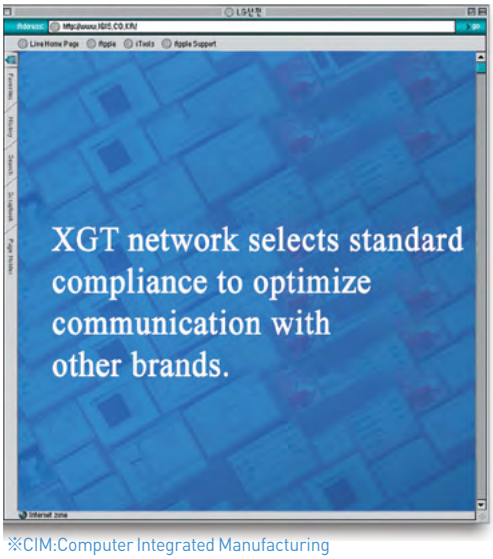
Network

Along with Ethernet, Profibus-DP, and DeviceNet, XGT series provide the maximum in control integration and communication flexibility.

Contents

XGT Network system

Features



※CIM:Computer Integrated Manufacturing

About RAPIEnet+

Real-time, hybrid & ring topology-based industrial Ethernet solution, integrating Modbus TCP/IP, EtherNet/IP and RAPIEnet for IoT, future-oriented technology for high performance & efficiency.

RAPIEnet

- IEC standard (RAPIEnet) communication technology applied
- Dedicated network for LS PLC
- Communication speed: 100Mbps, 1Gbps
- Topology : Star, Line, Ring
- Dual port (T.Pair / F.Optic / Hybrid)
- Built-in high performance industrial switch
- Max read/write data size : 1,400 byte
- Max No. of connected stations per network : 64 stations

EtherNet/IP

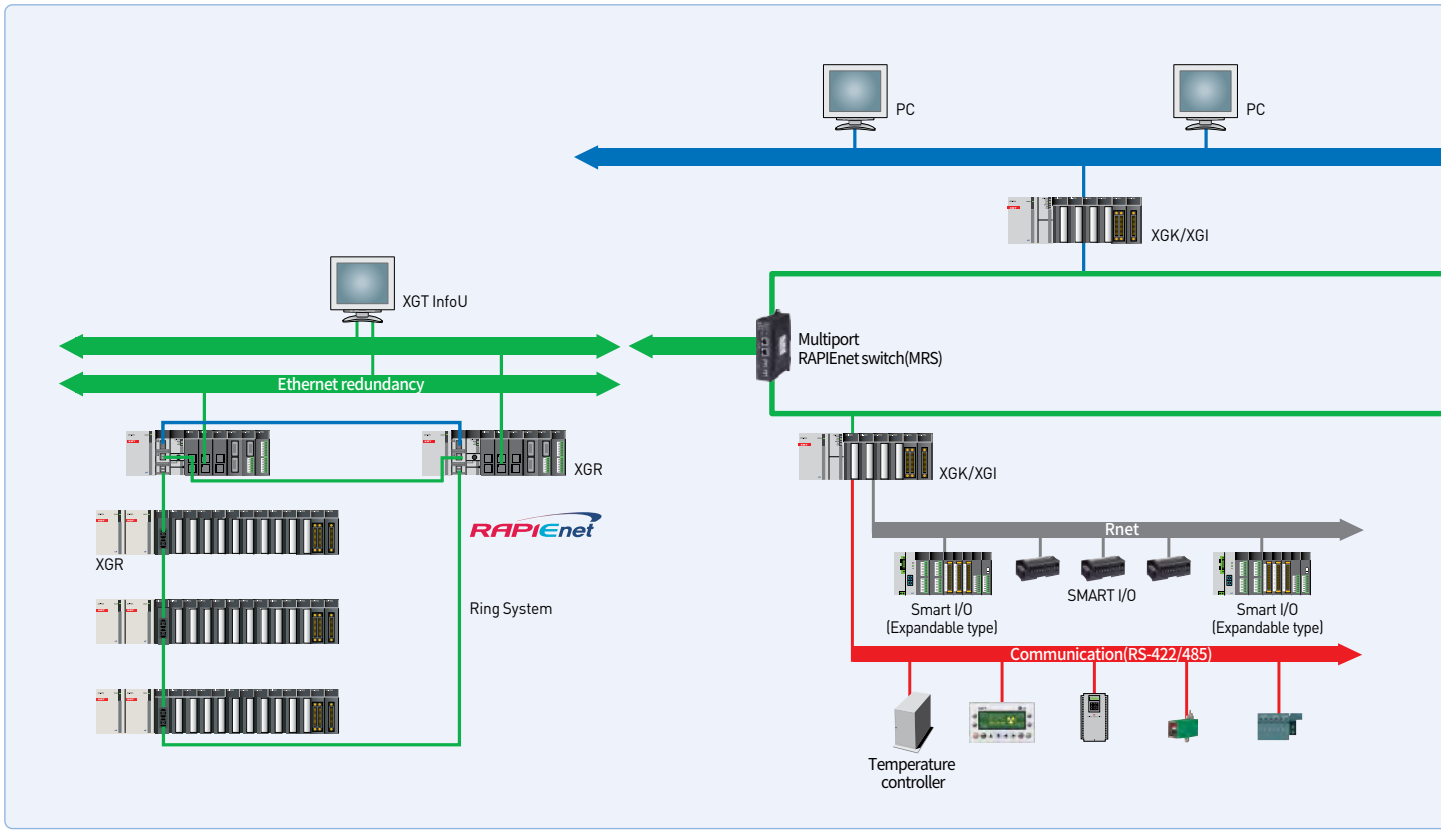
- Topology : Star, Line
- Communication speed: 100Mbps, 1Gbps
- Dual port (T.Pair / F.Optic / Hybrid)
- Built-in high performance industrial switch
- Max read/write data size : 1,400 byte(Non-periodic tag)
- Max No. of connected stations per network : 64 stations

Modbus TCP/IP

- Eopology : Star, Line
- Communication speed: 100Mbps, 1Gbps
- Dual port (T.Pair / F.Optic / Hybrid)
- Built-in high performance industrial switch
- Max read/write data size : 125/123 Word
- Max No. of connected stations per network : 64 stations

XGT dedicated

- Topology : Star, Line
- Communication speed: 100Mbps, 1Gbps
- Dual port (T.Pair / F.Optic / Hybrid)
- Built-in high performance industrial switch
- Max read/write data size : 1,400 byte
- Max No. of connected stations per network : 64 stations



Computer Link(Cnet)
- RS-232C/485/422 communication
- Long-distance communication via modem connection
- Various connection to HMI S/W (XGT, Modbus RTU, Modbus ASCII)
- User-defined communication
- Convenient P2P master (XGT, Modbus)

Fnet
- Dedicated network for LS PLC
- Easy high-speed link parameter setup
- 1Mbps high-speed communication
- Max. 750m
- Max. 6ea repeater available (Max. expansion 5.25km)
- Network management through Auto scan

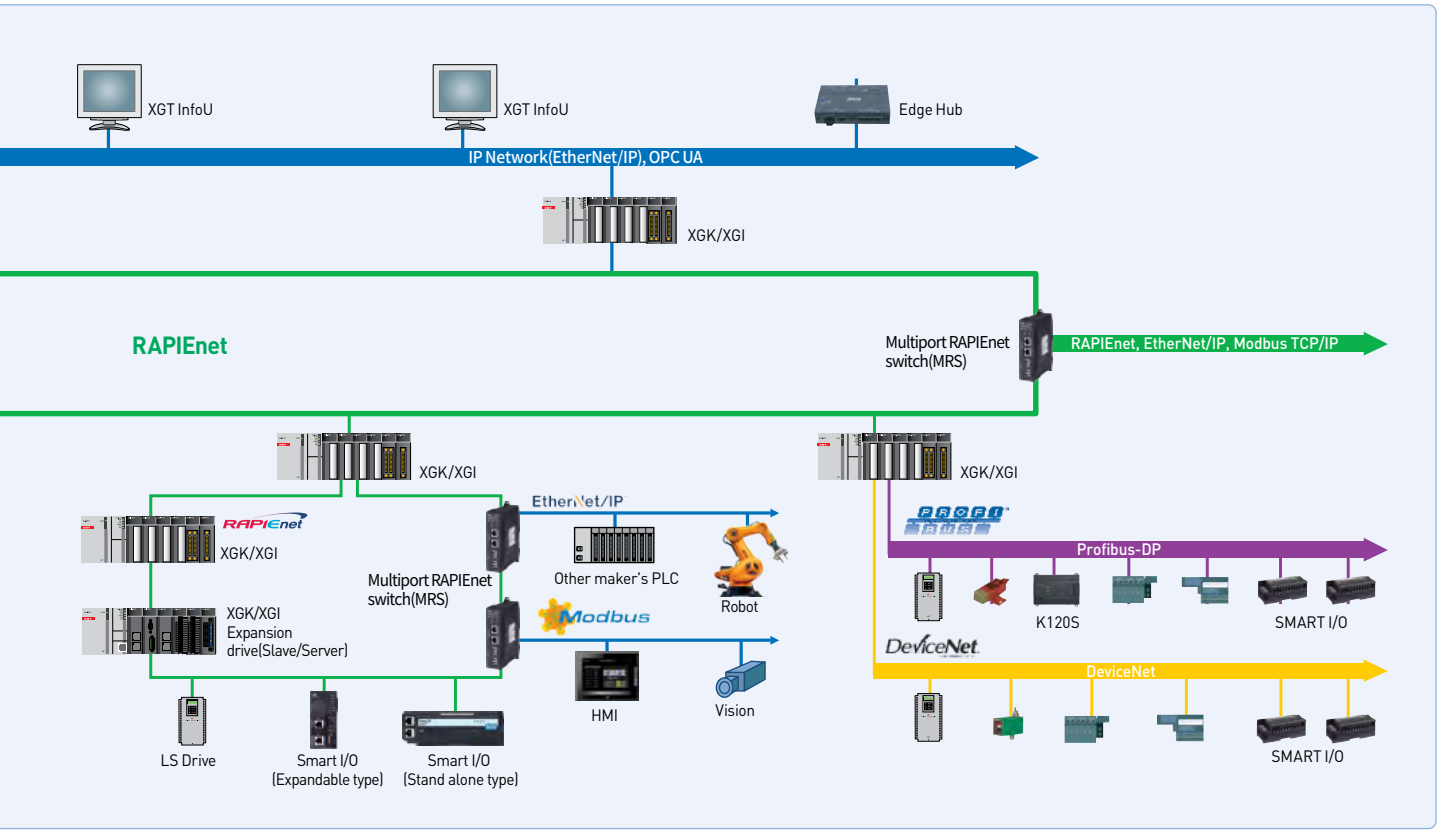
Rnet
- High-speedcommunication 1Mbps
- Longcommunicationdistance Max.750m
- Max. 6 repeaters (up to 5.25km)
- Network management using Auto-scan (Slave module information)

DeviceNet(Dnet)
- Connectable to other PLCs and control device
- Compliance of the ODVA standard
- Flexible communication speed setting: 125/250/500Kbps
- Multi-drop and T branch connection
- Long communication distance: Max. 500m

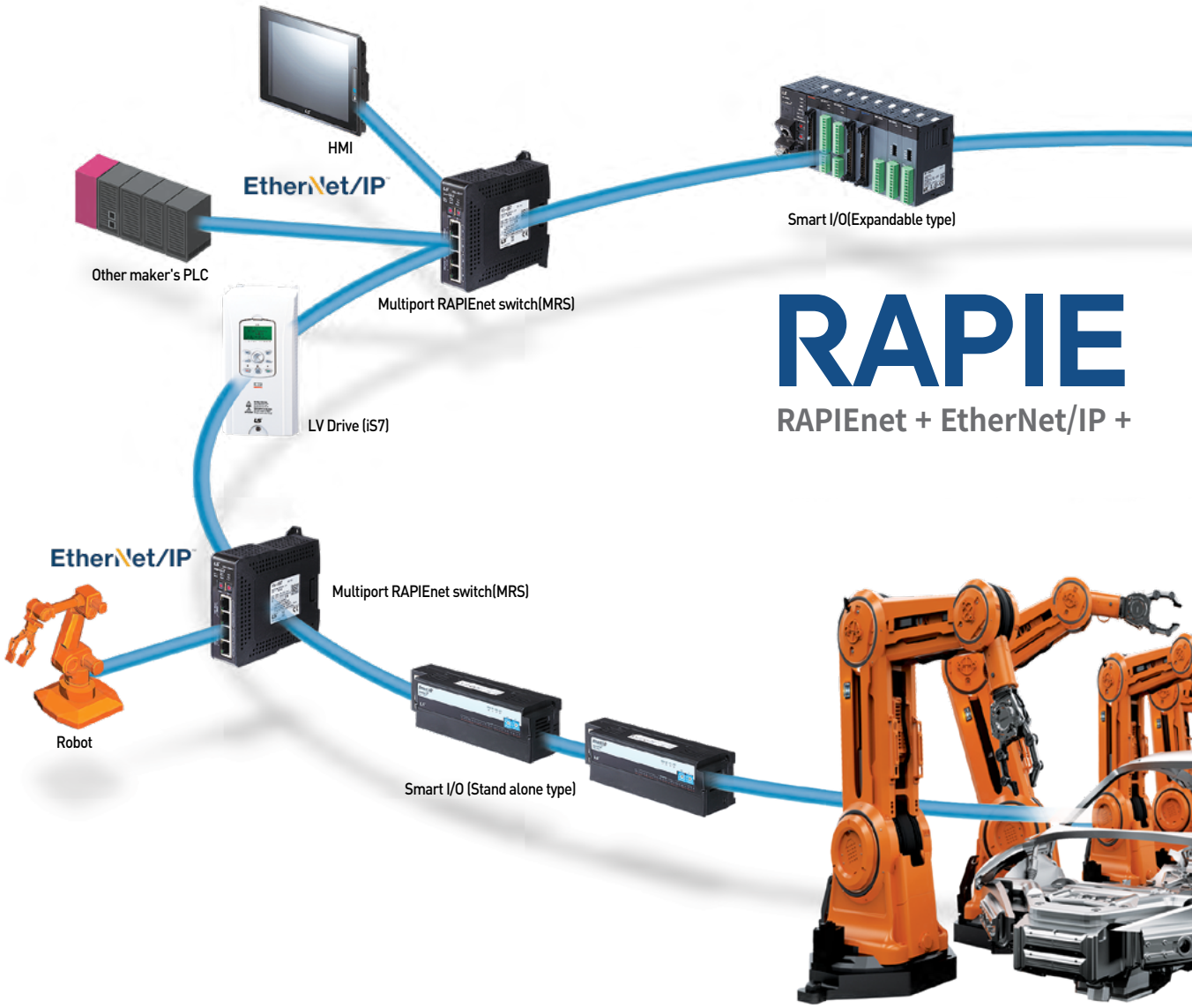
Profibus-DP(Pnet)
- Optimum communication for a master automation device and distributed slave I/O devices
- Fast slave communication omitting application layer
- Long communication distance: Max. 1200m
- Communication using High-speed link parameter

Installation number of network module available

Item	XGK / XGI / XGR CPU
Total network module	24
High-speed link module	12
P2P service	8



XGT RAPIEnet+

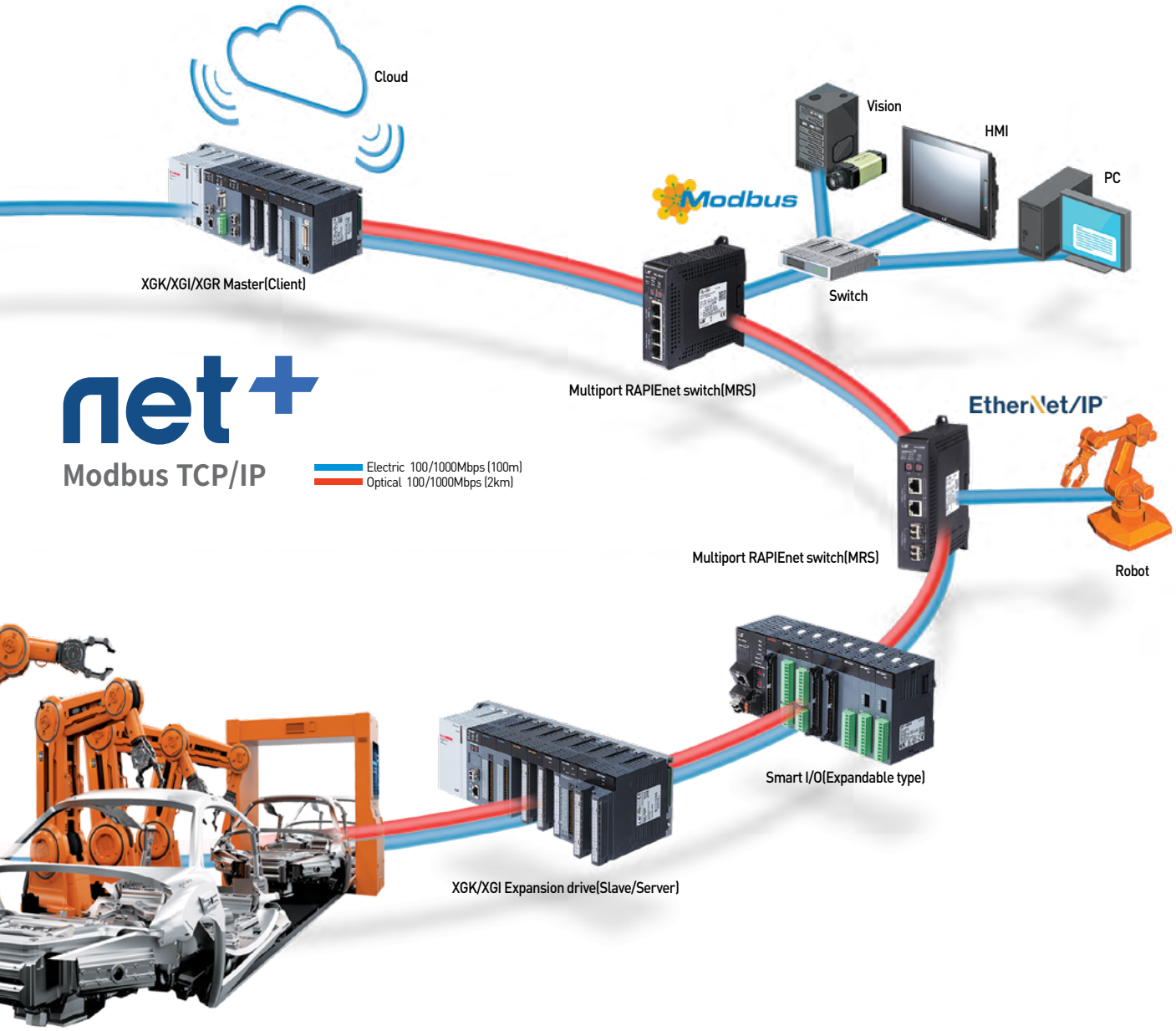


About RAPIEnet+

Real-time, hybrid & ring topology-based industrial Ethernet solution, integrating Modbus TCP/IP, EtherNet/IP and RAPIEnet for IoT and future-oriented technology for high performance & efficiency.

Professional

- Integrated hybrid network solution
- Three protocols in a single product: Modbus TCP/IP, EtherNet/IP, RAPIEnet
- Various and convenient network system configuration with smart extension service
- IEC standard (RAPIEnet) communication technology applied
- Gibabit Ethernet from 100Mbps to 1Gbps for large networks



NETWORK

Efficiency

- Efficient network configuration with 2-port Ethernet
- Network cost reduction using electrical to fiber optic cable
- Optimized system configuration with automation products (PLC, remote I/O, Drive, etc.)
- Easy engineering via intuitive and user-friendly programming tool (XG5000)

Convenience

- Autoscan for netwok registeration
- Min. parameter and programming setup
- Simple editing (add/change) for modules of operating system
- Variable maintenance available: service status, diagnosis, comm. history, etc.

Reliability

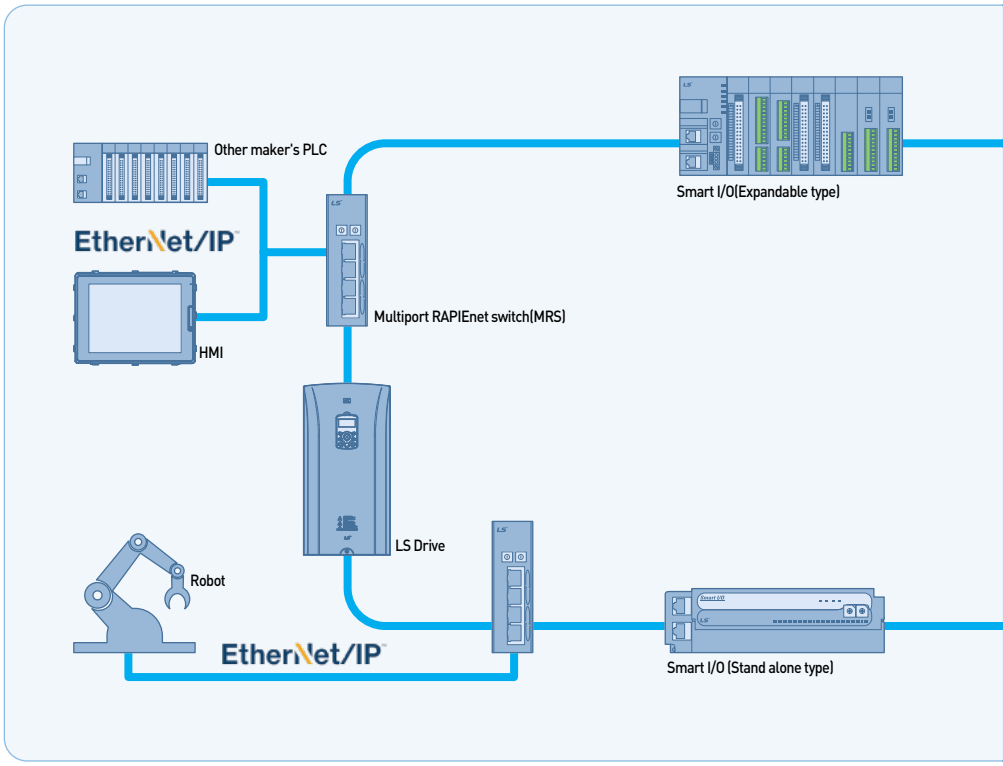
- Reliability improvement for ring topology network
- Various functions for network monitoring and diagnosis
- Noise reduction by fiber-optic network

XGT RAPIEnet+ System Configuration

Ring Type

- Ring topology and configuration with third-party devices: reliability & product/ wiring reduction
- Hybrid network (electric/fiber-optic): system cost reductio

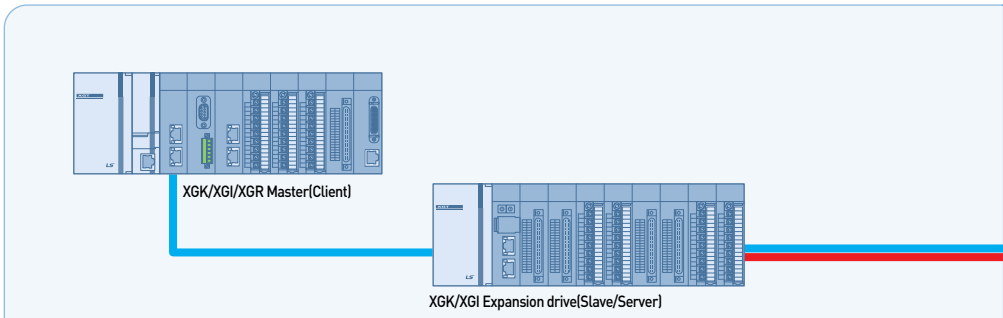
Electric 100/1000Mbps (100m)
Optical 100/1000Mbps (2km)



Daisy-chain Type

- Integrated network configuration with third-party devices
- EtherNet/IP and Modbus Hybrid communication: product/wiring reduction

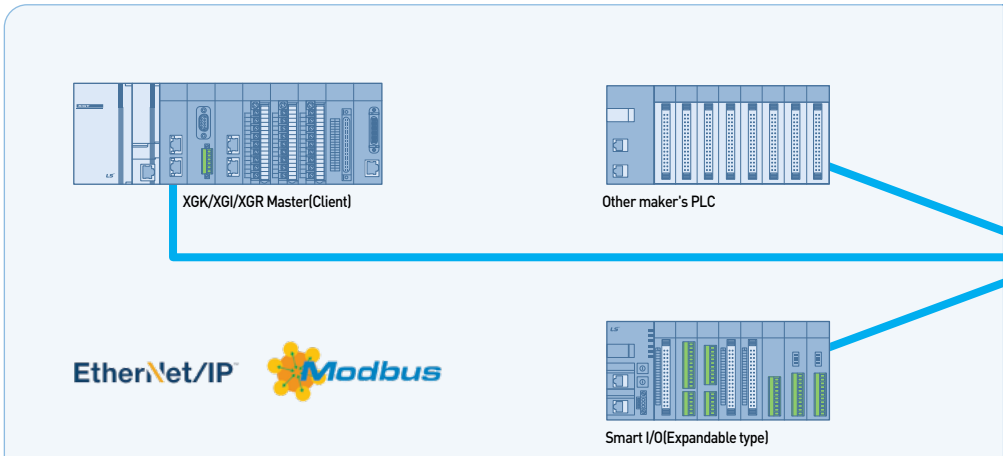
Electric 100/1000Mbps (100m)
Optical 100/1000Mbps (2km)

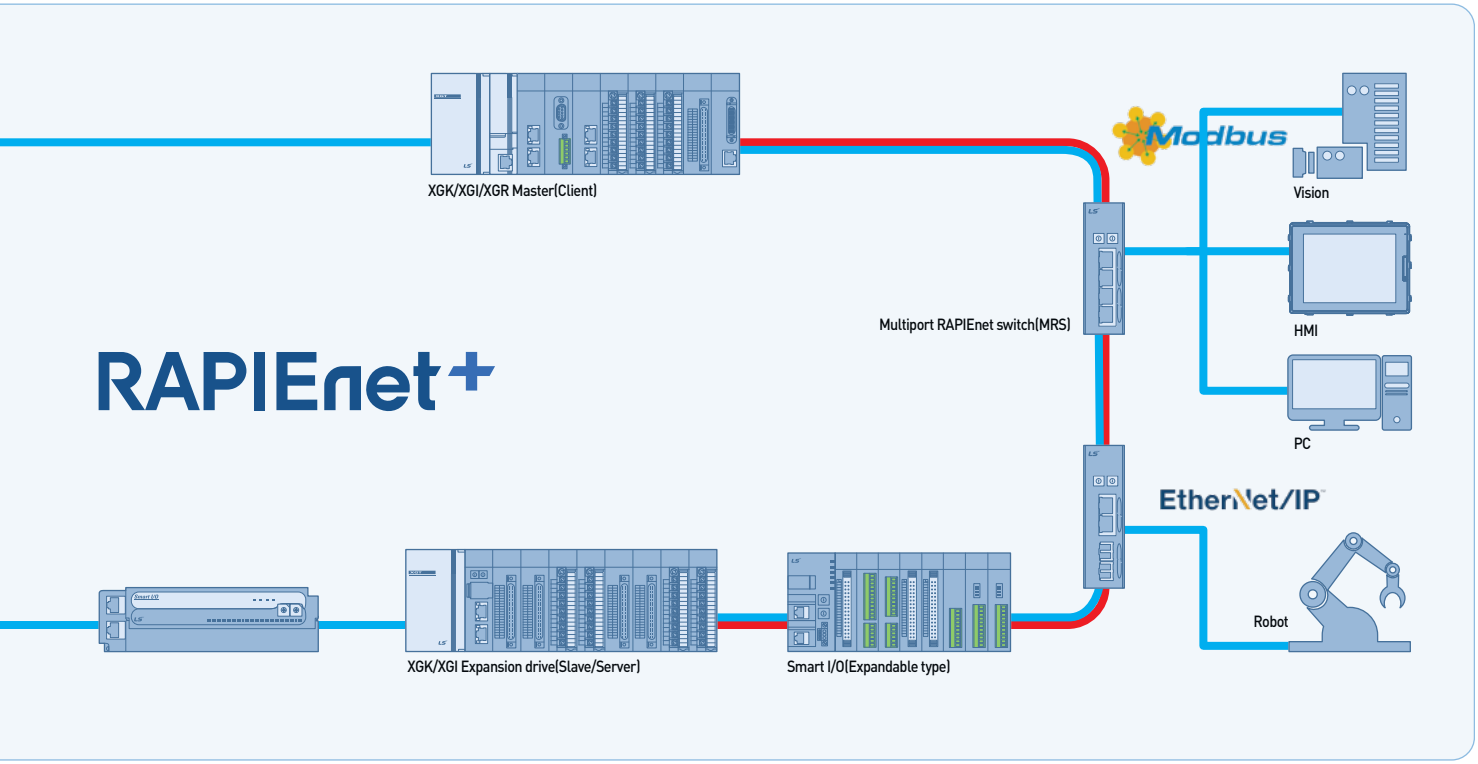


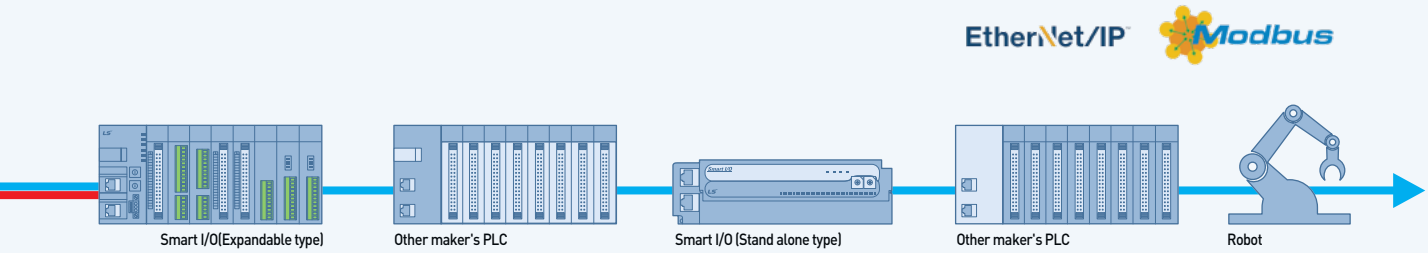
Star Type

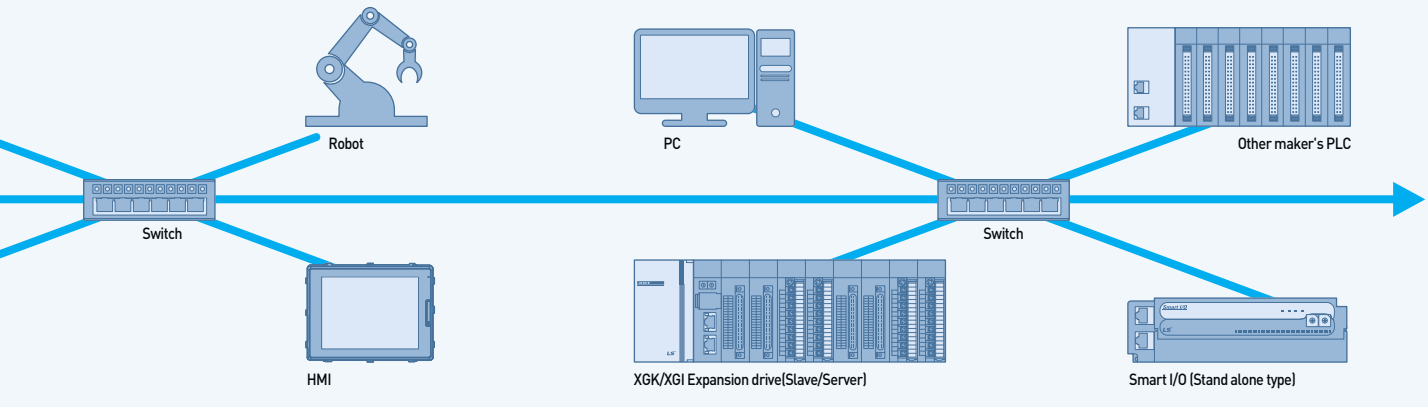
- Integrated network configuration with third-party devices
- Varioud network configuration (general switch application available)

Electric 100/1000Mbps (100m)




RAPIEnet+
XGK/XGI/XGR Master(Client)
Modbus
Vision
HMI
PC
Multiport RAPIEnet switch(MRS)
EtherNet/IP
Robot
XGK/XGI Expansion drive(Slave/Server)
Smart I/O(Expandable type)


EtherNet/IP
Modbus
Smart I/O(Expandable type)
Other maker's PLC
Smart I/O (Stand alone type)
Other maker's PLC
Robot


Robot
PC
Other maker's PLC
Switch
Switch
HMI
XGK/XGI Expansion drive(Slave/Server)
Smart I/O (Stand alone type)

NETWORK

XGT RAPIEnet+ Master(Client) module

XGL-EFMTB, XGL-EFMFB, XGL-EFMHB

- Gigabit Ethernet (1Gbps)
- Two-port support
- Ring/Line topology configuration support: no additional switch required
- Modbus TCP/IP, RAPIEnet (v6.0 or higher), EtherNet/IP (v6.0 or higher) protocol support
- Max 5.000pps network load (based on server operation)
- Data processing speed: 1ms
- Various and convenient network system configuraion with Smart Extension Service (v8.0 or higher)
- XG5000 network setup and programming (v4.30 or higher)
- User protocol editing and P2P service: (network with third-party devices)
- Various diagnostic functions and module/ network status information
- Network module check function (Ping test)
- Network service information (HS link, P2P, media status, etc)
- OPC UA Server support (OPC UA Specification v1.03, XGL-EFMxB v7.0)
  - OS replacement for OPC UA Server of XGL-EFMxB in XG5000 is required. (Please refer to user's manual).

Specification

Item			XGL-EFMTB	XGL-EFMFB	XGL-EFMHB
Transmission Specifications	Transmission speed (Mbps)		10/100/1000	100/1000	Electric: 10/100/1000 Optical: 100/1000
	Transmission method		Baseband		
	Maximum distance between nodes		100m (Node-Switch)	2km (Multi-mode)	Electric: 100m Optical: 2km
	Send media		Electric: Category 5E or higher STP (Shielded Twisted-pair) cable Optical: Multi mode(MMF)/Single mode(SMF) cable		
	Maximum protocol size		1,500 Byte		
	Communication network access method		CSMA/CD		
	Frame error check method		CRC32		
Max. load			Ethernet: 10,000pps, RAPIEnet: 40,000pps		
Topology			Line, Tree, Star, Ring (RAPIEnet Enable)		
Diagnosis function			Station number / IP collision detection function, Diagnosis using XG5000		
Station number / IP setting method			Rotary switch, XG5000, BOOTP/DHCP		
Station number / IP setting range			Station number setting value set by the tool(XG5000) (0 to 220) - IP: 192.168.1.xx(xx:100 + rotary switch 1~99)		
External connecting terminal			RJ45, SFP : PADT connection, data communication		
Basic Specific	Current consumption (mA)	100Mbps	560	750	670
		1Gbps	900	740	670
	Weight(g)		146	130	120

Network service specification

Item		XGL-EFMTB	XGL-EFMFB	XGL-EFMHB
RAPIEnet	Data processing unit	Byte(8bit)		
	Max read/write data size	1,400 byte		
	Max No. of connected stations per network	221 stations (However, 64 stations are used for the Smart extension service.)		
EtherNet/IP	Data processing unit	Byte(8bit)		
	Max read/write data size	Non-periodic tag: 1,400 Byte Non-periodic object : 1,024 Byte Cycle 1,024 Byte		
	Available communication type	Connection-type (Cycle) messages: Class1 Non connection type(Non-periodic) message: Tag, Object		
	Maximum number of connections	Connection-type (periodic)+ Non connection type(Non-periodic):64		
Modbus / TCP	Data processing unit	Word(16bit),bit		
	Max read data size	125 Word(2,000 Bits)		
	Max write data size	123 Word(1,968 Bits)		
	Maximum number of connections	64		
XGT dedicated	Data processing unit	Byte(8bit)		
	Max read/write data size	1,400 byte		
	Maximum number of connections	64		

Smart extension master

Smart extension service is network service between LS Automation products to enable users to extend several PLCs and drives without network parameter and programming, including EtherNet/IP client service.

Smart Extension Setup Wizard	Users could do network setup easily with 'Smart Extension Setup Wizard' in XG5000.
Smart Extension Autoscan	Autoscan execution of network & control setting during online.
Remote Device Setting	* Automatic execution of I/O and Basic Parameter Setting via XGL-EFMxB (master) * Hot swap seting for slave module replacement
Smart Extension Diagnosis Flag	Diagnostic infomration service for network devices and modules of Smart Extension system
Remote network	Device IP/Station No. change Remote network device IP and station no. change during online based on user setting (master)

XGT RAPIEnet+ Expansion driver module

XGL-DBDT, XGL-DBDF, XGL-DBDH

- Large PLC system configuration with XGL-DBDx(slave module) installation on CPU slot of XGK/XGK main base
  - PLC extension system configuration: 63-stage network extension (XGT base extension: 7 stage)
  - Extension distance: electric 100m, fiber-optic 2km (XGT base extension: 15m)
  - I/O point: Max. 49,152 (XGT base extension: 6,144)
- Modbus TCP/IP, RAPIEnet, EtherNet/IP protocol simultaneou support
- Electric/Fiber-optic/Hybrid module comm. speed: Max. 1Gbps
- 2-port (dual port) support
  - No additional switch required for ring/line topology configuration
- Hot swap for base replacement (add/delete available)
  - Base replacement without system in case of extension base error
- Ring-to-line: fast reconfiguration to line topology for a line fault of ring
- Extension base power redundancy (with XGR extension base)
- Diagnostic function for service status

Specification

Item		XGL-DBDT	XGL-DBDF	XGL-DBDH
Transmission Specifications	Transmission speed (Mbps)	100/1000	100/1000	Electric: 100/1000 Optical: 100/1000
	Transmission method	Base band		
	Maximum distance between nodes	100m@CAT5E or higher	2km@100Mbps.MM	Electric: 100m Optical: 2km
	Send media	Electric: Category 5E or higher STP (Shielded Twisted-pair) cable Optical: Multi mode(MMF)/Single mode(SMF) cable		
	Maximum protocol size	1,500Bytes		
	Communication network access method	CSMA/CD		
	Frame error check method	CRC32		
Max. load		Ethernet: 10,000pps, RAPIEnet: 40,000pps		
Topology		When using RAPIEnet : Lines, Ring (using MRS if you use a different topology) When not using RAPIEnet : Line, Tree, Star etc. (with switch)		
Diagnosis function		Station number/IP collision detection function, self-diagnosis service, diagnosis using XG5000		
Station number / IP setting method		Rotary switch, XG5000, BOOTP/DHCP		
Station number / IP setting range		Station number: Rotary switch(1 ~ 99) IP: 192.168.1.xx(xx:100 + rotary switch 1~99)		
External connecting terminal		USB mini B : PADT connection RJ45, SFP : PADT connection, data communication		
Status indication LED		PWR, RUN, SVR, I/F, RELAY. PADT, CHK, ERR, FAULT ,LINK, ACT		
Parameter setting		XG5000(USB, Ethernet port)		
Device file		EDS file(Only EtherNet/IP)		
Maximum number of modules to be installed		12		

Network service specification

Item		XGL-DBDT	XGL-DBDF	XGL-DBDH
RAPIEnet	Data processing unit	Byte(8bit)		
	Max read data size	1,400 Byte		
	Max write data size	1,400 Byte		
	Max No. of connected stations per network	64 station		
EtherNet/IP	Data processing unit	Byte(8bit)		
	Max read data size	Non-periodic tag: 1,400 Byte / Non-periodic object: 1,024 Byte / Cycle: 1,024 Byte		
	Max write data size	Non-periodic tag: 1,400 Byte / Non-periodic object: 1,024 Byte / Cycle: 1,024 Byte		
	Available communication type	Connection-type (Cycle) messages: Class1 Non connection type(Non-periodic) message: Tag, Object		
	Maximum number of connections	Connection-type (Cycle):10 Non connection type(Non-periodic) message(Tag, Object):10		
Modbus TCP/IP	Data processing unit	Word(16bit),bit		
	Max read data size	125 Word(2,000 Bits)		
	Max write data size	123 Word(1,968 Bits)		
	Maximum number of connections	64		

Available Module

Item		I/O module
Digital	Input	XGI-D21A
		XGI-D22A/B
		XGI-D24A/B
		XGI-D28A/B
		XGI-A12A
		XGI-A21A/C
		XGI-D21D
	Output	XGQ-RY1A
		XGQ-RY2A/B
		XGQ-TR1C
		XGQ-TR2A/B
		XGQ-TR4A/B
		XGQ-TR8A/B
		XGQ-SS2A
		XGQ-RY1D
	Input/Output	XGH-DT4A
Analog	Input	XGF-AV8A
		XGF-AC8A
		XGF-AD4S
		XGF-AD8A

Item		I/O module
Analog	Input	XGF-AD16A
		XGF-AC4H
		XGF-AW4S
	Output	XGF-DV4A
		XGF-DV8A
		XGF-DC4A
		XGF-DC8A
		XGF-DV4S
		XGF-DC4S
		XGF-DC4H
	High-speed counter	XGF-HO2A
		XGF-HD2A
		XGF-HO8A
	RTD & thermocouple	XGF-RD4A
		XGF-RD4S
		XGF-TC4S
		XGF-RD8A
	Input/Output	XGF-AH6A
	Temperature controller	XGF-TC4UD
		XGF-TC4RT

XGT RAPIEnet+ Smart I/O (Stand alone type)

GEL-D24C, GEL-DT4C1, GEL-TR4C1, GEL-RY2C, GEL-AV8C, GEL-AC8C, GEL-DV4C, GEL-DC4C

- Modbus TCP/IP, RAPIEnet, EtherNet/IP protocol support
- RJ45 connector
- Flexibility in network topology (ring, line)
  - Redundancy support in ring topology
- Simple module setting with station no. setup (No IP setup required)
- Easy & Simple parameter setup: Autoscan for module add, checkbox for parameter setup (No program required)
- High-speed data processing
- Cost reduction in wiring
- Various diagnostic service
  - Station no. collision error
  - Remote batch processing in O/S upgrade via master module
  - Network status check by CRC error flag
  - Enhanced Autoscan function: station collision, module information, etc.
  - Error flag: comm. error between master and Smart I/Os

Specification

Item		Content	
Transmission Specifications	Transmission speed	PORT1/2: 100Mbps	
	Transmission method	Base band	
	Maximum distance between nodes	100m@CAT5E or higher	
	Send media	Electric: Category 5E or higher STP (Shielded Twisted-pair) cable	
	Maximum protocol size	1,500Bytes	
	Communication network access method	CSMA/CD	
	Frame error check method	CRC32	
Max. load		Ethernet: 10,000pps, RAPIEnet: 40,000pps	
Topology		When using RAPIEnet : Lines, Ring (using MRS if you use a different topology) When not using RAPIEnet : Line, Tree, Star etc. (with switch)	
Diagnosis function		Station number / IP collision detection function, self-diagnosis service, diagnosis using XG5000	
Station number / IP setting method		Rotary switch, XG5000, BOOTP/DHCP	
Station number / IP setting range		Station number: Rotary switch(1 ~ 99) IP: 192.168.1.xx(xx:100 + rotary switch 1~99)	
Status indication LED		STATUS,PORT1,PORT2, LACTH(output Only)	
Parameter setting		XG5000(Ethernet)	
Device file		EDS file(Only EtherNet/IP)	
Protocol		RAPIEnet, EtherNet/IP, Modbus-TCP, BOOTP, DHCP(RAPIEnet, EtherNet/IP can be Smart extension with XGL-EFMxB)	
I/O Refresh size		Max inputs: refresh size	64 bytes
		Max inputs: refresh size	64 bytes

Network service specification

Item		Content
RAPIEnet	Data processing unit	Byte(8bit)
	Max read data size	1,400 byte
	Max write data size	1,400 byte
	Max No. of connected stations per network	64 station
EtherNet/IP	Data processing unit	Byte(8bit)
	Max read data size	Non-periodic tag: 1,400 Byte Non-periodic object : 1,024 Byte Cycle: 1,024 Byte
	Max write data size	Non-periodic tag: 1,400 Byte Non-periodic object : 1,024 Byte Cycle: 1,024 Byte
	Available communication type	Connection-type (Cycle) messages: Class1 Non connection type(Non-periodic) message: Tag, Object
	Maximum number of connections	Connection-type (Cycle) :10 Non connection type(Non-periodic) message(Tag, Object):10
Modbus TCP/IP	Data processing unit	Word(16bit),bit
	Max read data size	125 Word(2,000 Bits)
	Max write data size	123 Word(1,968 Bits)
	Maximum number of connections	64

Input/output specification

Item		GEL-D24C	GEL-DT4C1	GEL-TR4C1	GEL-RY2C
Digital I/O	Points	32(Input)	16/16(In/Out)	32(Output)	16(Output)
	Rated input current	5mA		-	-
	Rated load voltage	-	DC24V		DC24V/AC220V, 2A/point, 5A/COM
	Max. load current	-	0.5A/point, 3A/COM		AC250V, DC110V, 1,200times/hour
	On voltage	DC 19V or higher		-	Min. switching load : DC 5V/1mA
	Off voltage	DC 6V or less		-	
	Insulation method	Photo coupler insulation			

Item		GEL-AV8C	GEL-AC8C	GEL-DV4C	GEL-DC4C
Analog I/O	Channels	8		4	
	Input/output type	Voltage	Current	Voltage	Current
	Input/outpu range	1 ~ 5V 0 ~ 5V 0 ~ 10V -10 ~ 10V	4 ~ 20mA 0 ~ 20mA	1 ~ 5V 0 ~ 5V 0 ~ 10V -10 ~ 10V	4 ~ 20mA 0 ~ 20mA
	Accuracy	0.3% (ambient air temperature 0 ~ 55Đ)			
	Max. resolution	1/16,000			
	Max. conversion rate	10ms / channels			
	Insulation method	insulation between input / output terminal and PLC power (no insulation between channels)			

XGT RAPIEnet+ Smart I/O (Expandable type)

XEL-BSSRT, XEL-BSSRF, XEL-BSSRH

- Slave PLC system configuration: XEL-BSSRx (extension Smart I/O adaptor) with XGB I/Os (DI/DO/AI/AO)
  - No. of XGB extension I/O: 8
- Modbus TCP/IP, RAPIEnet, EtherNet/IP protocol support
- Electric/Fiber-optic/Hybrid module comm. speed: Max. 1Gbps
- 2-port (dual port) support
  - No additional switch required for ring/ line topology configuration
- Ring-to-line: fast reconfiguration to line topology for a line fault of ring
- Diagnostic function for service status

Specification

Item		XEL-BSSRT	XEL-BSSRF	XEL-BSSRH
Transmission Specifications	Transmission speed (Mbps)	100/1000	100/1000	Electric: 100/1000 Optical: 100/1000
	Transmission method	ĐĐĐĐĐ		
	Maximum distance between nodes	100m@CAT5E or higher	2km@100Mbps.MM	Electric: 100m Optical: 2km
	Send media	Electric: Category 5E or higher STP (Shielded Twisted-pair) cable Optical: Multi mode(MMF)/Single mode(SMF) cable		
	Maximum protocol size	1,500Bytes		
	Communication network access method	CSMA/CD		
	Frame error check method	CRC32		
Max. load		Ethernet: 10,000pps, RAPIEnet: 40,000pps		
Topology		When using RAPIEnet : Lines, Ring (using MRS if you use a different topology) When not using RAPIEnet : Line, Tree, Star etc. (with switch)		
Diagnosis function		Station number / IP collision detection function, self-diagnosis service, diagnosis using XG5000		
Station number / IP setting method		Rotary switch, XG5000, BOOTP/DHCP		
Station number / IP setting range		Station number: Rotary switch(1 ~ 99) IP: 192.168.1.xx(xx:100 + rotary switch 1~99)		
External connecting terminal		USB mini B : PADT connection RJ45, SFP : PADT connection, data communication 3pin Push in/Screw fixed type connector : power Input		
Status indication LED		RUN, RMS, RNS, RELAY, LINK/ACT1, LINK/ACT2 6 types		
Parameter setting		XG5000(USB, Ethernet)		
Device file		EDS file(Only EtherNet/IP)		
Maximum number of modules to be installed		8ea		
Protocol		RAPIEnet, EtherNet/IP, Modbus-TCP, BOOTP, DHCP (RAPIEnet, EtherNet / IP can be Smart extension with XGL-EFMxB)		

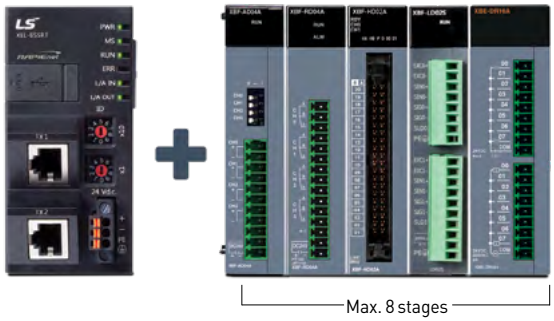
Network service specification

Item		XEL-BSSRT	XEL-BSSRF	XEL-BSSRH
RAPIEnet	Data processing unit	Byte(8bit)		
	Max read data size	1,400 Byte		
	Max write data size	1,400 Byte		
	Max No. of connected stations per network	64 station		
EtherNet/IP	Data processing unit	Byte(8bit)		
	Max read data size	Non-periodic tag: 1,400 Byte / Non-periodic object : 1,024 Byte / Cycle: 1,024 Byte		
	Max write data size	Non-periodic tag: 1,400 Byte / Non-periodic object : 1,024 Byte / Cycle: 1,024 Byte		
	Available communication type	Connection-type (Cycle) messages: Class1 Non connection type(Non-periodic) message: Tag, Object		
	Maximum number of connections	Connection-type (Cycle): 10 Non connection type(Non-periodic) message(Tag, Object): 10		
Modbus TCP/IP	Data processing unit	Word(16bit),bit		
	Max read data size	125 Word(2,000 Bits)		
	Max write data size	123 Word(1,968 Bits)		
	Maximum number of connections	64		

Available XGB I/O Module

Item		Module
Digital	Input	XBE-DC08A
		XBE-DC16A/B
		XBE-DC32A
		XBE-AC08A
	Output	XBE-TN/TP08A
		XBE-TN/TP16A
		XBE-TN/TP32A
		XBE-RY08A/B
		XBE-RY16A
	Input/output	XBE-DR16A
		XBE-DN32A
Analog	Input	XBF-AD04A
		XBF-AD08A
		XBF-AD04C

Item		Module
Analog	Output	XBF-DV04A
		XBF-DC04A
		XBF-DC04B
		XBF-DV04C
		XBF-DC04C
	Input/output	XBF-AH04A
	RTD	XBF-RD04A
		XBF-RD01A
	TC	XBF-TC04B
		XBF-TC04S
	Load cell	XBF-LD02S
	High-speed counter	XBF-HO02A
		XBF-HD02A



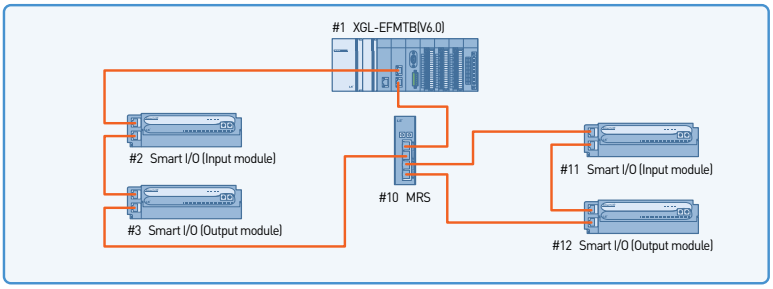
XGT RAPIEnet+ Multiport RAPIEnet switch(MRS)

XOL-ES4T, XOL-ES4H

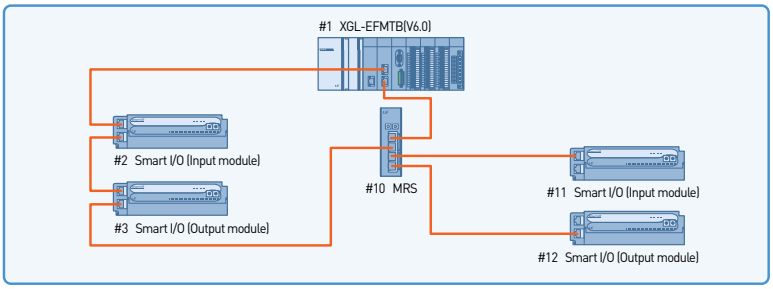
- Multi-port switch to integrate RAPIEnet, Modbus TCP/IP and EtherNet/IP network
- Max. 64 stations including master module
- Simple module setup with station no.: no additional S/W required.
- Module status information in XG5000 (Autoscan)
- Available from RAPIEnet v2.0 or later.

Various system methods can be configured by using MRS

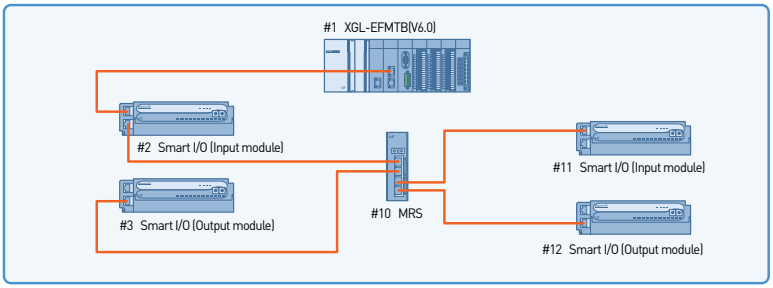
2 Ring System (Ring to Ring)



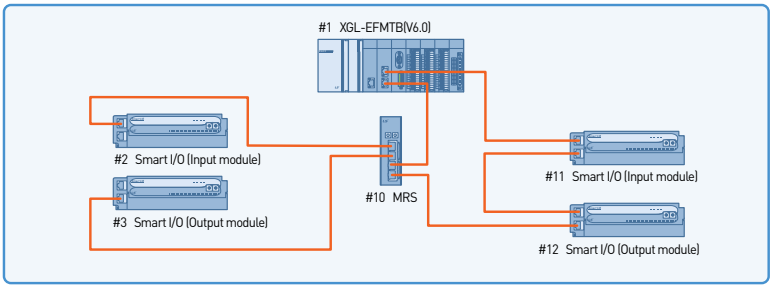
1 Ring / 1 Line System (Ring to Line)



2 Line System (Line to Line)



1 Line / 1 Ring System (Line to Ring)

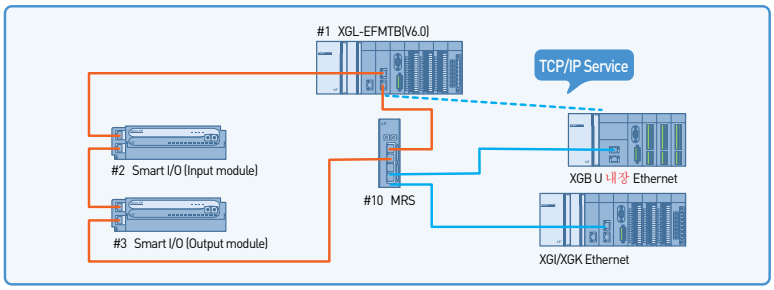


Specification

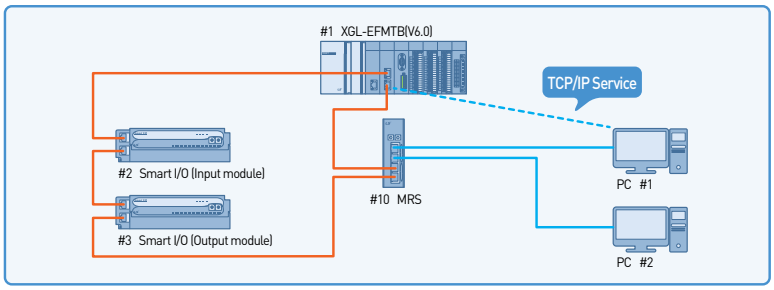
Item		RAPIEnet	
		XOL-ES4T	XOL-ES4H
Transmission Specifications	Transmission speed	100Mbps(1,2 port) 100Mbps/1 Gbps (3,4 port)	100Mbps/1 Gbps (1,2 port, electric) 100Mbps/1 Gbps (3,4 port,optical)
	Port type and number of ports	RJ45 4Ports	RJ45 2Ports, LC 2Ports
	Transmission distance	100m	100m/2km
	Diagnosis function	LED display	LED display
Basic Specifications	Power supply(DC)	24V(Input range:20.4~28.8V)	
	Current consumption(mA)	300	300
	Weight(g)	200	280

Various system methods can be configured by using MRS (Ethernet compatibility)

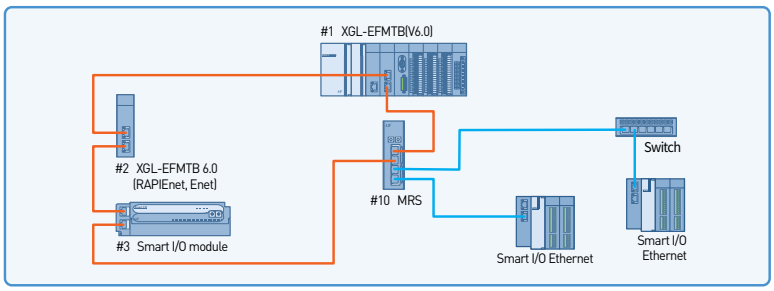
RAPIEnet(1,2 Port), Ethernet(3,4 Port)



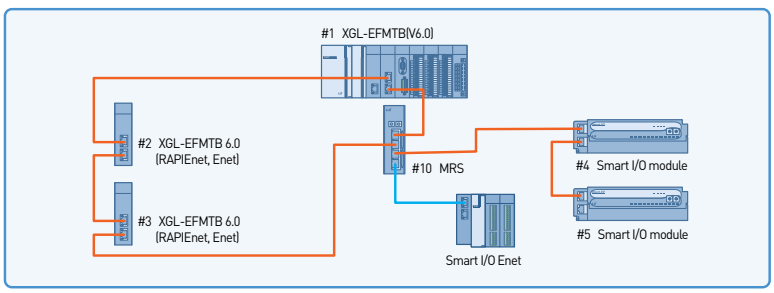
Ethernet(1,2 Port), RAPIEnet(3,4 Port)



Ethernet, RAPIEnet(1,2 Port),
Ethernet(3,4 Port)



RAPIEnet, Ethernet(1,2 Port),
RAPIEnet, Ethernet(3,4 Port)



XGT RAPIEnet+ PC Card

XOL-RCPUA

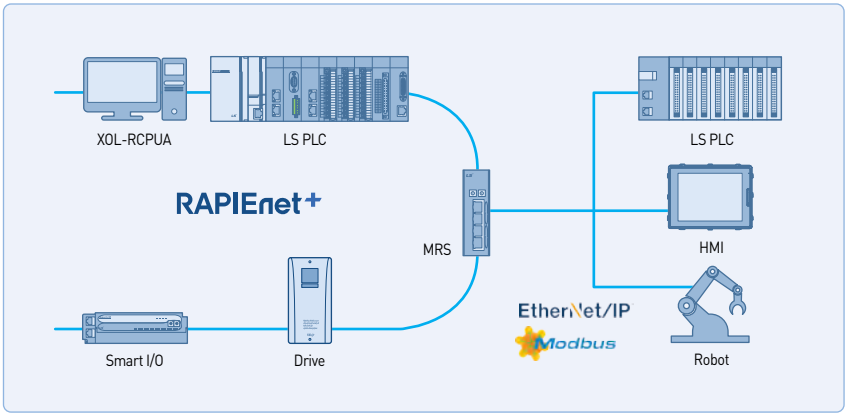
- Connect to RAPIEnet+ network from a PC
- Easy installation to PCIe slot on a PC
- Simple driver installation

Specification

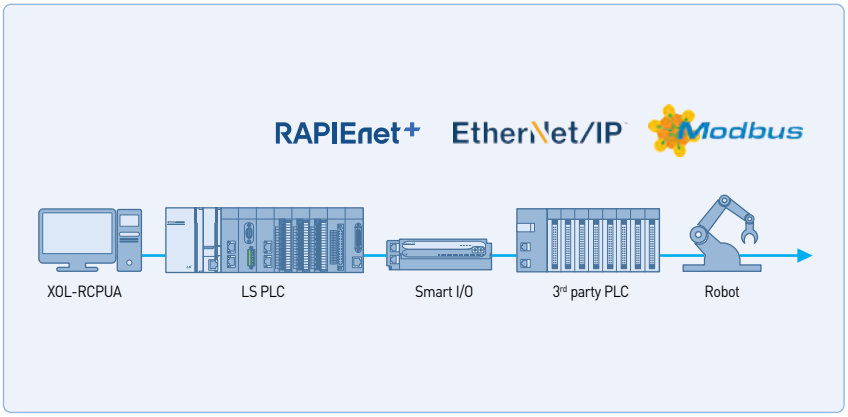
Item			XOL-RCPUA	Remark
Data Memory	I Variable		16KB	
	Q Variable		16KB	
	Direct variable	M	1MB	
		W	512KB	
	Flag variable	F	8KB	System Flag
		L	22KB	Link Flag
		U	4KB	Analog data refresh
		N	49KB	P2P Parameters
Operation Mode			RUN, STOP	
Restart Mode			Cold, Warm	
Programming Port			USB(1Ch), Ethernet (1Ch)	
Weight (g)			200	

RAPIEnet+ System Configuration with XOL-RCPUA

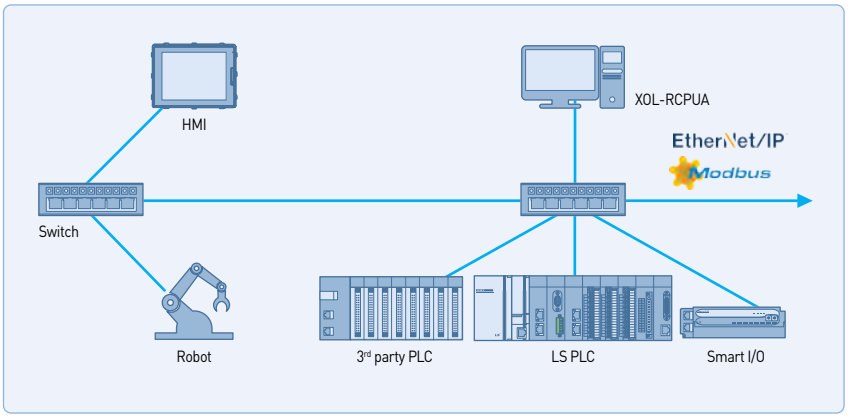
Ring topology with Ethernet/IP and Modbus configured through RAPIEnet+



Daisy Chain configuration with RAPIEnet+, Ethernet/IP, or Modbus



Star topology configuration with Ethernet/IP or Modbus



XGT Computer-Link [Cnet]

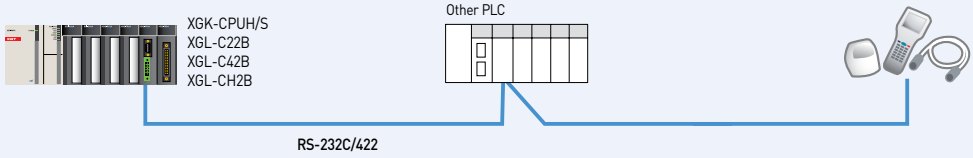
XGL-C22B, XGL-CH2B, XGL-C42B

- Smart server recognizes the protocol (XGT dedicated communication or Modbus RTU/ASCII) automatically and operates.
- Repeater mode is able to use as an insulated repeater or convert RS-232C to RS422/485.
- Contains built- in termination resistor and it can be set in the basic parameter window.
- Easy protocol editing and communication parameter setting: XG5000
- Long-distance communication via modem connection
- Dedicated protocol for multi-drop configuration connectable up to 32 units
- RS-232C/422 communication port
- Flexible communication speed setting (300~115,200bps)
- Supporting full duplex and half duplex communication
- Max. 12 modules available in one CPU
- P2P service: User-defined communication and XGT/ Modbus master
- Various connection to MMI S/W(XGT, Modbus RTU, Modbus ASCII)
- Various diagnosis functions using XG5000 (I/O, link status, service status)
- Communication service information (Dedicated service, P2P service)
- Supporting simultaneously dedicated service in remote connection
- Communication without additional setting when replacing communication module

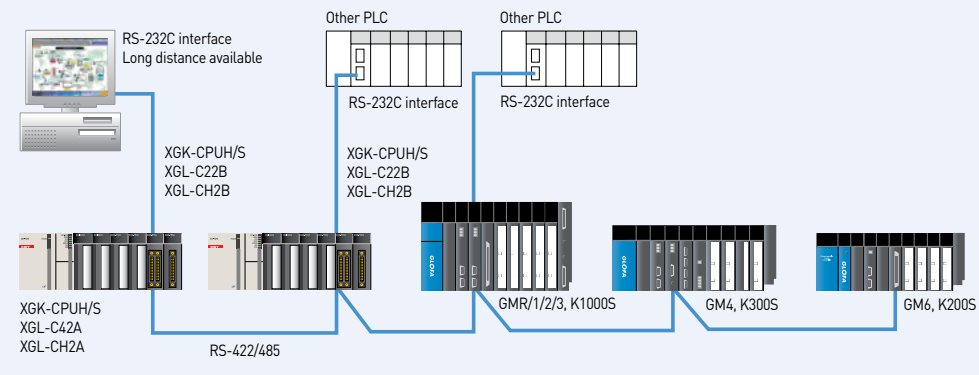
Various independent operation mode

- Operation mode
- Dedicated protocol mode (Simultaneous support)
- Program upload/download by XG5000 protocol (RS-232C) Communication using LS ELECTRICdedicated protocol
- User-defined communication of P2P mode and XGT/Modbus master

Communication via RS-232C/422



1: N and N: M connection (LS ELECTRIC and other)

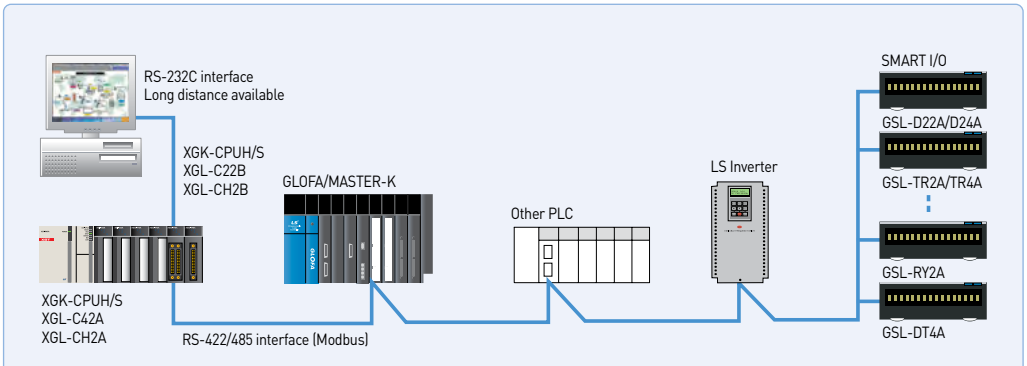


Specifications

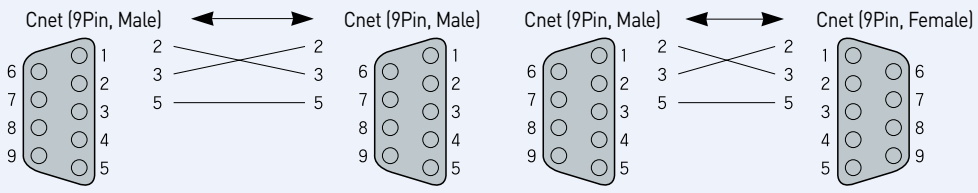
Item		Specification		
		XGL-C22B	XGL-CH2B	XGL-C42B
Serial communication channel	RS-232C	2 channels	1 channel	-
		Conforms to RS-232C standard		
	Line config	1:1		
	RS-422/485	-	1 channel	2 channels
			Conforms to RS-422/485 standards	
	Line config		1:1, 1:n, n:1	
Modem connection function		Remote communication with external devices is available via public telephone line by connecting external modem to the module.		-
Operating mode (specified per port)	P2P	XGT client, Modbus ASCII/RTU client, Use defined communication		
	SERVER	XGT server, Modbus ASCII/RTU server		
Data type	Start Bit	1		
	Data Bit	7 or 8		
	Stop Bit	1 or 2		
	Parity	Even/Odd/None		
Synchronization type		Asynchronous type		
Detecting error		BYTE SUM, WORD SUM, BYTE XOR, DLE AB, DLE SIEMENS, LS ELECTRICCRC, CRC 16, BYTE SUM 2' COMP, BYTE SUM 1's COMP 7BIT SUM, 7BIT XOR, CRC 16 IBM, CRC 16 CCITT		
Transmission speed (bps)		300/600/1,200 / 1,800 / 2,400 / 3,600 / 4,800 / 7,200 / 9,600/19,200 / 38,400 / 57,600 / 64,000 / 76,800 / 115,200 bps		
Station No. setting		Setting range : 0-31, Max. station No. : 32 stations		
Transmission Distance(m)		RS-232C: Max.15 (extendible if modem used)		-
		-	RS-422/485: Max. 1,200m	
Diagnosis function		Status LED diagnosis XG5000 diagnosis service(Frame monitor, Status by service, Loop-Back diagnosis) History, Saving history		
Appearance size(mm)		98(H) X 27(W) X 90(D)		
Current consumption(mA)		420	480	520
Weight(g)		121	119	116

* XGL-CH2A / C42A and XGL-CH2B / C42B differ from RS-422 / 485 communication connecter wiring, you refer to the operation manual.

Modbus



Cnet cable connection



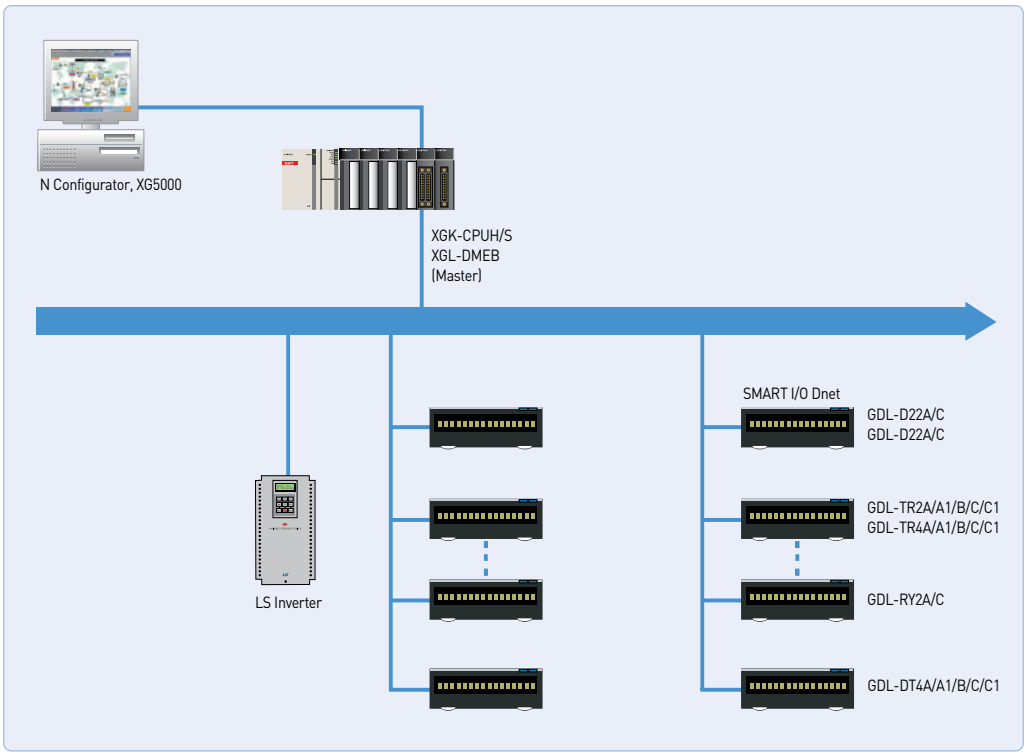
NETWORK

XGT DeviceNet [Dnet]

XGL-DMEB, XGL-DSEB

- DeviceNet protocol
- Direct control of various I/O devices via Dnet system
- Max. 63 slave modules controlled by one master module
- Flexibility in network configuration: Multi-drop and T branch connection
- Connectable to other master module and various slave modules
- Providing 'Auto Network Scan' function and various information with configuration tool (N Configurator)
- Communication using High-speed link parameter
- Connectable to various slave I/O including other module
  (Common I/O, Actuator, Switch, Optical switch, Valve, Inverter, A/D module, Position controller etc..)
- Automatic monitoring of slave modules in the network: Auto-scan (XG5000)
- Easy expansion: up to 12 master modules
- Network setting by N Configurator/XG5000(Parameter setting, diagnosis and monitoring)

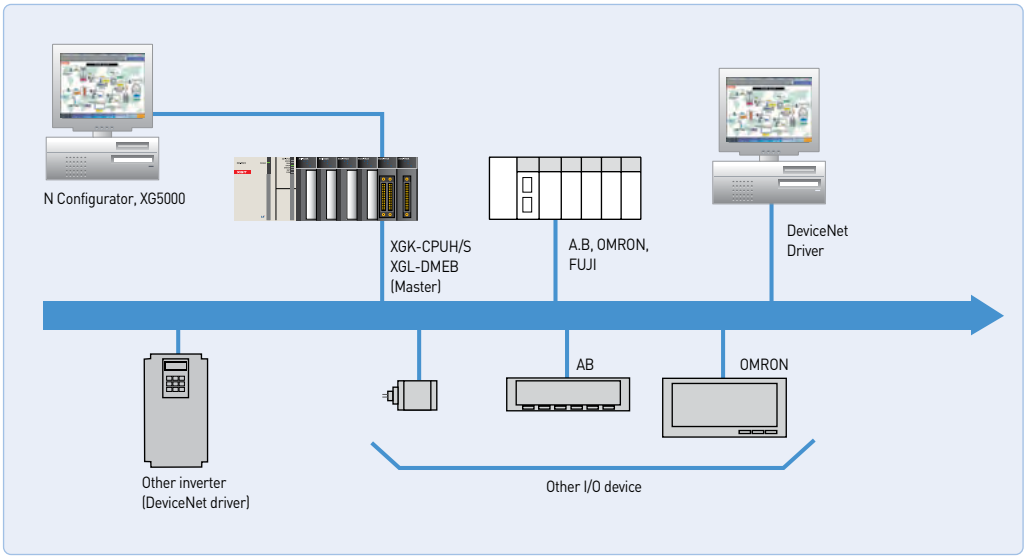
System configuration with LS ELECTRIC products



Specifications

Item			Performance Specifications
Transmission Specification	Transmission Speed (kbps)		125/250/500
	Transmission Type	I/O Connection	G2, UCMM
		I/O Communication	Poll, Bit strobe, COS, Cyclic
	Communication distance(m)	Thick Cable	500 (125kbps)/250 (250kbps)/100 (500kbps)
		Thin Cable	100 (125/250/500kbps)
	Terminal resistance (W)		121 (1%, 1/4W)
	Max.drop length(m)	125 kbps	6 (Max. extended length 156)
		250 kbps	6 (Max. extended length 78)
		500 kbps	6 (Max. extended length 39)
	Data Packet		0~8 Bytes
	Message Access Control		CSMA/NBA
	Network Structure		Trunk/drop line Power/Signal cable inside the identical network cable
	Bus Type		Poll type
	Max. number of nods		Up to 64 (including master) MAC IDs (MAC Identifier)
	System Features		Insertion and removal of nod available in voltage On status
	Operation Voltage		DC 24V
	Diagnosis Function		Module: Checks duplicated station/ Checks CRC error N Configurator: Detects defective station/Checks BusOff/Auto-scan function XG5000: Monitors High-speed link
	Master/Slave Operation		Available only in master
Parameter setting			1) N Configurator (CONFIG Port of Dnet I/F) 2) Setting to High-speed link of XG5000 (RS-232C of CPU module or USB port)
XG5000 (High -speed link)	Data process unit		Byte
	Send/Receive period		Select among 20ms, 50ms, 100ms, 200ms, 500ms, 1s, 5s and 10s - Default : 20ms
	Max. communication point		Send 128,520points, Receive 128,520 points, 16,065 bytes respectively
	Max. block number		63 (Setting range: 0~62)
	Max. point number per block		2040 points (255 bytes)
Basic Specification	Max. modules installed		Up to 12 (available on basic base and added base)
	Internal-consumed current (mA)		350mA
	Weight (g)		81g

System configuration with other products

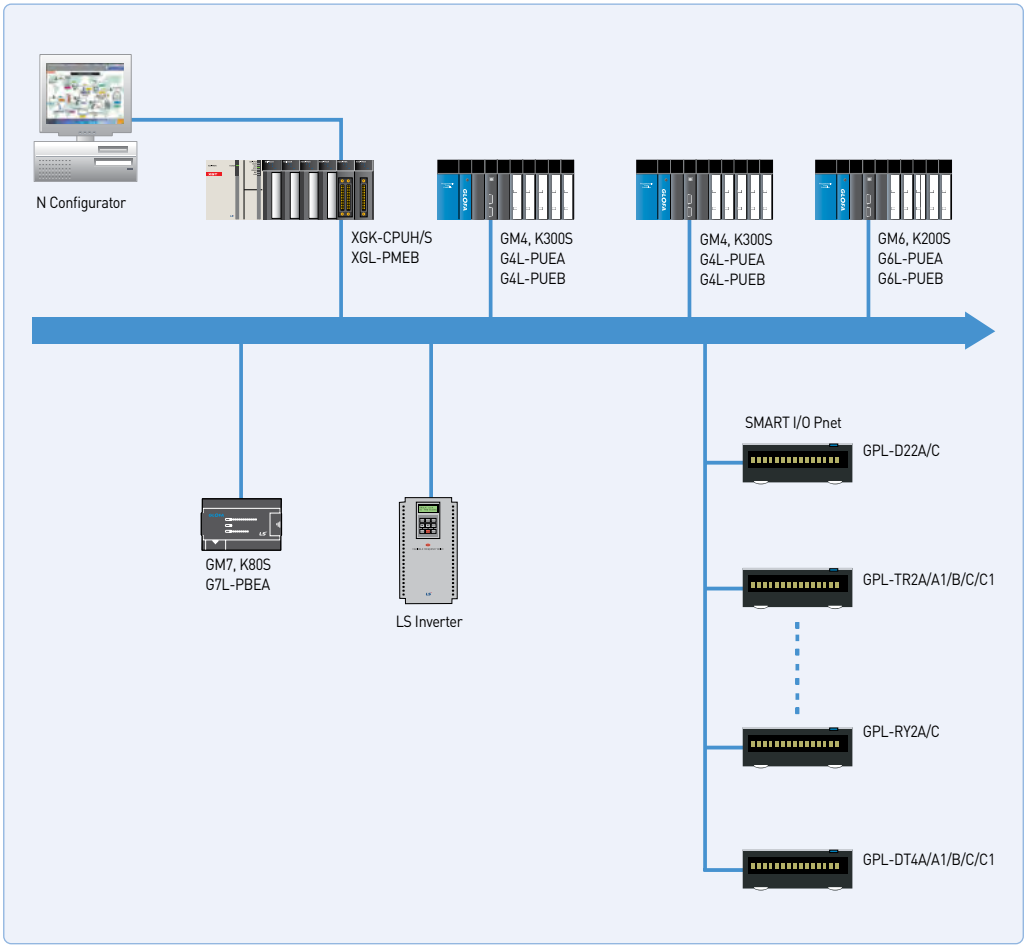


Profibus-DP [Pnet] system

XGL-PMEB

- Profibus-DP protocol
- Proper to communicate among a master automation device and distributed slave I/O devices.
- Fast slave communication without application layer
- Transmission speed: 9.6Kbps ~ 12Mbps
- Transmission distance: Max. 1,200m
- Max. 126 slave stations available (32 stations per segment)
- Network setting using N Configurator / XG5000 (Parameter setting, diagnosis and monitoring)
- I/O data of master station: 7kbytes
- Automatic monitoring of slave modules in the network: Auto-scan (XG5000)
- Multi master
- Easy configuration tool : N Configurator / XG5000

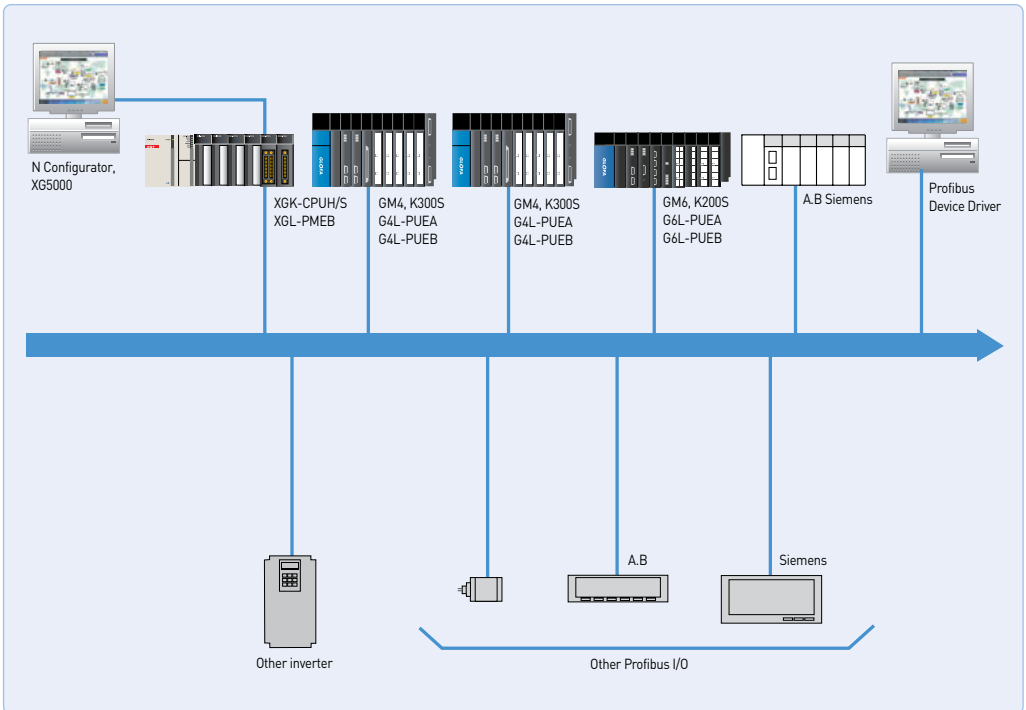
System configuration with LS ELECTRIC products



Specifications

Item	XGL-PMEB	
Module Type	Master	
Network Type	Profibus-DP	
Standard	EN50170/DIN19245	
Interface	RS-485 (Electric)	
Transmission Route	Bus type	
Modulation Type	NRZ	
MAC	Local Token Ring	
Max. Distance & Transmission Speed	Distance (m)	Transmission Speed (bps)
	1,200	9.6k/19.2k/31.25k/45.45k/93.7k
	1,000	187.5k
	400	500k
	200	1.5M
	100	3M/6M/12M
Max. number of stations per network	126	
Max. number of stations per segment	32 (including master & repeater)	
Max. number of modules per node	24 modules	
Cable used	Electric-twist shielded pair cable	
Max. communication size	7 KB	
Max. size per slave	244 bytes	
Max. number of units to be installed	XGK-CPUH/XGI-CPUU	XGK-CPUS/CPUA/CPUE
	12	12
Installation Position	XGK-CPUH/XGI-CPUU	XGK-CPUS/CPUA/CPUE
	Basic base ~ expansion stage 7	Basic base ~ expansion stage 3
Communication Parameters to set	XG5000 , SyCon (XGL-PMEA Dedicated Configuration Tool), N Configurator (XGL-PMEB/C Dedicated Configuration Tool)	
Internal-consumed current(mA)	500	
Weight (g)	88	

System configuration with other products



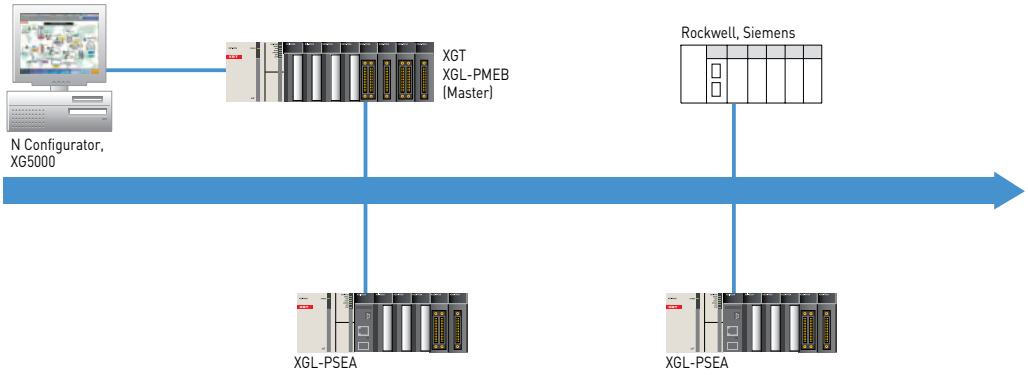
NETWORK

XGT Profibus-DP[Pnet] Slave I/F system

XGL-PSEA

- Profibus-DP
- Max. 98 stations available
- Other product Master 〈–〉 Pnet Slave I/F Module connect
- I/O configuration through XG5000 high-speed link parameter
- Provides online network status monitoring
- Global Command
  - Sync, Unsync, Freeze, Unfreeze

System configuration with other products



Specifications

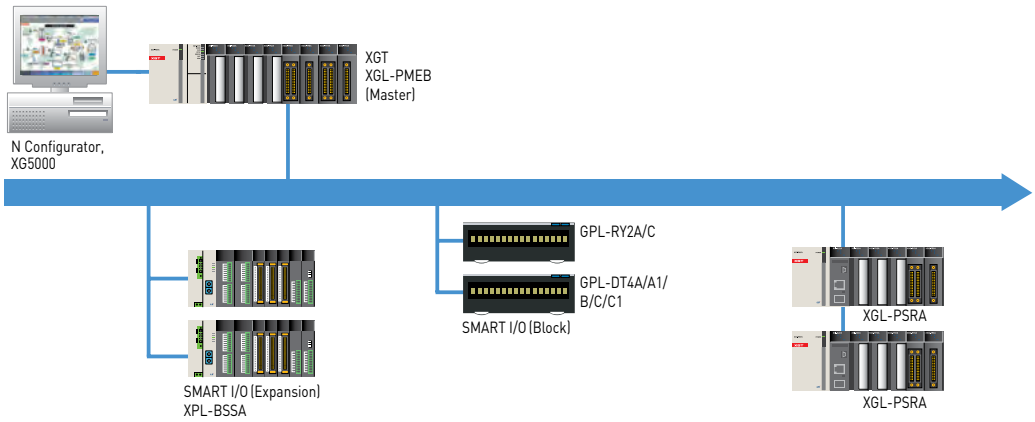
Item		XGL-PSEA				
Standard		EN50170 / DIN 19245				
Interface		RS-485(Electric)				
Media access		Polling				
Topology		Bus				
Modulation		NRZ				
Network Interface		Auto baud rate				
Master / Slave		Slave				
Max. number of slave per network		99				
Max. number of slave per segment		32				
Cable		Shield twisted pair cable				
Max. I/O data		244 byte				
Configuration tool		XG5000				
Transmission distance and speed	Trans. speed(kbps)	9.6	19.2	93.75	187.5	500
	Max. network length(m)	1200	1200	1200	1000	400
	Trans. speed(kbps)	1500	3000	6000	12000	-
	Max. network length(m)	200	100	100	100	-
Max num. of node		99(0~98)				
Max num. of transmission block		24				
Max num. of installation		12ea (XGR: Max. 6ea)				
Installation		XGK-CPUU/H, XGI-CPUU	Main base ~ 7th Expansion base			
		XGK-CPUE, XGI-CPUE	Main base ~ 1st Expansion base			
		XGK-CPUA/S, XGI-CPUH/S	Main base ~ 3rd Expansion base			
		XGR-CPUH/F, XGR-CPUH/T	Main base			
Current consumption (mA)		410				
Weight (g)		103				

Profibus-DP [Pnet] Remote I/F system

XGL-PSRA

- Profibus-DP
- Remote base implementation
- Max. 98 stations available
- Various I/O module
  - DI/DO module
  - AI/AO/RTD/TC module
- Provides online network status monitoring
- Hot swap function

System configuration with other products



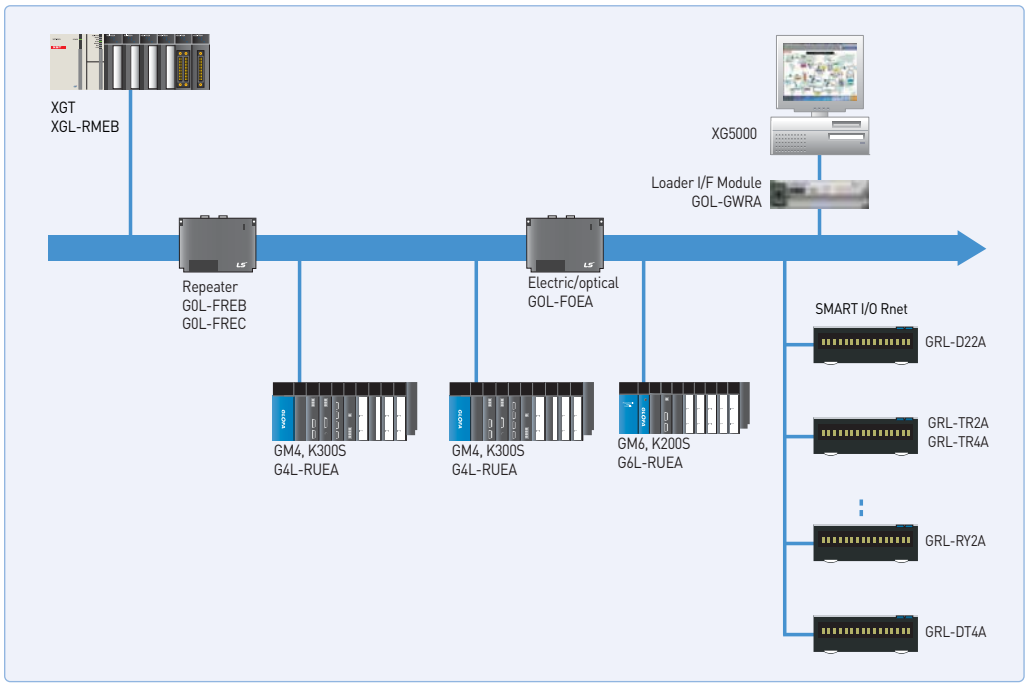
Specifications

Item		XGL-PSRA				
Standard		EN50170 / DIN 19245				
Interface		RS-485(Electric)				
Media access		Polling				
Topology		Bus				
Modulation		NRZ				
Network Interface		Auto baud rate				
Master / Slave		Slave				
Max. number of slave per network		100				
Max. number of slave per segment		32				
Cable		Shield twisted pair cable				
Max. number of communication points		244 byte				
Transmission distance and speed	Trans. speed(kbps)	9.6	19.2	93.75	187.5	500
	Max. network length(m)	1200	1200	1200	1000	400
	Trans. speed(kbps)	1500	3000	6000	12000	-
	Max. network length(m)	200	100	100	100	-
Max num. of node		100(0~99)				
Max. number of installation		12				
Max. digital I/O		768				
Max Analog I/O Channel		Input : 122ch. / Output : 96ch				
Current consumption (mA)		600				
Weight (g)		114				

XGL-RMEB

- Communication speed: 1Mbps
- Communication distance: Max. 750m
- Available to use max. 6 repeaters (Up to 5.25Km)
- Network management using Auto-scan (Slave module information)
- Multi-drop network with smart I/O
- Network diagnosis and monitoring by XG5000
- Max. 63 stations of slave modules controlled by one master module

System configuration



Specifications

Item		Specifications
Transmission Speed		1Mbps (Rnet I/F modules common)
Max. Tx distance		Max. 750m
Connection Cable		Twisted pair shielded cable - LIREV-AMESB 1Px22AWG (7/0.254):LS Cables
Maximum stations connected	Network	Master station 1[station no:0(fixed)] + Slave station 31[station no:1~63] = Max. 32 stations (In case of 32 stations, you have to use repeater.) - Only 1 master is available in the network.
Diagnostic function		XG5000 : High Speed Link Monitoring
System characteristic		Available detachment and attachment of slave module during communication
Terminal resistance(Ω)		110(5%,1/2W)
Master/Slave operation		Only available as Master
XG5000 (HS Link)	Data Processing unit	Byte
	Tx/Rx cycle	Selection among 20ms, 50ms, 100ms, 200ms, 500ms, 1s, 5s, 10s(default :200ms)
	Max. Communication points.	3,720bytes(slave 31stations * 120bytes/station)
	Max. Block number	63(setting range : 0~62)
	Max. points by Block	120 Byte(60words)
	Max. Tx. Block number	32 Blocks
	HS Link number	Max. 12
Specification	Max. module mounted	12 modules(Main Base + Extension Base)
	Internal current consumption(mA)	410
	Weight(g)	115

SMART I/O

- Reduction of wiring and real-time control of distributed I/O
- Various I/O module (16/32 points)

Repeater specifications

Item	Specifications
Type	G0L-FREB: AC110V ~ AC220V, G0L-FREC: DC 24V
Communication speed	1Mbps
Transmission method	Twisted pair shield cable
Transmission distance	Max. 750m per repeater
Max. number of installation between stations	Max. 6 repeaters
Max. distance between stations	5.25Km (when 6 repeaters are installed)
Fault data reception	Error data transmission
Frame error check	CRC 16 check

Network cable and peripheral devices

Item	Specifications	Remarks
Twisted pair electric cable	LIREV-AMESB, 2 ×1mm, 18AWG	LS cable
RF terminator	110 Ω, 1/2 W	-

XGT Fnet

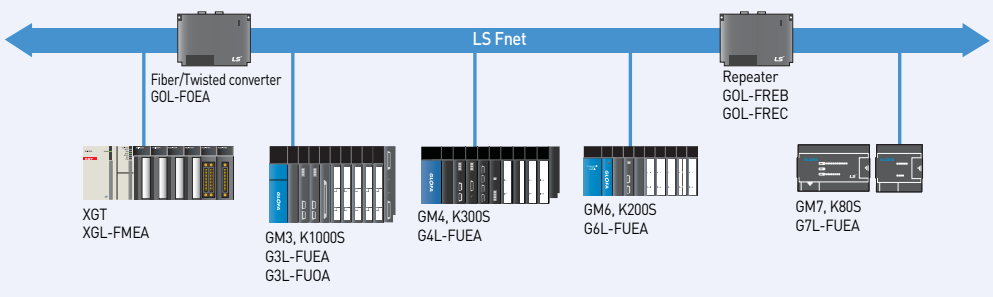
XGL-FMEA

- Dedicated network for LS PLC
- Easy high-speed link parameter setup
- 1Mbps high-speed communication
- Max. 750m
- Max. 6ea repeater available (Max. expansion 5.25km)
- Network management through Auto scan
- Max. 12ea on 1ea base
- Deterministic Network through Token Passing & Broadcasting
- 3,840 Word for each station
  (Send 1920 Word /Receive 1920 Word)
- Max. number of block: Send 32blocks, Receive 64blocks, 60words for each block
- Max. communication points: 3840words (64block ×60word)
- Setup: Parameter download via XG5000
- Diagnosis by XG5000: Communication module information, High speed link fault, Auto scan

Specification

Item	Description
Communication speed	1Mbps
Encoding method	Manchester Biphase-L
Transmission length (for one segment)	Max. 750m
Transmission length (via repeater)	Max. 750m ×(6ea repeaters+1)=5.25km
Transmission cable	Twisted pair shield cable
Max. number of connection	64stations (32stations /segment, 64stations for repeater)
Max. protocol size	256 bytes
Access method	Circulated Token Passing
Frame error check	CRC 16 check
Max. number of installation	12ea
Installation base	Main base or expansion base
Current consumption (mA)	410
Weight (g)	120

System configuration



Ethernet switching hub

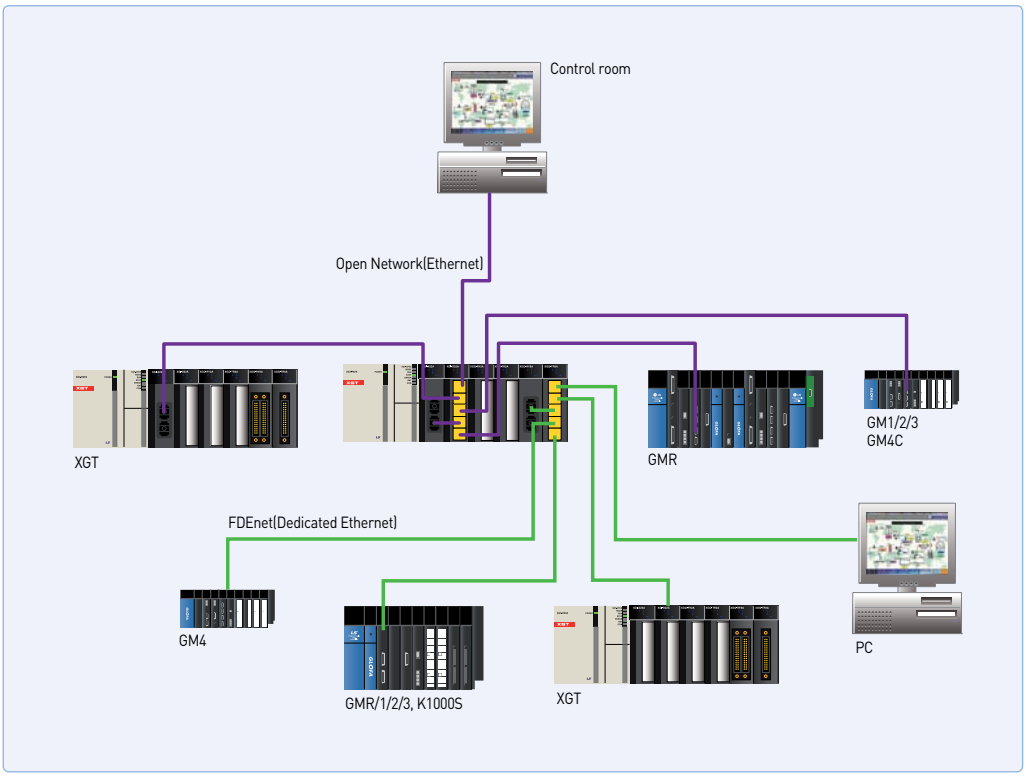
XGL-EH5T

- Rack type: No external power
- Reliability for industrial standard
- Auto Crossover
- FG (Frame Ground) for RJ-45 connector
  - Decreased communication error by shielded FTP/STP cable

Specification

Item		XGL-EH5T
Transmission	Communication speed	10/100Mbps
	Port type	10/100BASE-TX, TP cable, RJ-45 socket, 5ports
	Interface	Auto-Crossing, Auto-Nego., Auto-Polarity
	Distance	100m
	Diagnosis	LED (PWR, Link status, Data)
Current consumption (mA)		550
Weight (g)		90

System configuration



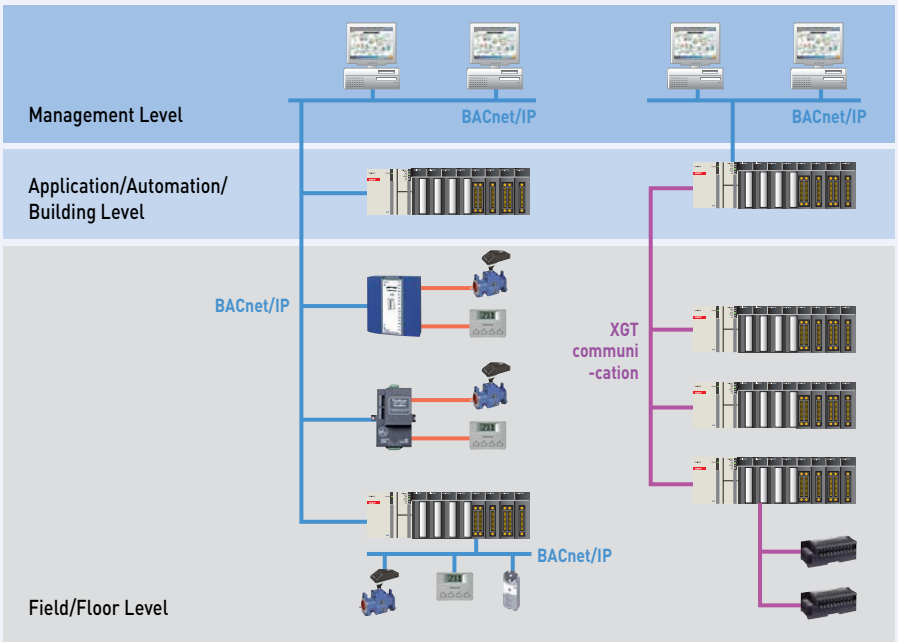
XGT BACnet/IP

XGL-BIPT

- Compatibility: compatible with ANSI/ASHRAE 135-1995
- Provides 100BASE-TX media, and supports 100Mbps/Full Duplex.
- Up to 24 modules can be equipped per CPU module, and can be installed on main base or augmenting base. However, they can be installed only on main base in XGR system.
- With its internal switch function, it requires no switch or HUB, which reduces wires and provides flexibility in terms of installation.
- Makes cable works easier with its auto cross-over function.
- Provides various diagnosis functions and status information for modules and networks.

System configuration

XGL-BIPT module can be connected to BACnet Network using client/server, XGL-BIPT module is used as BACnet server, and sub-device can be controlled by being connected with exclusive power line communication (PLC).



Device Profile	B-ASC + Client
Data Sharing	DS-RP-A, B DS-RPM-A, B DS-P-A, B DS-WPM-A, B
Device & Network Management	DM-DDB-B DM-DOB-B DM-DCC-A, B

Specifications

Item		Specification
Transmission standards	Transmission speed	100Mbps
	Transmission method	Base hand
	Maximum extension distance between nodes	100m
	Maximum size of protocol	1,536 bytes
	Communication access method	CSMA/CD
	Frame error check method	CRC 32 = $X^{32}+X^{26}+X^{23}+ \ldots\ldots +X^{2}+X+1$
	Maximum number of units installed	24 units
Service	Service type	P2P/Server
	Maximum communication data	1,400 bytes
	Support object(Server)	Device Object Binary Input Object Binary Output Object Analog Input Object Analog Output Object
	Diagnostic function	Communication module information Service status information Media information Ping test Auto scan DCC(Device Communication Control) System log
Basic standards	External dimensions(mm)	90(H) × 27(W) × 90(D)
	Current consumption(mA)	400
	Weight(g)	102

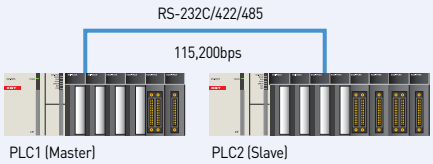
XGT Computer-Link

Communication among PLCs

This is a system configuration communicating between XGT PLCs by serial communication.
In this case, PLC 1 is the master (Client) and other PLC should be slaves (Server).
It is called Master/Slave communication. Master PLC is defined by comm. basic parameter and P2P setting.
And slave PLC is defined by basic parameter and driver setting.

Configuration

PLC1 reads present value, C0000 of PLC 2's up-counter and then saves it in M0200 of PLC1.

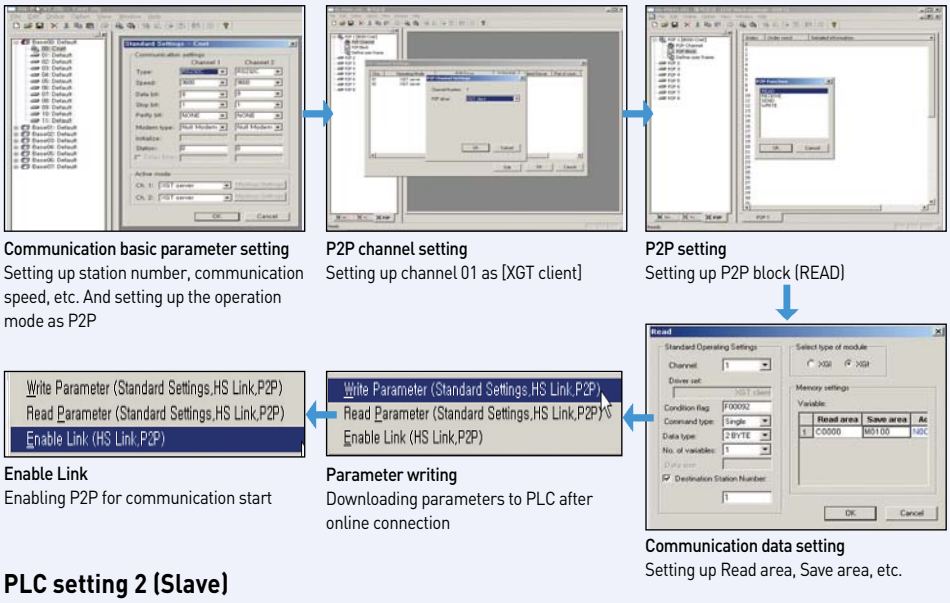


Data memory

PLC station	PLC memory	Setting Item
PLC 1	M0100	1. XG5000 parameter setting, 2. XG5000 programming
PLC 2	C0000	1. XG5000 parameter setting, 2. XG5000 programming

XG5000 setting

PLC setting 1 (Master)



Communication basic parameter setting
Setting up station number, communication speed, etc. And setting up the operation mode as P2P

P2P channel setting
Setting up channel 01 as [XGT client]

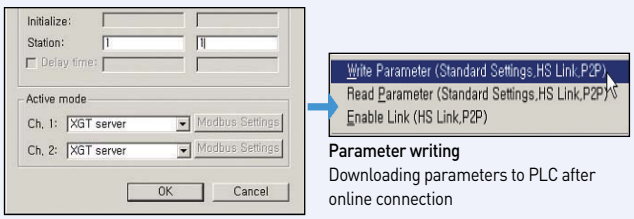
P2P setting
Setting up P2P block (READ)

Communication data setting
Setting up Read area, Save area, etc.

Enable Link
Enabling P2P for communication start

Parameter writing
Downloading parameters to PLC after online connection

PLC setting 2 (Slave)



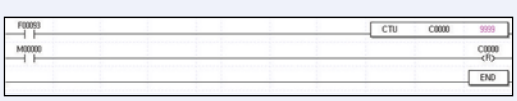
Communication parameter setting
Setting up station number and channel 01 mode as 1 and XGT server

Parameter writing
Downloading parameters to PLC after online connection

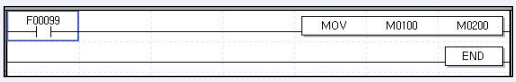
* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

PLC station 2 setting
Make up-counter program using CTU command



PLC station 1 setting
Check out the counter value of M0100 is transmitted.

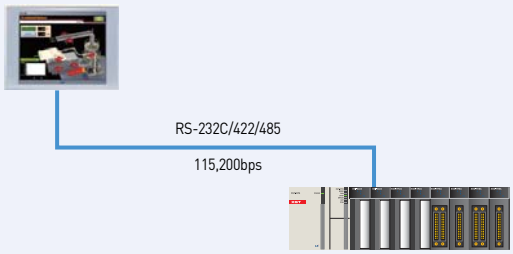


HMI communication configuration

This is a system configuration to monitor and control PLC (XGT) by XP (HMI).
In this case, PLC is the slave (Server) and XP should be the master (Client).
PLC is defined by comm. basic parameter and driver setting.

configuration

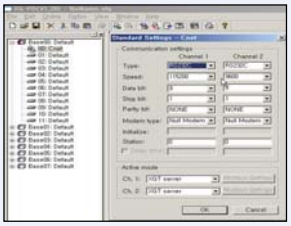
Making On/
Off touch tag for controlling
M0001 of XGT



Data memory

PLC memory	Setting item	PMU
M000D1	1. XG5000 parameter setting	Using touch tag
	2. XG5000 programming	

XG5000 setting



Basic communication parameter setting
Setting up station number, communication speed, etc And setting up the operation mode as XGT server

Parameter writing
Downloading parameters to PLC after online connection

PMU setting
Setting up communication setting (speed, data, stop, parity, etc) same as XGT

* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

Create program that P00010 is on right after M00001 is on.

NETWORK

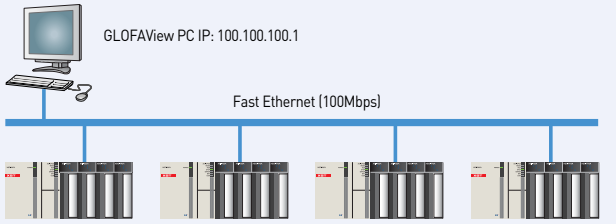
XGT Communication example (Ethernet)

HMI communication configuration

This is a data communication system configuration among XGT PLCs via Ethernet network.
In this case, communication is possible by HS link among PLCs.
It just needs basic parameter setting and HS link item setting.

configuration

Read the up-counter value C0000 of PLC1 and monitor it in GLOFAview.

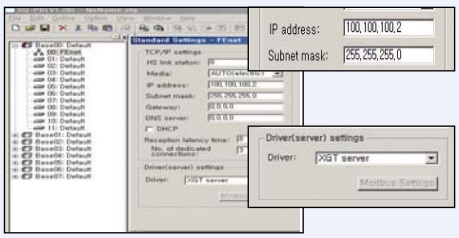


Data memory

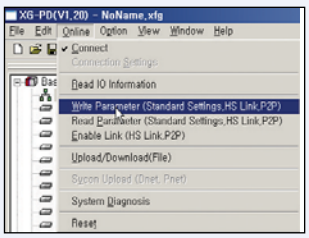
PLC station	Setting item	GLOFAView
C0000	1. XG5000 parameter setting	Using analog tag
	2. XG5000 programming	

XG5000 setting

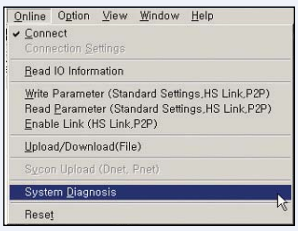
PLC setting 1 (Master)



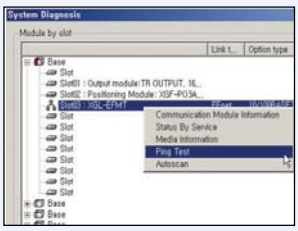
Basic communication parameter setting
Specifying IP address and Subnet mask of PLC as above



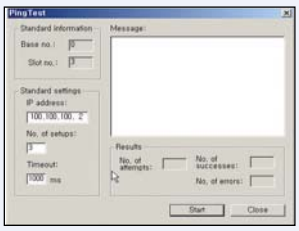
Parameter writing
Downloading parameters to PLC after online connection



Communication test
Checking online and system diagnosis



System Diagnosis
Selecting Ping Test



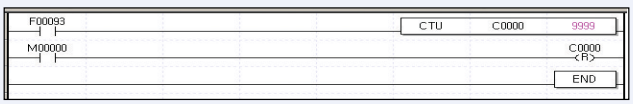
Ping Test
Starting diagnosis after inputting IP address of PLC

* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

Make the up-counter program using CTU command.

Check out if the counter value of CTU value is transmitted.

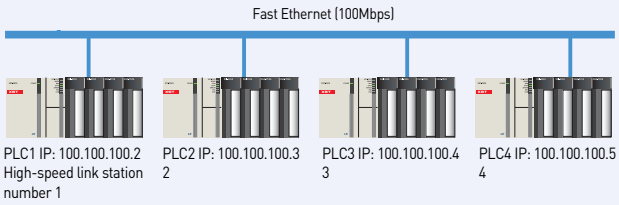


High-speed link communication

This is a configuration for XGT to communicate each other via Ethernet.
It just needs communication basic parameter setting and High-speed link item setting.

configuration

Read present value C0000 of PLC1 and transmit it to M0000 of PLC2.

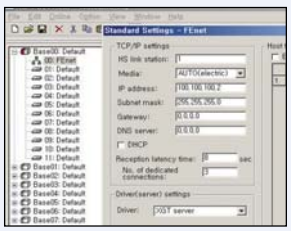


Data memory

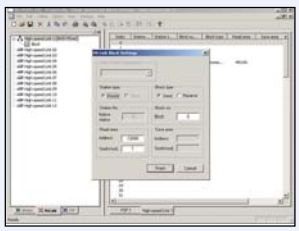
PLC station	PLC memory	Setting Item
PLC 1	C0000	1. XG5000 parameter setting, 2. XG5000 programming
PLC 2	M0100	1. XG5000 parameter setting, 2. XG5000 programming

XG5000 setting

PLC station 1 (setting)



Basic communication parameter setting
Specifying HS link station, IP address and Subnet mask of PLC as above

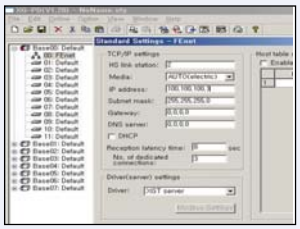


Communication data setting
Setting up communication data in HS link item as above

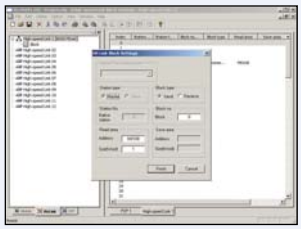
Parameter writing
Downloading parameters to PLC after online connection

Enable Link
Enabling link for communication start

PLC station 2 (setting)



Basic communication parameter setting
Specifying HS link station, IP address and Subnet mask of PLC as above



Communication data setting
Setting up communication data in HS link item as above

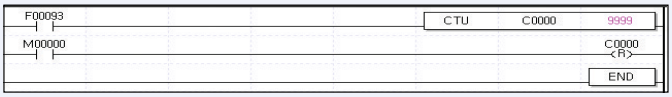
Parameter writing
Downloading parameters to PLC after online connection

Enable Link
Enabling link for communication start

* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

PLC1 setting
Make the up-counter program using CTU command



PLC2 setting
Check out if the counter value of M0100 is transmitted.

NETWORK

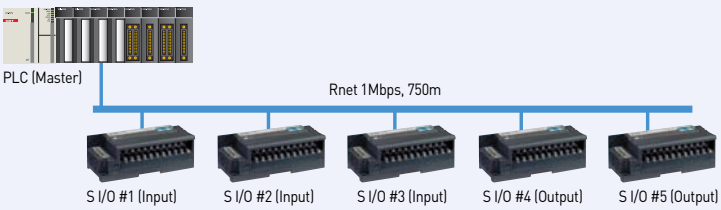
XGT Communication example (Rnet)

Remote I/O configuration

LS ELECTRICdeveloped communication method is Rnet which is 'Distributed Control System' using Smart I/O.
In this case, PLC is the master and the other Smart I/O are slaves.
It just needs basic parameter setting for communication and High-speed link setting.

configuration

PLC controls each Smart I/O (16-point).

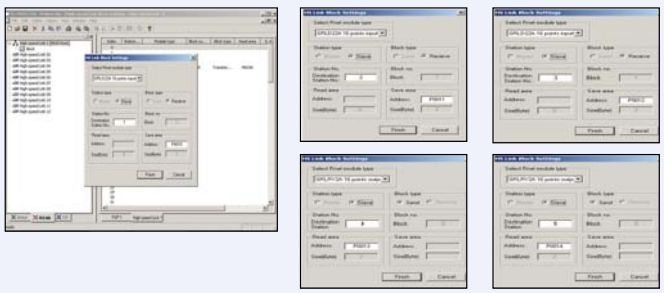


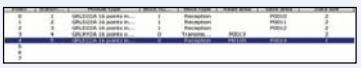
Data memory

Smart I/O #	Smart I/O address	PLC address	Setting item
1	P0000	P0010 (P00100~P0010F)	1. XG5000 parameter setting, 2. XG5000 programming
2	P0000	P0011 (P00110~P0011F)	
3	P0000	P0012 (P00120~P0012F)	
4	P0000	P0013 (P00130~P0013F)	
5	P0000	P0014 (P00140~P0014F)	

XG5000 setting

Communication data setting
Setting up type name, station number, address of each station's Smart I/O in HS link item as following example.





HS link registration completed

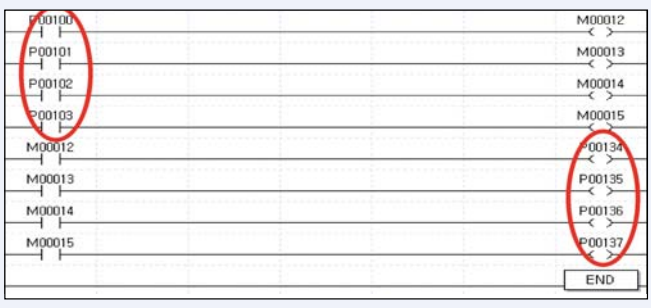
Parameter writing
Downloading parameters to PLC after online connection

Enable Link
Enabling link for communication start

* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

Write a program using I/O address of Smart I/O.

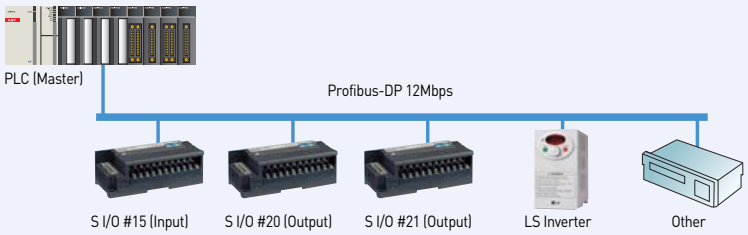


High-speed link communication among PLCs

XGT can create 'Distributed Control System' with Smart I/O, Inverter, pneumatic device via Profibus-DP.
In this case, PLC is the master and the other devices such as Smart I/O are slaves.
It just needs SyCon, basic parameter and High-speed link setting.

configuration

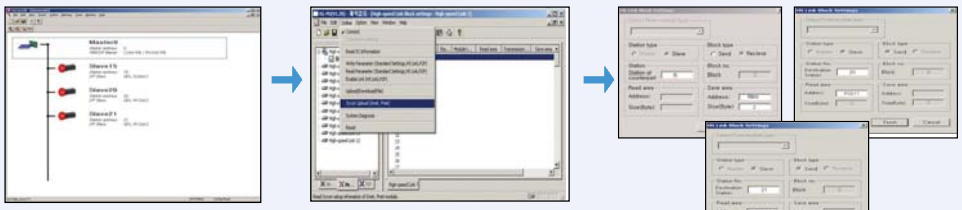
PLC controls each Smart I/O (16-point).



Data memory

Smart I/O #	Smart I/O address	PLC address	Setting item
15	P0000	P0010 (P00100~P0010F)	1. SyCon setting 2. XG5000 parameter setting, 3. XG5000 programming
20	P0000	P0011 (P00110~P0011F)	
21	P0000	P0012 (P00120~P0012F)	

XG5000 setting



SyCon setting
For detailed setting instruction, refer to page 43 (SyCon setting)

HS link setting
Uploading SyCon and setting up each Smart I/O station as following example

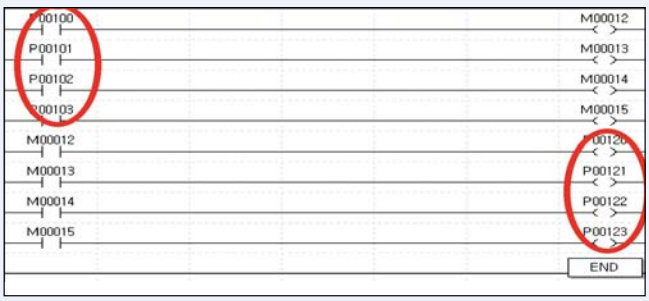
Parameter writing
Downloading parameters to PLC after online connection

Enable Link
Enabling link for communication start

* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

Write a program using I/O address of Smart I/O Pnet



NETWORK

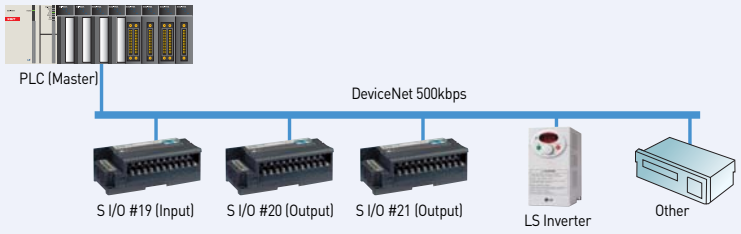
XGT Communication example (DeviceNet)

High-speed link communication among PLCs

XGT can create 'Distributed Control System' with Smart I/O, Inverter, pneumatic device via Dnet.
In this case, PLC is the master and the other devices such as Smart I/O are Slaves.
It just needs SyCon, basic parameter and High-speed link setting.

configuration

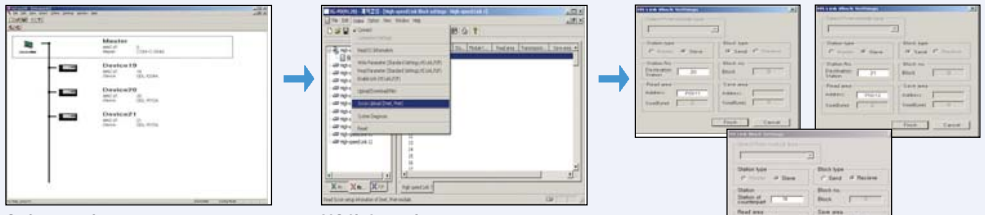
PLC controls each Smart I/O (16-point).



Data memory

Smart I/O #	Smart I/O address	PLC address	Setting item
19	P0000	P0010 (P00100~P0010F)	1. SyCon setting 2. XG5000 parameter setting, 3. XG5000 programming
20	P0000	P0011 (P00110~P0011F)	
21	P0000	P0012 (P00120~P0012F)	

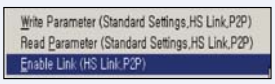
XG5000 setting



SyCon setting
For detailed setting instruction, refer to page 43 (SyCon setting)

HS link setting
Uploading SyCon and setting up each Smart I/O station as following example

Parameter writing
Downloading parameters to PLC after online connection

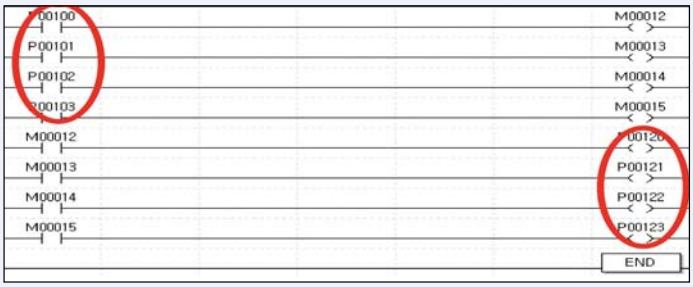


Enable Link
Enabling link for communication start

* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

XG5000 programming

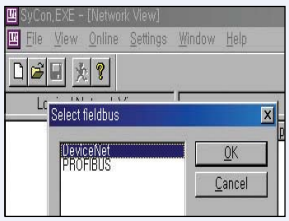
Write a program using I/O address of Smart I/O Dent.



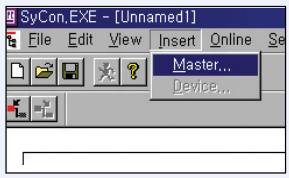
(SyCon setting Profibus, DeviceNet)

SyCon is the dedicated software that help user set up the communication environment for Profibus-DP and DeviceNet more easily and conveniently.

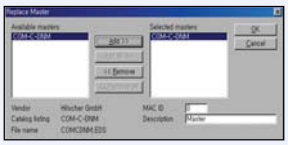
Example of application



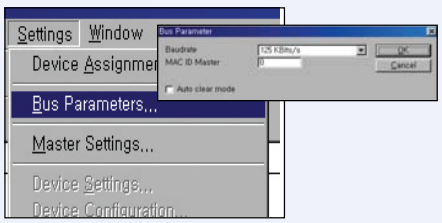
New file
Select fieldbus that is used.



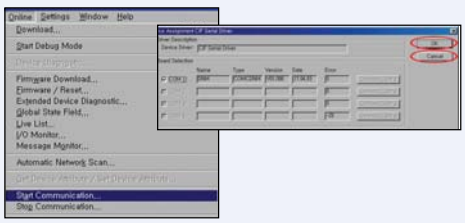
Basic communication parameter setting
Select [Master] in Insert menu.



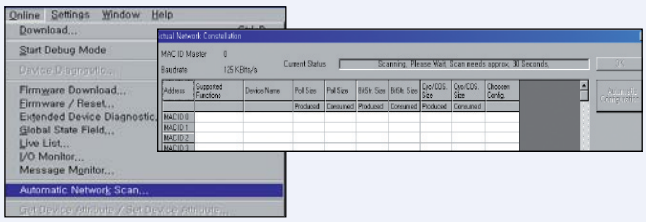
Master module setting
Select [COM-C-DNM] for DeviceNet.
Select [COM-C-DPM] for Profibus-DP.



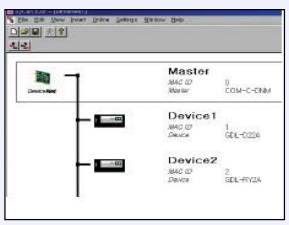
Bus parameter setting
Set up communication speed of master module.



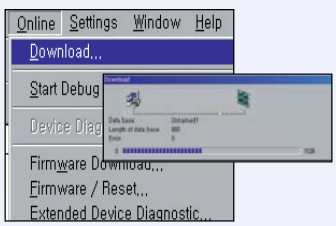
Master module setting
After clicking the port button, check, the right check-box.



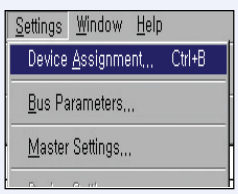
Automatic network scan of connected Smart I/O
Perform automatic network scan after station number setting and wiring with remote device such as Smart I/O.
At this time, all remote devices should be in normal connection (Power-On, etc).
After network scan is completed, press [Automatic Configuration] button and [OK] button.



Network checking
Check normal network (remote) condition.



Parameter download



Disconnect
Disconnect the port in Device Assignment.

XGT SMART I/O (Stand alone)

Features

- Wiring reduction and real time control of distributed I/O
- Supporting Rnet, DeviceNet, Profibus-DP, Modbus (RS-422/485), RAPIEnet
- Various I/O (DC/TR/Relay) modules with the unit of 16/32 points

Digital I/O specifications

Item		Input		Output			Mixed module	
		DC (Sink/Source)		Transistor (Sink)		Relay	DC (Sink/Source)	Transistor (Sink)
No. of point		16	32	16	32	16	16	16
Rated input (Load voltage)		DC 24 V		DC 24 V		DC 24 V/AC 110 V/220 V	DC 24 V	DC 24 V
Input current (Load current)		7 mA		0.1 A/2 A, 0.5 A/3 A		2 A/5 A	7 mA 0.1 A/2 A, 0.5 A/3 A	
Response time	Off →On	3 ms or less		3 ms or less		3 ms or less	3 ms or less	3 ms or less
	On →Off	3 ms or less		3 ms or less		3 ms or less	3 ms or less	3 ms or less
Common		16 points/COM		16 points/COM		16 points/COM	16 points/COM	16 points/COM
Current consumption		200 mA	300 mA	280 mA	380 mA	550 mA	350 mA	
Network	Rnet	GRL-D22C	GRL-D24C	GRL-TR2C1	GRL-TR4C1	GRL-RY2C	GRL-DT4C1	
	Profibus-DP	GPL-D22C	GPL-D24C	GPL-TR2C/TR2C1	GPL-TR4C/TR4C1	GPL-RY2C	GPL-DT4C/DT4C1	
	DeviceNet	GDL-D22C	GDL-D24C	GDL-TR2C/TR2C1	GDL-TR4C/TR4C1	GDL-RY2C	GDL-DT4C/DT4C1	
	Modbus	GSL-D22C	GSL-D24C	GSL-TR2C1	GSL-TR4C1	GSL-RY2C	GSL-DT4C1	
RAPIEnet		-	GEL-D24C	-	GEL-TR4C1	GEL-RY2C	-	GEL-DT4C1

Note1) C Source, Rated current: 0.5A, terminal separated type
C1 Sink, Rated current: 0.5A terminal separated type

Analog I/O specifications

Item	GPL-AV8C/GEL-AV8C	GPL-AC8C/GEL-AC8C	Item	GPL-DV4C/GEL-DV4C	GPL-DC4C/GEL-DC4C
Input channels	8 channels		Output channels	4 channels	
Analog input	DC 1~5 V, 0~5 V, 0~10 V, -10~+10 V	0~20 mA, 4~20 mA, - 20~20 mA	Digital input	0~4000, 0~8000, -8000~8000	0~8000
			Analog output	DC 1~5 V, 0~5 V, 0~10 V, -10~+10 V	0~20 mA, 4~20 mA
Digital output	0~4000, 0~8000, -8000~8000	0~4000, -8000~8000			
Input impedance	1 M Ω	250 Ω	Load impedance	1 K Ω or more (0~5 V or 1~5 V)	
Max. resolution	±15 V	±30 mA		2 K Ω or more (0~10 V or -10~10 V)	500 Ω or less
	1.25 mV	2.5 μA	Resolution	1.25 mV	2.5 μA
Accuracy	±0.3% (full scale, Ta=0~55 °C)	±0.3% (full scale, Ta=23 °C±5 °C)	Accuracy	±0.3% (full scale, Ta=0~55 °C)	±0.3% (full scale, Ta=23 °C ±5 °C)
		±0.4% (full scale, Ta=0~55 °C)			±0.4% (full scale, Ta=0~55 °C)
Conversion speed	10 ms or less/8 channel		Conversion speed	10 ms or less/4 channel	
Response period	10 ms or less/8 channels + Transmission period (ms)		Response period	10 ms or less/8 channels + Transmission period (ms)	
	Analog input/output terminal with FG→Insulation			Analog input/output terminal with FG→Insulation	
Insulation method	Analog input/output terminal with Communication terminal→Insulation		Insulation method	Analog input/output terminal with Communication terminal→Insulation	
	Analog input/output terminal with each channel→No insulation			Analog input/output terminal with each channel→No insulation	
External power supply	DC 24 V (21.6 ~ 26.4)		External power supply	DC 24 V (20.4 ~ 28.8)	
External current consumption	DC 24 V : 220 mA		External current consumption	210 mA	240 mA
Weight (kg)	0.313	0.313	Weight (kg)	0.314	0.322

Communication specifications

Item	Rnet (LS dedicated network)	Profibus-DP	DeviceNet	MODBUS	RAPIEnet(RJ-45)
Protocol	LS ELECTRICdedicated protocol (Fnet for Remote)	Profibus-DP (RS-485/EN50170)	DeviceNet (CAN)	MODBUS (RS-422/485)	Fast Ethernet
Transmission speed	1 Mbps	9.6 Kbps ~ 12 Mbps	125/250/500 Kbps	2.4 Kbps ~ 38.4 Kbps	100Mbps
Transmission distance	750 m/segment	100 m ~ 1.2 km	500/250/125 m (Thin cable: 100 m)	500 m	100M
Topology	Bus Token	Bus	Trunk & Drop	Bus	CRC32
Transmission	Pass & Broadcast	Token Pass & Master/Slave (Poll)	CSMA/NBA (Poll, Cyclic, COS, Bit Strobe)	Master/Slave (Poll)	CSMA/CD
No. of stations	32/segment (Input: 32, Output: 32)	32/segment, 99/network	64	32	64

(Modbus TCP/IP, Ether Net/IP Adapter)

Features

- IEEE 802.3 standard
- Modbus TCP/IP, EtherNet/IP
- 10/100BASE-TX media
- Ethernet Twisted pair 2ports (RJ-45)
- 2channels Ethernet MAC
- Auto-Negotiation/Auto-Crossover
- Various system configuration

Specification

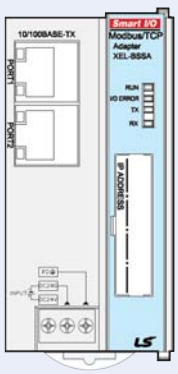
Items		XEL-BSSA	XEL-BSSB
I/F	Protocol	Modbus TCP	EtherNet/ IP
	Transmission speed	10 /100Mbps	
	Connector	RJ-45(2ports)	
	Topology	Software(BootpServer)	
	IP setup	Bus, Star	
Max. expansion module		8ea	
Max. digital I/O point		256 points	
Max. analog I/O channel		32ch (Input 16ch, Output 16ch)	
Operating power	Rated voltage	DC 24V	
	Range	DC19.2 ~ 28.8V	
	Rated current	1.5A	
	Insulation	Non-Insulation, Comm. Part insulation	

System configuration

Items		Description	Max. I/O point
Digital I/O	XBE-DC08A	DC24V input 8pt	Max. 256 points
	XBE-DC16A	DC24V input 16pt	
	XBE-DC32A	DC24V input 32pt	
	XBE-RY08A	Relay output 8pt	Max. 256 points
	XBE-RY16A	Relay output 16pt	
	XBE-TN08A	Tr output 8pt, Sink	
	XBE-TP08A	Tr output 8pt, Source	
	XBE-TN16A	Tr output 16pt, Sink	
	XBE-TP16A	Tr output 16pt, Source	
	XBE-TN32A	Tr output 32pt, Sink	
	XBE-TP32A	Tr output 32pt, Source	
	XBE-DN16A	DC24V input 8pt , Tr output 8pt	
Analog, Temperature	XBF-AD04A	Current/Voltage input 4Ch	Input Max. 16ch Output Max. 16ch
	XBF-AD04C	4-channel analog input (current / voltage, resolution : 1/16000)	
	XBF-DC04A	Current output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-DV04A	Voltage output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-RD04A	RTD input 4Ch	
	XBF-TC04S	TC input 4Ch	

* When Digital input and Analog input is used together or Digital output Analog output is used, configure the system within 32bytes
(Ex) If 4ch analog input is used, Digital input can be used max. 192points

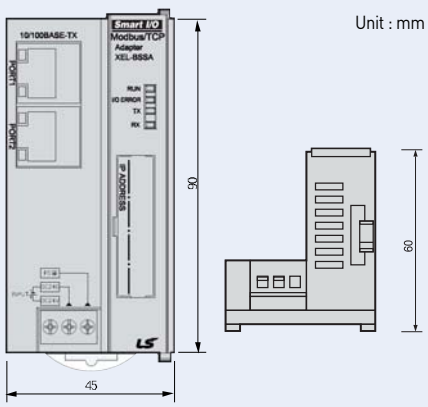
Externals and inscriptions



Item	LED status
RUN	Operation status
	On: Normal operation
	Off: Abnormal operation
I/O ERROR	Interface status of expansion module
	On: Expansion module error
	Off: Normal operation
TX	Data send status to master
	On: Under transmission
	Off: No data
RX	Data receive status from master
	On: Under receiving
	Off: No data

Dimension

Unit : mm



NETWORK

XGT SMART I/O (DeviceNet adapter)

Features

- Max. 63 stations
- Flexible connection via DeviceNet
- Utilize same I/O modules with XGB
  - Max. 512 I/O points
  - Max. 32 channels analog input/output

Specification

Items		Description		
Communication Specification		Poll, Bit-strobe, COS/Cyclic		
		Group 2 only slave		
		Auto baud rate		
Module' s Type		Slave		
Max. Node Number (MAC ID)		64(0~63)		
Number of Expansion I/O Slots		8		
Max. DC I/O Data Size		Input:32bytes / Output:32bytes		
Max. Analog Channels		Input : 16Channels / Output : 16Channels		
Speed & Distance	Comm. Speed	125 kbps	250 kbps	500 kbps
	Distance	500 m	250 m	100 m
Input Power	System Power	DC 24V		
	Range	19.2V ~ 28.8V(11V operate)		
	Output Voltage/ Current	5V(±20%) /1.5A		
Weight(g)		100		

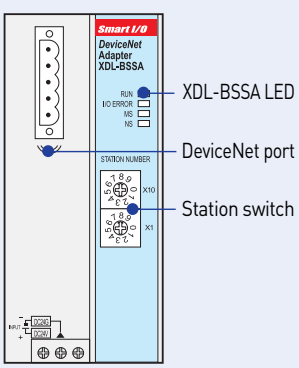
* When I/O module is installed, check the current consumption (Max. Current: 1.5A)

System configuration

Items		Description	Max. I/O point
Digital I/O	XBE-DC08A	DC24V input 8pt	256points
	XBE-DC16A	DC24V input 16pt	
	XBE-DC32A	DC24V input 32pt	
	XBE-RY08A	Relay output 8pt	
	XBE-RY16A	Relay output 16pt	
	XBE-TN08A	Tr output 8pt, Sink	
	XBE-TP08A	Tr output 8pt, Source	
	XBE-TN16A	Tr output 16pt, Sink	
	XBE-TP16A	Tr output 16pt, Source	
	XBE-TN32A	Tr output 32pt, Sink	
	XBE-TP32A	Tr output 32pt, Source	
	XBE-DN16A	DC24V input 8pt , Tr output 8pt	
Analog, Temperature	XBF-AD04A	Current/Voltage input 4Ch	16channels
	XBF-AD04C	4-channel analog input (current / voltage, resolution : 1/16000)	
	XBF-DC04A	Current output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-DV04A	Voltage output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-RD04A	RTD input 4Ch	
	XBF-TC04S	TC input 4Ch	

* When Digital input and Analog input is used together or Digital output Analog output is used, configure the system within 32bytes
(Ex) If 4ch analog input is used, Digital input can be used max. 192points

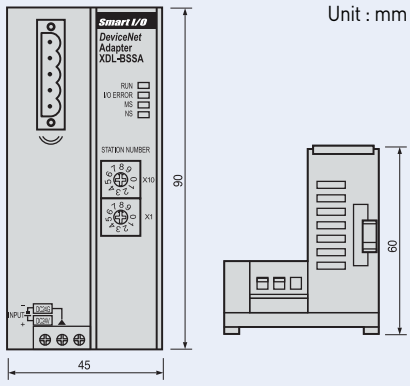
Externals and inscriptions



Item	LED status
RUN	ON : Normal
	OFF : Module error
I/O ERROR	ON : I/O module error
	OFF : Normal
MS	Green ON: Normal
	Green blink: Normal
	Red ON: Module error
NS	Green ON: Normal
	Green blink: Waiting
	Green off: Comm. stop
	Red ON: Network error
	Red blink: Disconnect

Dimension

Unit : mm



SMART I/O (Profibus-DP adapter)

Features

- Max. 100 stations (32stations per segment)
- Flexible connection via Profibus
- Utilize same I/O modules with XGB
  - Max. 512 I/O points
  - Max. 32 channels analog input/output

Specification

Item			Performance Specification				
Transmission	Standard		EN50170 / DIN 19245				
	Interface		RS-485(Electric)				
	Media Access		Polling				
	Topology		BUS				
	Encoding Method		NRZ				
	Interface		Sync mode , Freeze mode Auto baud rate				
	Master/Slave		Slave				
	Cable Type		Twisted Pair Shielded Cable				
	Comm. Distance	Kbps	9.6	19.2	93.75	187.5	500
		m	1200	1200	1200	1000	400
		kbps	1500	3000	6000	12000	-
		m	200	100	100	100	-
	Max. Node Number		100 (0 ~ 99)				
	Number of Expansion I/O Slots		8				
	IO Data Size		64bytes (Input:32bytes/Output:32bytes)				
	Number of Analog Channels		32Channels (Input : 16Channels/Output :16Channels)				
Input Power	System Power		Supply Voltage : DC 24Vdc 19.2 ~ 28.8Vdc				
	Output Voltage/ Current		5V(±20%) / 1.5A				
Weight(g)			100				

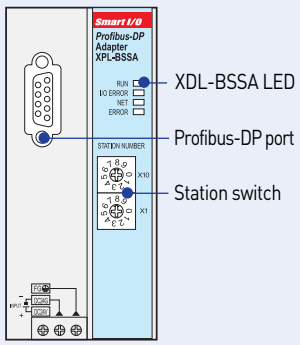
* When I/O module is installed, check the current consumption (Max. Current: 1.5A)

System configuration

Items		Description	Max. I/O point
Digital I/O	XBE-DC08A	DC24V input 8pt	256points
	XBE-DC16A	DC24V input 16pt	
	XBE-DC32A	DC24V input 32pt	
	XBE-RY08A	Relay output 8pt	
	XBE-RY16A	Relay output 16pt	
	XBE-TN08A	Tr output 8pt, Sink	
	XBE-TP08A	Tr output 8pt, Source	
	XBE-TN16A	Tr output 16pt, Sink	
	XBE-TP16A	Tr output 16pt, Source	
	XBE-TN32A	Tr output 32pt, Sink	
	XBE-TP32A	Tr output 32pt, Source	
	XBE-DN16A	DC24V input 8pt , Tr output 8pt	
Analog, Temperature	XBF-AD04A	Current/Voltage input 4Ch	16channels
	XBF-AD04C	4-channel analog input (current / voltage, resolution : 1/16000)	
	XBF-DC04A	Current output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-DV04A	Voltage output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-RD04A	RTD input 4Ch	
	XBF-TC04S	TC input 4Ch	

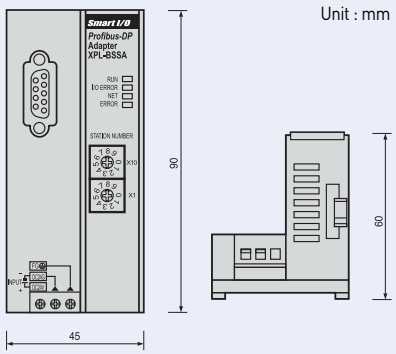
* When Digital input and Analog input is used together or Digital output Analog output is used, configure the system within 32bytes
(Ex) If 4ch analog input is used, Digital input can be used max. 192points

Externals and inscriptions



Item	LED status
RUN	ON : Normal
	Blink: Waiting or comm. error
	OFF : Module error
I/O ERROR	ON : I/O module error
	OFF : Normal
NET	ON : Data send/receive
	OFF : Disconnection
ERROR	ON : Comm. error
	OFF : Normal

Dimension



XGT SMART I/O (Rnet adapter)

Features

- Max. 63 stations
- LS dedicated protocol (Rnet)
- Utilize same I/O modules with XGB
  - Max. 512 I/O points
  - Max. 32 channels analog input/output

Specification

Item		Performance Specification
Transmission	Tran. Rate	1Mbps
	Transmission Path	Bus type
	Method	750m
	Max. Cable Length	5 pin connector
	Connector type	Twisted Pair Shielded Cable
	Cable type	32(non-used repeater),
	No. of Station	64(used repeater)
	(Included Master)	512(Input : 256, Output: 256)
	Max. Digital I/O points	96
	Max. Analog I/O points	Digital I/O 8
	Number of I/O Slots	Analog I/O 4
	Selection of Latch/Clear	handling of mode change switch
Rated Voltage/current		DC24V/0.55A
Weight (g)		100

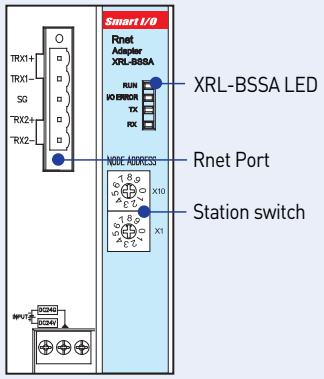
* When I/O module is installed, check the current consumption (Max. Current: 1.5A)

System configuration

Items		Description	Max. I/O point
Digital I/O	XBE-DC08A	DC24V input 8pt	256points
	XBE-DC16A	DC24V input 16pt	
	XBE-DC32A	DC24V input 32pt	
	XBE-RY08A	Relay output 8pt	
	XBE-RY16A	Relay output 16pt	
	XBE-TN08A	Tr output 8pt, Sink	
	XBE-TP08A	Tr output 8pt, Source	
	XBE-TN16A	Tr output 16pt, Sink	
	XBE-TP16A	Tr output 16pt, Source	
	XBE-TN32A	Tr output 32pt, Sink	
	XBE-TP32A	Tr output 32pt, Source	
	XBE-DN16A	DC24V input 8pt , Tr output 8pt	
Analog, Temperature	XBF-AD04A	Current/Voltage input 4Ch	16channels
	XBF-AD04C	4-channel analog input (current / voltage, resolution : 1/16000)	
	XBF-DC04A	Current output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-DV04A	Voltage output 4Ch	
	XBF-DV04C	4-channel analog input (voltage, resolution : 1/16000)	
	XBF-RD04A	RTD input 4Ch	
	XBF-TC04S	TC input 4Ch	

* When Digital input and Analog input is used together or Digital output Analog output is used, configure the system within 32bytes
(Ex) If 4ch analog input is used, Digital input can be used max. 192points.

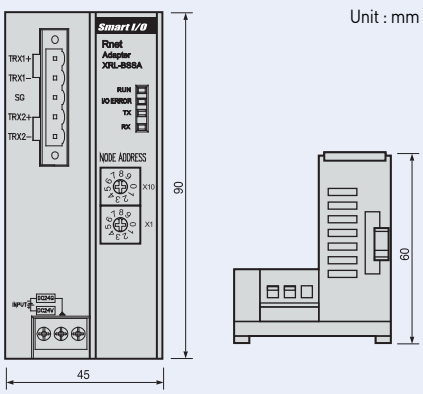
Externals and inscriptions



Item	LED status
RUN	ON : Normal
	OFF : Module error
I/O ERROR	ON : I/O module error
	OFF : Normal
TX	Data send
RX	Data receive

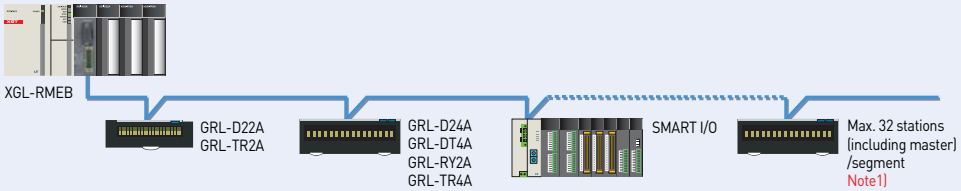
Dimension

Unit : mm

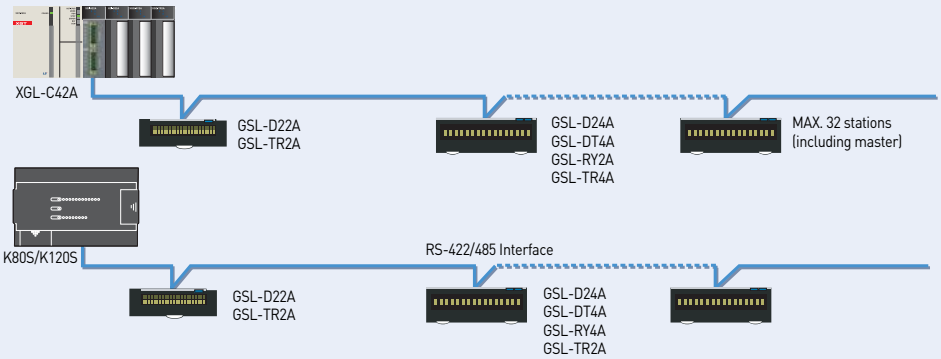


SMART I/O (Features)

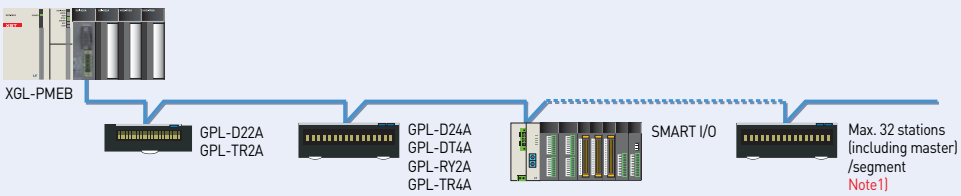
Smart I/O Rnet system



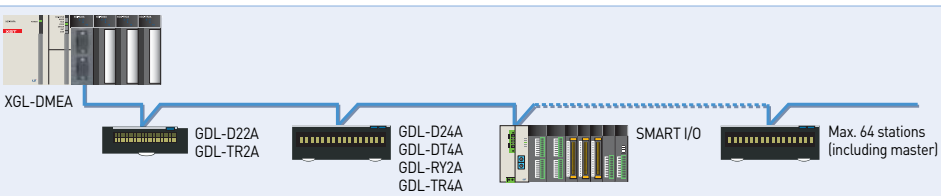
Smart I/O Modbus system



Smart I/O Profibus-DP system

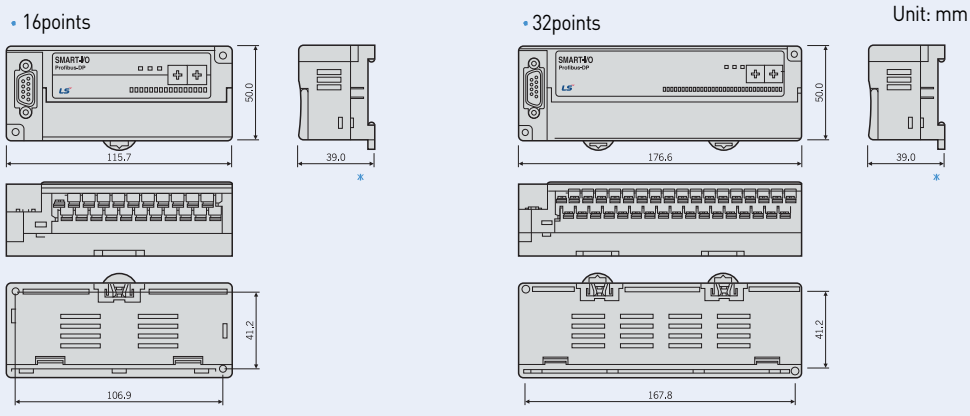


Smart I/O DeviceNet system



Note1) Segment: Communication section that does not use repeater or second master.

Dimensions



* GxL-RY2 (16-point relay output) module follows the dimension of 32-point module.
* The length of C type Smart I/O is 47.5mm

Network Standard

Item	Rnet (LS dedicated network)	Profibus-DP	DeviceNet	MODBUS	RAPIEnet (RJ-45)
Protocol	LSELECTRIC dedicated protocol (Fnet for Remote)	Profibus-DP (RS-485/EN50170)	DeviceNet (CAN)	MODBUS (RS-422/485)	Fast Ethernet
Transmission speed	1 Mbps	9.6 Kbps ~ 12 Mbps	125/250/500 Kbps	2.4 Kbps ~ 38.4 Kbps	100Mbps
Transmission distance	750 m/segment	100 m ~ 1.2 km	500/250/125 m (Thin cable: 100 m)	500 m	100M
Topology	Bus Token	Bus	Trunk & Drop	Bus	CRC32
Transmission	Pass & Broadcast	Token Pass & Master/Slave (Poll)	CSMA/NBA (Poll, Cyclic, COS, Bit Strobe)	Token Pass & Master/Slave (Poll)	CSMA/CD
No. of stations	32/segment (Input: 32, Output: 32)	32/segment, 99/network	64	32	64

NETWORK