Top 100
Global
Innovator
for 10 years

XGT Series

Programmable Logic Controller

LS ELECTRIC

XGT series, innovative solutions for system integration
from field to information level.
Open Network System Integration



neXt Generation Technology

XGT Series

Welcome to XGT World*!*

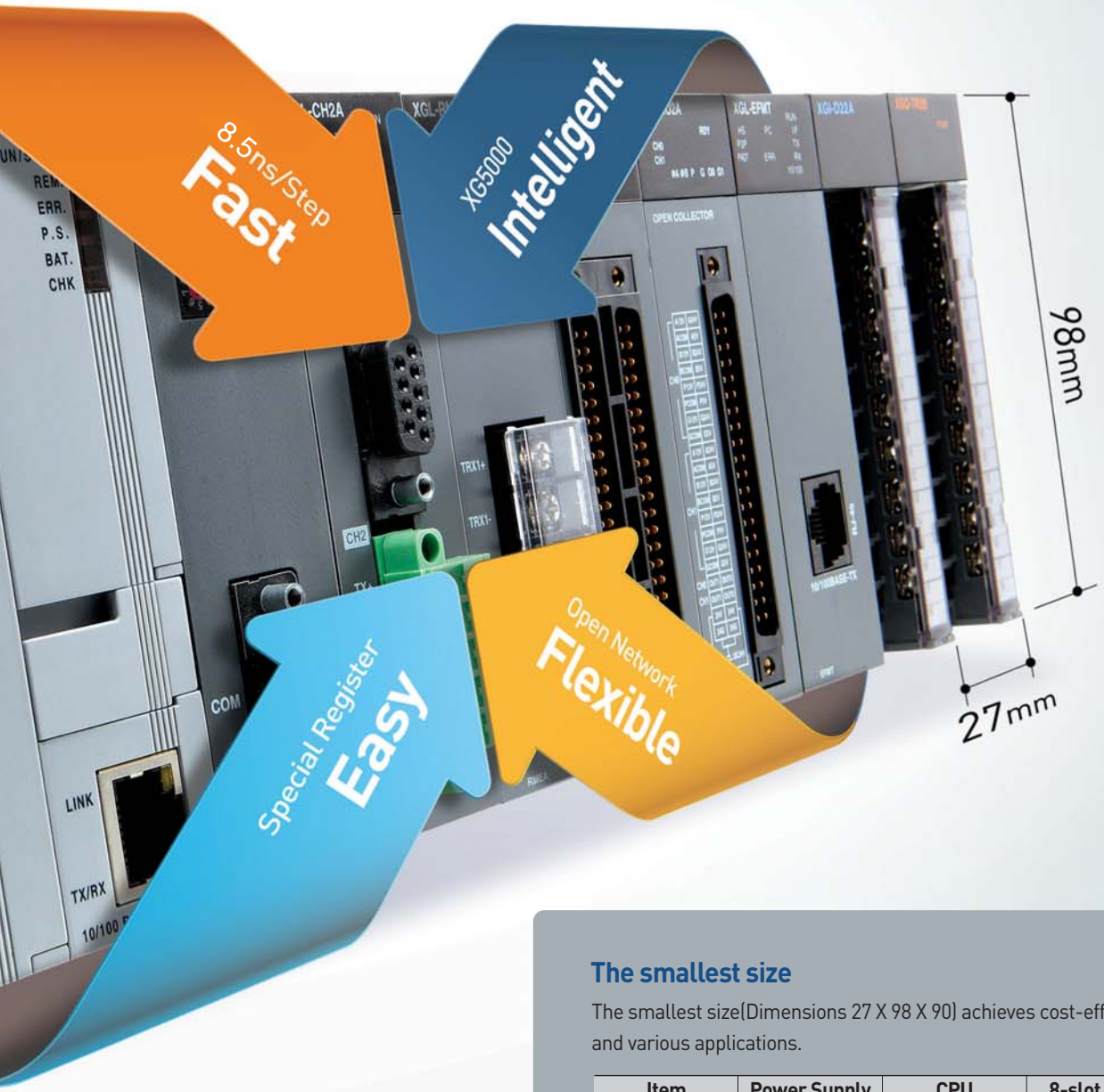
XGT series will meet your needs and expectations, enabling the highest possible productivity and performance levels and more.

XGK / I

CPUU CPUS
CPUH CPUE
CPUA


XGR
XGK/I
CPUUN
CPUHN
CPUSN

XGT series is the next-generation solution with a new concept providing advanced engineering environment based on open network, fastest processing speed, compact size and user-friendly software.



The smallest size

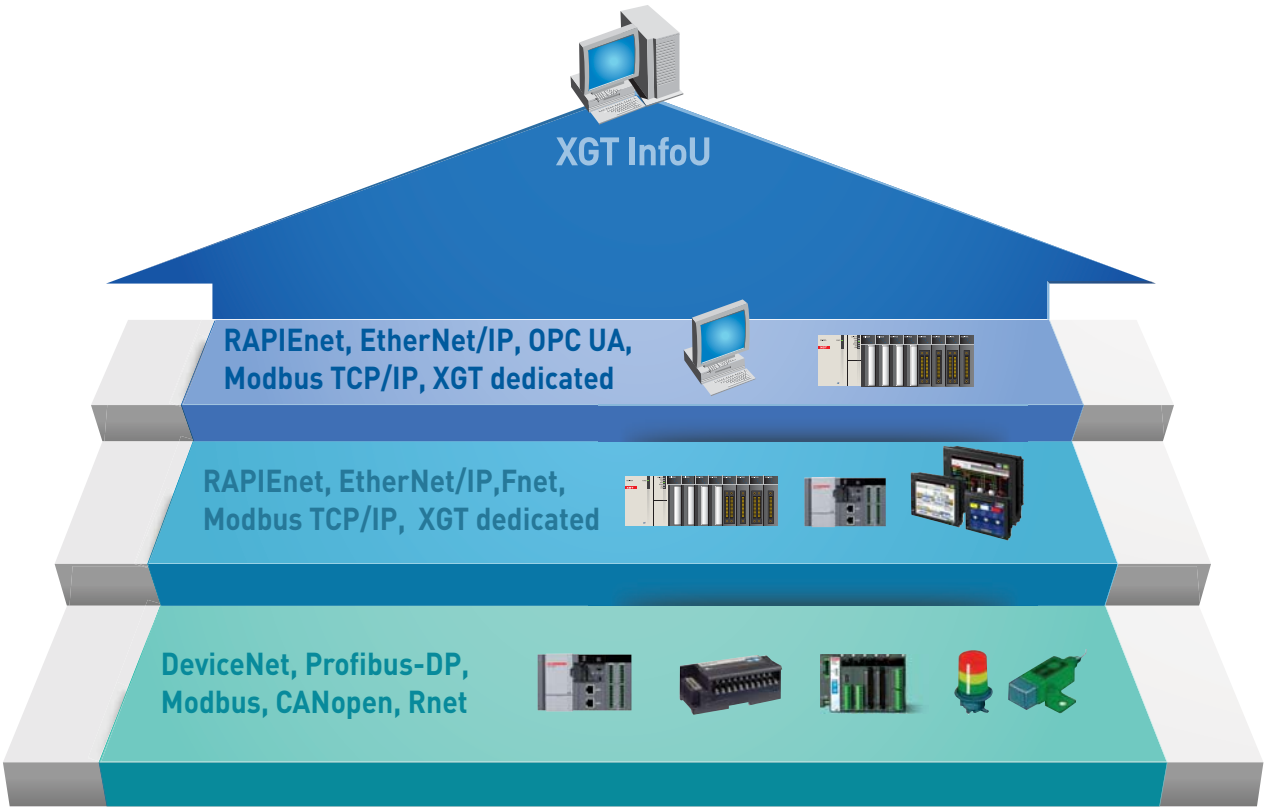
The smallest size(Dimensions 27 X 98 X 90) achieves cost-efficiency and various applications.

Item	Power Supply	CPU	8-slot Base
Size (WXHXD)	55X98X90	27X98X90	318X98X17

XGT series, neXt Generation Technology for easier, faster and smarter automation, will provide you with future-oriented solutions, bringing greener, safer and more convenient life for you...

System Integration of Open Network

XGT series support various communication solutions ranging from field control to information level with Fast Ethernet, Profibus-DP, DeviceNet, Modbus, etc.

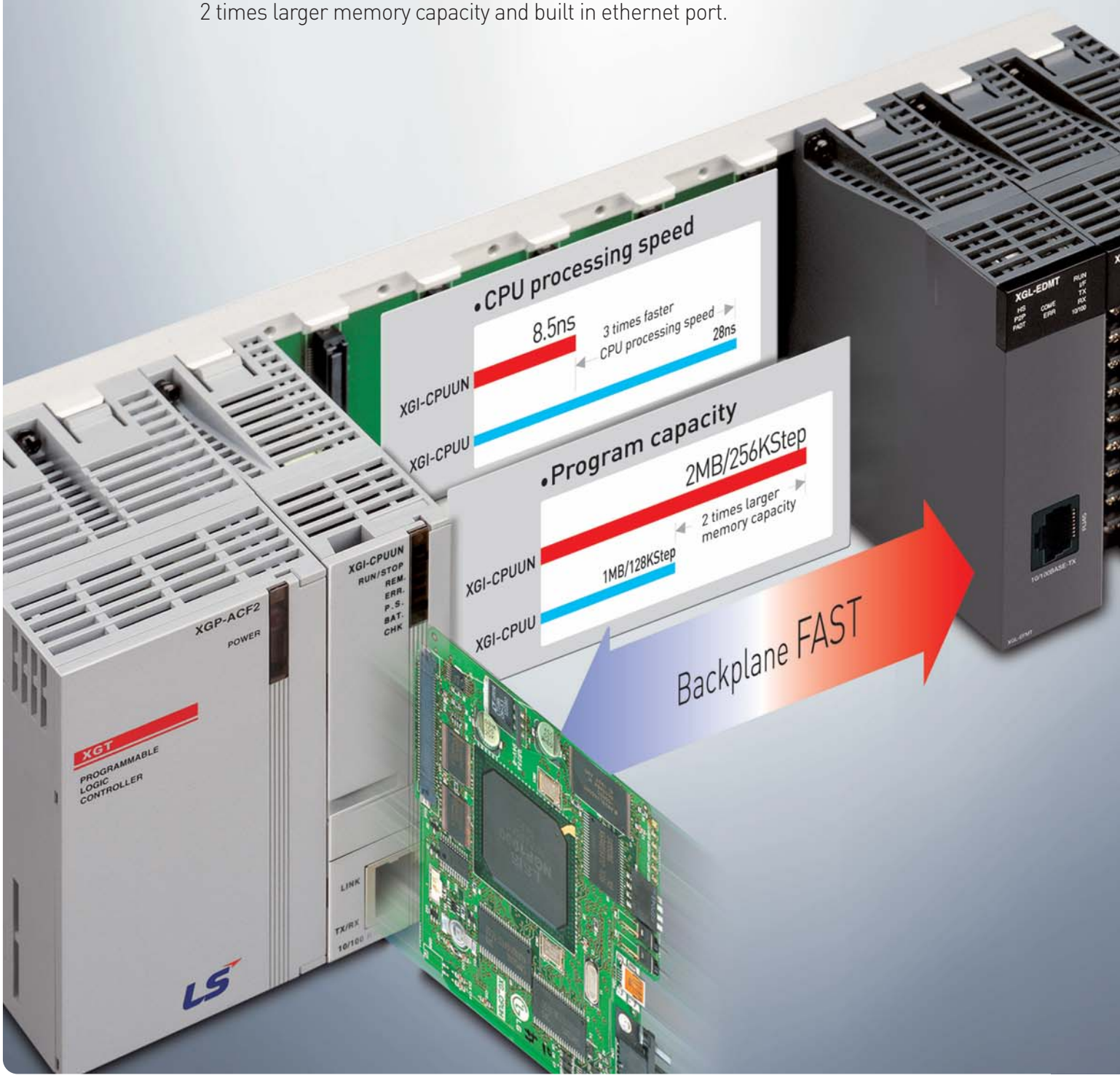


Item		Industrial Ethernet network				Fieldbus network				
		RAPIEnet	EtherNet/IP	ModbusTCP/IP	XGT dedicated	Cnet	Fnet	Profibus-DP	DeviceNet	Rnet
Master/Client module		XGL-EFMTB, XGL-EFMFB, XGL-EFMHB				XGL-C22B, XGL-C42B, XGL-CH2B	XGL-FMEA	XGL-PMEB	XGL-DMEB	XGL-RMEB
Slave/Server module		XGL-DBDT, XGL-DBDF, XGL-DBDH				-	-	XGL-PSRA, XGL-PSEA	-	-
Transmission speed Media		100/1000Mbps				300 ~ 115,200bps	1Mbps	Max.12Mbps	Max.500Kbps	1Mbps
Distance (Node to node)		100m(Tp) 2Km (Fiber Optic)				Max.1.2km (422/485)	750m(Seg) Max.5.25km	Max.1.2km	Max.500m	750m (Seg) Max.5.25km
Max. number of connection		64	64	64	64 16(Server)	32	64	32(Seg) 128	64	64
Protocol		RAPIEnet	EtherNet/IP	Modbus TCP/IP	XGT dedicated	Modbus RTU/ASCII	Fnet (LS dedicated)	Profibus-DP	DeviceNet	Rnet (LS dedicated)
Service	High-speed link	●	–	–	●	–	●	●	●	●
	P2P	●	●	–	●	●	–	–	–	–
	XG5000 Service	●	●	–	●	●	–	–	–	–
	E-Mail Service	–	–	–	●	–	–	–	–	–
Configuration Software		XG5000								
Max. number of installation		24ea(High-speed link : 12ea, P2P service : 8ea)								

Do you want more powerful features and performance? answer is LS ELECTRIC

XGT New CPU

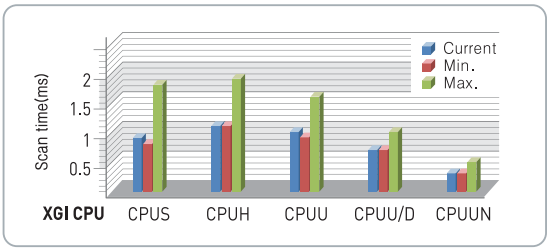
New XGT CPU has 3 times faster cpu processing speed,
2 times larger memory capacity and built in ethernet port.



Compare of scan time between XGI-CPUU and XGI-CPUUN

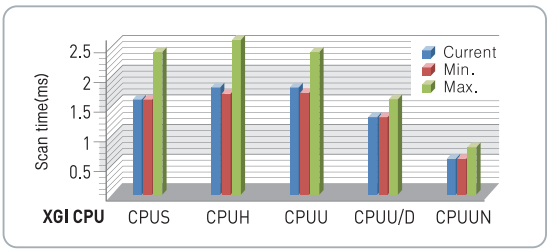
Using 1 MOVE word

Item	XGI-CPUUN	XGI-CPUU/D	XGI-CPUU	XGI-CPUH	XGI-CPUS
Current scan time	0.2ms	0.6ms	0.9ms	1.0ms	0.8ms
Min. scan time	0.2ms	0.6ms	0.8ms	1.0ms	0.7ms
Max. scan time	0.4ms	0.9ms	1.5ms	1.8ms	1.7ms



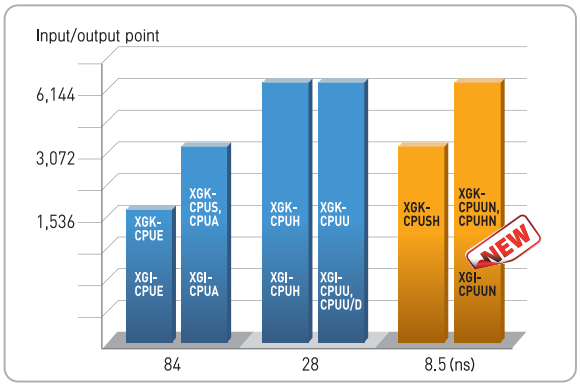
Using 1,000 MOVE word

Item	XGI-CPUUN	XGI-CPUU/D	XGI-CPUU	XGI-CPUH	XGI-CPUS
Current scan time	0.5ms	1.2ms	1.7ms	1.7ms	1.5ms
Min. scan time	0.5ms	1.2ms	1.6ms	1.6ms	1.5ms
Max. scan time	0.7ms	1.5ms	2.3ms	2.5ms	2.3ms



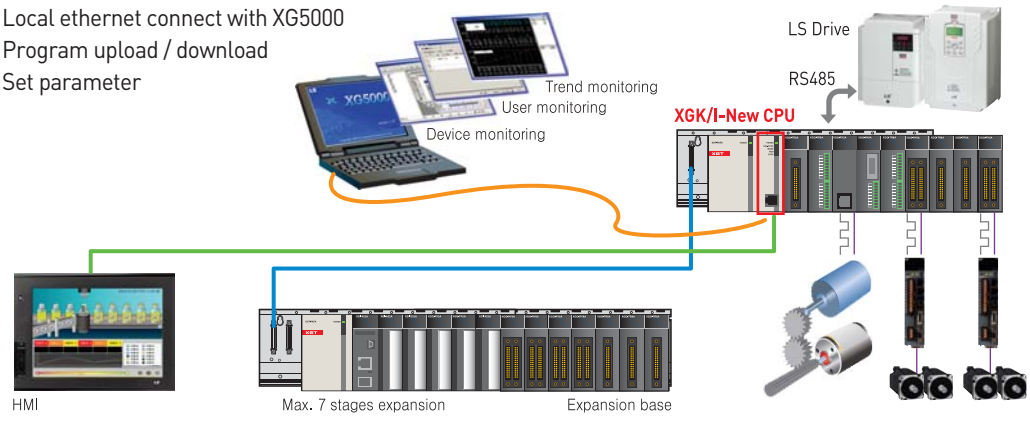
Device memory range

CPU	Device memory	XGI-CPUU	XGI-CPUUN
XGI CPU	A	512KB	1024KB
	M	256KB	512KB
XGK CPU	P/M/K	32,768 point	65,536 point
	T	T000 – T2047	T000 – T8191
	C/S/Z, R/ZR	2 ~ 8 times larger	



Easy connection

- Local ethernet connect with XG5000
- Program upload / download
- Set parameter



Engineering & Programming
Innovation Easy

Special Register

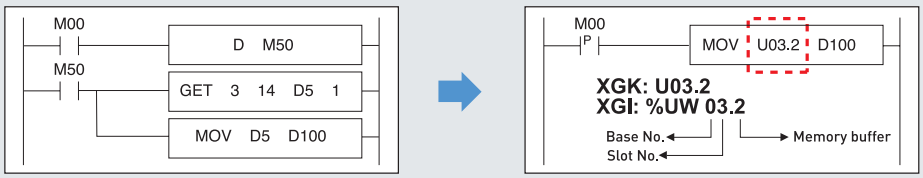
XGT series expand device memory and support advanced programming environment with Index register (Z), File register (U), and Analog register (U).

R **File register**
As a non-volatile memory type, data are secured even in times of blackout or CPU reset.

U **Analog register**
Assigning base, slot and memory buffer of an analog module to device, A/D conversion data can be accessed without analog commands.

Z **Index register**
Index register is used in the sequence program for array operation.

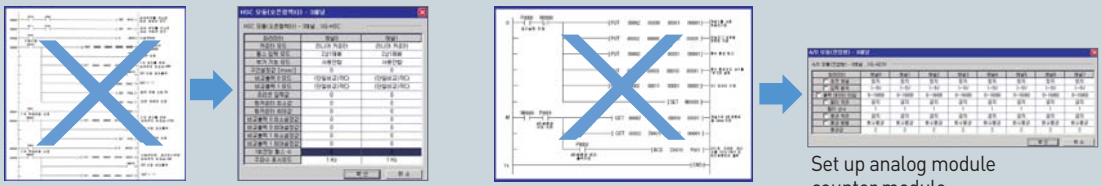
Example of Analog Register



KGLWIN XG5000

Analog Operation without Programming

Special module setup and operation is achieved by just parameter setting without additional program.



Set up high-speed

Set up analog module
counter module

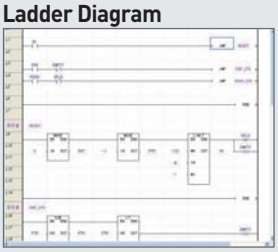
Program Modularization and Task Operation

Available to run multiful programs through medulization of scan programs based on functions and author, and to operate task programs triggered by specific conditions.

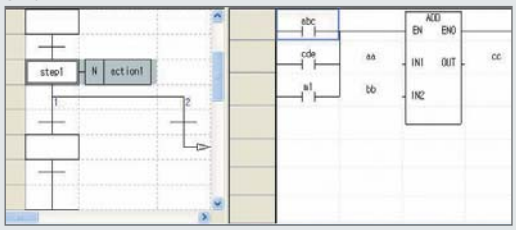
Program type		Description	Number
Scan program	Scan	Executed in every scan	256-task
Task program	Initialization task	Executed only one time when power turns on	1
	Time driven task	Executed with a constant time interval specified in parameter setting	32
	Internal task	Executed by internal condition	32
	External interrupt task	Executed by external interrupt input	32

IEC standard language (XGI): LD, SFC, ST

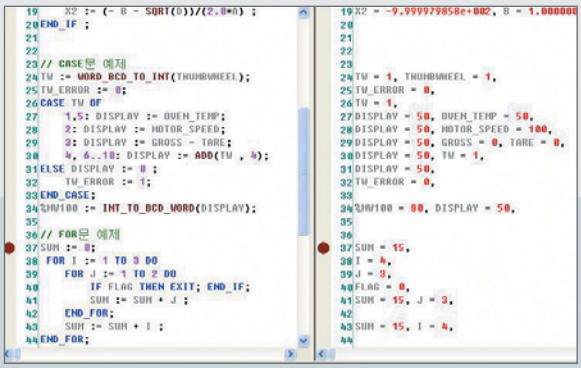
Ladder Diagram



SFC



ST



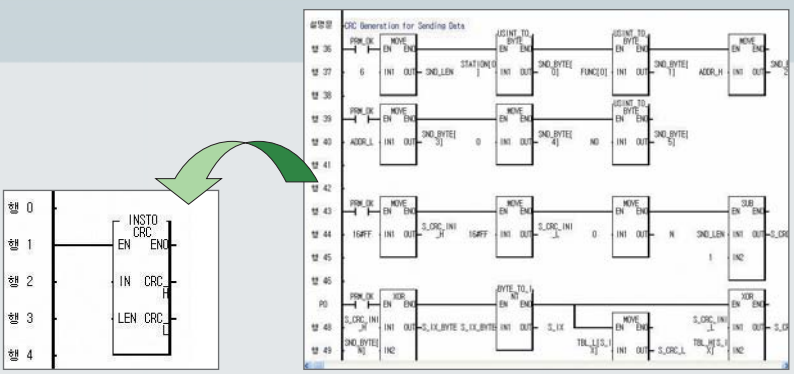
```
// CASE문 예제
TW := WORD_BCD_TO_INT(THUMBWHEEL);
TW_ERROR := 0;
CASE TW OF
    1,5: DISPLAY := OVEN_TEMP;
    2: DISPLAY := MOTOR_SPEED;
    3: DISPLAY := GROSS - TARE;
    4, 6..10: DISPLAY := ADD(TW , 4);
ELSE DISPLAY := 0 ;
    TW_ERROR := 1;
END_CASE;
%MW100 := INT_TO_BCD_WORD(DISPLAY);

// FOR문 예제
SUM := 0;
FOR I := 1 TO 3 DO
    FOR J := 1 TO 2 DO
        IF FLAG THEN EXIT; END_IF;
        SUM := SUM + J ;
    END_FOR;
    SUM := SUM + I ;
END_FOR;
```

ST features

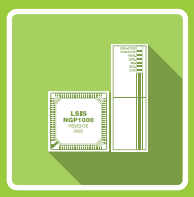
- High-level Language
- Fit for the complicate algorithm
- Various open source (Compatibility)
- Easy data processing
- Convenient text editor

User defined Function block (XGI)



- Standardize the program using function or function block
- Register the standardized program as a library file and reuse the library for another project


XGP-ACF2
POWER
XGI-CPUUN
RUN/STOP
REM.
ERR.
P.S.
BAT.
CHK
XGL-PMEC
HS
CFG
P-RUN
STATUS
ERR
RUN
I/F
XGF-DV4A
RUN
XGL-EIPT
I/F
P2P
PADT
SVR
MS
NS
RUN
1 ACT
LNK
2 ACT
LNK
XGF-PN8B
AX1
AX2
AX3
AX4
AX5
AX6
AX7
AX8
RDY
RUN
ACT
XGQ-RY2A
OS DOWN.
STATION NUMBER
x10
x1
TX1
ENC1A+
ENC1A-
ENC1B+
ENC1B-
ENC1Z+
ENC1Z-
ENC2A+
ENC2A-
ENC2B+
ENC2B-



CPU & System Configuration

XGT series contain variety of CPU types for customized solutions which support wide coverage from small / middle- to large size-system control.

Contents

XGT CPU Module

XGK CPU (LS Standard)

Premium CPU for high-speed and large scale application

XGK-CPUUN

- Program capacity: 256K steps
- I/O points: 6,144
- I/O device point: 65,536 (Remote I/O)
- Processing speed: 8.5ns/step

XGK-CPUHN

- Program capacity: 128K steps
- I/O points: 6,144
- I/O device point: 65,536 (Remote I/O)
- Processing speed: 8.5ns/step

XGK-CPUSN

- Program capacity: 64K steps
- I/O points: 3,072
- I/O device point: 65,536 (Remote I/O)
- Processing speed: 8.5ns/step

XGK-CPUU (Ultra capacity)

- Program capacity: 128K steps
- I/O points: 6,144
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 28ns/step

XGK-CPUH (High performance)

- Program capacity: 64K steps
- I/O points: 6,144
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 28ns/step

XGK-CPUA (Advanced)

- Program capacity: 32K steps
- I/O points: 3,072
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 28ns/step

General sequence controller PLC CPU

XGK-CPUS (Standard)

- Program capacity: 32K steps
- I/O points: 3,072
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 84ns/step

XGK-CPUE (Economic)

- Program capacity: 16K step
- I/O point: 1,536
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 84ns/step

XGI CPU (IEC Standard)

Premium CPU for high-speed and large scale application

XGI-CPUUN

- Program capacity: 2MBytes
- I/O points: 6,144
- I/O device point: 131,072 (Remote I/O)
- Processing speed: 8.5ns/step

XGI-CPUU

- Program capacity: 1MBytes
- I/O points: 6,144
- I/O device point: 131,072 (Remote I/O)
- Processing speed: 28ns/step

XGI-CPUH

- Program capacity: 512KBytes
- I/O points: 6,144
- I/O device point: 131,072 (Remote I/O)
- Processing speed: 28ns/step

General sequence controller PLC CPU

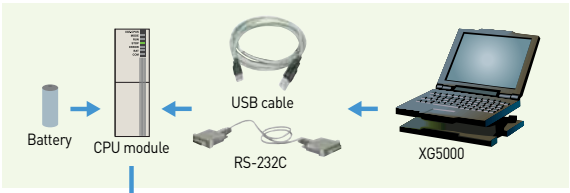
XGI-CPUS (IEC Standard)

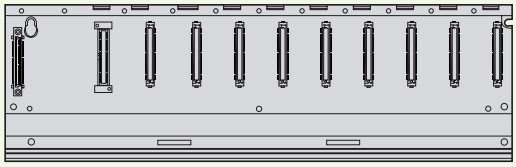
- Program capacity: 128KBytes
- I/O points: 3,072
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 28ns/step

XGI-CPUE (IEC Standard)

- Program capacity: 64KBytes
- I/O points: 1,536
- I/O device point: 32,768 (Remote I/O)
- Processing speed: 84ns/step

CPU Module System composition

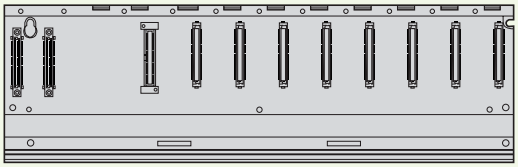




Main Base (XGB-M□□A)

Expansion cable (XGC-E□□□)

Item	Type	Description
Expansion cable	XGC-E041	Expansion cable 0.4m
	XGC-E061	Expansion cable 0.6m
	XGC-E121	Expansion cable 1.2m
	XGC-E301	Expansion cable 3.0m
	XGC-E501	Expansion cable 5.0m
	XGC-E102	Expansion cable 10m
	XGC-E152	Expansion cable 15m
Expansion terminator	XGT-TERA	Expansion terminator



Expansion base (XGB-E□□A)

Item	Main base	Expansion base
4 slot	XGB-M04A	XGB-E04A
6 slot	XGB-M06A	XGB-E06A
8 slot	XGB-M08A	XGB-E08A
10 slot	XGB-M10A	-
12 slot	XGB-M12A	XGB-E12A

Power module (XGP-□□□□)

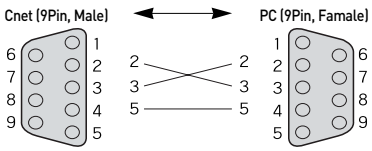
Input module (XGI-□□□□)

Output module (XGQ-□□□□)

Special module (XGF-□□□□)

Communication module (XGL-□□□□)

XG5000 Cable (RS-232C)



	CPU module	I/O point
XGK	XGK-CPUH,CPUU, CPUHN, CPUUN	6,144
	XGK-CPUS,CPUA, CPUSN	3,072
	XGK-CPUE	1,536
XGI	XGI-CPUUN, CPUU/D, CPUU, CPUH	6,144
	XGI-CPUS	3,072
	XGI-CPUE	1,536

CPU Connecting Cable	
USB 301A	USB downloading cable
K1C-050A	RS-232C downloading cable

Item	Type	Description
USB cable	USB-301A	USB downloading cable
RS-232C cable	KIC-050A	RS-232C downloading cable

Item	Input module		
	AC110V	AC220V	DC24V
8 points	-	XGI-A21A	XGI-D21A
16 points	XGI-A12A	-	XGI-D22A
	-	-	XGI-D22B
32 points	-	-	XGI-D24A
	-	-	XGI-D24B
64 points	-	-	XGI-D28A
	-	-	XGI-D28B

Power module			
AC	Free Voltage	XGP-ACF1	DC5V 3A DC24V 0.6A
		XGP-ACF2	DC5V 6A
	220V	XGP-AC23	DC5V 8.5A
DC		XGP-DC42	DC5V 6A

Item	Output module		
	Relay	Triac	Transistor
8 points	XGQ-RY1A	-	XGQ-TR1C
16 points	XGQ-RY2A	XGQ-SS2A	XGQ-TR2A
	XGQ-RY2B	-	XGQ-TR2B
32 points	-	-	XGQ-TR4A
	-	-	XGQ-TR4B
64 points	-	-	XGQ-TR8A
	-	-	XGQ-TR8B

Special module		
Analog input	XGF-AV8A	Voltage input type, 8Ch
	XGF-AC8A	Current input type, 8Ch
	XGF-AD8A	Voltage/ Current input, 8Ch
	XGF-AD4S	Voltage/ Current input, 4Ch (Isolated)
	XGF-AD16A	Voltage/ Current input, 16Ch
	XGF-AW4S	2-wire, Voltage/ Current input, 4Ch (Isolated)
Analog output	XGF-DV4A	Voltage output type, 4Ch
	XGF-DC4A	Current output type, 4Ch
	XGF-DV8A	Voltage output type, 8Ch
	XGF-DC8A	Current output type, 8Ch
	XGF-DV4S	Voltage output, 4Ch (Isolated)
	XGF-DC4S	Current output, 4Ch (Isolated)
Analog Input/Output	XGF-AH6A	Input: 4ch, Voltage/ Current
		Output: 2Ch Voltage/ Current
High-speed counter	XGF-HO2A	Pulse (OC) input type, 2Ch
	XGF-HD2A	Pulse (LD) input type, 2Ch
Positioning	XGF-P01H~P04H	Open collector, 1~4axes
	XGF-PD1H~PD4H	Line drive, 1~4axes
Positioning (Network Type)	XGF-PN8A	LS Standard EtherCAT Net. 8axes
	XGF-PN8B	Standard EtherCAT Net. 8axes
Motion Module	XGF-M32E	Standard EtherCAT Net. 8axes
Temperature control	XGF-TC4S	Thermocouple input, 4Ch
	XGF-RD4A	RTD input, 4Ch
	XGF-RD4S	RTD input, 4Ch (Insulated)
Temperature controller	XGF-TC4UD	Input: 4ch.(Voltage/Current, RTD/TC)
		Output: 8ch.(TR/Current)
		Controller: 4 loops
	XGF-TC4RT	Input: 4ch.(RTD)
		Output: 4ch.(TR)
		Controller: 4 loops
Event input	XGF-SOEA	DC24V, 32points
Data log	XGF-DL16A	USB2.0,CF2001,Max16Gbyte, 32 points 1 slot(Input 22 points, output 10 points)

Communication module		
RAPIEnet+ - RAPIEnet v2 - EtherNet/IP - Modbus TCP/IP - Dedicated XGT Network	XGL-EFMTB	Master/Client, Twisted fair 2ch.
	XGL-EFMFB	Master/Client, Fiber optic 2ch.
	XGL-EFMHB	Master/Client, Twisted fair/fiber optic
	XGL-DBDT	Expansion driver - Twisted pair 2ch.
	XGL-DBDF	Expansion driver - Fiber optic 2ch.
	XGL-DBDH	Expansion driver - Fiber optic / Twisted pair
	XOL-ES4T	Stand alone switch twisted pair 4ch.
	XOL-ES4H	Stand alone switch twisted 2ch. fiber 2ch.
	XGL-EH5T	Open Ethernet switching hub
Computer Link (Cnet)	XGL-CH2B	RS-232C 1ch, RS-422/485 1ch
	XGL-C22B	RS-232C 2ch
	XGL-C42B	RS-422/485 2ch
DeviceNet(Dnet)	XGL-DMEB	DeviceNet, Master
	XGL-DSEB	DeviceNet, Slave
Profibus-DP (Pnet)	XGL-PMEB	Profibus-DP, Master
	XGL-PSRA	Profibus-DP Slave, Remote interface
	XGL-PSEA	Profibus-DP Slave
Rnet	XGL-RMEB	Rnet, Master, TP
	GOL-RR8T	Rnet stand alone repeater hub
Fnet	XGL-FMEA	Fnet, Master
BACnet/IP	XGL-BIPT	BACnet client/server
RAPIEnet v1	XGL-EIMT	RAPIEnet, Twisted fair 2Ch
	XGL-EIMF	RAPIEnet, Fiber optic 2Ch
	XGL-EIMH	RAPIEnet, Twisted fair, Fiber optic
EtherNet/IP	XGL-EIPT	Industrial Ethernet, Twisted fair 2Ch

Specifications

Item	Description				Standard
Ambient temperature	0 ~ 55 °C				
Storage temperature	-25 ~ +70 °C				
Ambient humidity	5 ~ 95%RH, (Non-condensing)				
Storage humidity	5 ~ 95%RH, (Non-condensing)				
Vibration resistance	Occasional vibration			-	IEC 61131-2
	Frequency	Acceleration	Pulse width	10 times each direction (X, Y and Z)	
	10 ≤ f < 57Hz	-	0.075mm		
	57 ≤ f < 150Hz	9.8m/s²{1G}	-		
	Frequency	Acceleration	Pulse width		
	10 ≤ f < 57Hz	-	0.035mm		
	57 ≤ f < 150Hz	4.9m/s²{0.5G}	-		
Shock resistance	• Peak acceleration: 147 m/s{15G} • Duration: 11ms • Half-sine, 3 times each direction per each axis				IEC 61131-2
Noise resistance	Square wave impulse noise		± 1,500 V		LSIS Standard
	Electrostatic discharge		± 4kV		IEC 61131-2, IEC 61000-4-2
	Radiated electromagnetic field noise		27 ~ 500 MHz, 10 V/m		IEC 61131-2, IEC 61000-4-3
	Fast transient / Burst noise		0.25kV		IEC 61131-2, IEC 61000-4-4
Operating Ambience	Free from corrosive gases and excessive dust				
Altitude	Up to 2,000m				
Pollution degree	Less than equal to 2				
Cooling	Air-cooling				

* Pollution degree 2 is nonconductive pollution of the sort where occasionally a temporary conductivity caused by condensation must be expected.

XGK

Item		Description			Remarks
		XGK-CPUUN	XGK-CPUHN	XGK-CPUSN	
Operation method		Cyclic execution of stored program, Time-driven interrupt, Process-driven interrupt			
I/O control method		Batch processing by scan synchronization (Refresh), Direct input/output by instruction			
Program language		Ladder diagram, Instruction list, SFC (Sequential Function Chart), ST (Structured Text)			
Number of instructions	Basic	40			
	Application	700			
Processing speed	LD	0.0085㎲/Step			
	MOVE	0.255㎲/Step			
	Real number operation	±: 182.2ns (S), 327.3ns (D)			S: Single real number D: Double real number
		×: 336ns (S), 427ns (D)			
		÷: 345ns (S), 808ns (D)			
Program capacity		256Kstep (2,048KB)	128Kstep (1,024KB)	64Kstep (512KB)	
I/O points (available to install)		6,144	6,144	3,072	
Data area	P	P00000 ~ P4095F(65,536 points)			
	M	M00000 ~ M4095F(65,536 points)			
	K	K00000 ~ K4095F(65,536 points)			
	L	L0000 ~ L11263F(180,224 points)			
	F	F0000 ~ F4095F(65,536 points)			
	T	100ms : T0000 - T2999			Timer (Adjustable)
		10ms : T3000 - T5999			
		1ms : T6000 - T7999			
		0.1ms : T8000 - T8191			
	C	C0000 ~ C4095			
	S	S00.00 ~ S255.99			
	D	D0000 ~ D524287		D0000 ~ D262143	
	U	U0.0~U7F.31		U0.0~U3F.31	Special module data refresh area
	Z	256 points			
	N	N00000 ~ N21503			
	R	16 block	8 block	2 block	32K word per 1 block (R0 ~ R32767)
Flash area		2M byte, 32 blocks			Controllable by R device
Program type	Total program	256			
	Initialization	1 (_INT)			
	Time-driven	32			
	Internal	32			
Operation mode		RUN, STOP, DEBUG			
Self-diagnosis		Execution, Delay, Memory error, I/O error, Battery error, Power error			Modbus slave
Programming port		RS-232C (1Ch), USB (1Ch)			
Data retention at power failure		Set "retain" at data declaration			
Max. expansion stage		7		3	Total length 15m
Current consumption (mA)		960			
Weight (Kg)		0.12			

XGK

Item		Description					Remarks
		XGK-CPUU	XGK-CPUH	XGK-CPUA	XGK-CPUS	XGK-CPUE	
Operation method		Cyclic execution of stored program, Time-driven interrupt, Process-driven interrupt					-
I/O control method		Batch processing by scan synchronization (Refresh), Direct input/output by instruction					-
Program language		Ladder diagram, Instruction list, SFC (Sequential Function Chart), ST (Structured Text)					-
Number of instructions	Basic	40					-
	Application	700					-
Processing speed	LD	0.028㎲/Step			0.084㎲/Step		-
	MOVE	0.084㎲/Step			0.252㎲/Step		-
	Real number operation	±: 0.602㎲ (S), 1.078㎲ (D) ×: 1.106㎲ (S), 2.394㎲ (D) ÷: 1.134㎲ (S), 2.66㎲ (D)			±: 1.442㎲ (S), 2.87㎲ (D) ×: 1.948㎲ (S), 4.186㎲ (D) ÷: 1.442㎲ (S), 4.2㎲ (D)		S: Single real number D: Double real number
Program capacity		128Kstep(512KB)	64Kstep(256KB)	32Kstep(128KB)		16Kstep(64KB)	-
I/O points (availableto install)		6,144		3,072		1,536	-
Data area	P	P00000 ~ P2047F(32,768 points)					-
	M	M00000 ~ M2047F(32,768 points)					-
	K	K00000 ~ K2047F(32,768 points)					-
	L	L0000 ~ L11263F(180,224 points)					-
	F	F0000 ~ F2047F(32,768 points)					-
	T	10ms : T1000 - T1499 1ms : T2000 - T2047		100ms : T0000 - T0999 1ms : T1500 - T1999			Change area is available by Parameter seting
	C	C0000 ~ C2047					
	S	S00.00 ~ S127.99					
	D	D0000 ~ D32,767			D0000 ~ D19,999		
	U	U0.0~U7F.31		U0.0~U3F.31	U0.0~U3F.31	U0.0~U1F.31	Special module data refresh area
	Z	128 points					
	N	N00000 ~ N21503					
	R	2 block			1 block		32K word per 1 block (R0 ~ R32767)
Flash area		2M byte, 32 blocks					Controllable by R device
Program type	Total program	256					
	Initialization	1 (_INT)					
	Time-driven	32					
	Internal	32					
Operation mode		RUN, STOP, DEBUG					
Self-diagnosis		Execution, Delay, Memory error, I/O error, Battery error, Power error					Modbus slave
Programming port		RS-232C (1Ch), USB (1Ch)					
Data retention at power failure		Set "retain" at data declaration					
Max. expansion stage		7		3		1	Total length 15m
Current consumption (mA)		960		940			
Weight (Kg)		0.12					

XGI

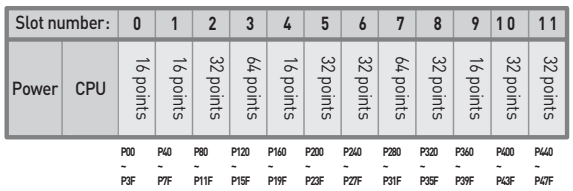
Item			XGI-CPUUN	XGI-CPUU/D	XGI-CPUU	XGI-CPUH	XGI-CPUS	XGI-CPUE	Remarks
Operation system			Reiterative operation, fixed cycle operation, constant scan						
I/O Control system			Scan synchronous batch processing system(refresh system), direct system by command						
Program language			Ladder Diagram, SFC (Sequential Function Chart), ST (Structured Text)						
Operation processing speed (basic command)	Operator		18						
	Basic function		136 types + real number operation function						
	Basic function block		43						
	Dedicated function block		Dedicated function blocks by special function modules, communication dedicated function block(P2P)						
	Basic		0.0085㎲/step	0.028㎲/step				0.084㎲/step	
	MOVE		0.255㎲/step	0.084㎲/step				0.252㎲/step	
	Real number operation		± : 0.119㎲(S), 0.281㎲(D) × : 0.272㎲(S), 0.680㎲(D) ÷ : 0.281㎲(S), 0.685㎲(D)	± : 0.392㎲(S), 0.924㎲(D) × : 0.896㎲(S), 2.240㎲(D) ÷ : 0.924㎲(S), 2.254㎲(D)				± : 1.442㎲(S), 2.87㎲(D) × : 1.948㎲(S), 4.186㎲(D) ÷ : 1.442㎲(S), 4.2㎲(D)	S: Single real number D: Double real number
Program memory capacity			2M	1M		512KB	128KB	64KB	
I/O points (installable)			6,144 points				3,072 points	1,536 points	
Max. I/O memory contact			131,072 points				32,768 points		
Data memory	Symbolic variable area(A)		1024KB (max. 512KB retain settable)	512KB (max. 256KB retain settable)			128KB (max. 64KB retain settable)	64KB (max. 32KB retain settable)	
	I variable(I)		16KB				4KB		
	Q variable(I)		16KB				4KB		
	Direct variable	M	512KB (max. 256KB retain settable)	256KB (max. 128KB retain settable)			64KB (max. 32KB retain settable)	32KB (max. 16KB retain settable)	
		R	64KB × 16block		64KB × 2block		64KB × 1block	32KB × 1block	
		W	1,024KB		128KB		64KByte	32KByte	R
	Flag variable	F	8KB		4KB				System flag
		K	16KB				4KB		PID flag
		L	22KB						High speed link flag
		N	42KB						P2P Parameters
		U		8KB			4KB	2KB	Analog data Refresh
Flash area			2MB, 32block						1MB, 16block
Timer			No point limit Time range: 0.001~ 4,294,967.295 second(1,193 hours)						20 bytes of symbolic variable area per point
Counter			No point limit Coefficient range : 64 bit expression						8 bytes of symbolic variable area per point
Program structure	Total no. of programs		256						
	Initialization task		1						
	Fixed cycle task		32						
	Internal device task		32						
Operation mode			RUN, STOP, DEBUG						
Restart mode			Cold, Warm						
Self diagnosis			Operation delay monitoring, memory fault, I/O fault, battery fault, power fault and etc						
Data protection in case of power failure			Retain area setting by basic parameters						
Max. base extension			7				3	1	Total length 15m
Current consumption (mA)			960mA				940mA		
Weight (kg)			0.12kg						

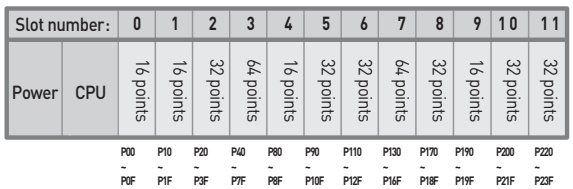
XGK/XGI CPU built-in Ethernet specification

Item		XGK-CPUSN, CPUHN, CPUUN / XGI-CPUUN	Remarks
Ethernet	Feature	1 Port	-
		10/100BASE-TX	-
		Auto negotiation (Full-duplex and half duplex)	-
		Auto MDIX Crossover	-
		Max. Support 4 channel	Support 8Kbyte each send and receive channel
		Max. Distance between nodes : 100m	-
		Max. Protocol size : 1500Byte	IP Fragmentation is not supported.
	Cable	UTP, STP, FTP cables is available	FTP, STP is recommended to prevent noise
	Service	Setting communication parameters with XG5000	-
		Loader service (XG5000 connection) supported	Remote stage 1 connection with PLC is available
		LS protocol(XGT) supported.	Server & TCP supported. Client & UDP not supported.
		Other company's protocol (Modbus TCP/IP) supported	

XGK system configuration

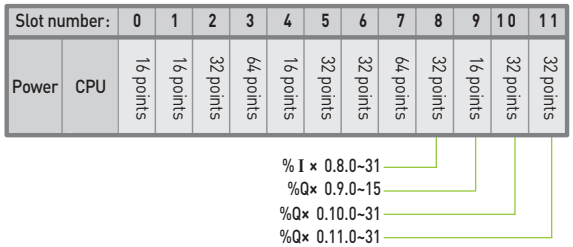
Item	XGK-CPUE	XGK-CPUS, CPUSN	XGK-CPUA	XGK-CPUH, CPUHN	XGK-CPUU, CPUUN
Max. expansion stage	1 Stage	3 Stage	3 Stage	7 Stage	7 Stage
Max. installation of module	24 Module	48 Module	48 Module	96 Module	96 Module
Max. number of I/O point	1,536 Points	3,072 Points	3,072 Points	6,144 Points	6,144 Points
Max. expansion distance	15m				
Assignment of I/O number (Fixed)	• 64 points are assigned to each slot of base regardless of installation of module. • I/O numbers equivalent to 12 slots are assigned to a base. • The starting number of base 0 is P0000. • Refer to the following figure regarding the I/O number assignment of 12 slots				
I/O assignment (Variable)	• I/O point is assigned automatically according to the installed module. • I/O parameter is used to install modules. • The starting number of base 0 is P0000. • 16 points are assigned automatically to the slot of special or communication module • Refer to the following figure regarding the I/O number assignment of 12 slots.				





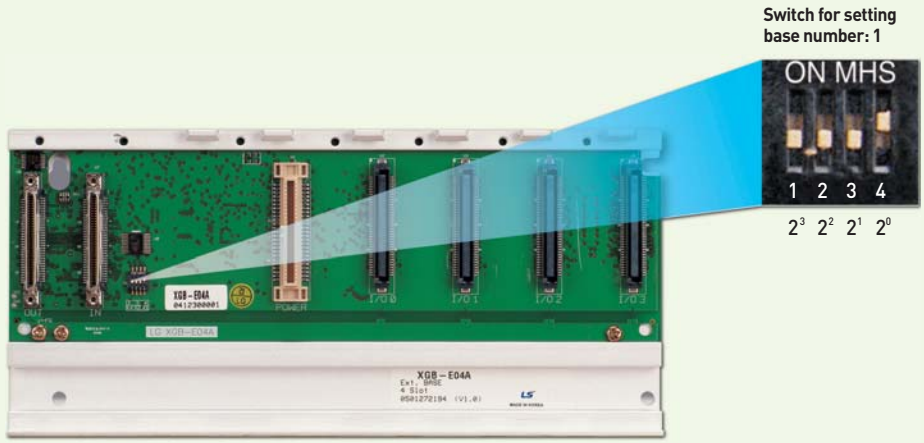
XGI system configuration

Item	XGI-CPUU, CPUH, CPUU/D, CPUUN	XGI-CPUS	XGI-CPUE
Max. expansion stage	7 Stage	3 Stage	1 Stage
Max. installation of module	96 Module	48 Module	24 Module
Max. number of I/O point	16 point : 1,536 Points 32 point : 3,072 Points 64 point : 6,144 Points	16 point : 768 Points 32 point : 1,536 Points 64 point : 3,072 Points	16 point : 384 Points 32 point : 768 Points 64 point : 1,536 Points
Max. expansion distance	15m		
I/O assignment	• 64 points are assigned to each slot of base regardless of installation of module. • No limit in installation of special module • Special module is controlled by function block and the memory assignment is done automatically • Refer to the following figure regarding the I/O assignment of 12 slots		

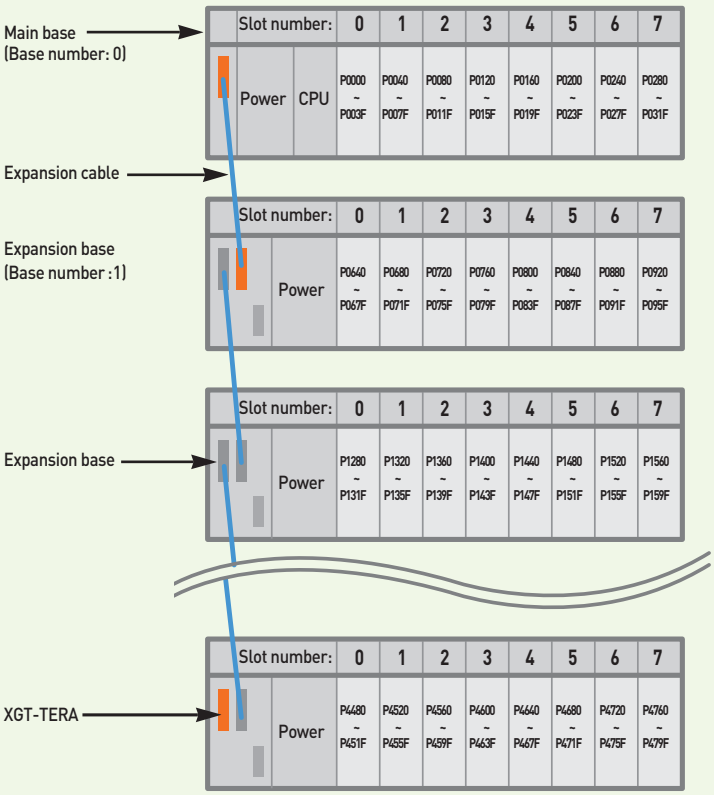


Expansion system composition

1. The following figure is the example of expansion system with the fixed I/O point type of XGK-CPUH.
2. The address of I/O point is adjustable by XG5000 parameter.



The lowest expansion base should be connected to the upper stage with expansion terminator(XGF-TERA).



XGT-TERA should be installed at the end of the last expansion base.

XGT I/O Module

Features

- 8, 16, 32, 64 points I/O module
- Operation monitoring by LED display
- Easy maintenance: Terminal block type, one-touch installation of module

Input module specifications

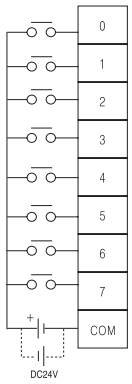
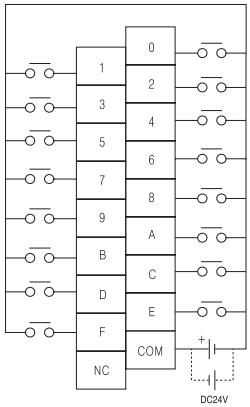
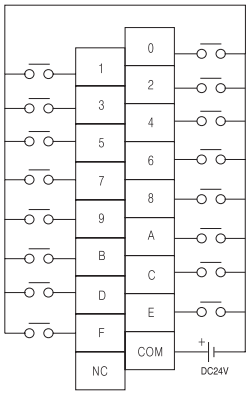
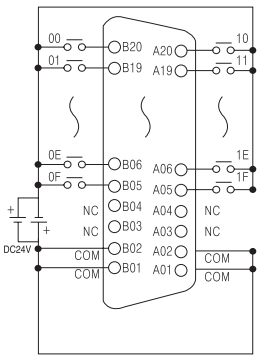
Item		DC input							AC input		
Type		XGI-D21A	XGI-D22A	XGI-D22B	XGI-D24A	XGI-D24B	XGI-D28A	XGI-D28B	XGI-A12A	XGI-A21A	XGI-A21C
Input point		8	16		32		64		16	8	8
Rated input voltage		DC24V							AC100~120V	Free voltage	DC100/240V
Rated input current		4mA							8mA	17mA	17mA
ON voltage/current		19V or more / 3mA or less							AC80V or more / 5mA or less	AC130V or more / 10mA or less	AC80V or more / 5mA or less
OFF voltage/current		DC11V or more / 1.7mA or less							AC80V or more / 5mA or less	AC60V or more / 2mA or less	AC30V or more / 1mA or less
Response	Off→On	1ms/5ms/10ms/20ms/70ms (set by CPU parameter) Initial value: 3ms							15mA or less		
	On→Off	1ms/5ms/10ms/20ms/70ms (set by CPU parameter) Initial value: 3ms							25mA or less		
Common (COM)		8 points/COM	16 points/COM		32 points/COM				16 points/COM	8 points/COM	1 points/COM
Insulation method		Photocoupler							Photocoupler		
Current consumption (mA)		20	30		50		60		30	20	20
Weight (Kg)		0.1	0.12		0.1		0.15		0.13	0.13	0.13

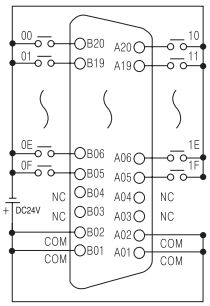
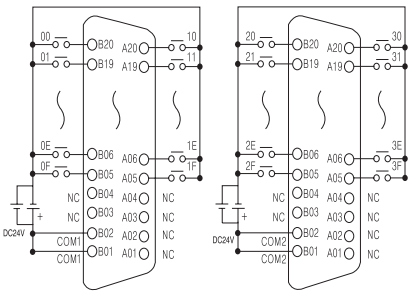
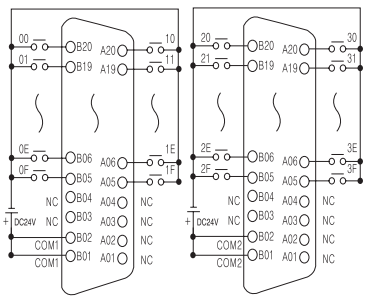
Output module specifications

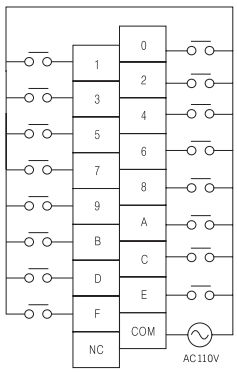
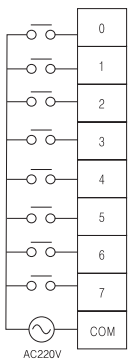
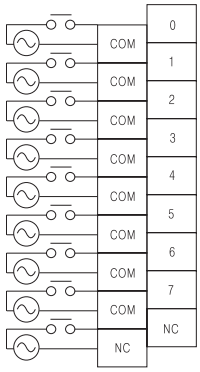
Item		Relay			Transistor						Triac
Type		XGQ-RY1A	XGQ-RY2A	XGQ-RY2B	XGQ-TR1C	XGQ-TR2A	XGQ-TR2B	XGQ-TR4A	XGQ-TR4B	XGQ-TR8A	XGQ-TR8B	XGQ-SS2A
Ouput point		8	16		8	16		32		64		16
Rated input voltage		DC12/24V, AC110/220V			DC12/24V							AC110/220V
Rated input current	1 Point	2A			2A	0.5A		0.1A				0.6A
	Common	5A			0.1A	4A		2A				4A
Response time	Off→On	10ms or less			3ms or less	1ms or less						1ms or less
	On→Off	12ms or less			10ms or less	1ms or less						0.5cycle +1ms or less
Common (COM)		1 piont/COM	16 pionts/COM		1 pionts/1COM	32 pionts/COM						16 points/COM
Insulation method		Relay			Photocoupler							
Current consumption (mA)		260	500		100	70		130		230		300
Weight (Kg)		0.13	0.17	0.19	0.11	0.11		0.1		0.15		0.2
Surge killer		-		Varistor	Zener diode							Varistor
External power supply		-			DC12/24V	DC						-

Note) B1, B2 of 32, 62 points terminal (connector) are shorted inside of the product.

Wiring diagram for input modules

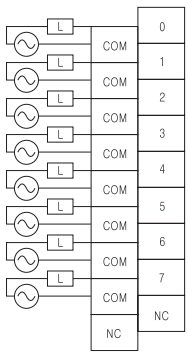
XGI-D21A	XGI-D22A	XGI-D22B	XGI-D24A
			

XGI-D24B	XGI-D28A	XGI-D28B
		

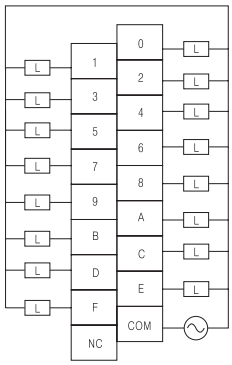
XGI-A12A	XGI-A21A	XGI-A21C
		

Wiring diagram for output modules

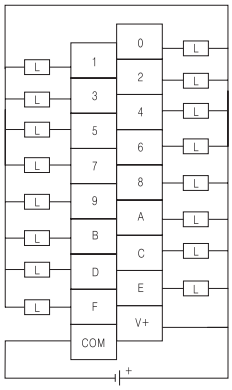
XGQ-RY1A



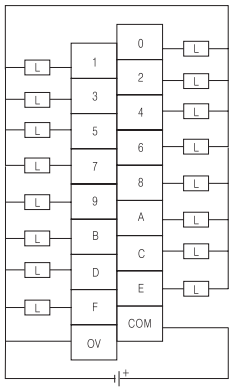
XGQ-RY2A/B



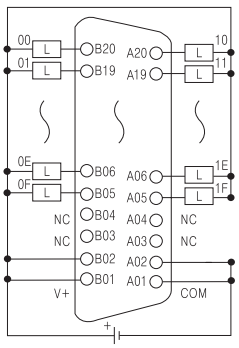
XGQ-TR2A



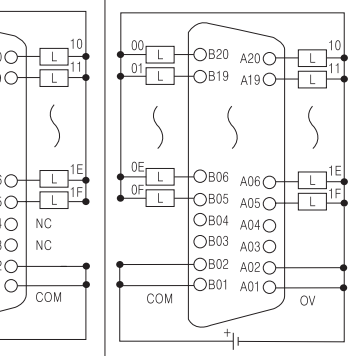
XGQ-TR2B



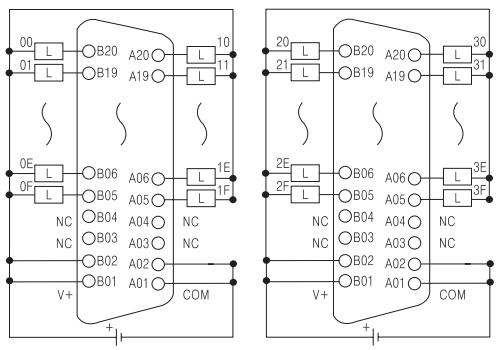
XGQ-TR4A



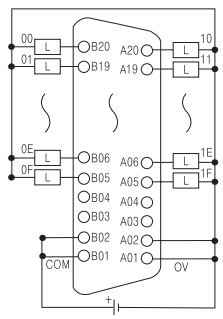
XGQ-TR4B

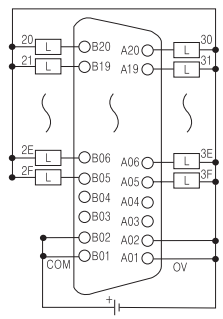


XGQ-TR8A

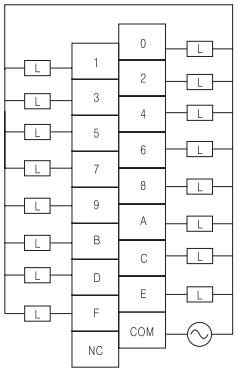


XGQ-TR8B

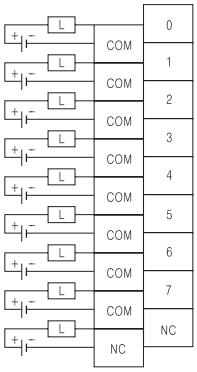




XGQ-SS2A

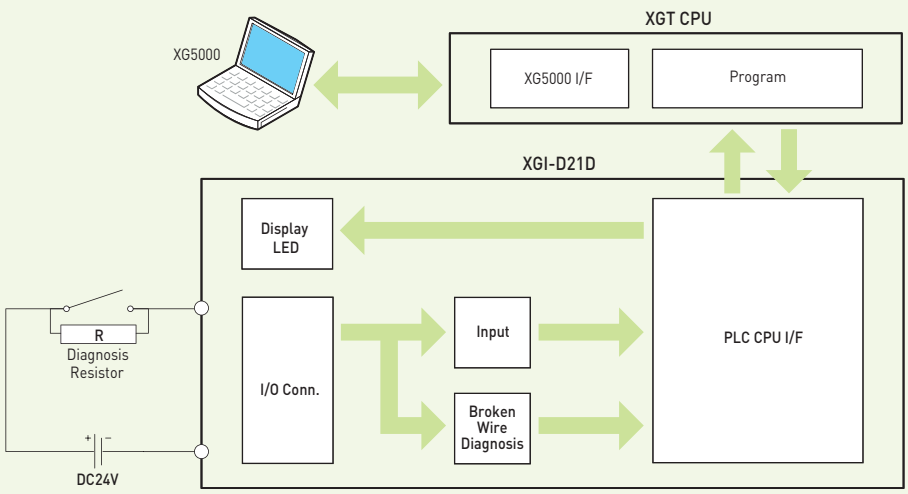


XGF-TR1C



Diagnostic Digital Input Module(XGI-D21D)

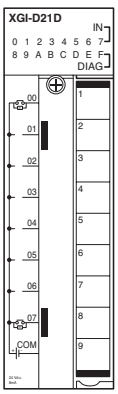
- Diagnostic Digital Input module receives and processes DC 24V input signal. It has a wire break detection function of each input signal.
- Input signal and wire break detection signal are displayed on the device of the CPU module, it can be used in the PLC program.



Diagnostic digital input module system configuration

In order to operate wire break detection function normally, you must connect the diagnostic resistor in parallel with the input device installed in the wiring, as shown in Figure

Specifications



IN: Input status(0~7)
- On: Input On
- Off: Input Off

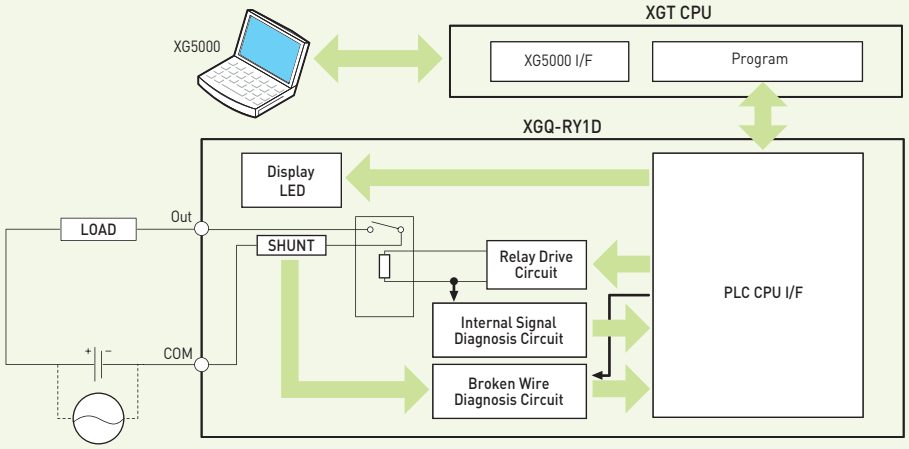
DIAG: Diagnosis status(8~F)
- On: broken wire occurs
- Off: Normal state

Item		Specifications
Input point		8 points
Insulation method		Photo coupler insulation
Rated input voltage / current		DC24V / Approx. 8mA
Voltage range		DC20.4~28.8V (5% and lower ripple rate)
On voltage / On current		19V and higher / 5.2mA and higher
Off voltage / On current		11V and lower / 4.7mA and lower
Response time (Input filter)	Off→On	1ms/3ms/5ms/10ms/20ms/70ms/100ms, Initial value:3ms
	On→Off	1ms/3ms/5ms/10ms/20ms/70ms/100ms, Initial value:3ms
Insulation withstand voltage		DC 500V
Insulation resistance		10 Ω and higher by Insulation ohmmeter
Diagnosis function		Wire break detection
Common method		8 point / 1COM
Suitable cable size		Stranded cable between 0.3~0.75mm² (2.8mm and smaller outer dia.)
Suitable clamped terminal		R1.25-3 (Sleeve built-in clamped terminal is not available)
Current consumption(mA)		60mA
Operation display		LED On with input On LED On during wire break
External connection method		9 point Terminal strip connector (M3 X 6 screws)
Weight		95g

XGT I/O Module

Diagnostic Digital Output Module(XGQ-RY1D)

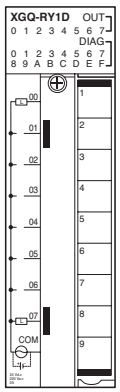
- Diagnostic digital output module outputs output signal via the relay to the outside. It has a diagnostic function of the internal signal and wire break detection for each output signal.
- Diagnositic signals are displayed on the device of the CPU module, it can be used in the PLC program.



Diagnostic digital output module system configuration

Digital output module provides diagnostic functions of the following two.
1) Interal output signal diagnosis : Diagnosing whether internal output signal circuit is operating property.
2) Wire break detection : Diagnosing whether the disconnection of the external wiring connected to the relay.

Specifications



OUT: Output status (0 ~ 7)
- On: Relay output On
- Off: Relay output Off

DIAG : Diagnosis status
Internal output signal diagnosis (0 ~7)
- On: Internal output signal fail
- Off: Normal state

Wire break detection(8~F)
- On: broken wire occurs
- Off: Normal state

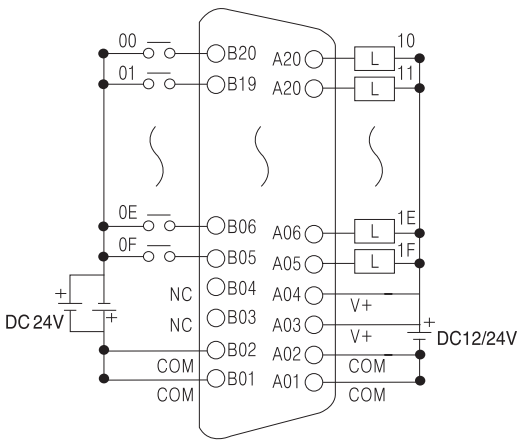
Item		Specifications
Output point		8 points
Insulation method		Relay insulation Photo coupler insulation
Rated load voltage		DC24V (resistance load) / AC220V (COS φ = 1)
Rated load current	1point	2A
	Common	5A
Min. load voltage / current		DC5V / 1mA
Max. load voltage / current		AC250V, DC125V / 2A
Leakage current at Off		0.1mA (AC220V, 60Hz)
Max. switching frequency		1,800 times/hour
Surge killer		None
Life	Mechanical	20 million and more times
	Electrical	Rated load voltage/current 100 thousand and more times
		AC200V / 1.5A, AC240V / 1A (COS φ = 0.7) 100 thousand and more times
		AC200V / 1A, AC240V / 0.5A (COS φ = 0.35) 100 thousand and more times
		DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 100 thousand and more times
Response time	Off→On	10ms and lower
	On→Off	12ms and lower
Diagnosis function		Wire break detection Internal output signal diagnosis
Common method		8 point/1COM
Current consumption(mA)		Max. 400mA
Operation display		LED On with output On LED On during wire break LED On when the internal output signal fail
External connection method		9 point Terminal strip connector (M3 X 6 screws)
Weight		145g

Input/output mixed Type (XGH-DT4A)

Input			Output		
Input points		16 points	Input points		16 points
Insulation method		Photo coupler	Insulation method		Photo coupler
Rated input voltage		DC24V	Rated input voltage		DC12/24V
Rated input current		4mA	Rated input current		DC10.2~26.4V
Input voltage range		DC20.4~28.8V	Input voltage range		0.1A/point, 1.6A/COM
Insulation pressure		AC560Vrms / 3Cycle	Insulation pressure		0.1mA or less
On voltage/current		DC19V or more / 3mA or more	On voltage/current		0.7A/10ms or less
Off voltage/current		DC11V or more / 1.7mA or more	Off voltage/current		Zener diode
Input resistance		5.6㏀	Input resistance		DC 0.2V or less
Response	Off→On	1ms/3ms/5ms/10ms/20ms/70ms/100ms (Setting by CPU parameter) Initial value: 3ms	Response	Off→On	1ms or less
	On→Off	1ms/3ms/5ms/10ms/20ms/70ms/100ms (Setting by CPU parameter) Initial value: 3ms		On→Off	1ms or less (rated load, resistance load)
Common (COM)		16 points/COM			
Operation display		LED lighting when output is ON			
Internal current consumption		100mA			
External connection		40-point connector			
Weight (kg)		0.1			

Wiring diagram for mixed type

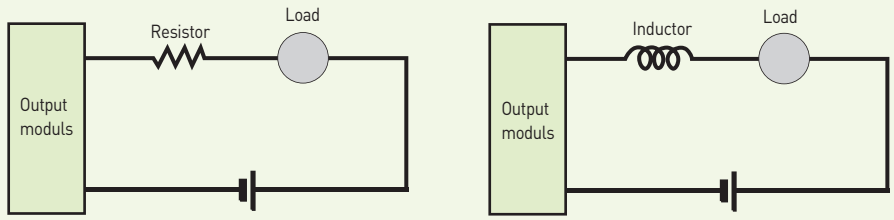
XGH-DT4A



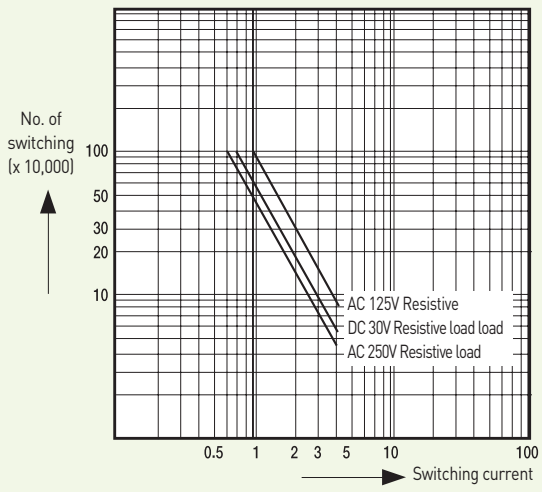
NOTE) Input address for XGK CPU is P00~P0F and Output address is P10~P1F when it is installed on the slot 0.
Input address for XGI CPU is %IX0.0.0~%IX0.0.15 and Output address is %QX0.0.16~%QX0.0.31

Precaution during installation of I/O module

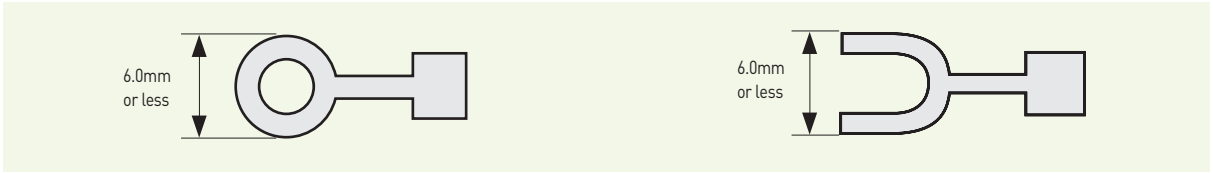
- XGT has 2 kinds of digital input type: Current sink input, Current source input. For DC input module has different wiring depending on the input type, digital input type should be selected with consideration about connected input device.
- Max. number of simultaneous input point differs according to the module type. Therefore, review specification of input module before its application.
- Use an interrupt module when a response of high-speed input is demanded. But only one interrupt module can be installed per CPU module.
- If switching frequency is high or inductive switching load is used, the lifespan of relay output module will be reduced. Therefore, it is recommended to use transistor output module or triac output module.
- When driving an inductive load with output module, set the maximum switching frequency as 'ON' for 1 second and 'OFF' for 1 second.
- When using counter or timer with DC/DC converter, it is possible to have inrush current which cause a break down. Therefore to reduce an effect of inrush current, connect resistor or inductor to load or use the module whose max. load current is high.



- Fuse of output module is not exchangeable to prevent a damage of external wiring when output module has a short-circuit.
- The number of simultaneous 'ON' points varies depending on input voltage, ambient temperature. Refer to the specification of input module.
- The following graph presents the relay lifespan of relay output module. It shows the maximum lifespan of relay which is used in the relay output.



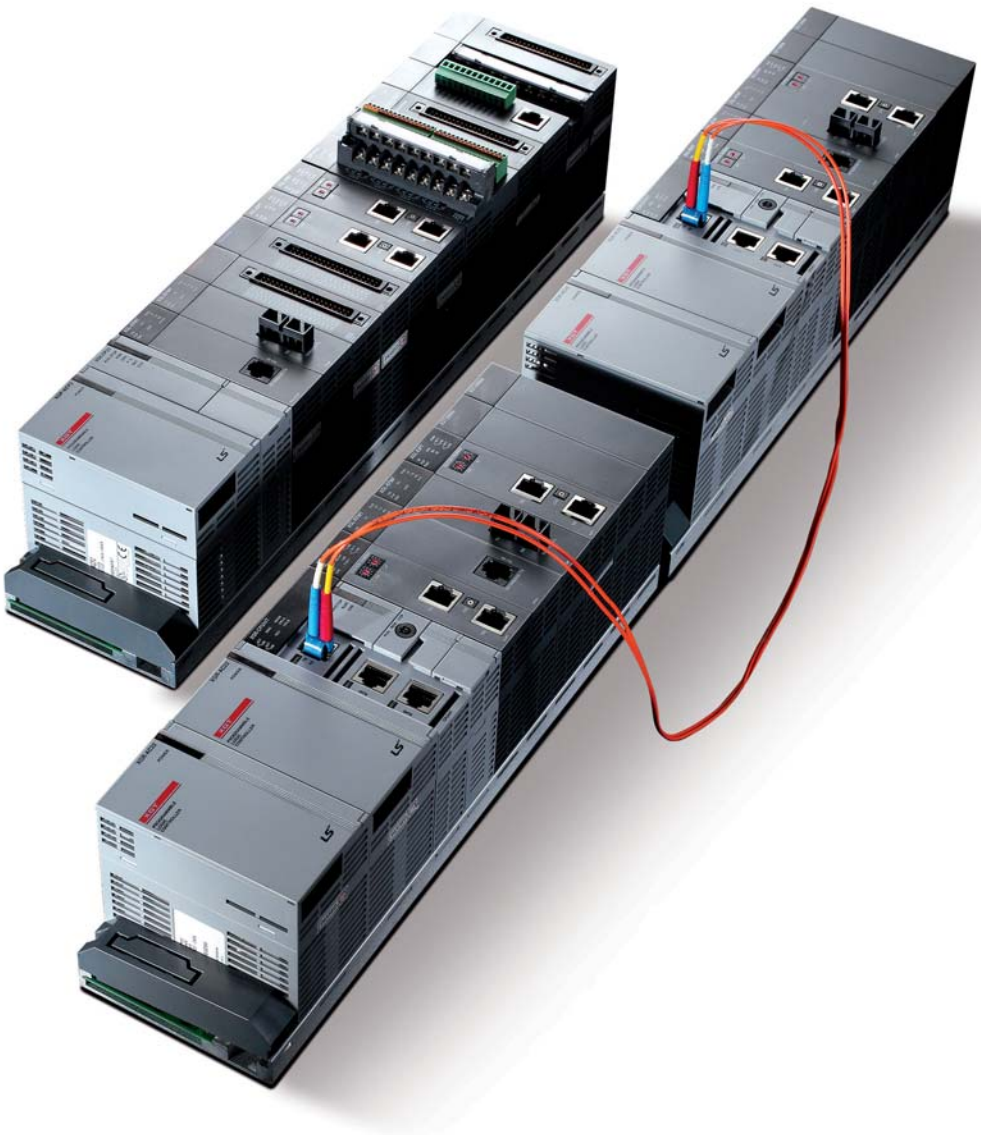
- Compressed terminal attaching sleeve cannot be mounted to XGT terminal block. The following picture shows appropriate compressed terminals for terminal block.



- Use 0.3~0.75mm twisted pair, below 2.8mm thickness cable for connecting to terminal block.
- Be careful when choosing and using the cable since the permissible current differs according to the insulation thickness.
- Joint torque of fixed screw and terminal block screw of the module needs to be within the range in the following table.

Joint	Joint torque range
I/O module terminal block screw (M3)	42~58 N·cm
I/O module terminal block fixed screw (M3)	68~89 N·cm

- Thermal protector is built in transistor module. Thermal protector is a function that protects PLC from an overload and overheating.




XGR-AC22
POWER
XGT
PROGRAMMBLE
LOGIC
CONTROLLER
XGR-AC22
POWER
XGT
PROGRAMMBLE
LOGIC
CONTROLLER
XGR-CPUH/T
ACT
LINK
RING
MASTER
CPU-A
CPU-B
RED
TX
RX
WAR.
ERR.
RUN
REM
STOP
RJ45
RJ45

XGR Redundancy System

Redundancy system for high-speed process control based on IEC

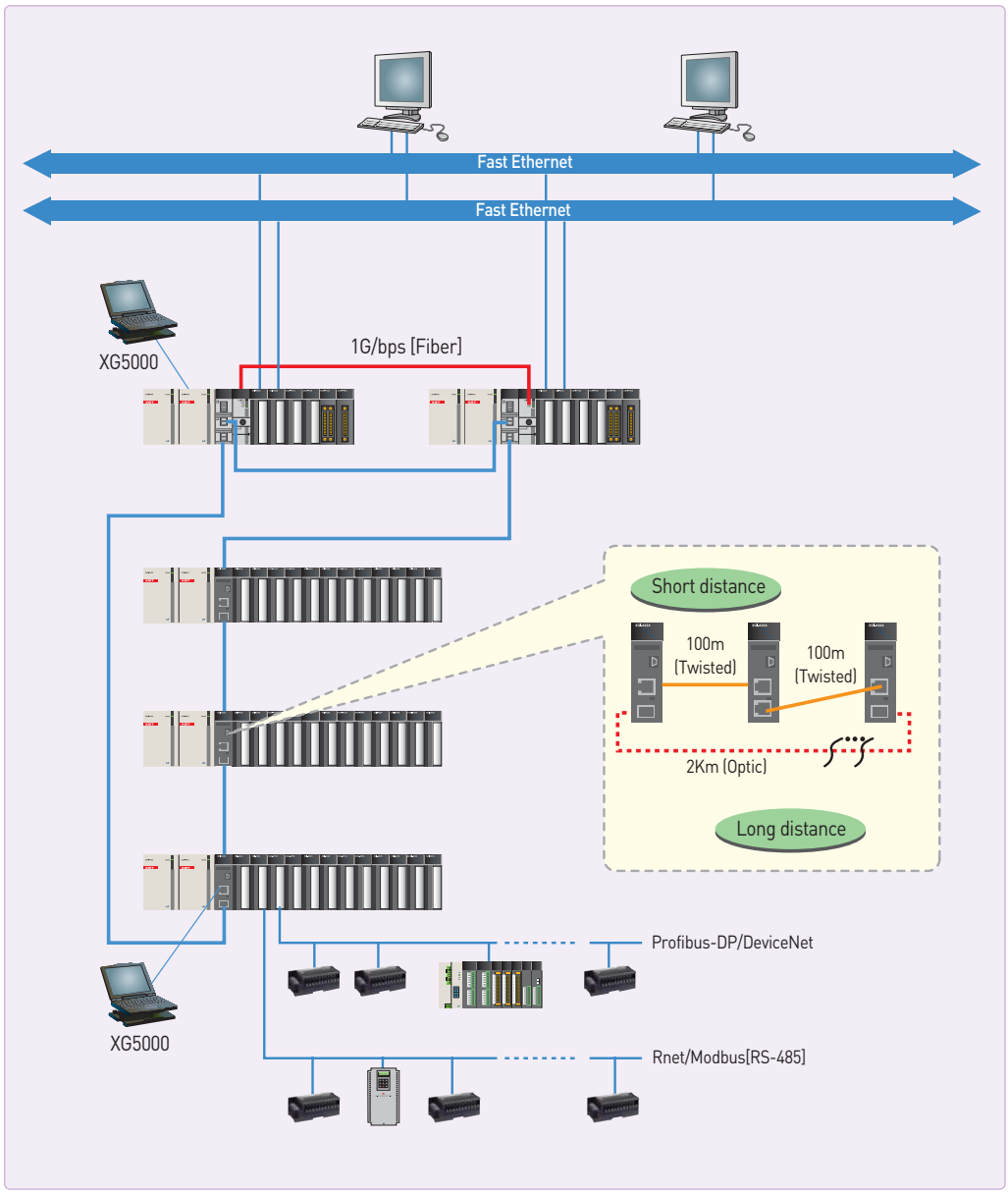
- Processing speed: 42ns/step
- I/O Points: Max. 131,072
- Total memory: 25MB (Program 7MB, Data 2MB, Flash 16MB)
- Switching over time: Min 4.3ms, Max 22ms
- Built-in 256 PID loops control

Contents

XGR Configuration

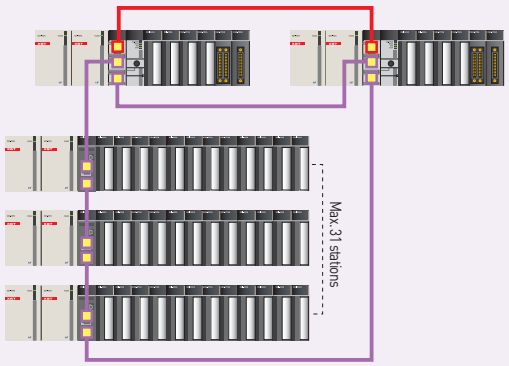
XGR Configuration

- Base, Power, CPU, Network redundancy
- Dual port and 3 kinds of media (Twisted-Twisted, Optic-Optic, Twisted-Optic)



System configuration method

Fiber-optic



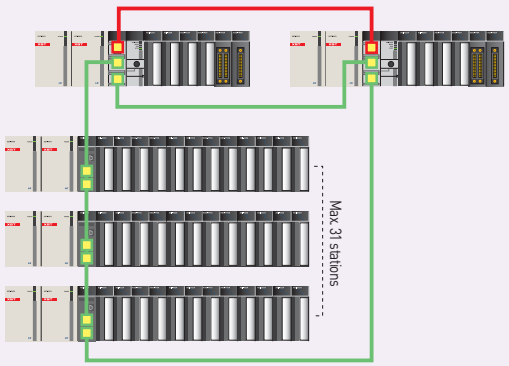
XGR-CPUH/F

- Main CPU
- Fiber optic:
  Max. distance 2Km

XGR-DBDF

- Expansion drive module
- Fiber optic:
  Max. distance 2Km
  (Installed on the expansion base)
- Max. 31 stations

Twisted pair



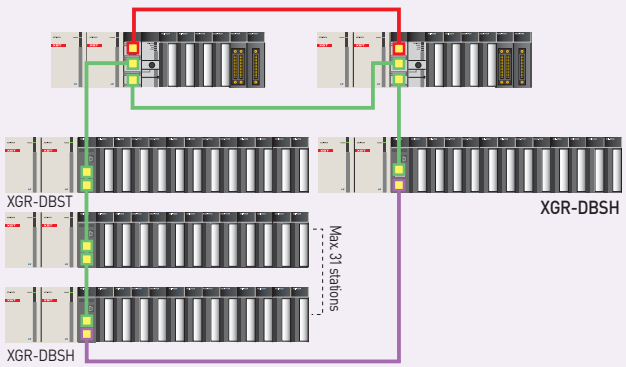
XGR-CPUH/T

- Main CPU
- Twisted fair:
  Max. distance 100m

XGR-DBDT

- Expansion drive module
- Twisted fair :
  Max. distance 100m
  (Installed on the expansion base)
- Max. 31 stations

Hybrid (Twisted pair + Fiber Optic)



XGR-CPUH/T XGR-CPUH/F

- Main CPU
- Fiber optic:
  Max. distance 2Km
  Twisted fair:
  Max. distance 100m

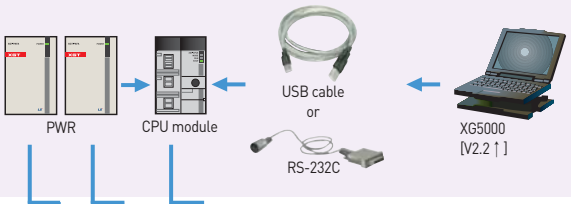
XGR-DBDH

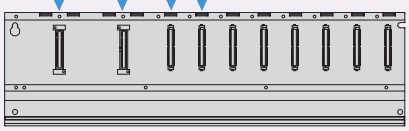
- Expansion drive module
- Fiber optic: Max. distance 2Km
  Twisted fair: Max. distance 100m
  (Installed on the expansion base)
- Max. 31 stations

* Max. expandable distance: Fiber optic 60km, Twisted fair 3km
* CPU synchronization cable: 2m, 5m

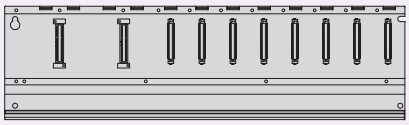
SYSTEM

System configuration





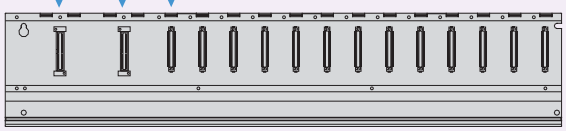
Main base [A Side] XGR-M06P / XGR-M02P



Main base [B Side] XGR-M06P / XGR-M02P

Main base

- 2 types of CPU (Fiber optic, Twisted fair)
- Power: AC110V, AC220V
- 6slot base: enable to install 6 communication modules



Expansion base XGR-E12P / XGR-E12H

Expansion base

- Power: 8.5A/AC110V, 8.5A/AC220V
- Expansion drive: Fiber optic, Twisted fair, Hybrid
- EFM* and EIM*: not available with 12slot base

XGR module		
CPU	XGR-CPUH/T	Twisted pair
	XGR-CPUH/F	Fiber optic(2km)
	XGR-CPUH/S	Fiber optic(15km)
Power	XGR-AC12	110V, 5.5A(Main base)
	XGR-AC13	110V, 8.5A(Expansion base)
	XGR-AC22	220V, 5.5A(Main base)
	XGR-AC23	220V, 8.5A(Expansion base)
	XGR-DC42	DC24V/DC5V 7A, Main(Expansion base)
Base	XGR-M02P	2Slot(Main base)
	XGR-M06P	6Slot(Main base)
	XGR-E08P	8Slot(Expansion base)
	XGR-E12P	12Slot(Expansion base)
	XGR-E12H	12Slot(Expansion base, Drive Redundancy)
Expansion drive	XGR-DBST	Twisted pair - Twisted
	XGR-DBSF	Pair Fiber optic - Fiber optic(2km)
	XGR-DBSH	Twisted pair - Fiber optic(2km)
	XGR-DBSFS	Pair Fiber optic - Fiber optic(15km)
	XGR-DBSHS	Twisted pair - Fiber optic(15km)

XGR module		
Expansion drive redundancy	XGR-DBDT	Twisted pair - Twisted
	XGR-DBDF	Pair Fiber optic - Fiber optic(2km)
	XGR-DBDH	Twisted pair - Fiber optic(2km)
Sync & Expansion cable	XGC-F201	2m (Fiber optic)
	XGC-F501	5m (Fiber optic)

Item	Input module		
	AC110V	AC220V	DC24V
8 points	-	XGI-A21A, XGI-A21C	XGI-D21A
16 points	XGI-A12A	-	XGI-D22A
	-	-	XGI-D22B
32 points	-	-	XGI-D24A
	-	-	XGI-D24B
64 points	-	-	XGI-D28A
	-	-	XGI-D28B

Item	Output module		
	Relay	Triac	Transistor
8 points	XGQ-RY1A	-	XGQ-TR1C
16 points	XGQ-RY2A	XGQ-SS2A	XGQ-TR2A
	XGQ-RY2B	-	XGQ-TR2B
32 points	-	-	XGQ-TR4A
	-	-	XGQ-TR4B
64 points	-	-	XGQ-TR8A
	-	-	XGQ-TR8B

Item	Input/Output mixed module	
	16-point DC input	16-point TR output

Special module		
Analog input	XGF-AV8A	Voltage input type, 8Ch
	XGF-AC8A	Current input type, 8Ch
	XGF-AD8A	Voltage/ Current input, 8Ch
	XGF-AD4S	Voltage/ Current input, 4Ch (Isolated)
	XGF-AD16A	Voltage/ Current input, 16Ch
	XGF-AW4S	2-wire, Voltage/ Current input, 4Ch (Isolated)
Analog output	XGF-DV4A	Voltage output type, 4Ch
	XGF-DC4A	Current output type, 4Ch
	XGF-DV8A	Voltage output type, 8Ch
	XGF-DC8A	Current output type, 8Ch
	XGF-DV4S	Voltage output, 4Ch (Isolated)
	XGF-DC4S	Current output, 4Ch (Isolated)
Analog Input/Output	XGF-AH6A	Input: 4ch, Voltage/ Current
		Output: 2Ch Voltage/ Current
High-speed counter	XGF-HO2A	Pulse (OC) input type, 2Ch
	XGF-HD2A	Pulse (LD) input type, 2Ch
Positioning	XGF-P01H-P04H	Open collector, 1~4axes
	XGF-P01H-P04H	Line drive, 1~4axes
Positioning (Network Type)	XGF-PN8A	LS Standard EtherCAT Net. 8axes
	XGF-PN8B	Standard EtherCAT Net. 8axes
Motion modnle	XGF-M32E	Standard EtherCAT Nee. 32axes
Temperature control	XGF-TC4S	Thermocouple input, 4Ch
	XGF-RD4A	RTD input, 4Ch
	XGF-RD4S	RTD input, 4Ch (Insulated)
Temperature controller	XGF-TC4UD	Input: 4ch.(Voltage/Current, RTD/TC)
		Output: 8ch.(TR/Current)
		Controller: 4 loops
	XGF-TC4RT	Input: 4ch.(RTD)
		Output: 4ch.(TR)
		Controller: 4 loops
Event input	XGF-SOEA	DC24V, 32points

Communication module		
RAPIEnet+ -RAPIEnet v2 -EtherNet/IP -Modbus TCP/IP -Dedicated XGT Network	XGL-EFMTB	Master/Client, Twisted fair 2ch.
	XGL-EFMFB	Master/Client, Fiber optic 2ch.
	XGL-EFMHB	Master/Client, Twisted fair/fiber optic
	XOL-ES4T	Stand alone switch twisted pair 4ch.
	XOL-ES4H	Stand alone switch twisted 2ch. fiber 2ch.
	XGL-EH5T	Open Ethernet switching hub
Computer Link (Cnet)	XGL-CH2B	RS-232C 1ch, RS-422/485 1ch
	XGL-C22B	RS-232C 2ch
	XGL-C42B	RS-422/485 2ch
DeviceNet(Dnet)	XGL-DMEB	DeviceNet, Master
Profibus-DP (Pnet)	XGL-PMEB	Profibus-DP, Master
	XGL-PSRA	Profibus-DP Slave, Remote interface
	XGL-PSEA	Profibus-DP Slave
Rnet	XGL-RMEB	Rnet, Master, TP
	GOL-RR8T	Rnet stand alone repeater hub
Fnet	XGL-FMEA	Fnet, Master
BACnet/IP	XGL-BIPT	BACnet client/server

Specification

Item			Description		Remark
			XGR-CPUH/F	XGR-CPUH/T	
Media			Fiber optic	Twisted pair	
Operation method			Cyclic execution, Periodic operation, Interrupt operation, Fixed scan		
I/O control method			Scan synchronized batch processing method (Refresh method)		
Program language			LD (Ladder Diagram), ST (Structured Text), SFC (Sequential Function Chart), IL (Read only)		
Number of Instructions	Operator		18		
	Standard function		130 + Real type function		
	Standard function block		41		
Special function/ function block			Special function block, Process control function block		
Processing speed	LD		0.042㎲/Step		
	MOV		0.126㎲/Step		
	Real type		±: 0.602㎲(S), 1.078㎲(D) x : 1.106㎲(S), 2.394㎲(D) ÷: 1.134㎲(S), 2.66 ㎲(D)		S: Real type D: Long real type
I/O points			I: 131,072 points, Q: 131,072 points (Total: 1131,072)		
DRAM	Program memory		7MB		Including Upload, Parameter, System area *Battery back-up memory : 8MB
	Data memory		2MB		
	Reserved memory		7MB		
Flash memory			16MB		
Data memory	Direct variable		256k Byte		
	Auto allocated variable		512k Byte		
	Timer		No limitation, Range: 0.001sec ~ 4,259,967.295sec (1,193hours)		
	Counter		No limitation, Range: -32,768 ~ +32,767		
	Flag	System	4k Byte		
		Communication	64k Byte		L, N area
		Special	2k Byte (32 base, 16 slot, 32 channel)		U area: Analog device area
File register			64k Byte *2		R area: read/write (Command, XG5000)
Program	Number of program blocks		256		
	Initial task		1 (_INT)		
	Cycle task		32		
	Internal device task		32		
Operation mode			RUN, STOP, DEBUG		
Restart mode			Warm, Cold		
Self diagnostic functions			Watchdog timer, Memory error, I/O error, Battery error, Power Supply error		
Program download			RS-232C (1CH), USB (1CH)		
Data retain			Auto allocated variable: set by variable definition Direct variable: set by parameter		
Max. expansion base			31 stages		

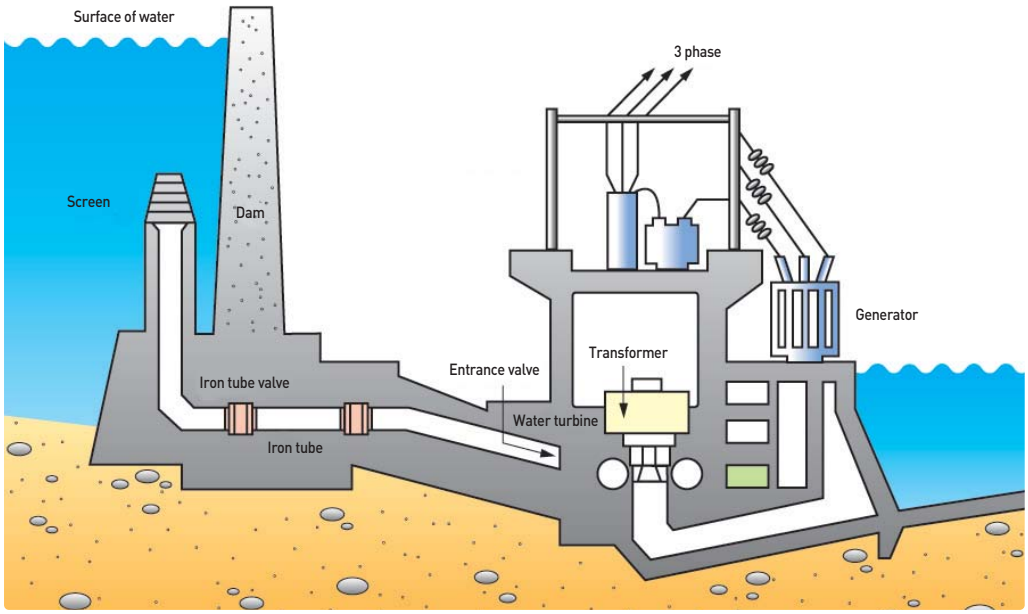
Specification

Item	Hardware		Remark
CPU module	2 slot / Fiber, Twisted fair		
Expansion drive module	1 slot / Fiber, Twisted fair, Hybrid		
Base	Main base: 6 slot, Expansion base: 12 slot		
Power	AC110V	5V-5.5A	
	AC220V	5V-5.5A	
	AC110V	5V-8.5A	
	AC220V	5V-8.5A	
Expansion method and Max. expansion base	31 stages by network		
Base number setting	Rotary switch of expansion drive module		
Distance between expansion bases	Twisted fair: 100m (3km), Fiber: 2km (60km)		
Master/Standby switching over time	50ms or less		

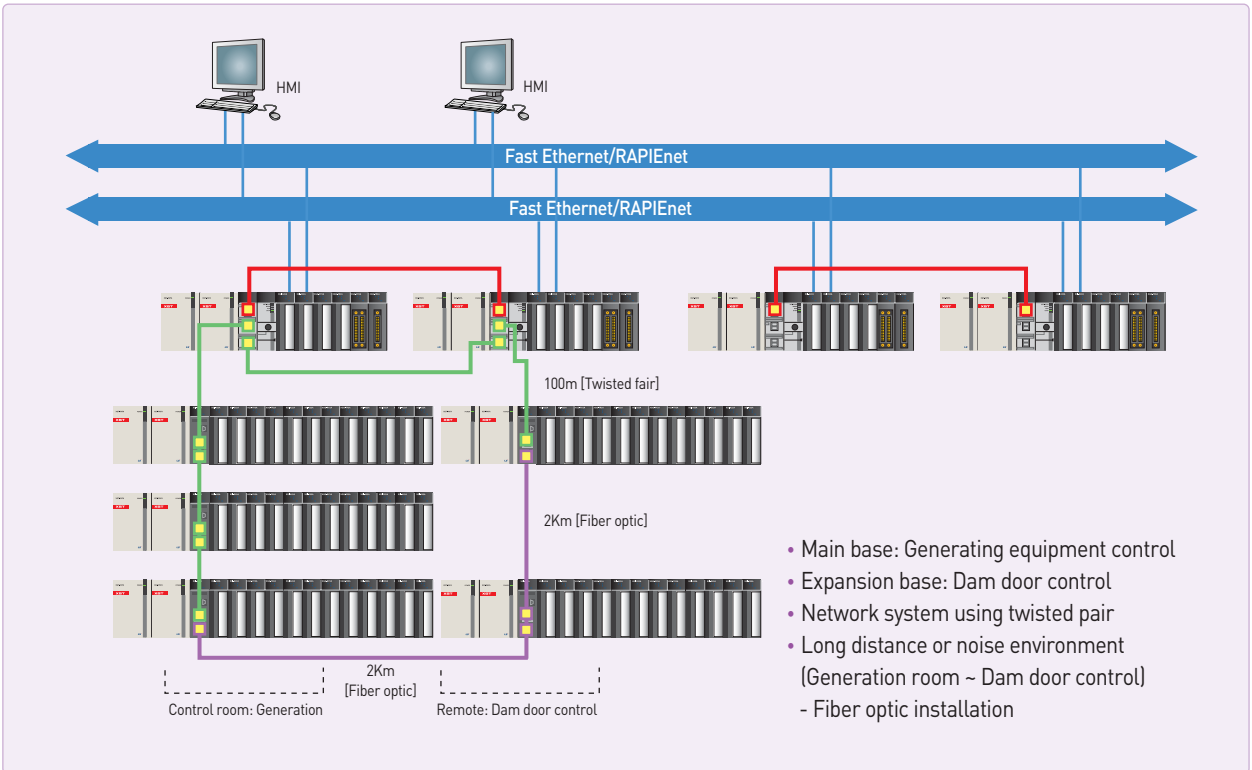
Available modules for each base

	Base	Available modules
1	Main base	CPU, Ethernet module (XGL-EFMx), RAPIEnet module (XGL-EIMx) * x: T (Twisted fair), F (Fiber optic), H (Hybrid)
2	Expansion base	I/O modules for XGI (Ethernet based communication module should be installed on Main base Number of communication module: 12 for High-speed link, 8 for P2P Number of analog module: Analog input (139), Analog output (250)

Water power generation or Dam door control

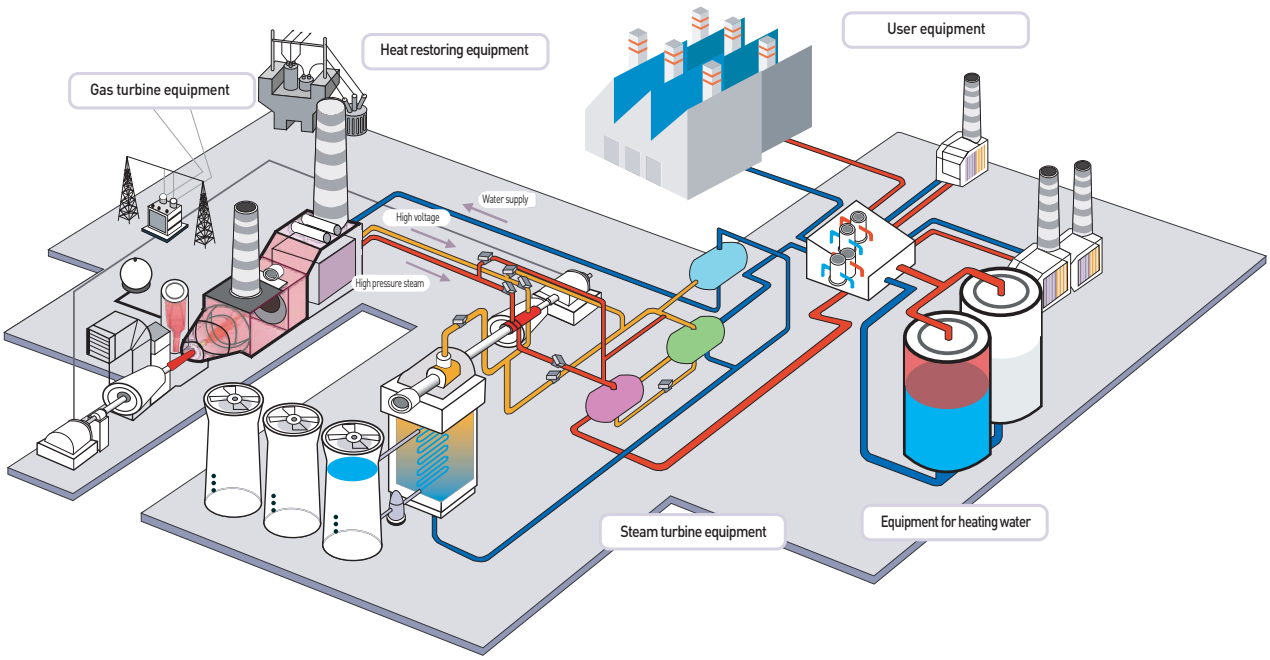


System configuration

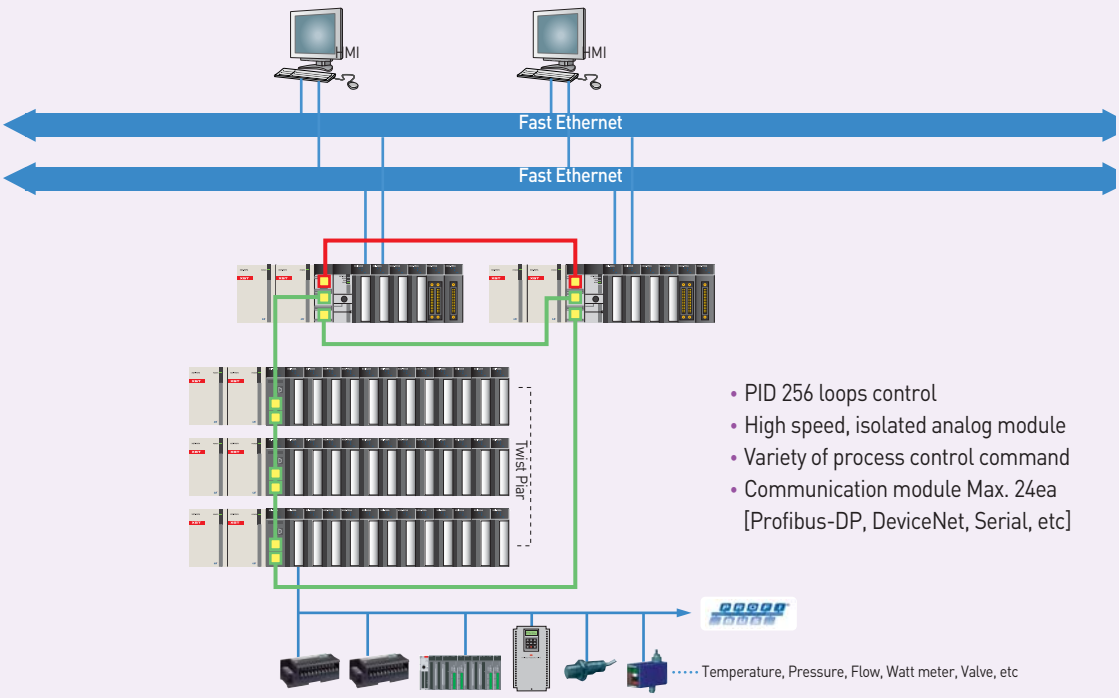


- Main base: Generating equipment control
- Expansion base: Dam door control
- Network system using twisted pair
- Long distance or noise environment
  (Generation room ~ Dam door control)
  - Fiber optic installation

Generating boiler control

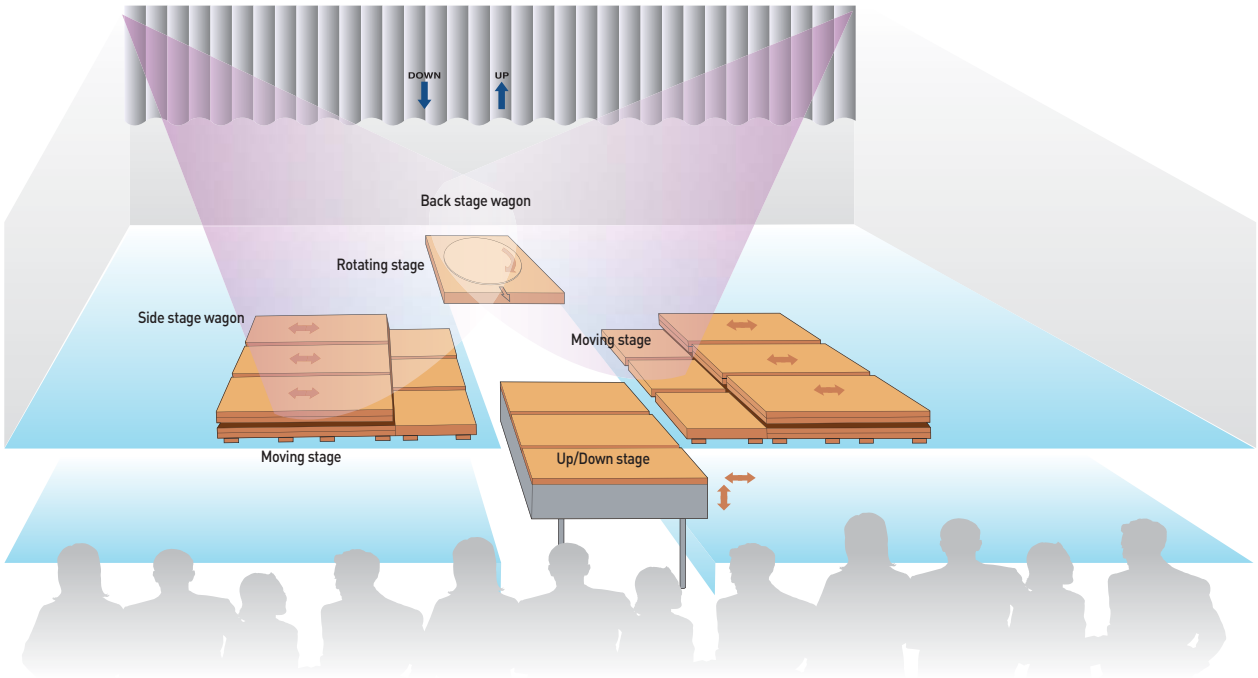


System configuration

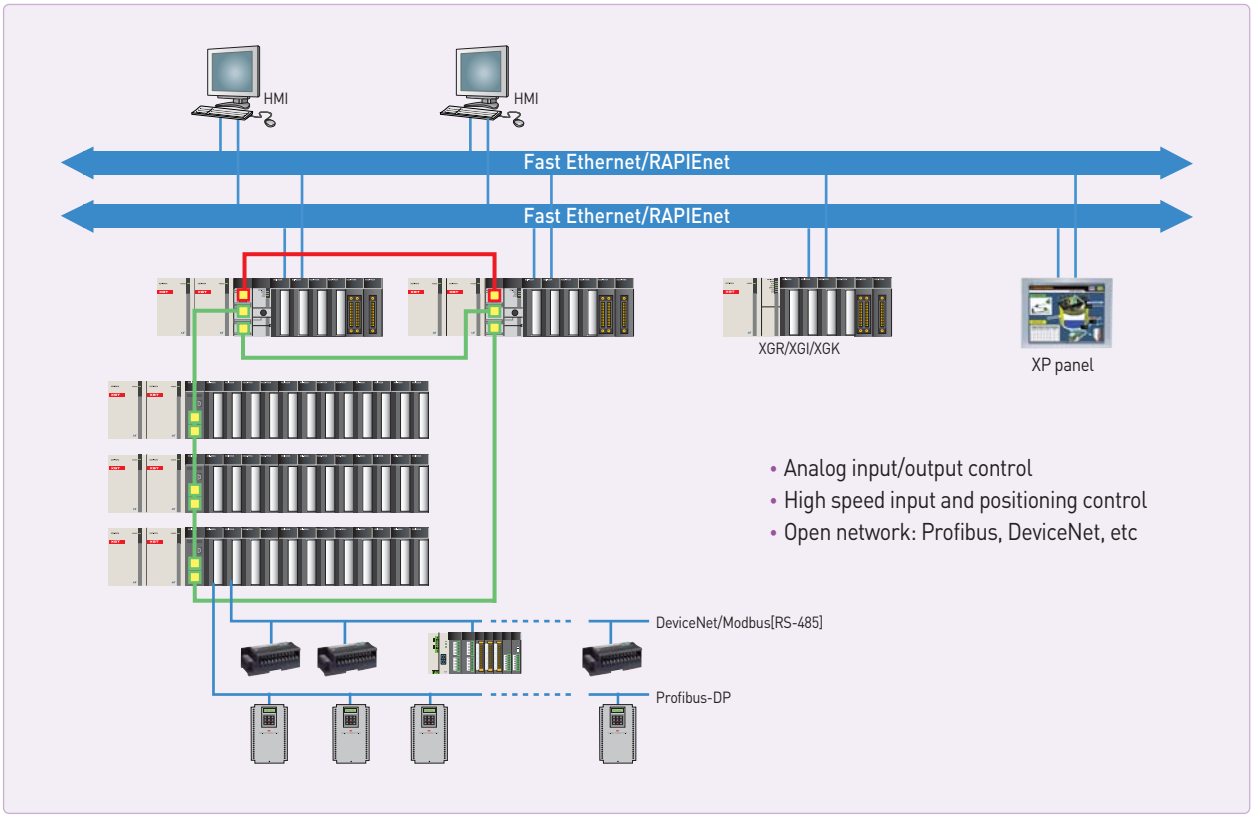


- PID 256 loops control
- High speed, isolated analog module
- Variety of process control command
- Communication module Max. 24ea
  [Profibus-DP, DeviceNet, Serial, etc]

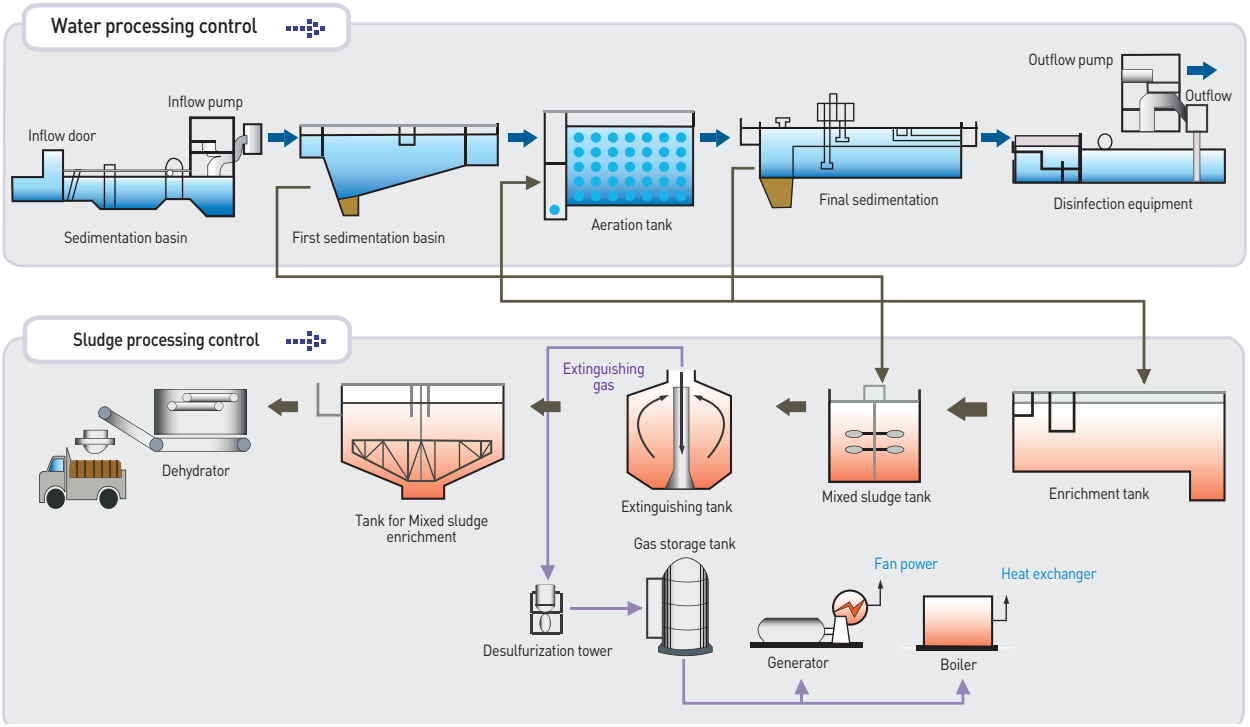
Stage control



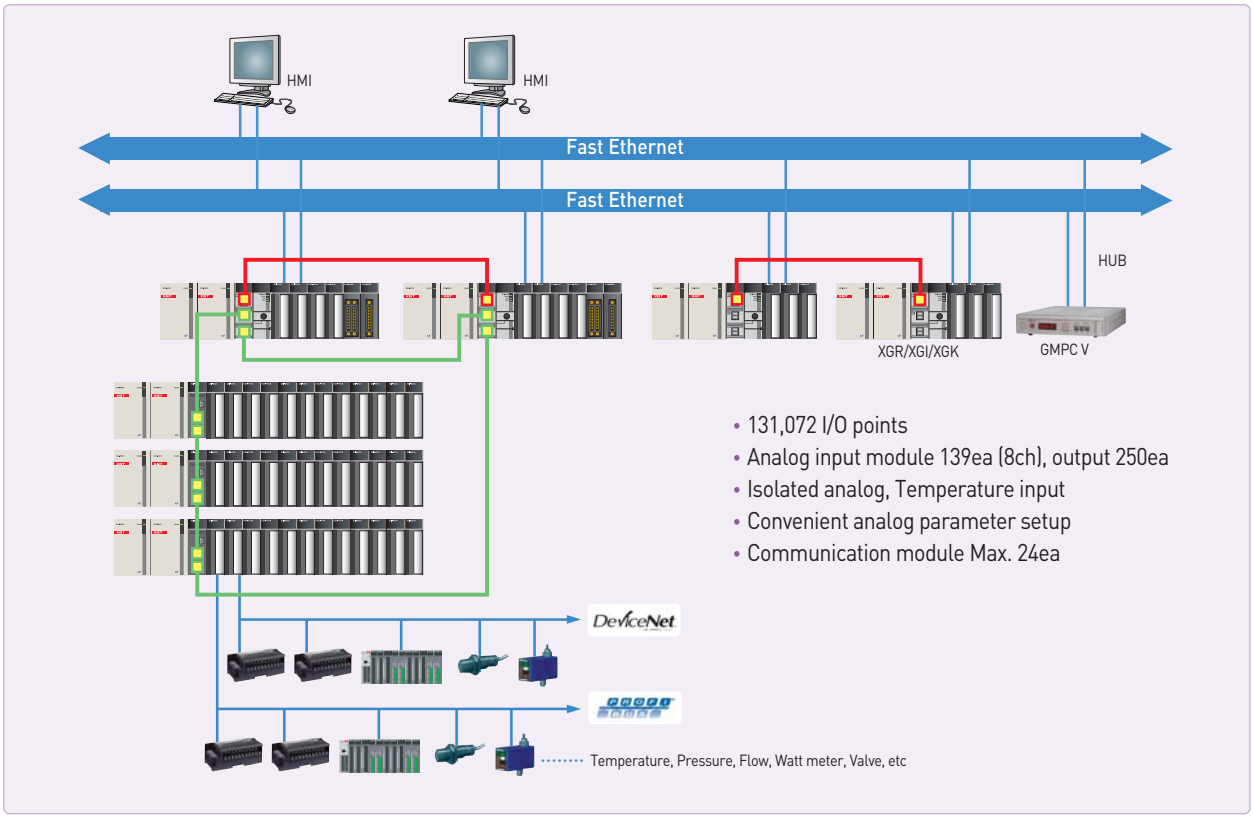
System configuration



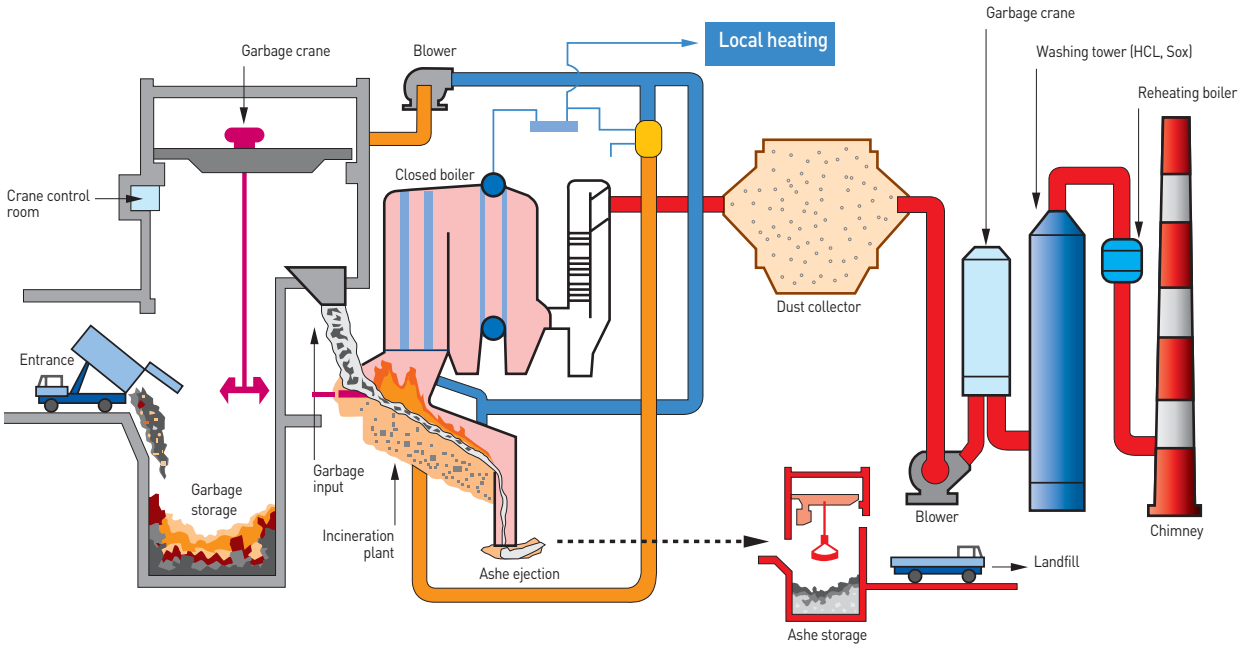
Water processing control



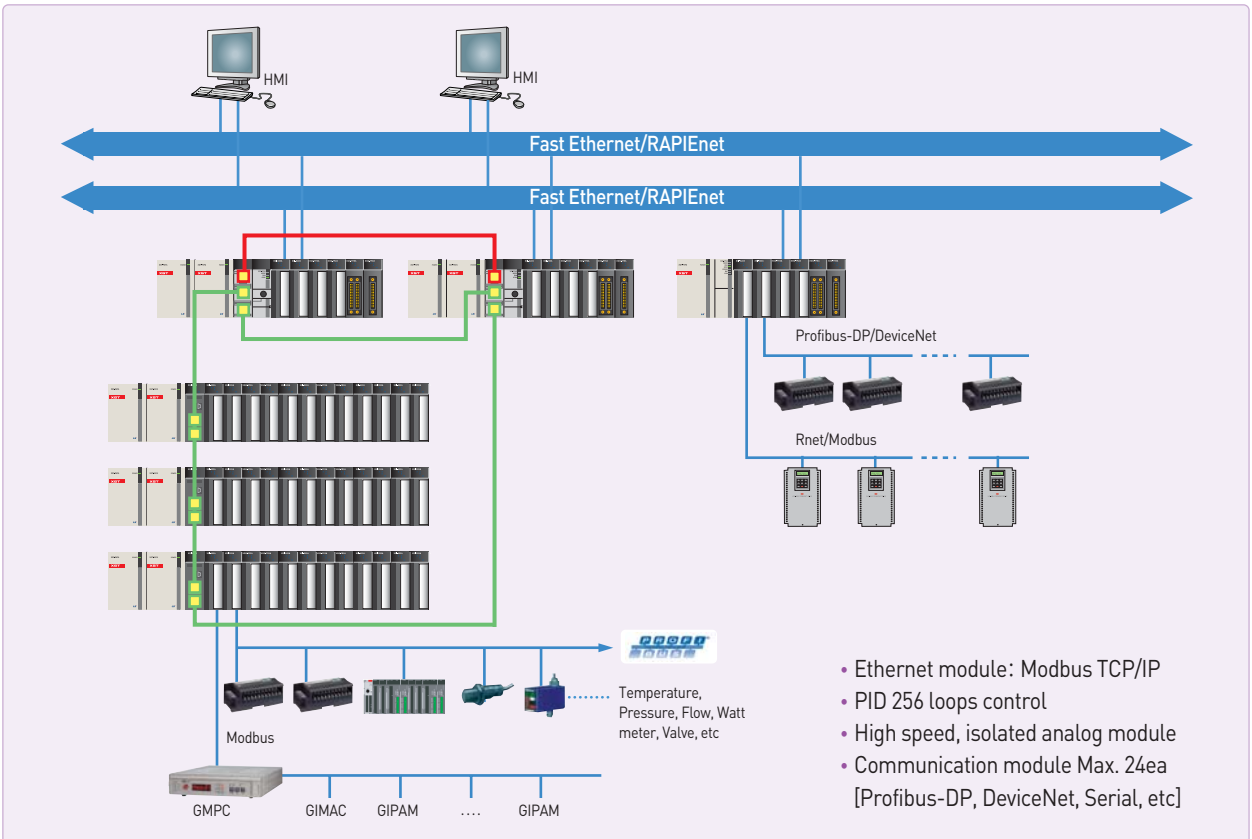
System configuration



Incinerator control

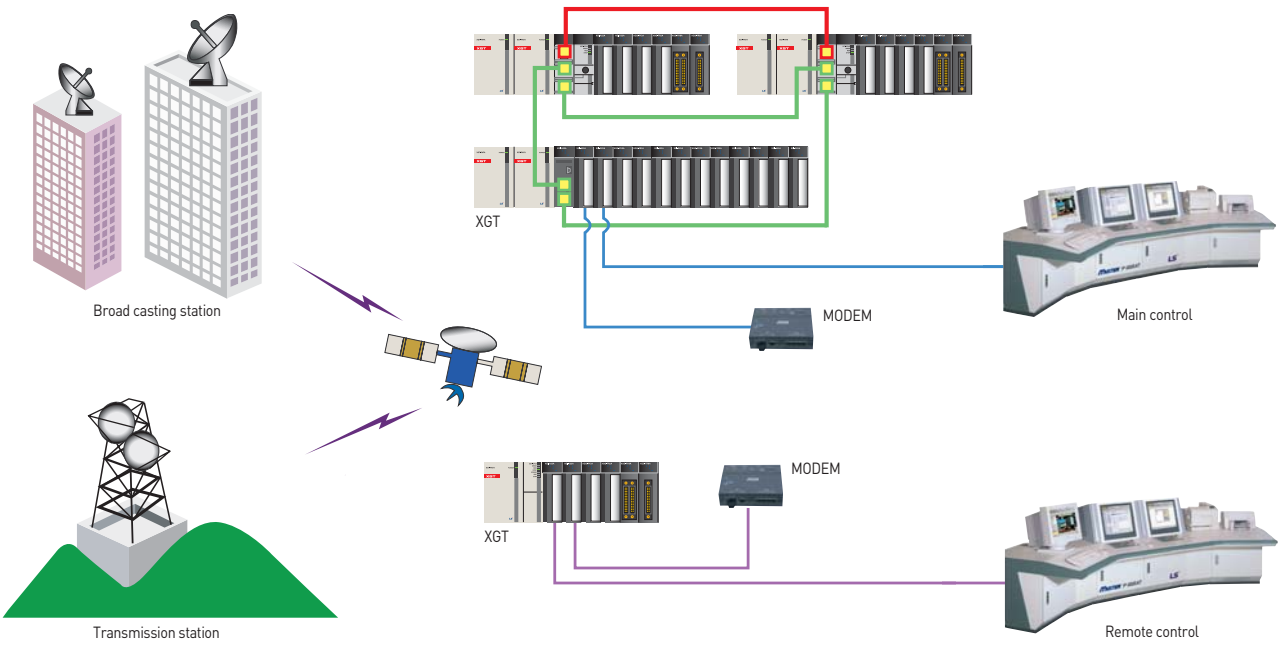


System configuration

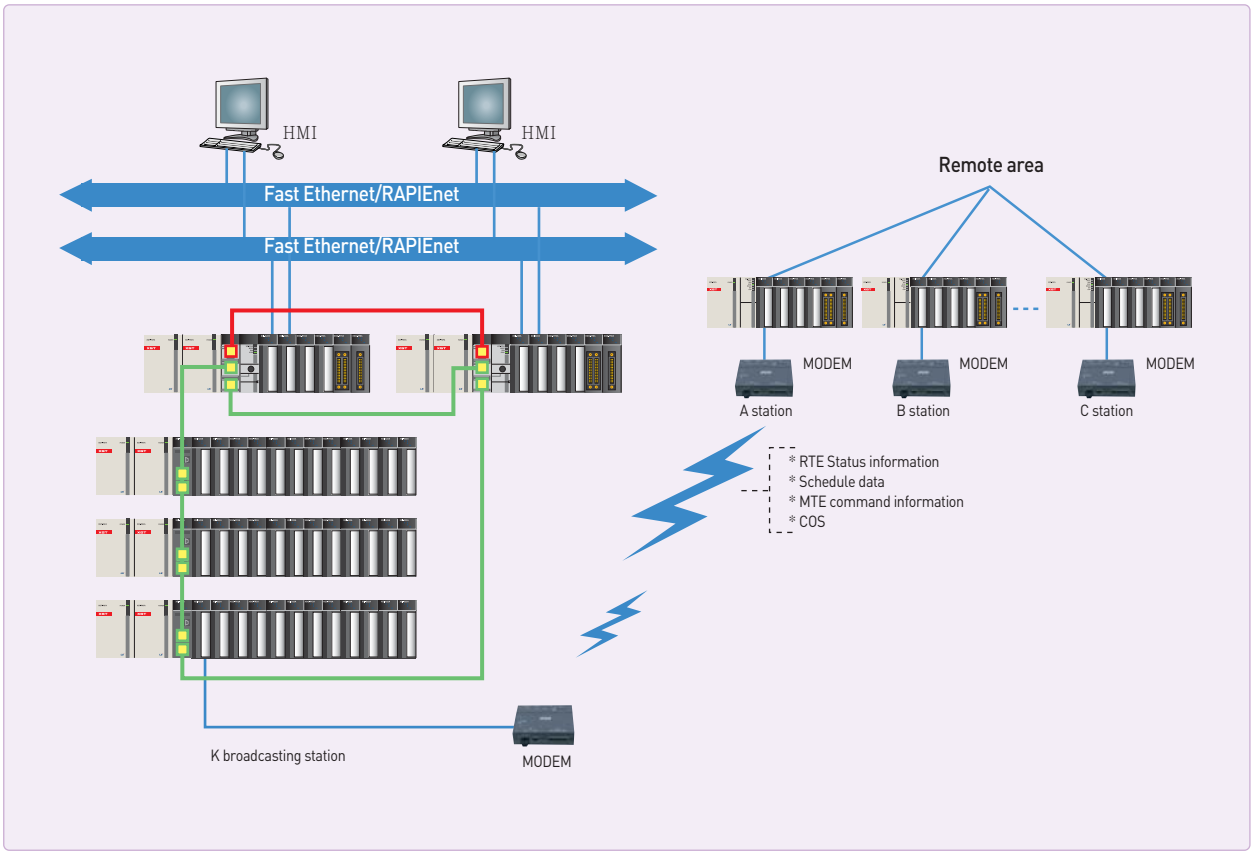


- Ethernet module: Modbus TCP/IP
- PID 256 loops control
- High speed, isolated analog module
- Communication module Max. 24ea [Profibus-DP, DeviceNet, Serial, etc]

Broad casting system



System configuration




XGL-CH2A
XGF-M32E
XGF-DL16A
RDY
RUN
ERR
ACT
USB
CF
CH1
CH2
TX+
TX-
RX+
RX-
SG
Industrial Grade
CF CARD
EJECT

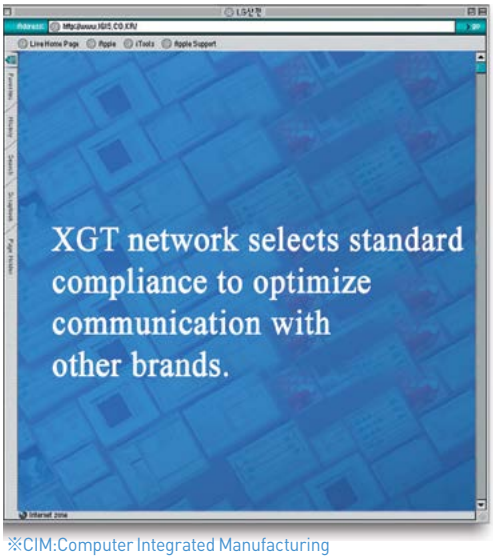
Network

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

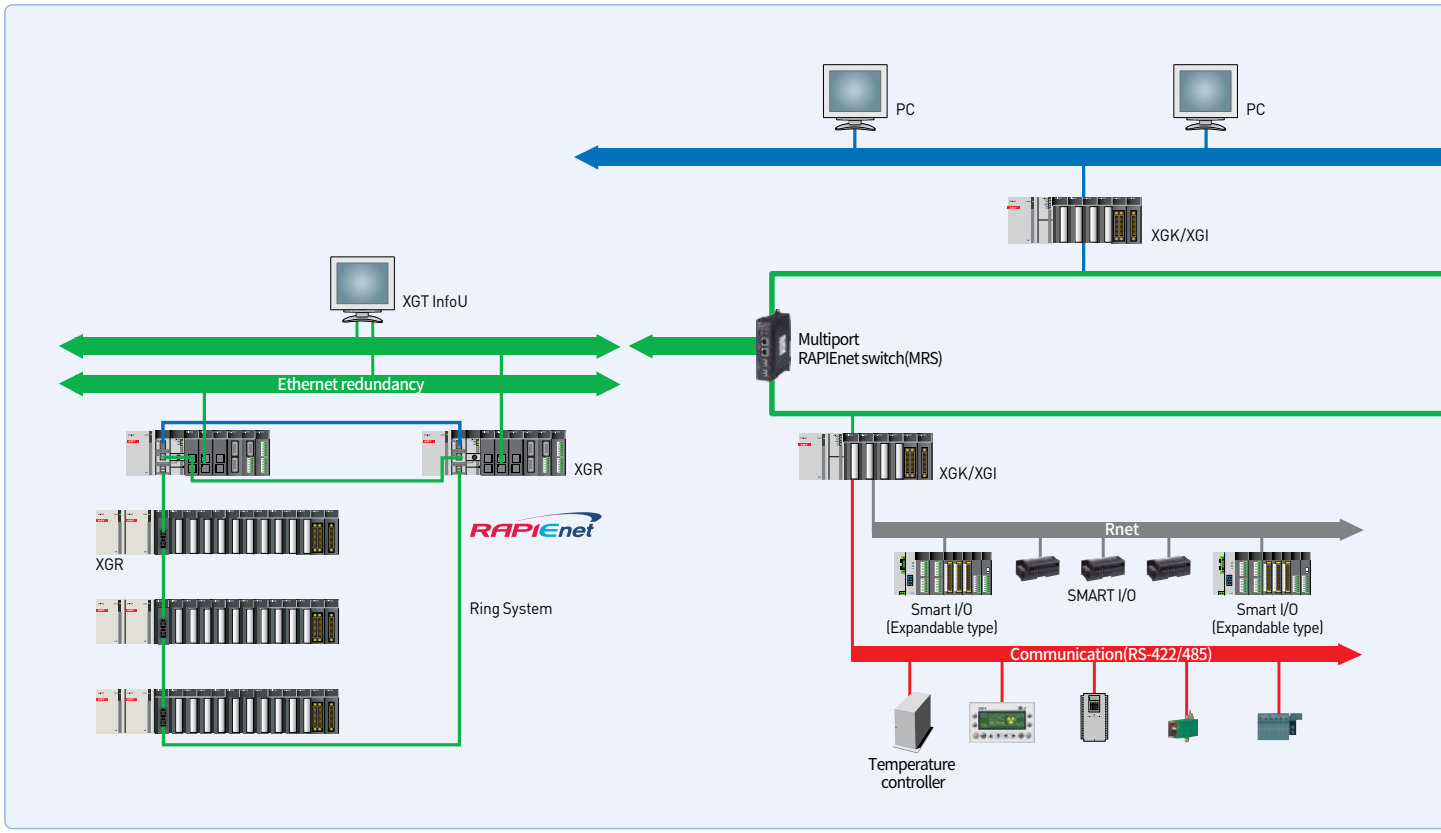
- Topology : Star, Line
- Communication speed: 100Mbps, 1Gbps
- Dual port (T.Pair / F.Optic / Hybrid)
- Built-in high performance industrial switch
- Max read/write data size : 1,400 byte(Non-periodic tag)
- Max No. of connected stations per network : 64 stations

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

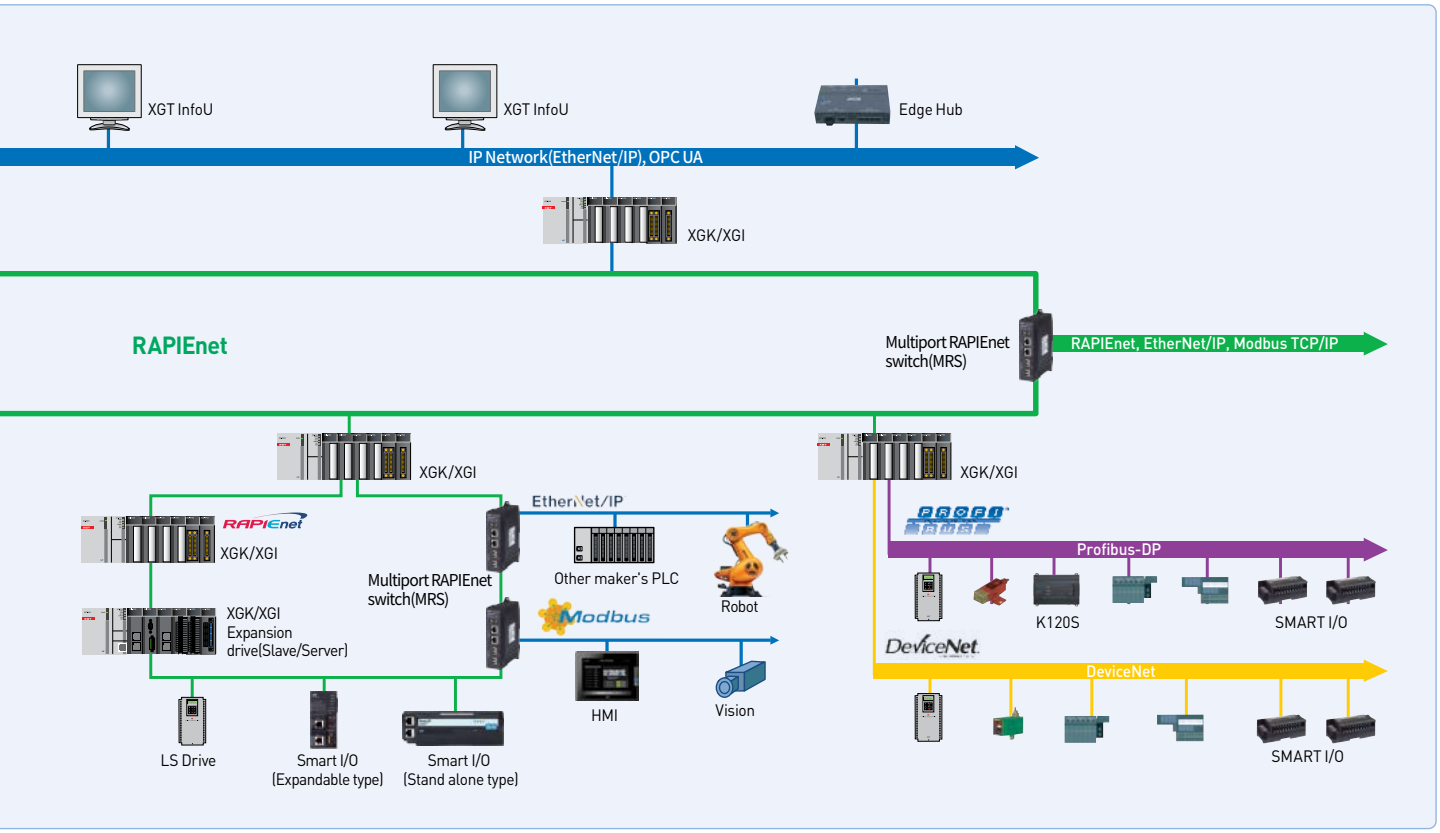
Rnet
- High-speedcommunication 1Mbps
- Longcommunicationdistance Max.750m
- Max. 6 repeaters (up to 5.25km)
- Network management using Auto-scan (Slave module information)

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

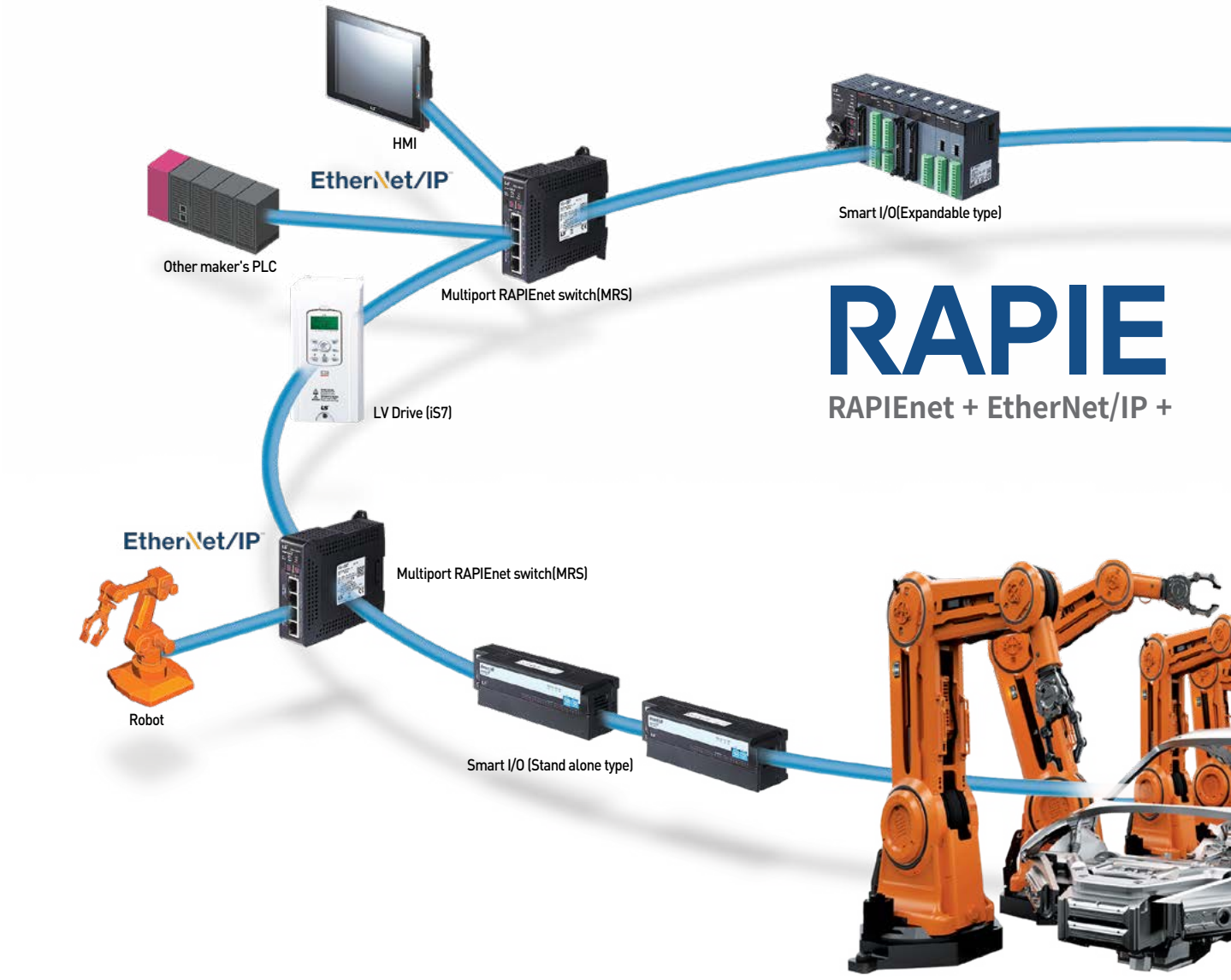
Profibus-DP(Pnet)
- Optimum communication for a master automation device and distributed slave I/O devices
- Fast slave communication omitting application layer
- Long communication distance: Max. 1200m
- Communication using High-speed link parameter

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+

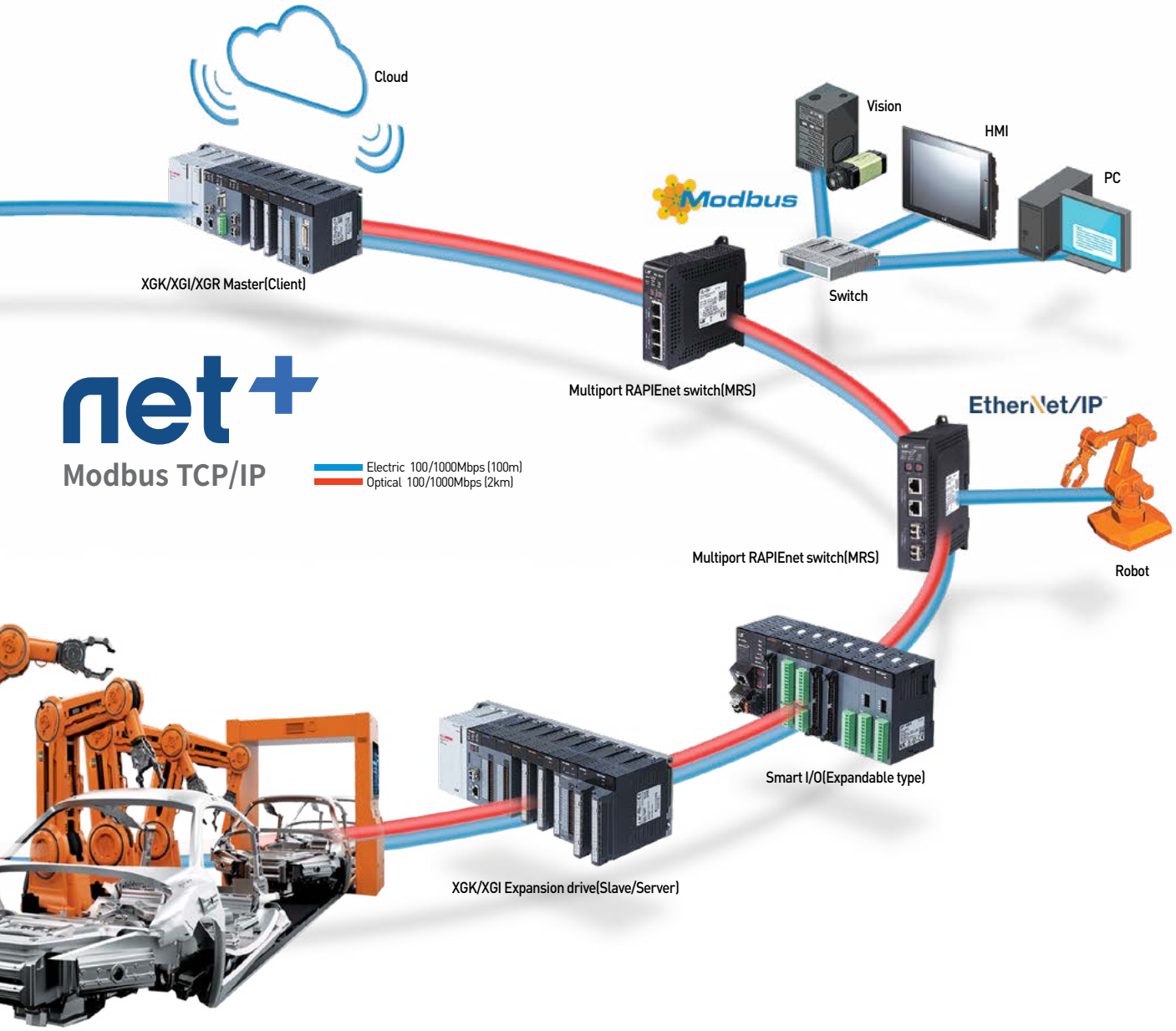


About RAPIEnet+

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

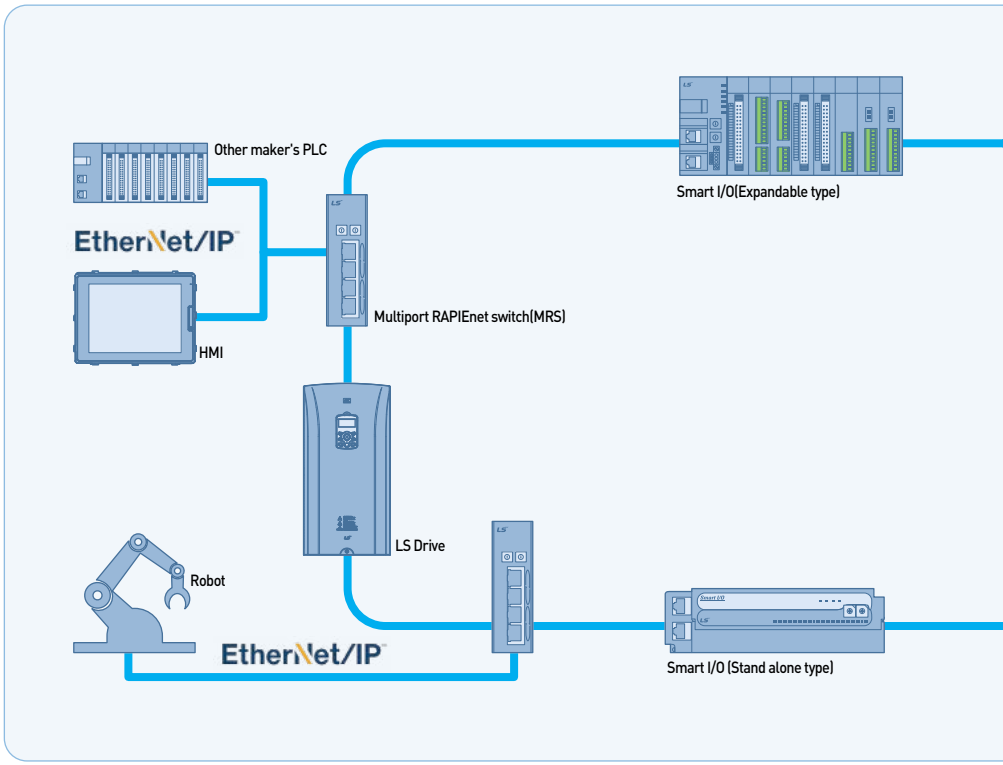
- Reliability improvement for ring topology network
- Various functions for network monitoring and diagnosis
- Noise reduction by fiber-optic network

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

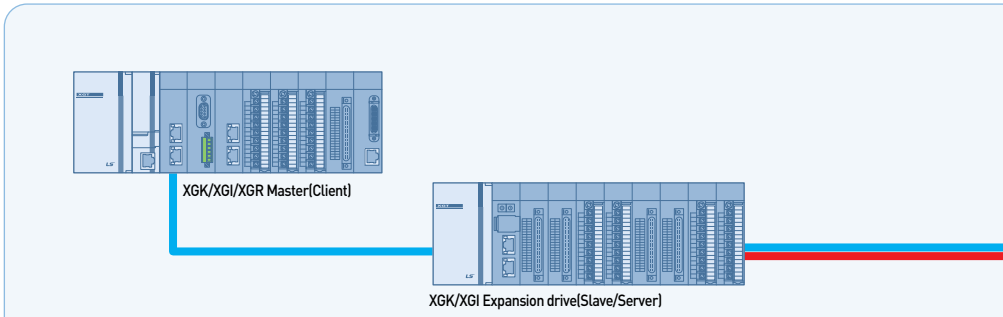
Electric 100/1000Mbps (100m)
Optical 100/1000Mbps (2km)



Daisy-chain Type

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

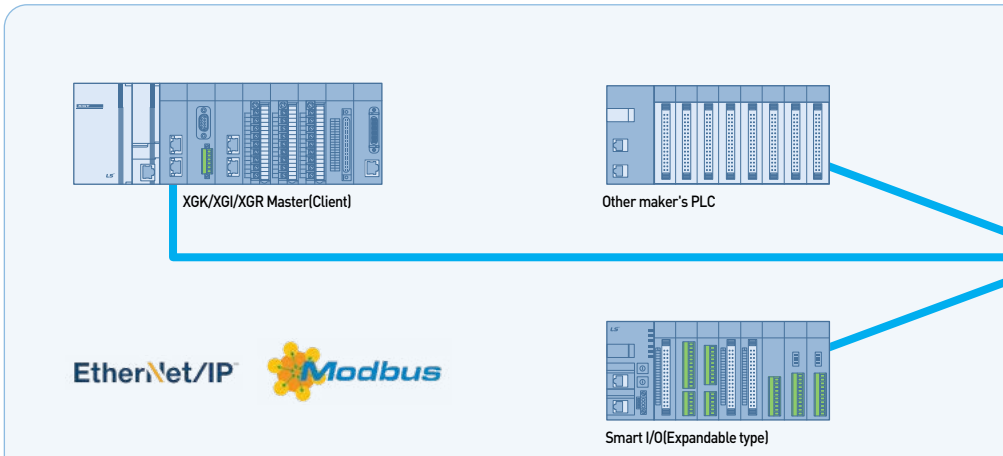
Electric 100/1000Mbps (100m)
Optical 100/1000Mbps (2km)

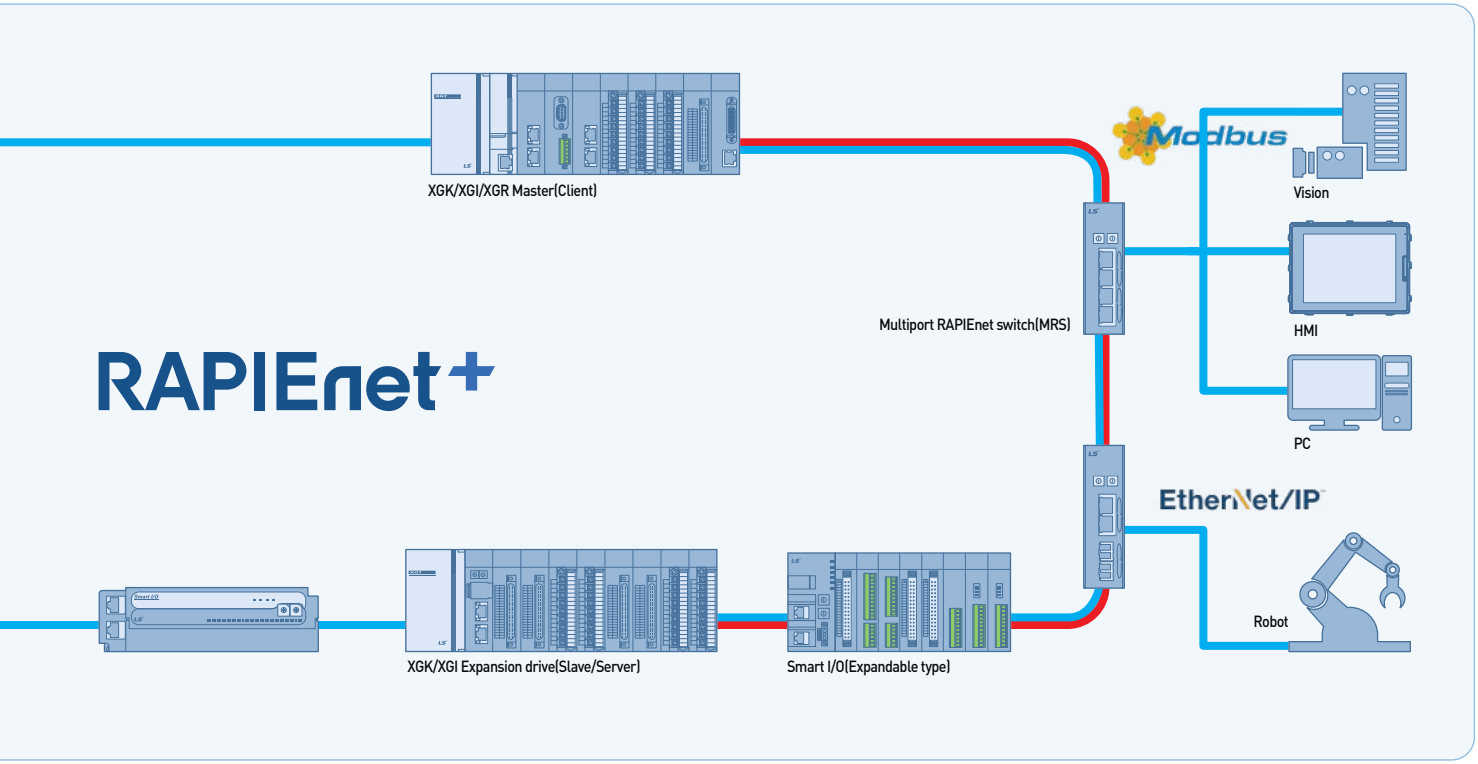


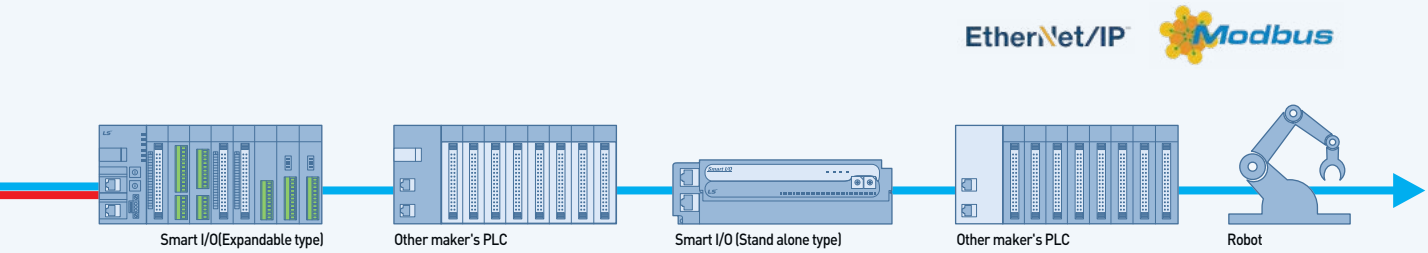
Star Type

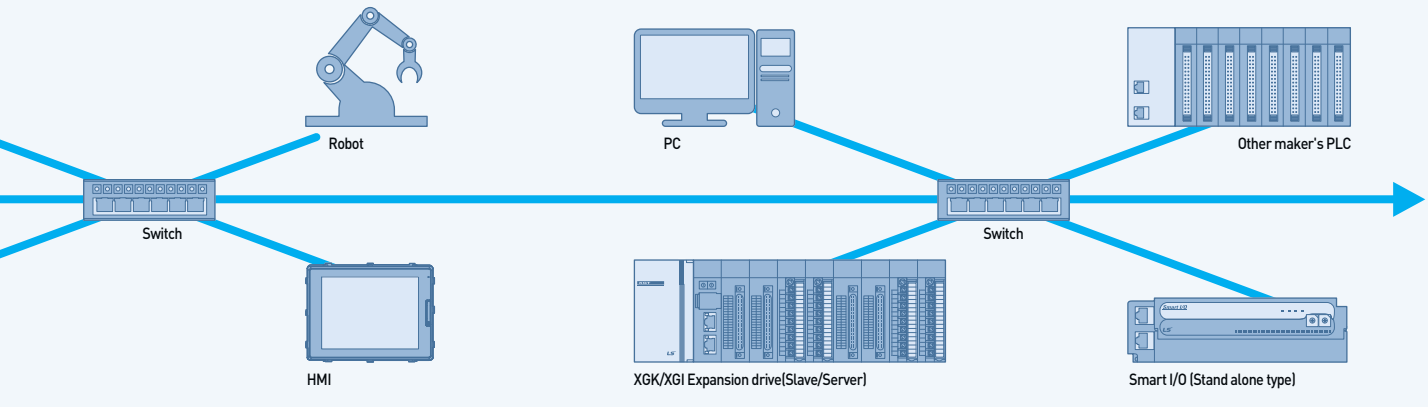
- Integrated network configuration with third-party devices
- Varioud network configuration (general switch application available)

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)		

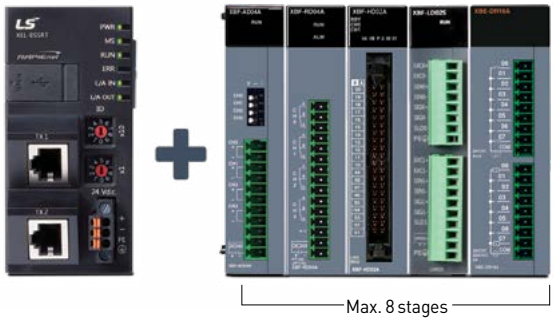
Network service specification

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



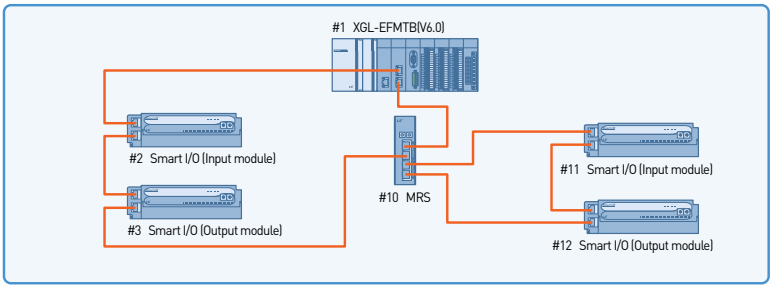
XGT RAPIEnet+ Multiport RAPIEnet switch(MRS)

XOL-ES4T, XOL-ES4H

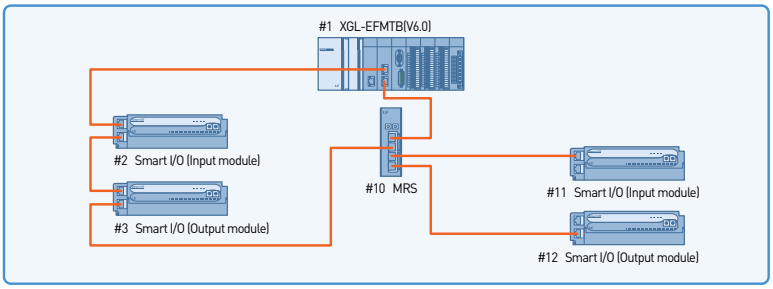
- Multi-port switch to integrate RAPIEnet, Modbus TCP/IP and EtherNet/IP network
- Max. 64 stations including master module
- Simple module setup with station no.: no additional S/W required.
- Module status information in XG5000 (Autoscan)
- Available from RAPIEnet v2.0 or later.

Various system methods can be configured by using MRS

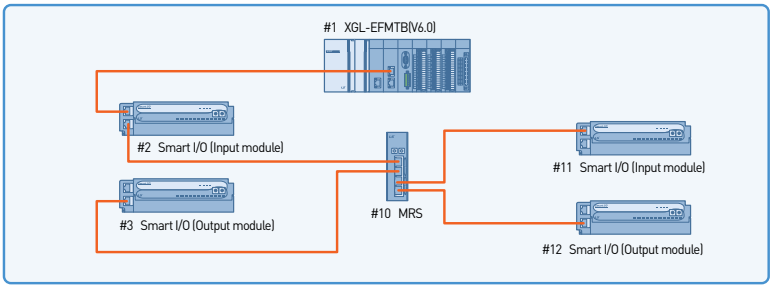
2 Ring System (Ring to Ring)



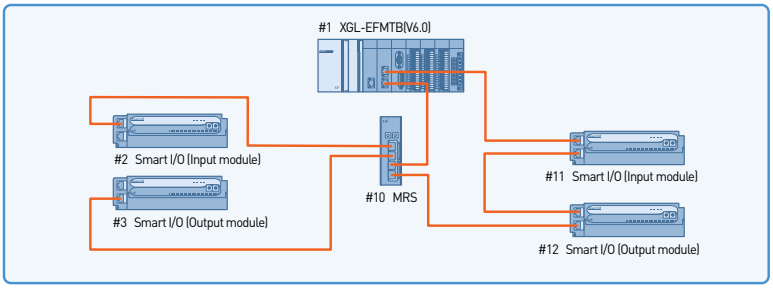
1 Ring / 1 Line System (Ring to Line)



2 Line System (Line to Line)



1 Line / 1 Ring System (Line to Ring)

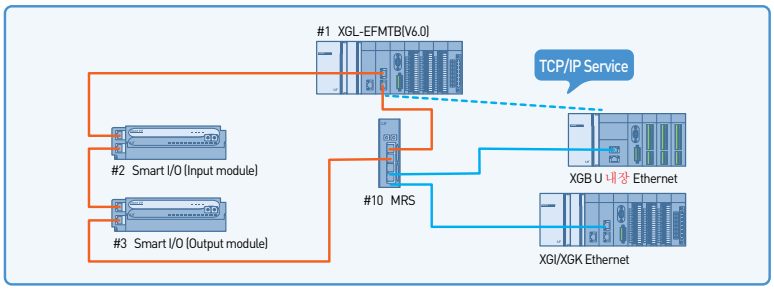


Specification

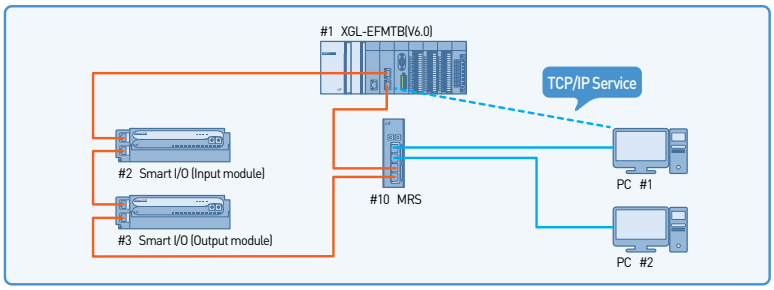
Item		RAPIEnet	
		XOL-ES4T	XOL-ES4H
Transmission Specifications	Transmission speed	100Mbps(1,2 port) 100Mbps/1 Gbps (3,4 port)	100Mbps/1 Gbps (1,2 port, electric) 100Mbps/1 Gbps (3,4 port,optical)
	Port type and number of ports	RJ45 4Ports	RJ45 2Ports, LC 2Ports
	Transmission distance	100m	100m/2km
	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)

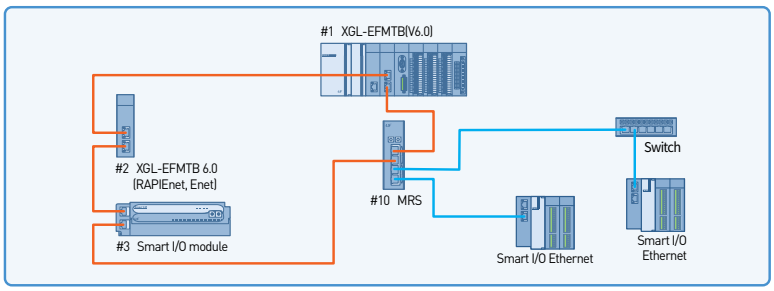
RAPIEnet(1,2 Port), Ethernet(3,4 Port)



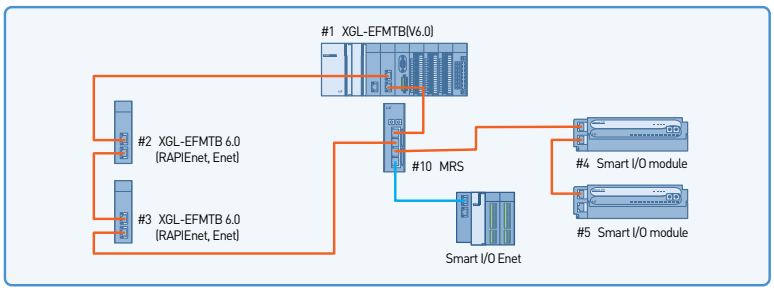
Ethernet(1,2 Port), RAPIEnet(3,4 Port)



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



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



NETWORK

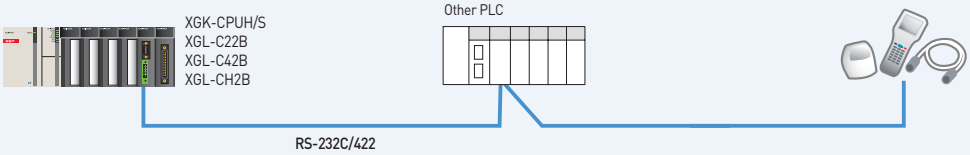
XGL-C22B, XGL-CH2B, XGL-C42B

- 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

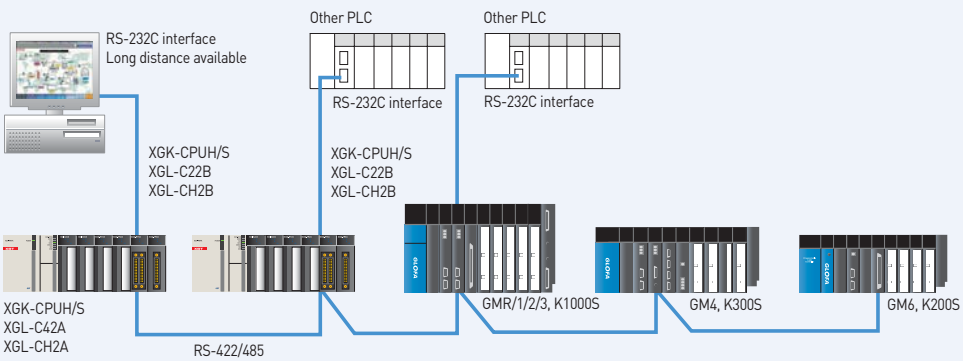
Various independent operation mode

- 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 ELECTRICand other)

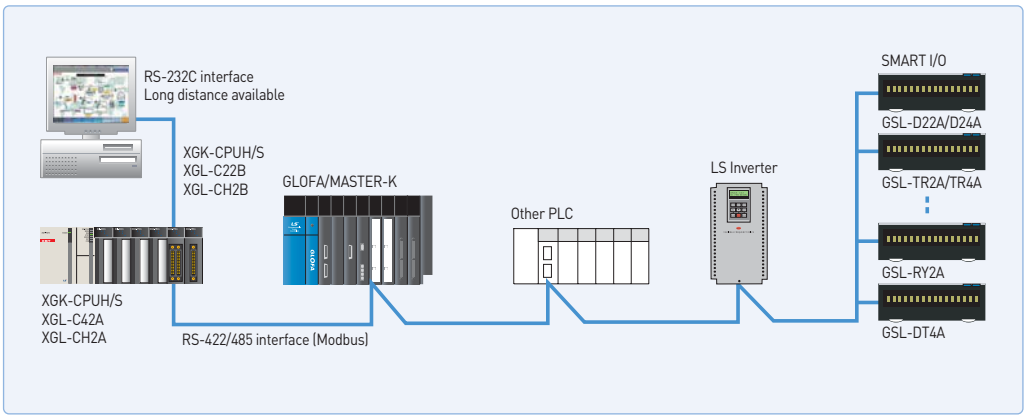


Specifications

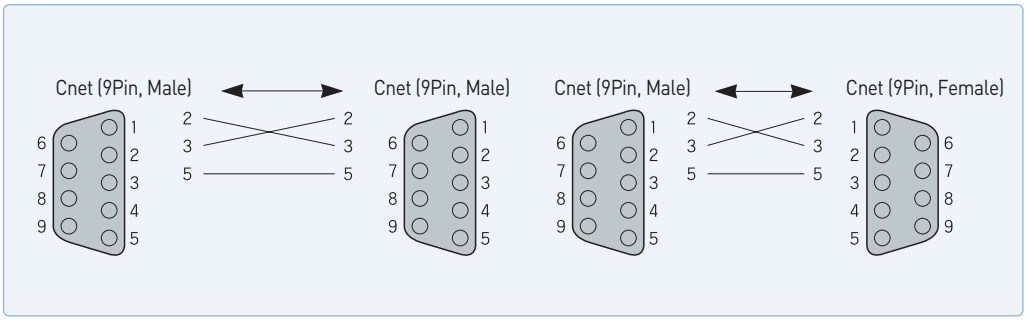
Item		Specification		
		XGL-C22B	XGL-CH2B	XGL-C42B
Serial communication channel	RS-232C	2 channels	1 channel	-
		Conforms to RS-232C standard		
	Line config	1:1		
	RS-422/485	-	1 channel	2 channels
			Conforms to RS-422/485 standards	
	Line config		1:1, 1:n, n:1	
Modem connection function		Remote communication 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



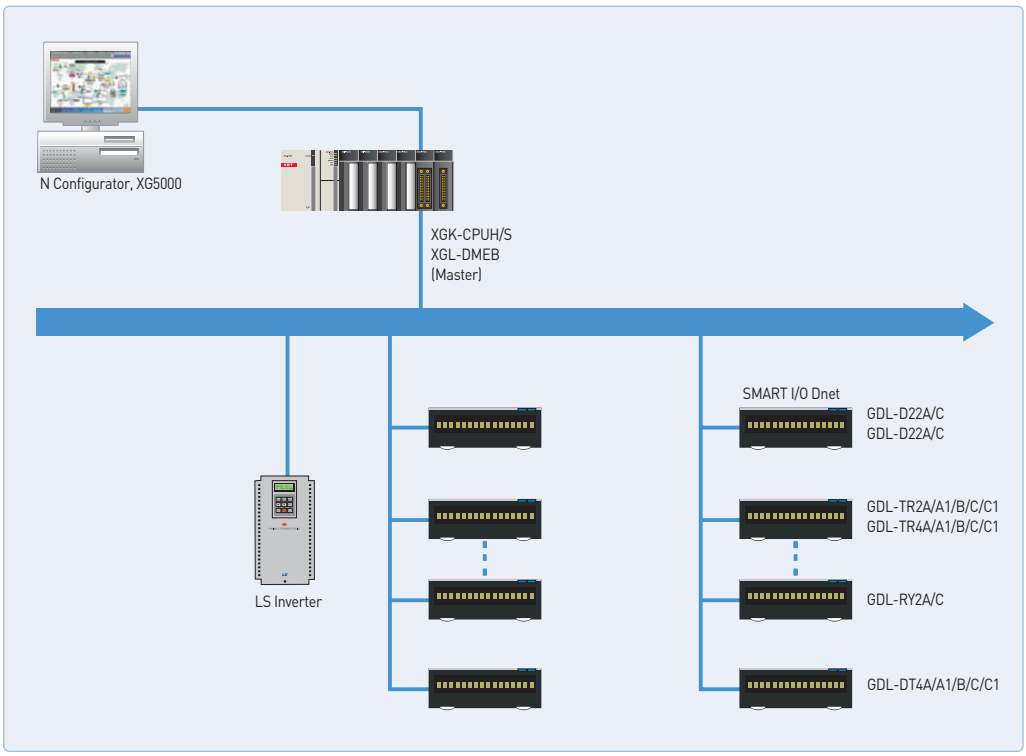
NETWORK

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)

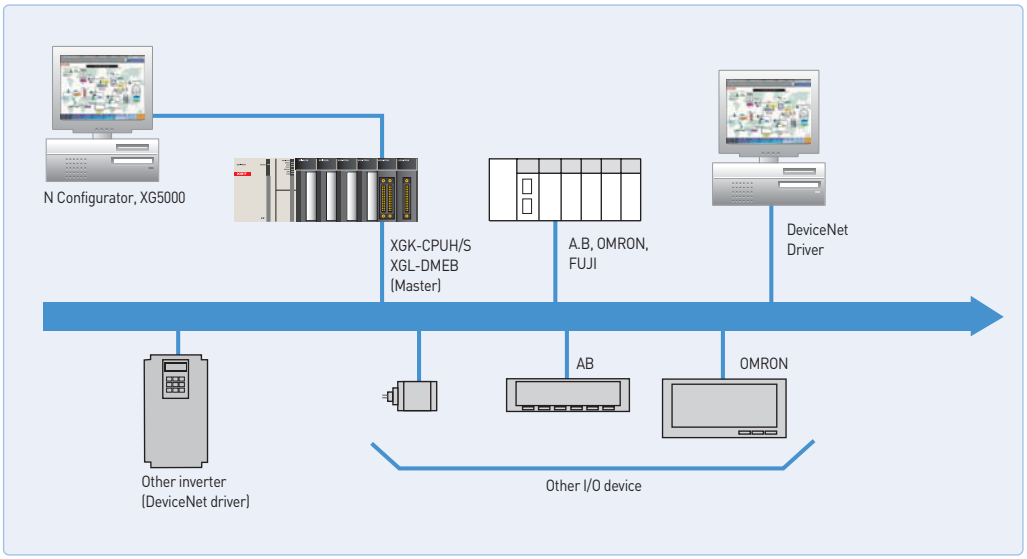
System configuration with LS ELECTRIC products



Specifications

Item			Performance Specifications
Transmission Specification	Transmission Speed (kbps)		125/250/500
	Transmission Type	I/O Connection	G2, UCMM
		I/O Communication	• XGL-DMEB: Poll, Bit strobe, COS, Cyclic • XGL-DSEB: Poll, 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
	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		• XGL-DMEB: Available only in master • XGL-DSEB: Available only in slave
Parameter setting			• N Configurator (CONFIG Port of Dnet I/F) • Setting to High-speed link of XG5000 • Station number, baudrate setting by H/W switch(XGL-DSEB)
XG5000 (High -speed link)	Data process unit		Byte
	Send/Receive period		Select among 10, 20ms, 50ms, 100ms, 200ms, 500ms, 1s, 5s, 10s - Default : 20ms
	Max. communication point		• XGL-DMEB: Send 128,520 points, Receive 128,520 points, 16,065 bytes respectively • XGL-DSEB: Send 2,040 points, Receive 2,040 points, 255 bytes respectively
	Max. block number		64 (Setting range: 0~63)
	Max. point number per block		2,040 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



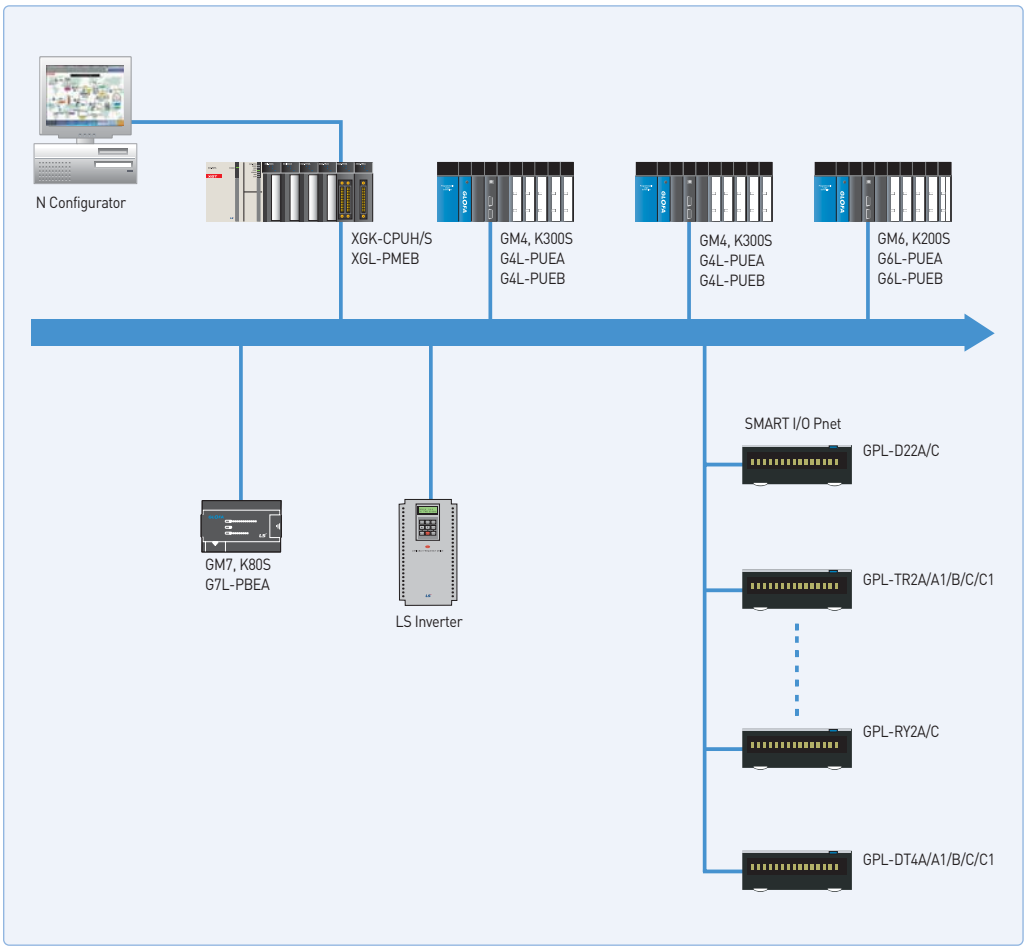
NETWORK

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

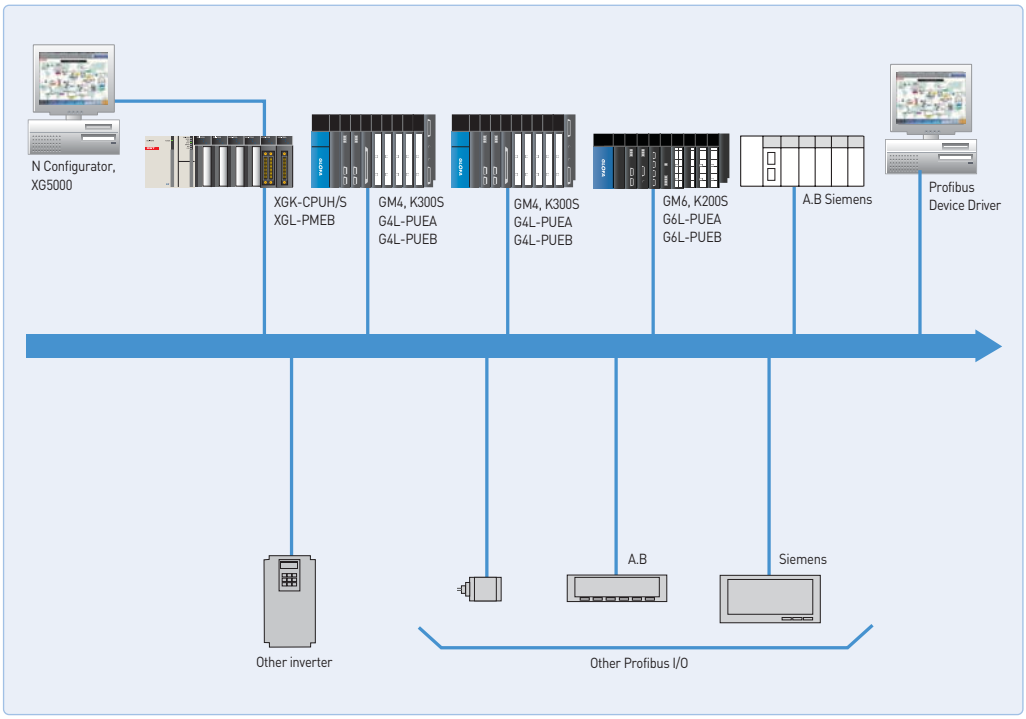
System configuration with LS ELECTRIC products



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



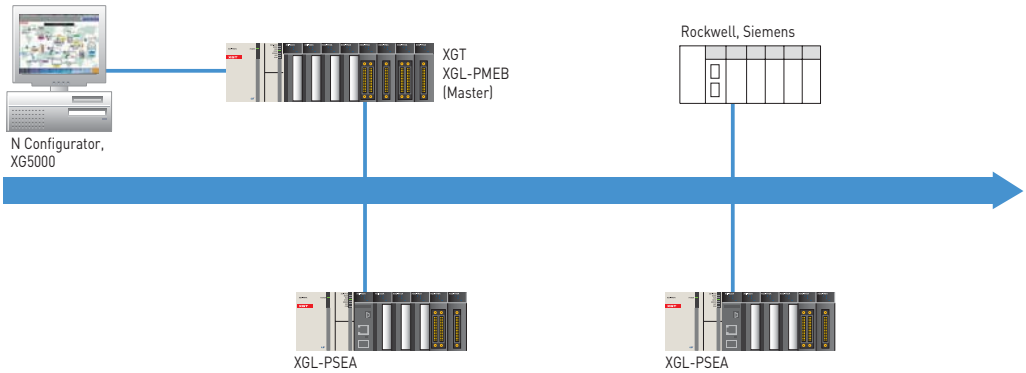
NETWORK

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

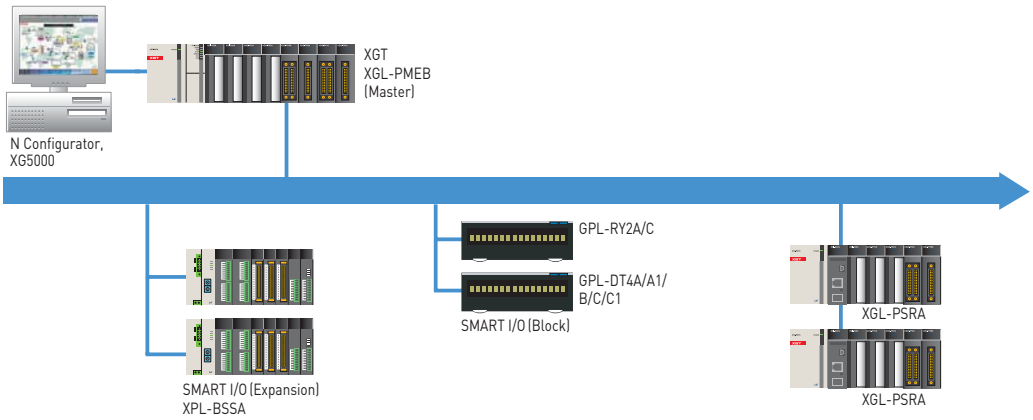
Item		XGL-PSEA				
Standard		EN50170 / DIN 19245				
Interface		RS-485(Electric)				
Media access		Polling				
Topology		Bus				
Modulation		NRZ				
Network Interface		Auto baud rate				
Master / Slave		Slave				
Max. number of slave per network		99				
Max. number of slave per segment		32				
Cable		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



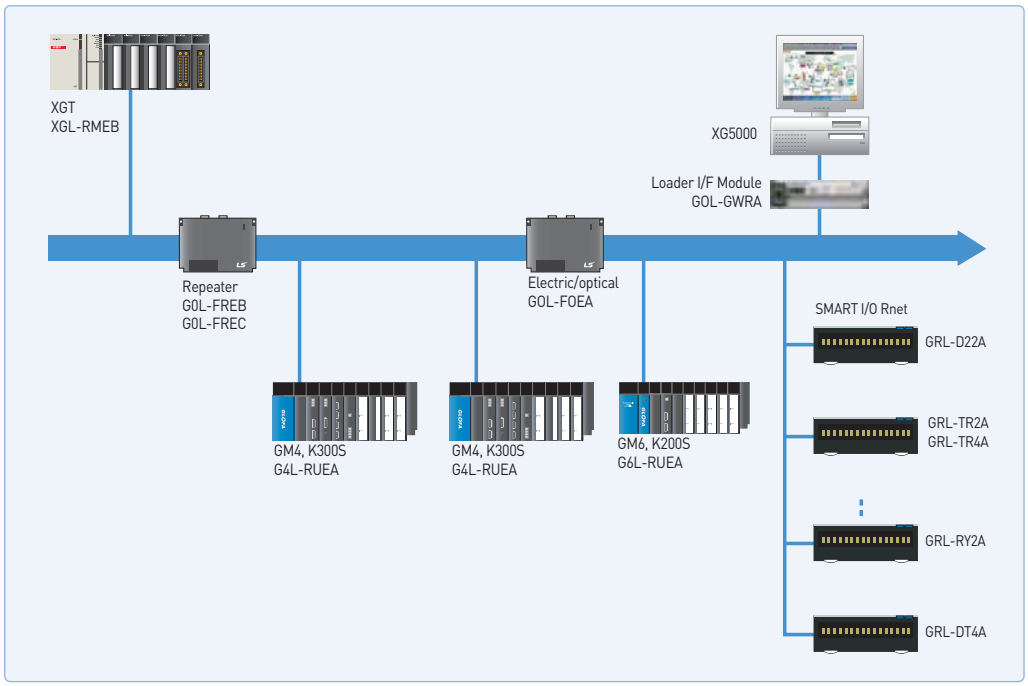
Specifications

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	110Ω , 1/2 W	-

XGT Fnet

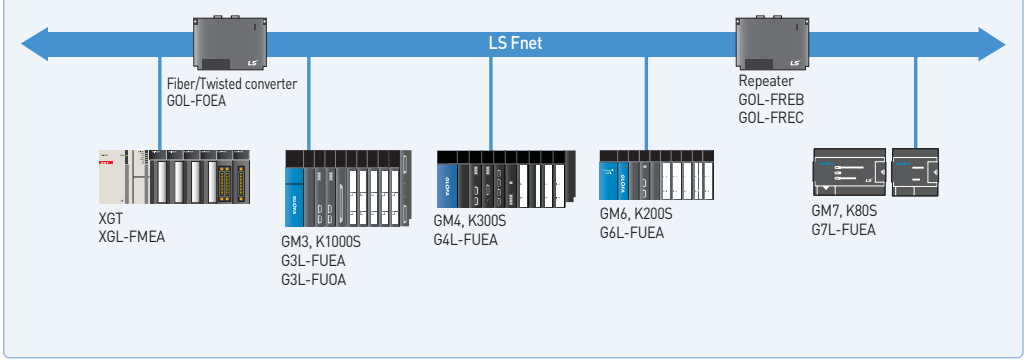
XGL-FMEA

- 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

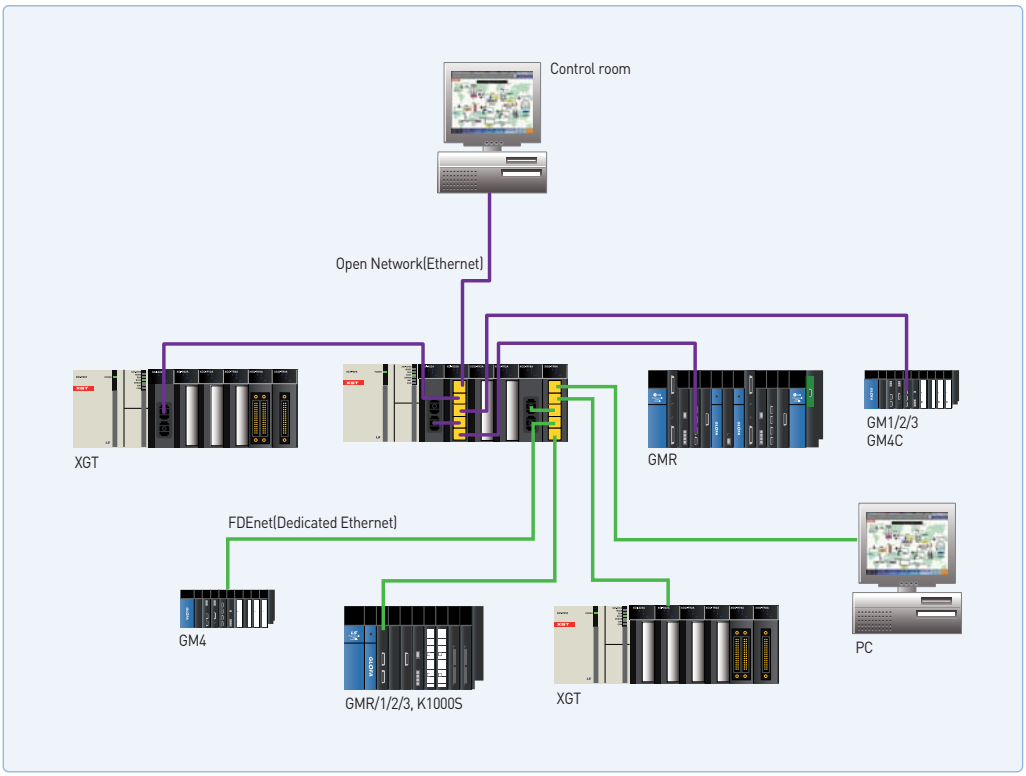
XGL-EH5T

- 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



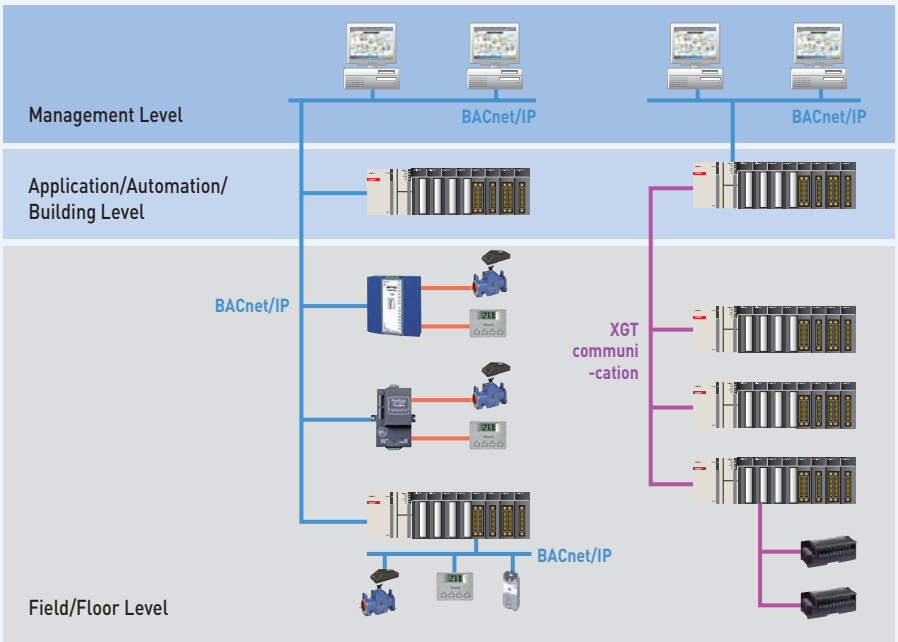
XGT BACnet/IP

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

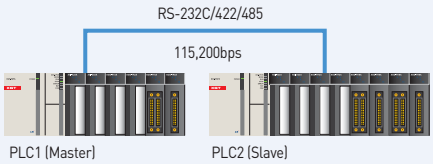
XGT Computer-Link

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.

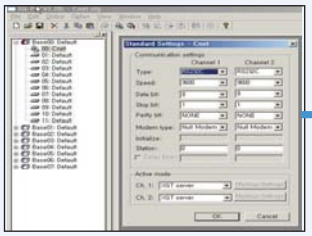


Data memory

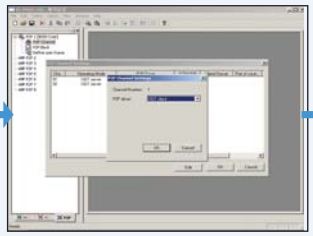
PLC station	PLC memory	Setting Item
PLC 1	M0100	1. XG5000 parameter setting, 2. XG5000 programming
PLC 2	C0000	1. XG5000 parameter setting, 2. XG5000 programming

XG5000 setting

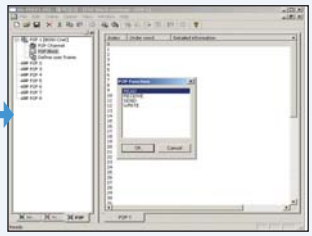
PLC setting 1 (Master)



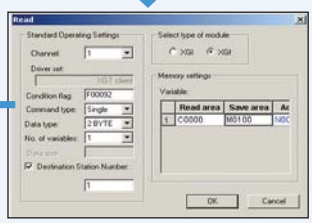
Communication basic parameter setting
Setting up station number, communication speed, etc. And setting up the operation mode as P2P



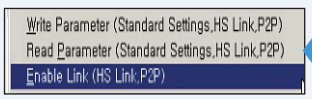
P2P channel setting
Setting up channel 01 as [XGT client]



P2P setting
Setting up P2P block (READ)



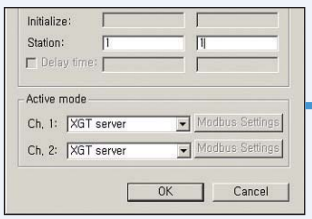
Communication data setting
Setting up Read area, Save area, etc.



Enable Link
Enabling P2P for communication start

Parameter writing
Downloading parameters to PLC after online connection

PLC setting 2 (Slave)



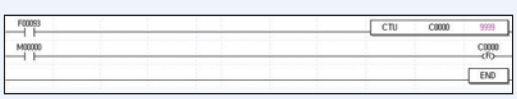
Communication parameter setting
Setting up station number and channel 01 mode as 1 and XGT server

Parameter writing
Downloading parameters to PLC after online connection

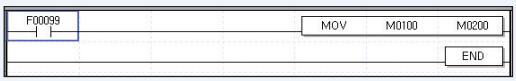
* For basic parameter setting and SyCon setting/change, reset the module (Online reset).

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.

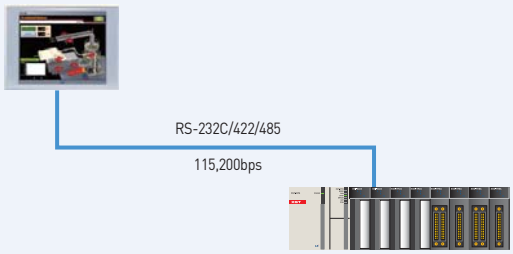


HMI communication configuration

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

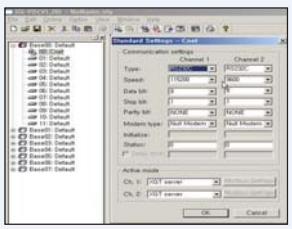
Making On/
Off touch tag for controlling
M0001 of XGT



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

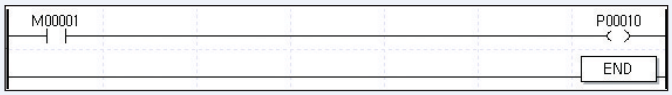
Parameter writing
Downloading parameters to PLC after online connection

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

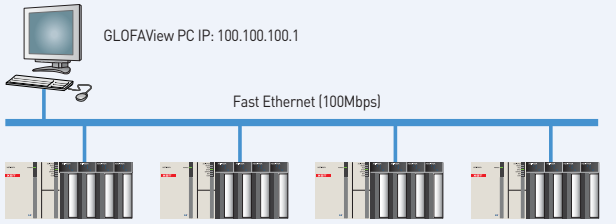
XGT Communication example (Ethernet)

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.

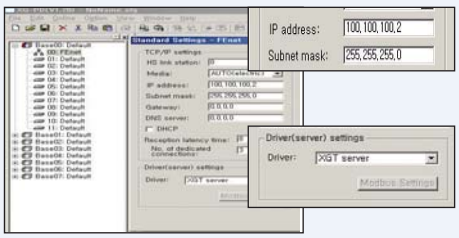


Data memory

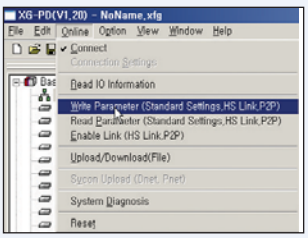
PLC station	Setting item	GLOFAView
C0000	1. XG5000 parameter setting	Using analog tag
	2. XG5000 programming	

XG5000 setting

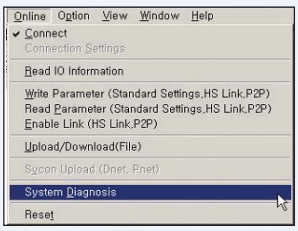
PLC setting 1 (Master)



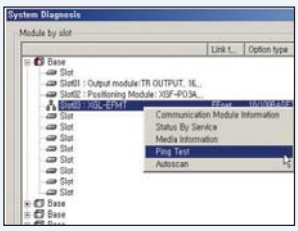
Basic communication parameter setting
Specifying IP address and Subnet mask of PLC as above



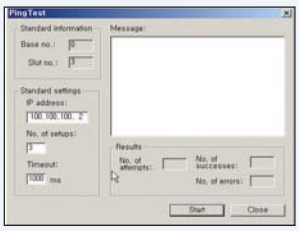
Parameter writing
Downloading parameters to PLC after online connection



Communication test
Checking online and system diagnosis



System Diagnosis
Selecting Ping Test



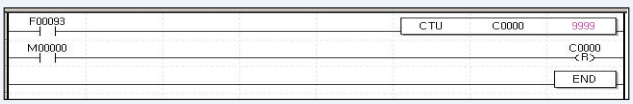
Ping Test
Starting diagnosis after inputting IP address of PLC

* 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.

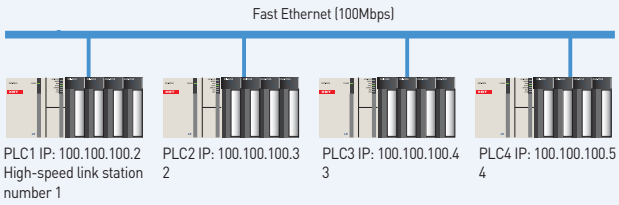


High-speed link communication

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.

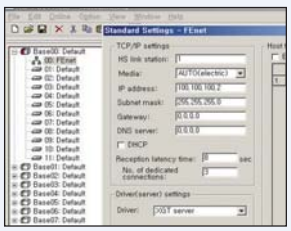


Data memory

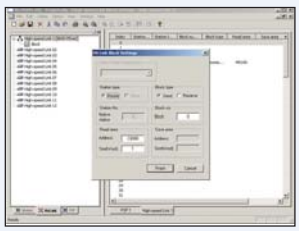
PLC station	PLC memory	Setting Item
PLC 1	C0000	1. XG5000 parameter setting, 2. XG5000 programming
PLC 2	M0100	1. XG5000 parameter setting, 2. XG5000 programming

XG5000 setting

PLC station 1 (setting)



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

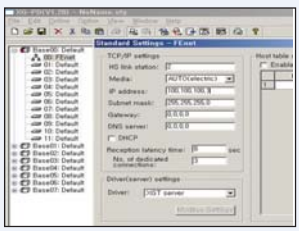


Communication data setting
Setting up communication data in HS link item as above

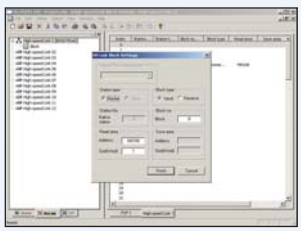
Parameter writing
Downloading parameters to PLC after online connection

Enable Link
Enabling link for communication start

PLC station 2 (setting)

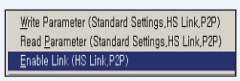


Basic communication parameter setting
Specifying HS link station, IP address and Subnet mask of PLC as above



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

Parameter writing
Downloading parameters to PLC after online connection



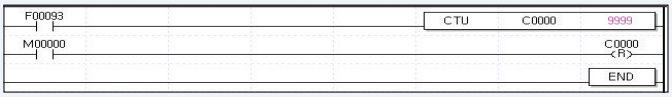
Enable Link
Enabling link for communication start

* 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

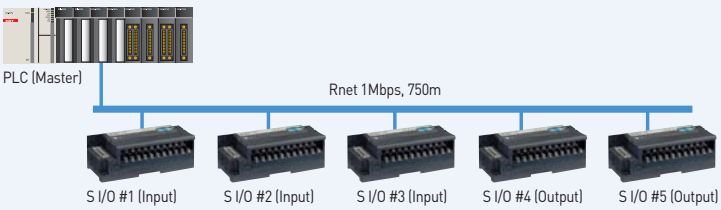
XGT Communication example (Rnet)

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).

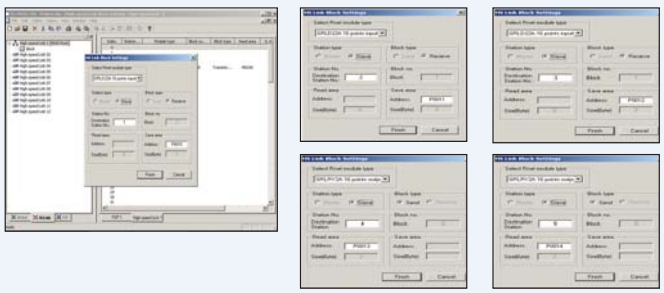


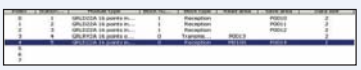
Data memory

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

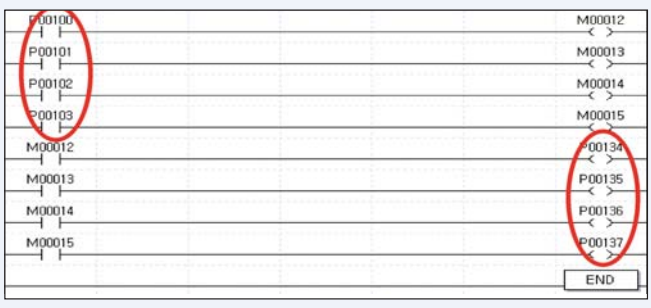
Parameter writing
Downloading parameters to PLC after online connection

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.

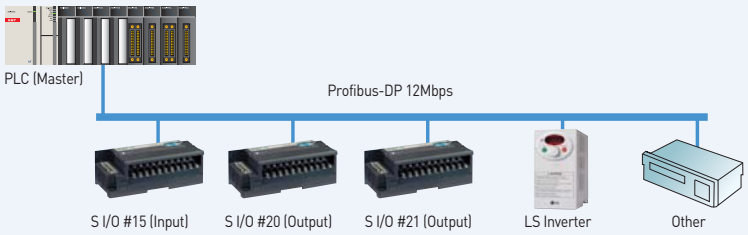


High-speed link communication among PLCs

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

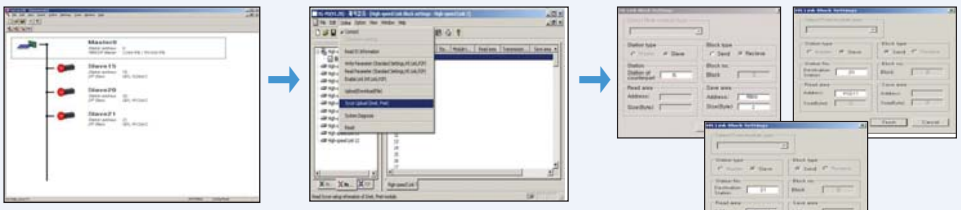
PLC controls each Smart I/O (16-point).



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

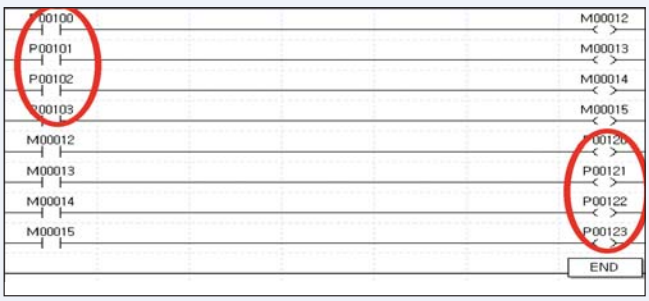
Parameter writing
Downloading parameters to PLC after online connection

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

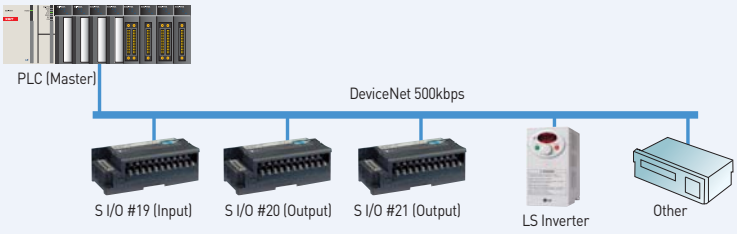
XGT Communication example (DeviceNet)

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

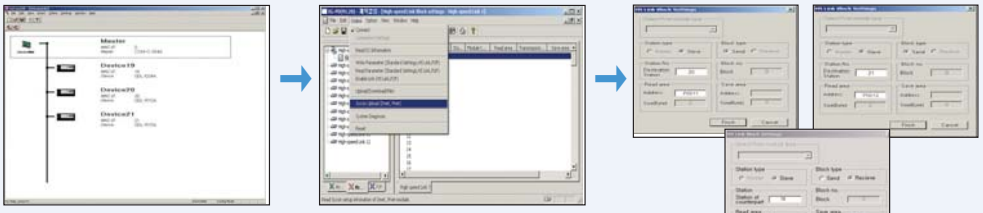
PLC controls each Smart I/O (16-point).



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

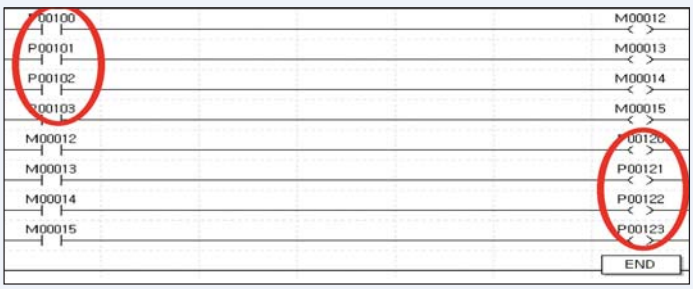
Parameter writing
Downloading parameters to PLC after online connection

Enable Link
Enabling link for communication start

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

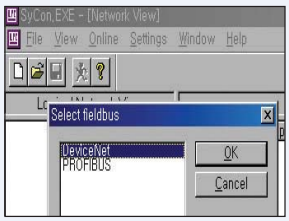
XG5000 programming

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

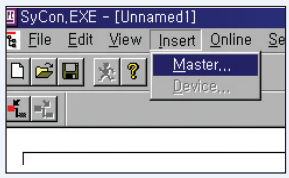


SyCon is the dedicated software that help user set up the communication environment for Profibus-DP and DeviceNet more easily and conveniently.

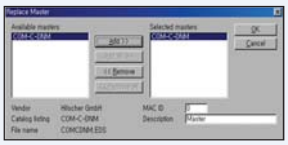
Example of application



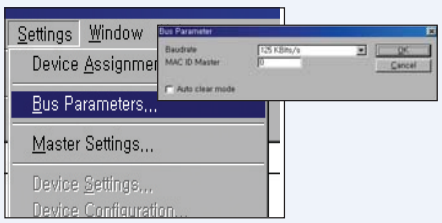
New file
Select fieldbus that is used.



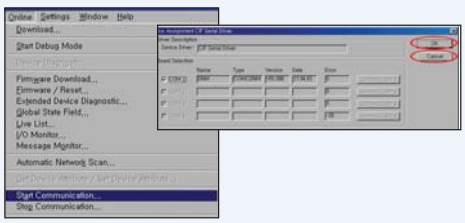
Basic communication parameter setting
Select [Master] in Insert menu.



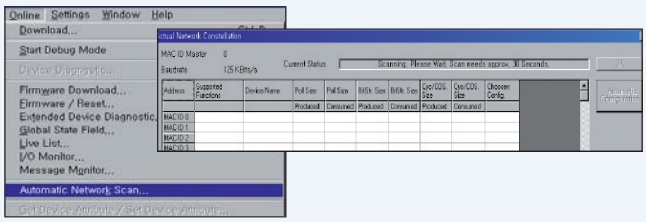
Master module setting
Select [COM-C-DNM] for DeviceNet.
Select [COM-C-DPM] for Profibus-DP.



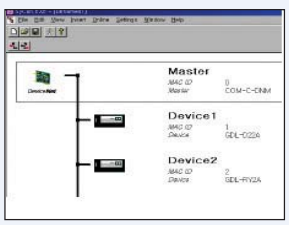
Bus parameter setting
Set up communication speed of master module.



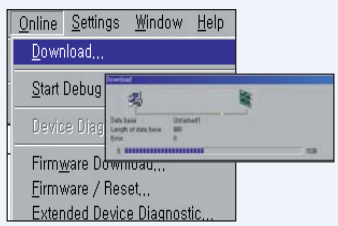
Master module setting
After clicking the port button, check, the right check-box.



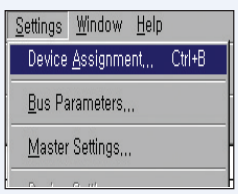
Automatic network scan of connected Smart I/O
Perform automatic network scan after station number setting and wiring with remote device such as Smart I/O.
At this time, all remote devices should be in normal connection (Power-On, etc).
After network scan is completed, press [Automatic Configuration]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



Network checking
Check normal network (remote) condition.



Parameter download



Disconnect
Disconnect the port in Device Assignment.

NETWORK

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
Digital output	0~4000, 0~8000, -8000~8000	0~4000, -8000~8000	Analog output	DC 1~5 V, 0~5 V, 0~10 V, -10~+10 V	0~20 mA, 4~20 mA
Input impedance	1 MΩ	250 Ω	Load impedance	1 KΩ or more (0~5 V or 1~5 V)	
Max. resolution	±15 V	±30 mA		2 KΩ 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	
External power supply	DC 24 V (21.6 ~ 26.4)		External power supply	insulation	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

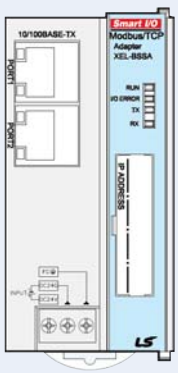
Items		XEL-BSSA	XEL-BSSB
I/F	Protocol	Modbus TCP	EtherNet/ IP
	Transmission speed	10 /100Mbps	
	Connector	RJ-45(2ports)	
	Topology	Software(BootpServer)	
	IP setup	Bus, Star	
Max. expansion module		8ea	
Max. digital I/O point		256 points	
Max. analog I/O channel		32ch (Input 16ch, Output 16ch)	
Operating 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

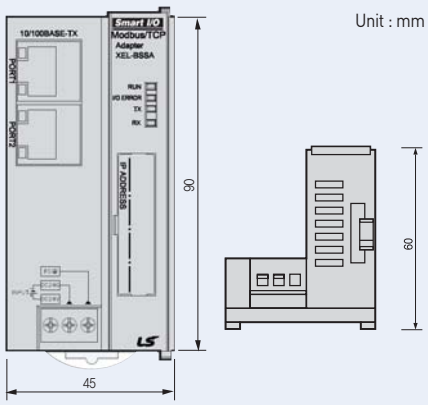
Externals and inscriptions



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		

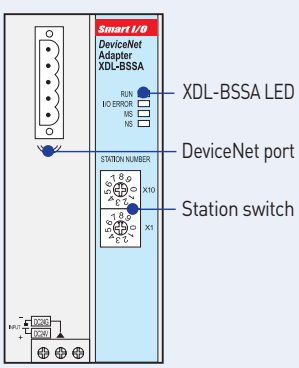
* When I/O module is installed, check the current consumption (Max. Current: 1.5A)

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

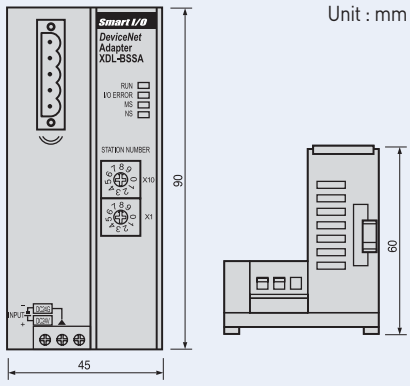
Externals and inscriptions



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				

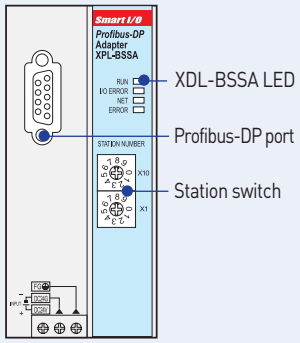
* When I/O module is installed, check the current consumption (Max. Current: 1.5A)

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	

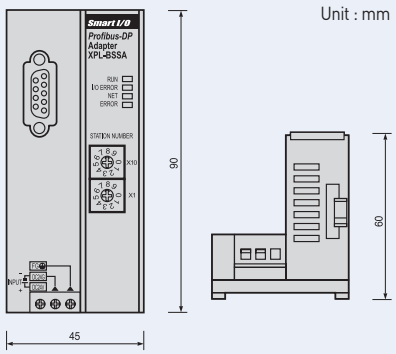
* When Digital input and Analog input is used together or Digital output Analog output is used, configure the system within 32bytes
(Ex) If 4ch analog input is used, Digital input can be used max. 192points

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



NETWORK

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

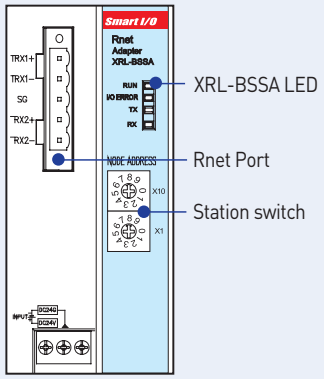
* When I/O module is installed, check the current consumption (Max. Current: 1.5A)

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.

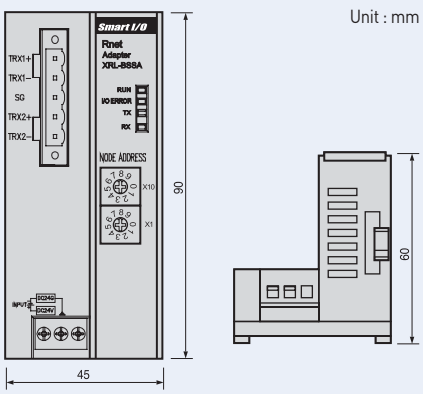
Externals and inscriptions



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

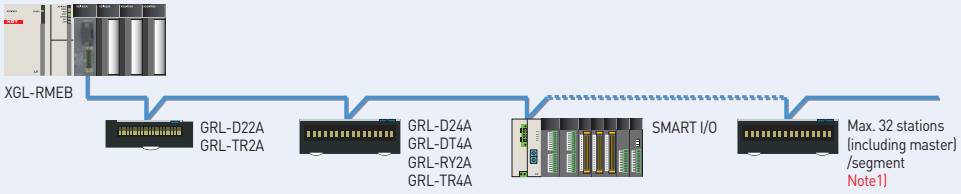
Dimension

Unit : mm

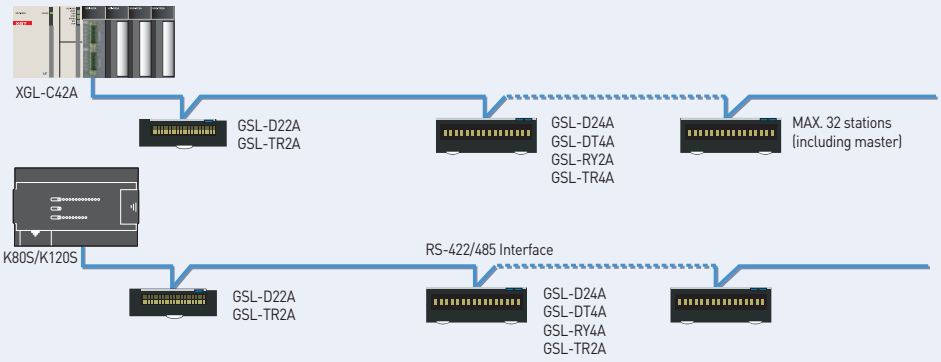


SMART I/O (Features)

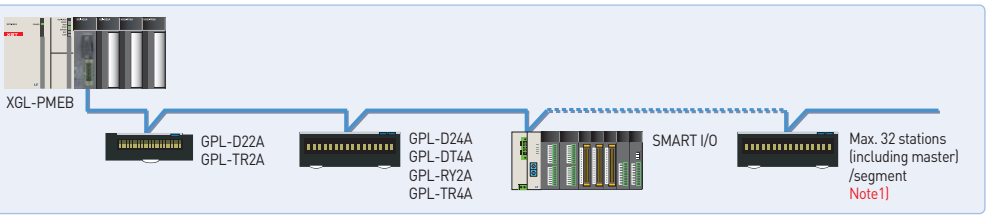
Smart I/O Rnet system



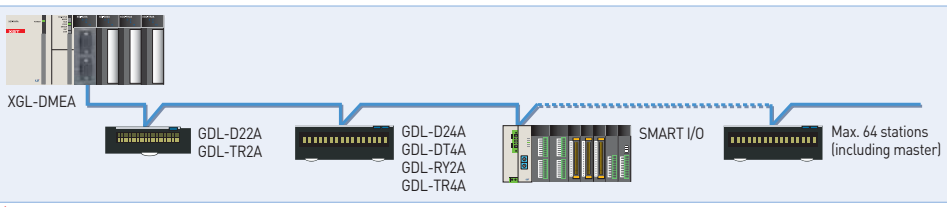
Smart I/O Modbus system



Smart I/O Profibus-DP system



Smart I/O DeviceNet system

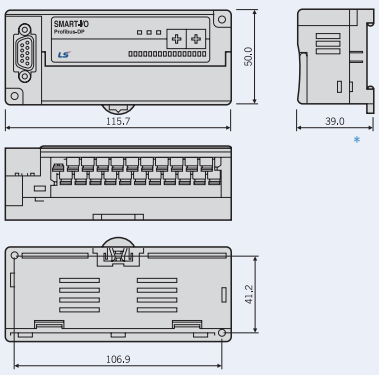


Note1) Segment: Communication section that does not use repeater or second master.

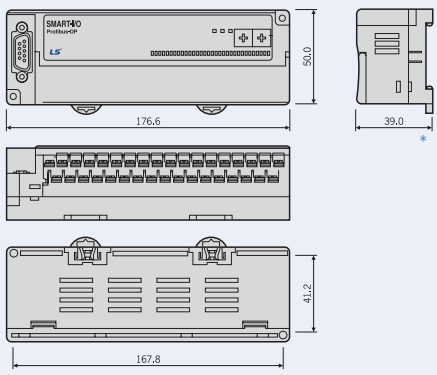
Dimensions

Unit: mm

• 16points



• 32points



* 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


XGI-D22A
XGQ-TR4A
XGL-CH2A
XGL-DMEA
XGF-PO3A
XGF-M16M
XGQ-TR2A
XGI-D24A

Special

XGT series offer diverse special modules such as analog, HSC, and positioning to satisfy complicated industrial needs

Contents

Revolution of easy to use ... XGT Special module

Fast processing of parameter and data of special module

- Continually refreshing operation data of special module by CPU module
- Including contact points such as conversion data of AD/DA module and command of HSC & positioning module

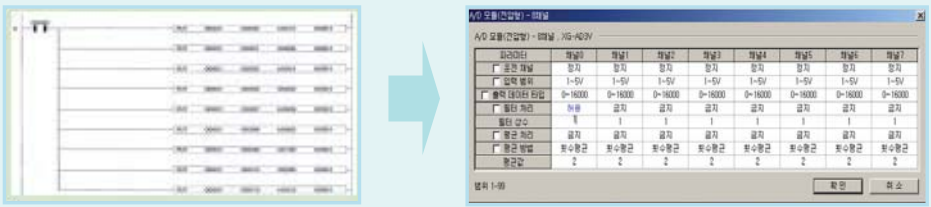
Easy- to-use(Easy operation parameter setting and data monitoring)

- Convenient parameter setting available through XG5000
- Providing useful functions that can monitor and test operation data and contact points through XG5000

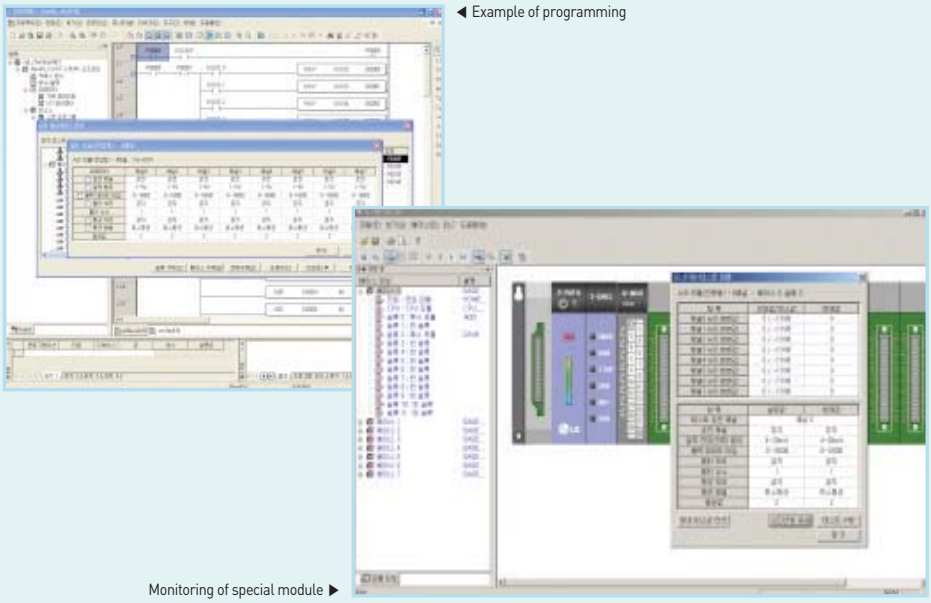
Simple maintenance (Changing online module)

- Without turning off and holding CPU, users can change special module with ease.

Before



◀ Example of programming



Monitoring of special module ▶

Analog input/output module

Analog input module

XGF-AV8A	8 channels, voltage
XGF-AC8A	8 channels, current
XGF-AD8A	8 channels, voltage/current
XGF-AD4S	4 channels, voltage/current
XGF-AD16A	16 channels, voltage/current
XGF-AW4S	2-wire, Voltage/ Current input, 4Ch (Isolated)

Analog output module

XGF-DV4A	4 channels, voltage
XGF-DC4A	4 channels, current
XGF-DV8A	8 channels, voltage
XGF-DC8A	8 channels, current
XGF-DV4S	4 channels, voltage, Isolated
XGF-DC4S	4 channels, current, Isolated

Analog input/output module

XGF-AH6A	Input: 4ch, Voltage/ Current Output: 2Ch Voltage/ Current

Temperature module

Temperature input module

XGF-TC4S	4 channels, thermocouple input, Isolated
XGF-RD4A	4 channels, RTD input
XGF-RD4S	4 channels, RTD input, Isolated

Temperature controller

XGF-RD8A	8 channels input: RTD
XGF-TC4UD	4 channels input: voltage/current/TC/RTD 8 channels output: current/TR
XGF-TC4RT	4 channels input: RTD 4 channels output: TR Control: 4loop

Positioning module/Motion controller

Positioning module

XGF-P01A~P03A	Open collector, 1~3axis
XGF-PD1A~PD3A	Line drive, 1~3axis
XGF-P01H~P04H	Open collector, 1~4axis
XGF-PD1H~PD4H	Line drive, 1~4axis

Motion module

Motion module

XGF-M32E	Standard EtherCAT Net, 32 axes

High speed counter module

High-speed counter module

XGF-H02A	2 channels, Open collector
XGF-HD2A	2 channels, Line driver
XGF-H08A	8-channels high speed counter module, 8Ch

Event input module

High-speed counter module

XGF-SOEA	DC24V, 32points

SPECIAL

XGT Analog input module

Features

- Fast conversion processing
- High resolution
- Setting and monitoring the special module parameter through XG5000
- Supporting 4 types of digital output data format

Specifications

Item	XGF-AV8A (Voltage input)	XGF-AC8A (Current input)	XGF-AD4S (Voltage/Current input)
No. of input channel	8 channels		4 channels
Analog input	DC 1~5V, 0~5V, 0~10V, -10~10V	DC 4~20mA, 0~20mA	DC 1~5V, 0~5V, 0~10V, -10~10V DC 4~20mA, 0~20mA

Digital output

Selection of input range in program or S/W package (Available to be set per channel)

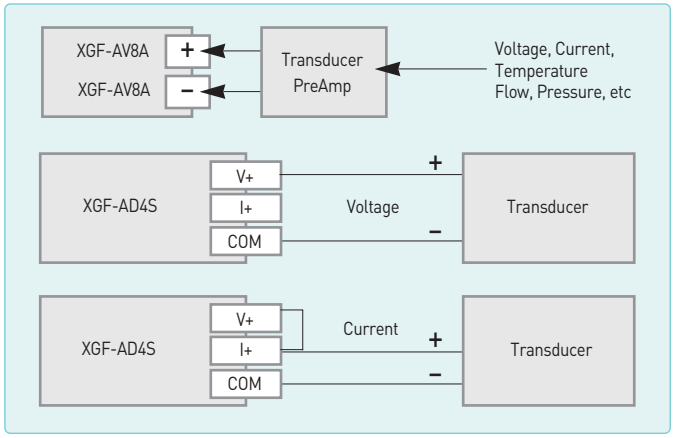
XGF-AV8A	Analog input		1~5V	0~5V	0~10V	-10~10V	
	Digital output	Unsigned value	0~16,000				
		Signed value	-8000~8,000				
		Precise value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000	
		Percentile value	0~10,000				
XGF-AC8A	Analog input		4~20mA		0~20mA		
	Digital output	Unsigned value	0~16,000				
		Signed value	-8,000~8,000				
		Precise value	4,000~20,000		0~20,000		
		Percentile value	0~10,000				
XGF-AD4S	Analog input		1~5V	0~5V	0~10V	-10~10V	4~20mA	0~20mA
	Digital output	Signed value	-32,000~32,000					
		Precise value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000	4,000~20,000	0~20,000
		Percentile value	0~10,000					

Resolution

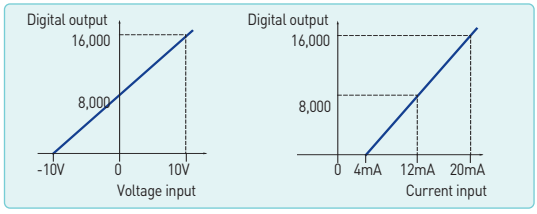
XGF-AV8A				XGF-AD4S			
1/16,000				1/64,000			
1~5V	0.250mV	4~20mA	1.0μA	1 ~ 5V	62.5μV	4~20mA	250nA
0~5V	0.3125mV			0~5V	78.1μV		
0~10V	0.625mV	0~20mA	1.25μA	0 ~ 10V	156.3μV	0~20mA	312.5nA
-10V~10V	1.250mV			±10V	312.5μV		

Accuracy	±0.2% or less (Ambient temperature 25℃) ±0.3% or less (Range of operation temperature)		±0.05% or less (Ambient temperature 25℃) Temp. coefficient ±16.7ppm/℃(Range of operation temperature)
Conversion speed	250μs/channel		
Max. absolute input	15V	±30mA	Voltage: ±15V, Current: ±30mA
Insulation method	Photo-coupler Insulation between input terminal and power supply		
	No insulation between channels		Insulation between channels
Connection terminal	18 points		
No. of occupied	Fixed type (Setting in basic parameter): 64 points		
I/O points	Variable type (Dissolving in basic parameter): 16 points		
Current consumption	420mA		610mA
Weight (Kg)	0.14		

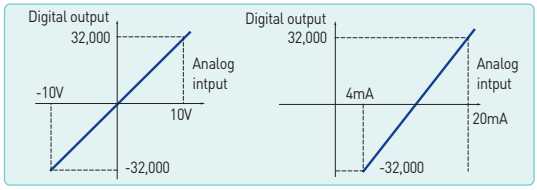
Configuration



A/D conversion characteristics



Insulation type



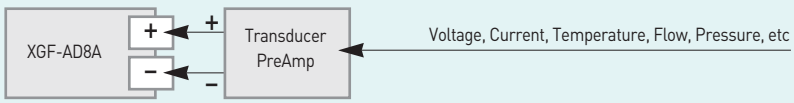
Features

- Fast conversion processing
- High resolution
- Setting and monitoring the special module parameter through XG5000
- Supporting 4 types of digital output data format

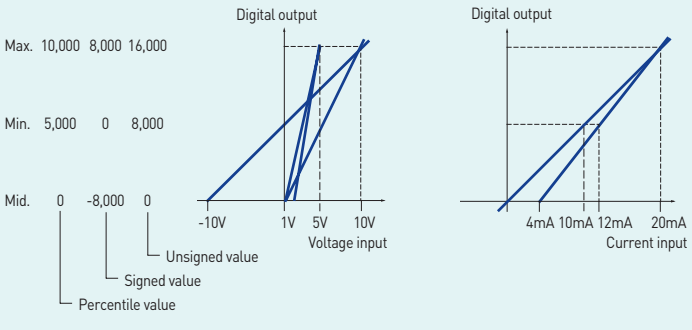
Specifications

Item		XGF-AD16A			XGF-AD8A		
No. of input channel		16 channels			8 channels		
Analog input	Voltage input	DC 1~5V, DC 0~5V, DC 0~10V, DC -10~10V (Input resistance: 1MΩ)					
	Current input	DC4~20㎃, DC 0~20㎃ (Input resistance: 250Ω)					
	Input selection	Dip switch					
	Range selection	Selection of input range in the program or S / W package (Available to set per each channel)					
	Input type	Voltage input				Current input	
		DC 1~5V	DC 0~5V	DC 0~10V	DC -10~10V	DC 4~20㎃	DC 0~20㎃
Digital output	Unsigned value	0~16,000					
	Signed value	-8,000~8,000					
	Precise value	0~10,000					
	Percentile value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000	4,000~20,000	0~20,000
	Resolution(1/16000)	0.2500mV	0.3215mV	0.6250mV	1.250mV	1.00㎂	1.25㎂
	Range selection	Selection of input type by program or parameter (Available to be set per each channel)					
Resolution		±0.2% or less (Ambient temperature 25℃), ±0.3% or less (Range of operation temperature)					
Max. absolute input		±15V				±30㎃	
Conversion speed		500㎲/channels			250㎲/channels		
Insulation method		Photo-coupler insulation between terminal and power supply					
Terminal		32 points			18 points		
No. of occupied I/O points (XGK)		Fixed type (Setting in basic parameter): 64 points			Variable type (Dissolving in basic parameter): 16 points		
Current consumption		DC 5V : 420㎃					
Wight		140g					

Configuration



A/D conversion characteristics



SPECIAL

XGT 2Wire Analog input module

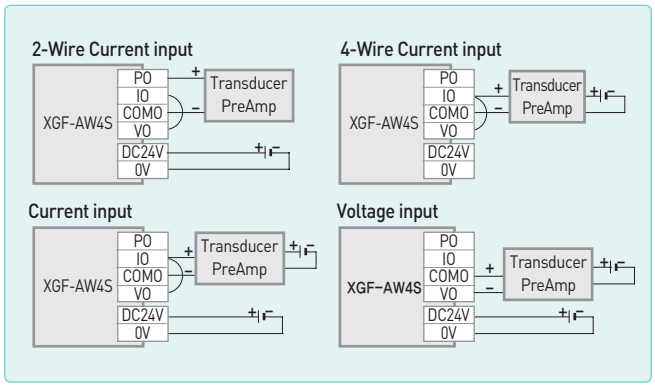
Features

- 2Wire sensor (transmitter) input
- 1/64000 resolution
- Channel insulation
- Various additional functions

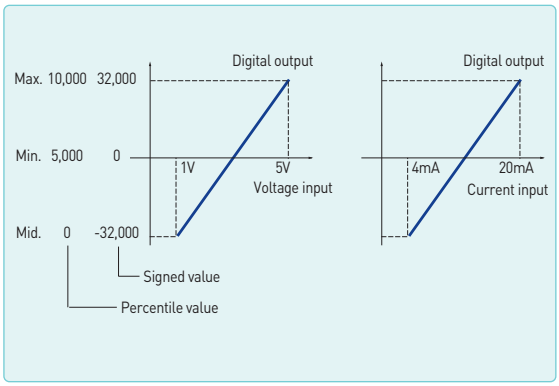
Specifications

Item		XGF-AW4S		
No. of input channel		4channels		
Voltage input		DC 1~5V(Input resistance: 1MΩ)	DC 4~20mA(Input resistance : 250Ω)	
Digital output	Signed value	-32,000~32,000	-32,000~32,000	
	Precise value	1,000~5,000	4,000~20,000	
	Percentile value	0~10,000	0~10,000	
	Resolution(1/64000)	0.25mV	1uA	
	Range selection	Selection of input range in program or S/W package (Available to be set per channel)		
Resolution		±0.05% or less (Ambient temperature 25℃), Temp. coefficient ±70ppm/℃(Range of operation temperature)		
Max. absolute input		±6V	±30mA	
Conversion speed		10ms/4channels		
Insulation	Item	Method	Withstand voltage	Resistance
	Channel	Transformer	500VAC, 50/60Hz, 1min, Leakage current: 10mA or less	500VDC,10MΩ or more
	Terminal - Power	Photo-coupler		
Transmitter	Voltage	DC 24V ± 15%		
	Max. current	30mA		
	Short circuit protection	Limit current: 25 ~35mA		
External power		DC 24V + 20%, -15%		
Terminal		18 point terminal		
No. of occupied I/O points (XGK)		Fixed type (Setting in basic parameter): 64 points, Variable type (Dissolving in basic parameter): 16 points		
Current	DC 5V	180mA		
consumption	DC 24V	480mA		
Wight		140		

Configuration



A/D conversion characteristics



Analog input module(Isolated)

Features

- Channel isolation
- 1/64000 resolution
- ±0.05%(25℃) fixed density
- Setting and monitoring the special module parameter through XG5000

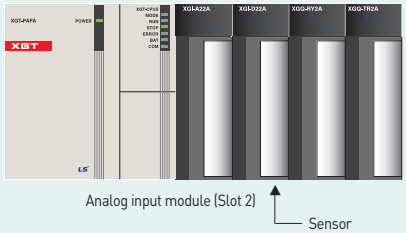
Specifications

Item		XGF-AD4S					
No. of input channel		4 channel					
Analog input	Voltage input	DC 1~5V, DC 0~5V, DC 0~10V, DC -10~10V (Input resistance: 1㏁)					
	Current input	DC 4~20㎃, DC 0~20㎃ (Input resistance: 250Ω)					
	Input selection	Dip switch			–		
	Range selection	Selection input range in the program or S/W package(Available to set per each channel)					
	Input type	Voltage input				Current input	
		DC 1~5V	DC 0~5V	DC 0~10V	DC -10~10V	DC 4~20㎃	DC 0~20㎃
Digital output	Signed value	-32,000~32,000					
	Precise value	0~10,000					
	Percentile value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000	4,000~20,000	0~20,000
	Resolution(1/64,000)	0.0625mV	0.0781mV	0.1563mV	0.3125mV	0.25㎂	0.3125㎂
	Range selection	Selection input range in the program or S/W package(Available to set per each channel)					
Resolution		±0.2% or less(Ambient temperatue 25℃), ±0.3% or less(Range of operation temperature)					
Max. absolute input		±15V				±30㎃	
Conversion speed		10ms/4 channel					
Isolation Standards	Item	Isolation Method		Isolation withstand voltage		Isolation resistance	
	Channels	Transformer isolation		500VAC, 50/60Hz		10㏁ or more	
	Input-PLC Power	Photo-coupler isolation					
Terminal		18 points					
No. of occupied I/O points (XGK)		Fixed type(Setting in basic parameter):64points, Variable type(Dissolving in basic parameter): 16points					
Current consumption		DC 5V: 610㎃					
Wight		140					

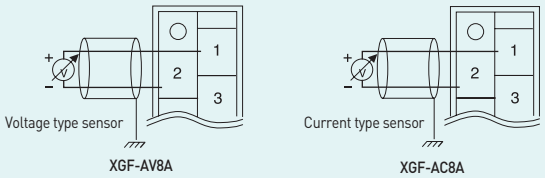
Analog input module (Example)

System Configuration

This is a simple example to start Analog input module setting. For more details, refer to user's manual.

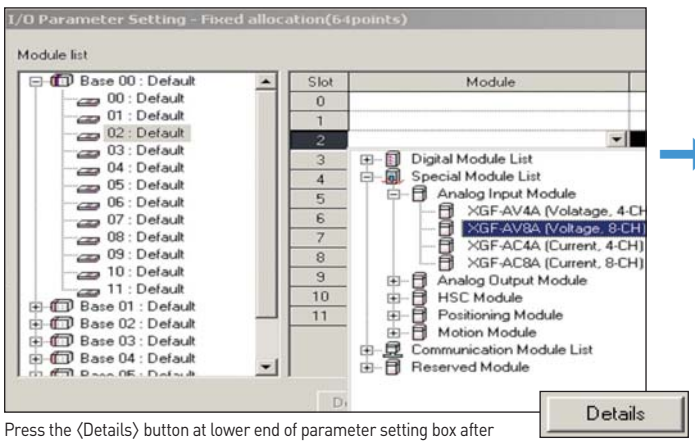


Wiring

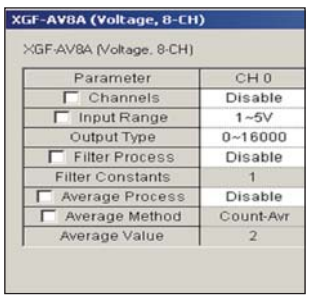


Parameter setting

In the parameter setting box, select slot and analog module that you want to use.
(This example shows to select ' 0' channel of voltage input type.)



Press the 〈Details〉 button at lower end of parameter setting box after selecting the module.



You need to fill out each item suitable for your system.

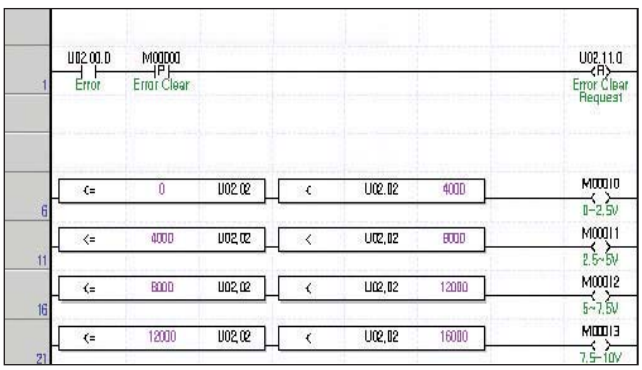
Programming

Create a program for A/D conversion (0~10V to 0~16,000).

Special devices for programming

Refer to user's manual for more details.
U02.0.0: Error
U02.11.0: Requesting error-clear
U02.02: Memory of channel A/D value

Uxy.aa.bb
x: Base number
y: Slot number
aa,bb: Refer to user's manual.



Analog output module

Features

- Fast conversion processing
- High resolution
- Setting and monitoring the special module parameter through XG5000
- Supporting 4 types of digital input data format

Specifications

Item	XGF-DV4A, XGF-DV8A, XGF-DV4S (Voltage output type)	XGF-DC4A, XGF-DC8A, XGF-DC4S (Current output type)
No. of output channel	XGF-DV4A/4S, XGF-DC4A/4S : 4 channels / XGF-DV8A, XGF-DC8A : 8 channels	
Analog output range	DC 1~5V, 0~5V	DC 4~20mA
	DC 0~10V, -10~10V	DC 0~20mA
	Selection of input range in the program or S/W package (Available to set per each channel)	

Digital input range

Analog output	Voltage type		1~5V	0~5V	0~10V	-10~10V
	Digital input	Unsigned value	0~16,000			
		Signed value	-8,000~8,000			
		Precise value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000
		Percentile value	0~10,000			
Analog output	Current type		4~20㎃		0~20㎃	
	Digital input	Unsigned value	0~16,000			
		Signed value	-8,000~8,000			
		Precise value	4,000~20,000		0~20,000	
		Percentile value	0~10,000			
16-bit binary value: selection of input type by program or parameter (Available to be set per each channel)						

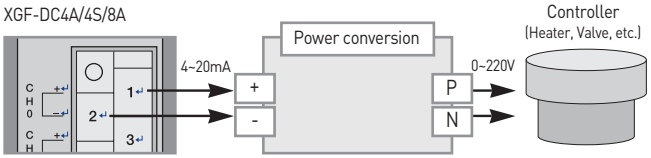
Max. resolution	1/16,000 (Per each input range)			
	1~5V	0.250㎷	4~20㎃	1.0㎂
	0~5V	0.3125㎷		
	0~10V	0.625㎷	0~20㎃	1.25㎂
	±10V	1.250㎷		
Accuracy	XGF-DV4A/8A, DC4A/8A : ±0.2% or less (Ambient temperature 25℃), ±0.3% or less (Range of operation temperature)			
	XGF-DV4S/DC4S : ±0.1% or less (Ambient temperature 25℃), temp coefficient: ±80ppm/℃			
Conversion speed	250㎲/channel			
Max. absolute output	±15V		±24㎃	
Insulation method	Photo-coupler insulation between terminal and power supply XGF-DV4A/8A, XGF-DC4A/8A: No insulation between channels XGF-DV4S, XGF-DC4S (Insulation type): Insulation between channels			
Connection terminal	18 point terminal			
No. of occupied points	Fixed type (Setting in basic parameter): assign 64 points			
	Variable type (Dissolving in basic parameter): assign 16 points			

Current consumption (mA)	DV4A	DV8A	DV4S	DC4A	DC8A	DC4S
Internal	190	190	200	190	190	200
External	140	180	150	210	300	220

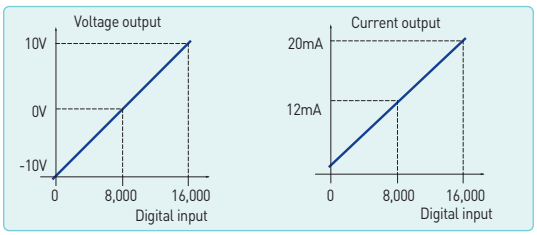
Weight (Kg)	0.15

Output wiring

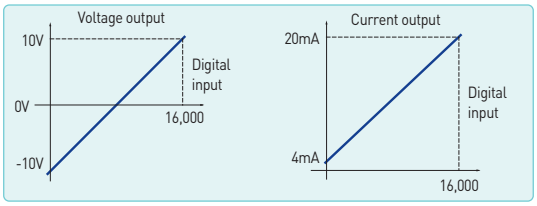
XGF-DV4A/4S/8A
XGF-DC4A/4S/8A



I/O conversion characteristics



Insulation type

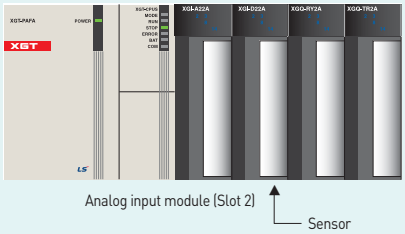


SPECIAL

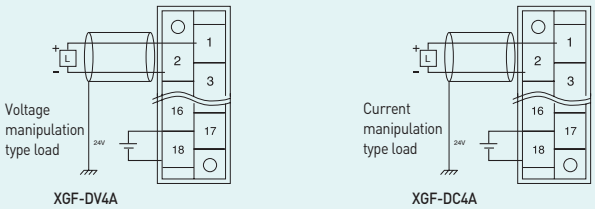
Analog output module (Example)

System Configuration

This is a simple example to start Analog output module setting. For more details, refer to user's manual.

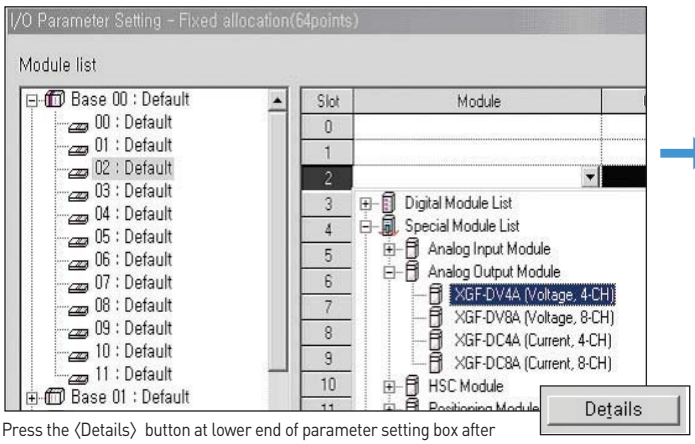


Wiring

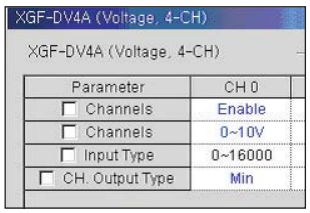


Parameter setting

In the parameter setting box, select slot and analog module that you want to use.
(This example shows to select '0' channel of voltage output type.)



Press the 〈Details〉 button at lower end of parameter setting box after selecting the module.



You need to fill out each item suitable for your system.

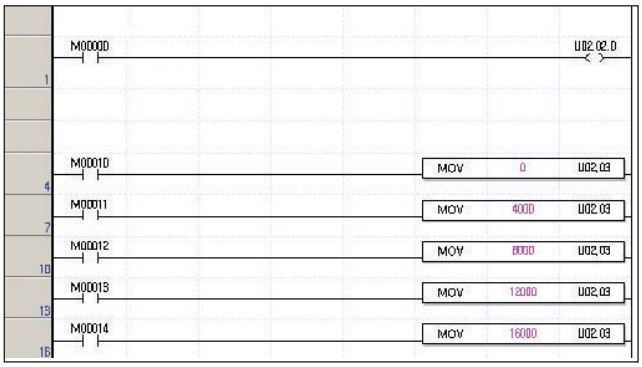
Programming

Create a program for D/A conversion (0~16000 to 0~10V).

Special devices for programming

Refer to user's manual for more details.
U02.02.0: Admitting Channel 0 output
U02.03: Output data of channel 0

Uxy.aa.bb
x: Base number
y: Slot number
aa,bb: Refer to user's manual.



Analog input/output module

Features

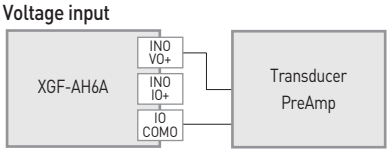
- Input 4channels Output 2channels
- 4channels, 1/8000 resolution
- Parameter setting and monitoring by XG5000

Specifications

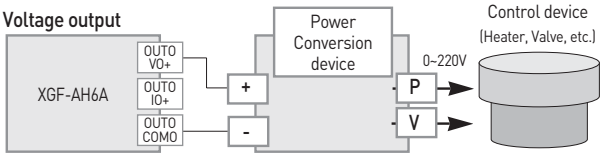
Item			XGF-AH6A				
Input	No. of input channel		4channels				
	Analog output	Range	DC1~5V	DC0~5V	DC0~10V	DC-10~10V	DC4~20mA
		Resistance	1MΩ				250Ω
		Selection	V+ and COM				
	Digital output	Unsigned value	0~8,000				0~8,000
		Signed value	-4,000~4,000				-4,000~4,000
		Precise value	0~10,000				0~10,000
		Percentile value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000	4,000~20,000
		Resolution(1/8000)	0.5mV	0.625mV	1.25mV	2.5mV	2.0uA
		Range selection	Selection of input range in program or S/W package (Available to be set per channel)				
	Resolution		±0.2% or less (Ambient temperature 25℃), ±0.3% or less (Range of operation temperature)				
	Max. absolute input		±15V				±30mA
	Conversion speed		500㎳/channels				
Output	No. of input channel		2channels				
	Analog output	Range	DC1~5V	DC0~5V	DC0~10V	DC-10~10V	DC4~20mA
		Resistance	1kΩ or more				600Ω or less
		Selection	V+ and COM				
	Digital output	Unsigned value	0~8,000				0~8,000
		Signed value	-4,000~4,000				-4,000~4,000
		Precise value	0~10,000				0~10,000
		Percentile value	1,000~5,000	0~5,000	0~10,000	-10,000~10,000	4,000~20,000
		Resolution(1/8000)	0.5mV	0.625mV	1.25mV	2.5mV	2.0uA
		Range selection	Selection of input range in program or S/W package (Available to be set per channel)				
	Resolution		±0.2% or less (Ambient temperature 25℃), ±0.3% or less (Range of operation temperature)				
	Max. absolute input		±15V				±24mA
	Conversion speed		500us/channels				
Insulation method			Photo-coupler insulation between terminal and power supply				
Terminal			18 point terminal				
No. of occupied I/O points (XGK)			Fixed type (Setting in basic parameter): 64 points, Variable type (Dissolving in basic parameter): 16 points				
Current consumption (DC5V)			770mA				
Wight			140				

Wiring

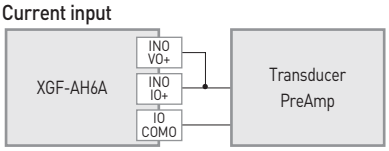
Voltage input



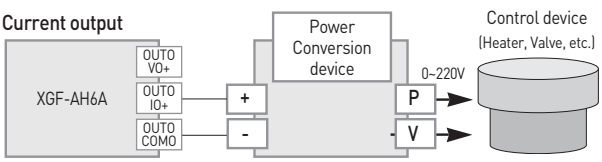
Voltage output



Current input



Current output



SPECIAL

XGT HART interface analogue/digital conversion module

Features

- It supports HART protocol
  In the input range of 4 ~ 20mA, bi-directional digital communication is available by using analog signal wiring. If analog wiring is currently used, there is no need to add wiring for HART communication (HART communication is not supported in the range of 0 ~ 20mA)
- High accuracy
- Operation parameters setting/monitoring
- Input disconnection detection function

Specifications

Item		XGF-AC4H		XGF-DC4H	
No. of Channels		4channels		4channels	
Analog input/output range		DC4~20mA,DC 0~20mA, (Input Resistance 250Ω)		DC 4~20mA,DC 0~20mA, (Load resistance 600Ω or less)	
Digital input/ output	Analog output/Digital input	DC4~20mA	DC0~20mA	DC4~20mA	DC0~20mA
	Signed value	-32000~32000		-8000~8000	
	Unsigned value	-		0~1600	
	Precise value	4000~2000	0~2000	4000~2000	0~2000
	Percentile value	0~10000			
Max. resolution		0 / 64000			
		4~20mA:250.0㎁, 0~20mA:312.5㎁		4~20mA:1.00㎂, 0~20mA:1.25㎂	
Accuracy		±0.10% or less (when ambient temperature is 25℃±5℃)		±0.10% or less (when ambient temperature is 25℃±5℃)	
		±0.25% or less (when ambient temperature is 0℃~55℃)		±0.3% or less (when ambient temperature is 0℃~55℃)	
Conversion speed		10ms/4channels			
Absolute Max. input/output		±3mA		DC 24mA	
Analog input points		4 channels / 1module			
Isolation specification		Photo-coupler isolation between input terminal and PLC power (no isolation between channels)			
Terminal connected		18-point terminal			
I/O points occupied		Fixed type: 64 points, Non fixed type : 16 points			
HART communication method		Mono drop only Primary master only			
Internal-consumed current		DC5V:340㎃		DC5V:200㎃, DC24V:220mA	
Weight (g)		145		150	

High-speed counter module

Features

- Parameter setting and monitoring using XG5000
- Incremental encoder available
- Supporting various pulse input (5V, 12V, 24V)
- Various multiplication (1/2 phase pulse input)
- External present input
- Providing function to prevent from counting external signal
- Supporting HTL-level incremental encoder in the line-drive input type

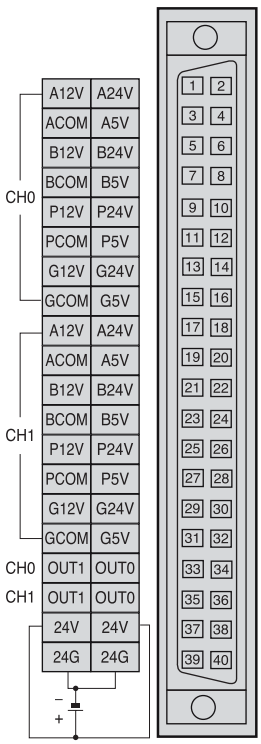
Specifications

Item			XGF-HO2A			XGF-HD2A
No. of command	Signal		A Phase, B Phase			
	Input type		Voltage input (Open Collector)			Differential input (Line Driver)
	Signal level		DC 5/12/24V			RS-422 Line Drive/HTL LEVEL Line Drive
	Input voltage		24V DC (17.0V ~ 26.4V)	12V DC (9.8V ~ 13.2V)	5V DC (4.5V ~ 5.5V)	Line Driver
	Input current		7~11mA	7~11mA	7~11mA	RS-422 Line Drive HTL Level Line Drive
	Min. On guaranteed voltage		17.0V	9.8V	4.5V	
	Max. Off guaranteed voltage		4.5V	3.0V	1.7V	
	Counter enable		Set by program (Count only in ' Enable')			
Max. counting speed			200Kpps			500Kpps (HTL input: 250Kpps)
No. of channels			2 channels			
Counting range			Signed 32 Bit (-2,147,483,647 ~ 2,147,483,647)			
Counting type (Program setting)			Linear count (Generating Carry/Borrow when exceeding counting range, Max/Min value)			
Input mode (Program setting)			1 Phase input			
			2 Phase input			
			CW/CCW input			
Signal type			Voltage			
Up/Down counter setting	1-phase input		Program or B-phase			
	2-phase input		Phase difference			
	CW/CCW		A-phase input: Up count B-phase input: Down count			
Multiplication	1-phase input		1/2 multiplication (Programming)			
	2-phase input		1/2/4 multiplication (Programming)			
	CW/CCW		1 multiplication			
Control input	Signal		Preset signal, Signal to admit additional signal (Setting by terminal block or programming)			
	Signal level		DC 5V/12V/24V input type (Selecting terminal)			
	Signal type		Voltage			
External output	No. of output point		2 points/channel: Terminal output available			
	Type		Single comparison (>,>=,=,=<,<) or section comparison			
	Output type		Open Collector (Sink)			
Operating status display	Input signal		A-phase, B-phase, Preset signal, Signal to admit additional signal			
	Output signal		OUT1, OUT2			
	Operation status		Module Ready, Pulse input status of A, B phase			
Addition functions (Program setting)			• Count clear, Count latch • Pulse frequency count (Each input channel) • Section count (Set time value:1~60000ms) • Measuring counting number per a unit time (Set time value:1~60000ms) • Preventing from counting (Setting by internal/external input during counting)			
No. of occupied			Fixed type (Setting in basic parameter): 64 points			
I/O points			Variable type (Dissolving in basic parameter): 16 points			
Terminal block			40-pin connector			
Current consumption			270			330
Weight (Kg)			0.09			

SPECIAL

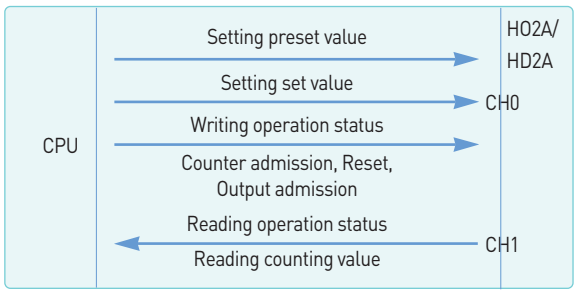
Terminal block configuration

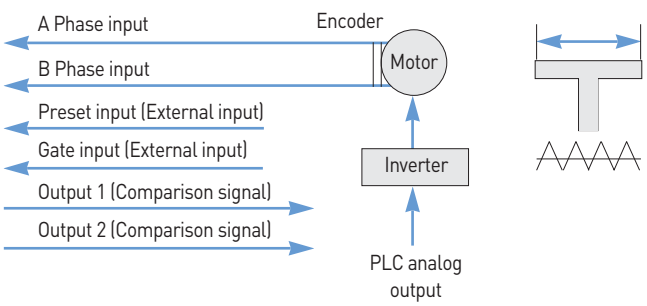
XGF-H02A



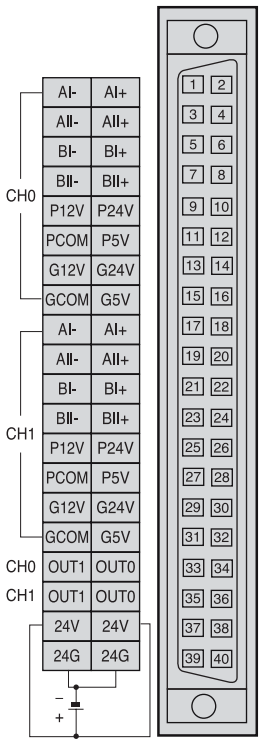
Pin number		Signal name	
CH0	CH1		
1	17	A12V	A phase DC12V input
2	18	A24V	A phase DC24V input
3	19	A_C	A phase COM
4	20	A5V	A phase DC5V input
5	21	B12V	B phase DC12V input
6	22	B24V	B phase DC24V input
7	23	B_C	B phase COM
8	24	B5V	B phase DC5V input
9	25	P12V	Preset DC12V input
10	26	P24V	Preset DC24V input
11	27	P_C	Preset COM
12	28	P5V	Preset DC5V input
13	29	G12V	Gate DC12V input
14	30	G24V	Gate DC24V input
15	31	G_C	Gate COM
16	32	G5V	Gate DC5V input
33	35	OUT1	Comparison output OUT1
34	36	OUT0	Comparison output OUT0
37	38	24V	External power supply
39	40	24G	DC24V

Configuration

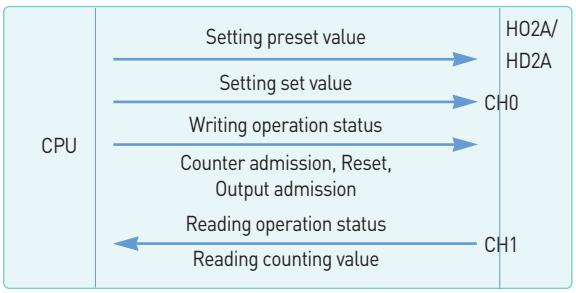


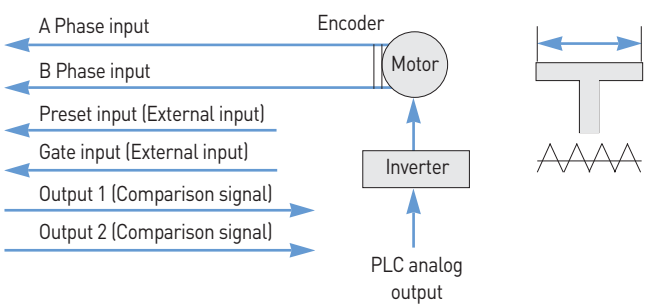


XGF-HD2A

Pin layout	Pin number		Signal name	
	CH0	CH1		
	1	17	AI-	AI-Input (LINEDRIVETTL LEVEL Input)
	2	18	AI+	AI+Input (LINEDRIVETTL LEVEL Input)
	3	19	AII-	AII-Input (LINE DRIVEHTL LEVEL Input)
	4	20	AII+	AII+Input (LINEDRIVEHTL LEVEL Input)
	5	21	BI-	BI- Input (LINEDRIVETTL LEVEL Input)
	6	22	BI+	BI+Input (LINE DRIVETTL LEVEL Input)
	7	23	BII-	BII-Input (LINEDRIVEHTL LEVEL Input)
	8	24	BII+	BII+Input (LINEDRIVEHTL LEVEL Input)
	9	25	P12V	Preset DC12V input
	10	26	P24V	Preset DC24V input
	11	27	P_C	Preset COM
	12	28	P5V	Preset DC5V input
	13	29	G12V	Gate DC12V input
	14	30	G24V	Gate DC24V input
	15	31	G_C	Gate COM
	16	32	G5V	Gate DC5V input
	33	35	OUT1	Comparison output OUT1
	34	36	OUT0	Comparison output OUT0
	37	38	24V	External power supply
	39	40	24G	DC24V

Configuration





SPECIAL

XGT 8-Channel high peed counter module

Features

- Multiple high-speed counter input support(8ch, 80-pin connector)
- Only improve performance and safety caused by the use of FPGA enhanced
- Program controlled by the preset function
- Per 1 channel output 1 point(Program setting)
- Input filter can be set (100kpps, 10kpps, 1kpps, 0.1kpps)
- The output signal through the operation status display

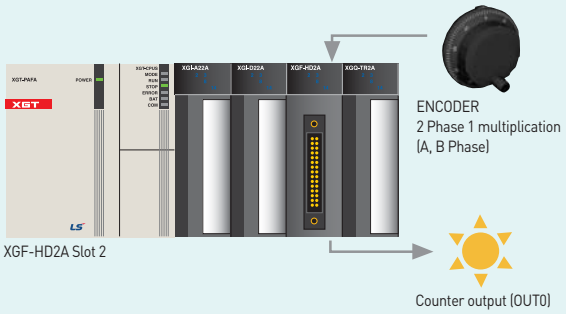
Specifications

Item		XGF-H08A
No. of Channels		8 channels
Phase		1-phase input, 2-phase input
Signal level		5V DC (7 to 11mA), 24V DC (7 to 11mA)
Input type		1/2/4 multiplication, CW/CCW
Max. counting speed		200 kpps
Input filter		None, 100kpps, 10kpps, 1kpps, 0.1kpps
Counting range		Signed 32bit (-2147483648 ~ 2147483647)
Counting type		Linear counter, Ring counter
Up/Down Counter setting	1-phase input	B-phase : Up/Down count
	2-phase input	Phase difference
	CW/CCW	A-phase : Up count, B-phase : Down count
Multiplica-tion	1-phase input	1/2 multiplication(Programming)
	2-phase input	1/2/4 multiplication(Programming)
	CW/CCW	1 multiplication
External output	Comparison detection	Single comparison(→,→=,=,=←,←) or Section comparison
	Output points	1 point/channels : Internal or External output (programming)
	type	Open collector output(Sink)
Operating status display	Input signal	A-phase, B-phase
	Output signal	OUT
	Operating condition	Module ready
Addition functions(Program setting)		Counter clear, Count latch
		Section count(Set time value : 1 ~ 60000ms)
		Pulse frequency(Each input channel)
		Measuring counting number per a unit time (Set time value : 1 ~ 60000ms)
		Preventing from counting
Power		DC5V (600mA)
Terminal block		80-pin connector

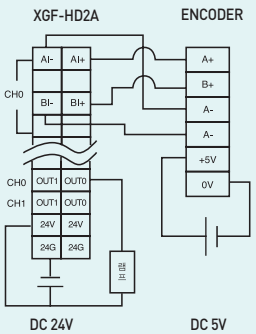
High-speed counter module (Example)

This is a simple example of high-speed counter module setting.
For more details, refer to user's manual.

System Configuration



Wiring



* This is wiring diagram of line driver. For open collector or other control, refer to user's manual.

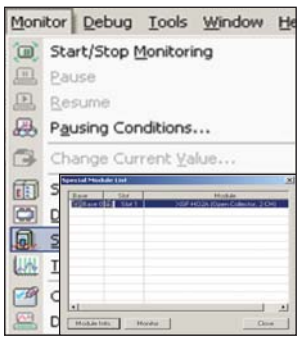
XGT High-speed counter module (Example)

Control configuration

- Light a lamp of output when present value reaches 1000 of pulse input counted by encoder.
- Current value of pulse is saved in D100~D101 and is monitored.

Module test (Online)

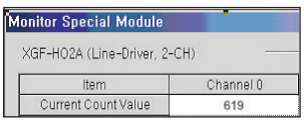
- Module test function of XGT enables to monitor operation status of high-speed counter module and to test-run.



Select [Monitor] → [Special Module Monitoring] in menu and appoint high-speed counter.

After pressing the button for [Start Monitoring], press the button [FLAG monitor].

Change [Counter Enable] status to ON.



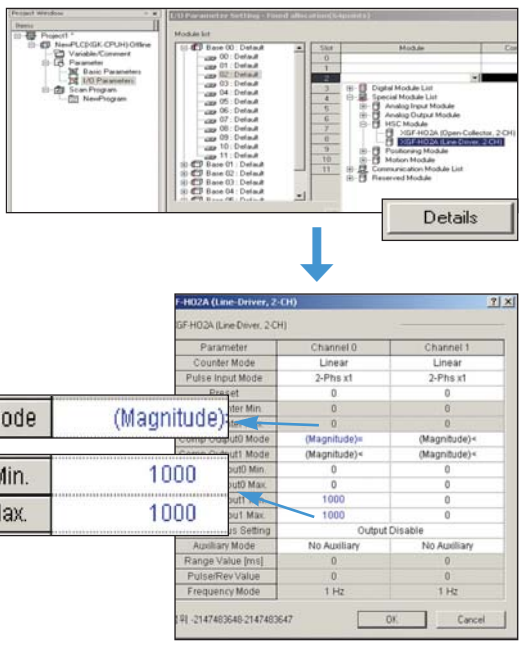
Check current counting value in 'Monitor Special Module' screen box.

Parameter setting

- In I/O parameter setting box, select slot and analog module that you want to use. (This example shows to select 2-channel line driver.)

  Press the 〈Details〉 button at lower end of parameter setting box after selecting the module.

  Input 1000 as Max. and Min. comparison output.



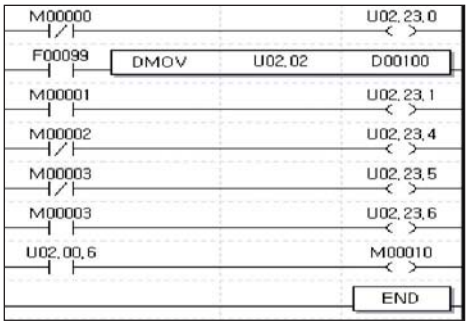
programming

- After completing programming like following figure, download it to PLC and check operation status.

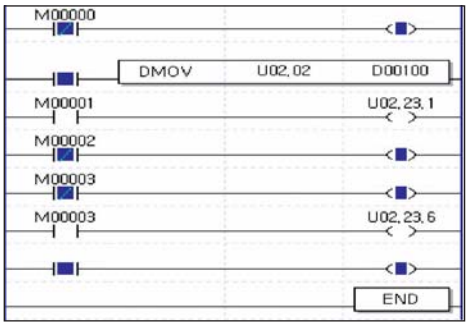
Special devices for programming

Refer to user's manual for more details.
U02.23.0: Count operation admission
U02.23.1: Count preset
U02.23.4: Consistent output admission
U02.23.5: Output external terminal admission
U02.23.6: OUT0 consistent signal reset
U02.00.6: Contact for checking external output
(Practically effective output is outputted through OUT0 terminal)
U02.02~U02.03: Counter present value

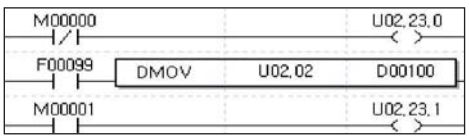
Uxy.aa.bb
x: Base number
y: Slot number
aa,bb: Refer to user's manual



After downloading, monitor operation status.



For monitoring just present value, follow the example.



SPECIAL

XGT Positioning module(XPM)

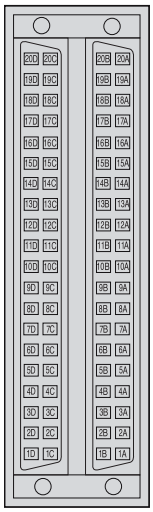
Features

- Max 4Axis, Max pulse output 4Mpps
- Circular/linear/ellipse/helical interpolation
- Asymmetric acceleration and deceleration driving
- FRAM parameter
- XG5000 monitoring, simulation, trace
- CAM profile program

Specifications

Item			XGF-PO1H XGF-PD1H	XGF-PO2H XGF-PD2H	XGF-PO3H XGF-PD3H	XGF-PO4H XGF-PD4H
Number of axis			1 axis	2 axis	3 axis	4 axis
Interpolation			–	Circular, linear, ellipse	Circular, linear, helical, ellipse	
Control method			Position control, speed control, speed/position control, position/speed control, FEED			
Positioning data			Each axis has 400 data items (Operation step number 1~400). It is available to set with XG5000 or programming.			
Configuration Tool			XG5000 (Connected with USB or RS-232C Port of CPU module)			
Data backup			FRAM (Parameter, Operation data), Flash memory (CAM Data), No battery			
Pulse output			XGF-POxH: Open collector, XGF-PDxH: line driver			
Positioning	Positioning method		Absolute / Incremental			
	Position address range	mm	-214,748,364.8~ 214,748,364.7(㎛)			
		inch	-21,474.83648 ~ 21,474.83647			
		degree	-21,474.83648 ~ 21,474.83647			
		pulse	-2,147,483,648 ~ 2,147,483,647			
	Position address speed	mm	0.01 ~ 20,000,000.00(㎜/min)			
		inch	0.001 ~ 2,000,000.000(inch/min)			
		degree	0.001 ~ 2,000,000.000(degree/min)			
		pulse	1 ~ 500,000(pulse/sec): Open collector, 1 ~ 4,000,000(pulse/sec): line driver			
		RPM	0.1 ~ 100,000.0(RPM)			
	Accel/Decel pattern		Trapezoidal & S-curve acceleration/deceleration			
	Accel/Decel time		0~2,147,483,647ms			
Max. output pulse			Open collector: 500kpps, line driver: 4Mpps			
Max. distance			Open collector: 5m, line driver: 10m			
Max. encoder input			500kpps			
Error display			LED			
Size of cable			AWG #24			
Occupied points of I/O			64 points (Fixed type), 16 points (Variable type)			
Connection connector			40Pin		80Pin	
Current consumption (mA)			XGF-PO1H:400mA	XGF-PO2H:410mA	XGF-PO3H:420mA	XGF-PO4H:430mA
			XGF-PD1H:520mA	XGF-PD2H:600mA	XGF-PD3H:850mA	XGF-PD4H:890mA
Weight (kg)			120		130	

Terminal block configuration



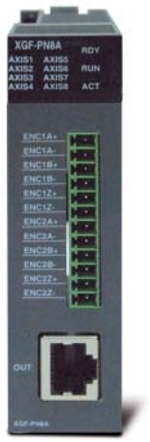
Pin number				Signal name		Remarks
AX1	AX2	AX3	AX4			
20A				MPG A+	Manual pulse generntor / Encoder A+ input	
20B				MPG A–	Manual pulse generntor / Encoder A- input	
19A				MPG B+	Manual pulse generntor / Encoder B+ input	
19B				MPG B–	Manual pulse generntor / Encoder B- input	
20C, 19C, 20D, 19D				NC	Not used	
18A	18B	18C	18D	FP+	Foward pulse (+)	
17A	17B	17C	17D	FP–	Foward COM (–)	
16A	16B	16C	16D	RP+	Backward pulse (+)	
15A	15B	15C	15D	RP–	Backward COM (–)	
14A	14B	14C	14D	OV+	Max. signal	
13A	13B	13C	13D	OV–	Min. signal	
12A	12B	12C	12D	DOG	Appoximate orgin signal	
11A	11B	11C	11D	EMG	Emergency stop	
				STOP	External stop signal	
10A	10B	10C	10D	VTP	Speed / Position switching signal	
9A	9B	9C	9D	COM	Common (0V+,0V-,DOG,EMG,STOP,VTP)	
8A	8B	8C	8D	DR	Drive ready signal	
7A	7B	7C	7D	INP	In-position	
6A	6B	6C	6D	DR/INP COM	Drive ready / In-position Common	
5A	5B	5C	5D	CLR	Deviation counter clear signal	
4A	4B	4C	4D	CLR COM	Deviation counter clear signal Common	
3A	3B	3C	3D	HOME +5V	Zero signal (+5V)	
2A	2B	2C	2D	HOME COM	Zero signal (+5V) Common	
1A, 1C				+24V	+24V	
1B, 1D				+24V COM	+24V GND	

* Open collector type module : +24V (1A/1C: 24V, 1B/1D: 0V)

XGT Positioning module(Network Type)

Features

- XGF-PN8A : Dedicated LS ELECTRICEtherCAT Network Support (XGT Servo N series)
- XGF-PN8B : Standard EtherCAT Network Support(Standard EtherCAT Servo)
- Direct connect with servo driver Max 8
- 2~8 axis linear interpolation, 2axis circular interpolation, 3axis helical interpolation
- Position, speed, feed control is possible through the various operation
- Parameters, the operation data stored in the FRAM(without Battery)
- CAM for controlling up to eight different types of CAM data



Specifications

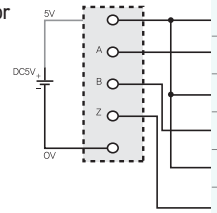
Item		XGF-PN8A/PN8B			XGF-PN4B
Number of axis		8 axis			4 axis
Interpolation		2~8 axis linear, 2axis circular, 3axis helical interpolation			
Control method		Position, speed, Speed/position, position/speed position/torque, Feed control			
Setting unit		pulse, mm, inch, degree			
Positioning data		Each axis has 400 data items (Operation step number 1~400). It is available to set with software package or programming.			
XG5000	Port	RS-232C, USB			
	Data	Basic, expansion, manual, servo parameter, operation data, cam data, command information			
	Monitor	Operation, trace, input sort, error information			
Back-up		FRAM(parameter, operation data) no battery			
Positioning	Positoning method	Absolute/Incremental			
	Position address range		Absolute	Incremental	Speed/position, position/speed conversion control
		mm	-214748364.8 ~ 214748364.7(㎛)	-214748364.8 ~ 214748364.7(㎛)	-214748364.8 ~ 214748364.7(㎛)
		inch	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647
		degree	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647	-21474.83648 ~ 21474.83647
		pulse	-2147483648 ~ 2147483647	-2147483648 ~ 2147483647	-2147483648 ~ 2147483647
	Position speed range	mm	0.01 ~ 20000000.00(mm/Min)		
		inch	0.001 ~ 2000000.000(inch/Min)		
		degree	0.001 ~ 2000000.000(degree/Min)		
		pulse	1 ~ 20.000.000(pulse/Sec)		
		RPM	0.1 ~ 100000.0(RPM)		
	Accel/Decel pattern	Trapezoidal & S-curve acceleration/deceleration			
	Accel/Decel time	1~2.147.483.647 ms			
Manual		Jog/ MPG/ inching			
Homing method		Max+Z(Forward), Min+Z(Backward), Near-point+Z(Forward, Backward), Max+near-point+Z(Forward), Min+near-point+Z(Backward), Z(Forward, Backward), near-point(Forward, Backward)			
The ability to Change speed		Absolute/Percent			
Torque		Rated torque %			
Absolute position System		0 (Absolute encoder type servo)			
Encoder input	Channel	2 Channel			
	Max. Input	Max. 200 Kpps			
	Input method	line-drive input(RS-422A IEC), open collector output type			
	Type	CW/CCW, Pulse/Dir, Phase A/B			
	Connector	12 Pin connector			
Communication Cycle		800 ㎲			
Max. distance		100 m			
Cable		STP(Shielded Twisted pair) cable			
Error display		LED			
Operation display		LED			
Occupied points of I/O		64points (Fixed type), 16points (Variable type)			
Current consumption (mA)		500 ㎃			
Weight(kg)		115 g			

Terminal block configuration

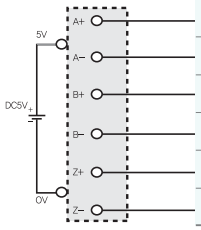
Pin layout	Pin Number	Signal name	
ENC1A+	1	ENC1A+	Encoder1 A+input
ENC1A-	2	ENC1A-	Encoder1 A - input
ENC1B+	3	ENC1B+	Encoder1 B+input
ENC1B-	4	ENC1B-	Encoder1 B - input
ENC1Z+	5	ENC1Z+	Encoder1 Z+input
ENC1Z-	6	ENC1Z-	Encoder1 Z- input
ENC2A+	7	ENC2A+	Encoder2 A+input
ENC2A-	8	ENC2A-	Encoder2 A - input
ENC2B+	9	ENC2B+	Encoder2 B+input
ENC2B-	10	ENC2B-	Encoder2 B - input
ENC2Z+	11	ENC2Z+	Encoder2 Z+input
ENC2Z-	12	ENC2Z-	Encoder2 Z- input

External encoder wiring

* Open collector type



* line-drive type

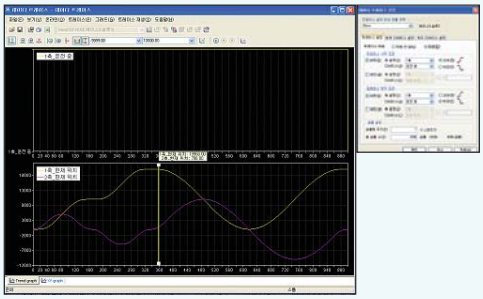


Pin Number	Signal	
1	ENC1A+	Encoder1 A+input
2	ENC1A-	Encoder1 A - input
3	ENC1B+	Encoder1 B+input
4	ENC1B-	Encoder1 B - input
5	ENC1Z+	Encoder1 Z+input
6	ENC1Z-	Encoder1 Z- input
7	ENC2A+	Encoder2 A+input
8	ENC2A-	Encoder2 A - input
9	ENC2B+	Encoder2 B+input
10	ENC2B-	Encoder2 B - input
11	ENC2Z+	Encoder2 Z+input
12	ENC2Z-	Encoder2 Z- input

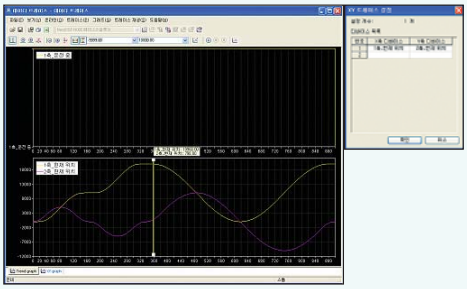
Features

- Configuration tool with updated APM software package
- All models can be used for XGT Positioning module (APM, XPM)
- Simultaneous communications can be accessed with XG5000
- Powerful simulation, trace, monitoring

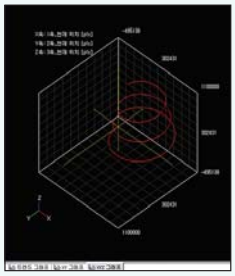
System View



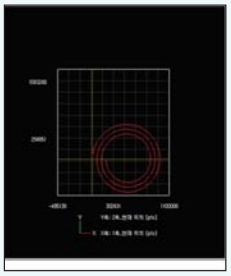
Data trace (trend graph)



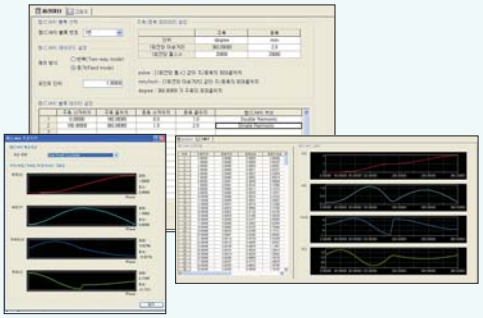
Data trace (XY graph)



XYZ trend
(3D View)



XYZ monitor
(2D View)



CAM control profile

Simulation

Motion Module[EtherCAT]

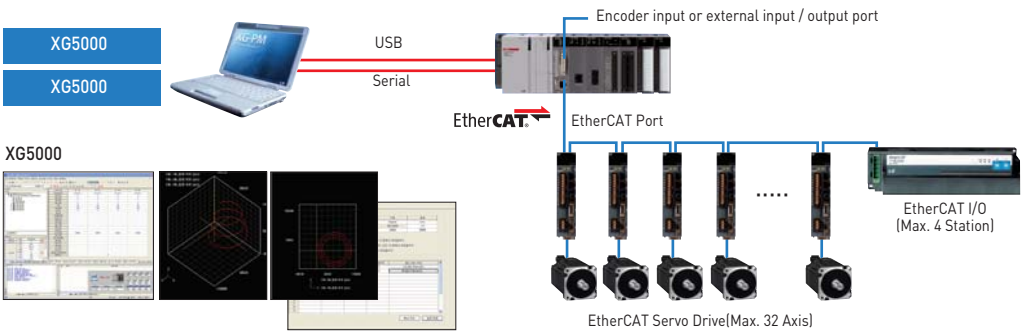
Features

- 32 axes (master) and 4 axes (virtual) control
- EhterCAT CoE supported servo drive
- Communication cycle : 1ms
- Built-in DI/DO 8 points each and EtherCAT I/O 512 points
- Program 2MB
- External encoder input 2ch (line drive)
- Max. transmission distance : 100m

Specifications

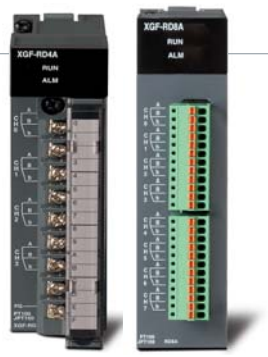
Item		XGF-M32E
Communication		EtherCAT (CoE : CANopen over EtherCAT)
Number of axis	Real	32 axes
	Virtual	4axes
	I/O	Input/output 8 points each (built-in) EtherCAT I/O connection available
Control period		1ms, 2ms, 4ms (same as main task period)
Control unit		Pulse, mm, inch, degree
I/O	Internal	Input 8 points, output 8 points
	External	EtherCAT I/O 4 ea (max. 256 points)
Motion Program	No. of program	Max. 256 ea
	Capacity	Max. 2Mbyte
	Language	LD(FB), ST
	Position data	6400 points/all aixs
Control method		Position, Velocity, Torque(Servo drivers support) control, Synchronous control, Interpolation control
Range of position/velocity		± LREAL, 0
Acc. Dec. process		Trapezoid type, S-type (Setting to specify the Jerk at function block)
Acc. Dec. time		1 ~ 2, 147, 483, 647ms
Manual operation		JOG operation
Torque unit		Rated torque % designation
Encoder input	Channel	2 chennels
	Max. input	Max. 500Kpps
	Input method	Line drive input (RS-422A IEC specification) Open collector output type encoder
	Input type	CW/CCW, Pulse/Dir, Phase A/B
Max. distance		100m
Communication cable		Over CAT.5 STP(Shielded Twisted-pair) cable
Error indication		Indicated by LED
Communication status indication		Indicated by LED
Occupied point I/O		Variable: 16 point, Fixed: 64 point
Communication physical layer		100BASE-TX
Consumable current(mA)		900mA
Weight		122g

System Confignration



SPECIAL

XGT RTD input module



Features

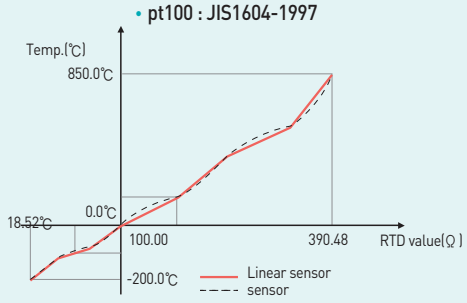
- Supports various additional functions (average, alarm, filter)
- Special module parameter setting and monitoring with XG5000
- Supports digital conversion, temperature display and user scaling
- Support Offset/Gain function(only RD8A)

Specifications

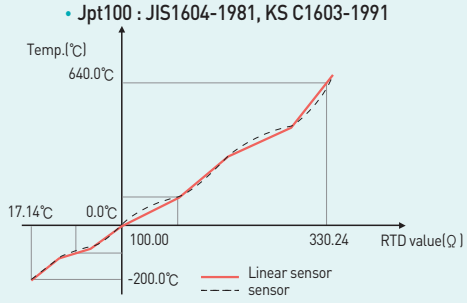
Item			XGF-RD4A	XGF-RD4S	XGF-RD8A
No. of input channel			4 channels	4 channels	8 channels
Input sensor type		Pt100	JIS C1604-1997	JIS C1604-1997	JIS C1604-1997
		JPt100	JIS C1604-1981, KS C1603-1991	JIS C1604-1981, KS C1603-1991	JIS C1604-1981, KS C1603-1991
		PT1000	-	JIS C1604-1997	-
		NI100	-	DIN 43760-1987	-
Temperature input range		Pt100	-200.0 ~ 850.0℃	-200.0 ~ 850.0℃	-200.0 ~ 850.0℃
		JPt100	-200.0 ~ 640.0℃	-200.0 ~ 640.0℃	-200.0 ~ 640.0℃
		PT1000	-	-200.0 ~ 850.0℃	-
		NI100	-	-60.0 ~ 180.0℃	-
Digital output	Temperature display (unit: 0.1)	Pt100	-2,000 ~ 8,500	-2,000 ~ 8,500	-2,000 ~ 8,500
		JPt100	-2,000 ~ 6,400	-2,000 ~ 6,400	-2,000 ~ 6,400
		PT1000	-	-2,000 ~ 8,500	-
		NI100	-	-2,000 ~ 1,800	-
	Scaling display (Customize)		0 ~ 65535		
			-32768 ~ 32767		
Accuracy	Normal temp.(25° C)		±0.2%	±0.1%	±0.2%
	Full temp.(0~55° C)		±0.3%	±70ppm/ ℃	±0.3%
Conversion speed			40ms / channel		
Insulation	Channel to Channel		Non-insulation	Insulation	Non-insulation
	Terminal to PLC Power		Photo-coupler		
Wiring method			3-wire	4-wire	3-wire
Function	Average		Time average (320~64000ms)		
			Counting average(2~64000 count)		
			Moving average(2~100 samples)		
	Alarm		Process alarm		
			Input changing rate alarm		
			Disconnection detection		
	Offset / Gain		-		0
	Filtering		Digital filter (160~64000ms)		
Terminal block			18-point terminal block		
Current consumption			5V: 450mA	5V: 720mA	5V: 450mA
Weight [g]			150g		

Characteristics of temperature conversion

• pt100 : JIS1604-1997

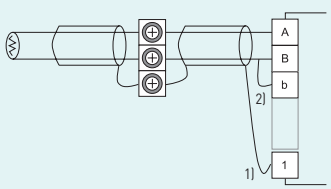


• Jpt100 : JIS1604-1981, KS C1603-1991

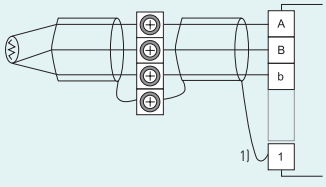


Wiring

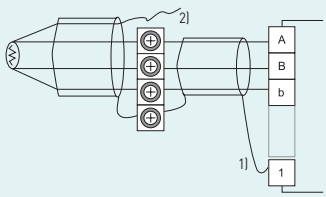
• Connection with 2-Wire type sensor



• Connection with 3-Wire type sensor



• Connection with 4-Wire type sensor



1) When sensor and compensating wire are shielded, shield-connection to FG terminal of the module is available.
2) The wiring of 4-wire type sensor is identical with the wiring of 3-wire type sensor. 3 wires is connected to the module.
But the other wire is not connected with the module.

Thermocouple module

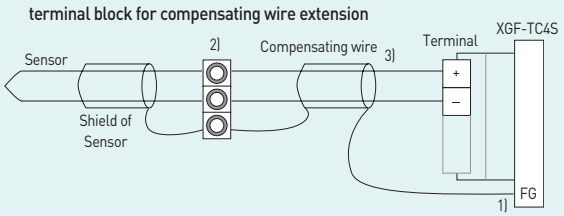
Features

- Insulation between channels
- ±0.1% (25℃) constant density
- Supports various input sensor (supporting C-type sensor)
- Various additional functions (average, filter, alarm, max/min value display)
- Special module parameter setting and monitoring with XG5000

Specifications

Item	XGF-TC4S	
Input channels	4 channels	
Input sensor type	K, J, E, T, B, R, S, N, C	JIS C1602-1995ITS-90
Input temperature range	K	-250 ~ 1350℃
	J	-200 ~ 1200℃
	E	-250 ~ 1000℃
	T	-250 ~ 400℃
	B	400 ~ 1800℃
	R	-50 ~ 1750℃
	S	-50 ~ 1750℃
	N	-270 ~1300℃
	C	0 ~ 2300℃
Digital output	Temperature display (unit: 0.1)	Display down to the first decimal place (0.1℃)
	Scaling (User range setting)	0 ~ 65535
		-32768 ~ 32767
Accuracy	Normal temp. (25℃)	±0.1%
		Some section can permit 0.5%
	Temperature coefficient (Operating temp. range)	±100ppm℃
Conversion speed	40ms/ channel	
Insulation	Between channels Insulation	
	Between terminals and power	Insulation(Photo-Coupler)
Compensation	Automatic compensation by RJC sensing (PT100)	
	Compensation degree	±1.0%
Function	Average	Average time (320 ~ 6400ms)
		Average number (2~ 64000)
		Average move (2 ~100)
	Alarm	Process Alarm
		Change rate alarm
		Burn-out detection
	Filter	Digital filter (160 ~ 64000ms)
	Max./Min. values display	Max./Min. values display
Terminal block	18-point terminal block	
Current consumption	5V : 610mA	
Weight (kg)	0.150	

Input wiring

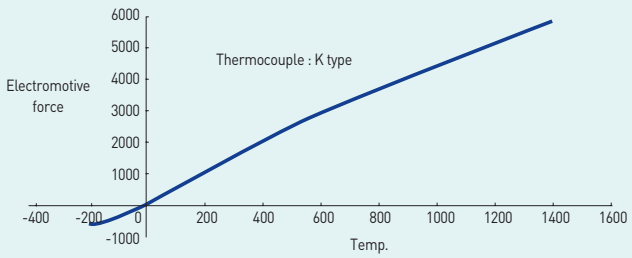


1) When sensor and compensating wire are shielded, shield connection to FG terminal is available.

2) To minimize an error, overall temperature of block terminal need to be equal.

3) Compensating sensor should be the same type of sensor which is used for measurement.

Characteristics of I/O conversion



SPECIAL

XGT Temperature controller

Features

XGF-TC4UD

- Optimum temperature control
- Universal input: TC, RTD, Voltage, Current
- Isolated input
- Output: Current/Transistor
- Parameter setting via dedicated software: TG-CON
- Variety of control types
  - PID control
  - Cascade control
  - On/ Off control
- Disconnection detection
- Various input functions: Bias, Filter, Square root
- Auto-tuning

XGF-TC4RT

- Input RTD : Pt100, JPt100, Pt1000
- Control Type : PID, On / Off Control

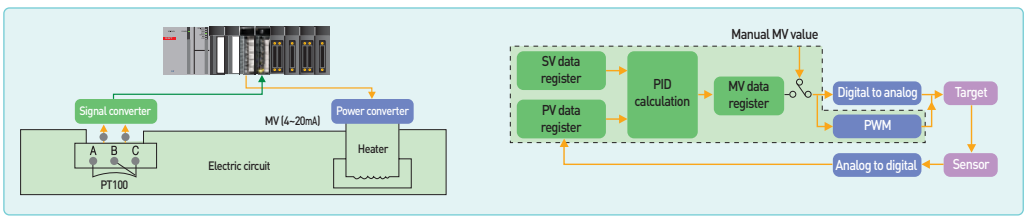
Specifications

Item	XGF-TC4UD			XGF-TC4RT
No. of loop	4 loops			4 loops
Input	Thermo couple	K	-200 ~ 1300 °C	–
			0 ~ 500 °C	
		J	-200 ~ 1200 °C	
			0 ~ 500 °C	
		E	-200 ~ 1000 °C	
		T	-200 ~ 400 °C	
		B	400 ~ 1800 °C	
		R	0 ~ 1700 °C	
		S	0 ~ 1700 °C	
		N	-200 ~ 1300 °C	
		C(W5Re/W26Re)	0 ~ 2300 °C	
		PL II	0 ~ 1300 °C	
		L	-200 ~ 900 °C	
		U	-200 ~ 600 °C	
	RTD	Pt100	-200 ~ 850 °C	-200 ~ 850 °C
		JPt100	-200 ~ 600 °C	-200 ~ 600 °C
		Pt1000	-200 ~ 800 °C	-200 ~ 800 °C
	Voltage	DC mV	0 ~ 10mV	–
			0 ~ 100mV	
		DC V	0 ~ 1V	–
			1 ~ 5V	
			0 ~ 5V	–
			0 ~ 10V	
			-5V ~ 5V	
			10V ~ 10V	
	Current	DC mA	4 ~ 20mA	–
			0 ~ 20mA	
	Input channel	4 channels(Input type selection per channel)		–

Specifications

Item	XGF-TC4UD				XGF-TC4RT
Resolution	Resolution Refer to the user's manual (Resolution for each input type)				
Cold junction compensation	Compensation		Automatic compensation by RJC sensor		–
	Precision		±0.2℃		–
Digital output	Temperature display		0.1℃/1℃ (Selection by software)		0.1℃
	Linear display		0~1000		–
	Scale display		Only for voltage/current input Range : -3,000~3,000 Setting range: 0~3000		–
Conversion speed	200ms / module				400ms / 4loops
Control type	PID, On/Off control				
Parameter	Set value (SV)		Selection per input type		
	Gain		0 : ON/OFF control, Real type		Range : 0.000~10000.000
	Integrated time		0 : No Differential control, Real type		Range : 0.000~10000.000
	Differential time		0 : No Integrated control, Real type		Range : 0.000~10000.000
Output	No. of output channel		8 channels (PWM or analog output)		4 channels
	PWM	Rated load voltage	DC 24V		
		Max. current point	0.1A points		
		On voltage drop	DC 0.3V or less		
		Off leakage current	0.1mA or less		
		Response time ON⇒OFF	1ms or less		
		Response time OFF⇒ON	1ms or less		
		Periodic	0.5~120.0sec (resolution: 0.5sec)		0.5~100.0sec(resolution: 0.1s)
		Time resolution	High value between 10ms or 0.5% of full scale		
	Analog output	Range	4~20mA		–
		Resistance	600Ω or less		
		Resolution	±1.0%, 25℃		
		Precision	8㎂		
Insulation	Item		Insulation	Insulation withstand voltage	Insulation resistance
	Channel - Channel		Trans	500V AC, 50/60Hz 1min, Leakage 10mA or less	500V DC, 10MΩ or more
	Input terminal - PLC		Photocoupler		
	Current output - Current output		Non insulation		
	External power- Output				
Warm-up	20min or more				–
Terminal	18 points terminal				
Power	5V, DC 24V (external)				
Current consumption	DC 5V : 900mA (Internal) DC 24V : 300mA (external)				DC 5V: 310mA DC 24V: 28mA

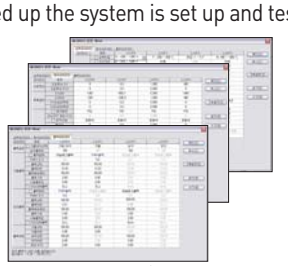
Example : Constant temperature



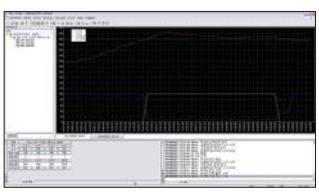
XG-TCON

- The configuration tool for the temperature control module
- Easy parameter settings, data monitoring and trend-monitor support
- Auto-tuning operation command to speed up the system is set up and test operation

Data Monitor



Parameter setting(input parameter)



Trend monitor

SPECIAL

XGT Event input module

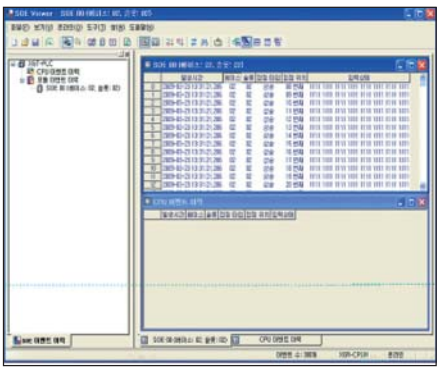
Features

- SOE: Sequence Of Events Recorder
- I/O information collection to analyze the control system in Generation and Transformer
- Event collection in every 1ms
- Max. 300ea data available
- Data retain by built-in memory
- Max. installable module: 16ea
- Event monitoring of history through SOE Viewer

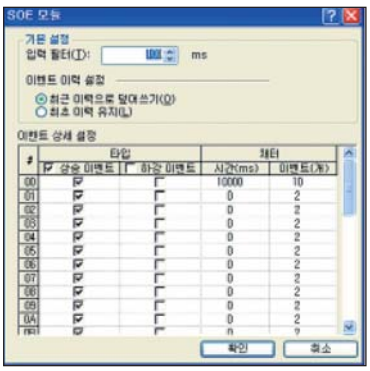
Specifications

Item		XGF-SOEA
No. of input point		32 points
Insulation method		Photo-Coupler Insulation
Memory size		1Mbit
The first event setting time		CPU RTC : 1 ms (±2ms : delay between modules) RS-422 IRIG-B :1 ms (±0.5ms : delay between modules)
Rated input voltage		DC24V
Rated input current		Approx. 4mA / points
Voltage range		DC20.4 ~ 28.8V(5% and lower ripple rate)
On voltage/On current		DC19V and higher / 3 mA and higher
Off voltage/ Off current		DC11V and lower/ 1.7 mA and lower
Input resistance		Approx. 5.6 kΩ
Response time (㎳)	Off → On	100us+Input filter time(User setting: 0~100ms)
	On → Off	150us+Input filter time(User setting: 0~100ms)
Clock Synchronization		CPU RTC or RS-422 by IRIG-B format
Withstand voltage		AC560V rms / 3 Cycle (altitude 2000m)
Insulation resistance		10MΩ and higher (DC500V)
COMM method		32point / COM
Current consumption		0.4 A (MAX)
Operation display		LED On with Input On
External connection method		40point connector
Size(mm)		27x98x90
Weight		0.2 kg

SOE Viewer



Monitoring window



Parameter setup

Datalog module

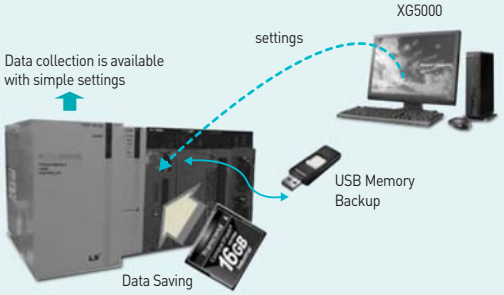
Features

- Capable to easily save PLC device data without PC
- Capable to save PLC control data without missing any change
  - Data can be saved whenever scanning is done or they can be saved at an interval of several ms(milliseconds).
- Capable to save a large volume of data file
  - Long-term data saving is available since CF card and USB memory with a large volume of up to 16GB can be used.

Specifications

Item		XGF-DL16A				
CF Card	Voltage of power supply	3.3V ± 5%				
	Card Type	CF200I(Transcend 's Industrial CF card)				
	Compatibility Capacity	1, 2, 4, 8, 16Gbyte				
	Number of mountable cards	1				
	Caution	Use only industrial CF cards manufactured by Transcend				
USB Memory	Voltage of power supply	5.0V ± 5%				
	Memory Type	USB 2.0 (Host function)				
	Compatibility Capacity	1, 2, 4, 8, 16Gbyte (Please use USB capacity above CF card capacity)				
	Saving Method	Auto Saving through PnP function (Activation of PnP auto duplication: when USB is mounted, when power is supplied again)				
	Number of mountable memories	1(Unavailable to support USB extension cables)				
Data Type	BOOL	0 or 1				
	BYTE	00 ~ FF				
	WORD	0000 ~ FFFF				
	DWORD	00000000 ~ FFFFFFFF				
	LWORD	00000000 00000000 ~ FFFFFFFF FFFFFFFF				
	SINT	-128 ~ 127				
	INT	-32, 768 ~ 32, 767				
	DINT	-2, 147, 483, 648 ~ 2, 147, 483, 647				
	LINT	-576, 460, 752, 303, 423, 488 ~ 576, 460, 752, 303, 423, 487				
	USINT	0 ~ 255				
	UINT	0 ~ 65,535				
	UDINT	0 ~ 4,294,967,295				
	ULINT	0 ~ 1,152,921,504,606,846,975				
	REAL	-3.402823466e+038 ~ -1.175494351e-038 or 0 or 1.175494351e-038 ~ 3.402823466e+038				
	LREAL	-1.7976931348623157e+308 ~ -2.2250738585072014e-308 or 0 or 2.2250738585072014e-308 ~ 1.7976931348623157e+308				
	STRING	Fixed letters (Maximum 8 letters)				
Data Saving	Number of Settings	Maximum 8				
	Number of Data	Maximum 32				
	Saving Kind	Saved by the ladder program				
	File Type	CSV file(Extension: csv)				
	Number of Saving Files	Total 800 (when using 16Gbyte CF memory)				
SavingSpeed	Processing Score(word)	4	16	64	256	1024
	Processing Speed(ms)	1	4	10	30	120
Time to Initialize CF card	Capacity(Gbyte)	1	2	4	8	16
	Time(s)	10	20	40	60	120
Collection Interval		1 ~ 9999999 ms (In consecutive saving)				
In/output Occupation Score		32 points 1 slot(Input 22 points, output 10 points)				
Clock		Synchronized at PLC CPU time whenever it is scanned				
DC5V Internal Consumption Current		0.53A				
External Size		98(H)[mm] x 27(W)[mm] x 90(D)[mm]				
Weight		0.13kg				

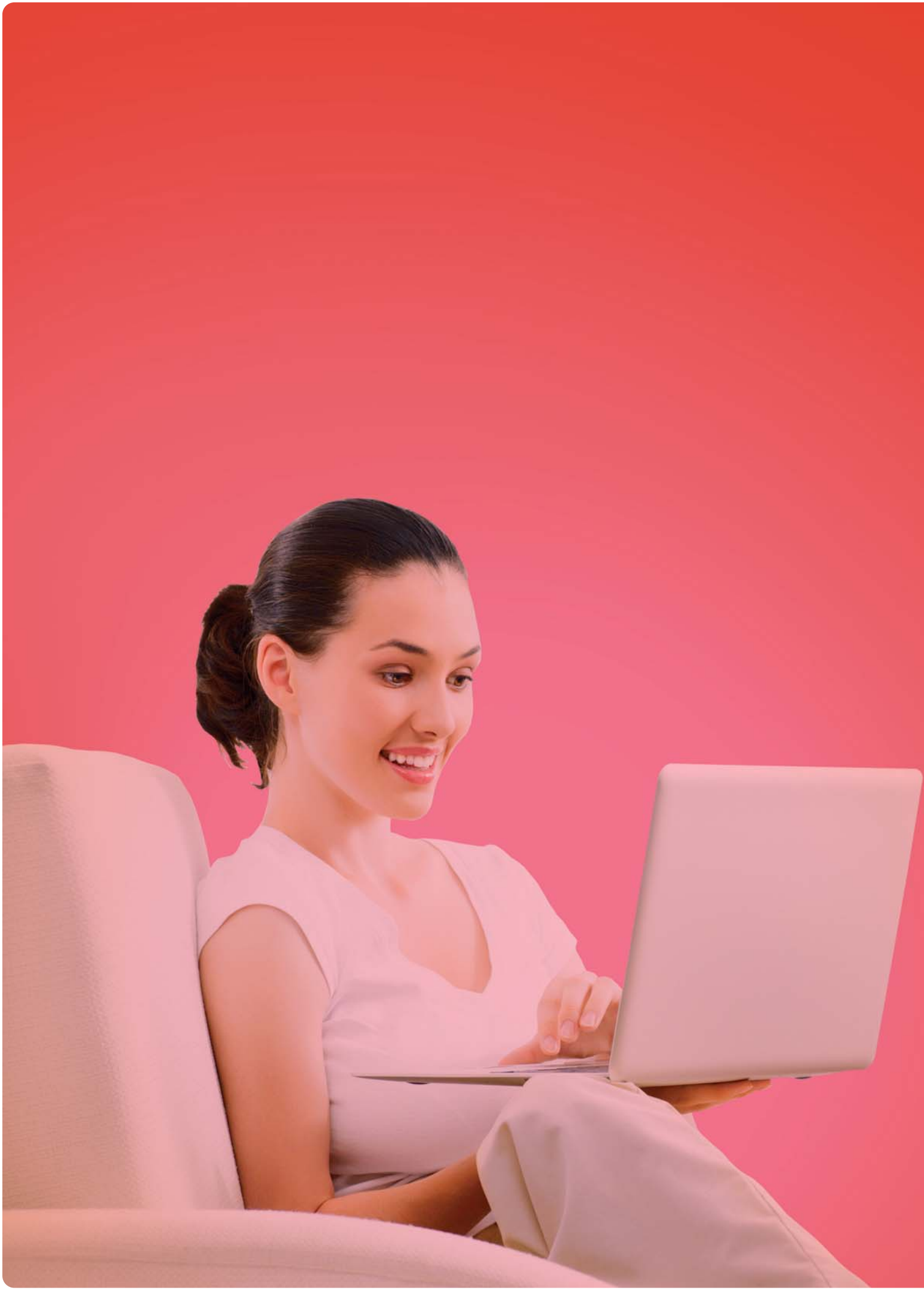
System Configuration



CSV File

	A	B	C	D
1	Time	Index	DWORD	WORD
2	2011/07/04/09:22:35.038	1807154	05701D3C	1D3C
3	2011/07/04/09:22:35.058	1807155	05701D3D	1D3D
4	2011/07/04/09:22:35.079	1807156	05701D3E	1D3E
5	2011/07/04/09:22:35.098	1807157	05701D3F	1D3F

SPECIAL



Software

Software innovation for integrated solution.

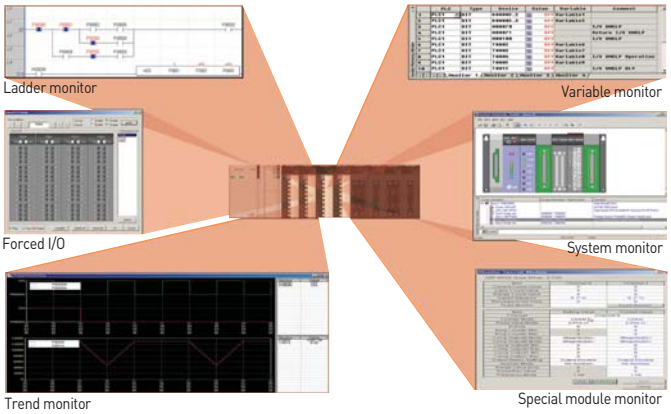
XG5000 is the optimum software which can cover various programming needs, debugging, and easy maintenance. Especially, XG5000 achieves customer satisfaction with useful maintenance tool by internet.

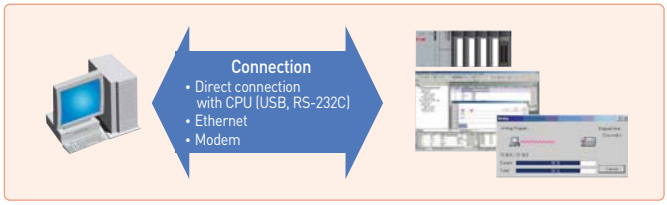
Contents

XGT XG5000 programming

Features

- Program editing & Engineering software
- Windows-based easy operation
- Multi-PLC, Multi-program, Multi-task in one project
- Various monitoring and diagnosis functions
- Windows 2000, XP, VISTA, Win7, Win8(32/64bits) (Limited use in Windows 98, ME)



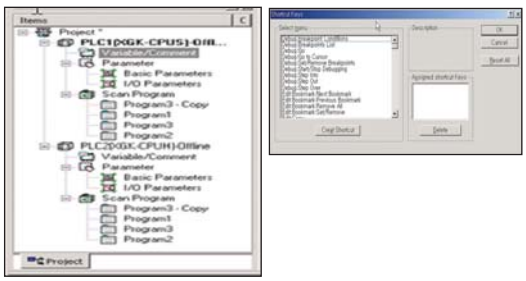


Programming tools

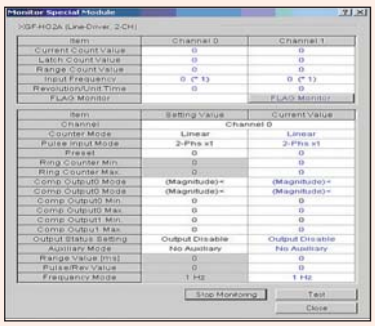
MPMP (Multi-PLC Multi-programming)
Different PLC systems can be edited, monitored, and managed simultaneously in one project.

Drag & Drop
It is available in project, variable/comment, ladder diagram editing and monitoring.

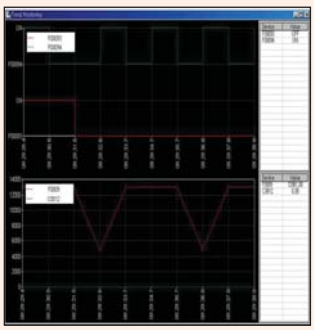
User-defined shortcut keys
User-defined shortcut keys increase editing convenience.



Monitoring

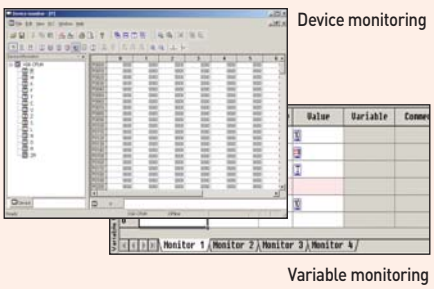


Special module monitoring
Monitoring and test-run of various special modules are available.



Trend monitoring
The changing value of specific device can be monitored and saved as a file.

System monitoring



Device monitoring

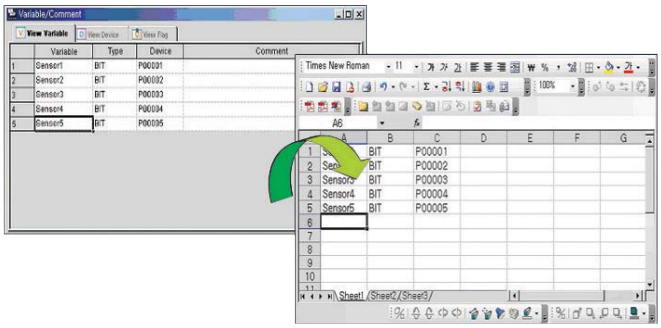
Variable monitoring

System requirement

Item	System requirement
O/S	Windows 2000, XP, VISTA, Win7, Win8(32/64bits) (Limited use in Windows 98, ME)
CPU	IBM compatible PC with Min. 200MHz Pentium processor
Memory	Min. 128M
HDD	100 MB (Free memory space)
Serial port	Communication port for program transmission (RS-232C, USB)
Printer	Compatible with Windows 98 or later
Mouse	Compatible with Windows 98 or later

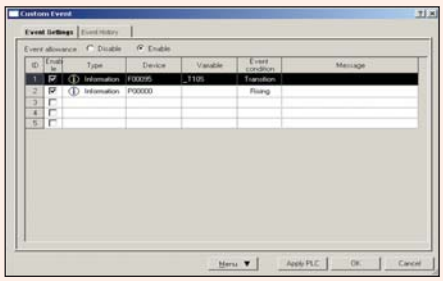
Variable and programming editing

- Data input like EXCEL
- Cell-unit edit
- Auto Fill function
- Compatible with Microsoft Excel
- Redo and Undo (Unlimited)
- Segment screen edit

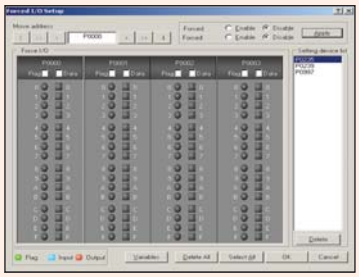


Improved diagnosis and maintenance

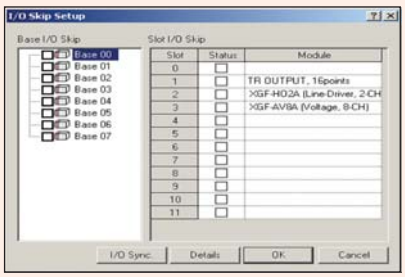
Module exchange wizard
It supports safe module exchange during 'RUN' mode.



User-defined event
By registering user-defined event, users can read the record of specified event and use it for PLC operation and debugging



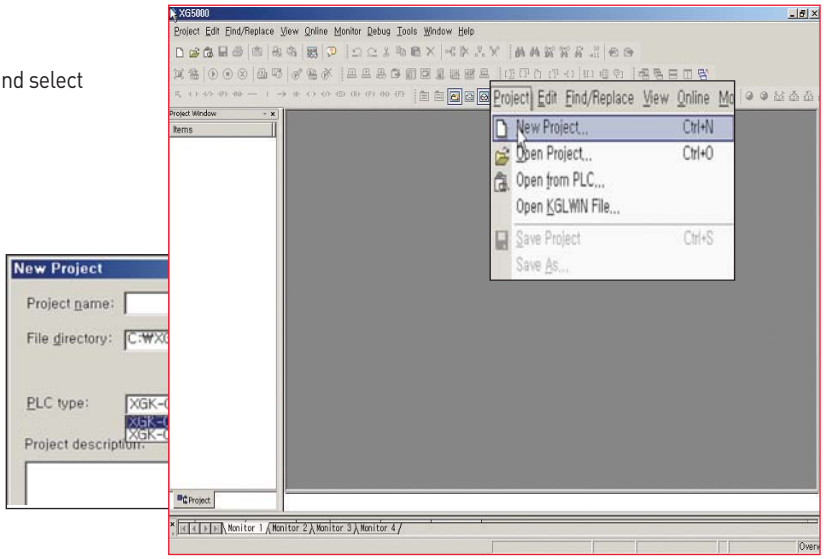
Forced I/O
The status of external output device can be checked without program. And when input device breaks down, forced input function specifies ON/OFF and can operate the system without interruption of equipment.



I/O skip, Error Mask
I/O inspection and renewal can be set for specific module and continuous operation is available when an error is occurred.

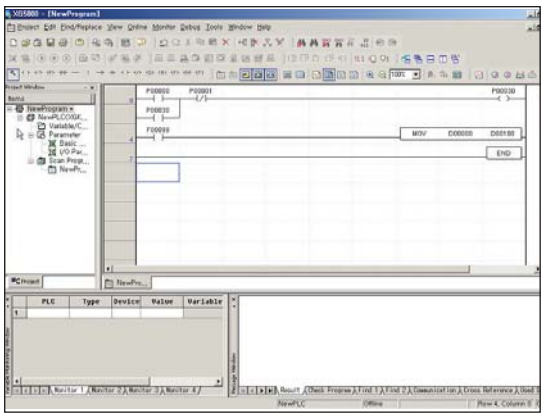
Program editing

- Start XG5000
- Select [New Project]
- Write project name and select CPU type



Configure ladder lines as below with ladder input tool bar

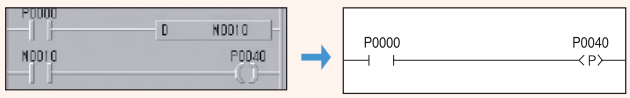
- Select input point and command with ladder tool bar.



Icon	Description	Short key
	Arrow mode	ESC
	Normally open contact	F3
	Normally closed contact	F4
	Positive transition-sensing contact (On for 1 scan when Off ⋯› On)	Shift+F1
	Negative transition-sensing contact(On for 1 scan when On ⋯› Off)	Shift+F2
	Horizontal line	F5
	Vertical line	F6
	Fill horizontal line	Shift+F8
	Coil	F9
	NOT instruction contact	Shift+F9
	Negated coil	F11
	SET coil	Shift+F3
	RESET coil	Shift+F4
	Positive transition-sensing coil (On for 1 scan when Off ⋯› On)	Shift+F5
	Negative transition-sensing coil (On for 1 scan when On ⋯› Off)	Shift+F6
	Function	F10

Note) Addition of 'EDGE' detection instructions

Develop user-friendly programming through adding D,
D NOT instructions (Rising EDGE, dropping EDGE) to contact and output coil.



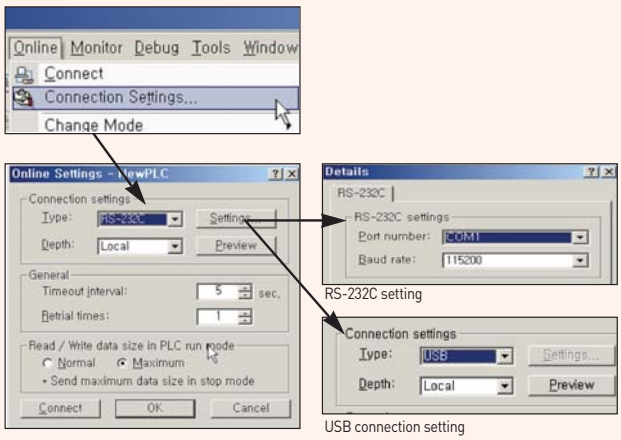
Program download

Connection setting

- Check a setting for connection between XGT and XG5000
- XGT supports USB and RS-232C

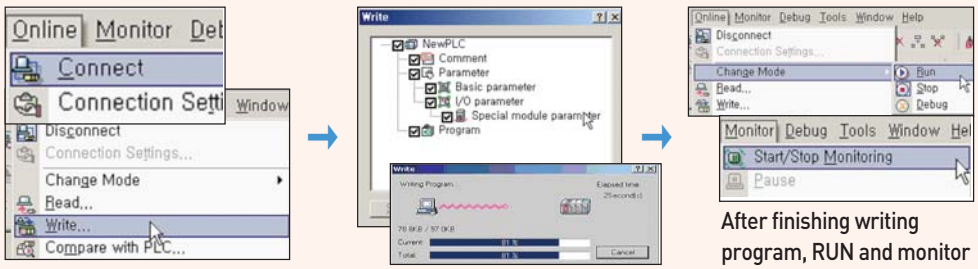
Set up communication port and download speed

* using ' USB TO RS-232C' converter, 115,200bps connection may be unavailable depending on characteristics of converter. In this case, change the communication speed to 38,400bps.



Connection

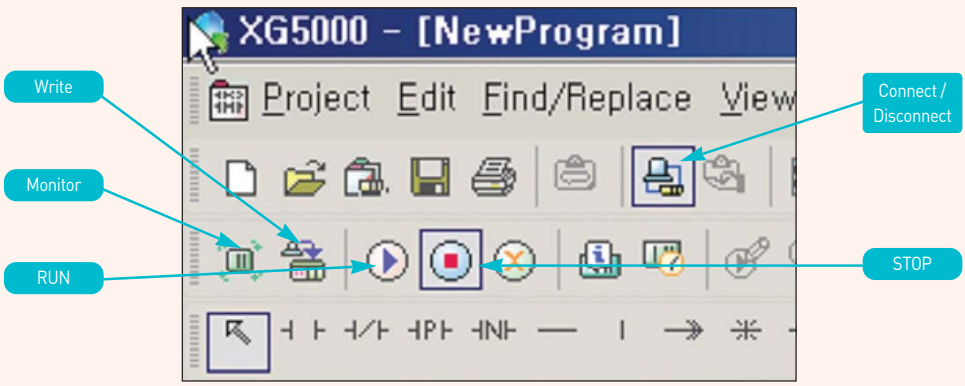
Connect to PLC and download the program as below.



After finishing writing program, RUN and monitor XGT.

Short icon

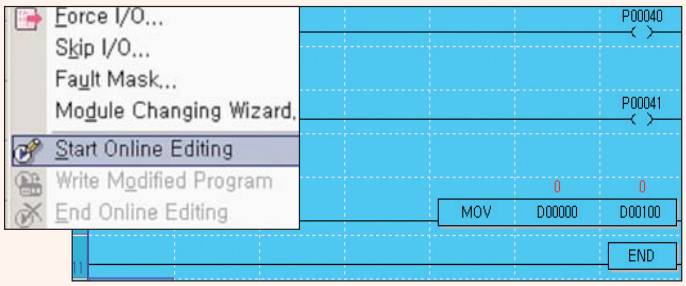
* XGT doesn' t support collective-writing monitoring for system safety.



SOFTWARE

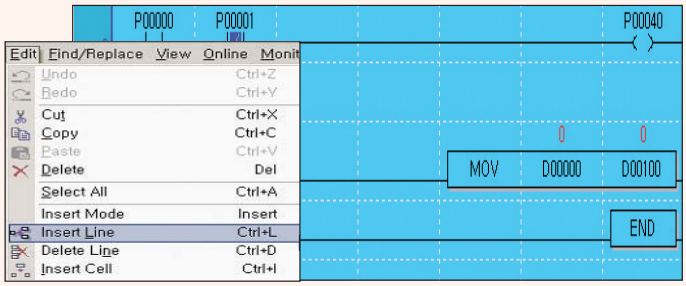
Online Editing

Select [Start Online Editing] in Online menu.



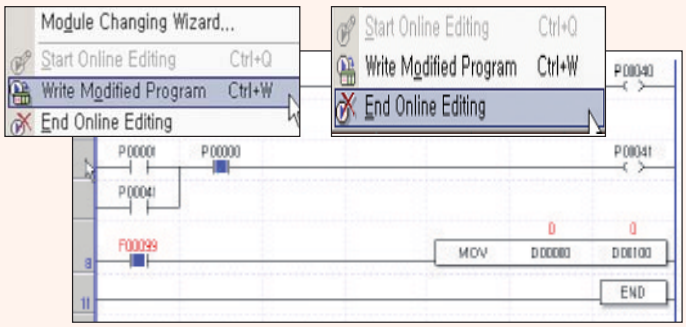
When starting Online Editing, the screen color becomes blue.

Modify the program.



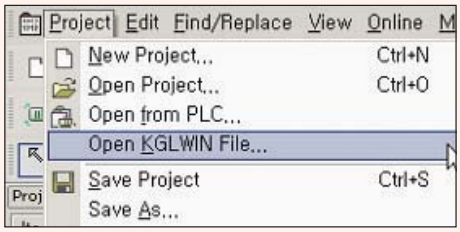
Edit menu

After finishing modifying the program, select [Write Modified Program] and [End Online Editing].

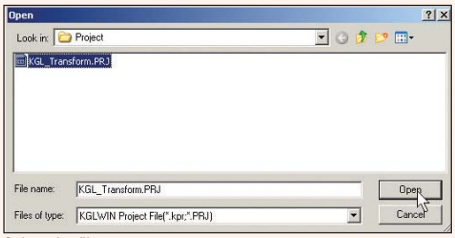


After finishing ' Online Editing'

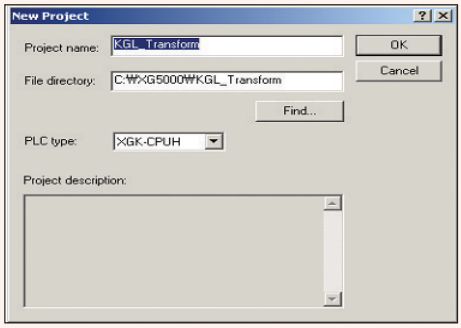
Open a project written in KGL-WIN



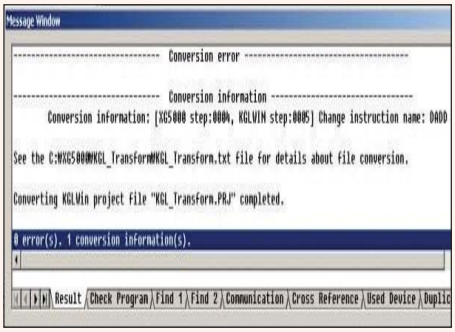
Select [Open KGWIN file] in project.



Select the file.



Select the type of XGT CPU.



Check converted information in the message window.

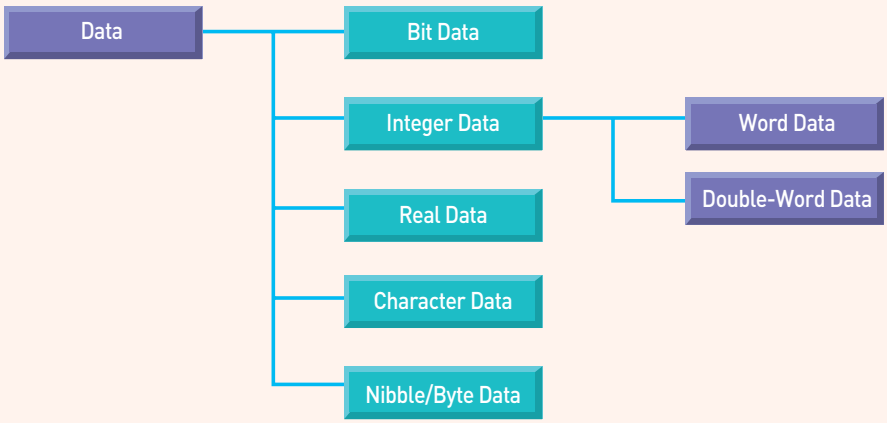
Note] Dedicated instructions and special parameters for MASTER-K cannot be converted.
Mostly General instructions and descriptions are converted.
Information impossible to be converted is displayed as ERR.

• Content of main special flag (F) change

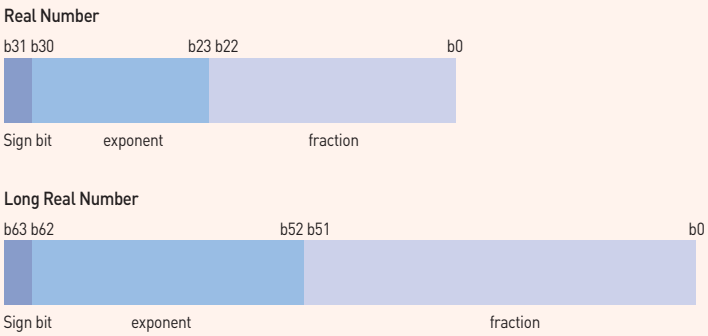
MASTER-K	XGT	Specifications
F10	F99	ON regularly
F11	F9A	OFF regularly
F12	F9B	ON during first one scan
F13	F9C	OFF during first one scan

For more detailed information, refer to user's manual.

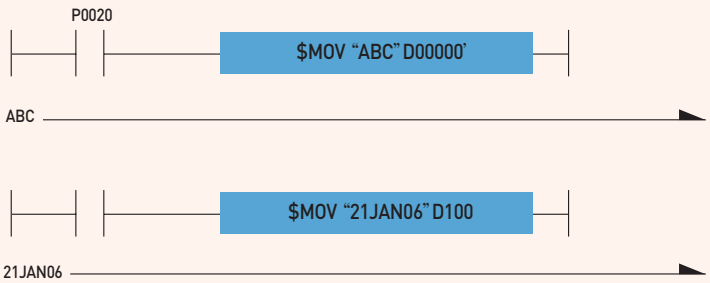
Data type



- Nibble: 4-bit unit data
- Byte: 8-bit unit data
- Real Data: 32-bit/64-bit floating point data



- Character Data: Saving numbers, alphabets, symbols as a type of ASCII code



D100	0x31	0x32
D101	0x41	0x4A
D102	0x30	0x4E
D103	0x00	0x36
D104	0x00	0x36

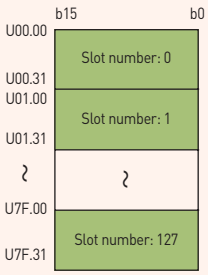
Device type

Device	Size	Bit Contact	Word Data	Name
P	32768 points	P00000 ~ P2047F	P0000 ~ P2047	I/O Relay
M	32768 points	M00000 ~ M2047F	M0000 ~ M2047	Assistant Relay
L	180224 points	L00000 ~ L11263F	L0000 ~ L11263	Link Relay
N *1)	21K words	N/A	N00000 ~ N21503	Comm. data register
K	32768 points	K00000 ~ K2047F	K0000 ~ K2047	Keep Relay
F	32768 points	F00000 ~ F2047F	F0000 ~ F2047	Special Relay
T *2)	2048 points	T0000 ~ T2047	T0000 ~ T2047	Timer
C *3)	2048 points	C0000 ~ C2047	C0000 ~ C2047	Counter
U	3072 words	U00.00.0 ~ U7F.31.F	U00.00 ~ U7F.31	Special Module Counter
Z	128 words	N/A	Z0 ~ Z127	Index Register
S	128 groups	S00.00 ~ S127.99	N/A	Step Control Relay
D	32K words	D00000.0 ~ D32767.F	D00000 ~ D32767	Data Register
R (Internal RAM) *4)	32K words	R00000.0 ~ R32767.F	R00000 ~ R32767	File Register
ZR (Internal RAM) *5)	32K words	N/A	ZR00000 ~ ZR65535	File Register
R (Expanded)	1M words	N/A	Available as much as extension size	File Register
ZR (Expanded)	1M words	N/A	Available as much as extension size	File Register

Note] 1. When communication module is not used, it can be used as internal data area.
2. Word data in timer shows a current value of relevant bit contact.
3. Word data in counter shows a current value of relevant bit contact
4. Even when using more than 32K words internal RAM, bit contact available to display is R00000.0~R32767.F Also word data enable to be displayed in the range of R00000.0~R32767.F
5. When internal RAM is more than 32K words, bit contact can be in the range of ZR00000.0~ZR32767.F and word data can be displayed as much as the size of internal RAM

Special module register U

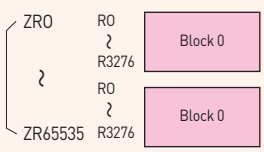
Register for reading data from special module mounted in slot



- Assigning 32 words per slot in U area
- Bit type display available
  Ex) U93.12.x (x: Bit location, Hexadecimal display)
- Available to read/write internal memory value of special module without using PUT (P), GET (P), PUTS (P), GETS (P)
- Basic display in U area
  Ex) Uxy.z
  x: Base number (0~7)
  y: Slot number (0~F)
  z: Word number of special module internal memory

File register R, ZR

Register that a recorded value is not deleted when power failure is occurred. File register is used for data backup or data storage.



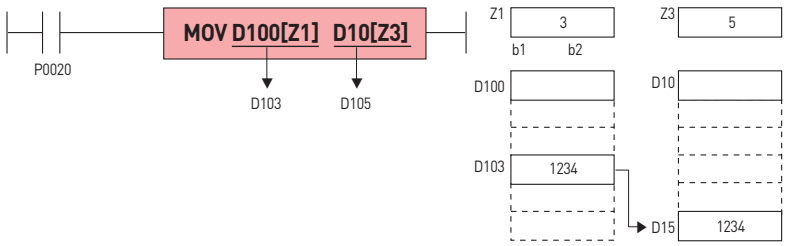
R: Block unit access
ZR: Entire file register access

Internal RAM (Temporary preservation): 32K words
FLASH (Permanent preservation): 1M words

SOFTWARE

Index register

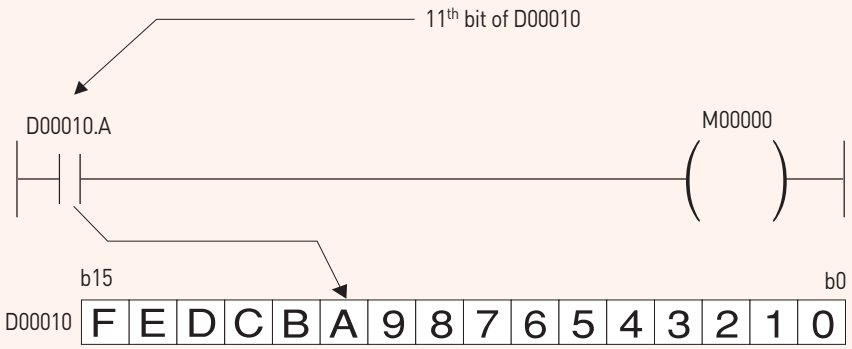
Index register sets up devices using index function.
The sum of index register value and directly specified device number is real device number.



Available Device

- Bit Device: P, M, L, K, F, T, C
- Word Device: U, D, R, ZR, N, present value of T and present value of C
  Ex) MOV T1[Z1] D10 : If Z1 is 5, present value of T(1+5)=T6 is transmitted to D10.
  Ex) LOAD D10[Z1].5 : If Z1 is 5, LOAD(10+5).5 => LOAD D15.5 is set.

Bit specifying method of word device

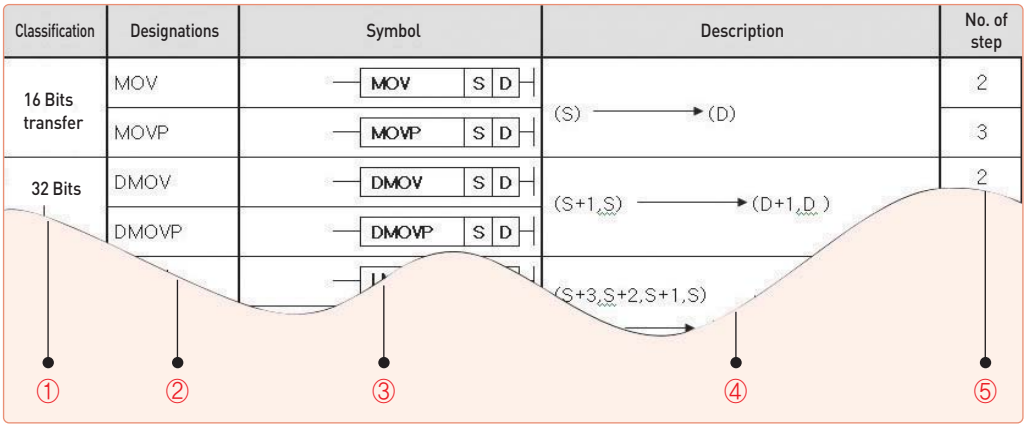


By assigning bit number to word device, bit data is available to use.

Word device number	·	Bit number

In this case, word device number should be addressed as decimal and bit number should be addressed as hexadecimal.
Relevant Device: U, D, R

Instructions



① Classification: Classifies instructions into applications.

② Designations: Displays instruction names to be used in program.

- Display rules: Instructions shall be basically displayed in word unit. According to data size, operation characteristics, real number data process, text process, the rules are as follows;
- Based on Data Size & Type

D: Double Word related instruction.
R: Real Number related instruction.
L: Long Real Number related instruction.
However, LMOV is 64 Bits transfer instruction.
$: String related instruction.
G: Group calculation.
4: Nibble related instruction, used only at the back of instruction.
8: Byte related instruction, used only at the back of instruction.
3: Instruction that process 3 operands, used only at the back of instruction.

- Based on Operation Characteristics

P: Instruction that is executed for 1 scan when input signal is changed OFF = 〉 ON

③ Symbol: Displays symbols used in program, showing the number of used operands and the type of Source or Destination. Operand display rules are as follows;

S: Source, with data value not changed after calculated.
D: Destination, with data value changeable after calculated.
N, n: The number to process.
St, En: Start and End, used only in BSFT & WSFT.
Sb: Source in case Bit position is specified, mostly used in Nibble/Byte instruction.
Db: Destination in case Bit position is specified.
Z: Control word, which means previously specified format as based on each instruction.

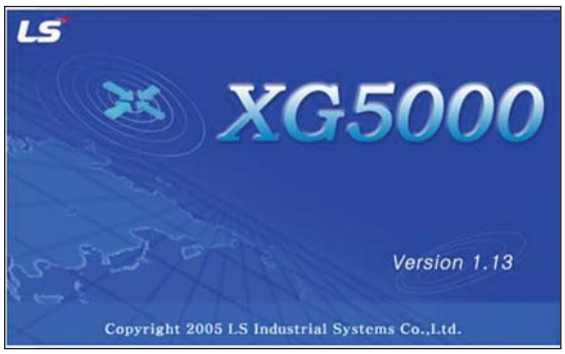
④ Description: Describes general functions of instruction.

⑤ No. of step: The number of basic steps of instruction, which means the number of steps in case indirect specification, index formula and direct variable input were not used.

XG5000 Communication Parameters

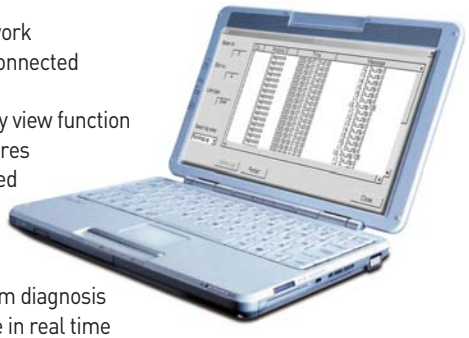
Features

- Default settings of the network and easy of user program
- Network system and provides extensive monitoring and control of the communication module
- Efficient implementation of a fast interface with the CPU to the network management
- Easy access with XGT and Modbus
- Rich built-in diagnostic function (Condition of CPU, Link, Auto SCAN, Frame monitor)



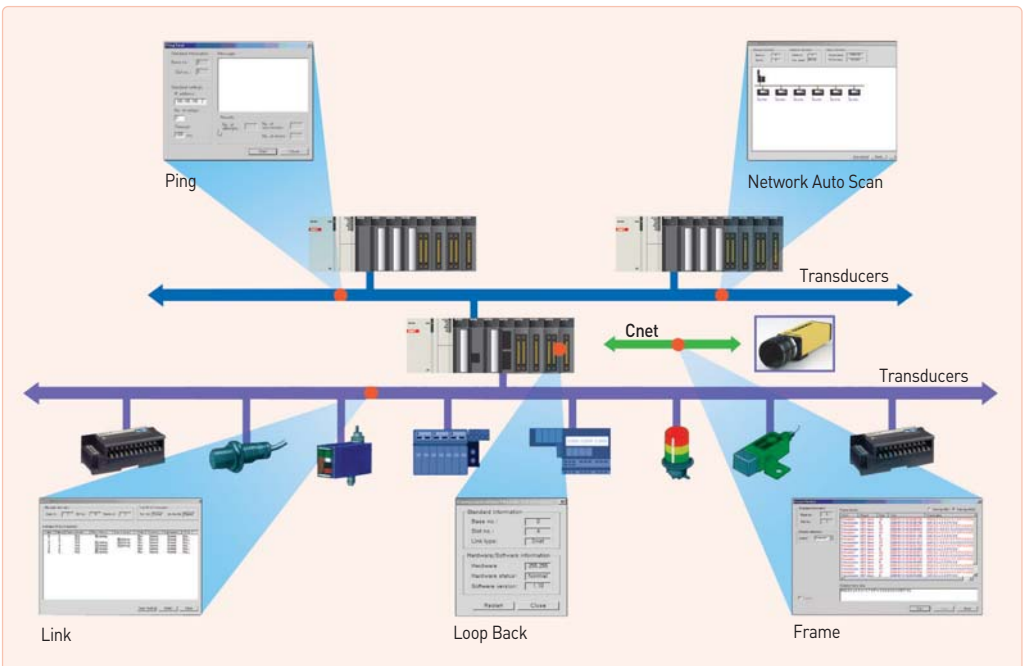
Item		Industrial Ethernet network				Fieldbus network				
		RAPIEnet	EtherNet/IP	Modbus TCP/IP	XGT dedication	Cnet	Fnet	Rnet	DeviceNet	Profibus-DP
Network service	Smart extension	○	○	–	–	–	–	–	–	–
	High speed link	○	–	–	○	–	○	○	○	○
	P2P	○	○	○	○	○	–	–	–	○
	XGT server	–	–	–	○	○	–	–	–	–
	Modbus server	–	–	○	–	○	–	–	–	–
Smart extension	Max. station	63	63	-	-	-	-	-	-	-
	Network cycle time	2~1000ms	2~2,147,483,647ms	-	-	-	-	-	-	-
	No. of block	64	64	-	-	-	-	-	-	-
	Data per block	768 bytes	1400 bytes	-	-	-	-	-	-	-
High speed link	Max. station	64	-	-	64	-	64	64	63	123
	No. of block	128	-	-	128	-	64	64	63	123
	Send block	64	-	-	32	-	32	32	63	123
	Receive block	128 - Send block	-	-	128 - Send block	-	64 - Send block	32	63	123
	Data per block	200 words	-	-	200 words	-	60 words	60 words	256 bytes	244 bytes
P2P	No. of block	64	64	64	64	64	-	-	-	64
	Data per block	1400 bytes	1400 bytes	125 bytes	1400 bytes	256 bytes	-	-	-	244 bytes
Transmission speed Media		100/1,000Mbps	100/1,000Mbps	100/1,000Mbps	100/1,000Mbps	900~115,200Mbps	1Mbps	1Mbps	125/250/500kbps	9.6k~12,000kbps
Topology		Ring, Line, Srat	Line, Srat	Line,Srat	Line, Srat	Bus	Bus	Bus, Srat	Bus, Srat	Bus, Srat
Configration Tool		XG5000							XG5000 / N Configurator	

Various network diagnosis and monitoring



- Auto Scan: Searching and displaying each node connected to network
- Ping Test : Indicates the port connection status of other stations connected to the network.
- View Communication Module Log : Communication module history view function of XG5000 program can check whether error occurred and measures
- Remote O/S download : Update OS of the remote module connected to the network.
- Loopback test : This function is to check for port anomalies and performs a loopback test for each port.
- System synchronization : Synchronize current PLC status to system diagnosis
- Frame Monitor: Collecting and displaying sending/receiving frame in real time

Item	Industrial Ethernet network				Fieldbus network				
	RAPIEnet	EtherNet/IP	Modbus TCP/IP	XGT dedication	Cnet	Fnet	Rnet	DeviceNet	Profibus-DP
Communication module status	O	O	O	O	O	O	O	O	O
Service status	O	O	O	O	O	O	O	O	O
Media information	O	O	O	O	O	–	–	–	–
Auto Scan	O	O	O	O	–	O	O	O	O
Ping Test	–	O	O	O	–	–	–	–	–
View Communication Module Log	O	O	O	O	O	O	O	–	O
Remote O/S download	O	–	–	–	–	–	–	–	–
Loopback test	O	O	O	O	O	–	–	–	–
System synchronization	O	O	O	O	O	O	O	O	O
Frame monitor	-	-	-	-	O	-	-	-	-



XGT Panel iXP2 Series

Main Specification

- Aluminum body frame, responsive touch screen.
- Easy-to-use Multi-touch, gesture, dual screen, portrait mode.
- Multi connected with 1Gbits 2ch.
  Ethernet between PC to PLC.
- Various interfaces : USB host /device, SD card, HDMI.
- High resolution : 1024 X 768
- IP66, UL type 4x, NEMA 4x standards
- Explosion proof. IECEx, ATEX, KCs

CE KC c UL US LISTED

Item		iXP2-0800A/D	iXP2-1000A/D	iXP2-1200A/D	iXP2-1500A/D
Display type		TFT color LCD			
Screen size		8.4″	10.4″	12.1″	15″
Display resolution		800×600	1,024×768		
Color indication		24-bit color (16.7M colors)			
Backlight		LED method, automatic On / Off support			
Backlight lifetime		50,000 hour			
Touch panel		Capacitive touch			
Audio output		Magnetic buzzer (85dB)			
Processor		1GHz, Dual core			
Memory	Flash	1GB			
	Operating RAM	1GB			
	Backup RAM	1 Mbyte			
Backup data		Date / Time data, Logging / Alarm / Recipe data, Non-volatile devices			
Battery		CR2032(3.0V/210mAh, About 3years/25℃)			
Video output		1 × HDMI			
Ethernet		1 ×10Base-T / 100Base-TX, 1 × 10Base-T / 100Base-TX / 1000Base-T			
USB host		3 x USB 2.0 (Front × 1, Rear x 2)			
USB device		1 × USB 2.0 (Send / Receive front, PC and project data etc.)			
RS-232C		1 × RS-232C (DSUB 9 / Male type)			
RS-422/485		1 × RS-422/485 (Terminal block)			
Multi-language		Can display 12 languages simultaneously			
Animation		GIF format support			
Recipe		Support			
Data logging		Support			
Script launcher		Support			
Standard certification		CE, KC, UL, IECEx, ATEX, KCs			
Protection standard		IP66, Conform to the UL type 4x, NEMA 4x standard			
Explosion proof		Ex nA IIC T5 Gc, Ex tc IIIC T100℃ Dc IP64			
Dimensions (mm)		240 ×180 × 60	271×212× 60	313 × 239 x 60	395 × 294 × 66
Panel cut (mm)		228.5 × 158.5	259.0 × 201.0	301.5 × 227.5	383.5 × 282.5
Power		iXP2-xxxxA : AC100 / 240V, iXP2-xxxxD : DC24V			
Power consumption (W)		25	25	30	30
Weight (Kg)		1.87	2.35	3.0	4.6

XGT Panel iXP Series

Main Specification

- 1GHz 32bit RISC Embedded CPU
- 16,777,216 TFT color LCD
- 128MB display data and 1MB back-up memory
- Ethernet 1ch, RS-232C 2ch, RS-422/485 1ch
- USB host 3ch and device 1ch
- SD memory card interface

Main Functions

- PLC ladder monitoring (XGK/XBC PLC only)
- Web Server/Data Server
- Path through
- XP-Remote : Remote controlling and monitoring

Item		iXP50-TTA/DC	iXP70-TTA/DC iXP70-TTA/AC	iXP80-TTA/DC iXP80-TTA/AC	iXP90-TTA/DC iXP90-TTA/AC
Display type		TFT color LCD			
Screen size		21.3cm (8.4″)	26.4cm (10.4″)	30.7cm (12.1″)	38.1cm (15″)
Display Resolution		800×600 pixel (SVGA)	800×600 pixel (SVGA)	800×600 pixel (SVGA)	1,024×768 pixel (SVGA)
Color indication		16-bit and 24-bit Color (default: 16-bit Color)			
Indication degree		Left/Right: 80 deg. Up: 80 deg. Down: 60 deg.	Left/Right: 80 deg. Up: 60 deg. Down: 80 deg.		
Backlight		LED Type			
Backlight duration		70,000 hours	60,000 hours		
Brightness		500 cd/㎡	700 cd/㎡	550 cd/㎡	800 cd/㎡
Touch panel		4-Line type, analog			
Sound Output		Magnetic buzzer (85dB)			
Process		ARM Cortex-A8 Core (32bit RISC), 1GHz			
Memory	Flash	512MB(display 128MB)	1GB(display 128MB)		
	Operating RAM	256MB	512MB		
	Backup RAM	1MB			
Backup data		Date/Hour data, Logging/Alarm/Recipe data and nonvolatile device			
Battery duration		Approx. 3 years (Operating ambient temperature of 25℃)			
Ethernet		1 channel, 10/100BASE-TX			
USB Host		3 channels, USB 2.0 host (mouse, keyboard, printer* and USB memory driver is available)			
		1 channel, USB 2.0 slave (for download and upload project file)			
RS-232C		1 channel			
RS-422/485		1 channel, RS-422/485 mode			
SD Card		1 Slot (SDHC)			
Human sensor		-	Detection range: side 1-1.5m, front 40-50cm Angle: high/low 100°, left/right 140° (detecting 5-20 micron infrared light)		
Audio output		LINE-OUT 1 channel			
Expansion module		For communication and I/O option module (available later)			
VM module		-	4 channels video input (available later)		
Multi-language		Up to 12 language simultaneously			
Animation		GIF format is available			
Recipe		available			
Data logging		available			
Script executor		available			
Certifications		CE, UL(cUL), KC			
Protection standard		IP65			
Dimension (mm)		240.5×180.0×54.4	270.5×212.5×60.0	313.0×239.0×56.0	395.0×294.0×60.0
Panel cut (mm)		228.5×158.5	259.0×201.0	301.5×227.5	383.5×282.5
Rated voltage		DC24V	DC12/24V(AC 100-240V)		
Power consumption (W)		30.8	42.3	42.3	42.3
Weight(Kg)		1.9	2.2	2.4	3.9

* SEWOO printer only

XGT Panel eXP2 Series

Fully compatible with eXP

- Panel cut, interface, design, and drawing file are 100% compatible.

Superior Performance

- ARM Cortex A8 800MHz, eMMC 4G, DDR3

Enhanced product reliability

- LCD Backlight lifespan extended
- Non Battery Type NVRAM

Variety of interfaces and functions

- Various communication drivers and Micro SD I/F available

Item		eXP2-04□*0D	eXP2-05□*0D	eXP2-05□*2D	eXP2-07□*0D	eXP2-07□*1D	eXP2-07□*2D	eXP2-10□*0D	eXP2-10□*1D
Display Type		TFT Color LCD							
Screen Size		10.9cm (4.3")	14.2cm (5.6")		17.8cm (7")			25.9cm (10.1")	
Display Resolution		480 x 272	640 x 480		800 x 480			1024 x 600	
Color Indication		24Bit Color (16.7M)	18Bit Color (262,144)		24Bit Color (16.7M)			24Bit Color (16.7M)	
Indication Degree		Left/Right: 60 deg. Upper: 40 deg. Lower: 50 deg	Left/Right: 60 deg. Upper: 40 deg. Lower: 60 deg.		Left/Right: 70 deg. Upper: 50 deg. Lower: 70 deg.			Left/Right: 70 deg. Upper: 50 deg. Lower: 70 deg.	
Backlight		LED Type (Supports Backlight Auto-off Function)							
Backlight Duration		50,000 Hours	20,000 Hours		50,000 Hours			30,000 Hours	
Touch Panel		4-Wire Resistive, Analog							
Audio Output		Magnetic Buzzer (85dB)							
Process		800MHz	800MHz		800MHz			800MHz	
Memory	Drawing Memory	64MB	64MB		64MB			64MB	
	Operating RAM	512MB	512MB		512MB			512MB	
	Operating RAM	128KB	128KB		128KB			128KB	
Backup Data		Date/Hour Data, Logging/Alarm/Recipe Data and Nonvolatile Device							
Battery Life		Approx. 3 years (Operating Ambient Temperature of 50°C)							
Ethernet		1 Channel, IEEE802.1a, 10Base-T/100Base-TX		-	1 Channel, IEEE802.1a, 10Base-T/100Base-TX		-	1 Channel, IEEE802.1a, 10Base-T/100Base-TX	
USB Host		1 Channel, USB 2.0 Host (Mouse, keyboard, printer, USB flash drive, etc.)							
USB Device		-	1 Channel, USB 2.0 Device (for Download and Upload Project)					1 Channel, USB 2.0 Device (for Download and Upload Project File)	
Micro SD Card		-	-		-	1 Channel SDHC Class10	-	-	1 Channel SDHC Class10
RS-485, RS-232C		1 Channel, RS-232C (DSUB 9/Male Type)			2 Channels, RS-485, RS-232C (DSUB 9/Male Type)				
RS-422/485		1 Channel, RS-422/485 (DSUB 9/Male Type)			1 Channel, RS-422/485 Mode (Terminal Type)				
Multi-language		Up to 12 Language Simultaneously							
Animation		GIF Format is Available							
Recipe		Available							
Data Logging		Available							
Script Executor		Available							
Certifications		CE, UL(cUL), UL Type 4X, KC		CE, UL(cUL), KC	CE, UL(cUL), UL Type 4X, KC		CE, UL(cUL), KC	CE, UL(cUL), UL Type 4X, KC	
Protection Standard		IP65 Note 1)	IP65 Note 1)		IP65 Note 1)			IP65 Note 1)	
Dimension (mm)		128 x 102 x 32.5	165 x 132.5 x 36.1		208 x 154 x 44.4			276 x 218 x 35.1	
Panel Cut (mm)		119 x 93	156 x 123.5		192 x 138			260 x 202	
Rated Voltage		DC24V	DC24V		DC24V			DC24V	
Power Consumption (W)		4	5.5	5.5	6			6	
Weight (kg)		0.27	0.43	0.43	0.59	0.59	0.58	1.0	1.0

□*:0 (WinCE 7.0 Core), 1 (WinCE 7.0 Pro)
Note 1): IP66 for UL Type 4X models.

XGT Panel eXP Series

Main Specification

- TFT LCD-applied wide type
- LED Backlight adopted for enhanced contrast ratio and low-power
- PLC Ladder monitoring function: Only XGK/XBC supports*
- Web Server* / Data Server* / Path-Through Function*
- Remote Viewer Function*
- Screen editor : XP-Builder

* Functions that support only the TTA model

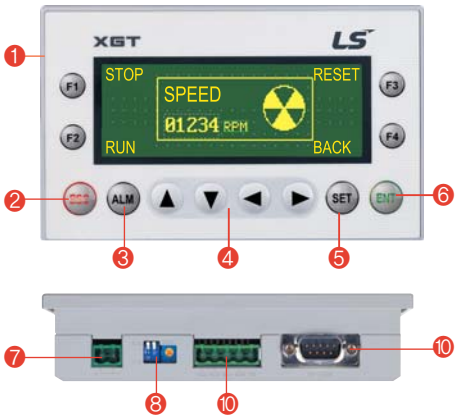
Item		eXP20-TTA/DC, CERTI	eXP20-TTA/DC	eXP30-TTA(B)/DC	eXP30-TTE/DC	eXP40-TTE/DC	eXP40-TTA(B)/DC	eXP40-TTA/DC, CERTI	eXP60-TTA(B)/DC	eXP60-TTA/DC, CERTI
Display type		TFT color LCD								
Screen size		10.9cm (4.3inch)		14.2cm(5.6inch)		17.8cm(7inch)			25.9cm(10.2inch)	
Display Resolution		480 x 272 pixel		640 x 480 pixel		800 x 600 pixel(WVGA)				
Color indication		24-bit Color(16.7M)		16-bit Color(65,536 Color)		24-bit Color(16.7M)			16-bit Color(65,536)	
Indication degree		Left/Right:60 deg. Upper:40 deg. Lower:60 deg.							Left/Right:55 deg. Upper:35 deg. Lower:55 deg.	
Backlight		LED Type (Supports backlight auto-off function)								
Backlight duration		30,000 hours		20,000 hours						
Touch panel		4-Wire Resistive, analog								
Audio output		Magnetic buzzer (85dB)								
Process		i.MX283(454MHz)								
Memory	Flash	128MB(Screen 64MB)								
	Operation RAM	128MB								
	Backup RAM	128KB								
Backup data		Date/Hour data, Logging/Alarm/Recipe data and nonvolatile device								
Battery duration		Approx. 3 years (Operating ambient temperature of 50 °C)								
RTC		Time error Approx. 3 sec/1day(Operating ambient temperature of 25 °C)								
Ethernet		1 channel, IEEE802.1a, 10Base-T/100Base-TX			-			1 channel, IEEE802.1a, 10Base-T/100Base-TX		
USB Host		1 channel, USB 2.0 Host (mouse, keyboard, printer and USB memory driver is available)								
USB Device		-		1 channel, USB 2.0 Device (for download and upload project)						
RS-485, RS-232C		1channel, RS-232C (DSUB 9/Male Type)				2channels, RS-485, RS-232C (DSUB 9/Male Type)				
RS-422/485		1channel, RS-422/485 (DSUB 9/Male Type)				1channel, RS-422/485 mode (Terminal Type)				
Multi-language		Up to 12 language simultaneously								
Animation		GIF format is available								
Recipe		available								
Data logging		available								
Script executor		available								
Certifications		CE, UL Type4X, KC		CE, UL(cUL), KC				CE, UL Type4X, KC	CE, UL(cUL), KC	CE, UL Type4X, KC
Protection standard		IP66		IP65				IP66	IP65	IP66
Dimension (mm)		128x102x32		165x132.5x36.1		208.0 x 154.0 x 44.4			276.0 x 218.0 x 44.4	
Panel cut (mm)		119x93		156.0 x 123.5		192.0 x 138.0			260.0 x 202.0	
Rated voltage		DC24V								
Power consumption (W)		4.6W		7.2W			6.5W		10W	
Weight(Kg)		0.3		0.42	0.39	0.62	0.63		1.08	

* SEWOO printer only

XGT Panel XP Series

Text type XP10

- Screen: 192×64 Graphic STN LCD
- System RAM: 1000 words
- Flash memory: Program/Parameter back up
- Communication: Half-duplex comm.
  - Baud rate: 1200~115200 bps
  - Master/slave setting available
  - RS-232C/RS-485 2 CH separate to use
- Power requirements - 24 V input or 5 V direct input by LS PLC
- Various function key - ESC, ALM, SET, ENT, F1~F4, Arrow keys
- Panel Editor - Easy programming and H/W setting

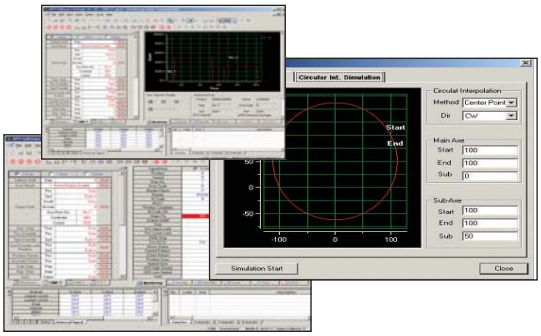


1. Key to control PLC device and screen
2. ESC key
3. Alarm history
4. Data input and Screen change
5. PLC data setting
6. Enter key
7. DC24V input terminal
8. RS-232C port to download a project
9. Brightness adjustment
10. RS-422 port

Item		Specifications	
		XP10BKA/DC	XP10BKB/DC
Input voltage	5VDC	DC 4.9 ~ 5.1 (RS-232C port)	
	24VDC	DC 21.6 ~ 26.4 (DC Input connector)	
	Consumption current	Less than 200mA	
Display		LED back-light (192 x 64 Dots)	
Communication interface		RS-232C, RS-422/485	
Flash memory		256K bytes	
Language		Default: English, Can be switched to Korean/Chinese/Russian	
RTC		None	Supports
Download specification		115,200bps	
Keys		12 Keys (F1~F4, ESC, ALM, ▲, ▼, ◀, ▶, SET, ENT)	

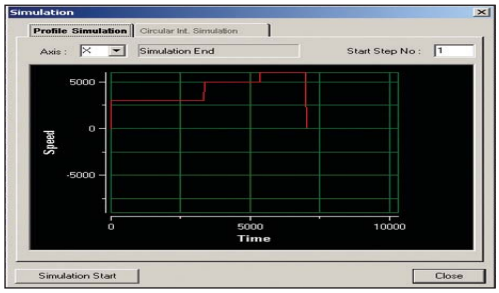
Features

- Windows-based easy operation
- Supporting all types of LS APM module
- Improved parameter editing
  (Copy, Paste, Initialization, etc.)
- Various monitoring
  (Operation type of each axis, etc.)
- Profile trace and operation monitoring
- Profile graph and simulation of circular interpolation
- Available to edit operation parameter in EXCEL

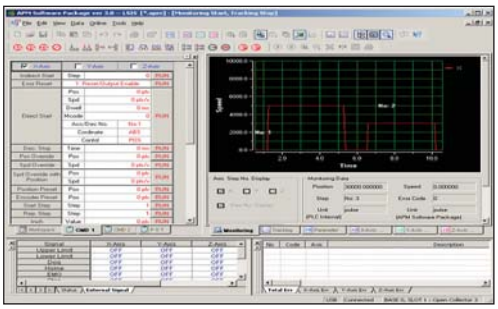


Step	Cord	Control	Pattern	Method	Address [pulse]	Sub Address [pulse]	M Code	A/D No.	Speed [pls/s]	Dwell [ms]	Cir.Int Dir
1	ABS	POS	END	SIN	10000	0	0	No.1	1000	0	CW
2	ABS	POS	END	SIN	0	0	0	No.1	0	0	CW
3	ABS	POS	END	SIN	0	0	0	No.1	0	0	CW
4	ABS	POS	END	SIN	0	0	0	No.1	0	0	CW
5	ABS	POS	KEEP	SIN	100000	0	0	No.1	0	0	CW
6	ABS	POS	END	SIN	0	0	0	No.1	10000	0	CW
7	ABS	POS	END	SIN	0	0	0	No.1	10000	0	CW
8	ABS	POS	END	SIN	0	0	0	No.1	0	0	CW
9	ABS	POS	END	SIN	0	0	0	No.1	0	0	CW
10	ABS	POS	CONT	SIN	100000	0	0	No.1	0	0	CW
11	ABS	POS	END	SIN	1000	0	0	No.1	10000	0	CW
12	ABS	POS	END	SIN	0	0	0	No.1	5000	0	CW

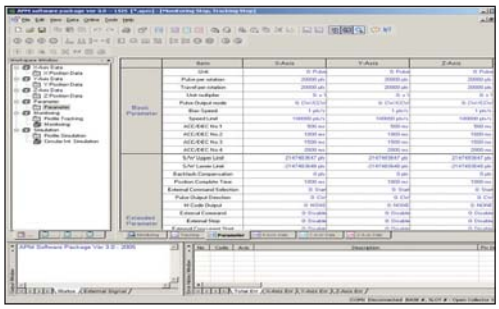
Operation Data
Define operation method, target location, operation speed of each axis.



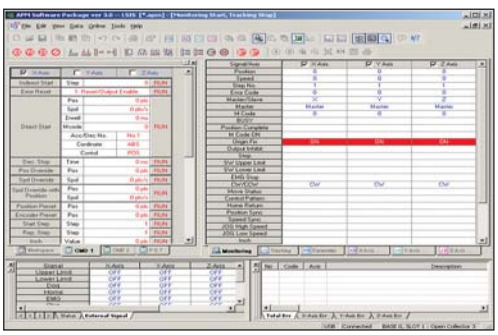
Profile simulation (Off-line)
Monitoring operation speed of each axis with graph type and saving result as image file.



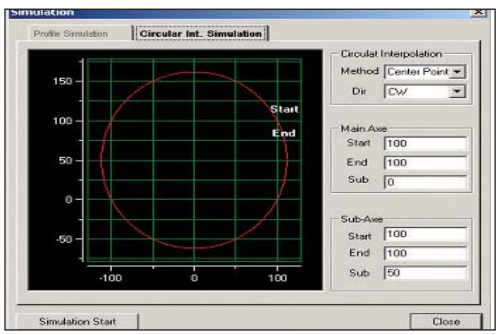
Profile Trace (On-line)
Monitoring operation speed of each axis with graph type and saving result as image file.



Operation parameter
Setting basic operation characteristics and limit value.



Monitoring (On-line)
Checking basic operation characteristics about each axis and monitoring operation condition.



Circular interpolation simulation (Off-line)

SOFTWARE

XGT Product list

CPU / PWR / Base / I/O

CPU	XGK-CPUH,* CPUU, CPUHN, CPUUN	6,144pt, Program memory : 64Ksteps
	XGK-CPUS,* CPUA, CPUSN	3,072pt, Program memory : 32Ksteps
	XGK-CPUE*	1,536pt, Program memory : 16Ksteps
	XGI-CPUUN, CPUU/D, CPUU, CPUH*	9,144pt (IEC type), Program memory:1Mbyte
	XGI-CPUS*	3,072pt (IEC type), Program memory:128kbyte
	XGI-CPUE*	1,536pt (IEC type), Program memory:64kbyte
Power	XGP-ACF1*	Free Voltage/DC5V 3A, DC24V 0.6A
	XGP-ACF2*	Free Voltage/DC5V 6A
	XGP-AC23*	220V/DC5V 8.5A
	XGP-DC42*	DC24V/DC5V 6A
Main base	XGB-M04A*	4 Slot
	XGB-M06A*	6 Slot
	XGB-M08A*	8 Slot
	XGB-M10A*	10 Slot
	XGB-M12A*	12 Slot
Expansion base	XGB-E04A*	4 Slot
	XGB-E06A*	6 Slot
	XGB-E08A*	8 Slot
	XGB-E12A*	12 Slot
Input	XGI-A12A	AC110V, 16pt
	XGI-A21A	AC220V, 8pt
	XGI-A21C	AC 220V Input, 8pt(1COM)
	XGI-D21A	DC24V, 8pt
	XGI-D22A*	DC24V, 16pt, Sink/Source
	XGI-D22B	DC24V, 16pt, Source
	XGI-D24A*	DC24V, 32pt, Sink/Source
	XGI-D24B	DC24V, 32pt, Source
	XGI-D28A*	DC24V, 64pt, Sink/Source
	XGI-D28B	DC24V, 64pt, Source
Output	XGQ-RY1A	Relay, 8pt
	XGQ-RY2A*	Relay, 16pt
	XGQ-RY2B	Relay, 16pt, Surge killer
	XGQ-SS2A	Triac, 16pt
	XGQ-TR1C	Transist, 8pt(2A, 1COM)
	XGQ-TR2A*	Transist, 16pt, Sink
	XGQ-TR2B	Transist, 16pt, Source
	XGQ-TR4A*	Transist, 32pt, Sink
	XGQ-TR4B	Transist, 32pt, Source
	XGQ-TR8A*	Transist, 64pt, Sink
	XGQ-TR8B	Transist, 64pt, Source
Input/output	XGH-DT4A*	DC24V 16pt, Transist, 16pt, Sink

* : G3 Coating Products

Special module

Analog input	XGF-AV8A*	Voltage, 8ch
	XGF-AC8A*	Current, 8ch
	XGF-AD8A*	Voltage /Current, 8ch
	XGF-AD16A*	Insulation Voltage /Current, 16ch
	XGF-AD4S*	Voltage /Current, 4ch
	XGF-AW4S*	2-wire, Voltage/ Current input, 4Ch (Isolated)
Analog output	XGF-DV4A*	Voltage, 4ch
	XGF-DC4A*	Current, 4ch
	XGF-DV8A*	Voltage, 8ch
	XGF-DC8A*	Current, 8ch
	XGF-DV4S*	Voltage, 4ch, Insulation
	XGF-DC4S*	Current, 4ch, Insulation
Analog input/output	XGF-AH6A*	Input: 4ch, Voltage/ Current Output: 2Ch Voltage/ Current
HART I/F Analog input/output	XGF-AC4H	Input: 4ch
	XGF-DC4H	Output: 4Ch
High speed counter	XGF-HO2A*	Open collector, 2ch
	XGF-HD2A*	Line drive, 2ch
	XGF-HO8A *	8-channels high speed counter module, 8Ch
Positioning	XGF-P01H~P04H	Open collector, 1~4axis
	XGF-PD1H~PD4H	Line drive, 1~4axis
Positioning (Network type)	XGF-PN8A	LS ELECTRIC EtherCAT Network, 8axis
	XGF-PN8B	Standard EtherCAT Network, 8axis
	XGF-PN4B	Standard EtherCAT Network, 4axis
Motion control	XGF-M16M	MECHATROLINK-II, 4axis
	XGF-M32E	Standard EtherCAT, 32axes
Temperature input	XGF-RD8A	RTD, 8ch
	XGF-RD4A*	RTD, 4ch
	XGF-RD4S*	RTD, 4ch, Insulation
	XGF-TC4S*	Thermo couple, 4ch, Insulation
Temperature controller	XGF-TC4UD	Input: 4Ch(Voltage/Cuttent/RTD/TC) Output: 8Ch(TR/Current) 4loops
	XGF-TC4RT	Input:4Ch(RTD) Output: 4Ch(TR) 4loops
Event input	XGF-SOEA	DC24V, 32points
Datalog	XGF-DL16A	USB 2.0, CF2001, Max. 16Gbyte, 32points(input 22points, output 10points)

* : G3 Coating Products

Communication module

RAPIEnet+ -RAPIEnet v2 -EtherNet/IP -Modbus TCP/IP -Dedicated XGT Network	XGL-EFMTB*	Master/Client, Twisted fair 2ch.
	XGL-EFMFB*	Master/Client, Fiber optic 2ch.
	XGL-EFMHB*	Master/Client, Twisted fair/fiber optic
	XGL-DBDT	Expansion driver-Twisted pair 2ch.
	XGL-DBDF	Expansion driver-Fiber optic 2ch.
	XGL-DBDH	Expansion driver-Fiber optic/Twisted pair
	XOL-ES4T	Stand alone switch twisted pair 4ch.
	XOL-ES4H	Stand alone switch twisted 2ch. fiber 2ch.
	XGL-EH5T	Open Ethernet switching hub
Computer Link (Cnet)	XGL-CH2B*	RS-232C 1ch, RS-422/485 1ch
	XGL-C22B*	RS-232C 2ch
	XGL-C42B*	RS-422/485 2ch
DeviceNet(Dnet)	XGL-DMEB*	DeviceNet, Master
Profibus-DP (Pnet)	XGL-PMEB*	Profibus-DP, Master
	XGL-PSRA	Profibus-DP Slave, Remote interface
	XGL-PSEA	Profibus-DP Slave
Rnet	XGL-RMEB*	Rnet, Master, TP
	GOL-RR8T	Rnet stand alone repeater hub
Fnet	XGL-FMEA	Fnet, Master
BACnet/IP	XGL-BIPT	BACnet client/server
RAPIEnet V1	XGL-EIMT	RAPIEnet, Twisted fait 2ch
	XGL-EIMF	RAPIEnet, Fiber optic 2ch
	XGL-EIMH	RAPIEnet, Twisted fair, Fiber optic
EtherNet/IP	XGL-EIPT	Industridl Ethernet, Twisted fair 2ch

* : G3 Coating Products

XGR module

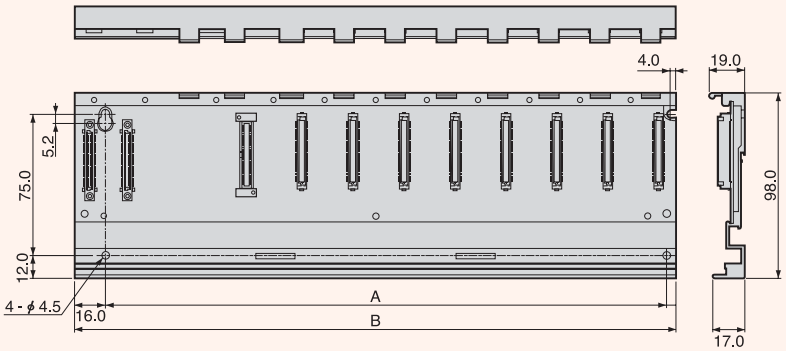
CPU	XGR-CPUH/T*	Twisted pair
	XGR-CPUH/F	Fiber optic(2km)
	XGR-CPUH/S	Fiber optic(15km)
Power	XGR-AC12*	110V, 5.5A(Main base)
	XGR-AC13*	110V, 8.5A(Expansion base)
	XGR-AC22*	220V, 5.5A(Main base)
	XGR-AC23*	220V, 8.5A(Expansion base)
	XGR-DC42*	DC24V/DC5V 7A, Main(Expansion base)
Base	XGR-M06P*	6Slot(Main base)
	XGR-M02P*	2Slot(Main base)
	XGR-E08P	8Slot(Expansion base)
	XGR-E12P*	12Slot(Expansion base)
	XGR-E12H*	12Slot(Expansion base, Drive Redundancy)
Expansion drive	XGR-DBST*	Twisted pair - Twisted
	XGR-DBSF*	Pair Fiber optic - Fiber optic(2km)
	XGR-DBSH*	Twisted pair - Fiber optic(2km)
	XGR-DBSFS	Pair Fiber optic - Fiber optic(15km)
	XGR-DBSHS	Twisted pair - Fiber optic(15km)
Expansion drive redundancy	XGR-DBDT	Twisted pair - Twisted
	XGR-DBDF	Pair Fiber optic - Fiber optic(2km)
	XGR-DBDH	Twisted pair - Fiber optic(2km)

* : G3 Coating Products

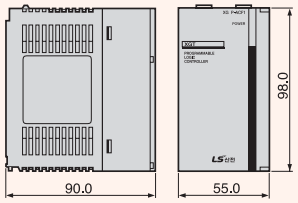
CPU	Product	Description
Expansion cable	XGC-E041	0.4m
	XGC-E061	0.6m
	XGC-E121	1.2m
	XGC-E301	3.0m
	XGC-E501	5.0m
	XGC-E102	10m
	XGC-E152	15m
Termination connector	XGT-TERA	Termination connector for expansion base download cable
USB cable	USB-301A	USB download cable
RS232C cable	K1C-050A	RS232C download cable
Sync & Expansion cable	XGC-F201	2m (Fiber optic)
	XGC-F501	5m (Fiber optic)
Dummy	XGT-DMMA	Dummy module
	XGR-DMMA	Dummy module

Dimensions

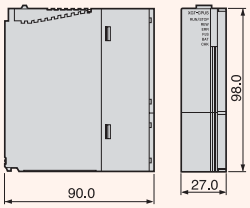
• Base



• Power module



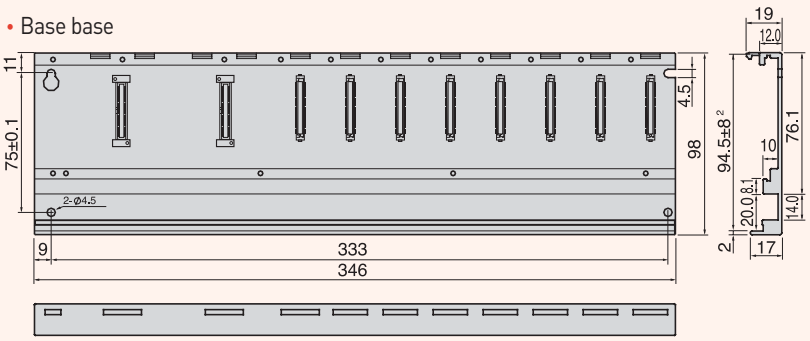
• CPU and I/O module



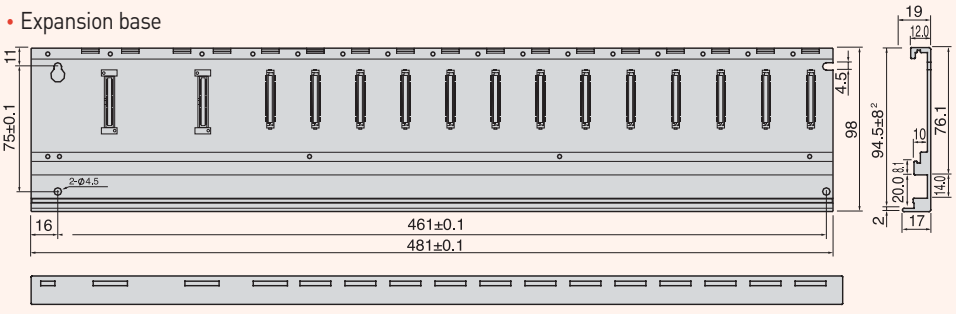
Base Dimensions (W)

Item	XGB-M04A/E04A	XGB-M06A/E06A	XGB-M08A/E08A	XGB-M10A	XGB-M12A/E12A
A	190	244	298	355	406
B	210	264	318	375	426

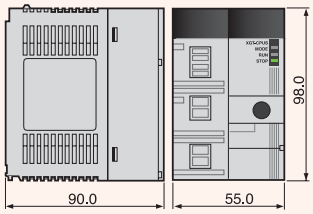
• Base base



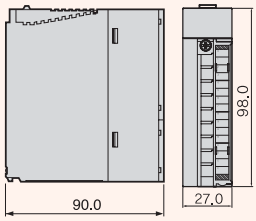
• Expansion base



• Power and CPU



• I/O



Base Dimensions (W)

Item	XGR-M06P	XGR-E08P	XGR-E12P
A	333	353	461
B	346	373	481

Memo

FUTURING SMART ENERGY

We open up a brighter future through
efficient and convenient energy solutions.

Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

- According to The WEEE Directive, please do not discard the device with your household waste.

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2021. 11

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