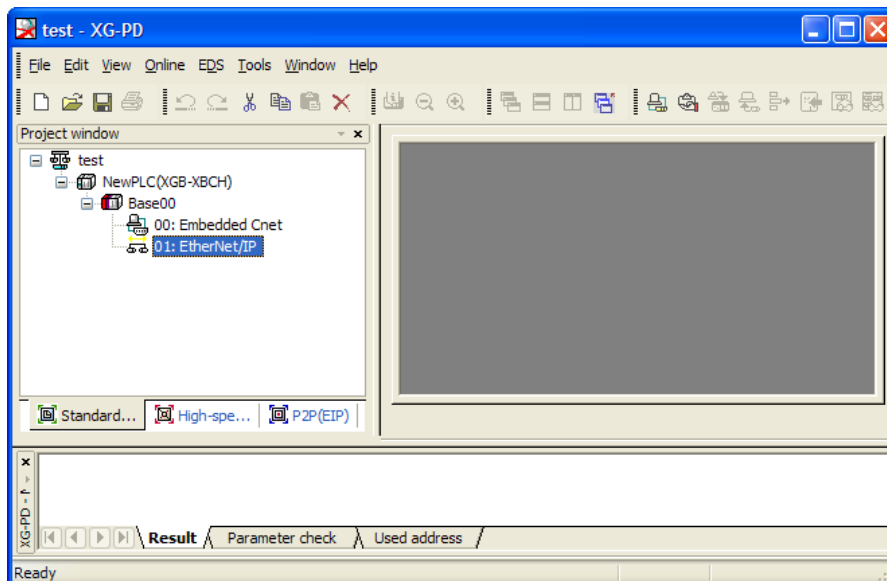
(1) Enter in the Project Window

If you click the right button of the mouse while cursor is on the base where module will be installed in the project window, the communication module set-up window appears as follows.



(2) I/O Information - Read

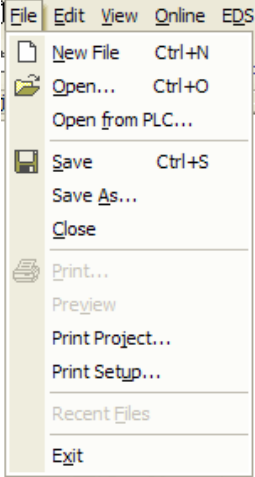
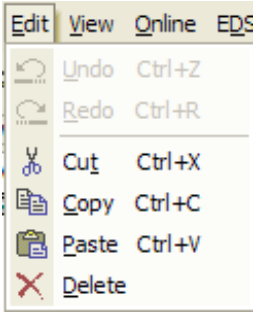
Select Online → Connect → Read I/O information to read the module installed to the current base.



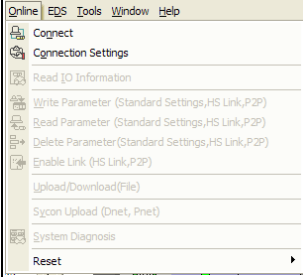
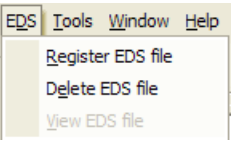
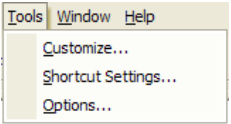
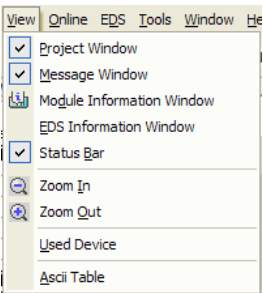
2) Operation Check-out

- (1) Select Online → System Diagnosis or click icon ().
- (2) Click the right button of the mouse in the module of the 'System Diagnosis' Window and check out whether communication has been in normal state or not after clicking Communication Module Information 'or State by Services.

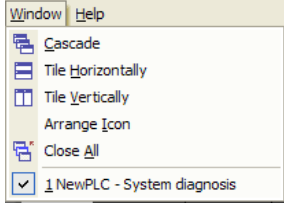
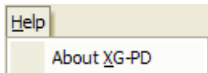
5.1.5 The Relationship between the Menu Bar and Shortcut Icons

Menu Bar		Menu	Icon	Contents
File		New File		When making up new files
		Open		When opening stored files
		Open from PLC	–	When reading the file stored in PLC
		Save		When storing the file which is being made up
		Save As	–	When storing a file in other names
		Print		When printing
		Preview	–	When previewing the contents that will be printed
		Print Project	–	When printing set-up parameters
		Printer Setup	–	When setting up a printer and printing direction
Edit		Undo		When returning to the current state
		Redo		When returning to the original state after executing “Undo”
		Cut		When deleting contents made up or post them to others
		Copy		When copying
		Paste		When pasting contented copies
		Delete		When deleting

Chapter 5 Installation of Software and communication Parameters

Menu Bar		Menu	Icon	Contents
Online		Connection		When connecting PLC to a computer
		Connection Setting		When setting up connection methods between a computer and PLC
		Read IO Information		When reading the information of PLC
		Write Parameter		When writing parameter contents edited from XG-PD
		Read Parameter		When reading the parameter stored in PLC
		Enable Link		When approving the communication on high speed link and communication set up
		Upload/Download	-	When O/S downloading communication module
		SyCon Upload	-	When reading the data set in SyCon (Corresponding to Dnet, Pnet)
		System Diagnosis		When monitoring the operating state of communication module
		Reset	Reset PLC	When resetting PLC
			Reset Individual Module	When resetting communication modules
EDS		Register EDS File	-	When registering EDS file
		Delete EDS File	-	When deleting EDS file (Used to delete EDS of the module activated on EIP Configuration Window)
		View EDS File	-	When marking EDS file on the memo pad (The activated information of the module EIP on the configuration window)
Tools		Customize	-	When selecting / canceling a user of the menu related to a tools
		Shortcut Settings	-	When setting up/canceling a hotkey for each menu
		Options	-	Applying/canceling the option related to the projection
View		Project Window	-	When activating tool bars in XG-PD
		Message Window	-	When the message window is activated
		Module Information Window	-	When displaying whether the online - system diagnosis has been activated
		EDS Information Window	-	When displaying EDS information window
		State Bar	-	When displaying a state display line
		Used Device	-	When displaying the used device area on the parameter
		Ascii Table	-	When wanting to see Ascii and Sexadecimal Values

Chapter 5 Installation of Software and communication Parameters

Menu Bar		Menu	Icon	Contents
Window		Cascade		When arranging the Edit Window in stair type
		Tile Horizontally		When arranging the Edit Window horizontally
		Te Vertically		When arranging the Edit Window vertically
		Arrange Icon		Not used
		Close All		When closing all - open windows
Help		About XG-PD		When checking out XG-PD version information

Chapter 6 EIP Service

6.1 EtherNet/IP Communication Method

The communication methods of EtherNet/IP are divided into Implicit Communication Method and Explicit Communication Method and each method is again divided into client and server function. In XGB EtherNet/IP I/F module, Implicit communication method is provided by periodic client /periodic server and explicit communication method is provided by aperiodic client/aperiodic server.

The periodic client/server is similar to the high speed link of the existing XGT communication service, which is the service used when data is transmitted and received periodically. The aperiodic client/server method is the communication method used when particular events happen. In XGB EtherNet/IP I/F module these two services are incorporated into EIP service and provided.

6.1.1 EtherNet/IP Terms

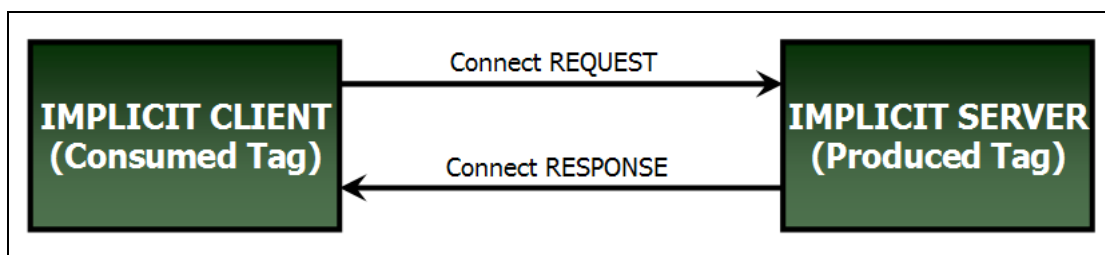
- 1) Implicit Messaging: Suggestive message, the message where the header information other than data has been implicated to the minimum (In XGB EtherNet/IP I/F module the message is provided via client /periodic server communication)
- 2) Explicit Messaging: Clear message, including all information that can translate frames besides data
(In XGB EtherNet/IP I/F module the message is provided via aperiodic client communication)
- 3) Client: The subject requiring information
- 4) Server: The subject that provides information at request
- 5) Producer: The entity that create producers, information
- 6) Consumer: The entity that receives consumer information and consumes it
- 7) Tag: Nameplate , Named Variable
- 8) EDS File: The abbreviation for Electric Data Sheets. The file where the information on the device and on the communication set –up is recorded
- 9) RPI: The abbreviation for Requested Packet Interval, meaning the period when Packet will be sent
(In XGT EtherNet/IP I/F module, packet is provided at transmission period)

6.1.2 EDS File

Electrical Description Script (EDS) File is a description on devices and it includes the information about a product type and connection, as well as Vendor ID. In EtherNet/IP I/F module it is the basic principle to set up using EDS File. To install RDS File, EDS register menu of XG-PD should be set up.

6.1.3 Periodic Communication (Implicit) System

Implicit Message provided in periodic communication in XGB EtherNet/IP I/F module means a suggestive and implied message. As this message contains header information to the minimum except for the data in frame, it also refers to the message which is impossible to see what data means. In addition, if we translate it in different way, this message means that header information is small in quantity, so the process of translating the frame has been simplified and it is possible to process data quickly. In EtherNet/IP, connection between client and server is set up with the parameter for sending this data. Client requires connection and it becomes the object that receives and consumes data, and sever comes to transmit the said data in transmission period (Requested Packet Interval: RPI) and communication method (Unicast/Multicast) like the way client wants. Thus, client comes to set up consumed tag and server will set up produced tag (XGT EtherNet/IP IF: Input Only Type).

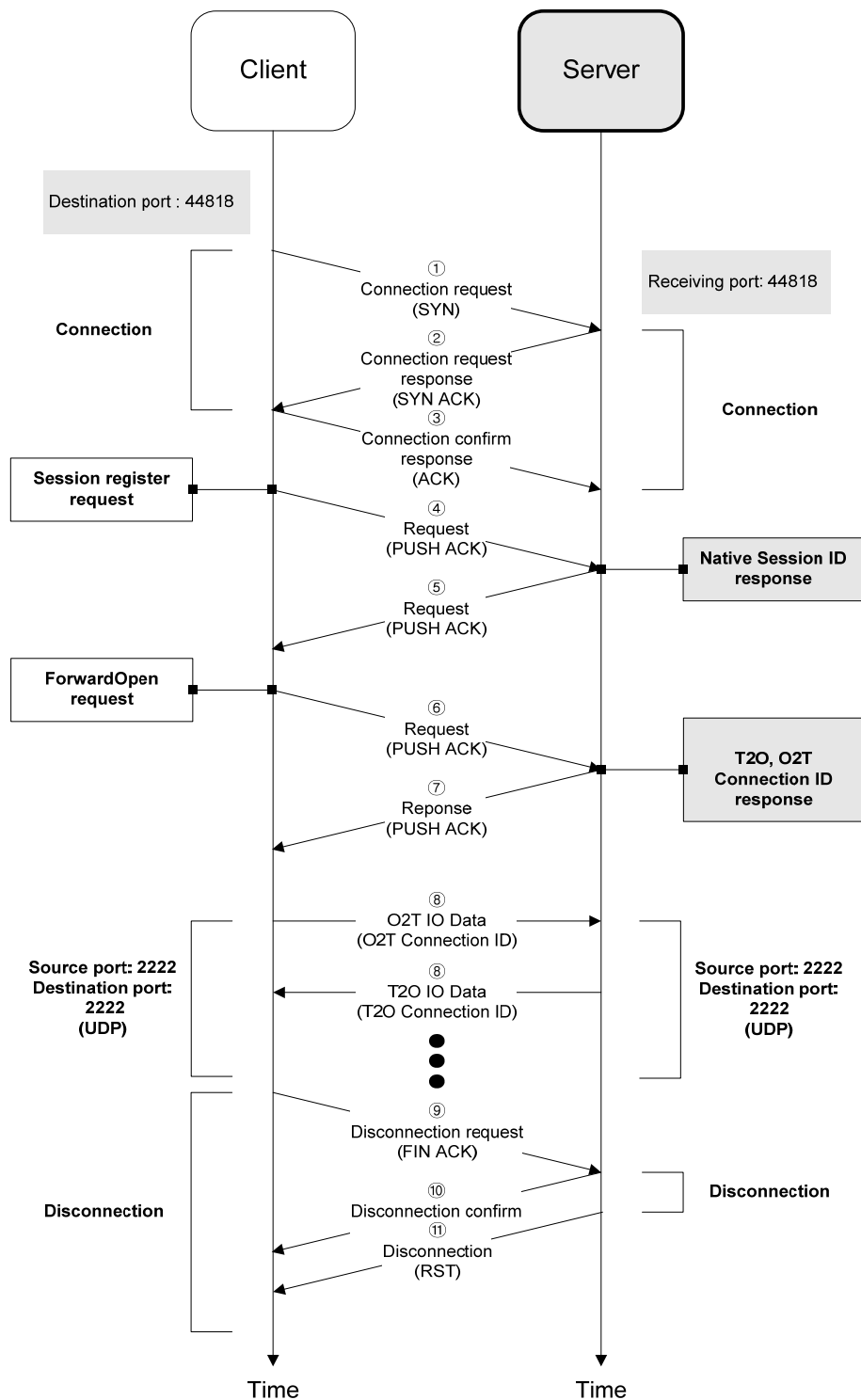


[Illustration 6.1] Client and Server in XGT EtherNet/IP I/F - Module Periodic Communication

Notice

Implicit Server is created also in Implicit Client. Server can set up timeout in the period that client grants according to types. Using data that client provides, it is possible to output to his own module.

Operating procedure of periodic communication is as follows.



[Illustration 6.2] Operating procedure of periodic communication

6.1.4 Aperiodic Communication (Explicit) System

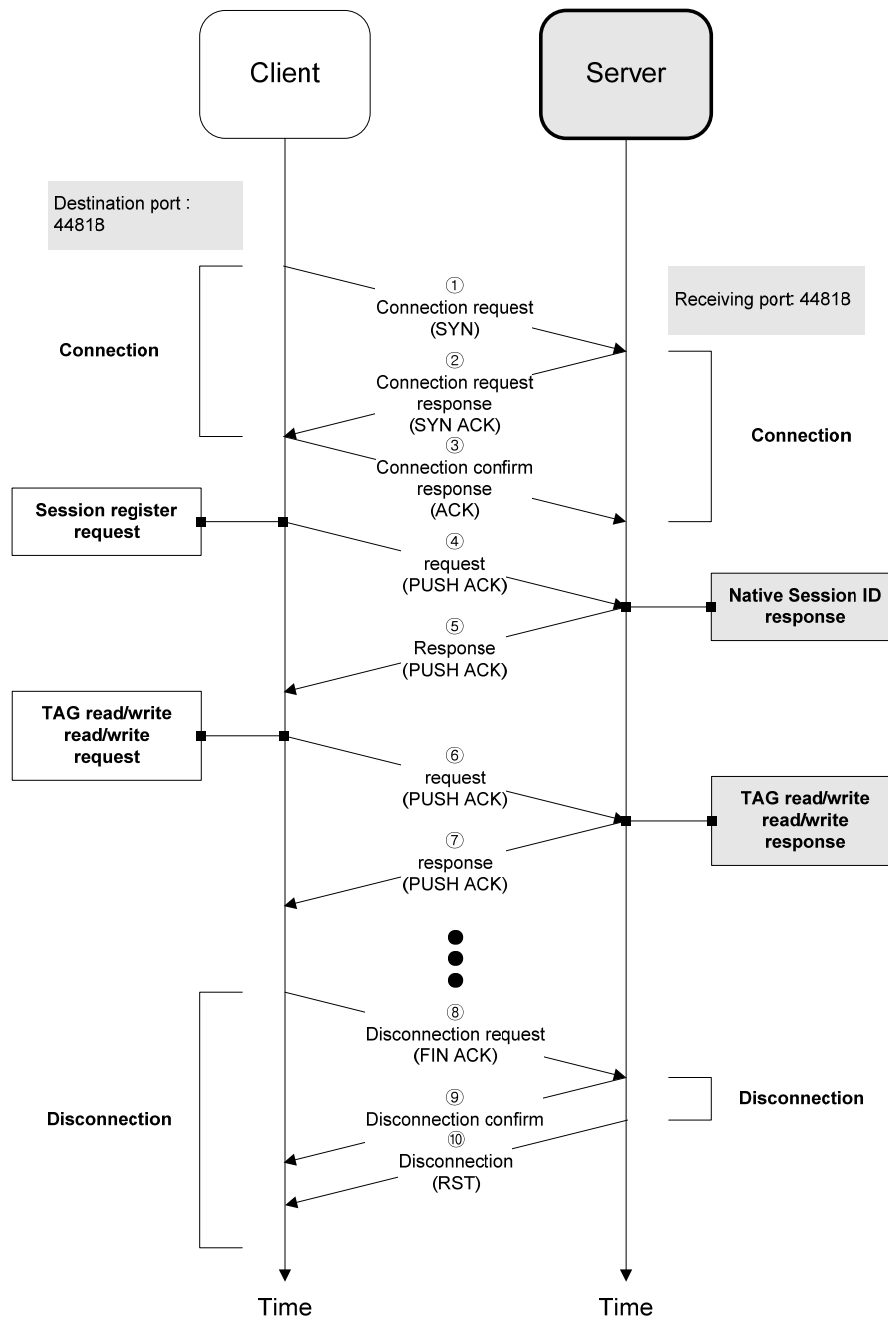
Explicit Message provided in aperiodic communication from XGB EtherNet/IP I/F module means clear and explicit message. This message also means that all information which is possible to translate data to data frame. Thus, even though it takes some time to translate frame, if the message we want is sent without the process of setting parameter, frame is translated from server and the response is made.

In general it is utilized as monitoring data to aperiodic data rather than control data.

The following table shows the parameter items set up when XGB EtherNet/IP I/f module is used.

Parameter	Inferior Configuration	Set-up Items	Set-up Scope	Set-up or Not			Remarks
				Periodic Client	Periodic Server	Aperiodic Client	
EIP	EIP Configuration	-	-	o	x	x	Drag & drop from EDS File
	EIP Channel	-	0-15	x	o	o	Set up other's IP
	EIP Block	Channel	0-15	o	o	o	Enter the channel you will use of set up channels in EIP channel
		Operation Mode	Pursuant to EIP Channel	o	o	o	Automatically displayed in accordance with set up channels
		I/O Type	Defined in EDS	o	x	x	Select I/O type defined in EDS
		Connection Type	Multicast, Point to Point	o	x	x	Select one among connection types defined in EDS
		Function	Write, Read, Tag Read, Tag Write	x	x	o	Select one among aperiodic clients
		Parameter	Parameter item	o	x	o	Set up the parameter defined in EDS - In case of aperiodic client, only read/write can be set up for read /write
		Parameter Contents	Defined in parameter	x	x		Display the contents set up in the Parameter
		Mobile Conditions	Contact Point	x	x	o	Set up mobile conditions
		Transmitting Period	20-10000	o	x	X	Period transmitting data
		Timeout	0-7	o	x	X	Transmission Period – Timeout(0-7)
		Data Type	BIT, 1/2/4/8 BYTE	o	o	o	Set up a data type
		Tag Set-up/ Local Tag	PLC Device	o	o	O	The device area of the local axis where "Write" or "Read" is executed you will
		Tag Set-up/ Remote Tag	Destination TAG name	o	x	o	Designate Other's TAG(Maximum 40 letters) In case remote station is XGT PLC, it is set up as "% + Device Name" (Ex. % MW200)
		Tag Set-up/Size		o	o	O	Periodic Client/Server : Maximum 500 Byte Aperiodic Client : Maximum 1400 Byte

Operating procedure of aperiodic communication is as follows.



[Illustration 6.3] Operating procedure of aperiodic communication

6.2 EIP Service

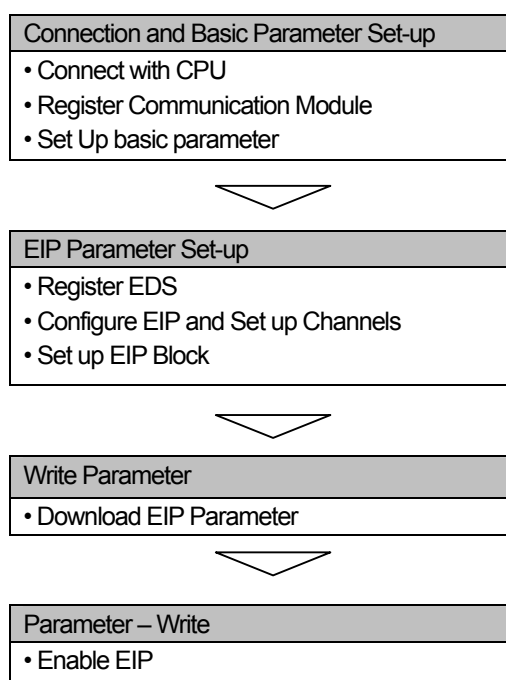
EtherNet/IP is divided into a periodic message service (Implicit Service), and an aperiodic message service (Explicit Service). In XBL-EIPT module these two services are incorporated to be provided as periodic/client server and aperiodic client.

In Periodic Client / Server Service the tag for communication must be set up in parameter system. Thus, client and server tag must be shared with information for communication when parameter is exchanged. In XGB EhterNet/IP I/F module, client and server must be set up with XG-PD. Make sure client is set up in periodic client and sever is set up with periodic server. For the detail contents, see 6.2.

Aperiodic client service must be communicated after you put the tag to be communicated and communication set-up. Thus, when required from client, server receives al information in frame and translates, and responds. In other words, it is the service without setting up from server side.

In this part, EIP types and use methods provided to a user are described.

The flowing refers to the order for making up the program using EIP.

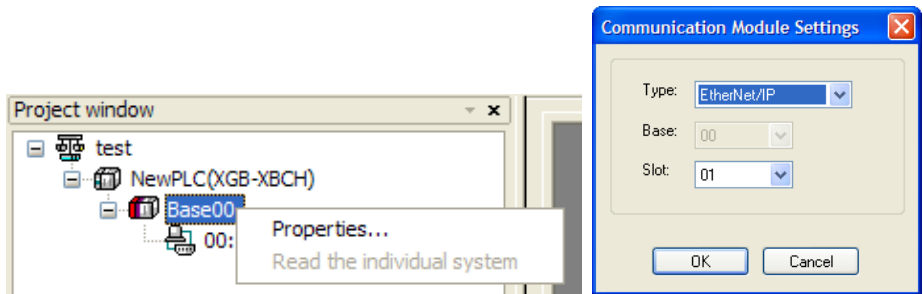
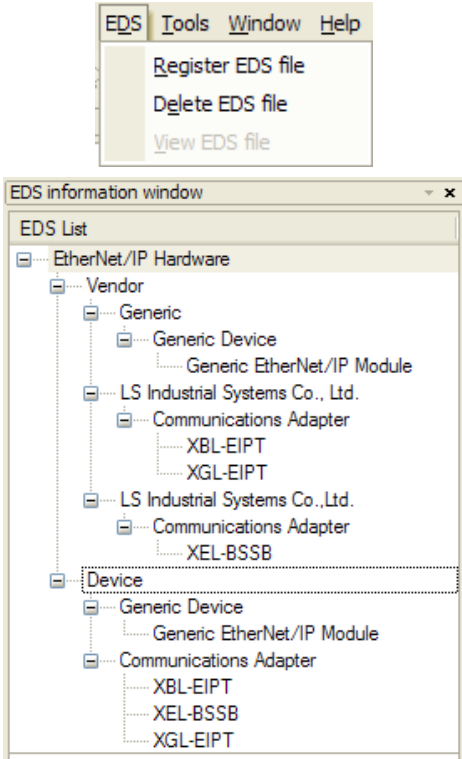


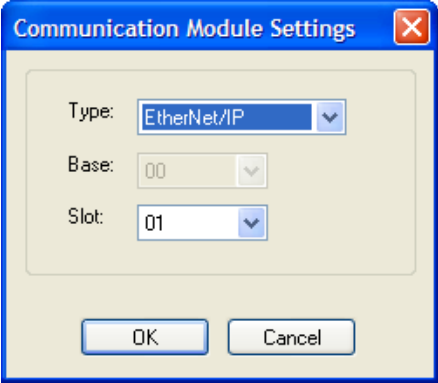
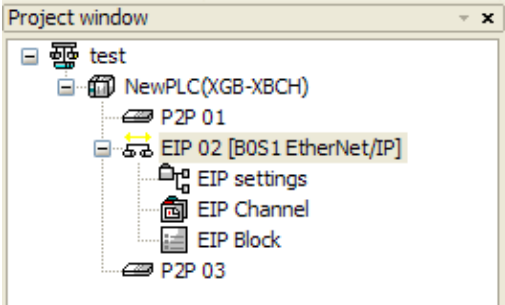
6.3 Communication Set-up with Own Communication Module

6.3.1 Periodic Client Communication Service

After set up the communication module and the basic parameter using XG-PD, drag EDS File with the mouse of an opponent's country and start set-up.

1) Basic Parameter Set – up and EDS Register

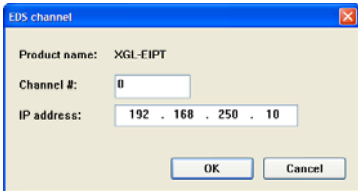
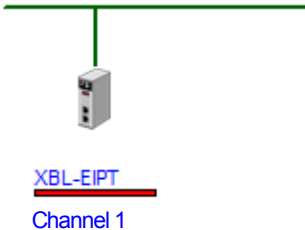
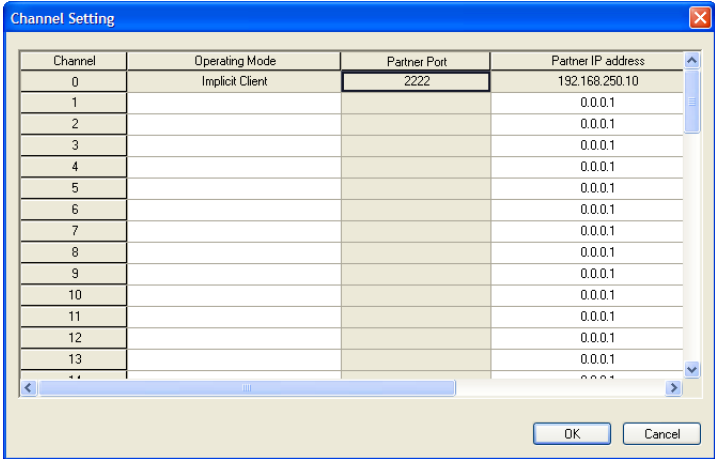
Order	Set-up Procedure	How to Set up
1	Communication Module Set-up	 1) Click the base you want and select EtherNet/IP I/F module 2) Double click communication module and set up basic parameter
2	EDS File Register	 1) Register the EDS file of the communication module you want to set up 2) Click View→EDS Information Window of XG-PD 3) If you register, you will be able to view EDS File registered in EDS File Information Window

Order	Set-up Procedure	How to Set up
3	EIP Service Register	 
Double click P2P(EIP) of Set - up Window and enter the module number and the slot number.		

Notice

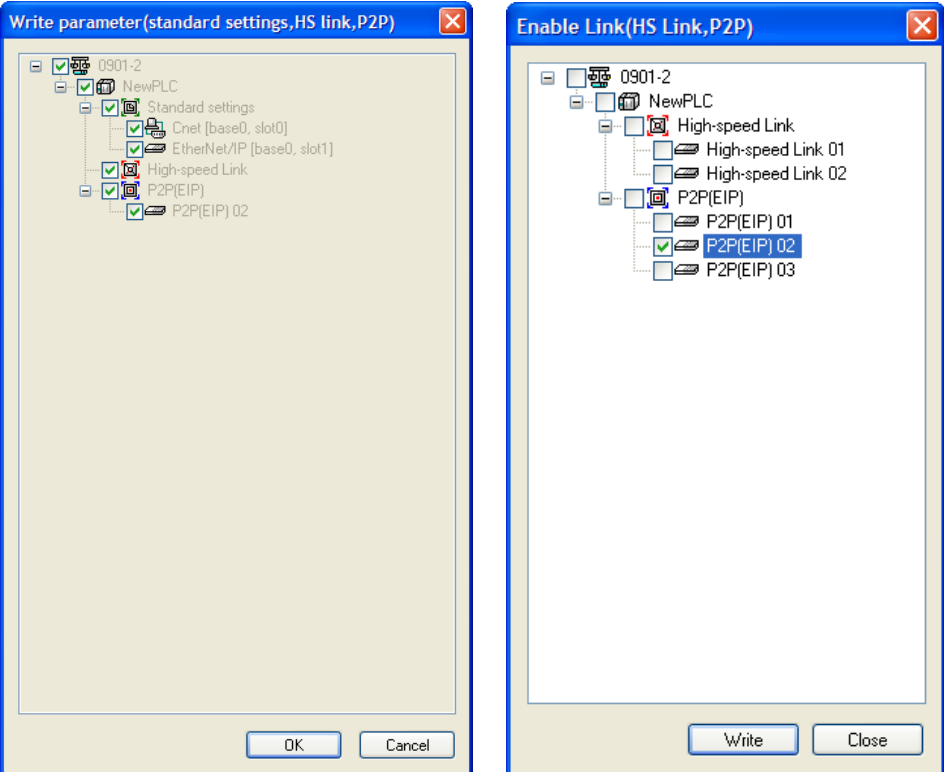
P2P 01 is allocated for built-in communication, P2P 02 for the first communication module and P2P 03 for the second communication module. Keep this in mind when setting.

2) EIP Configuration and Parameter Set-up

Order	Set – up Procedure	How to Set up
1	EIP Configuration	
		1) Drag registered EDS File from EDS Information Window and post it on EIP Configuration Window. 2) Channel Set-up Window appears as soon as registered EDS is posted. 3) Set up channel No. and IP address.
2	EIP Channel Information Check-out	
		1) After registration in EIP Configuration, it is possible to check out the information on channels in EIP channel window. 2) In periodic client communication, more set-up is not required, so the said channel becomes inactivated.

Chapter 6 EIP Service

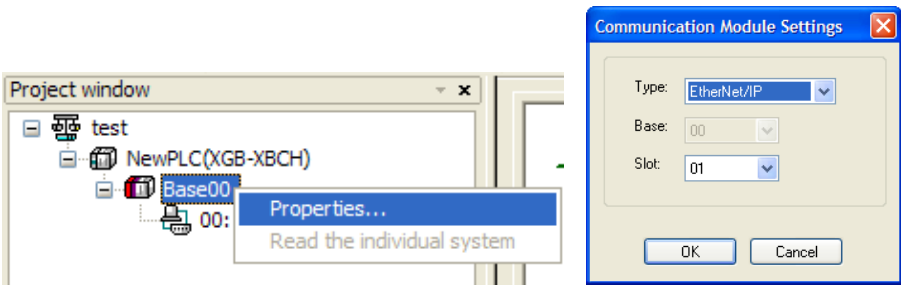
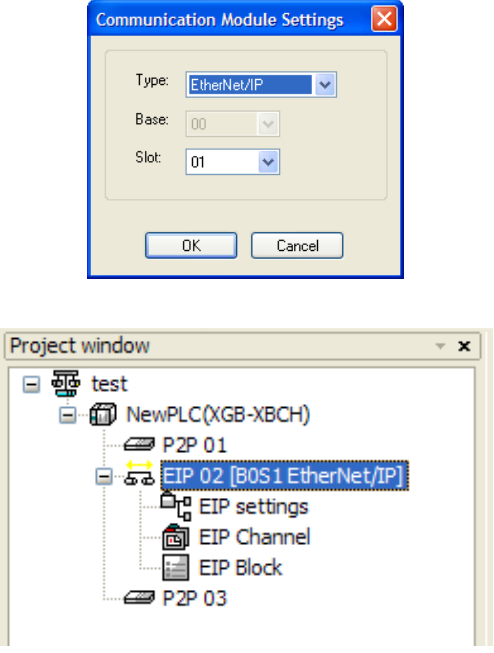
Order	Set-up Procedure	How to Set up														
3	EIP Block Set-up															
		Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings		
		0	0	Implicit Client	0 Read Only(ID)	Multicast		Parameter	T20 Tag Size:1 Output Assembly Instance(8bit)0 Input Assembly Instance(8bit)0		200	0. RPI x4	2 BYTE	%Qw0.1.0		1
1) Channel: Drag EDS File and display channels set up. If several channels are set up, it is possible to select the channel a user wants and form the block. 2) Operating Mode: This mode is the contents displayed in accordance with the channel set up and it is expressed as periodic communication, aperiodic communication, and periodic server. 3) I/O Type: The name of connection defined in the EDS File of the device. Connection will be open with server the connection way as set up here. 4) Connection Type: The method for communicating with server is set up. The information supported according to modules is recorded in EDS, which can be MULTICAST, Point To Point (UNICAST). 5) Parameter: This is the parameter on the server side that a user must set up. For the contents of the parameter, refer to the manual of the server side ▶ In case of using own EtherNet/IP: In case of own company, Output/Input Assembly Instance should be the same. (1) T20 Tag Size : The data size that server will read (Word) (2) Output Assembly Instance(8bit) : The block number of server that will write - After selecting Generic EDS, when connecting to the periodic server set at the P2P block 0 of XGB, set as 150. - After selecting XBL-EIPT EDS, when connecting to the periodic server set at the P2P block 0 of XGB, set as 0. (Since the offset in the XBL-EIPT is 150, it is adjusted as (setting value +150)) (3) Input Assembly Instance(8bit) : The block number of the server that will read - After selecting Generic EDS, when connecting to the periodic server set at the P2P block 0 of XGB, set as 100. - After selecting XBL-EIPT EDS, when connecting to the periodic server set at the P2P block 0 of XGB, set as 0. (Since the offset in the XBL-EIPT is 150, it is adjusted as (setting value +100)) 6) Parameter Contents: The contents of the parameter set up are displayed. 7) Transmission period (ms): This is the transmission period of data and the set – up scope is established at 20~10000 ms. 8) Timeout: If frame does not appear within the time set up after the value as much as constant times of the time set up in transmission period, the time for displaying errors is set up. Set up scope is obtained in this calculation – transmission period × 0~7. 9) Date Type: This refers to data type (BIT, 1 BYTE, 2 BYTE, 4 BYTE, 8 BYTE). In own company, it is fixed to be 2BYTE. 10) Local Tag: This tag is used to read local data or to set up the area to write it.																

Order	Set-up Procedure	How to Set up
4	Write Parameter and Enable Link	 The left screenshot shows the 'Write parameter(standard settings,HS link,P2P)' window. It contains a tree view with the following structure: 0901-2 (checked), NewPLC (checked), Standard settings (checked), Cnet [base0, slot0] (checked), EtherNet/IP [base0, slot1] (checked), High-speed Link (checked), P2P(EIP) (checked), and P2P(EIP) 02 (checked). The 'P2P(EIP)' item is highlighted with a red box. At the bottom are 'OK' and 'Cancel' buttons. The right screenshot shows the 'Enable Link(HS Link,P2P)' window. It contains a tree view with the following structure: 0901-2 (checked), NewPLC (checked), High-speed Link (checked), High-speed Link 01 (checked), High-speed Link 02 (checked), P2P(EIP) (checked), P2P(EIP) 01 (checked), P2P(EIP) 02 (checked), and P2P(EIP) 03 (checked). The 'P2P(EIP) 02' item is highlighted with a blue box. At the bottom are 'Write' and 'Close' buttons.
		1) Online → Click “ Write Parameter,” check out P2P(EIP), and click “Ok” 2) After click online → Enable Link, check out P2P(EIP)set up, click “Write.” 3) If Enable Link has not been checked out, EIP set up does not operate.

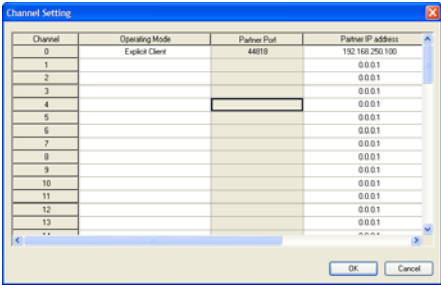
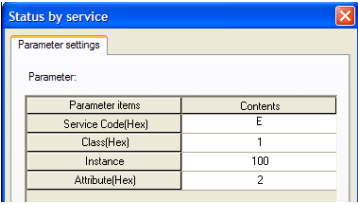
6.3.2 Set-up of Aperiodic Client Communication Service

Aperiodic Communication is the service when reading or writing an opponent's tag data. This service is used similarly to P2P service of XGB. It is possible to use an opponent's tag service without setting up EDS set-up.

1) Basic Parameter Set-up and EIP Service Register

Order	Set-up Procedure	How to Set up
1	Communication Module Set-up	
		1) Click the base you want and select EtherNet/IP I/F module. 2) Double click the communication module and set up the basic parameter.
2	EIP Service Register	
		Double - click P2P (EIP) on P2P (EIP) Set-up Window and enter modules and slot numbers.

2) EIP Channel and Parameter Set-up

Order	Set-up Procedure	Hot to Set up																																																																																	
1	EIP Channel Information Check-out	 1) After double click EIP Channel, set up operation mode into aperiodic client. 2) Enter an opponent country's IP address																																																																																	
2	Block Set-up	► Example of Tag Read <table><tr><th rowspan="2">Index</th><th rowspan="2">Ch.</th><th rowspan="2">Operating Mode</th><th rowspan="2">I/O type</th><th rowspan="2">Connection type</th><th rowspan="2">Function</th><th rowspan="2">Parameter</th><th rowspan="2">Parameter contents</th><th rowspan="2">Conditional flag</th><th rowspan="2">Transmission period(ms)</th><th rowspan="2">Time out</th><th rowspan="2">Data type</th><th colspan="3">tag settings</th></tr><tr><th>Local tag</th><th>Remote tag</th><th>Size</th></tr><tr><td>0</td><td>0</td><td>Explicit Client</td><td></td><td></td><td>TAG READ</td><td></td><td></td><td>%FX32</td><td></td><td></td><td>2 BYTE</td><td>%Mw100</td><td>mw100</td><td>2</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> ► Example of Read <table><tr><th rowspan="2">Index</th><th rowspan="2">Ch.</th><th rowspan="2">Operating Mode</th><th rowspan="2">I/O type</th><th rowspan="2">Connection type</th><th rowspan="2">Function</th><th rowspan="2">Parameter</th><th rowspan="2">Parameter contents</th><th rowspan="2">Conditional flag</th><th rowspan="2">Transmission period(ms)</th><th rowspan="2">Time out</th><th rowspan="2">Data type</th><th colspan="3">tag settings</th></tr><tr><th>Local tag</th><th>Remote tag</th><th>Size</th></tr><tr><td>0</td><td>0</td><td>Explicit Client</td><td></td><td></td><td>Generic READ</td><td>Parameter</td><td>Service Code(Hex):E Class(Hex):1 Instance:100 Attribute(Hex):2</td><td>%FX32</td><td></td><td></td><td>2 BYTE</td><td>%Mw100</td><td></td><td>2</td></tr></table> ► Example of Parameter Set-up  1) Channel: Select and use the one among those set up with aperiodic client. 2) Operating Mode: The operation of the channel set up in accordance with channel set-up is displayed. 3) Function: There are Tag Read – Order that reads tag data from server and Tag Write - Order that stores data into server, and Read/Write that enters parameter, not tag. 4) Parameter: Set up is available only if Read/Write is set up. ► Service Code(Hex): Enter the Service Code that you will use.(Example : 0E : Get , 10 : Set) ► Class(Hex): Enter the Class that sets up parameter ► Instance(Hex): Enter the Instance that you will set up parameter ► Attribute(Hex): Enter the Attribute that you will set up parameter 5) Conditional flag: Set up operation conditions where you will send messages. 6) Data Type: Input the Data Type if Tag that you will set up. 7) Tag Settings: Make sure client (own) tag is set up into local tag and the tag of server is set up into remote tag, and set up the size.	Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings			Local tag	Remote tag	Size	0	0	Explicit Client			TAG READ			%FX32			2 BYTE	%Mw100	mw100	2	1															Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings			Local tag	Remote tag	Size	0	0	Explicit Client			Generic READ	Parameter	Service Code(Hex):E Class(Hex):1 Instance:100 Attribute(Hex):2	%FX32			2 BYTE	%Mw100		2
Index	Ch.	Operating Mode													I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings																																																											
			Local tag	Remote tag	Size																																																																														
0	0	Explicit Client			TAG READ			%FX32			2 BYTE	%Mw100	mw100	2																																																																					
1																																																																																			
Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings																																																																							
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0	0	Explicit Client			Generic READ	Parameter	Service Code(Hex):E Class(Hex):1 Instance:100 Attribute(Hex):2	%FX32			2 BYTE	%Mw100		2																																																																					

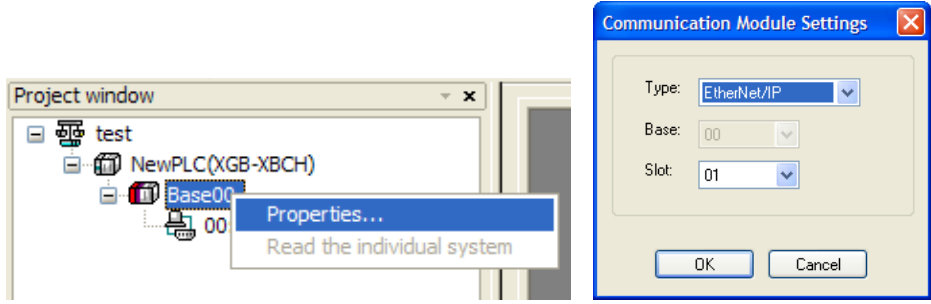
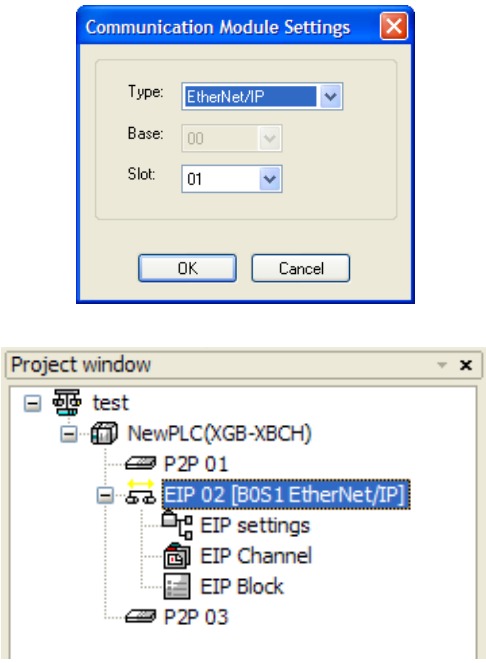
Notice

After adding two XBL-EIPTS to a basic unit and registering 32 blocks as aperiodic client for one and setting another module acting as server, if you time how long it takes for 32 blocks to be serviced, it is 1.3s. So time to deal with 1 block is about 40ms, when registering 32 blocks, service count per second get less 1. So if you set start condition fast, the service faster than 1.3 is not available.

6.3.3 Periodic Server Communication Service

In case of the module operating via sever when a user communicates via periodic communication, using EtherNet/IP I/F, it is necessary to set up the size of tag and address.

1) Basic Parameter Set-up and EIP Service Registry

Order	Set-up Procedure	How to Set up
1	Communication Module Set – up	
		1) Click the base you want using the right side of the mouse and select EtherNet/IP I/F module 2) Double click communication module and set up the basic parameter
2	EIP Service Register	
		Double - click P2P (EIP) on P2P (EIP) Set-up Window and enter modules and slot numbers.

2) EIP Channel and Parameter Set-up

Order	Set - up Procedure	How to Set up																																																																														
1	EIP Channel Information Check - out	Channel Setting <table><thead><tr><th>Channel</th><th>Operating Mode</th><th>Partner Port</th><th>Partner IP address</th></tr></thead><tbody><tr><td>0</td><td>Implicit Server</td><td></td><td>0.0.0.1</td></tr><tr><td>1</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>2</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>3</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>4</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>5</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>6</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>7</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>8</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>9</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>10</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>11</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>12</td><td></td><td></td><td>0.0.0.1</td></tr><tr><td>13</td><td></td><td></td><td>0.0.0.1</td></tr></tbody></table> OKCancel 1) Double click EIP channel and set up operation mode into periodic server. 2) The module where the basic module has been set up operates, there is no need to enter an opponent country's IP address.	Channel	Operating Mode	Partner Port	Partner IP address	0	Implicit Server		0.0.0.1	1			0.0.0.1	2			0.0.0.1	3			0.0.0.1	4			0.0.0.1	5			0.0.0.1	6			0.0.0.1	7			0.0.0.1	8			0.0.0.1	9			0.0.0.1	10			0.0.0.1	11			0.0.0.1	12			0.0.0.1	13			0.0.0.1																		
Channel	Operating Mode	Partner Port	Partner IP address																																																																													
0	Implicit Server		0.0.0.1																																																																													
1			0.0.0.1																																																																													
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2	Block Set-up	<table><thead><tr><th rowspan="2">Index</th><th rowspan="2">Ch.</th><th rowspan="2">Operating Mode</th><th rowspan="2">I/O type</th><th rowspan="2">Connection type</th><th rowspan="2">Function</th><th rowspan="2">Parameter</th><th rowspan="2">Parameter contents</th><th rowspan="2">Conditional flag</th><th rowspan="2">Transmission period(ms)</th><th rowspan="2">Time out</th><th rowspan="2">Data type</th><th colspan="3">tag settings</th></tr><tr><th>Local tag</th><th>Remote tag</th><th>Size</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>Implicit Server</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2 BYTE</td><td>%Mw/200</td><td></td><td>2</td></tr><tr><td>1</td><td>0</td><td>Implicit Server</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2 BYTE</td><td>%Mw/300</td><td></td><td>22</td></tr><tr><td>2</td><td>0</td><td>Implicit Server</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2 BYTE</td><td>%Mw/400</td><td></td><td>20</td></tr><tr><td>3</td><td>0</td><td>Implicit Server</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2 BYTE</td><td>%Mw/500</td><td></td><td>250</td></tr></tbody></table> 1) Channel : Select and use the one among the channels where periodic servers have been set up 2) Operating Mode: The operation mode of the channel set up according to the channel set-up is displayed. 3) Date Type: Enter the data type of the tag that you will set up. 4) Local Tag: This tag is the device area of the module operating via server. 5) Size: The data size of the module operating via server.	Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings			Local tag	Remote tag	Size	0	0	Implicit Server									2 BYTE	%Mw/200		2	1	0	Implicit Server									2 BYTE	%Mw/300		22	2	0	Implicit Server									2 BYTE	%Mw/400		20	3	0	Implicit Server									2 BYTE	%Mw/500		250
Index	Ch.	Operating Mode													I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings																																																								
			Local tag	Remote tag	Size																																																																											
0	0	Implicit Server									2 BYTE	%Mw/200		2																																																																		
1	0	Implicit Server									2 BYTE	%Mw/300		22																																																																		
2	0	Implicit Server									2 BYTE	%Mw/400		20																																																																		
3	0	Implicit Server									2 BYTE	%Mw/500		250																																																																		

Notice

When a user sets up the module operating via periodic server, the index of EIP block is granted the following meanings.

(In case of being set by other company's client)

1. Input Assembly Instance's start index is 100
2. Output Assembly Instance's start index is 150
3. For example, in case index 0 is set as periodic server, Input Assembly Instance should be 100 and Output Assembly Instance should be 150.
4. O2T Input Only Heartbeat Instance ID is 198.
5. O2T Listen Only Heartbeat Instance ID is 199.
6. Configuration Assembly Instance ID is 197.

6.3.4 Aperiodic Server Communication Service

This chapter describes on how to name the tag in the client when EtherNet/IP I/F module acts as aperiodic server. When our company's EtherNet/IP modules, XBL-EIPT or XGL-EIPT become the client, you input the tag name of the server at the "Remote tag" in the XG-PD.

Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings		
												Local tag	Remote tag	Size
0	1	Explicit Client			TAG READ			F00092			2 BYTE	M0100	%Mw100	2
1														

For one TAG READ or WRITE request frame, up to 64 tags are allowed. But in case XBL-EIPT, XGL-EIPT is client, you can input only one tag.

Max. 16 characters are available as tag name.

The following is max. Read/Write count and EIP type per one tag by type

	Bit	Byte	Word	Double Word	Long Word
Max. count	1	512	256	128	64
EIP type ^(note1)	<u>hC1</u>	hC2, <u>hC6</u> , hD1	hC3, <u>hC7</u> , hD2	hC4, <u>hC8</u> , hD3, hCA	hC5, <u>hC9</u> , hD4, hCB

* Note1) When acting as server, this is available EIP type list. Types other than them are considered as error.

Type with an underline, when XGL-EIPT, XBL0EIPT is client, is EIP type which is changed about the type set in the XG-PD. When the server responds, it responds by using the requested type.

1) Standard for tag naming

There are 5 kinds of the supported type (Bit, Byte, Word, Double Word, Long Word). The format of tag name per type is as follows.

a) Bit type tag format

'%(1 letter)	Device name (1letter)	Type (1 letter)	Word address (at least 1 letter)	Bit address (1 letter)
'0' (note1)	* 2) Refer to available device type and size (note2)	'X' or 'x'	* 2) Refer to available device type and size (note2)	'0' ~ 'F' (note3)

* note1) '%' is not necessary item. Tag name can start from '%' or device name.

* note2) Both small letter and capital letter are available for device name.

* note3) Both small letter 'a' ~ 'f' and capital letter 'A' ~ 'F' are available for bit address.

- Valid tag name example) "PX0F"

- Invalid tag name example) "MX0" -> there have to be at least 2 letters after type

b) Byte, Word, Double Word, Long Word type tag format

% (1Byte)	Device name (1Byte)	Type (1Byte)	Word address
'%' (note1)	* 2) Refer to available device type and size (note2)	Byte: 'B' or 'b' Word: 'W' or 'w' Double Word: 'D' or 'd' Long Word: 'L' or 'l'	* 2) Refer to available device type and size (note2)

* note1) '%' is not necessary item. Tag name can start from '%' or device name.

* note2) Both small letter and capital letter are available for device name.

- Valid tag name example) "MW0"

- Invalid tag name example) "M0000" -> There have to be type after device name

2) Available device type and size

- XBM-DXXXXS and XBC-DXXXXH

Area	"S" type range	"H" type range	Size (Word)	Remark
P	P0 – P127	P0 – P1023	1024	Read/Write/Monitor available
M	M0 – M255	M0 – M1023	1024	Read/Write/Monitor available
K	K0 – K2559	K0 – K4095	4096	Read/Write/Monitor available
F	F0 – F255	F0 – F1023	1024	Read/Monitor available
T	T0 – T255	T0 – T1023	1024	Read/Write/Monitor available
C	C0 – C255	C0 – C1023	1024	Read/Write/Monitor available
L	L0 – L1279	L0 – L2047	2048	Read/Write/Monitor available
N	N0 – N3935	N0 – N5119	5120	Read/Monitor available
D	D0 – D5119	D0 – D10239	10240	Read/Write/Monitor available
U	U00.00 – U07.31	U00.00 – U0A.31	352	Read/Write/Monitor available
Z	Z0 – Z127	Z0 – Z127	128	Read/Write/Monitor available
R	-	R0 – R10239	10240	Read/Write/Monitor available

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- XEC-DXXXH

Area	Range	Size (Word)	Remark
I	%IW0.0.0 ~ %IW15.15.3	1024	Read/Write/Monitor available
Q	%QW0.0.0 ~ %QW15.15.3	1024	Read/Write/Monitor available
M	%MW0 ~ %MW8191	8192	Read/Write/Monitor available
W	%WW0 ~ %WW10239	10240	Read/Write/Monitor available
R	%RW0 ~ %RW10239	10240	Read/Write/Monitor available
F	%FW0 ~ %FW1023	1024	Read/Monitor available
K	%KW0 ~ %KW4095	4096	Read/Write/Monitor available
L	%LW0 ~ %LW2047	2048	Read/Write/Monitor available
N	%NW0 ~ %NW5119	5120	Read/Monitor available
U	%UW0.0.0 ~ %UW0.15.31	512	Read/Write/Monitor available

Notice

1. In the timer/counter, Bit means contact point and Byte, Word means current value.

3) EIP data type

The following is EIP data type used at the XGL-EIPT which comes from CIP (Common Industrial Protocol) certificate.

C-5.2.1 BOOL Encoding

If the value is:	Then:
FALSE	bit 0 of the octet is 0 ('00'H)
TRUE	bit 0 of the octet is 1 ('01'H)

C-6.1 Elementary Data type Reporting

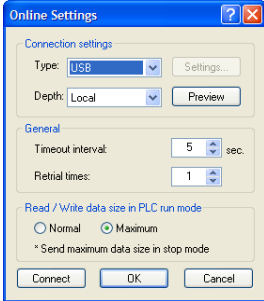
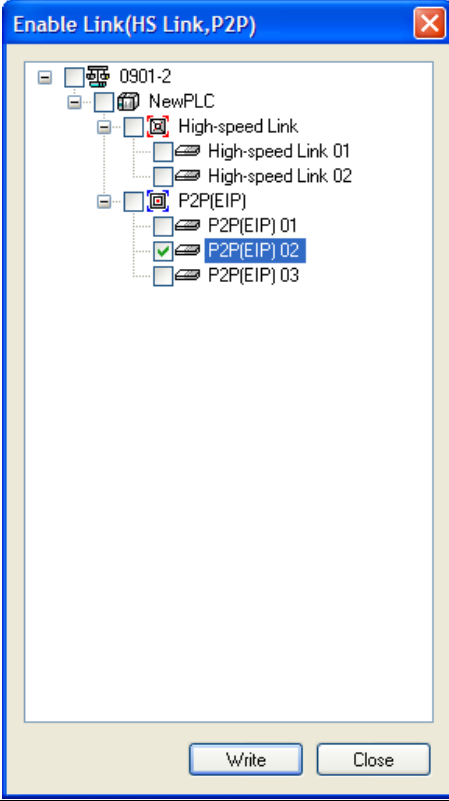
Data Type Name	Data Type Code (in hex)	Data Type Description
BOOL	C1	Logical Boolean with values TRUE and FALSE
SINT	C2	Signed 8-bit integer value
INT	C3	Signed 16-bit integer value
DINT	C4	Signed 32-bit integer value
LINT	C5	Signed 64-bit integer value
USINT	C6	Unsigned 8-bit integer value
UINT	C7	Unsigned 16-bit integer value
UDINT	C8	Unsigned 32-bit integer value
ULINT	C9	Unsigned 64-bit integer value
REAL	CA	32-bit floating point value
LREAL	CB	64-bit floating point value
BYTE	D1	bit string - 8-bits
WORD	D2	bit string - 16-bits
DWORD	D3	bit string - 32-bits
LWORD	D4	bit string - 64-bits

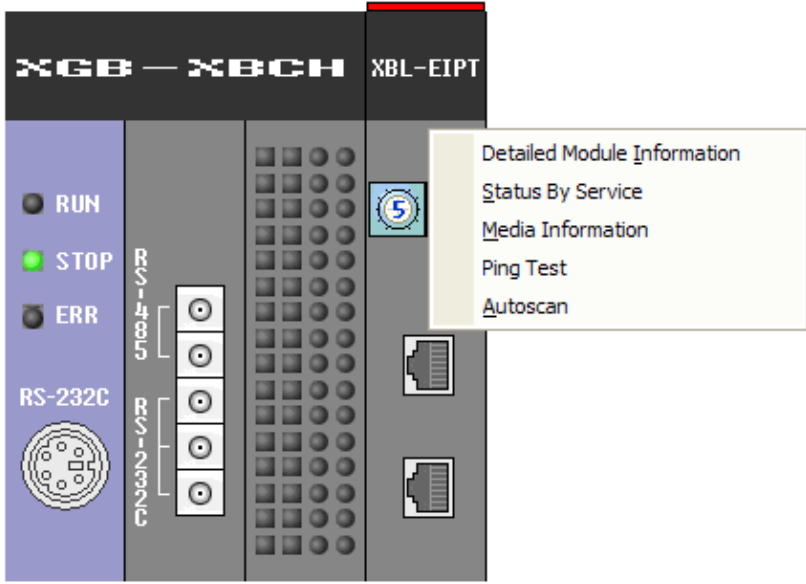
6.4 Operation Start

The operation of the XGB EtherNet/IP I/F module is largely divided into periodic communication service and aperiodic communication service.

For set - up contents, refer to 5.3 and 5.4.

6.4.1 XG-PD Set-up

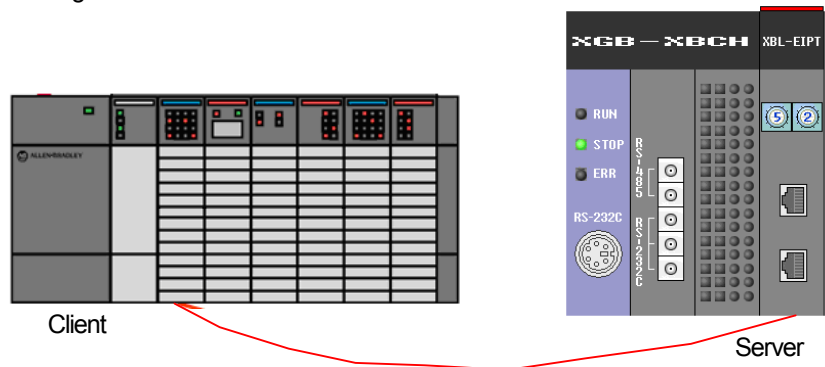
Order	Set-up Procedure	How to Set up
1	Connection Set-up	 The 'Online Settings' dialog box is shown. It has two tabs: 'Connection settings' and 'General'. Under 'Connection settings', 'Type' is set to 'USB' and 'Depth' is set to 'Local'. There are 'Settings...', 'Preview', 'Connect', 'OK', and 'Cancel' buttons. Under 'General', 'Timeout interval' is set to 5 sec and 'Retrial times' is set to 1. There is a section for 'Read / Write data size in PLC run mode' with 'Normal' and 'Maximum' radio buttons, and a note '* Send maximum data size in stop mode'.
		1) Online → Select Connection Set-up or Click Icon (). 2) After setting up the connection option suitable for a use's environment, click "Connection."
2	Read I/O Information	Select Online → I/O Information Read or click icon (), and read the information loaded in the module
3	Enable Link	 The 'Enable Link(HS Link, P2P)' dialog box is shown. It displays a tree structure of the PLC configuration. Under '0901-2', there is a 'NewPLC' folder. Inside 'NewPLC', there is a 'High-speed Link' folder and a 'P2P(EIP)' folder. Under 'High-speed Link', there are 'High-speed Link 01' and 'High-speed Link 02'. Under 'P2P(EIP)', there are 'P2P(EIP) 01', 'P2P(EIP) 02', and 'P2P(EIP) 03'. The 'P2P(EIP) 02' checkbox is checked. There are 'Write' and 'Close' buttons at the bottom.
		1) Online → Select Link Enable or click icon (). 2) Check out EIP where set-up has been completed and click "Write"

Order	Set-up Procedure	How to Set up
4	Operation Check-out	
		1) Select Online → System Diagnosis or click icon (). 2) After clicking the module, press the right side of the mouse, then it is possible to check out whether communication has been successfully done by clicking frame monitoring or the state by services. * For the details on system diagnosis, refer to Diagnosis Function Chapter 7.

6.5 Use Examples

6.5.1 Communication with Rockwell 1756-ENBT Communication Module

1) System Configuration



Segment	1756-ENBT	XGL-EIPT
IP Address	192.168.250.100	192.168.250.00
Data Size	4 BYTE	4 BYTE
Reading Area	-	%MW0~1
Storing Area	EIPT Tag	-
Communication Method	Periodic Client (Implicit service)	Periodic Server

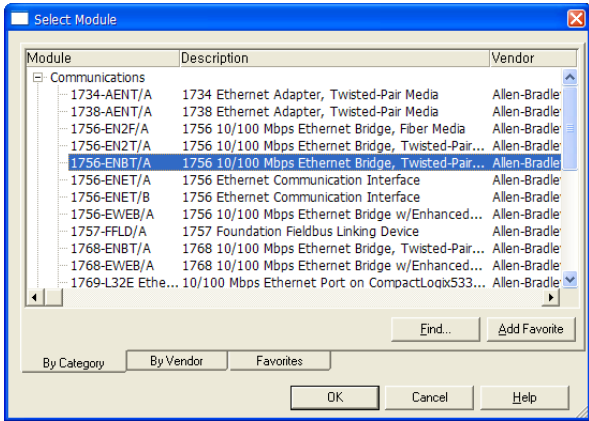
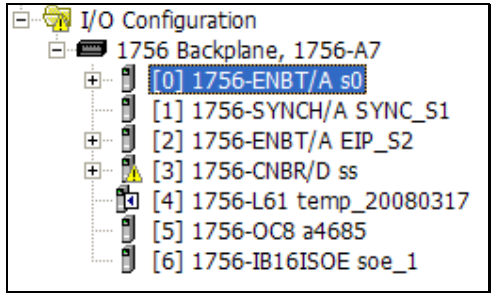
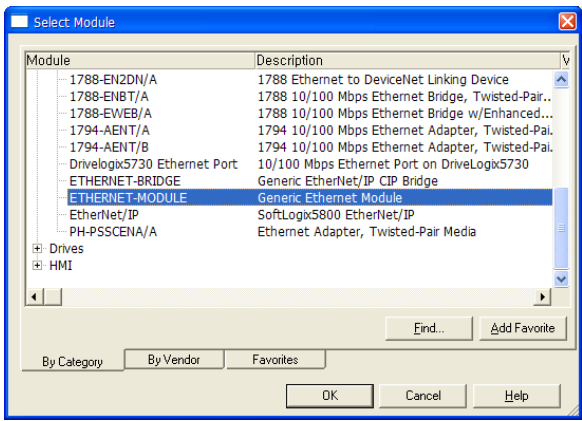
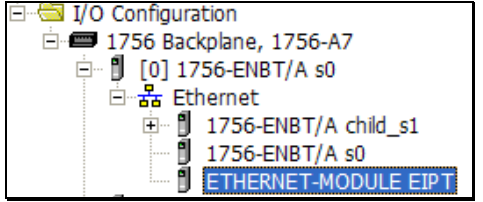
2) Set -up of XGT EtherNet/IP I/F Module Parameter

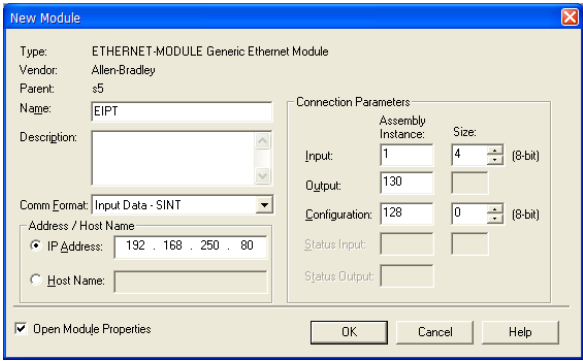
XGT is used as Server, so refer to the Server Set-up Contents in 6.2.3 above. Herein, for example, server has been set up to Channel No.0 and Block No.0.

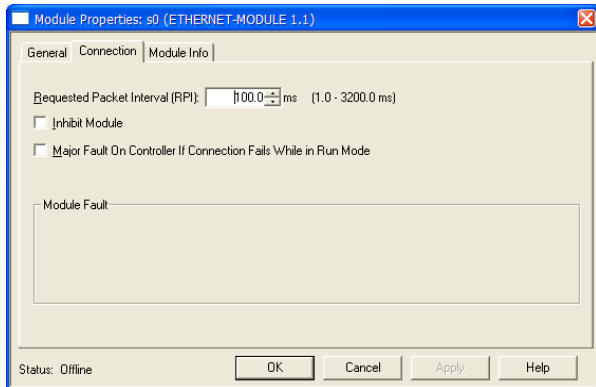
Order	Set-up Procedure	How to Set up														
1	Server Set-up															
		Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings		
		0	0	Implicit Server									2 BYTE	Local tag	Remote tag	Size
		1														2
1) Channel: Select the one among the channels where periodic servers have been set up. 2) Operating Mode: The operation mode of the channel set up in accordance with channel set-up is displayed. 3) Data Type: Enter the data type of the tag a user will set up 4) Local Tag : This tag is the device area of the module operating via server 5) Size: The data size of the module operating via server.																

3) Rockwell 1756-ENBT Communication Module and Communication Set-up

Set up Rockwell's Client using Rockwell's SW(RSLogix 5000).

Order	Set-up Procedure	How to Set up
1	Module Set - up	 
		Search for the module in I/O Configuration and install it
2	Network Module Installation	 
		1) If ENBT Module has been installed, extend it into network and install the module of the network connected. 2) Herein, the installation of Rockwell's module only is available, and modules, not Rockwell's one, are possible to set up, using Generic Device. 3) For the connection of XGT EtherNet/IP I/F Module, set up Generic Device.

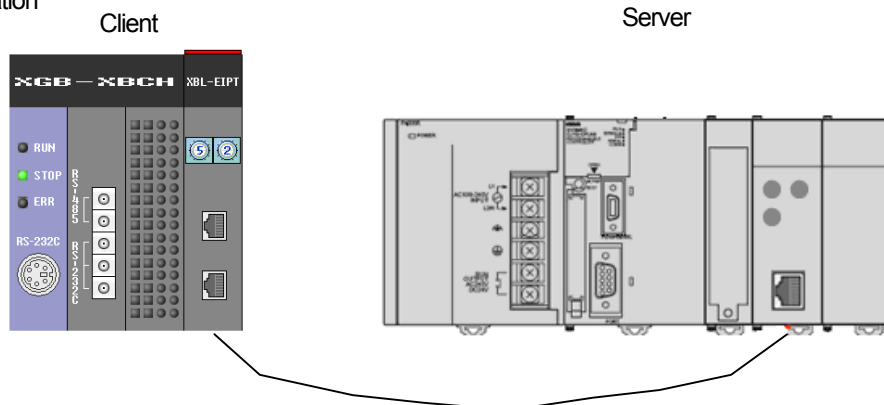
Order	Set-up Procedure	How to Set up
	Network Address and Connection Information Input	
3		1) Name: Enter the names that will be used to modules 2) IP Address: Enter IP of Server Module 3) Connection Parameter: Enter connection information. Mapping has been done between this information and block set-up number), and the number has been allotted to Consumed Tag input by blocks and Produced Tag output, respectively. Our EtherNet/IP module operates as server. (a) In case of Input Only 100+P2P index number at Input Assembly Instance in Generic EDS 198(Heartbeat Assembly Instance) at Output Assembly Instance - P2P index number in XBL-EIPT EDS (b) In case of Listen Only 100+P2P index number at Input Assembly Instance in Generic EDS 199(Heartbeat Assembly Instance) at Output Assembly Instance - P2P index number in XBL-EIPT EDS (c) In case of Exclusive Owner 100+P2P index number at Input Assembly Instance in Generic EDS 150 + P2P index number at Output Assembly Instance - P2P index number in XBL-EIPT EDS 4) Configuration Assembly Instance: 197 5) Size : When Generic EDS, Byte unit When XBL-EIPT EDS, Word unit

Order	Set-up Procedure	How to Set up										
4	PPI Set-up	 1) Requested Packet Interval (RPI): Set up the period of data that a user will receive from server. Client sets up on what information to get and the server adopts this set-up, data (Produced Tag) will be transmitted as the way set up. Thus, client allots to this RPI parameter in how long period server will transmit. 2) If clicking OK, parameter is downloaded and is automatically connected. Then, data communication starts.										
5	Data Check-out	<table><tr><td>- EIPT:I</td><td>{...}</td><td>{...}</td><td></td><td>AB:ETHERN...</td></tr><tr><td>+ EIPT:I.Data</td><td>{...}</td><td>{...}</td><td>Decimal</td><td>SINT[4]</td></tr></table> When a module set up, the tag named to Controller Tags in module name is automatically set up, so the check-out of data is confirmed in Controller Tags. In case of being set up as seen above, data check - out is available in EIPT: I.	- EIPT:I	{...}	{...}		AB:ETHERN...	+ EIPT:I.Data	{...}	{...}	Decimal	SINT[4]
- EIPT:I	{...}	{...}		AB:ETHERN...								
+ EIPT:I.Data	{...}	{...}	Decimal	SINT[4]								

6.5.2 Communication with OMRON CJ1W-EIPT Communication Module

This illustration is the example on when XGT EtherNet/IP I/F Module and OMRON CJ1W-EIPT Communication is communicated (Implicit). Then, the periodic client is XGT EtherNet/IP I/F and the server will be OMRON CJ1W-EIPT.

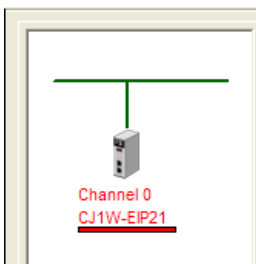
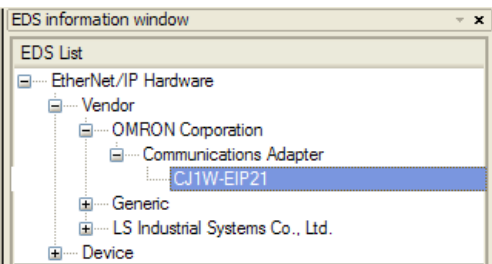
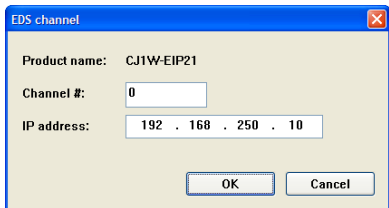
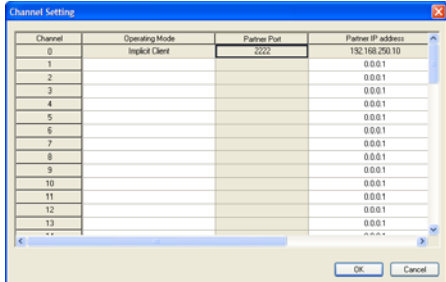
1) System Configuration



Segment	XGL-EIPT	
IP Address	192.168.250.100	192.168.250.10
Data Size	2 BYTE	2 BYTE
Reading Area	-	D0
Storing Area	MW0	-
Communication Method	Periodic Client (Implicit service)	Periodic Server

2) XGB EtherNet/IP I/F Module Parameter Set-up

In case of the basic set-up and EDS registry, the set-up is same as 6.2.1 - periodic client communication service.

Order	Set-up Procedure	How to Set up
1	EIP Configuration	  1) Drag registered EDS File from EDS Information Window and posts it on EIP Configuration Window. 2) As soon as EDS File is posted, Channel Set-up Window appears. 3) In Set-up Window, set up channel numbers and IP addresses.
2	Channel Set-up	  Set up channel numbers and IPs and start setting up blocks.

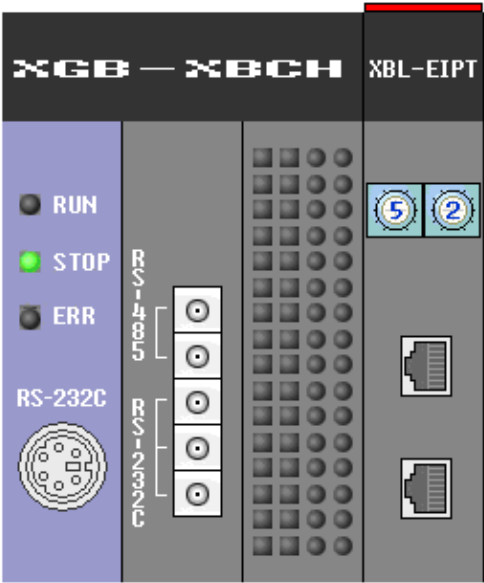
Order	Set-up Procedure	How to Set up														
	EIP Block Set-up	Index	Ch.	Operating Mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag	Transmission period(ms)	Time out	Data type	tag settings		
		0	0	Implicit Client	0:Input Only (Tag type)	Multicast		Parameter	T20 Size:1		200	0. RPI x4	2 BYTE	Local tag	Remote tag	Size
														%MW0	d0	1
3	If a user sets up blocks, using the channels set up, the information that has to be input in EDS File that OMRON Module provides appears. A user must enter this information and complete Connection. 1) I/O Type: The Connection name that EDS provides. 2) Connection Type: Select from Multicast/Unicast. 3) Transmission Period : Set up transmission period(RPI)(ms unit) 4) Timeout: Select as much as constant times of the time set up in transmission period and carry out set-up. 5) Remote Tag: Set up the tag of server side. On the server side tag must be set up already.															
4	1) After carrying out Write the EIP of Parameter, execute Enable EIP Link.															

Chapter 7 Diagnosis Function

This chapter describes how to check out systems and modules, how to check out network state, and how to download O/S. When checking out states of system configuration and EtherNet/IP I/F Module, a user should review the following procedure.

7.1 System Diagnosis

This diagnosis is the method to check out the state of EtherNet/IP I/F Module and systems. If click 'Online' → 'System Diagnosis' after clicking 'Online' → 'Connection' on XG-PD, the system diagnosis screen is open as seen in [Illustration 7.1.1] and Module Information Window is open in system diagnosis below as seen in [Illustration 7.1.2].



[Illustration 7.1.1] System Diagnosis Screen

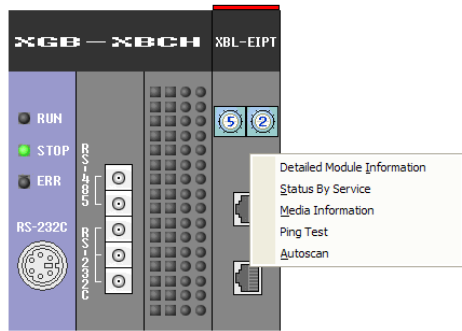
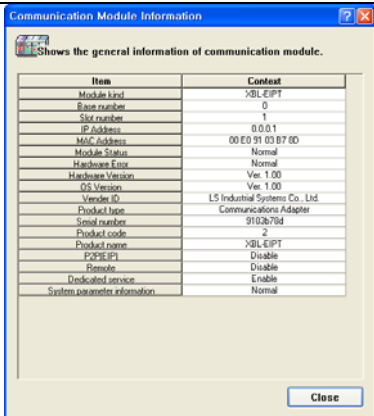
System information	Allocation information - Fixed	Comment
Base 0 : XGB-M11A		Main Base(11 Slots)
CPU : XGB-XBCH		High Performance CPU Module(I/O : Maximum 384 Points)
Slot 0 : Internal Cnet		Internal Cnet Module, RS-232C/RS-485
Slot 0 : XEC-DN/DP64H	[P00000 ~ P0003F]	DC 24V Input, Transistor Output, 64 Contacts (Sink Output/Source Output)
Slot 1 : XBL-EIPT	[P00040 ~ P0007F]	EtherNet/IP Module
Slot 2 : Empty slot	[P00080 ~ P0011F]	
Slot 3 : Empty slot	[P00120 ~ P0015F]	
Slot 4 : Empty slot	[P00160 ~ P0019F]	
Slot 5 : Empty slot	[P00200 ~ P0023F]	
Slot 6 : Empty slot	[P00240 ~ P0027F]	
Slot 7 : Empty slot	[P00280 ~ P0031F]	
Slot 8 : Empty slot	[P00320 ~ P0035F]	
Slot 9 : Empty slot	[P00360 ~ P0039F]	
Slot 10 : Empty slot	[P00400 ~ P0043F]	

[Illustration 7.1.2] Module Information Window

When Extension Base has been connected, if a user clicks the extension base on module information window to open System Diagnosis Screen, the system diagnosis screen of the extension base appears. The above [Illustration 7.1.1] and [Illustration 7.1.2] show the main base system diagnosis screen of the system composed of the main base and the extension base. If a user clicks the base 1 in [Illustration 7.1.2] to see the system diagnosis screen of the extension base in the above illustration, he can see the extension base diagnosis screen in Illustration [7.1.3].

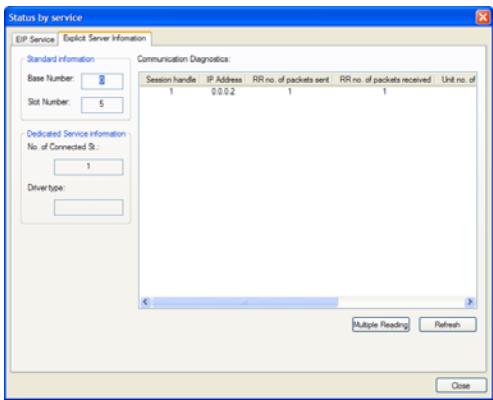
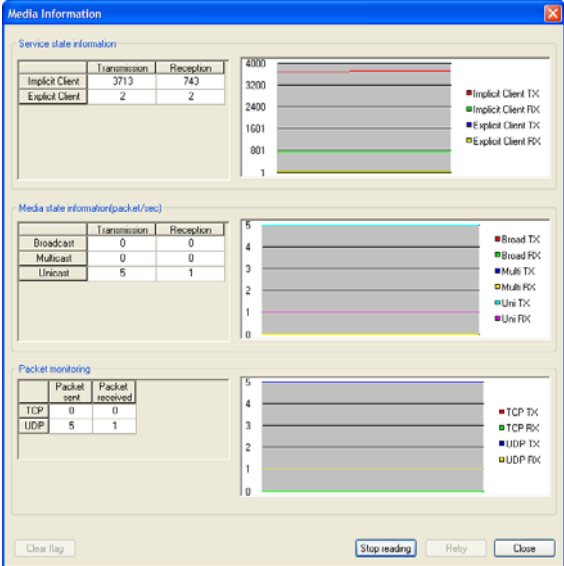
7.2 System Diagnosis Items and Contents

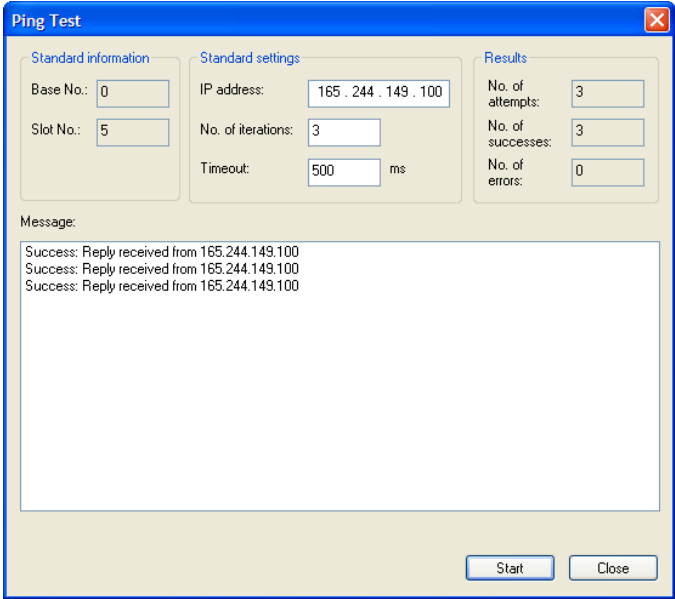
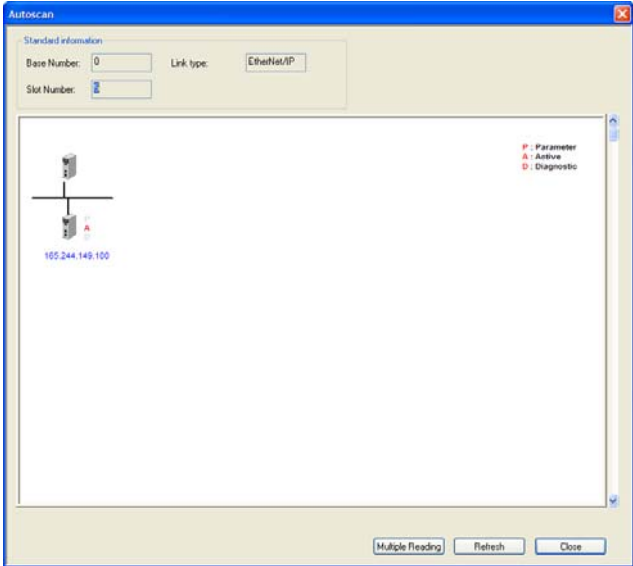
This part describes the diagnosis items and contents of EtherNet/IP I/F Module provided from XG-PD.

Order	Diagnosis Items	How to Set up and Contents
1	System Diagnosis	 1) Select XG-PD → 'Connection' → 'Online' → 'System Diagnosis' 2) Put the mouse on XGL-EIP and click it with the right side of the mouse to check out the diagnosis information of EtherNet/IP I/F Module a user wants.
2	Communication Module Information	 The general information of EtherNet/IP I/F Module is displayed. 1) Module Kind: Displays kinds of modules (XBL-EIPT). 2) Base No. : Displays the base location of the module installed. 3) Slot No.: Displays the slot location of the module located. 4) IP Address: Displays IP address set up in module. 5) MAC Address: Displays MAC address set up in the modules. 6) Module Status: Displays the state of the module. 7) Hardware Error: Displays whether the error of the hardware has been made or not. 8) Hardware Version: Displays the version of the hardware. 9) OS Version: Displays the version of module OS. 10) Vender ID: Vendor ID of Displays EtherNet/IP Module 11) Product Type: Displays the Product Type of Ethernet/IP 12) Serial No.: Displays the serial no. of the module. 13) Product Code: Displays the code No. of the module 14) Product Name : Displays the name of the module 15) Dedicated service: Displays when operation channel exists as aperiodic server 16) System parameter information: Displays basic parameter setting status

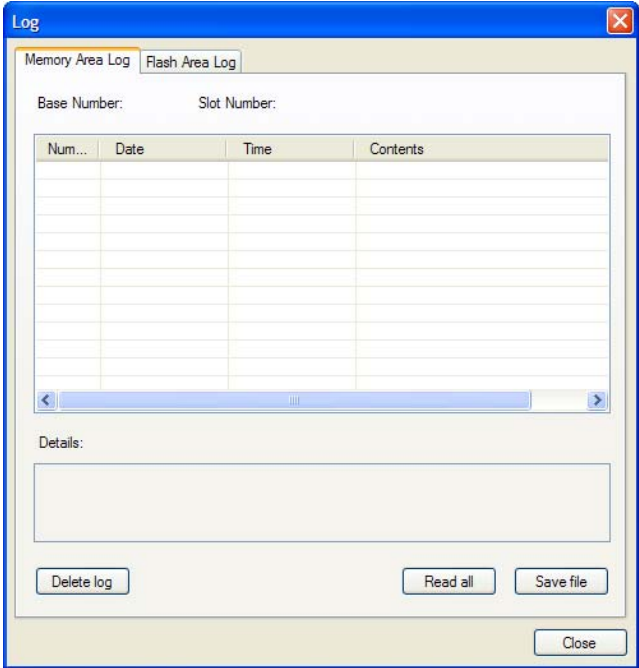
Order	Diagnosis Items	How to Set up and Contents												
	State by Services EIP Service	Status by service EIP Service Explicit Server Information Standard information Base Number: 0 Slot Number: 2 Service information Parameter existence: Exist No. of blocks in service: 1 Parameter task status: DOWNLOAD Communication Diagnostics: <table><thead><tr><th>service kind</th><th>Connection status</th><th>Block status</th><th>Service count per second</th><th>accumulative service count</th><th>accumulative error count</th></tr></thead><tbody><tr><td>Implicit Client</td><td>CONNECT</td><td>READY</td><td>5</td><td>1326</td><td>17</td></tr></tbody></table> Multiple Reading Refresh Close	service kind	Connection status	Block status	Service count per second	accumulative service count	accumulative error count	Implicit Client	CONNECT	READY	5	1326	17
service kind	Connection status	Block status	Service count per second	accumulative service count	accumulative error count									
Implicit Client	CONNECT	READY	5	1326	17									
3		1) Specific Flag Information Window (1) Block No. : Displays the index of the parameter that a user set up with EIP Service. (2) Channel No.: Displays the number of the channel that a user set up in each block. (3) Service Kind: Displays the type of the service that a user set up : Implicit Client / Implicit Server / Explicit Client (4) Connection Status: Displays whether EIP Block has been connected or not. ►CONNECT: State that connection has been completed ►IDLE: State that connection has not been completed (5) Block Status: Displays the block state of EIP Block ►NONEXIST: State that the set-up of connection has not been done ►REGSESSION: State that TCP Connection has been completed and EtherNet/IP Connection is in the process of being set up ►READY: State that communication is available ►BUSY: State that response on required frame has not been received yet (6) Service Count per Second: Displays how many times the service has been carried out per 1 second. (7) Accumulative Service Count : Displays the number of services till now (8) Accumulative Error Count : Displays the number of errors till now												

Chapter 7 Diagnosis Function

Order	Diagnosis Items	How to Set up and Contents
4	State by Services Explicit Server Information	 1) Session Handle : The original number granted to connected client 2) IP Address : IP Address of connected client 3) The Number of RR packets sent: The Number of Transmission Packets of the Message in the form of Request/Reply 4) The Number of RR Packets received: The Number of Reception Packets of the Message in the form of Request/Reply 5) The Number of Unit Packets sent: The Number of Transmission Packets of the Message used after connection set-up 6) The Number of Unit Packets received: The Number of Reception Packets of the Message used after connection set-up 7) The Number of Error Packets : The Number of Error Packets coming into Server
5	Media Information	 1) Service State Information: Displays the number of service completed in EtherNet/IP I/F Module. 2) Media State Information: Displays the packet quantity per second in service type of EtherNet/IP I/F Module. 3) Packet Monitoring

Order	Diagnosis Items	How to Set up and Contents
6	Ping Test	
	It is possible to check out the operation state of an opponent country by entering an opponent country's IP Address In case of not receiving the signal from an opponent country, it is necessary to check out the basic set-up information	
7	Auto Scan	
	A user can check out the system configuration state of the whole system. ▶ Parameter: In case EIP Parameter is set up, it is marked as 'P.' ▶ Active: The module operating normally (Online State) is marked as 'A.' ▶ Diagnostic: The module that diagnosis needs to be marked as 'D.'	

Chapter 7 Diagnosis Function

Order	Diagnosis Items	How to Set up and Contents
8	System Log	 In case a user cannot check out the performance of errors and services or stores the contents of the current memory area into flash, when pressing the Log switch, memory area log is automatically stored to flash. 1) Memory Area Log: Displays the history when errors and the problems in service performance are made. In case of Memory Area Log, when the power is turned off, it automatically extinct. 2) Flash Area Log: When a user presses the log switch on the module's front side, the log of the memory area is stored into memory, and even if the power is turned off, the history can be maintained.

7.3 Troubleshooting

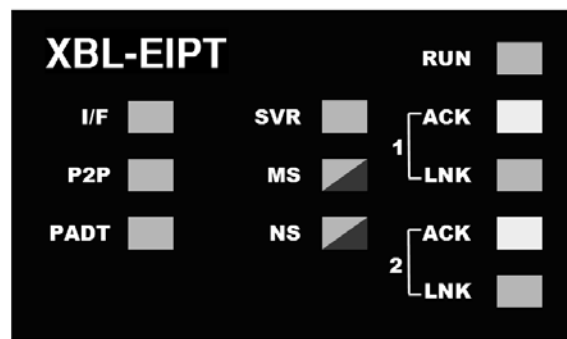
This part describes causes and actions on failures and errors that may happen in operating systems. When a user wants to check out errors and problems in EtherNet/IP I/F Module, the following procedure will help you check out those malfunctions. When judging whether the module is in abnormal state or not, make sure to take actions in order, using Troubleshooting. Do not repair and disassemble at your discretion.

7.3.1 Check-out through LED in Communication Module

This check-out is the way of checking out the state of the module to see whether it is defective or not.

1) Abnormal Operation Display

LED located on the front side of EtherNet/IP I/F Module enables a user to check out.



[Illustration 7.3.1] LED of EtherNet/IP I/F Module

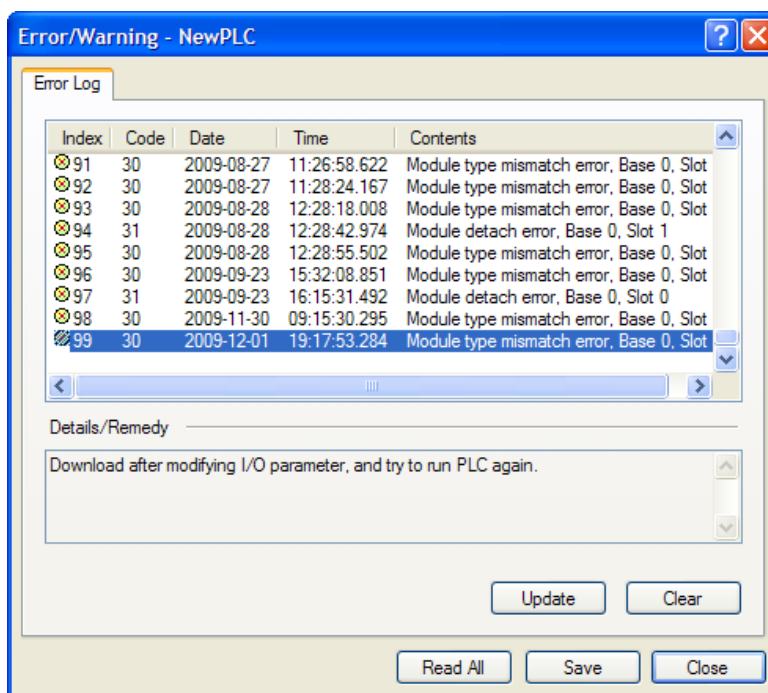
LED Contents	Error Contents	Actions
RUN	Light out after supplying the module power	1) Check out whether EtherNet/IP Communication Modules has been properly installed or not - Check out whether the DC 5V – supply power for power module has been normal or not. - Check out whether the communication module has been properly installed to the base 2) Consult with Warranty Service Center
I/F	Operation stops when light is on and off	1) Check out whether CPU and Communication Modules have been properly installed 2) Consult with Warranty Service Center
P2P	Light is off during service for command languages	1) Check out whether command language has been properly entered or not 2) Check out connection has been properly done or not 3) Check out whether Link Enable in Menu is on or not
PADT	Light is off during remote connection service	1) Check out whether telephone office numbers for remote connection(PADT) have been properly set up or not 2) Check out whether PADT Program – Remote Connection has been canceled
SVR	Light is off during server operation	1) Check out whether the connection with client has been properly done
MS	Red light is on and off	1) Check out the basic set-up and supply power again
	Red light is on	1) Supply power again 2) Consult with Warranty Service Center
NS	Red light is on and off	1) Check out the device where Timeout happened
	Red light is off	1) Set up IP Address again (Find the same IP Address)

Chapter 7 Diagnosis Function

LED Contents	Error Contents	Actions
ACT	Light is off during normal communication	1) Check out the transmission or reception parameter 2) Check out whether connection has been properly done
LNK	Light is off during normal communication	1) Check out whether cables have been properly connected ports 2) Check out whether an opponent's port is normally operating ha been

7.3.2 Check out of Module Errors through XG5000

It is possible to simply monitor errors of the module through XG5000 Program. After connecting RS-232C or USB Connector to CPU, check out online' → 'PLC History', 'PLC Error /Warning'in XG5000.



[Illustration 7.3.2] PLC History - Specific Information Monitor

In case hard errors or CPU interface errors are made to the module, naturally LED abnormally operates, but it is possible to figure out this state, using exclusive programs.

[Illustration 7.7.2] will help a user check out error/warning information through PLC history from [Online] of XG5000 and it is possible to solve problems by referring to "Details and Actions" contents.

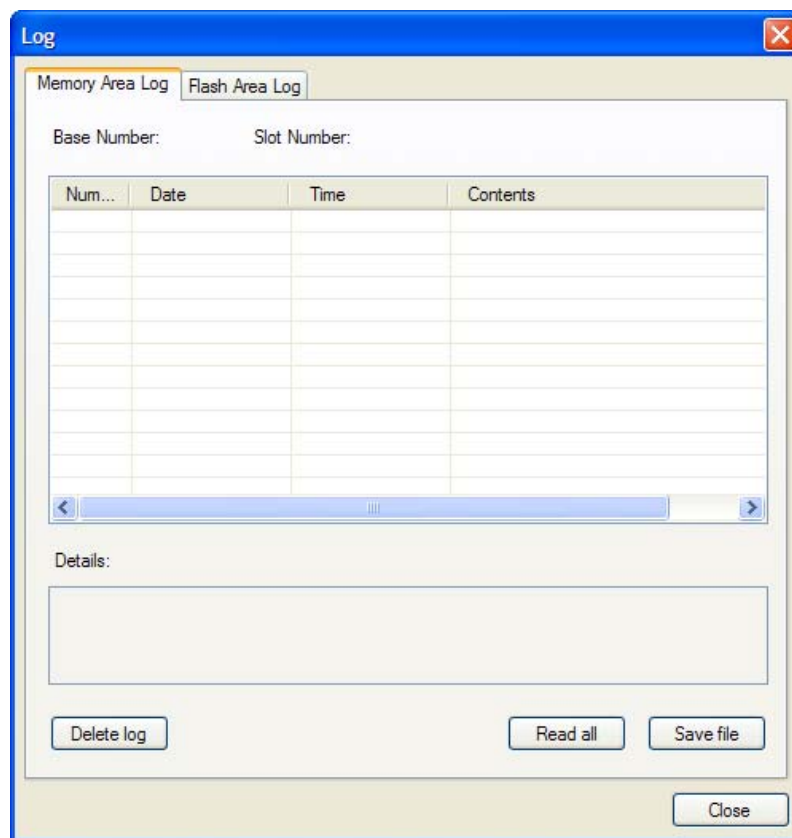
7.3.3 Check-out on Module Errors through System Log

It is possible to monitor whether communication module has been malfunctioned through XG-PD Program. After connecting RS-232C or USB Connector to CPU Module, click EtherNet/IP I/F Module with the right side of the mouse on "Diagnosis Screen" in XG-PD and select "System Log," and then Log Screen is open.

1) Memory Area Log

It is possible to check out whether errors have been made or services have been performed.

[Illustration 7.3.3] shows the memory area log screen of 'System Log.'



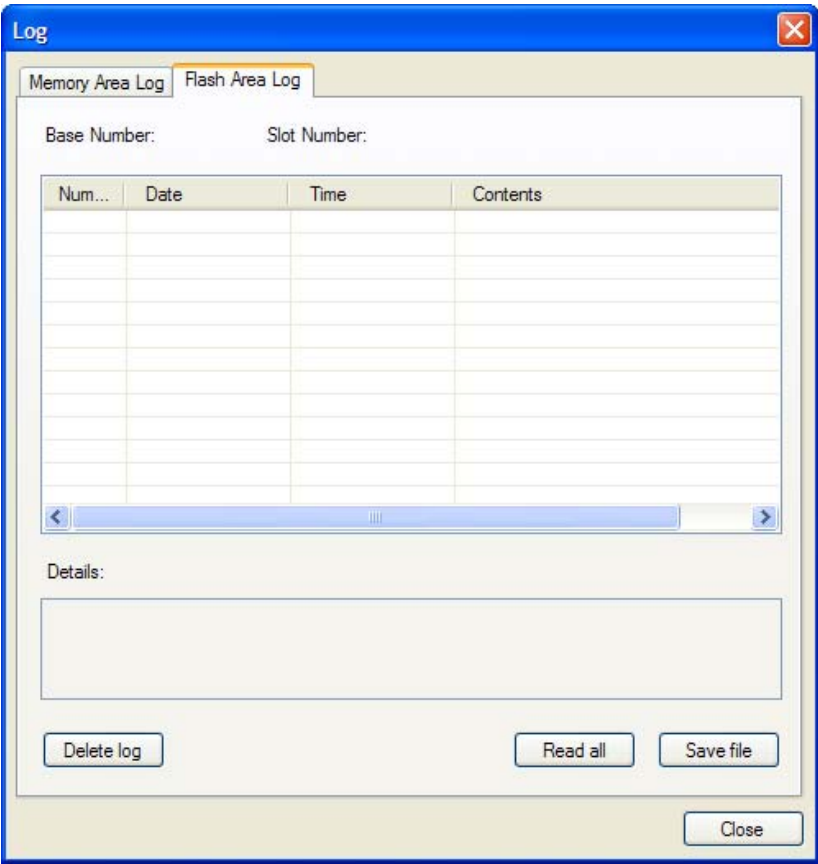
[Illustration 7.3.3] Memory Log Area Screen of 'System Log'

It is possible to check out the date, time, contents when events, such as error occurring or service performing, happened.

1) Flash Area Log

If it is impossible to check out errors or service performances through XG-PD or if a user wants to store the contents in current memory area into flash, when pressing Log Switch on the front side on EtherNet/IP I/F Module, memory area log is automatically stored to Flash.

[Illustration 7.3.4] shows the flash area – log screen of 'System Log.'



[Illustration 7.3.4] Flash Area Log Screen of 'System Log'

Appendix

A.1 Terms

1. IEEE 802.3

IEEE 802.3 regulates standards on Ethernet based on CSMA/CD. In other words it is a short distance net(LAN) based on CSMA/CD (Carrier Sense Multiple Access with Collision Detection) Ethernet devised by IEEE 802.3 Group, divided into the following specific projects.

(1) IEEE P802.3 - 10G Base T Study Group

(2) IEEE P802.3ah - Ethernet in the First Mile Task Force

(3) IEEE P802.3ak - 10G Base-CX4 Task Force

※ Ethernet and IEEE 802.3 must be standardized in RFC894 and RFC1042, and mutual frame processing must be possible.

2. ARP (Address Resolution Protocol)

This Protocol is created to find MAC Address, using an opponent's IP address in Ethernet LAN.

3. Bridge

This is the device used to connect two networks so that they can operate as if those two were one. Bridge is used to connect two networks and also applied to divide one big network into two small networks for improving performance ability.

(1) Related Standards: IEEE 802.1D

(2) Bridge (Layer2 Switch) is the device connected in Layer 2, which extends transmission limit distance of Ethernet and operates in Filtering and Forwarding as well.

4. Client

This refers to a user of network service, or a computer or a program using the resources of other computer (In general, the part who asks for services).

5. CSMA/CD (Carrier Sense Multiple Access with Collision Detection)

Each Client transmits its own data in case network is empty by checking out(Carrier Sense) whether there is a signal or not before sending off data to network. Then, all Clients are same in authority for transmission (Multiple Access), and if Clients more than two ones transmit, collision conflict occurs and the Client that detected these transits again in fixed hours.

6. DNS (Domain Name System)

This system is the method used to convert Domain Name on the internet in alphabet into Internet Number (Namely, IP Address) corresponding to it.

7. Dot Address

This refers to IP Address expressed into '100.100.100.100' and each number is represented in decimal number, and it takes up 1 BYTE among 4 BYTES in total.

8. E-mail Address

This is the address of a user having his login account in the special device connected through the internet, and in general, it is expressed in a user's ID@ domain name (Device Name). In other words, it is expressed like [hjje@microsoft.com](mailto:hjee@microsoft.com), where @ is called "at" and it is the key board appearing if a user press shift+2 on keyboard. The letters in the back of "@" refer to special institutions (school, research center, corporation ...) and the letters in front of "@" becomes a user's ID.

The end letters in domain name are top-ranked ones, and in case of USA, the following abbreviation is mostly used and in case of Korea, Korea is expressed in .kr for displaying nationality:

.com: usually corporations (company) / .edu: usually educational institutions like university (education). / .ac (academy) used in Korea, / .gov: governmental institutions, for example, NASA - nasa.gov (government) / .mil: sites related to the military. For example, USA air force is "to af.mil, (military)" / .org means private organizations. Nations are expressed as follows: (/ .au: Australia / .uk: England / .ca: Canada / .kr: Korea / .jp: Japan / .fr: France / .tw: Taiwan, etc.).

9. Ethernet

This net is LAN Connection System (IEEE 802.3) that USA (Xerox), Intel, and DEC jointly developed. Ethernet, a network connection with 10Mbps transmission ability and 1500 BYTE packet used, can collect a variety of computers in network. Thus, it is called "pronoun of LAN" and the diverse products in generality in size, not for special providers, have been launched.

10. Gateway

This part is software/hardware translating two different protocols and is the device corresponding to the exit enabling a user to exchange information with other systems.

11. Header

This device is the part of the packet including own country's and an opponent country's addresses, and the part for checking out errors.

12. ICMP (Internet Control Message Protocol)

This protocol creates error messages and test packets for managing internet via extension protocol of IP address and is designed to report errors and take control.

13. IP (Internet Protocol)

This protocol is designed for network layers for internet. This is the protocol in non-connective datagram which transmits and receives data as data like TCP, UDP, ICMP, IGMP uses IP (32BYTE).

14. IP Address

This term means the address on internet in each computer composed of numbers and this address consists of **binary numbers** in 32BYTE (4BYTE) size to classify each device on internet. IP address is divided into 2 parts in total and is composed of address for classifying network and host address for dividing hosts. IP address is classified into 3 classes - (Class) A/ B/ C – according to how many BYTES are allotted to network address and host address. IP address is unique one over the world, so it is not decided at discretion but NIC (Network Information Center), the regional information net center allots when subscribing to internet, and In case of Korea, KRNIC (Korea Network Center) is in charge of allotment. Example) 165,244.149.190

15. ISO (International Organization for Standardization)

This organization is a subsidiary under UN established to enact international standards and to carry out management.

16. LAN (Local Area Network)

This network is a short distance network or an information communication network in region which enables a user to connect a variety of computers in limited scope and to exchange data with each other.

17. MAC (Medium Access Control)

This term refers to the way of deciding which device will use network within given time In Broadcast Network.

18. Node

Each computer connected to network net is called "node," respectively.

19. Packet

This is a bundle of data which becomes the basic unit for transmitting data via network. In general packet creates a bundle in size from tens to hundreds BYTE. On the front side of each bundle Header is posted and the information on which way this bundle to be sent and more information required are added.

20. PORT number

This number is an identifier used to classify applications on TCP/UDP. On TCP, this PORT number is used to decide to which PORT data should be sent and the program used in general operation system has each own PORT.

Example) 21/tcp: Telnet

21. PPP (Point-to-Point Protocol)

This protocol is an agreement on telephone communication that allows packets to be transmitted. In other words, it is the commonest protocol on internet that enables a computer to be connected to TCP/IP through general telephone lines and modems.

This protocol is similar to SLIP, but it is equipped with modern – communication protocol factors such as error detection, data compression, etc., so it displays excellent performances compared to SLIP.

22. Protocol

Protocol is the regulations on how computers connected to network transmit and receive information with each other. Protocol means the regulation for exchanging messages on high level as the interface between one device and the other device is specifically described on low level(For example, which BIT/BYTE should go through lines) or files are transmitted through internet.

23. Router

This device is used to transmit data packets between networks. It also judges whether to send data packets to the final destination or not and whether to wait or not if network is busy, and which LAN to be connected to from a plural LAN diverging point. In other words, this device is a special computer /software that manage the connection for more than two networks.

24. Server

This term means the part which passively responds to Client's request and shares its own resources.

25. TCP (Transmission Control Protocol)

(1) Transport Layer Protocol for the Internet

- Supports Transmission/Reception, using Connection
- Supports Multiplexing Function
- Performs reliable transmission of data in connecting - oriented aspect
- Supports transmission of emergency data

26. TCP/IP (Transmission Control Protocol/Internet Protocol)

This term means the agreement on transmission for communication between computers in different model. This protocol plays a role that enables the communication between general PC and medium host, IBM PC and MAC, and among medium or large scaled computers produced by other manufactures. This term is used as a general term of the protocol for transmitting the information between computer networks and included FTP, Telnet, SMTP, etc. TCP is divided into data packets and transmitted by IP, and the packet transmitted is configured by TCP again.

27. Near-end crosstalk

Near-end crosstalk is a kind of disturbance generated by the electricity from a communication signal or a magnetic field that affect other signals in neighboring lines. In telephone line, near-end crosstalk may cause some dialogue contents on other lines to be heard. The phenomenon generated by near-end crosstalk is called "Electro Magnetic Interference." This may happen on small circuits in computer or audio equipments as well as network lines. This term may be applied to optic signals that disturb each other. For example, as seen in an insulated conductor of a telephone cable, if electrostatic coupling or electromagnetic coupling between one insulated conductor and the other insulated conductor occurs and the phone current on one insulated conductor is derelict to other insulated conductor, crosswalk-talk happens. Of these crosswalk-talks, the crosswalk-talk that happened to a transmitting part called "Near-end crosstalk" and the one that happened to a receiving part is called Far-end crosstalk.

A.2 Flag List

A.2.1 Special Relay (F) List

Word	Bit	Variable	Function	Description
F000~1	-	_SYS_STATE	Mode and State	Displays the Mode and Run State of PLC
	F0000	_RUN	RUN	Run State
	F0001	_STOP	STOP	Stop state
	F0002	_ERROR	ERROR	Error state.
	F0003	_DEBUG	DEBUG	Debug State
	F0004	_LOCAL_CON	LOCAL CONTROL	Local Control Mode
	F0006	_REMOTE_CON	REMOTE MODE	Remote Control Mode
	F0008	_RUN_EDIT_ST	CORRECTING WHILE RUN	Downloading Correction Program while Run.
	F0009	_RUN_EDIT_CHK	CORRECTING WHILE RUN	Internal Processing for Correction while Run
	F000A	_RUN_EDIT_DONE	CORRECTION COMPLETED WHILE RUN	Correction Completed while Run
	F000B	_RUN_EDIT_END	CORRECTION END WHILE RUN	Correction Ended while Run
	F000C	_CMOD_KEY	OPERATION MODE	Operation Mode Transformed by the Key
	F000D	_CMOD_LPADT	OPERATION MODE	Operation Mode Transformed by the Local PADT
	F000E	_CMOD_RPADT	OPERATION MODE	Operation Mode Transformed by Remote PADT
	F000F	_CMOD_RLINK	OPERATION MODE	Operation Mode Transformed by Remote Communication Mode
	F0010	_FORCE_IN	FORCIBLE ENTRY	Forcible Entry State
	F0011	_FORCE_OUT	FORCIBLE OUTPUT	Forcible Output State
	F0014	_MON_ON	MONITOR	Executing Monitor
	F0015	_USTOP_ON	STOP	Stopped by Stop Function
	F0016	_ESTOP_ON	ESTOP	Stopped by EStop Function
	F0017	_CONPILE_모드	COMPILING	Performing Compiling
	F0018	_INIT_RUN	INITIALIZING	Performing Initializing Task
	F001C	_PB1	PROGRAM CODE 1	Program Code 1 Selected
	F001D	_PB2	PROGRAM CODE 2	Program Code 2 Selected
	F001E	_CB1	COMPILE CODE1	Compile Code 1 Selected
	F001F	_CB2	COMPILE CODE 2	Compile Code 2 Selected

Appendix

Word	Bit	Variable	Function	Description
F002~3		_CNF_ER	SYSTEM ERROR	Reports Serious Failure State of the System
	F0021	_IO_TYER	MODULE TYPE ERROR	Module Type does not corresponds.
	F0022	_IO_DEER	MODULE REMOVAL ERROR	Module Removed
	F0024	_IO_RWER	MODULE IN/OUTPUT ERROR	Problems occurred in to Module In/Output
	F0025	_IP_IFER	MODULE INTERFACE ERROR	Problems occurred in the special/communication module interface
	F0026	_ANNUM_ER	EXTERNAL DEVICE ERROR	Serious Errors detected from External Devices
	F0028	_BPRM_ER	BASIC PARAMETER	Errors in Basic Parameter
	F0029	_IOPRM_ER	IO PARAMETER	Errors with IO Configuration Parameter
	F002A	_SPPRM_ER	SPECIAL MODULE PARAMETER	Special Module Parameter is in Abnormal State
	F002B	_CPPRM_ER	COMMUNICATION MODULE PARAMETR	Communication Module Parameter is in Abnormal State
	F002C	_PGM_ER	PROGRAM ERROR	Errors in Program
	F002D	_CODE_ER	CODE ERROR	Errors in Program Code
	F002E	_SWDT_ER	SYSTEM WATCH DOG	Scan Watchdog Operated
	F0030	_WDT_ER	SCAN WATCHDOG	Scan Watchdog Operated
F004	-	_CNF_WAR	SYSTEM WARNIGN	Reports on the Light Errors of the System
	F00041	_DBCK_ER	BACKUP ERROR	Problem Occurred in Data Back Up
	F00043	_ABSD_ER	OPERATION ERROR STOP	Stops due to Abnormal Operation
	F00046	_ANNUM_WAR	EXTERIAL DEVCIE ERROR	The Light Error of the External Device Detected
	F00048	_HS_WAR1	HIGH SPEED LINK1	High Speed Link – abnormal
	F00049	_HS_WAR2	HIGH SPEED LINK2	High Speed Link – abnormal
	F0054	_P2P_WAR1	P2P PARAMETER 1	P2P – abnormal
	F0055	_P2P_WAR2	P2P PARAMETER 2	P2P – abnormal
	F0056	_P2P_WAR3	P2P PARAMETER 3	P2P – abnormal
	F005C	_CONSTANT_ER	FIXED PERIOD ERROR F	Fixed Period Errors

Word	Bit	Variable	Function	Description
F009	-	_USER_F	USER CONTACING POINT	User Usable Timer
	F0090	_T20MS	20ms	20ms Periodic Clock
	F0091	_T100MS	100ms	100ms Periodic Clock
	F0092	_T200MS	200ms	200ms Periodic Clock
	F0093	_T1S	1s	1s Periodic Clock
	F0094	_T2S	2s	2s Periodic Clock
	F0095	_T10S	10s	10s Periodic Clock
	F0096	_T20S	20s	20s Periodic Clock
	F0097	_T60S	60s	60s Periodic Clock
	F0099	_ON	ALWAYS - ON	Always On – State Bit
	F009A	_OFF	ALWAYS - ON	Always Off – State Bit
	F009B	_1ON	1 SCAN - ON	1 st Scan Only On –State
	F009C	_1OFF	1 SCAN -OFF	1 st Scan Only Off –State
	F009D	_STOG	ANTI - CLOCK	Every Scan Anti –Clocked
F010	-	_USER_CLK	USER-CLOCK	User Set-up Available Clock
	F0100	_USR_CLK0	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 0
	F0101	_USR_CLK1	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 1
	F0102	_USR_CLK2	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 2
	F0103	_USR_CLK3	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 3
	F0104	_USR_CLK4	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 4
	F0105	_USR_CLK5	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 5
	F0106	_USR_CLK6	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 6
	F0107	_USR_CLK7	DEIGNATED SCAN REPEATED	On/Off Clock as much as Designated Scan 7
F0011	-	_LOGIC_RESULT	LOGIC RESULTS	Displays Logic Results
	F00110	_LER	CALCULATION ERROR	On during 1 Scan when Errors made to Calculation
	F00111	_ZERO	ZERO FLAG	On if Calculation Result is 0
	F00112	_CARRY	CARRY FLAG	On if Carry occurred during Calculation
	F00113	_ALL_OFF	ALL OUTPUT OFF	On if All Outputs are OFF
	F00115	_LER_LATCH	CALCULATION ERROR LATCH	On Maintained when Errors made to Calculation
F0012	-	_CMP_RESULT	COMPARISION RESULTS	Display Comparison Results
	F0120	_LT	LT FLAG	On if “ Less Than ”
	F0121	_LTE	LTE FLAG	On if “The Same or Less Than”
	F0122	_EQU	EQU FLAG	On if “The Same ”
	F0123	_GT	GT FLAG	On if “Larger Than ”
	F0124	_GTE	GTE FLAG	On “Larger Than or The Same ”
	F0125	_NEQ	NEQ FLAG	On if “Not The Same ”
F014	-	_FALS_NUM	FALS NUMBER	Displays the Number of FALS

Appendix

Word	Bit	Variable	Function	Description
F015	-	_PUTGET_ERR0	PUT/GET ERROR 0	Main Base PUT / GET ERROR
F023	-	_PUTGET_NDR0	PUT/GET COMPLETED 0	Main Base PUT / GET COMPLETED
F044	-	_CPU_TYPE	CPU TYPE	Displays the Information on CPU Type
F045	-	_CPU_VER	CPU VERSION	Displays CPU Version
F046	-	_OS_VER	O/S VERSION	Displays O/S Version
F048	-	_OS_DATE	O/S DATE	Displays O/S Distribution Date
F050	-	_SCAN_MAX	MAXIMUM SCAN TIME	Displays Maximum Scan Time
F051	-	_SCAN_MIN	MINIMUM SCAN TIME	Displays Minimum Scan Time
F052	-	_SCAN_CUR	CURRENT SCAN TIME	Displays Current Scan Time.
F0053	-	_MON_YEAR	MONTH / YEAR	Month, Year Data of PLC
F0054	-	_TIME_DAY	HOUR / DATE	Hour, Date Data of PLC
F0055	-	_SEC_MIN	SECOND / MINUTE	Second, Minute Data of PLC
F0056	-	_HUND_WK	100 YEARS / DAY	100 Years , Minute Data of PLC
F0057	-	_FPU_INFO	Not used	
	F00570	_FPU_LFLAG_I	Not used	
	F00571	_FPU_LFLAG_U	Not used	
	F00572	_FPU_LFLAG_O	Not used	
	F00573	_FPU_LFLAG_Z	Not used	
	F00574	_FPU_LFLAG_V	Not used	
	F0057A	_FPU_FLAG_I	Not used	
	F0057B	_FPU_FLAG_U	Not used	
	F0057C	_FPU_FLAG_O	Not used	
	F0057D	_FPU_FLAG_Z	Not used	
	F0057E	_FPU_FLAG_V	Not used	
	F0057F	_FPU_FLAG_E	IRREGULAR VALUE ENTRY	Reports when Entering Irregular Value
F0058	-	_ERR_STEP	ERROR STEP	Stores Error Step.
F0060	-	_REF_COUNT	REFRESH	Increases if Module Refresh Performed
F0062	-	_REF_OK_CNT	REFRESH OK	Increases if Module Refresh is in Normal State
F0064	-	_REF_NG_CNT	REFRESH NG	Increases if Module Refresh in Abnormal State
F0066	-	_REF_LIM_CNT	REFRESH LIMIT	Increases if Module Refresh in Abnormal State (Timeout)
F0068	-	_REF_ERR_CNT	REFRESH ERROR	Increases if Module Refresh in Abnormal State
F0070	-	_MOD_RD_ERR_CNT	Not used	
F0072	-	_MOD_WR_ERR_CNT	Not used	
F0074	-	_CA_CNT	Not used	
F0076	-	_CA_LIM_CNT	Not used	
F0078	-	_CA_ERR_CNT	Not used	
F0080	-	_BUF_FULL_CNT	BUFFUR FULL	Increases if CPU Internal Buffer FULL

Word	Bit	Variable	Function	Description
F0082	-	_PUT_CNT	PUT COUNT	Increases if Performing PUT.
F0084	-	_GET_CNT	GET COUNT	Increases if Performing GET.
F0086	-	_KEY	CURRENT KEY	Displays the Current State of Local Key.
F0088	-	_KEY_PREV	PREVIOUS KEY	Displays the Previous State of Local Key
F0090	-	_IO_TYER_N	INCONSISTENT SLOT	Displays Module Type – Inconsistent Slot No.
F0091	-	_IO_DEER_N	REMOVAL SLOT	Displays Slot No. where Module Removal Occurred
F0093	-	_IO_RWER_N	RW ERROR SLOT	Displays Module Read/Write –Error Slot No.
F0094	-	_IP_IFER_N	I/F ERROR SLOT	Displays Interface Error Slot No.
F0096	-	_IO_TYER0	MODULE TYPE 0 ERROR	Main Base - Module Type Error
F0104	-	_IO_DEER0	MODULE REMOVAL 0 ERROR	Main Base Module Removal Error
F0120	-	_IO_RWER0	MODULE RW 0 ERROR	Main Base - Module Read/Write Error
F0128	-	_IO_IFER_0	MODULE I/F 0 ERROR	Main Base Module - Interface Error
F0140	-	_AC_FAIL_CNT	POWER SHUT-OUT FREQUENCY	Stores the Frequency that Power has been Shut out.
F0142	-	_ERR_HIS_CNT	ERROR OCCURRENCE FREQUENCY	Stores the Frequency that Errors were Made
F0144	-	_MOD_HIS_CNT	MODE CONVERSION FREQUENCY	Stores the Frequency that the Mode has been Converted
F0146	-	_SYS_HIS_CNT	HISTORY OCCURRENCE FREQUENCY	Stores the Frequency that the System History Occurred.
F0148	-	_LOG_ROTATE	LOG ROTATE	Stores Log Rotate Information
F0150	-	_BASE_INFO0	SLOT INFORMATION 0	Main Base Slot Information
F200	-	_USER_WRITE_F	USABLE CONTACTING POINT	Contacting Point Usable in Program
	F2000	_RTC_WR	RTC RW	Writes and Read Data to RTC
	F2001	_SCAN_WR	SCAN WR	Scan Value Initialization
	F2002	_CHK_ANC_ERR	EXTERNAL SERIOUS FAILURE REQUEST	Requires Serious Failures from External Devices
	F2003	_CHK_ANC_WAR	EXTERNAL WARNING REQUEST	Requests to Detect Light Failures from External Devices
F201	-	_USER_STAUS_F	USER CONTACTING POINT	User Contacting Point
	F2010	_INIT_DONE	INITIALIZATION COMPLETED	Displays Initialization Task Performance Completed
F202	-	_ANC_ERR	EXTERNAL SERIOUS FAILURE INFORMATION	Displays Serious Failures Information of External Devices
F203	-	_ANC_WAR	EXTERNAL LIGHT FAILURE WARNING	Displays the Light Failures Information of External Devices
F210	-	_MON_YEAR_DT	MONTH / YEAR	Clock Information Data (Month / Year)
F211	-	_TIME_DAY_DT	HOUR / DAY	Clock Information Data (Hour / Day)
F212	-	_SEC_MIN_DT	SECOND / MINUTE	Clock Information Data (Second / Minute)
F213	-	_HUND_WK_DT	100 YEARS / DAY	Clock Information Data(100 Years / Day)

Appendix

(2) Common area

Communication flag according to P2P service setting
In case of XGB, P2P parameter 1~3, P2P block 0~31

Device	IEC type	Key word	Type	Description
L5120	%LX8192	_P2P1_NDR00	Bit	P2P Parameter 1 block 0 service normal end
L5121	%LX8193	_P2P1_ERR00	Bit	P2P Parameter 1 block 0 service abnormal end
L513	%LW513	_P2P1_STATUS00	Word	When P2P Parameter 1 block 0 service abnormal end, indicates error code.
L514	%LD257	_P2P1_SVCCNT00	Double Word	Indicates P2P Parameter 1 block 0 service normal execution count
L516	%LD258	_P2P1_ERRCNT00	Double Word	Indicates P2P Parameter 1 block 0 service abnormal execution count
L5180	%LX8288	_P2P1_NDR01	Bit	P2P Parameter 1 block 1 service normal end
L5181	%LX8289	_P2P1_ERR01	Bit	P2P Parameter 1 block 1 service abnormal end
L519	%LW519	_P2P1_STATUS01	Word	When P2P Parameter 1 block 1 service abnormal end, indicates error code.
L520	%LD260	_P2P1_SVCCNT01	Double Word	Indicates P2P Parameter 1 block 1 service normal execution count
L522	%LD264	_P2P1_ERRCNT01	Double Word	Indicates P2P Parameter 1 block 1 service abnormal execution count
L524~L529	%LW524~%LW529	-	Word	P2P parameter1 block 2 service
L530~L535	%LW530~%LW535	-	Word	P2P parameter1 block 3 service
L536~L697	%LW536~%LW697	-	Word	P2P parameter1 block 4~30 service
L698~L703	%LW698~%LW703	-	Word	P2P parameter1 block 31 service

A.2.2 Network Register (N) List

This chapter describes on communication network register (P2P parameter: 1~3, P2P block: 0~31)

Device	IEC type	Key word	Type	Description
N000	%NW000	_P1B00SN	Word	Saves P2P parameter1 block 00's partner station number.
N0001~0004	%NW0001~0005	_P1B00RD1	Word	Saves Saves P2P parameter1 block 00 Read area device 1
N005	%NW006	_P1B00RS1	Word	Saves Saves P2P parameter1 block 00 Read area size 1
N0006~0009	%NW0007~0011	_P1B00RD2	Word	Saves Saves P2P parameter1 block 00 Read area device 2
N010	%NW012	_P1B00RS2	Word	Saves Saves P2P parameter1 block 00 Read area size 2
N0011~0014	%NW0013~0017	_P1B00RD3	Word	Saves Saves P2P parameter1 block 00 Read area device 3
N015	%NW018	_P1B00RS3	Word	Saves Saves P2P parameter1 block 00 Read area size 3
N0016~0019	%NW0019~0023	_P1B00RD4	Word	Saves Saves P2P parameter1 block 00 Read area device 4
N020	%NW024	_P1B00RS4	Word	Saves Saves P2P parameter1 block 00 Read area size 4
N0021~0024	%NW0025~0029	_P1B00WD1	Word	Saves Saves P2P parameter1 block 00 Save area device 1
N025	%NW030	_P1B00WS1	Word	Saves Saves P2P parameter1 block 00 Save area size 1
N0026~0029	%NW0031~0035	_P1B00WD2	Word	Saves Saves P2P parameter1 block 00 Save area device 2
N030	%NW036	_P1B00WS2	Word	Saves Saves P2P parameter1 block 00 Save area size 2
N0031~0034	%NW0037~0041	_P1B00WD3	Word	Saves Saves P2P parameter1 block 00 Save area device 3
N035	%NW042	_P1B00WS3	Word	Saves Saves P2P parameter1 block 00 Save area size 3
N0036~0039	%NW0043~0047	_P1B00WD4	Word	Saves Saves P2P parameter1 block 00 Save area device 4
N040	%NW0048	_P1B00WS4	Word	Saves Saves P2P parameter1 block 00 Save area size 4
N0041~0081	%NW0049~0097	-	Word	P2P parameter 1 block 01 Save area
N0082~0122	%NW0098~0146	-	Word	P2P parameter 1 block 02 Save area
N0123~1311	%NW0147~1567	-	Word	P2P parameter 1 block 03 ~ 31 Save area
N1312~2623	%NW1568~3135	-	Word	P2P parameter 2 Save area
N2624~3935	%NW3136~4703	-	Word	P2P parameter 3 Save area

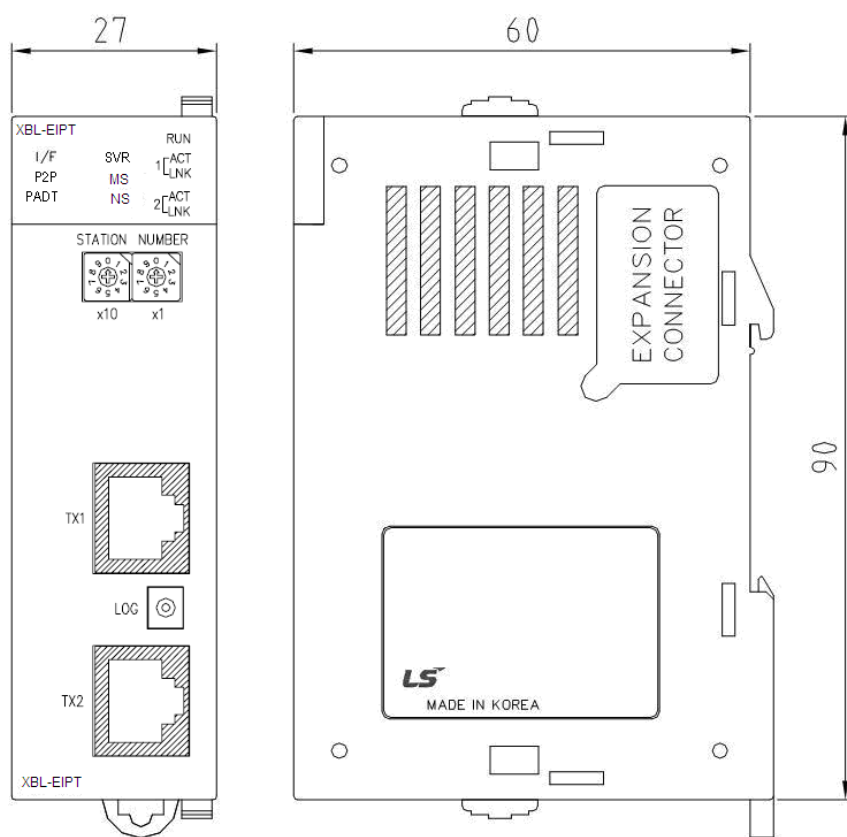
Notice

❑ Network register is Read Only device in the XGB.

A.3 External Dimension

Dimension Unit : mm

• XBL-EIPT



Warranty

1. Warranty Period

The product you purchased will be guaranteed for 18 months from the date of manufacturing.

2. Scope of Warranty

Any trouble or defect occurring for the above-mentioned period will be partially replaced or repaired. However, please note the following cases will be excluded from the scope of warranty.

- (1) Any trouble attributable to unreasonable condition, environment or handling otherwise specified in the manual,
- (2) Any trouble attributable to others' products,
- (3) If the product is modified or repaired in any other place not designated by the company,
- (4) Due to unintended purposes
- (5) Owing to the reasons unexpected at the level of the contemporary science and technology when delivered.
- (6) Not attributable to the company; for instance, natural disasters or fire

3. Since the above warranty is limited to PLC unit only, make sure to use the product considering the safety for system configuration or applications.

Environmental Policy

LS Industrial Systems Co., Ltd supports and observes the environmental policy as below.

Environmental Management

LS Industrial Systems considers the environmental preservation as the preferential management subject and every staff of LS Industrial Systems use the reasonable endeavors for the pleasurable environmental preservation of the earth.

About Disposal

LS Industrial Systems' 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.



LS values every single customers.

Quality and service come first at LSIS.

Always at your service, standing for our customers.

<http://eng.lsis.biz>

LS Industrial Systems

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