



# LSIS Automation Products

Programmable Logic Controller / Human Machine Interface / Servo Drive & Motor

## XGT PLC High Performance

### Rack Type (XGR/XGK/XGI Series)

#### XGR: Redundancy System

- CPU processing speed: 42ns/step
- I/O point: 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

#### XGK: Ladder Programming

- CPU processing speed: 8.5ns/step
- I/O point: max. 6,144
- Various types of CPU E/S/A/H/U/SN/HN/UN (16K/32K/32K/64K/128K/64K/128K/256K)
- Integrated intelligent software package: XG5000
- System solution based on Open network: Ethernet, Profibus-DP, DeviceNet
- PID control
- Built-in Ethernet port: SN/HN/UN

#### XGI: IEC Standard Programming

- CPU processing speed: 8.5ns/step
- I/O point: max. 6,144
- Various types of CPU S/H/U/UN (128K/512K/1MB/2MB)
- IEC 61131-3 Standard programming
  - LD (Ladder Diagram), SFC (Sequential Function Chart), ST (Structured Text)
  - User defined FB (Function Block)
- PID control
- Built-in Ethernet port: UN

### Block Type (XGB Series)

- Supporting floating-point arithmetic
- Built-in Cnet, HSC, PID, Positioning, Pulse catch, Input filter, External interrupt
- Fieldbus Option: RS-232C, RS-422/485, Ethernet, Ethernet I/P, CANopen, Profibus-DP, DeviceNet
- Download port: Serial, USB

#### Terminal Block Type

- XGB-U (XBC/XEC-U)
  - CPU processing speed: 60ns/step
  - Max. 352 I/O points
  - Program capacity: 32Ksteps/384KB (XBC/XEC)
  - Various line-up: standard, built-in analog, built-in positioning
  - Compatible with XGB expansion modules
- High performance (XBC/XEC-H)
  - CPU processing speed: 83ns/step
  - Max. 384 I/O points
  - Program capacity: 15Ksteps/200KB (XBC/XEC)
- Standard (XBC/XEC-SU)
  - CPU processing speed: 94ns/step
  - Max. 284 I/O points
  - Program capacity: 15Ksteps/200KB (XBC/XEC)
- Economic (XBC/XEC-E)
  - CPU processing speed: 240ns/step
  - Max 38 I/O points
  - Program capacity: 4Ksteps/50KB (XBC/XEC)
  - Option I/O only

#### Standrd (XBM-S): Connector Type

- Programming language: Ladder
- CPU processing speed: 160ns/step
- Max. 256-point I/O control
- Program capacity: 10Ksteps

#### Option I/O

|           |   |           |   |
|-----------|---|-----------|---|
| XBO-RTCA  | RTC (Real Time Clock), Battery                    | XBO-AD02A | Voltage/Current, Input 2ch                                |
| XBO-DC04A | DC 24V Input 4 points                             | XBO-DA02A | Voltage/Current, Output 2ch                               |
| XBO-TN04A | Transistor (Sink) Output 4 points                 | XBO-AH02A | Voltage/Current, Input 1ch<br>Voltage/Current, Output 1ch |
| XBO-RD02A | RTD (Resistance Temperature Detect),<br>Input 2ch | XBO-TC02A | TC (Thermocouple), Input 2ch                              |

\* High speed counter and positioning functions are available in XBO-DC04A and XBO-TN04A, respectively with XGB standard type.



XGR



XGK/XGI

\* Programming language selection via CPU replacement



XBC/XEC U



XBC/XEC H



XBC/XEC S



XBC/XEC E



XBM (XBC-S)

## XGT Panel Human Machine Interface

### iXP Series (iXP50/iXP70/iXP80/iXP90)

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

### eXP Series (eXP20/eXP40/eXP60)

- 4.3", 7" and 10.2" wide-screen sizes TFT color LCD
- Ethernet 1ch, RS-485 1ch, RS-232C 1ch, RS-422/RS-485 1ch
- Large memory for drawing (64MB)
- USB Host 1ch and device 1ch

### XP Series (XP90/XP80/XP70/XP50/XP40/XP30)

- High and vivid distinction with 65,536 colors
- 10/100BASE-T Ethernet interface
- USB host for peripheral devices: USB drive, mouse, keyboard, etc.
- Sufficient memory for screen data: 10MB

### Text Type (XP10)

- Screen: 192 x 64 Graphic STN LCD
- RS-232C/RS-485 2ch separate to use
- Various function key-ESC ALM SET ENT F1~F4 Arrow keys



## XGT InfoU SCADA Software

- Integrated development environment from graphic technology
- Various graphic library and graphic script
- Active X control and VB script supported
- Industrial standard interface like OLE DB, OPC server/client
- XP, Vista, Window 7, Window 8, 32/64 bit compatible



## Smart I/O Distributed System

### Stand Alone Type

- Wiring reduction and real time control of distributed I/Os
- Supports Rnet, DeviceNet, Profibus-DP, MODBUS (RS-422/485), RAPIenet
- Various I/O (DC/TR/Relay) modules with 16/32 points

### Expandable Type

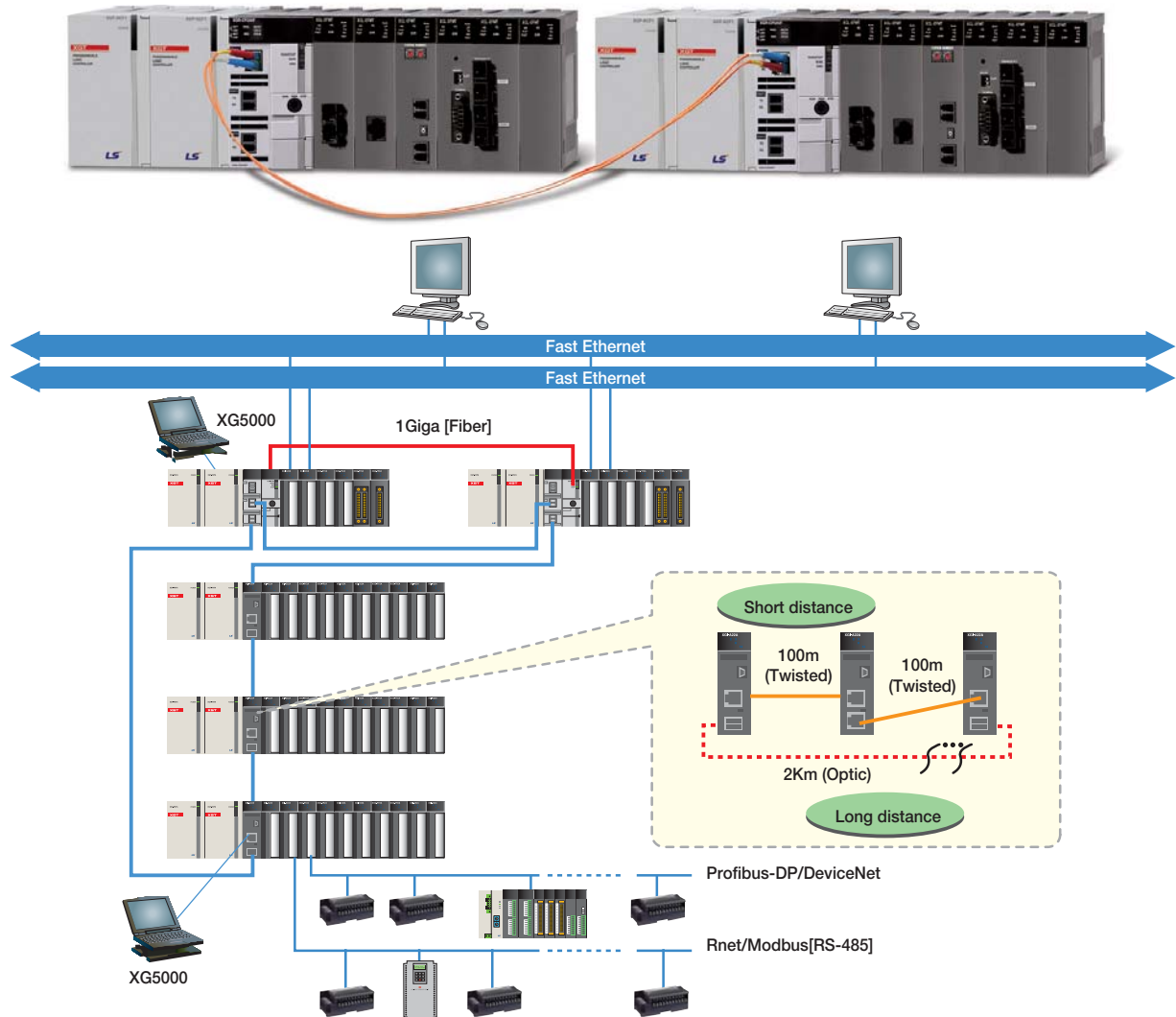
- Easy configuration of remote system using XGB expansion I/Os
- Up to 8 modules expandable with Network adapter
- Max. 256 point digital I/O
- Max. 16 channel analog I/O
- Network adapter: Profibus-DP, DeviceNet, Rnet, Modbus TCP/IP, EtherNet/IP



## XGT Servo XDL/XML Series

- High resolution serial type encoder (~19bit)
  - Accurate position control and improved stability at low speed
- Motion network type (EtherCAT) XDL-N Series
- 100BASE-TX (100Mbps) Ethernet based real-time communication
- Supports full-closed control (Network type)
- Serial communication (RS-422/485, Modbus)
- Supports various operation modes (CSP, CSV, CST, PP, PV, PT, HM, IP, etc.)
- Safe torque off function
- Linked with LSIS's XGT PLC





### High Performance

- Processing speed: 42ns/step
- CPU synchronization via fiber optic cable
- I/O points: max. 131,072
- Total memory: 25MB (Program 7MB, Data 2MB, Flash 16MB)
- Switching over time: min. 4.3ms/max. 22ms

### Easy Expansion Installation Using Network

- Max. 31 expansion base
- Distance: Fiber 2km (Max. expansion 60km), Twisted pair 100m (Max. expansion 3km)
- Program upload and download via expansion base
- No limit to install the communication master on the expansion base

### Enhanced Maintenance Via System History and

#### Network Ring Configuration

- Convenient system analysis using Operation history, Error history, System history
- Ring configuration to prevent a line disconnection error
- Network monitoring, protocol monitoring function
- Error channel monitoring via flag
- Graphic display for the system configuration
- Safe module exchange via Wizard

### IEC 61131-3 Standard Language

- LD, ST, SFC, IL (read only)
- Program configuration and data type based on IEC

### Variety of Communication Function

- Easy interface using open network (Ethernet, Profibus-DP, DeviceNet, RS-232C, RS-422/485, etc.)
- Max. 24 communication module installation on the expansion base (High speed link 12, P2P 8)
- Network diagnosis via network and frame monitoring
- PLC link via dedicated communication based on Ethernet (RAPIEnet)

### Variety of Input and Output Modules

- 8/16/32/64 points (8 / 16 points relay output)
- Input/Output / Mixed module

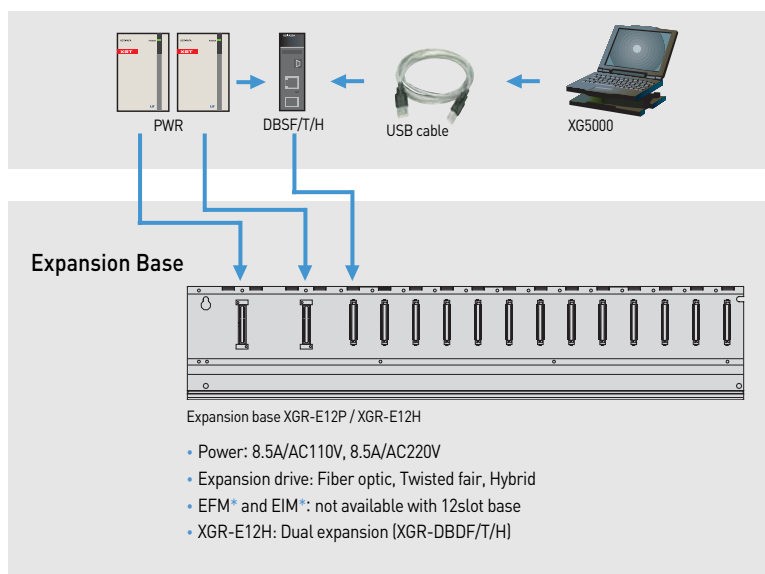
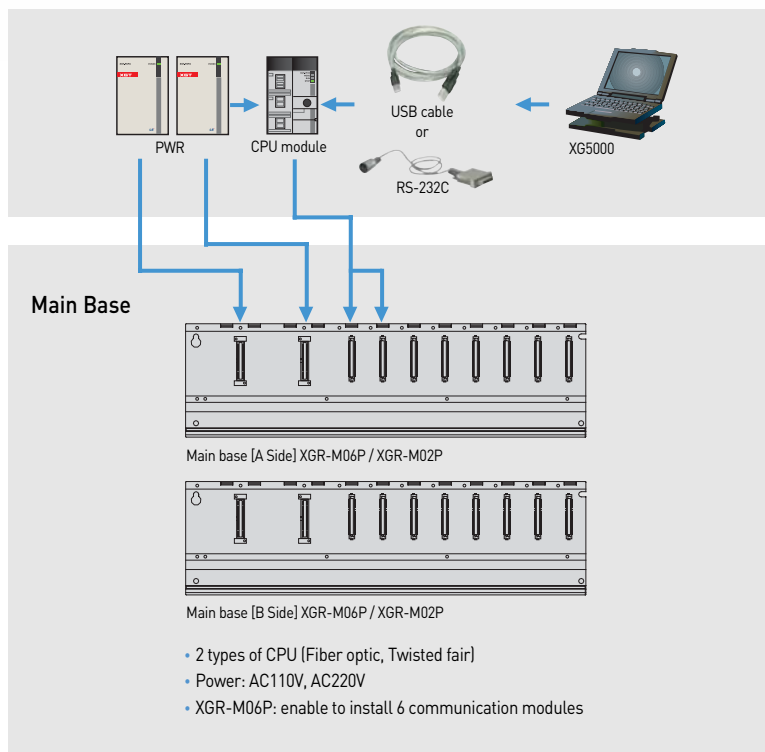
### Enhanced Analog Function

- Enable to install the analog module on the expansion base (Max. 250, analog input 139)
- Insulated type and temperature module
- Easy to set the parameter via I/O parameter and flag
- Debugging function via special module monitoring

### Integrated Programming & Engineering Environment

- XG5000: Easy to program, various monitoring functions and enhanced editing function
- XG-PD: Convenient setup for communication and network parameter
- XG-P: Software package for positioning module
- XG-TCON: Temperature control and function of auto tuning

# Product List



| CPU Module                |                     |
|---------------------------|---------------------|
| Type                      | I/O point           |
| XGR-CPUH/T [Twisted fair] | 2port 23,808 Points |
| XGR-CPUH/F [Fiber optic]  |                     |

| Type     | I/O point                     |
|----------|-------------------------------|
| USB-301A | USB downloading cable         |
| K1C-050A | RS232C downloading cable      |
| XGC-F201 | CPU synchronization cable: 2m |
| XGC-F501 | CPU synchronization cable: 5m |

| Power    |                                       |
|----------|---------------------------------------|
| XGR-AC12 | AC110V 5.5A (Main / Expansion base)   |
| XGR-AC13 | AC110V 8.5A (Expansion base)          |
| XGR-AC22 | AC220V 5.5A (Main / Expansion base)   |
| XGR-AC23 | AC220V 8.5A (Expansion base)          |
| XGR-DC42 | DC24V / 5V 7A (Main / Expansion base) |

| XGK                   | CPU Module                    |       | I/O point |
|-----------------------|-------------------------------|-------|-----------|
|                       | XGK-CPUH,CPUU, CPUHN, CPUUN   |       |           |
| XGK-CPUU, CPUA, CPUUN |                               |       | 3,072     |
| XGK-CPUE              |                               |       | 1,536     |
| XGI                   | XGI-CPUUN, CPUU/D, CPUU, CPUH | 6,144 |           |
|                       | XGI-CPUUS                     | 3,072 |           |
|                       | XGI-CPUE                      | 1,536 |           |

| Item          | Type     | Description               |
|---------------|----------|---------------------------|
| USB cable     | USB-301A | USB downloading cable     |
| RS-232C cable | K1C-050A | RS-232C downloading cable |

| Power Module |              |          |                       |
|--------------|--------------|----------|-----------------------|
| AC           | Free Voltage | XGP-ACF1 | DC5V 3A<br>DC24V 0.6A |
|              |              | XGP-ACF2 | DC5V 6A               |
| DC           | 220V         | XGP-AC23 | DC5V 8.5A             |
|              |              | XGP-DC42 | DC5V 6A               |

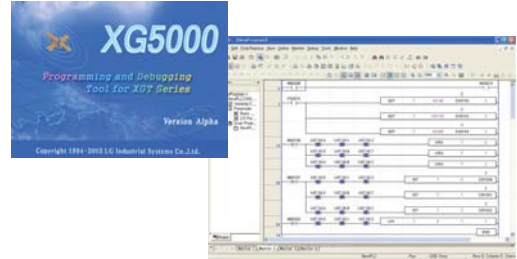
| Item      | Input Module |                    |          |
|-----------|--------------|--------------------|----------|
|           | AC110V       | AC220V             | DC24V    |
| 8 points  | -            | XGI-A21A, XGI-A21C | XGI-D21A |
| 16 points | XGI-A12A     | -                  | XGI-D22A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

| Item      | Output Module |          |            |
|-----------|---------------|----------|------------|
|           | Relay         | Triac    | Transistor |
| 8 points  | XGQ-RY1A      | -        | -          |
| 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]  |
| Analog Output              | XGF-AD16A     | Voltage/ Current input, 16Ch  |
|                            | XGF-AW4S      | 2-wire, Voltage/ Current input, 4Ch [Isolated]  |
|                            | 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<br>Output: 2Ch Voltage/ Current                            |
| High-speed Counter         | XGF-HO2A      | Pulse [OC] input type, 2Ch  |
|                            | XGF-HD2A      | Pulse [LD] input type, 2Ch  |
|                            | XGF-P01A-P03A | Open collector, 1-3axes   |
| Positioning                | XGF-P01H-P03H | Line drive, 1-3axes   |
|                            | 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  |
|                            | XGF-PN4B      | Standard EtherCAT Network, 4axis  |
| Motion Module              | XGF-M32E      | Standard EtherCAT Net. 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)<br>Output: 8Ch.(TR/Current)<br>Controller: 4 loops |
|                            | XGF-TC4RT     | Input: 4Ch.(RTD)<br>Output: 4Ch.(TR)<br>Controller: 4 loops                             |
| Event input                | XGF-S0EA      | DC24V, 32points   |

| Communication Module |           |                                       |
|----------------------|-----------|---------------------------------------|
| RAPIEnet             | XGL-EIMT  | RAPIEnet Twisted fair 2Ch             |
|                      | XGL-EIMH  | RAPIEnet Fiber optic/Twisted fair 1Ch |
|                      | XGL-EIMF  | RAPIEnet Fiber optic 2Ch              |
|                      | XGL-E54T  | RAPIEnet Switch. 4Ports               |
|                      | XGL-EIMT  | RAPIEnet Twisted fair 2Ch For PC      |
| Cnet                 | XGL-EIMF  | RAPIEnet Fiber optic 2Ch For PC       |
|                      | XGL-CH2B  | RS-232C/RS-422                        |
|                      | XGL-C22B  | RS-232C, 2Ch                          |
| Ethernet (Open)      | XGL-C42B  | RS-422, 2Ch                           |
|                      | XGL-EFMFB | Fiber optic, Master, SC type          |
|                      | XGL-EFMTB | Twisted pair, Master, RJ-45           |
| Ethernet (Dedicated) | XGL-EH5T  | Fast Ethernet, Switching hub          |
|                      | XGL-EDMF  | Fiber optic, Master, SC type          |
| EtherNet/IP          | XGL-EDMT  | Twisted pair, Master, RJ-45           |
|                      | XGL-EIPT  | Industrial Ethernet, 2ports           |
| Rnet                 | XGL-RMEA  | Rnet, Master, TP                      |
| DeviceNet            | XGL-DMEA  | DeviceNet, Master                     |
|                      | XGL-PMEA  | Profibus-DP, Master SyCon             |
| Profibus-DP          | XGL-PMEC  | Profibus-DP, Master ProfiCon          |
|                      | XGL-PSRA  | Profibus-DP Slave, Remote interface   |
|                      | XGL-PSEA  | Profibus-DP Slave                     |
| Fnet                 | XGL-FMEA  | Dedicated network                     |



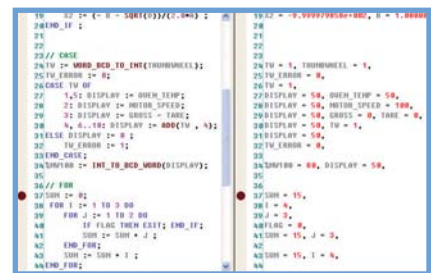
### XGK Series

- Fastest CPU processing of 8.5ns/step
- Up to 6,144 I/O points configurable (32,768 points controllable with remote I/O)
- Integrated intelligent software package: XG5000, XG-PD, XG-PM
- System solution based on open network: Ethernet, Profibus-DP, DeviceNet
- Special devices for easy programming
- Massive device memory
- USB I/F for programming up/download & monitoring

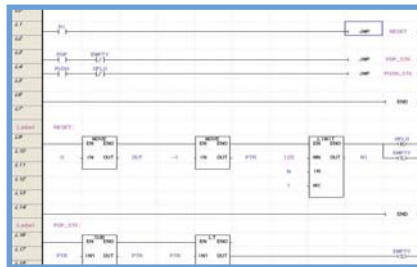
### XGI Series

- Fastest CPU processing of 8.5ns/step
- Up to 6,144 I/O points configurable (131,072 points controllable with remote I/O)
- IEC 61131-3 Standard programming
  - LD (Ladder Diagram), SFC (Sequential Function Chart), ST (Structured Text)
  - User defined FB (Function Block)
- Built-in PID function (Max. 256 loop)
- USB I/F for programming up/download & monitoring

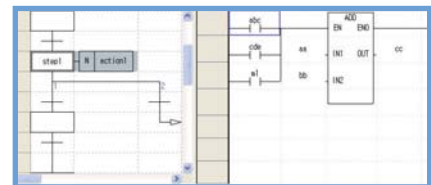
### ST



### LD



### SFC



### XGK/XGI-CPUUN, XGK-CPUHN, CPUSN

#### XGK-CPUUN (XGI-CPUUN)

- Built-in Ethernet port
- 256K (2MB) program memory
- 8.5ns processing speed
- 6,144 I/O points control

#### XGK-CPUHN

- Built-in Ethernet port
- 128K (1MB) program memory
- 8.5ns processing speed
- 6,144 I/O points control

#### XGK-CPUSN

- Built-in Ethernet port
- 64K (512KB) program memory
- 8.5ns processing speed
- 3,072 I/O points control

### XGI:CPUU/D, CPUU, CPUH, CPUS, CPUS/P, CPUE

#### XGK-CPUU (XGI-CPUU)

- 128K (1MB) program memory
- 28ns processing speed
- 6,144 I/O points control

#### XGK-CPUH (XGI-CPUH)

- 64K (512KB) program memory
- 28ns processing speed
- 6,144 I/O points control

#### XGK-CPUA

- 32K program memory
- 28ns processing speed
- 3,072 I/O points control

#### XGK-CPUS (XGI-CPUS)

- 32K (128KB) program memory
- 84ns processing speed
- 3,072 I/O points control

#### XGK-CPUE (XGI-CPUE)

- 16K (64KB) program memory
- 84ns processing speed
- 1,536 I/O points control

### Expansion modules

#### Power Modules

With AC Free voltage, 220V and DC 24 V power supply

#### Base Modules

With 4/6/8/12 main and expansion base

#### Digital Input/Output Modules

From 8 to 64 of transistor, relay and triac switches

#### Analog Input/Output Modules

With 4 or 8 ch current/voltage signals

#### Temperature Input Modules

With 4 ch Pt100/JPt100 resistance thermometer and thermocouple

#### High Speed Counter Module

For connection with incremental encoder (2 channels of Open collector or Line driver type)

#### Positioning Module

1~4 axes positioning for servo, step drive and motor

### Network Modules

#### Fast Ethernet Modules

Ethernet network with TCP/IP protocol

#### Profibus-DP Modules

Profibus-DP fieldbus protocol for connection between LS PLC and different manufacturers

#### DeviceNet Modules

DeviceNet fieldbus protocol for connection between LS PLC and different manufacturers

#### Rnet Modules

Dedicated network for remote I/O control (LS Smart I/O)

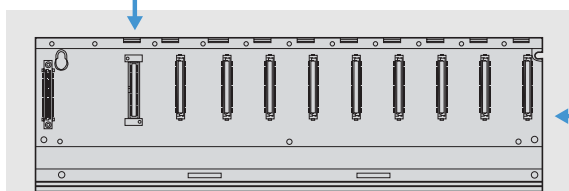
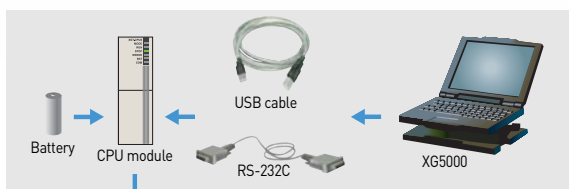
#### Cnet Modules

Serial communication module with RS-232C/422/485

#### RAPiNet Module

Dedicated network based on Ethernet

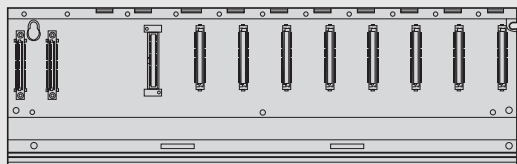
# Product List



Main Base (XGB-M □ □ A)



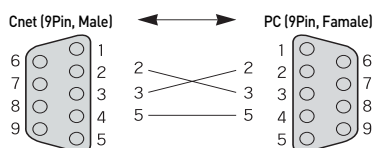
| Item                 | Type     | Description          |
|----------------------|----------|----------------------|
| Expansion cable      | XGC-E041 | Expansion cable 0.4m |
|                      | XGC-E061 | Expansion cable 0.6m |
|                      | XGC-E121 | Expansion cable 1.2m |
|                      | XGC-E301 | Expansion cable 3.0m |
|                      | XGC-E501 | Expansion cable 5.0m |
|                      | XGC-E102 | Expansion cable 10m  |
| Expansion terminator | XGC-E152 | Expansion cable 15m  |
|                      | 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       |
| 12 slot | XGB-M12A  | XGB-E12A       |

## 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 | K1C-050A | RS-232C downloading cable |

| 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 |



Power Module (XGP- □ □ □ □)



Input Module (XGI- □ □ □ □)



Output Module (XGQ- □ □ □ □)



Special Module (XGF- □ □ □ □)



Communication Module (XGL- □ □ □ □)

| Power Module |              |                      |                       |
|--------------|--------------|----------------------|-----------------------|
| AC           | Free Voltage | XGP-ACF1             | DC5V 3A<br>DC24V 0.6A |
|              | 220V         | XGP-ACF2<br>XGP-AC23 | DC5V 6A<br>DC5V 8.5A  |
| DC           |              | XGP-DC42             | DC5V 6A               |

| Item      | Output Module |          |            |
|-----------|---------------|----------|------------|
|           | Relay         | Triac    | Transistor |
| 8 points  | XGQ-RY1A      | -        | -          |
| 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 |

| 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<br>Output: 2Ch Voltage/ Current     |
| High-speed Counter         | XGF-HO2A      | Pulse [OC] input type, 2Ch                                       |
|                            | XGF-HD2A      | Pulse [LD] input type, 2Ch                                       |
| Positioning                | XGF-PO1A~PO3A | Open collector, 1~3axes  |
|                            | XGF-PD1A~PD3A | Line drive, 1~3axes  |
|                            | XGF-PO1H~PO4H | 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                                     |
|                            | XGF-PN4B      | Standard EtherCAT Network, 4axis                                 |
| Motion Modnle              | XGF-M32E      | Standard EtherCAT Net, 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)<br>Output: 8ch.(TR/Current) |
|                            |               | Controller: 4 loops  |
|                            | XGF-TC4RT     | Input: 4ch.(RTD)<br>Output: 4ch.(TR)                             |
|                            |               | Controller: 4 loops  |
| Event Input                | XGF-S0EA      | DC24V, 32points  |

| Communication Module |           |                                       |
|----------------------|-----------|---------------------------------------|
| RAPIEnet             | XGL-EIMT  | RAPIEnet Twisted fair 2Ch             |
|                      | XGL-EIMH  | RAPIEnet Fiber optic/Twisted fair 1Ch |
|                      | XGL-EIMF  | RAPIEnet Fiber optic 2Ch              |
|                      | XGL-ES4T  | RAPIEnet Switch, 4Ports               |
|                      | XOL-EIMT  | RAPIEnet Twisted fair 2Ch For PC      |
|                      | XOL-EIMF  | RAPIEnet Fiber optic 2Ch For PC       |
| Cnet                 | XGL-CH2B  | RS-232C/RS-422                        |
|                      | XGL-C22B  | RS-232C, 2Ch                          |
|                      | XGL-C42B  | RS-422, 2Ch                           |
| Ethernet (Open)      | XGL-EFMFB | Fiber optic, Master, SC type          |
|                      | XGL-EFMFB | Twisted pair, Master, RJ-45           |
|                      | XGL-EH5T  | Fast Ethernet, Switching hub          |
| Ethernet (Dedicated) | XGL-EDMF  | Fiber optic, Master, SC type          |
| Rnet                 | XGL-EDMT  | Twisted pair, Master, RJ-45           |
| EtherNet/IP          | XGL-EIPT  | Industrial Ethernet, 2ports           |
| DeviceNet            | XGL-RMEA  | Rnet, Master, TP                      |
|                      | XGL-DMEA  | DeviceNet, Master                     |
| Profibus-DP          | XGL-PMEA  | Profibus-DP, Master SyCon             |
|                      | XGL-PMEC  | Profibus-DP, Master ProfCon           |
|                      | XGL-PSRA  | Profibus-DP, Slave, Remote Inter face |
|                      | XGL-PSEA  | Profibus-DP, Slave                    |
| Fnet                 | XGL-FMEA  | Dedicated network                     |

LSIS introduces its most compact and high performance PLC, XGB series. The compactness, high performance, easiness, convenience and functionality are five important characteristics of the XGB PLC.

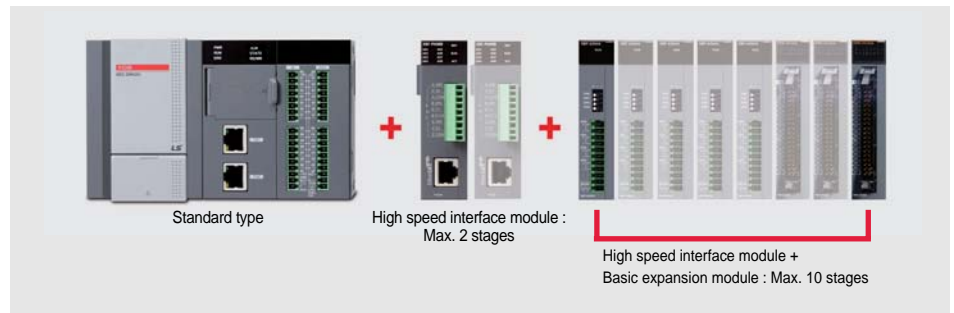
Its compactness ensures that it occupies less space in the equipment and its diverse expandability guarantees flexibility for needs. And its various built-in functions enable the cost-effective PLC system. This controller is particularly suitable for performing small-to-medium performance automation tasks.



### Features

#### XBC/XEC-U

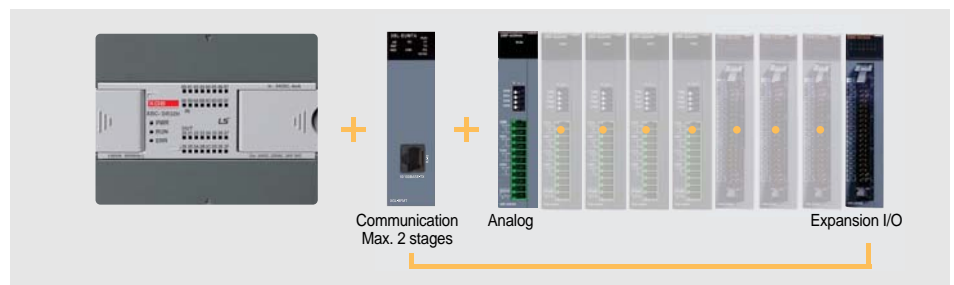
- Max. 69ns/step processing speed
- Max. 2 High speed backplane expansion modules
- Max. 10 expansion modules
- Max. 352 I/O points
- Compatible with XGB expansion modules



#### XBC/XEC-H/SU/E

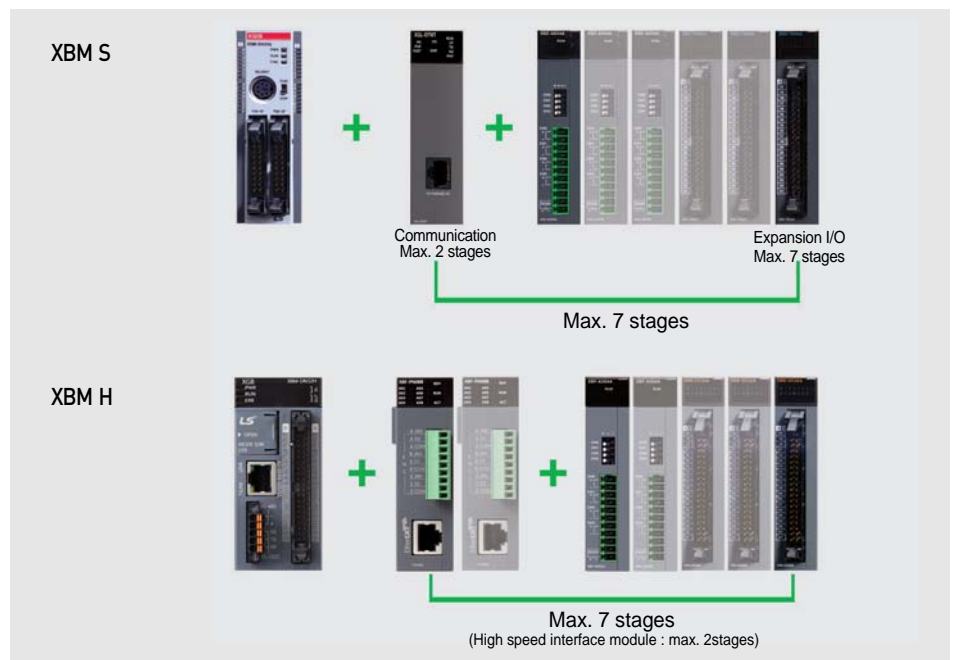
Max. 83ns/step processing speed and floating-point arithmetic with on-board CPU

- High Performance (H type): Max. 10 expansion modules and max. 384 I/O point control
- Standard (SU type): Max. 7 expansion modules including option modules and max. 284 I/O point control
- Economic (E type): Max. 2 option modules and max. 38 I/O point control



#### XBM (H, S-type)

- Faster Instruction Times: 83ns / step
- Larger Memory: 20Ksteps of built-in program memory
- Controllable I/O: 256 points
- Expandability: 7 cards (compatible with all XGB cards)
- 160ns/step processing speed and floating-point arithmetic with on-board CPU
- Max. 7 expansion modules, max. 256 I/O point control: PLC systems for small and medium scale applications
- Max. 5 channel communication with built-in functions and expansion modules



## Product List

### Main / Expansion Modules

| Block Type Unit (U)                |  |
|------------------------------------|--|
| Model                              | Specification  |
| XBC/XEC-DN(P)32U                   | AC 110-220V, 16points DC24V input, 16points transistor sink(source) type output                              |
| XBC/XEC-DR28U                      | AC 110-220V, 16points DC24V input, 12points relay output   |
| XBC/XEC-DN(P)32UP                  | AC 110-220V, 16points DC24V input, 16points transistor sink(source) type output, 4 axes built-in positioning |
| XBC/XEC-DR28UP                     | AC 110-220V, 16points DC24V input, 12points relay output, 4 axes built-in positioning                        |
| XBC/XEC-DN(P)32UA                  | AC 110-220V, DC24V input, 16points transistor sink(source) type output, 8 channel built-in analog            |
| XBC/XEC-DR28UA                     | AC 110-220V, DC24V input, 12points relay output, 8 channel built-in analog                                   |
| XBC/XEC-DN(P)32U/DC                | DC 24V, 16points DC24V input, 16points transistor sink(source) type output                                   |
| XBC/XEC-DR28U/DC                   | DC 24V, 16points DC24V input, 12points relay output  |
| XBC/XEC-DN(P)32UP/DC               | DC 24V, 16points DC24V input, 16points transistor sink(source) type output, 4 axes built-in positioning      |
| XBC/XEC-DR28UP/DC                  | DC 24V, 16points DC24V input, 12points relay output, 4 axes built-in positioning                             |
| XBC/XEC-DN(P)32UA/DC               | DC 24V, DC24V input, 16points transistor sink(source) type output, 8 channel built-in analog                 |
| XBC/XEC-DR28UA/DC                  | DC 24V, DC24V input, 12points relay output, 8 channel built-in analog  |
| Block Type Unit (High Performance) |  |
| XBC/XEC-DR32H                      | AC 100-240V, DC24 input 16 pts, relay output 16 pts  |
| XBC/XEC-DR64H                      | AC 100-240V, DC24 input 32 pts, relay output 32 pts  |
| XBC/XEC-DN32H                      | AC 100-240V, DC24 input 16 pts, Tr. output 16 pts [Sink]   |
| XBC/XEC-DN64H                      | AC 100-240V, DC24 input 32 pts, Tr. output 32 pts [Sink]   |
| XEC-DP32H                          | AC 100-240V, DC24 input 16 pts, Tr. output 16 pts [Source]   |
| XEC-DP64H                          | AC 100-240V, DC24 input 32 pts, Tr. output 32 pts [Source]   |
| XBC-DR32H/DC                       | DC 24V, DC24 input 16 pts, relay output 16 pts   |
| XBC-DR64H/DC                       | DC 24V, DC24 input 32 pts, relay output 32 pts   |
| XBC-DN32H/DC                       | DC 24V, DC24 input 16 pts, Tr. output 16 pts [Sink]  |
| XBC-DN64H/DC                       | DC 24V, DC24 input 32 pts, Tr. output 32 pts [Sink]  |
| XEC-DR32H/D1                       | DC 12/24V, DC12/24 input 16 pts, relay output 16 pts   |
| XEC-DR64H/D1                       | DC 12/24V, DC12/24 input 32 pts, relay output 32 pts   |
| Block Type Unit (Standard)         |  |
| XBC/XEC-DR20SU                     | AC 100-240, DC24V input 12 pts, relay output 8 pts   |
| XBC/XEC-DR30SU                     | AC 100-240, DC24V input 18 pts, relay output 12 pts  |
| XBC/XEC-DR40SU                     | AC 100-240, DC24V input 24 pts, relay output 16 pts  |
| XBC/XEC-DR60SU                     | AC 100-240, DC24V input 36 pts, relay output 24 pts  |
| XBC/XEC-DN20SU                     | AC 100-240, DC24V input 12 pts, Tr. output 8 pts [Sink]  |
| XBC/XEC-DN30SU                     | AC 100-240, DC24V input 18 pts, Tr. output 12 pts [Sink]   |
| XBC/XEC-DN40SU                     | AC 100-240, DC24V input 24 pts, Tr. output 16 pts [Sink]   |
| XBC/XEC-DN60SU                     | AC 100-240, DC24V input 36 pts, Tr. output 24 pts [Sink]   |
| XBC/XEC-DP20SU                     | AC 100-240, DC24V input 12 pts, Tr. output 8 pts [Source]  |
| XBC/XEC-DP30SU                     | AC 100-240, DC24V input 18 pts, Tr. output 12 pts [Source]   |
| XBC/XEC-DP40SU                     | AC 100-240, DC24V input 24 pts, Tr. output 16 pts [Source]   |
| XBC/XEC-DP60SU                     | AC 100-240, DC24V input 36 pts, Tr. output 24 pts [Source]   |
| Block Type Unit (Economic)         |  |
| XBC/XEC-DR10E                      | AC 100-240V, 6 pts DC input, 4 pts Relay output  |
| XBC/XEC-DR14E                      | AC 100-240V, 8 pts DC input, 6 pts Relay output  |
| XBC/XEC-DR20E                      | AC 100-240V, 12 pts DC input, 8 pts Relay output   |
| XBC/XEC-DR30E                      | AC 100-240V, 18 pts DC input, 12 pts Relay output  |
| XBC/XEC-DN10E                      | AC 100-240V, 6 pts DC input, 4 pts Tr. output[Sink]  |
| XBC/XEC-DN14E                      | AC 100-240V, 8 pts DC input, 6 pts Tr. output[Sink]  |
| XBC/XEC-DN20E                      | AC 100-240V, 12 pts DC input, 8 pts Tr. output[Sink]   |
| XBC/XEC-DN30E                      | AC 100-240V, 18 pts DC input, 12 pts Tr. output[Sink]  |
| XBC/XEC-DP10E                      | AC 100-240V, 6 pts DC input, 4 pts Tr. output[Source]  |
| XBC/XEC-DP14E                      | AC 100-240V, 8 pts DC input, 6 pts Tr. output[Source]  |
| XBC/XEC-DP20E                      | AC 100-240V, 12 pts DC input, 8 pts Tr. output[Source]   |
| XBC/XEC-DP30E                      | AC 100-240V, 18 pts DC input, 12 pts Tr. output[Source]  |
| Modular Type Unit                  |  |
| XBM-DN32H                          | DC24V, 16 pts DC 24V input, 16 pts TR output   |
| XBM-DR16S                          | DC 24V, 8 pts DC 24V input, 8 pts relay output   |
| XBM-DN16S                          | DC 24V, 8 pts DC 24V input, 8 pts TR output  |
| XBM-DN32S                          | DC 24V, 16 pts DC 24V input, 16 pts TR output  |
| Loader Cable                       |  |
| PMC-310S                           | Connection cable (PC to PLC), 9pin (PC)-6pin (PLC)   |
| USB-301A                           | Connection cable (PC to PLC), USB  |
| Memory Module                      |  |
| XBO-M2MB                           | Memory   |

| Expansion I/O Module                       |  |                         |               |               |               |              |
|--|--|-------------------------|---------------|---------------|---------------|--------------|
| Model                                      | Specification  |                         |               |               |               |              |
| XBE-DC08A                                  | 8 pts DC 24V input   |                         |               |               |               |              |
| XBE-DC16A                                  | 16 pts DC 12/24V input   |                         |               |               |               |              |
| XBE-DC16B                                  | 16 pts DC 24V input  |                         |               |               |               |              |
| XBE-DC32A                                  | 32 pts DC 24V input  |                         |               |               |               |              |
| XBE-RY08A                                  | 8 pts relay output   |                         |               |               |               |              |
| XBE-RY08B                                  | 8 pts relay output   |                         |               |               |               |              |
| XBE-RY16A                                  | 16 pts relay output  |                         |               |               |               |              |
| XBE-TN08A                                  | 8 pts Tr. [sink] output  |                         |               |               |               |              |
| XBE-TN16A                                  | 16 pts Tr. [sink] output   |                         |               |               |               |              |
| XBE-TN32A                                  | 32 pts Tr. [sink] output   |                         |               |               |               |              |
| XBE-TP08A                                  | 8 pts Tr. [source] output  |                         |               |               |               |              |
| XBE-TP16A                                  | 16 pts Tr. [source] output   |                         |               |               |               |              |
| XBE-TP32A                                  | 32 pts Tr. [source] output   |                         |               |               |               |              |
| XBE-DR16A                                  | 8 pts DC 24V input, 8pt relay output                                       |                         |               |               |               |              |
| XBE-DN32A                                  | 16 pts DC24V input, 16 pts TR output                                       |                         |               |               |               |              |
| Special Module                             |  |                         |               |               |               |              |
| XBF-AD04A                                  | 4ch analog input (current/voltage)   |                         |               |               |               |              |
| XBF-AD04C                                  | 4ch analog input (current/voltage, resolution : 1/16000)                   |                         |               |               |               |              |
| XBF-AH04A                                  | 2ch analog input (current/voltage)/<br>2ch analog output (current/voltage) |                         |               |               |               |              |
| XBF-DV04A                                  | 4ch analog output (voltage)  |                         |               |               |               |              |
| XBF-DV04C                                  | 4ch analog input (voltage, resolution : 1/16000)                           |                         |               |               |               |              |
| XBF-DC04A                                  | 4ch analog output (current)  |                         |               |               |               |              |
| XBF-DC04C                                  | 4ch analog input (current, resolution : 1/16000)                           |                         |               |               |               |              |
| XBF-RD04A                                  | 4ch RTD input  |                         |               |               |               |              |
| XBF-TC04S                                  | 4ch Thermocouple input   |                         |               |               |               |              |
| XBF-TC04TT                                 | Temperature controller, Thermocouple                                       |                         |               |               |               |              |
| XBF-TC04RT                                 | Temperature controller, RTD  |                         |               |               |               |              |
| XBF-PD02A                                  | Line drive 2axes   |                         |               |               |               |              |
| XBF-PN08B                                  | EtherCAT Positioning module, 8axes   |                         |               |               |               |              |
| XBF-PN04B                                  | Standard EtherCAT Network, 4axis   |                         |               |               |               |              |
| XBF-AD08A                                  | 8ch analog input (Current/voltage)   |                         |               |               |               |              |
| XBF-HO02A                                  | 2ch High-speed counter input (Open collector)                              |                         |               |               |               |              |
| XBF-HD02A                                  | 2ch High-speed counter input (Line drive)                                  |                         |               |               |               |              |
| Communication Module                       |  |                         |               |               |               |              |
| XBL-C41A                                   | Cnet [RS-422/485], 1ch   |                         |               |               |               |              |
| XBL-C21A                                   | Cnet [RS-232C], 1ch  |                         |               |               |               |              |
| XBL-EMTA                                   | Fast Ethernet [100Mbps], 1ch   |                         |               |               |               |              |
| XBL-EIPT                                   | Ethernet/IP, 2ch   |                         |               |               |               |              |
| XBL-EIMT                                   | RAPiEnet, Twisted pair 2ch, 100Mbps  |                         |               |               |               |              |
| XBL-EIMF                                   | RAPiEnet I/F, Max. 2km [Fiber 2ch.], 100Mbps                               |                         |               |               |               |              |
| XBL-EIMH                                   | RAPiEnet I/F [Twisted pair 1ch, Fiber 1ch.], 100Mbps                       |                         |               |               |               |              |
| XBL-PMEC                                   | Profibus-DP, Master, RS-485  |                         |               |               |               |              |
| XBL-PSEA                                   | Profibus-DP, Slave, RS-485   |                         |               |               |               |              |
| XBL-DSEA                                   | DeviceNet, Slave   |                         |               |               |               |              |
| XBL-RMEA                                   | Rnet, Master   |                         |               |               |               |              |
| XBL-CMEA                                   | CANopen (10, 20, 50, 100, 125, 250, 500, 800, 1000Kbps, Num of PDO : 32)   |                         |               |               |               |              |
| XBL-CSEA                                   | CANopen (10, 20, 50, 100, 125, 250, 500, 800, 1000Kbps, Num of PDO : 64)   |                         |               |               |               |              |
| Option Module                              |  |                         |               |               |               |              |
| XBO-AD02A                                  | Voltage/Current, Input 2ch   |                         |               |               |               |              |
| XBO-DA02A                                  | Voltage/Current, Output 2ch  |                         |               |               |               |              |
| XBO-AH02A                                  | Voltage/Current, Input 1ch, Voltage/Current, Output 1ch                    |                         |               |               |               |              |
| XBO-TC02A                                  | TC (Thermo couple), Input 2ch  |                         |               |               |               |              |
| XBO-RTCA                                   | RTC (Real time clock), Battery   |                         |               |               |               |              |
| XBO-DC04A                                  | DC 24V, Input 4 pts  |                         |               |               |               |              |
| XBO-TN04A                                  | TR [Sink], Output 4 pts  |                         |               |               |               |              |
| XBO-RD01A                                  | RTD (Resistance temperature detector), Input 1ch                           |                         |               |               |               |              |
| Terminal Board                             | Connection Cable   | XBM-DN16S/<br>XBM-DN32S | XBE-<br>DC32A | XBE-<br>TN32A | XBE-<br>TP32A | Cable Length |
| XTB-40H<br>(TG7-1H40S)<br>(Terminal Board) | R40H/20HH-05S-XBM3   | ●                       | -             | -             | -             | 0.5m         |
|  | R40H/20HH-10S-XBM3   | ●                       | -             | -             | -             | 1.0m         |
|  | C40HH-05SB-XBI   | -                       | ●             | ●             | ●             | 0.5m         |
|  | C40HH-10SB-XBI   | -                       | ●             | ●             | ●             | 1.0m         |
| TG7-1H40CA<br>(Terminal Board,<br>Common)  | C40HH-15SB-XBI   | -                       | ●             | ●             | ●             | 1.5m         |
|  | C40HH-20SB-XBI   | -                       | ●             | ●             | ●             | 2.0m         |
|  | C40HH-30SB-XBI   | -                       | ●             | ●             | ●             | 3.0m         |
|  | C40HH-05SB-XBI   | -                       | -             | ●             | -             | 0.5m         |
| R32C-NS5A-40P<br>(Relay Board:<br>Sink)    | C40HH-10SB-XBI   | -                       | -             | ●             | -             | 1.0m         |
|  | C40HH-15SB-XBI   | -                       | -             | ●             | -             | 1.5m         |
|  | C40HH-20SB-XBI   | -                       | -             | ●             | -             | 2.0m         |
|  | C40HH-30SB-XBI   | -                       | -             | ●             | -             | 3.0m         |
| R32C-PS5A-40P<br>(Relay Board:<br>Source)  | C40HH-05PH-XBP   | -                       | -             | -             | ●             | 0.5m         |
|  | C40HH-15PH-XBP   | -                       | -             | -             | ●             | 1.5m         |
|  | C40HH-20PH-XBP   | -                       | -             | -             | ●             | 2.0m         |

### Features

- Wiring reduction and real time control of distributed I/O
- Supporting Rnet, DeviceNet, Profibus-DP, MODBUS(RS-422/485), RAPIEnet(RJ-45)
- 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 |
| 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,<br>-10~+10 V   | 0-20 mA, 4-20 mA,<br>-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,<br>-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  | Resolution                   | 2 KΩ or more (0-10 V or -10-10 V)   | 500 Ω or less   |
|                              | 1.25 mV   | 2.5 μA  |                              |   | 2.5 μA  |
| Accuracy                     | ±0.3% (full scale, Ta=0-55 °C)  | ±0.3% (full scale, Ta=23 °C±5 °C)<br>±0.4% (full scale, Ta=0-55 °C) | Accuracy                     | ±0.3% (full scale, Ta=0-55 °C)  | ±0.3% (full scale, Ta=23 °C±5 °C)<br>±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)<br>Analog input/output terminal with FG→Insulation                              |   | Response Period              | 10 ms or less/8 channels + Transmission period (ms)<br>Analog input/output terminal with FG→Insulation                              |   |
| Insulation Method            | Analog input/output terminal with Communication terminal→Insulation<br>Analog input/output terminal with each channel→No insulation |   | Insulation Method            | Analog input/output terminal with Communication terminal→Insulation<br>Analog input/output terminal with each channel→No insulation |   |
| External Power Supply        | DC 24 V (21.6 ~ 26.4)   |   | External Power Supply        | DC 24 V (20.4 ~ 28.8)   |   |
| External Current Consumption | DC 24 V : 220 mA  |   | External Current Consumption | 210 mA  | 240 mA  |
| Weight (kg)                  | 0.313   | 0.313   | Weight (kg)                  | 0.314   | 0.322   |

### Communication Specifications

| Item                  | Rnet (LS Dedicated Network)                  | Profibus-DP                         | DeviceNet                                   | MODBUS               | RAPIEnet(RJ-45) |
|-----------------------|--|-------------------------------------|---|----------------------|-----------------|
| Protocol              | LSIS dedicated protocol<br>(Fnet for Remote) | Profibus-DP<br>(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 &<br>Master/Slave (Poll) | CSMA/NBA<br>(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              |

# SMART I/O

## Expandable Type



### Features

- Easy configuration of remote system using XGB expansion I/O
- Up to 8 modules expandable with Network adapter
- Max. 256 point digital I/O
- Max. 16 channel analog I/O
- Network adapter: Profibus-DP, DeviceNet, Rnet, Modbus TCP, EtherNet/IP



Modbus TCP, EtherNet/IP    DeviceNet    Profibus-DP

### Available Module

| In/Out       | Part Number   | XDL-BSSA | XPL-BSSA | XEL-BSSA | XEL-BSSB | XRL-BSSA |
|--------------|---------------|----------|----------|----------|----------|----------|
| DC Input     | XBE-DC08A     | ○        | ○        | ○        | ○        | ○        |
|              | XBE-DC16A(B)  | ○        | ○        | ○        | ○        | ○        |
|              | XBE-DC32A     | ○        | ○        | ○        | ○        | ○        |
| Relay Output | XBE-RY08A(B)  | ○        | ○        | ○        | ○        | ○        |
|              | XBE-RY16A     | ○        | ○        | ○        | ○        | ○        |
| TR Output    | XBE-TN(TP)08A | ○        | ○        | ○        | ○        | ○        |
|              | XBE-TN(TP)16A | ○        | ○        | ○        | ○        | ○        |
|              | XBE-TN(TP)32A | ○        | ○        | ○        | ○        | ○        |
| Mixed        | XBE-DR16A     | ○        | ○        | ○        | ○        | ○        |
| A/D (V/I)    | XBF-AD04A     | ○        | ○        | ○        | ○        | ○        |
|              | XBF-AD08A     | ×        | ○        | ○        | ○        | ○        |
|              | XBF-AD04C     | ×        | ○        | ○        | ○        | ○        |
| D/A (I)      | XBF-DC04A     | ○        | ○        | ○        | ○        | ○        |
|              | XBF-DC04C     | ×        | ○        | ○        | ○        | ○        |
| D/A (V)      | XBF-DV04A     | ○        | ○        | ○        | ○        | ○        |
|              | XBF-DV04C     | ×        | ○        | ○        | ○        | ○        |
| Mixed        | XBF-AH04A     | ○        | ○        | ○        | ○        | ○        |
| RTD          | XBF-RD04A     | ○        | ○        | ○        | ○        | ○        |
| TC           | XBF-TC04S     | ○        | ○        | ○        | ○        | ○        |
| Position     | XBF-PD02A     | ×        | ×        | ×        | ×        | ×        |

### Modbus TCP, EtherNet/IP Specification

| Item                                      | Specification               |                  |
|---|-----------------------------|------------------|
| Communication Speed                       | 10/100Mbps                  |                  |
| Transmission Path Method                  | Base Band                   |                  |
| Standard Functions                        | IEEE 802.3                  |                  |
| Flow Control                              | HALF/FULL                   |                  |
| Modulation Type                           | NRZI                        |                  |
| Max. Distance Between Nodes               | 100m                        |                  |
| Max. Protocol Size                        | Data 1500byte               |                  |
| Communication Zone Access Method          | CSMA/CD                     |                  |
| Check Method for Frame Error              | CRC32                       |                  |
| Connector Connection                      | RJ-45(2Port)                |                  |
| IP Setting                                | S/W Setting                 |                  |
| Topology                                  | Bus, Star                   |                  |
| Protocol                                  | MODBUS/TCP, EtherNet/IP     |                  |
| Max. Digital I/O Point                    | 512 (input 256, output 256) |                  |
| Max. Digital I/O Connection Number        | 8                           |                  |
| Max. Analog I/O Connection Number         | 8                           |                  |
| Expansion Analog Module Occupation Number | 8byte                       |                  |
| Power                                     | Rated Input Voltage/Current | DC 24V/0.7A      |
|   | Power Range                 | DC 19.2V ~ 28.8V |
|   | Output Voltage/Current      | 5V(±20%)/1.5A    |
|   | Insulation                  | Non-insulation   |
| Weight(g)                                 | 100                         |                  |

### DeviceNet Specification

| Item                                | Specification  |   |
|-------------------------------------|--|---|
| Communication Interface             | Poll, Bit-strobe, COS/Cyclic                         |   |
|                                     | Group 2 only slave                                   |   |
|                                     | Auto baud rate                                       |   |
| Master/Slave                        | Slave  |   |
| Max. Station                        | 64 (including master)                                |   |
| Max. No. of Extension I/O Equipment | 8  |   |
| Max. Digital I/O Point              | 512 point (input max 256 point/output max 256 point) |   |
| Max. No. of Analog I/O Channel      | Input 16 channels (output 16 channels)               |   |
| Communication Speed & Distance      | Speed  | 125kbps    250kbps    500kbps               |
|                                     | Distance   | 500m    250m    100m                        |
|                                     | Rated Input Voltage                                  | DC 24V                                      |
| Input Power                         | Power Range  | 19.2V ~ 28.8V (available to operate in 11V) |
|                                     | Output Voltage/Current                               | 5V(±20%) / 1.5A                             |
|                                     | Insulation   | Non-insulation                              |
| Basic Specification                 | Weight (g) 100                                       |   |

### Profibus-DP Specification

| Item                                | Specification  |   |      |      |       |       |
|-------------------------------------|--|---|------|------|-------|-------|
| Standard                            | EN50170 / DIN 19245  |   |      |      |       |       |
| Interface                           | RS-485   |   |      |      |       |       |
| Medium Access                       | Polling  |   |      |      |       |       |
| Topology                            | Bus  |   |      |      |       |       |
| Encoding Method                     | NRZ  |   |      |      |       |       |
| Communication Interface             | Sink mode, Freeze mode   |   |      |      |       |       |
| Master/Slave                        | Auto baud rate   |   |      |      |       |       |
| Cable                               | Slave  |   |      |      |       |       |
| Communication Speed and Distance    | Cable  | Shielded Twisted Pair                         |      |      |       |       |
|                                     |  | Speed (Kbps)                                  | 9.6  | 19.2 | 93.75 | 187.5 |
|                                     | Distance (m)   | 1200  | 1200 | 1200 | 1000  | 400   |
|                                     | Speed (Kbps)   | 1500  | 3000 | 6000 | 12000 | -     |
| Distance (m)                        | 200  | 100   | 100  | 100  | -     |       |
| Max. Node                           | 100 station (setting range: 0 ~ 99)  |   |      |      |       |       |
| Max. Modular Type I/O Equipment No. | 8  |   |      |      |       |       |
| Max. Digital I/O Point              | 512 point (input Max. 256 point/output max. 256 point)   |   |      |      |       |       |
| Max. Analog I/O Channel No.         | 32 channels (input Max. 16 channels/output Max. 16 channels) (analog module occupy digital 64 point) |   |      |      |       |       |
| Input Power                         | Rated Input Voltage/Current  | DC 24V/ 0.55A                                 |      |      |       |       |
|                                     | Power Range  | DC19.2 ~ 28.8V                                |      |      |       |       |
|                                     | Output Voltage/Current   | 5V(±20%) / 1.5A                               |      |      |       |       |
|                                     | Insulation   | Non-insulation, communication part insulation |      |      |       |       |
| Weight (g)                          | 100  |   |      |      |       |       |

### Graphic Type iXP50/iXP70/iXP80/iXP90

- 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
- 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<br>iXP70-TTA/AC  | iXP80-TTA/DC<br>iXP80-TTA/AC | iXP90-TTA/DC<br>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.  |   |                              |                              |
| Backlight             |               | LED Type   |   |                              |                              |
| Backlight Duration    |               | 70,000 hours   | 60,000 hours  |                              |                              |
| Brightness            |               | 500 cd/m <sup>2</sup>  | 700 cd/m <sup>2</sup>   | 550 cd/m <sup>2</sup>        | 800 cd/m <sup>2</sup>        |
| 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°C)  |   |                              |                              |
| Ethernet              |               | 1 channel, 10/100BASE-TX   |   |                              |                              |
| USB Host              |               | 3 channels, USB 2.0 host (mouse, keyboard, printer* and USB memory driver is available)<br>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<br>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                          |

\* SEW00 printer only

# eXP Series

## Human Machine Interface

### Graphic Type eXP20/eXP40/eXP60

- 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   | eXP40-TTE/DC  | eXP40-TTA/DC             | eXP60-TTA/DC                                  |
|-----------------------|---------------|--|---|--------------------------|---|
| Display Type          |               | TFT color LCD  |   |                          |   |
| Display Size          |               | 10.9cm (4.3 inch)  | 17.7cm (7 inch)   |                          | 25.9cm (10.2 inch)                            |
| Resolution            |               | 480 x 272 (WQVGA)  | 800 x 480 (WVGA)  |                          |   |
| Color                 |               | 16.7M colors   |   |                          | 65,536 colors                                 |
| Display Angle         |               | Left/Right: 60 deg. Up: 40 deg. Down: 60 deg.  |   |                          | Left/Right: 55 deg. Up: 35 deg. Down: 55 deg. |
| Backlight             |               | LED mode, Auto On/Off  |   |                          |   |
| Backlight Capacity    |               | 30,000 hr or more  | 20,000 hr or more   |                          |   |
| Brightness (LCD)      |               | 550 cd/m <sup>2</sup>  | 500 cd/m <sup>2</sup>   |                          | 350 cd/m <sup>2</sup>                         |
| Touch Panel           |               | 4-wire system, Analogue  |   |                          |   |
| Sound                 |               | Magnetic buzzer (85dB)   |   |                          |   |
| Processor             |               | ARM9 Core (32bit RISC), 454MHz   |   |                          |   |
| Memory                | Flash         | 128MB(Screen 64MB)   |   |                          |   |
|                       | Operation RAM | 128MB  |   |                          |   |
|                       | Backup RAM    | 128KB  |   |                          |   |
| Backup Type           |               | Date/Time data, Logging/Alarm/Recipe data, non-volatile device                         |   |                          |   |
| Battery Capacity      |               | Around 3 years (Upon operation at 25℃)   |   |                          |   |
| RTC Function          |               | Built-in   |   |                          |   |
| Ethernet              |               | 1 channel, 10/100BASE-TX   | -   | 1 channel, 10/100BASE-TX |   |
| USB Port              |               | 1 channel, 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-485                |               | -  | 1 channel   |                          |   |
| RS-422/485            |               | 1 channel, 422/485 Combination   |   |                          |   |
| Multi-language        |               | Up to 12 language simultaneously   |   |                          |   |
| Animation             |               | GIF format is available  |   |                          |   |
| Recipe                |               | available  |   |                          |   |
| Data Logging          |               | available  |   |                          |   |
| Script Executor       |               | available  |   |                          |   |
| Certification         |               | CE, UL(cUL), KC  |   |                          |   |
| Protection            |               | IP65   |   |                          |   |
| Size (mm)             |               | 128.0×102.0×32.0   | 208.0×154.0×44.0  |                          | 276.0×218.0×44.2                              |
| Panel Cut (mm)        |               | 119.0×93.0   | 192.0×138.0   |                          | 260.0×202.0                                   |
| Power                 |               | DC24V  |   |                          |   |
| Power Consumption (W) |               | 7.1  | 23.1  |                          | 1.0   |
| Weight (kg)           |               | 0.3  | 0.59  | 0.60                     | 1.0   |

\* SEW00 printer only

### Graphic Type XP30/XP40/XP50/XP70/XP80/XP90

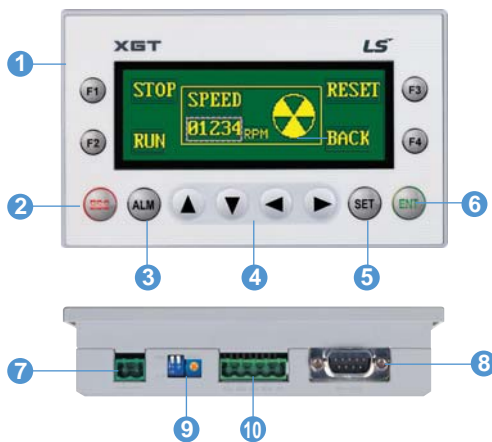
- High and vivid distinction with 65,536 colors
- High quality raster and vector symbols
- Various BMP JPG GIF graphic file support: BMP, JPG, GIF, WMF, etc
- Simple animation effects: animated GIF
- 10/100BASE-T Ethernet interface
- Convenient and easy screen editing
- Strengthened data management: Logging, Recipe, and Alarm
- Read function of a controller's state information: Monitoring and maintenance
- Multi-lingual display: up to 8 languages
- Offline and concurrent simulation with XG5000
- Easy to change the address of the graphic objects: Tag function with XP-Builder
- USB host for peripheral devices: USB Drive, Mouse, keyboard, printer, etc
- Sufficient memory for screen data: 10MB



| Model Type               | XP30-BTE/DC  | XP30-BTA/DC                       | XP30-TTE/DC                | XP30-TTA/DC          | XP40-TTE/DC          | XP40-TTA/DC          | XP50-TTA/DC                         | XP70-TTA/AC<br>XP70-TTA/DC | XP80-TTA/AC<br>XP80-TTA/DC | XP90-TTA/AC    |      |  |
|--------------------------|--|-----------------------------------|----------------------------|----------------------|----------------------|----------------------|-------------------------------------|----------------------------|----------------------------|----------------|------|--|
|                          | Mono   |                                   |                            | Color                |                      |                      |                                     |                            |                            |                |      |  |
| Display Element          | Mono Blue LCD  |                                   |                            | TFT Color LCD        |                      |                      |                                     |                            |                            |                |      |  |
| Screen Size              | 14cm [5.7"]  |                                   |                            |                      | 17.7cm [7"]          |                      | 21cm [8.4"]                         | 26cm [10.4"]               | 31cm [12.1"]               | 38cm [15"]     |      |  |
| Resolution               | 320 × 240  |                                   |                            |                      | 800 × 480            |                      | 640 × 480                           | 640 × 480                  | 800 × 600                  | 1024 × 768     |      |  |
| Color                    | 8-column Gray Scale  |                                   | 256 colors                 | 65,536 colors        | 65,536 colors        |                      |                                     |                            |                            |                |      |  |
| Backlight                | LED mode   |                                   |                            |                      |                      |                      | CCFL (can be replaced), Auto On/Off |                            |                            |                |      |  |
|                          | 50,000 hours   |                                   |                            | 60,000 hours         | 30,000 hours         |                      | 50,000 hours                        |                            |                            | 60,000 hours   |      |  |
| Contrast                 | Adjustable   |                                   |                            | Fixed                |                      |                      |                                     |                            |                            |                |      |  |
| Brightness               | 230cd/m <sup>2</sup>   |                                   |                            | 60cd/m <sup>2</sup>  | 280cd/m <sup>2</sup> | 480cd/m <sup>2</sup> | 430cd/m <sup>2</sup>                | 400cd/m <sup>2</sup>       | 450cd/m <sup>2</sup>       |                |      |  |
| Viewing Up/Down(Degree)  | 20/40  |                                   | 80/80                      | 70/70                | 50/60                | 50/60                | 45/65                               | 45/75                      | 60/50                      |                |      |  |
| Angle Left/Right(Degree) | 45/45  |                                   | 80/80                      |                      | 65/65                | 65/65                | 65/65                               | 65/65                      | 75/75                      |                |      |  |
| Touch Panel              | 4-wire system, analogue  |                                   |                            |                      | Analog resistive     |                      | 8-wire system, analogue             |                            |                            |                |      |  |
| Movement LED             | Green: Normal RUN (Monitoring & drawing data download) Red: Error (Communication error & drawing data error) |                                   |                            |                      |                      |                      |                                     |                            |                            |                |      |  |
| Memory                   | Screen Data  | 4MB                               | 10MB                       | 4MB                  | 10MB                 | 4MB                  | 10MB                                | 10MB                       |                            | 20MB           |      |  |
|                          | Backup Data  | 128KB                             | 512KB                      | 128KB                | 512KB                | 128KB                | 512KB                               |                            |                            |                |      |  |
| Ethernet                 | -  | 1ch, 10/100Base-T                 | -                          | 1ch, 10/100Base-T    | -                    | 1ch, 10/100Base-T    |                                     |                            |                            |                |      |  |
| USB Interface            | USB Host X 1   | USB Host X 2                      | USB Host X 1               | USB Host X 2         | USB Host X 1         |                      | USB Host X 2                        |                            |                            |                |      |  |
| Serial                   | RS-232C  | 2ch (1 port for PC communication) |                            |                      |                      |                      |                                     |                            |                            |                |      |  |
|                          | RS-422/485   | 1ch, 422/485 optional mode        |                            |                      |                      |                      |                                     |                            |                            |                |      |  |
| CF Card Interface        | -  | CF card (TAPE-1) × 1              | -                          | CF card (TAPE-1) × 1 | -                    |                      | CF card (TAPE-1) × 1                |                            |                            |                |      |  |
| AUX Interface            | -  | Optional                          | -                          | Optional             | -                    |                      | Optional                            |                            |                            |                |      |  |
| Certification            | CE, UL, KC   |                                   |                            |                      |                      |                      |                                     |                            |                            |                |      |  |
| Protection               | IP65 (Front Water Proof Structure)   |                                   |                            |                      |                      |                      |                                     |                            |                            |                |      |  |
| Size(W × H × D)mm        | 181 × 140 × 56.5   | 181 × 140 × 66.5                  | 181 × 140 × 56.5           | 181 × 140 × 66.5     | 203.5 × 153.5 × 41.5 |                      | 240 × 174 × 73                      | 317 × 243 × 73             |                            | 395 × 294 × 73 |      |  |
| Panel Cut (W × H)mm      | 155.0 × 123.5  |                                   |                            |                      | 192 × 138            |                      | 228.5 × 158.5                       | 294.5 × 227.5              |                            | 383.5 × 282.5  |      |  |
| Weight (kg)              | 0.62   | 0.75                              | 0.62                       | 0.75                 | 2.2                  | 2.4                  | 1.4                                 | 2.2                        | 2.4                        | 3.9            |      |  |
| Power                    | Rated Voltage  | DC 24V                            |                            |                      |                      |                      |                                     |                            |                            |                |      |  |
|                          | Permitted Voltage  | AC                                | -                          |                      |                      |                      |                                     |                            |                            |                |      |  |
|                          |  | DC                                | MIN 19.2 VDC, MAX 28.8 VDC |                      |                      |                      |                                     |                            |                            |                |      |  |
|                          | Power Consumption (W)  | AC                                | -                          | -                    | -                    | -                    | -                                   | -                          | 21.8                       | 31.9           | 31.9 |  |
| DC                       |  | 9.7                               | 16.9                       | 9.6                  | 17.4                 | 9.8                  | 9.8                                 | 18.7                       | 20.1                       | 25.7           | -    |  |

## 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)             |            |

### Inetlligent Control

#### The Interface of the Convenient and User Oriented Function

Enhanced user friendly function through Serial communication (RS-422), Parameter transmission using PC loader, etc.

### High Performance

#### High Resolution Serial Type Encoder (16Bit~21Bit)

- Accurate Position Control and Improved Stability at Low Speed

#### Stable Low Speed Operation with Accurate Speed Check

- Stable Measurement at Low Speed

#### Absolute Encoder (Multi-turn)

- Origin Function is not needed

#### Improved Speed Response Frequency

- About 1kHz
- Reduced Positioning Time



### Convenience

#### Motion Network Type(EtherCAT) - XDL N Series

##### High Performance

- High speed, Real-time capability and Synchronization mechanism

##### Open Network

- Over 1600 worldwide members

##### Cost Effective

- Standard Ethernet Cabling + Connectors,  
Less implementation efforts for master and slave

##### Easy to Use

- Versatile topology and Diagnostics

#### XDL Drive with Built-in EtherCAT Interface

- 100BASE-TX(100Mbps) Ethernet based real-time communication
- Support CiA402(IEC61800-7) drive profile
- Precise synchronization mechanism (1us)
- Freely settable process data length and mapping
- Four status indication LEDs (L/A0, L/A1, RUN, ERR)
- Standard RJ45 connector and cabling(CAT5)
- Have intrinsic functions of XDL S series (same size)
- Support various homing modes
- Support Full-Closed control (Being developed)

#### Support Various Operation Modes

- CSP, CSV, CST, PP, PV, PT, HM, IP

#### Safe Torque Off Function

- Forced torque off by HWBB signals without intervention of  $\mu$ P and FPGA(ASIC), International standard (IEC61508)

#### Versatile I/O Assignment by Parameters

- 6 inputs, 4 outputs

#### High Speed Position Capture Function

- Touch probe function(PROBE1, PROBE2)

#### Provide Specialized Commissioning Tools by LSIS's XGT PLC

- Tune inertia ratio, velocity/position gains, gain conversion configuration

#### Have Conformity of EtherCAT Device

- In-house test using CTT(Conformance Test Tool)

#### Support Scaling Objects for Position, Velocity and Acceleration

- Numerator and denominator

#### Provide Gain Tuning Tools and Commissioning Packages

- Automatic inertia tuning and PI gains
- Manual fine gain tuning tool
- Alarm history function(recently issued 20 alarm codes)

**EtherCAT**

- High Performance
- Open Network
- Easy to USE
- Cost Effective

Safety Module

Emergency S/W

Safety light curtain

LSIS XGT PLC + PN8B

# Servo Drive

## Product Features

### Standard Type

| Item                  | Model                | XDL-L7SA001 □  | XDL-L7SA002 □   | XDL-L7SA004 □ | XDL-L7SA008 □ | XDL-L7SA010 □ | XDL-L7SA020 □ | XDL-L7SA035 □ | XDL-L7SA050 □ |  |
|-----------------------|----------------------|--|---|---------------|---------------|---------------|---------------|---------------|---------------|--|
| Input Power           | Main Power Supply    | 3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]  |   |               |               |               |               |               |               |  |
|                       | Control Power Supply | Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]   |   |               |               |               |               |               |               |  |
|                       | Rated Current[A]     | 1.4  | 1.7   | 3.0           | 5.2           | 6.75          | 13.5          | 16.7          | 32            |  |
|                       | Peak Current[A]      | 4.2  | 5.1   | 9.0           | 15.6          | 20.25         | 40.5          | 50.1          | 96            |  |
|                       | Encoder Type         | Quad. Type Incremental Line Driver Max 10000[P/R] Serial Type 19Bit  |   |               |               |               |               |               |               |  |
| Performance           | Speed Control        | Speed Control Position   | Max. 1 : 5000   |               |               |               |               |               |               |  |
|                       |                      | Frequency Response   | Max. 1[kHz] or above (When using 19bit Serial Encoder)                              |               |               |               |               |               |               |  |
|                       |                      | Analog Speed Command   | DC-10[V]~+10[V] (Reverse rotation in case of - voltage)                             |               |               |               |               |               |               |  |
|                       |                      | Accel/Decel Time   | Linear or S-Shape Accel/Decel. (0~10,000[ms], Setting 1[ms] is possible)            |               |               |               |               |               |               |  |
|                       |                      | Speed Variation Ratio  | ±0.01[%] or less [at Load variation 0 ~ 100%], ±0.1[%] or less [at Temp. 25±10°C]   |               |               |               |               |               |               |  |
|                       | Position Control     | Input Frequency  | 1[Mpps], Line Driver / 200[kpps], Open Collector                                    |               |               |               |               |               |               |  |
|                       |                      | Input Pulse Type   | +Pulse, CW+CCW, A/B Phase   |               |               |               |               |               |               |  |
|                       |                      | Electric Gear Ratio  | Setting and selecting 4 digital electric gear ratio, Precise adjustment is possible |               |               |               |               |               |               |  |
|                       | Torque Control       | Analog Torque Command  | DC -10 ~ +10[V] (Reverse rotation in case of - voltage)                             |               |               |               |               |               |               |  |
|                       |                      | Speed Limit  | DC 0 ~ +10[V], within ±1[%] of internal speed command                               |               |               |               |               |               |               |  |
| Repeatability         |                      | ±1[%] or less  |   |               |               |               |               |               |               |  |
| Analog Input          | Input Range          | DC -10 ~ +10[V]  |   |               |               |               |               |               |               |  |
|                       | Resolution           | 12[bit]  |   |               |               |               |               |               |               |  |
| Input/Output Signal   | Digital Input        | Total 10 Input Channels (assignment available)<br>SVON, SPD1, SPD2, SPD3, ALMRST, DIR, CCWLIM, CWLIM, EMG, STOP, EGEAR1, EGEAR2, PCON, GAIN2, P_CLR, T_LMT, MODE, ABS_RQ, ZCLAMP<br>Above 19 functions can be inputted selectively for assignment<br>Signal can be set as positive logic or negative logic |   |               |               |               |               |               |               |  |
|                       | Digital Output       | Total 5 Channels (assignment available), 3 Channels (set as alarm code)<br>ALARM, READY, ZSPD, BRAKE, INPOS, TLMT, VLMT, INSPD, WARN<br>Above 9 outputs can be inputted selectively for assignment<br>Signal can be set as positive logic or negative logic  |   |               |               |               |               |               |               |  |
| Communication         | RS-422               | PC Software and RS422 Server are available   |   |               |               |               |               |               |               |  |
|                       | USB                  | Status monitoring, JOG operation, parameter upload/download are available with PC Software   |   |               |               |               |               |               |               |  |
|                       | Encoder              | Compatible with Serial BiSS encoder, Quadrature encoder  |   |               |               |               |               |               |               |  |
|                       | Encoder Output Type  | Random pre-scale output by FPGA (Max. 6.4Mpps)   |   |               |               |               |               |               |               |  |
| Built-in Function     | Dynamic Braking      | Built-in type (operates when Servo alarm or Servo off)   |   |               |               |               |               |               |               |  |
|                       | Regenerative Braking | Built-in type, and also external connection is available   |   |               |               |               |               |               |               |  |
|                       | Display              | 7 segments (5DIGIT)  |   |               |               |               |               |               |               |  |
|                       | Setting Function     | Loader ([SET], [MODE], [UP], [DOWN] key)   |   |               |               |               |               |               |               |  |
|                       | Additional Function  | Automatic gain tuning function, Z-phase detection, manual JOG operation, program JOG operation, analog-input auto Calibration function   |   |               |               |               |               |               |               |  |
|                       | Protective Function  | Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem                       |   |               |               |               |               |               |               |  |
| Operation Environment | Temperature          | 0 ~ 50[°C]   |   |               |               |               |               |               |               |  |
|                       | Humidity             | Below 90[%]RH (avoid dew-condensation)   |   |               |               |               |               |               |               |  |
|                       | Ambient Environment  | Indoor, avoid corrosive, inflammable gas or liquid and electrically conductive dust.   |   |               |               |               |               |               |               |  |

### Network Type

| Item                  | Model                              | XDL-L7NA001B   | XDL-L7NA002B | XDL-L7NA004B | XDL-L7NA008B | XDL-L7NA010B | XDL-L7NA020B | XDL-L7NA035B |
|-----------------------|------------------------------------|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Input Power           | Main Power Supply                  | 3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]  |              |              |              |              |              |              |
|                       | Control Power Supply               | Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]   |              |              |              |              |              |              |
|                       | Rated Current[A]                   | 1.4  | 1.7          | 3.0          | 5.2          | 6.75         | 13.5         | 16.7         |
|                       | Peak Current[A]                    | 4.2  | 5.1          | 9.0          | 15.6         | 20.25        | 40.5         | 50.1         |
|                       | Encoder Type                       | Serial 17Bit / 19Bit / 21Bit   |              |              |              |              |              |              |
| Performance           | Speed Control Position             | Max. 1 : 5000  |              |              |              |              |              |              |
|                       | Frequency Response                 | Max. 1[kHz] or above (When using 19bit Serial Encoder)   |              |              |              |              |              |              |
|                       | Analog Speed Command               | ±0.01[%] or lower(When the load changes between 0 and 100%), ±0.1[%] or less(Temperature of 25_ [±10])   |              |              |              |              |              |              |
|                       | Torque Control Repetition Accuracy | Within ±1%   |              |              |              |              |              |              |
|                       | Supported Drive Modes (CIA402)     | Profile Position Mode<br>Profile Velocity Mode<br>Profile Torque Mode<br>Interpolated Position Mode<br>Cyclic Synchronous Position Mode<br>Cyclic Synchronous Velocity Mode<br>Cyclic Synchronous Torque Mode<br>Homing Mode   |              |              |              |              |              |              |
| Input/Output Signal   | Digital Input                      | Total 6 Input Channels (assignment available) PCON, GAIN2, ALMRST, HOME, P-OT, N-OT<br>Above 6 functions can be inputted selectively for assignment<br>Signal can be set as positive logic or negative logic   |              |              |              |              |              |              |
|                       | Touch Probe Digital Input          | 2 input channels Providing rising and falling edge detection functions for each channel.   |              |              |              |              |              |              |
|                       | Digital Output                     | Total 4 Channels (assignment available) ALARM, READY, ZSPD, BRAKE, INPOS, INSPD, WARN<br>7 outputs can be inputted selectively for assignment<br>Signal can be set as positive logic or negative logic   |              |              |              |              |              |              |
| Communication         | USB                                | Program download is available with USB Communication.  |              |              |              |              |              |              |
| Built-in Function     | Dynamic Braking                    | Built-in type(operates when Servo alarm or Servo off)  |              |              |              |              |              |              |
|                       | Regenerative Braking               | Built-in type, and also external connection is available   |              |              |              |              |              |              |
|                       | Display                            | 7 segments(5DIGIT)   |              |              |              |              |              |              |
|                       | Setting Function                   | The [MODE] key changes the content displayed in 7 segments.  |              |              |              |              |              |              |
|                       | Additional Function                | Auto gain tuning function  |              |              |              |              |              |              |
|                       | Protective Function                | Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem |              |              |              |              |              |              |
| Operation Environment | Temperature                        | 0 ~ 50[°C]   |              |              |              |              |              |              |
|                       | Humidity                           | Below 90[%]RH (avoid dew-condensation)   |              |              |              |              |              |              |
|                       | Ambient Environment                | Indoor, avoid corrosive, inflammable gas or liquid and electrically conductive dust.   |              |              |              |              |              |              |

## NH Type

| Item                                  | Type Name                          | XDL-L7NHA001U  | XDL-L7NHA002U | XDL-L7NHA004U | XDL-L7NHA008U | XDL-L7NHA010U | XDL-L7NHA020U | XDL-L7NHA035U |
|---------------------------------------|------------------------------------|--|---------------|---------------|---------------|---------------|---------------|---------------|
| Input Power                           | Main Power Supply                  | 3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]  |               |               |               |               |               |               |
|                                       | Control Power Supply               | Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]   |               |               |               |               |               |               |
| Rated Current[A]                      |                                    | 1.4  | 1.7           | 3.0           | 5.2           | 6.75          | 13.5          | 16.7          |
| Peak Current[A]                       |                                    | 4.2  | 5.1           | 9.0           | 15.6          | 20.25         | 40.5          | 50.1          |
| Encoder Type                          |                                    | Quadrature(Incremental)<br>BiSS-B, BiSS-C(Absolute, Incremental)<br>Tamagawa Serial(Absolute, Incremental)<br>EnDat 2.2  |               |               |               |               |               |               |
| Control Performance                   | Speed Control Range                | Maximum 1: 5000  |               |               |               |               |               |               |
|                                       | Frequency Response                 | Maximum 1[kHz] or above(When the 19-bit Serial Encoder is applied)   |               |               |               |               |               |               |
|                                       | Speed Variation Ratio              | ±0.01[%] or lower(When the load changes between 0 and 100%)  |               |               |               |               |               |               |
|                                       | Torque Control Repetition Accuracy | ±0.1[%] or less(Temperature of 25°C[±10])  |               |               |               |               |               |               |
| EtherCAT Communication Specifications | Communication Standard             | FoE (Firmware download)<br>EoE (Parameter setting by UDP, Tuning, Secondary function, Parameter copy)<br>CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)   |               |               |               |               |               |               |
|                                       | Physical Layer                     | 100BASE-TX(IEEE802.3)  |               |               |               |               |               |               |
|                                       | Connector                          | RJ45 x 2   |               |               |               |               |               |               |
|                                       | Communication distance             | Within connection between nodes 100[m]   |               |               |               |               |               |               |
|                                       | DC(Distributed Clock)              | By DC mode synchronism. minimum DC cycle: 250[us]  |               |               |               |               |               |               |
|                                       | LED Display                        | LinkAct IN, LinkAct OUT, RUN, ERR  |               |               |               |               |               |               |
|                                       | Cia402 Drive Profile               | Profile Position Mode, Profile Velocity Mode<br>Profile Torque Mode, Cyclic Synchronous Position Mode<br>Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode<br>Homing Mode   |               |               |               |               |               |               |
| Digital Input/Output                  | Digital Input                      | Input Voltage range : DC 12[V] ~ DC 24[V]<br>Total 8 input channels (allocable)<br>Above 12 functions can be used selectively for assignment.<br>(*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST)<br>*Basic allocation signal                     |               |               |               |               |               |               |
|                                       | Digital Output                     | Service rating: DC 24[V] ±10%, 120[mA]<br>Total 4 input channels (allocable)<br>Above 11 functions can be used selectively for assignment.<br>(*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, VLMT±, INSPD±, WARN±, TGON±, INPOS±) *Basic allocation signal                       |               |               |               |               |               |               |
| Analog Monitor                        |                                    | There are 2 input channels.  |               |               |               |               |               |               |
| Safety Function                       |                                    | Above 15 functions can be used selectively for assignment.   |               |               |               |               |               |               |
| USB Communication                     | Function                           | 2 Input Channels (STO1, STO2), 1 Output Channels (EDM±)  |               |               |               |               |               |               |
|                                       | Communication Standard             | Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy   |               |               |               |               |               |               |
|                                       | Connect                            | USB 2.0 Full Speed (applies standard)<br>PC or USB storing medium  |               |               |               |               |               |               |
| Internal Function                     | Dynamic Braking                    | Standard built-in brake (activated when the servo alarm goes off or when the servo is off).  |               |               |               |               |               |               |
|                                       | Regenerative Braking               | Both the default built-in brake and an externally installed brake are possible.  |               |               |               |               |               |               |
|                                       | Display Function                   | 7 segments(5DIGIT)   |               |               |               |               |               |               |
|                                       | Self-setting Function              | The [MODE] key changes the content displayed in 7 segments   |               |               |               |               |               |               |
|                                       | Additional Function                | Auto gain tuning function  |               |               |               |               |               |               |
|                                       | Protection Function                | Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem |               |               |               |               |               |               |
| Environment                           | Temperature                        | 0 ~ +50[°C] / -20~ +70[°C]   |               |               |               |               |               |               |
|                                       | Humidity                           | Below 90[%]RH(avoid dew-condensation)  |               |               |               |               |               |               |
|                                       | Environment                        | Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.  |               |               |               |               |               |               |

### NH Type

| Item                                  |                                    | Type Name  | XDL-L7NHB001U | XDL-L7NHB002U | XDL-L7NHB004U | XDL-L7NHB008U | XDL-L7NHB010U | XDL-L7NHB020U |
|---------------------------------------|------------------------------------|--|---------------|---------------|---------------|---------------|---------------|---------------|
| Input Power                           | Main Power Supply                  | 3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]  |               |               |               |               |               |               |
|                                       | Control Power Supply               | Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]   |               |               |               |               |               |               |
| Rated Current[A]                      |                                    |  | 3.7           | 8             | 10.1          | 17.5          | 22.8          | 39            |
| Peak Current[A]                       |                                    |  | 11.1          | 24            | 30.3          | 47.25         | 57            | 97.5          |
| Encoder Type                          |                                    | Quadrature(Incremental)<br>BiSS-B, BiSS-C(Absolute, Incremental)<br>Tamagawa Serial(Absolute, Incremental)<br>EnDat 2.2  |               |               |               |               |               |               |
| Control Performance                   | Speed Control Range                | Maximum 1: 5000  |               |               |               |               |               |               |
|                                       | Frequency Response                 | Maximum 1[kHz] or above(When the 19-bit Serial Encoder is applied)   |               |               |               |               |               |               |
|                                       | Speed Variation Ratio              | ±0.01[%] or lower(When the load changes between 0 and 100%)  |               |               |               |               |               |               |
|                                       | Torque Control Repetition Accuracy | ±0.1[%] or less(Temperature of 25°C[±10])  |               |               |               |               |               |               |
| EtherCAT Communication Specifications | Communication Standard             | FoE (Firmware download)<br>EoE (Parameter setting by UDP, Tuning, Secondary function, Parameter copy)<br>CoE (IEC 61158 Type12, IEC 61800-7 CIA 402 Drive profile)   |               |               |               |               |               |               |
|                                       | Physical Layer                     | 100BASE-TX(IEEE802.3)  |               |               |               |               |               |               |
|                                       | Connector                          | RJ45 x 2   |               |               |               |               |               |               |
|                                       | Communication distance             | Within connection between nodes 100[m]   |               |               |               |               |               |               |
|                                       | DC(Distributed Clock)              | By DC mode synchronism. minimum DC cycle: 250[us]  |               |               |               |               |               |               |
|                                       | LED Display                        | LinkAct IN, LinkAct OUT, RUN, ERR  |               |               |               |               |               |               |
|                                       | Cia402 Drive Profile               | Profile Position Mode, Profile Velocity Mode<br>Profile Torque Mode, Cyclic Synchronous Position Mode<br>Cyclic Synchronous Velocity Mode, Cyclic Synchronous Torque Mode<br>Homing Mode   |               |               |               |               |               |               |
| Digital Input/Output                  | Digital Input                      | Input Voltage range : DC 12[V] ~ DC 24[V]<br>Total 8 input channels (allocable)<br>Above 12 functions can be used selectively for assignment.<br>(*POT, *NOT, *HOME, *STOP, *PCON, *GAIN2, *P_CL, *N_CL, PROBE1, PROBE2, EMG, A_RST)<br>*Basic allocation signal                     |               |               |               |               |               |               |
|                                       | Digital Output                     | Service rating: DC 24[V] ± 10%, 120[mA]<br>Total 4 input channels (allocable)<br>Above 11 functions can be used selectively for assignment.<br>(*BRAKE±, *ALARM±, *READY±, *ZSPD±, INPOS±, TLMT±, VLMT±, INSPD±, WARN±, TGON±, INPOS±) *Basic allocation signal                      |               |               |               |               |               |               |
| Analog Monitor                        |                                    | There are 2 input channels.<br>Above 15 functions can be used selectively for assignment.  |               |               |               |               |               |               |
| Safety Function                       |                                    | 2 Input Channels (STO1, STO2), 1 Output Channels (EDM±)  |               |               |               |               |               |               |
| USB Communication                     | Function                           | Firmware download, Parameter setting, Tuning, Secondary function, Parameter copy   |               |               |               |               |               |               |
|                                       | Communication Standard             | USB 2.0 Full Speed (applies standard)  |               |               |               |               |               |               |
|                                       | Connect                            | PC or USB storing medium   |               |               |               |               |               |               |
| Internal Function                     | Dynamic Braking                    | Standard built-in brake (activated when the servo alarm goes off or when the servo is off).  |               |               |               |               |               |               |
|                                       | Regenerative Braking               | Both the default built-in brake and an externally installed brake are possible.  |               |               |               |               |               |               |
|                                       | Display Function                   | 7 segments(5DIGIT)   |               |               |               |               |               |               |
|                                       | Self-setting Function              | The [MODE] key changes the content displayed in 7 segments   |               |               |               |               |               |               |
|                                       | Additional Function                | Auto gain tuning function  |               |               |               |               |               |               |
| Environment                           | Protection Function                | Overcurrent, overload, overvoltage, insufficient voltage, main power input problem, control power input problem, overspeed, motor cable, overheat(power module overheat, abnormal drive operation's temp), encoder problem, over-regenerative, sensor problem, communication problem |               |               |               |               |               |               |
|                                       | Temperature                        | 0 ~ +50[°C] / -20 ~ +70[°C]  |               |               |               |               |               |               |
|                                       | Humidity                           | Below 90[%]RH(avoid dew-condensation)  |               |               |               |               |               |               |
| Environment                           |                                    | Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.  |               |               |               |               |               |               |

**P Type**

| Item                               | Type Name                    | XDL-L7PA001U  | XDL-L7PA002U | XDL-L7PA004U | XDL-L7PA008U | XDL-L7PA010U | XDL-L7PA020U | XDL-L7PA035U |
|------------------------------------|------------------------------|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Input Power                        | Main Power Supply            | 3 Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]   |              |              |              |              |              |              |
|                                    | Control Power Supply         | Single Phase AC200 ~ 230[V](-15 ~ +10[%]), 50 ~ 60[Hz]  |              |              |              |              |              |              |
| Rated Current[A]                   |                              | 1.4   | 1.7          | 3.0          | 5.2          | 6.75         | 13.5         | 16.7         |
| Peak Current[A]                    |                              | 4.2   | 5.1          | 9.0          | 15.6         | 20.25        | 40.5         | 50.1         |
| Encoder Type                       |                              | Quadrature(Incremental)<br>BiSS-B, BiSS-C(Absolute, Incremental)<br>Tamagawa Serial(Absolute, Incremental)<br>EnDat 2.2   |              |              |              |              |              |              |
| Control Performance                | Speed Control Range          | Maximum 1 : 5000  |              |              |              |              |              |              |
|                                    | Frequency Response           | Maximum 1 [kHz] or above (When using 19bit Serial Encoder)  |              |              |              |              |              |              |
|                                    | Speed Variation Ratio        | ±0.01 [%] or lower [when load changes between 0 and 100%]<br>±0.1[%] or lower [temperature 25 ±10°C]  |              |              |              |              |              |              |
|                                    | Accel/Decel Time             | Straight or S-curve acceleration/deceleration [0~10,000[ms], 0~1,000[ms] Unit configurable]   |              |              |              |              |              |              |
|                                    | Input Frequency              | 1[Mpps], line drive / 200[kpps], Open Collector   |              |              |              |              |              |              |
|                                    | Input Pulse Type             | Symbol + Pulse Series, CW+CCW, A/B Phase  |              |              |              |              |              |              |
| RS422 Communication Specifications | Communication Specifications | ANSI/TIA/EIA-422 Standard Specifications  |              |              |              |              |              |              |
|                                    | Communication Protocol       | MODBUS-RTU  |              |              |              |              |              |              |
|                                    | Connector                    | RJ45 x 2  |              |              |              |              |              |              |
|                                    | Synchro Method               | Asynchronous  |              |              |              |              |              |              |
|                                    | Transmission Speed           | 9600 /19200/38400/57600 [bps]<br>Can be configured at [0x3002]  |              |              |              |              |              |              |
|                                    | Transmission Distance        | Maximum 200 [m]   |              |              |              |              |              |              |
|                                    | Power Consumption            | 100[mA]   |              |              |              |              |              |              |
|                                    | Terminating Resistance       | Dip S/W(On/Off), Built-In 120Ω  |              |              |              |              |              |              |
| Input/Output Signal                | Digital Input                | Input voltage range: DC 12[V] ~ DC 24[V] Total 16 input channel (allocatable)<br>32 function inputs can be selectively allocated<br>(*SV_ON, *POT, *NOT, *A-RST, *START, *STOP, *REGT, *EMG, *HOME, *HSTART, *ISEL0, *ISEL1, *ISEL2, *ISEL3, *ISEL4, *ISEL5, PCON, GAIN2, P_CL, N_CL, MODE, PAUSE, ABSRQ, JSTART, JDIR, PCLR, AOV, SPD1/LVSF1, SPD2/LVSF2, SPD3, PROBE1, PROBE2) * Basic allocation signal. |              |              |              |              |              |              |
|                                    | Digital Output               | Use rating: DC 24[V] ±10%, 120[βA] Total 8 input channel (allocatable)<br>19 function inputs can be selectively allocated<br>(*ALARM±, *READY±, *BRAKE±, *INPOS1±, *ORG±, *EOS±, *TGON±, *TLMT±, VLMT±, INSPD±, ZSPD±, WARN±, INPOS2±, IOU0±, IOU1±, IOU2±, IOU3±, IOU4±, IOU5±)<br>* Standard Allocation signal  |              |              |              |              |              |              |
| Analog Input/output                | Analog Input                 | Total 2 channels<br>analog speed override input(-10[V] ~ +10[V])<br>analog torque command input(-10[V] ~ +10[V])  |              |              |              |              |              |              |
|                                    | Analog Output                | Total 2 channels<br>15 function inputs can be selectively allocated   |              |              |              |              |              |              |
| USB Communication                  | Protection                   | Firmware download, parameter setting, tuning, auxiliary function, parameter copy  |              |              |              |              |              |              |
|                                    | Communication Specifications | Complies with USB 2.0 Full Speed Specifications   |              |              |              |              |              |              |
|                                    | Connection Device            | PC or USB storage media   |              |              |              |              |              |              |
| Built-in Functions                 | Dynamic Braking              | Standard built-in(activated by servo alarm or servo OFF)  |              |              |              |              |              |              |
|                                    | Regenerative Braking         | Built-in, external brake attachable   |              |              |              |              |              |              |
|                                    | Display                      | 7 Segment(5 DIGIT)  |              |              |              |              |              |              |
|                                    | Setting Function             | Drive node address can be set using rotary switch   |              |              |              |              |              |              |
|                                    | Additional Function          | Gain tuning, alarm history, JOG operation, origin search  |              |              |              |              |              |              |
|                                    | Protective Function          | Excessive current, overload, excessive current limit, overheating, excessive voltage, low voltage, excessive speed, encoder fail, position following fail, current sensing fail   |              |              |              |              |              |              |
| Environment                        | Temperature                  | 0 ~ 50[°C] / -20 ~ 65°C   |              |              |              |              |              |              |
|                                    | Humidity                     | Below 90[%]RH(avoid dew-condensation)   |              |              |              |              |              |              |
|                                    | Environment                  | Indoor, Avoid corrosive, inflammable gas or liquid, and electrically conductive dust.   |              |              |              |              |              |              |

### PEGASUS (Hybrid Type)

#### Rated Values of Servo Drive

| Rated                            | □40 50W         | □40 100W | □60 100W | □60 200W | □60 300W |
|----------------------------------|-----------------|----------|----------|----------|----------|
| Continuous output Current [Arms] | 1.77            | 2.38     | 3.62     | 5        | 6.8      |
| Maximum output Current [Arms]    | 3.54            | 3.75     | 7.24     | 10       | 13.6     |
| Input Voltage                    | DC 48V ~ DC 60V |          |          |          |          |

#### Basic Specifications

| Category                                  |   | Details  |  |
|---|---|--|--|
| Use Conditions                            | Control Method                            | PWM controlled sine wave current driving method  |  |
|   | Operating Temperature/Storage Temperature | 0~+40[°C] / -20~ +60[°C]   |  |
|   | Operating Humidity/Storage Humidity       | Below 80% RH / Below 90% RH (no freeze or condensation)  |  |
|   | Vibration-/Impact-resistance              | TBD  |  |
|   | Degree of Protection/Degree of Pollution  | TBD  |  |
|   | Altitude                                  | 1000m or lower   |  |
|   | Other                                     | To be free from electrostatic noise, strong electrolysis, or radiation.  |  |
| Performance                               | Speed Variation                           | Load Variation   | At 0 to 100% load: ± 3% (at rated speed) |
|   |   | Voltage Variation  | Rated voltage ± 10%: 0% (at rated speed) |
|   |   | Temperature Variation  | 25°C: ±0.1% or less (at rated speed)     |
| Input/Output Signal                       | Input Signal                              | Input voltage range: DC 12 V - DC 30 V<br>The 4-channel input signal can be assigned to 12 functions: POT, NOT, HOME, STOP, PCON, GAIN2, PCL, NCL, PROBE1, PROBE2, EMG, and ARST.              |  |
|   | Output Signal                             | Rated voltage and current: DC 24 V ± 10%, 120 [mA]<br>The 2-channel output signal can be assigned to 11 functions: BRAKE, ALARM, RDY, ZSPD, INPOS1, TLMT, VLMT, INSPD, WARN, TGON, and INPOS2. |  |
| Analog Monitor                            |   | Number of channels: 1, Output voltage range: ±4V, Angular resolution: 12 bits, Stabilization time: 15 us   |  |
| USB Communication                         | Connecting Device                         | PC or USB storage medium   |  |
|   | Communication Standard                    | Conform to the USB 2.0 Full Speed Standard.  |  |
|   | Function                                  | Firmware download, parameter setting, adjustment, auxiliary functions, and parameter copy function.  |  |
| Dynamic Brake (Three-phase Short-circuit) |   | Activates when servo alarm, servo OFF, or Emergency stop (POT, NOT and EMG) is input.  |  |
| Protection Functions                      |   | Overcurrent, overload, current limit, overheat, overvoltage, undervoltage, overspeed, encoder error, position follow error, ect.   |  |
| Auxiliary Functions                       |   | Gain adjustment, alarm history, JOG drive, programmed JOG drive, etc.  |  |
| Safety Functions                          | Input                                     | STO1 and STO2  |  |
|   | Compatible Standard                       | TBD  |  |

### EtherCAT Communication Specification

| Category               |     | Details   |
|------------------------|-----|---|
| Communication Standard | FoE | Firmware download   |
|                        | EoE | Parameter setting, adjustment, auxiliary functions, and parameter copy through UDP. |
|                        | CoE | IEC 61158 Type12, IEC 61800-7 CiA 402 drive profile                                 |
| Physical Layer         |     | 100BASE-TX(IEEE802.3)   |
| Connector              |     | RJ45 x 2  |
| Distance               |     | Within 100 m between nodes  |
| DC (Distributed Clock) |     | Sync by DC mode   |
| LED Display            |     | • L/A0(Link/Act IN) • L/A1(Link/Act OUT) • RUN • ERR                                |
| Cia402 Drive Profile   |     | Supports CSP, CSV, CST, PP, PV, PT, and HM Modes.                                   |

### Encoder Specification

| Category     | Details                  |
|--------------|--------------------------|
| Encoder Type | Magnetic Encoder (12bit) |

### Motor Specification

| Model        | Unit                                    | □40 50W | □40 100W | □60 100W | □60 200W | □60 300W |
|--------------|---|---------|----------|----------|----------|----------|
| Rated Torque | [Kgf cm]                                | 1.62    | 3.25     | 3.25     | 6.50     | 9.74     |
| Max. Torque  | [Kgf cm]                                | 3.24    | 4.88     | 6.50     | 13.0     | 19.48    |
| Rated Speed  | [rpm]                                   | 3000    | 2400     | 3000     | 3000     | 3000     |
| Max Speed    | [rpm]                                   | 3000    | 3000     | 3000     | 3000     | 3000     |
| Inertia      | [Kg m <sup>2</sup> x 10 <sup>-4</sup> ] | 0.0240  | 0.0450   | 0.114    | 0.182    | 0.321    |



### 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.

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