XGT Panel
Human Machine Interface

LS ELECTRIC

Leading Innovation,
Creating Tomorrow

LS ELECTRIC creates the core automation solutions for the fields ranging from production facilities to information systems.

It is the device and software operable using a designed screen for users to monitor and control the operating status of given facilities and equipments.

Windows CE platform based XGT panel is a user-friendly solution, providing convenient, clear and realistic display, prompt data transmission and processing as well as easy environments.

Based on the advanced technologies, LS ELECTRIC satisfies various requirements of clients, from unit facilities to advanced industrial fields, leading the HMI market.

C O N T E N T S

XGT Panel

NEW Product XGT Panel

iXP2 Series

intelligent XGT Panel

High functioning, user friendly and robust choiec for your system, **iXP2**

Durability
- Slim and durable design with aluminum frame and a reinforced glass
- IP66 Certification with enhanced waterproofing and protection against dust.

Flexibility
- Dual Monitor function clone/extended mode
- Multi-touch setting to prevent malfunction

Connectivity
- Various external interfaces to provide IoT solutions
- Ethernet 2ch., HDMI/Audio output, USB host/device, multimedia (video)

Convenience
- Same as iXP panel cut that can be replaced
- Depending on touch sensitivity, you can set it up with bare hands or gloves.

Responsive touch screen

- Touch sensitivity is improved by applying responsive touch screen.
- Use touch screen either with bare hands or with gloves.
- Various types of touch setting function can be used according to user's work environment

Dual-Core CPU offers high-speed communication and processing

High luminance/resolution LCD with an LED backlight and 24 bit colors to express clear and vivid colors of 16,777,216.
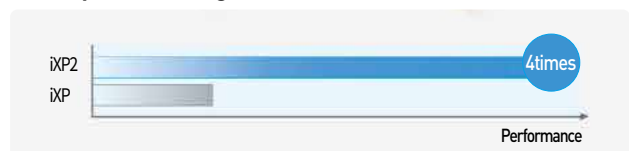
XGT Panel

iXP Series

intelligent XGT Panel

Convenient control with a single touch*!*

A user-oriented interface, enhanced performance, and
soft and quick screen switching and respond speed to touch*!*
Meet iXP series of LS ELECTRIC that genuinely and fully connects
humans with equipments.

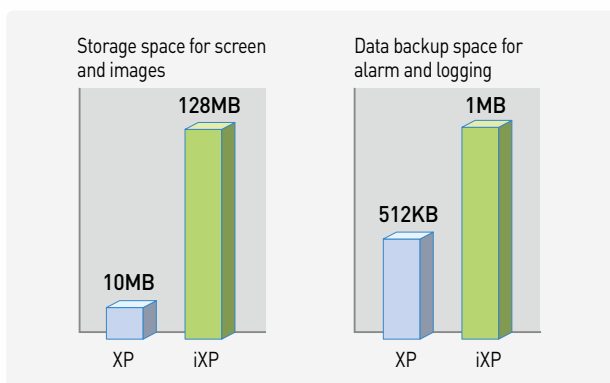## It is highly competitive using the user-friendly technologies.

- Quick screen switching and response speed to touch
- 16.7M TFT colored LCD
- Large drawing / backup memory (Drawing-128MB, Backup-1MB)
- Sound Output support
- Various interfaces
  - USB Host 3ch (Front: 1, Rear: 2), Device 1ch (Front)
  - SD card
  - Various communication drivers provided
- Presence sensor applied (within 1m)

High Speed

High-performance 1GHz CPU is installed to improve the data and screen switching speed, and Windows CE 6.0 OS is adopted to execute NET-based external applications.

Large Memory

Large device memory is provided to save mass data.

Storage space for screen and images

128MB
10MB
XP   iXP

Data backup space for alarm and logging
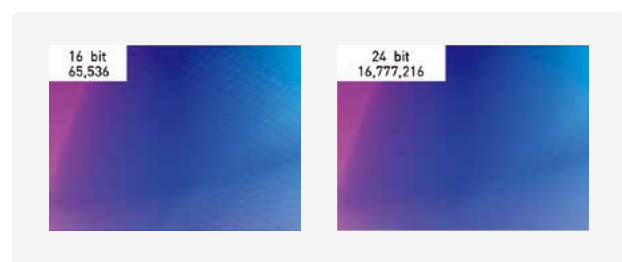
1MB
512KB
XP   iXP

Presence Sensor

Sensor detects movement within 1m, to control the backlight, ensuring a longer life of the product.

More Colorful

High luminance/resolution LCD with an LED backlight and 24 bit colors to express clear and vivid colors of 16,777,216.

16 bit
65,536

24 bit
16,777,216

Customize

- Put your company's brand on the front of HMI (inquire of your sales person about minimum order quantity condition).
- Purchase only hardware of HMI minus monitoring software if you do not need it (.NET Framework 3.5 included).

NEW Product XGT Panel

eXP Series

efficient XGT Panel

Effective Control and Monitoring Solution
Cost-Efficient eXP*!*

- Simple Design
- 4.3", 7" and 10.2" wide-screen sizes TFT color LCD
- Wide variety of communication interfaces
  - 2~3-channel serial communication
  - Ethernet

- Large memory for drawing (64MB)
- RTC function (maintained by battery)
- Convenient downloading/uploading of drawings via USB port in the front

Higher Level of Performance

Gives superior performance with improved CPU compared with the existing products

Wider Variety of Communication Interfaces

Communicable simultaneously with PLC, barcode reader, VFD, temperature controller

PLC (Ethernet) + Barcode Reader(RS-232C) + Drive(RS485) + Thermostat(RS422)
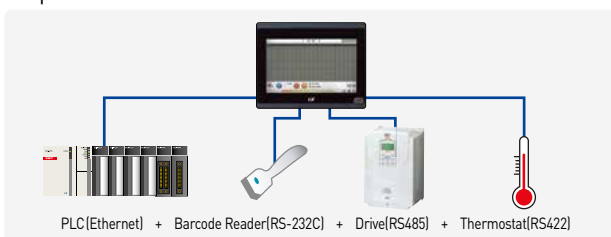
Slimmer and Lighter in Weight

20% lighter than previous products, provides more space and lightens user's panels
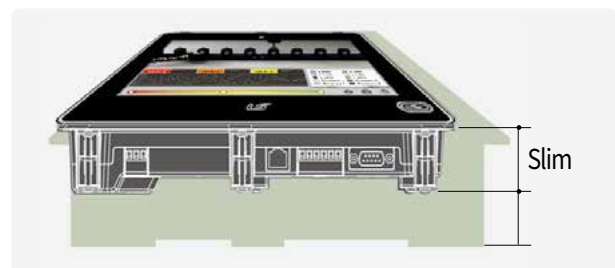
Slim

Customize

Put your company's brand on the front of HMI (inquire of your sales person about minimum order quantity condition).

Window CE-based new HMI developed with advanced technologies of
LS ELECTRIC to optimize the user experience

XGT Panel

iXP2 Series

	15"(38Cm)	12.1"(31Cm)	10.4"(26Cm)
Premium Ethernet I/F · Serial I/F(RS-232C) · Serial I/F(RS422/485) · USB I/F · SD Card I/F · HDMI I/F	**iXP2-1500** TFT 16,777,216 colors XGA(1024 X 768)	**iXP2-1200** TFT 16,777,216 colors XGA(1024 X 768)	**iXP2-1000** TFT 16,777,216 colors XGA(1024 X 768)

iXP Series

	15"(38Cm)	12.1"(31Cm)	10.4"(26Cm)
Premium Ethernet I/F · Serial I/F(RS-232C) · Serial I/F(RS422/485) · USB I/F · SD Card I/F	**iXP90-TTA** *2 TFT 16,777,216 colors XGA(1024 X 768)	**iXP80-TTA** *2 TFT 16,777,216 colors SVGA(800 X 600)	**iXP70-TTA** *2 TFT 16,777,216 colors SVGA(800 X 600)

eXP Series

			10.2"(25.9Cm)
Standard Serial I/F(RS-232C) · Serial I/F(RS422/485) · Serial I/F(RS-485) · USB I/F · Ethernet I/F			**eXP60-TTA** *2 *3 *4 TFT 65,536 colors WVGA(800 X 480)

8.4"(21Cm)

iXP2-0800

TFT 16,777,216 colors
SVGA(800 X 600)

8.4"(21Cm)

iXP50-TTA *2

TFT 16,777,216 colors
SVGA(800 X 600)

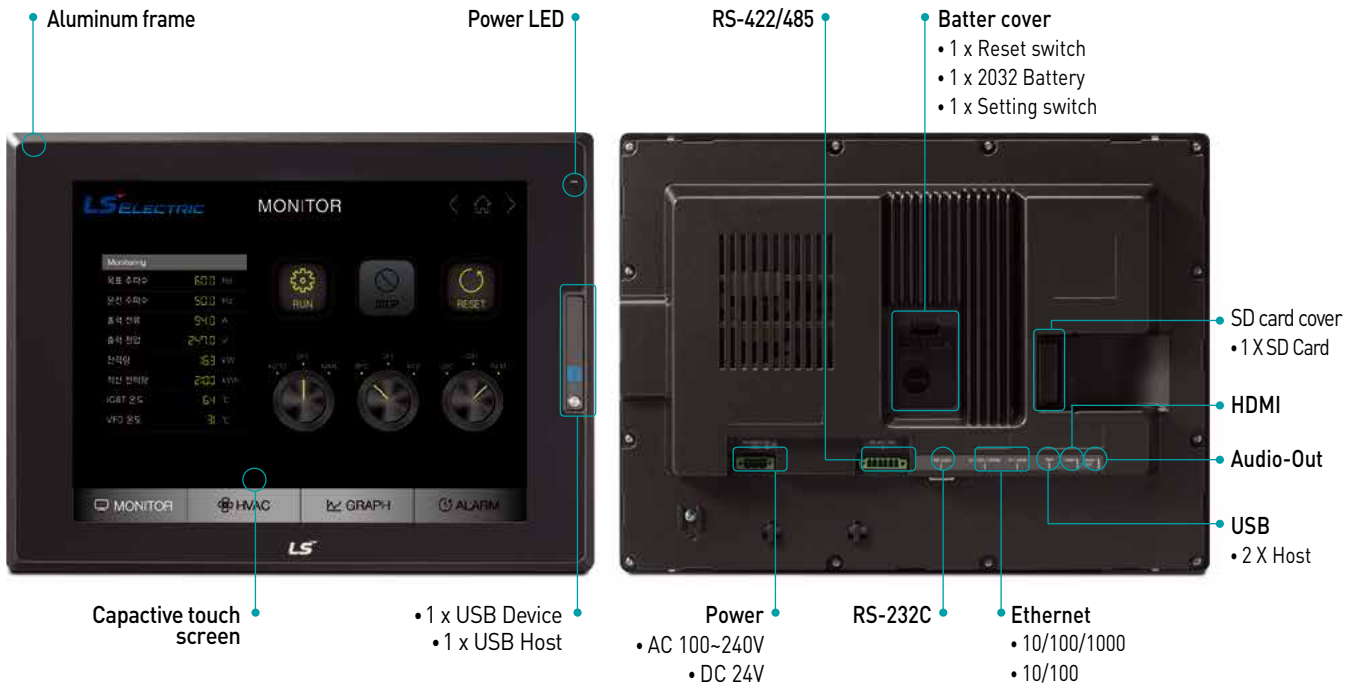| 7"(17.7Cm)	5.6"(14.2Cm)	4.3"(10.9Cm)
eXP40-TTA *2 *3 *4 **eXP40-TTE** *1 *2 *3 *4	**eXP30-TTA** *2 *3 *4 **eXP30-TTE** *1 *2 *3 *4	**eXP20-TTA** *2 *3 *4
TFT 65,536 colors WVGA(800 X 480)	TFT 65,536 colors VGA(680 X 480)	TFT 16.7M colors VGA(480 X 272)

*1 : Ethernet I/F not supported. *2 : CF card I/F not supported. *3 : Expansion port not supported. *4: SD card not supported.

High functioning, user friendly and robust choice for your system, **iXP2**

Aluminum frame   **Power LED**   **RS-422/485**   **Batter cover**
• 1 x Reset switch
• 1 x 2032 Battery
• 1 x Setting switch

SD card cover
• 1 X SD Card

HDMI

Audio-Out

USB
• 2 X Host

Capactive touch screen   • 1 x USB Device   • 1 x USB Host

Power   **RS-232C**   **Ethernet**
• AC 100~240V   • 10/100/1000
• DC 24V   • 10/100

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iXP2 Multiple interface methods to cope with the Internet of Things

Ethernet 2ch., HDMI / Audio output, USB host/device, multimedia (video)

* Multimedia function scheduled for release in '18.10

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iXP2 Multi-touch and gesture-control screens

Multi-touch maximizes operating stability and safety.
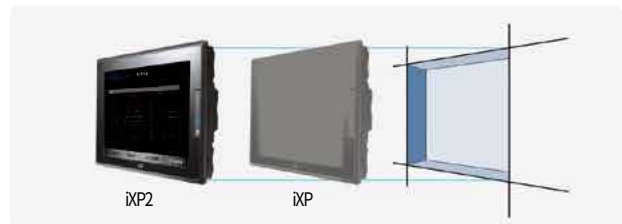Use gesture-control to view logging trend graphs and to change screens.

iXP2 Robust IP66 aluminum frame

Reinforced protection against water and dust. Conforms to NEMA 4X standard.

iXP2 One to one interchangeability with existing iXP series

Offers equivalent panel cut to iXP.

iXP2   iXP

iXP2 Screen gesture

Flick to change screens.
No extra switching button is needed to change screens.

iXP2 Object gesture

Select the object you want and then swipe and flick it.
Object list
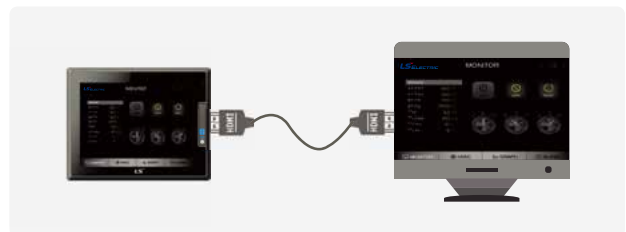• Logging trend graph • View logging history • View history alarms

iXP2 Multi-touch

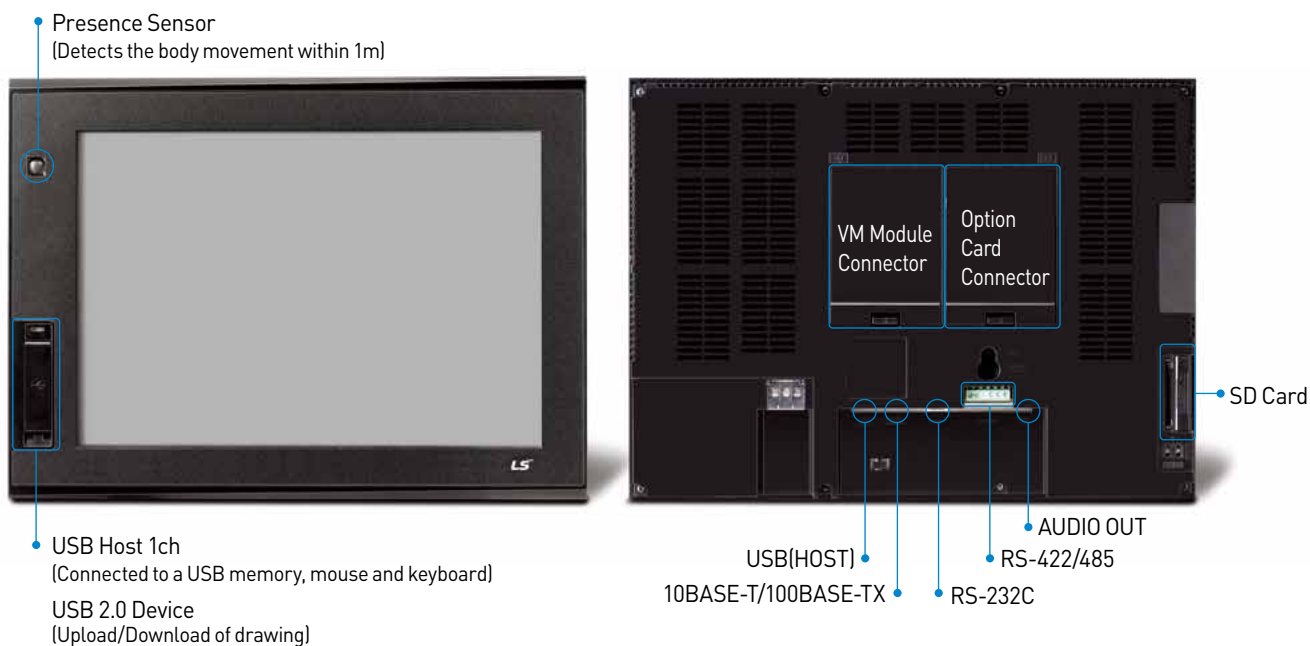Use multi-touch to protect your system from undesired errors.

iXP2 Dual monitor mode and extension mode

Increase your convenience by duplicating or extending your screens.

* Extension display mode scheduled for release in '18.09

Hardware Related Functions iXP

Presence Sensor
(Detects the body movement within 1m)

VM Module Connector

Option Card Connector

SD Card

USB Host 1ch
(Connected to a USB memory, mouse and keyboard)

USB 2.0 Device
(Upload/Download of drawing)

USB(HOST)

10BASE-T/100BASE-TX

AUDIO OUT

RS-422/485

RS-232C

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iXP 1 Respective Front USB Host/Device Channel

- An additional USB host channel is installed in the front panel.
- A front USB host is used to connect to a USB memory, mouse and keyboard.
- A front USB device port is used to change the XP-Runtime without opening a control panel or download/upload the drawing file created using XP-Builder.
- USB cable: USB-301A 2.0

Front USB port

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iXP Sound Output Function (For all iXP models)

- The sound files (wav, mp3) registered using XP-Builder can be output to speakers connected to HMI.
- An alarm is generated via speakers to warn operators.
- Up to 512 sound files can be saved.
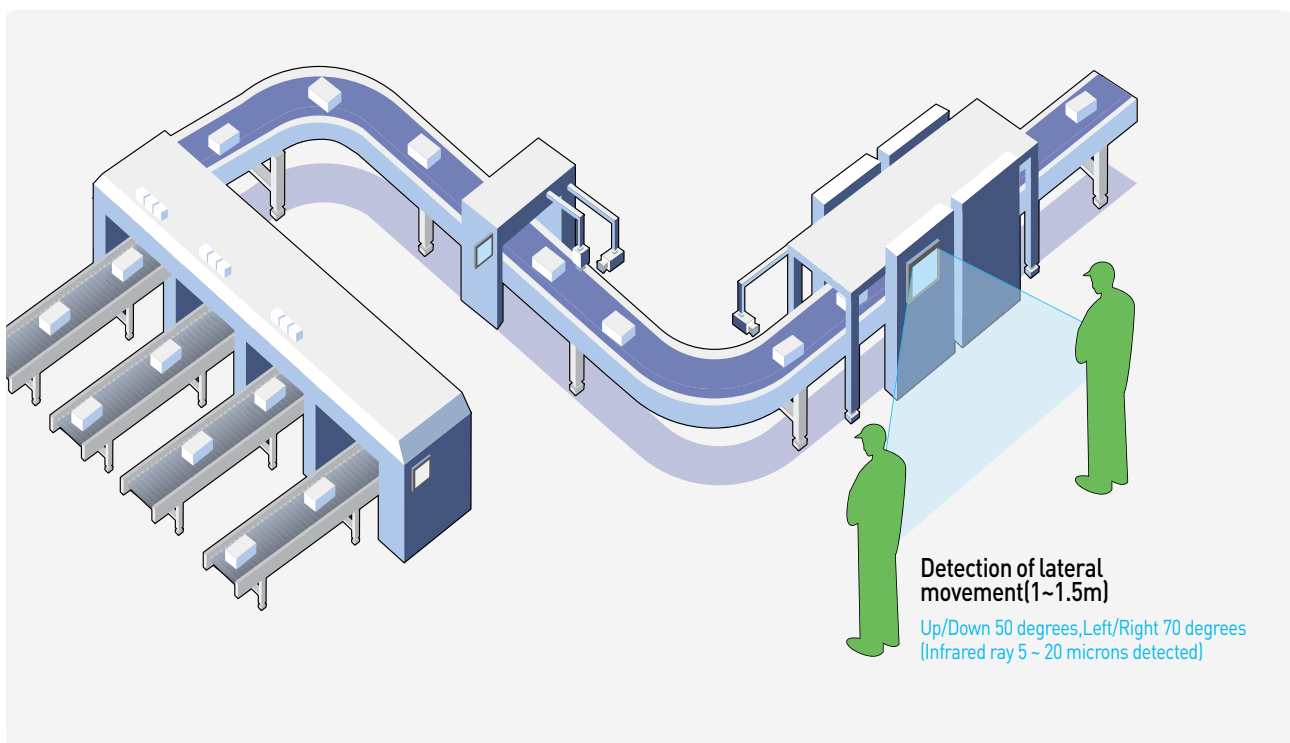
An alarm is turned on

An error occurred

Sound files: max. 512 files

PLC

iXP

Speaker

iXP Function to use SD Cards

iXP supports additional SD memory cards along with previous USB memory to diversify the backup means.

16 GB Additional
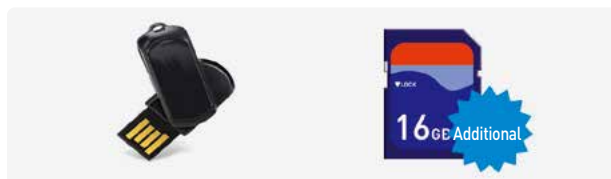
iXP Presence Sensor

- The XP presence sensor detects movement within 1m to turn on a backlight.
- When not used, it turns OFF the screen to maintain a longer lifespan of the backlight.

1m

Detection of movement
(40~50cm)

Detection of lateral
movement(1~1.5m)

Up/Down 50 degrees,Left/Right 70 degrees
(Infrared ray 5 ~ 20 microns detected)

Hardware Related Functions eXP

USB 2.0 Device
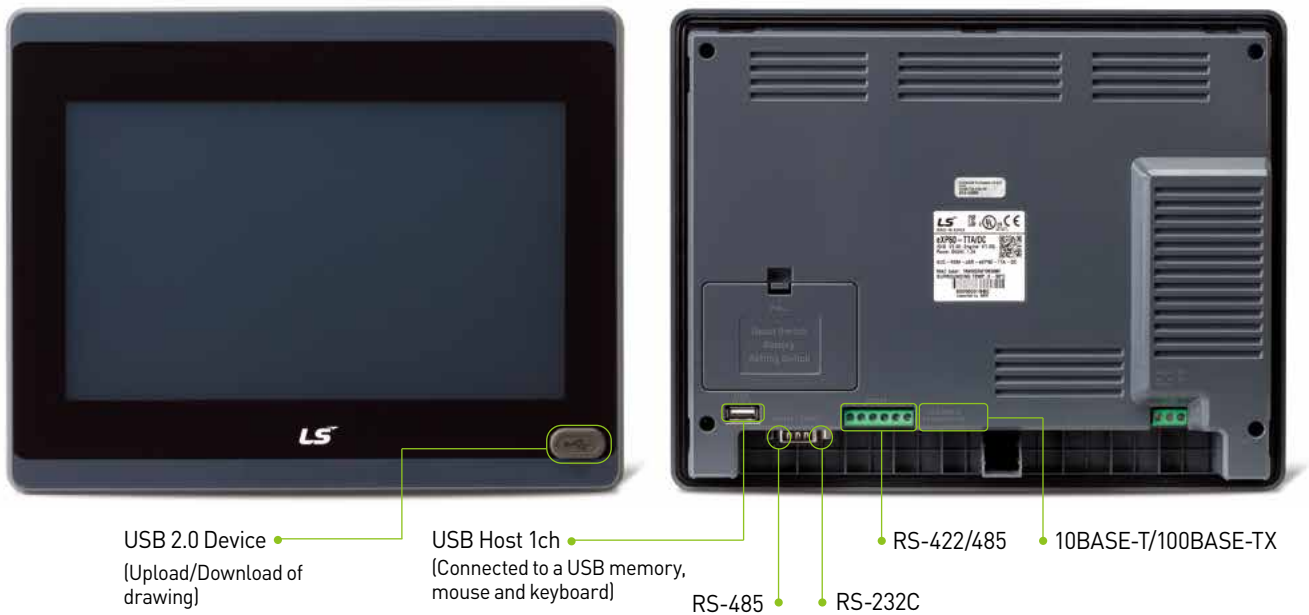(Upload/Download of drawing)

USB Host 1ch
(Connected to a USB memory, mouse and keyboard)

RS-485

RS-232C

RS-422/485

10BASE-T/100BASE-TX
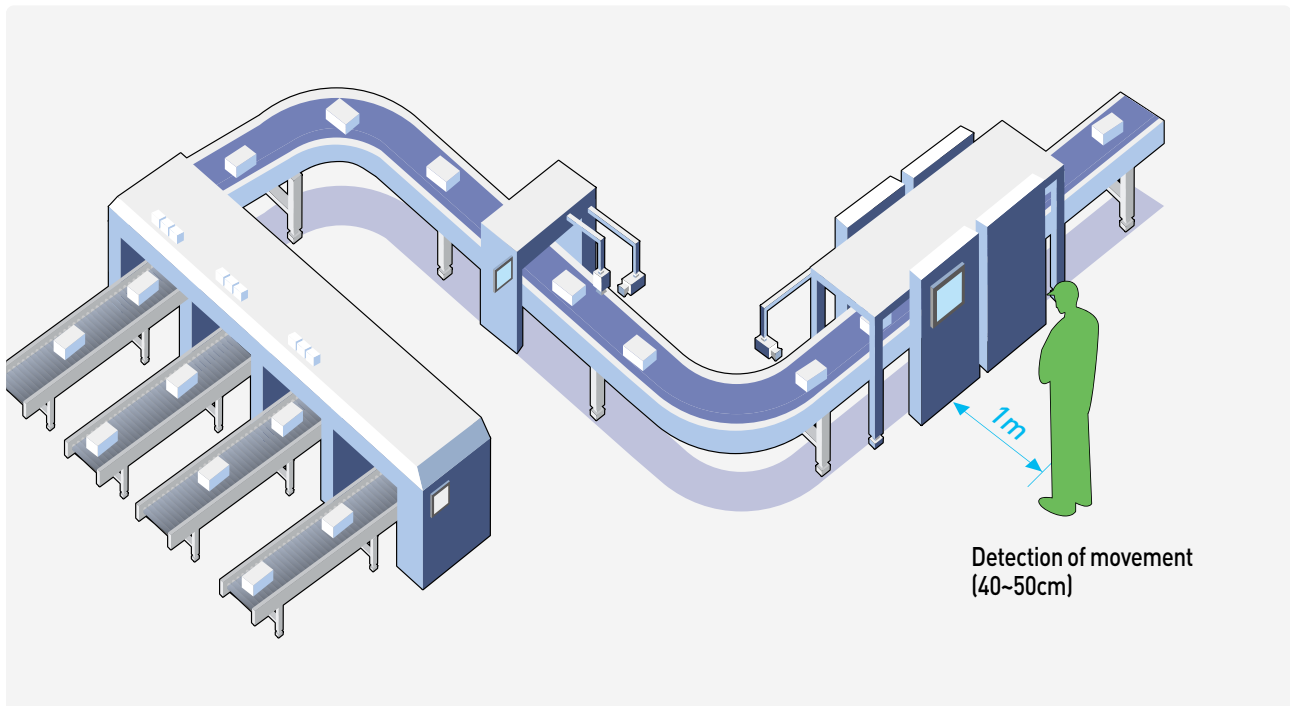
eXP USB Port in the Front for Devices

- With USB port in the front, no need to open the control panel to apply changes to XP-Runtime or download/upload drawing files made in XP-Builder
- USB cable: USB-301A 2.0

Front USB port

eXP 3-Channel Serial Communication

- Simultaneously communicable by RS-485, RS-232C, RS-422/485
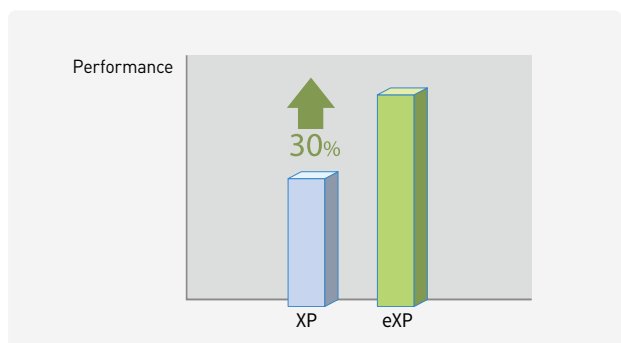- D-Sub 9-pin terminal includes COM1 and COM2

eXP RTC Function

- RTC (Real Time Clock) function operates with a battery even with the power off
- HMI time setting is adjustable quickly using XP-Builder

eXP High Performance

- About 30% better performance

Performance

30%

XP   eXP

# Hardware Related Functions iXP2 iXP eXP

Ethernet method for Quick Transmission of Mass Data

- Ethernet method has improved the transmission speed.
  Compared to the conventional RS-232C method,
  a quicker transmission speed: 115kbps → 10/100Mbps
- Regardless of the memory capacity, the drawing files can be quickly
  uploaded/ downloaded, and logging/alarm/recipe data can be conveniently used.
- Ethernet method is used for various production data collection,
  monitoring and control using PC.

Ethernet
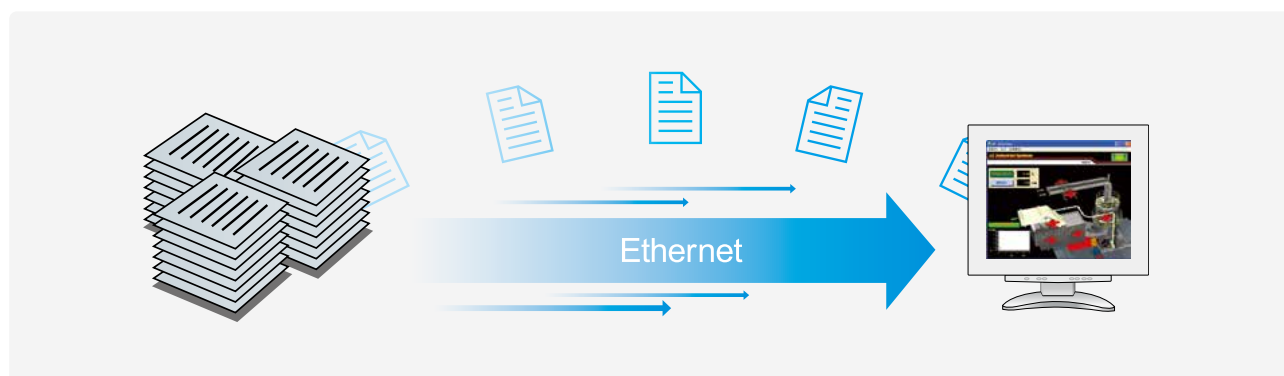
Barcode Scanner Communication

- ASCII data imported by accessing a barcode scanner from XGT Panel can be saved
  in the user-assigned PLC or XGT Panel's internal memory.
- Complete Bit can be randomly saved. It allows users to check whether the
  XGT Panel has read the data without errors.
- Communication with barcodes is possible by using the RS-232C interface installed
  in the XGT Panel.

PLC

Barcode Reader
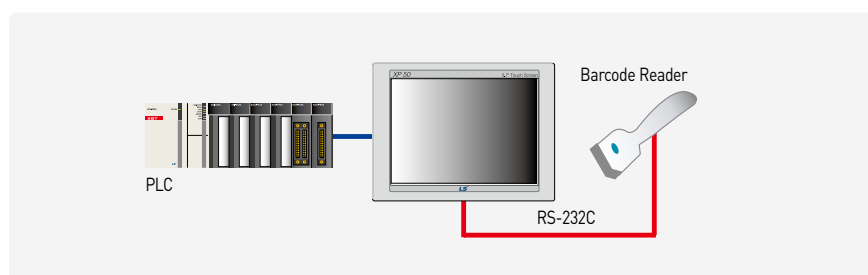
RS-232C

Providing Various Communication Channels

Using RS-232C, RS-422/485 and Ethernet, XP/eXP and iXP2/iXP are capable of communicating with up to 4 and 6 types of controllers, respectively. Refer to the system block diagram (TTE type does not have an Ethernet module).
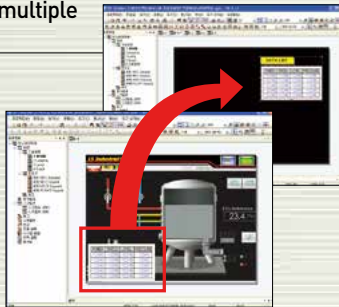
XP-Builder

XGT Panel offers easy and user-friendly multi-interface.

XP-Builder Functions

Implementation of multiple programs

In order to use the previously created drawing data for a new drawing, more than 2 XP-Builder programs are executed simultaneously.
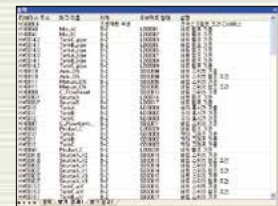
Function to check data

- To check for any error on the data created, and errors can be corrected by clicking on them.
- The specific description of error created is displayed.

Cross-reference function of devices

Devices used for drawing data and tags are displayed.

Animation function

- When GIF format is used, animation effects can be realized depending on the state of given bit.
- When a video clip on given site is created into GIF to be added to a drawing screen, more accurate information can be delivered to users. (Video clip files can be created using the commercial software for GIF creation)

Video Clip GIF

Drawing Editor: XP-Builder

Project Window

Add, delete and edit project property, logging, recipe and alarm conveniently.

Data Element Window

- Displays the objects on a screen currently shown.
- When double-clicked, a window on setting the properties appears.

Screen Window

Add, delete and edit basic screens, window screens and part screens easily

Output Window

- Displays the error checked on drawing data and the search results.
- It displays the specific description of the errors created.

Project Window

Data Elements

Screen Edit Window

Screen Edit

Output
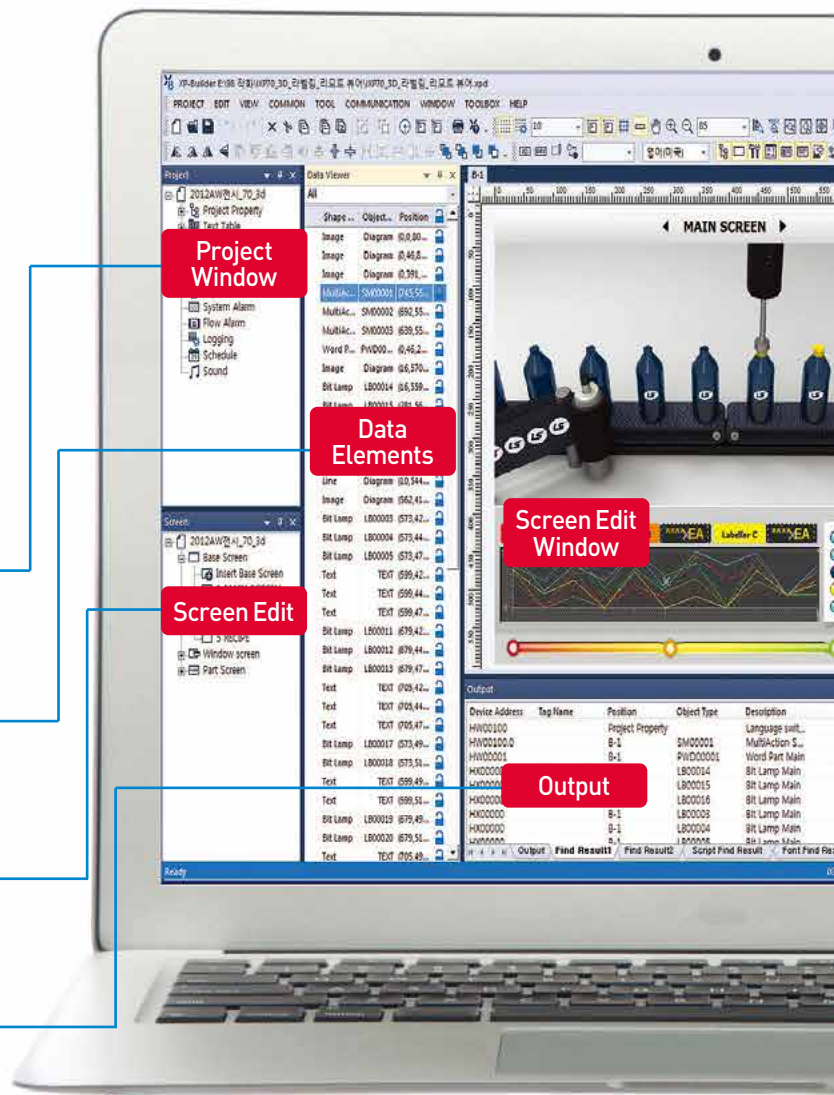
Tag function

- Users can set device address by desired name, which can be used in an object.
- When a set device is tagged to an object, addresses can be changed, collectively
- Up to 10,000 tags can be registered.

Various fonts with convenient setting options

- Windows fonts used in a PC can be transmitted to HMI for use.
- When using Windows fonts, font attributes (Italic, bold and underline) can be used as well.
- Various font sizes including True Type are supported.
- Supports the Unicode, characters of other countries such as the standard font and high-quality fonts are beautifully displayed.
- Sophisticated and elegant text can be used to create a screen using various fonts.

Arial : ABCDEFGHIJKLMNOPQRSTUVWXYZ
Book : ABCDEFGHIJKLMNOPQRSTUVWXYZ
Impact : ABCDEFGHIJKLMNOPQRSTUVWXYZ
Helvetica : ABCDEFGHIJKLMNOPQRSTUVWXYZ
Tahoma : ABCDEFGHIJKLMNOPQRSTUVWXYZ
Time : ABCDEFGHIJKLMNOPQRSTUVWXYZ
Verdana : ABCDEFGHIJKLMNOPQRSTUVWXYZ

가나다라마바사아자차카타파하
가나다라마바사아자차카타파하
가나다라마바사아자차카타파하
가나다라마바사아자차카타파하

User-oriented screen UI

Providing a flexible script language

- Provides a screen UI that can be easily used considering user's experiences.
- Divided into categories so that a graphic library can be easily searched.
- Various graphic libraries are offered for enhanced usability.
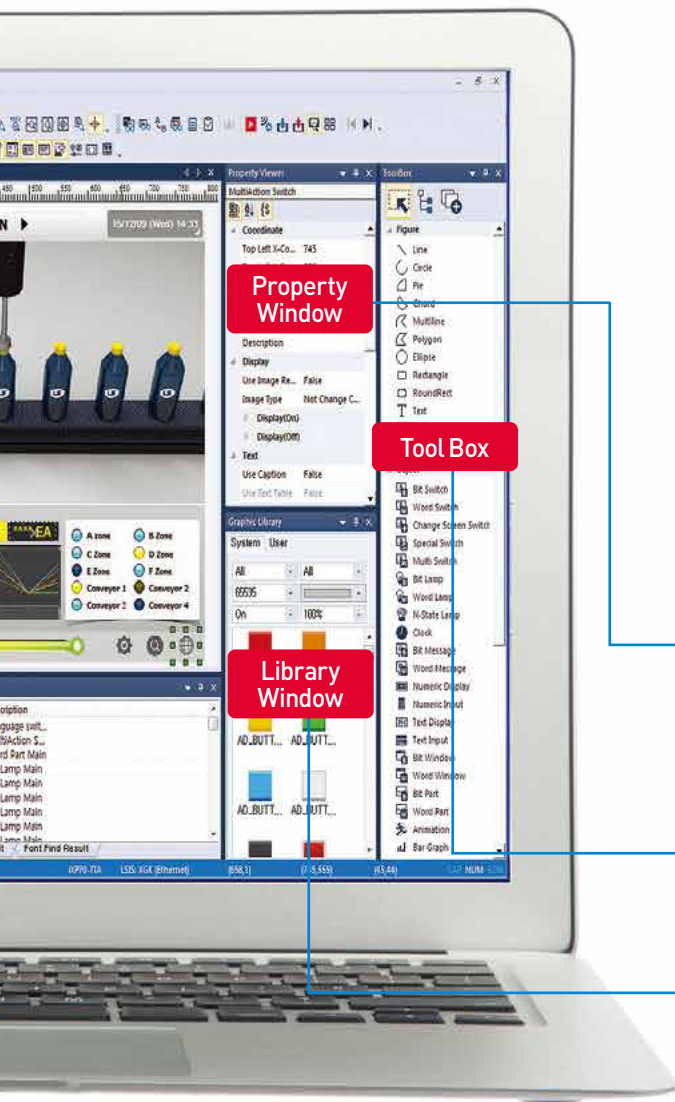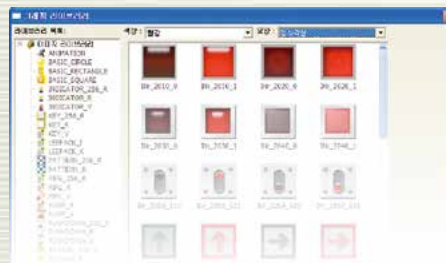
Property Window

Tool Box

Library Window

Property Window

This function enables users to change properties of numerous objects at once, so that users do not have to open each object like a button or a lamp for modification.

- Numerous objects on the screen can be selected at once to replace the pictures, enhancing users' convenience.
- When modifying several objects, only the objects with the same function should be selected.
- Users can correct both pictures and properties.

Tool Box

Used to select an object or draw a shape.

Library Window

- Library is divided by category for easier use, and preview is used for drawing.
- Convenient for users to register and delete the Library.
- Drag & Drop is used for a screen insertion.

Software Related Functions

Multi-lingual support & conversion to respond to the global enterprise environments

- In response to enterprise environment of global era, up to 12 languages can be simultaneously converted and users can select a language depending on his/her nationality.
- When desired character string is registered in a table, a language can be converted into a device value and switched upon operation.
- The languages supported include Korean, English, Chinese (PRC/Taiwan), Japanese, French, Turkish, Iranian (Persian), German, Greek, Russian, Italian, Norwegian, Polish, Portuguese and Spanish, all of which are supported in Windows.
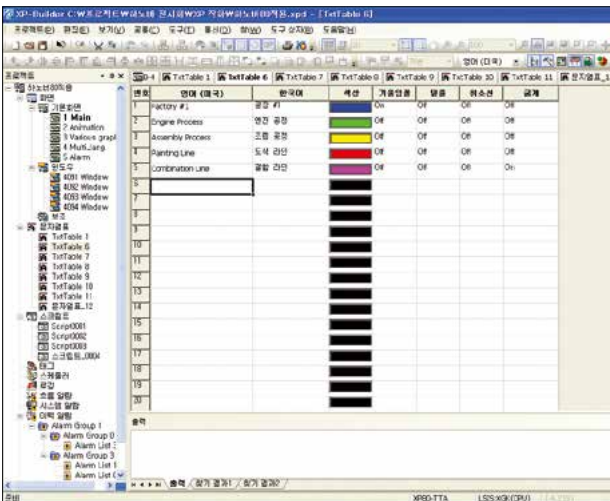
Strict control management using security setting

- Upon PLC control using objects like a switch or an input method editor, only the authorized users can perform controls depending on the set security level.
- It supports 10 security levels in total, and the password of a sub-level can be accessed using the password of a main level.
- When the security level is authorized, a session is disconnected after a certain period of time, asking for the password again.
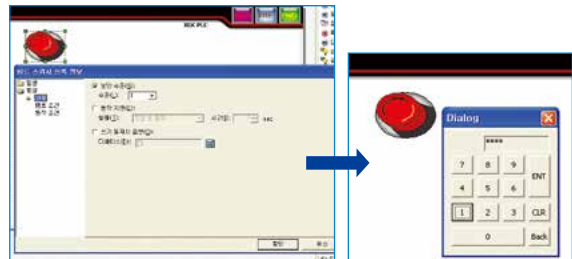
Free and easy moving of parts

- The fixed values and the parts related to the word device are selected/ switched to be displayed on a screen, and the images registered as the given parts can be used.
- A mouse is used to set the movement points for free moves, linear moves, and moves based on the XY coordinates, which can be chosen by users.

Free moves

Linear moves

Automatic registration of a character string table

This function enables the character string input by users in the objects to be automatically registered.

- When the file created using a single language is to be changed to a character string table for the purpose of multi-lingual support, it can be automatically registered to the character string table without inconvenience of users.
- All the static strings used in objects can be registered in the character string table.
- Up to 10,001 character strings can be added to a character string table, and the name of a new character string table and the editing languages can be set and registered by users.

Select "Automatic registration of strings to the table" from the [Tool] menu

Memo pad function

Function to create or save a short message by selecting various pen thicknesses and colors on XGT Panel.

- It is useful in exchanging messages between operators working in turns.
- The user chooses the thickness and color of the pen and writes on a screen in order to input the message.
- Such memo can be saved in a CF card or a USB memory, and the data are archived even when the power is turned off.
- Users touch the screen and drag to create a memo.
- When creating a memo, users can UNDO/REDO the memo, the thickness/color of a pen can be changed, and a specific memo or all memos can be deleted.

Advanced Functions

Alarm Function

- **History Alarm**
  The history of alarms can be saved in the device to check the description of occurrence.
  The alarm can be categorized into up to 8 upper and 8 lower class groups or an alarm list, and an alarm explorer can display only the group alarms the user may desire. When a screen on description to check the details of alarms generated is registered, the detailed screen window linked to the alarm will appear.
  (It can be used to check the measures or detailed description when an alarm is generated.)

- **Flow Alarm**
  The alarm generated is displayed on the upper/mid/lower section for users to promptly take actions.
  Flow alarm can be set to be operable at a specific screen, so it can be used to deliver the information on equipments and company.

- **System Alarm**
  When a serious fault or a trouble of HMI occurs, the system alarm informs the users, which is a critical function.
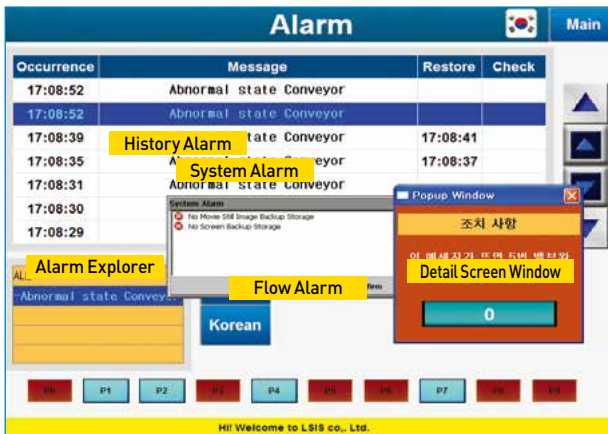
E-mail Function

- It offers a function to send backup files (.csv) using the E-mail address registered upon backup of the logging and alarm data in XGT Panel.
- The E-mail function for logging can only send the backup files of the group desired for each logging group.
- The E-mail function for history alarm includes a function to send to the E-mail only on the alarm messages to the designated receivers when the user-assigned alarm is generated or recovered.
- The logging and alarm backup files sent can be easily analyzed in PC using a program like EXCEL.
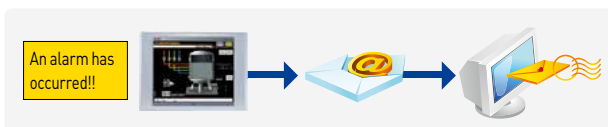
Logging Function

- It offers a cyclic logging that is repeated depending on the time and device state and a conditional logging which works under the device conditions.
- Up to 32 logging areas (conditions) can be provided, and the maximum size of an area can be set up to 512Kbyte, 100DWord.
- Up to 512Kbyte, 100DWord (64Bit upon bit logging) per logging can be saved.
- Basically, logging is saved in the built-in SRAM(512Kbyte, 100DWord), and the backup of logging is available using the CF card, SD card, USB memory stick or USB external hard disk.
- Logging data can be viewed in XGT Panel using a logging view object, and they can be converted into a CSV format to be easily edited using a PC via software such as EXCEL.

Encryption of Logging/Alarm Backup Files

- The backup file format can be archived as binary files to prevent the data from being damaged or manipulated.
- The encrypted files can be converted into CSV files using a CSV file converter offered from XP-Builder.

Able to View PDF

- Viewing PDF file XGT Panel
- Saving trouble shooting instructions for failures (alarm) in PDF format so that users could see in the field
- No number limit of PDF files as PDF files are saved in external memories
- This function is available only in iXP2/iXP series HMIs, not in XP series HMIs
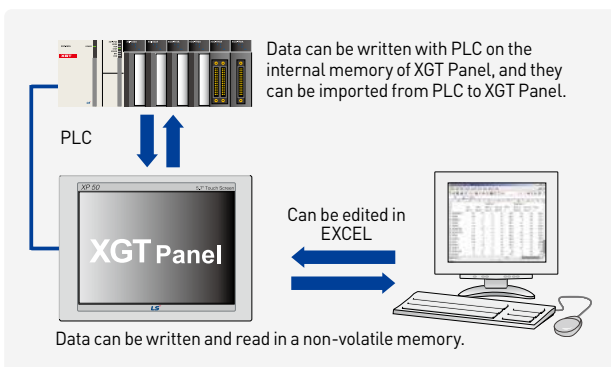
Scheduler

- Scheduler assigns an operation to be executed on a set time.
- Available functions include Bit ON/OFF, setting Word values and a script operation. Each scheduler can assign up to 8 operations.
- Up to 32 schedulers can be set.

Write

Recipe

- After the data to be written on PLC are created, the data values created on a PLC device continuously connected to a specific device can be written.
- It can read a lot of device values from the PLC continuously connected to a specific device.
- Basic recipe can register up to 10000 Word/DWord devices and 255 table blocks.
- Recipe data are saved in a non-volatile memory of XGT Panel. Thus, when the power is out, the data saved at the last minute are kept.
- Recipe data can be registered and edited using a XGT Panel or an EXCEL program.

Data can be written with PLC on the internal memory of XGT Panel, and they can be imported from PLC to XGT Panel.

PLC

XGT Panel

Can be edited in EXCEL

Data can be written and read in a non-volatile memory.

Script

Providing a flexible script language

- It is difficult to perform drawing using only the provided object functions, and it can be supplemented using a script.
- A structured language similar to the C language is used for user's convenience.
- The script using complicated arithmetic operations and various functions is executed to greatly reduce the load upon external controllers.
- A validity check of the grammar on the created scripts is available.

Various uses of scripts

- A wide range of scripts including global scripts, screen scripts and object scripts can be used depending on the usage.
- A global script operates according to ON/OFF of the device assigned, regardless of the screen operation, and a special device can be used for scripts in a regular basis.
- An object script can perform operational management of the object devices.
- A script can run when a screen opens or closes.

Mounting Flexibility

- All iXP2/iXP series models and eXP20 can be mounted in portrait or landscape mode as per user's needs and preference.
- Configurable in project property menu.

Operation Logging

- TTA models of XP Series and all iXP2/iXP models can save logs of your operation in touch screen.
- Use saved logs to check system's operation or errors.

Link with Controllers
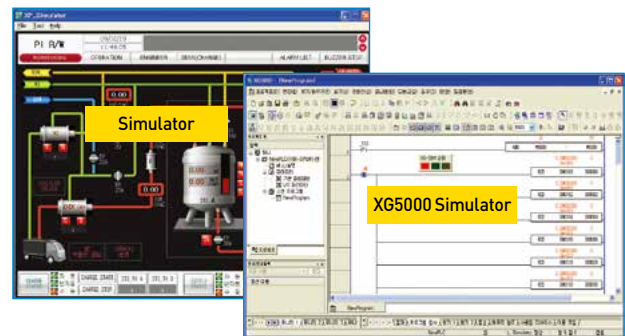
Convenient Simulator

Offline simulation

- Without XGT Panel, the drawing data can be directly viewed from PC.
- Devices can be monitored using a PC, and values can be directly input to check operations.
- A simulator is used to check the operations just like the XGT Panel. Before transmitting the drawing data to HMI, data errors and abnormal operations can be checked.

Simulator / Virtual Device Input

Path-through(XP-VSP)

When XGT Panel is connected to PLC with serial, PLC ladder program can be modified using the internal Ethernet.

- Users no longer have to change the cable for PLC program modification, or to go to the PLC for changes.
- A program can be modified even when a control panel is far away.

Serial (CPU)

Note) XP-VSP user manual reference

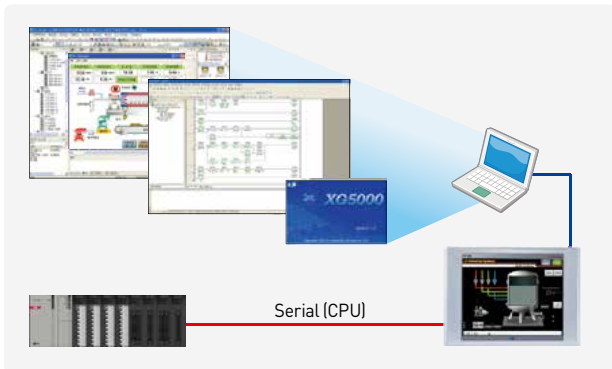| Manufacturers	Supported Drives
LS ELECTRIC	ALL LS ELECTRIC PLC CPU
	XGI/K Series Link(Only Remote-1 Connection)
Omron Corporation	CS/CJ Host Link Serial
YASKAWA	MEMOBUS RTU Master

Able to Link with PLC Simulator

- Controlling and monitoring testing in PC linking XP-Builder (XP-Simulator) and PLC simulator
- Linking with LS ELECTRIC PLC simulator and XG5000 simulator
- Linking with SIEMENS PLC simulator and S7-PLCSIM (S7-PLCSIM v5.4 or above)
- Linking with Rockwell Automation PLC simulator and RSLogix Emulate 5000 Controller (v21.00.00 or above)
- Linking with Mitsubishi PLC simulator and GX Simulator (GX Simulator v7.30 or above)

Simulator / XG5000 Simulator

Using XGT PLC for batch-registration of devices (tag function)

The variable names used in the PLC program that is created using XG5000 are automatically registered in XP-Builder, so that they can be used in drawings.

- [Save as a Variable/Description File] of XG5000 is used to first save the variable names used as CSV files.
- Using [Import XG5000 Symbols] from the [Tag] item of XP-Builder, an automatic registration via tags is possible (Array variables supported).
- Without changing the memory address, the variables used in the PLC program can be used.
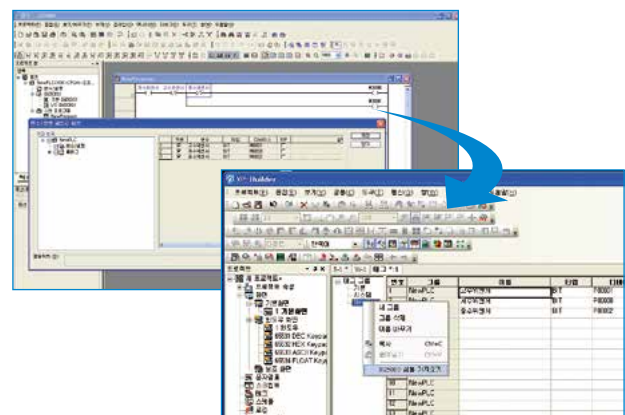
Communication Options

Fieldbus option provided

Various Fieldbus communications using the XGT Panel options

(RAPIEnet, Profibus-DP and CANopen Slave offered)

RAPIEnet(XPO-EIMT) twisted-pair ring system diagram

Trouble occurs

RAPIEnet
Real-time Automation Protocols for Industrial Ethernet

Fail

Fast Recovery !!

Note) An option module supports only XP (iXP to be supported in the future)
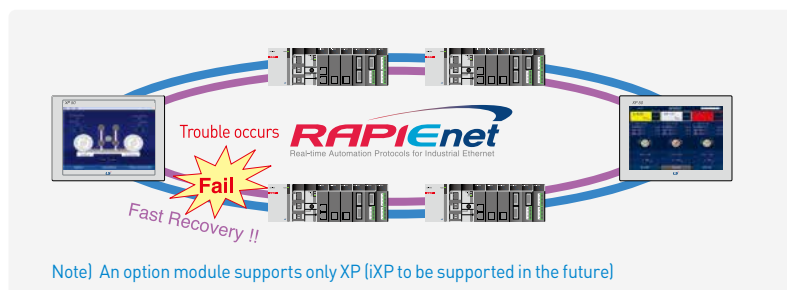
XP-Server Function

The data required from the production site's XGT Panel can be directly collected or saved in a PC.
It has several roles including a mutual data exchange between several XGT Panels, or sending an E-mail or connecting to a Database.

- It connects to the Database via PC to save, inquire and manage the XGT Panel data.
- When a trigger condition is generated, users will be informed via data E-mail of PC.
- When a trigger condition is generated, it imports or writes the screen capture, logging, alarm and recipe data of a specific XGT Panel.
- It is possible to collect various information including production outputs and causes of errors and failures from the XGT Panel to the DB server

Database

Factory

Ethernet

Data

Data

Data

Data

Data
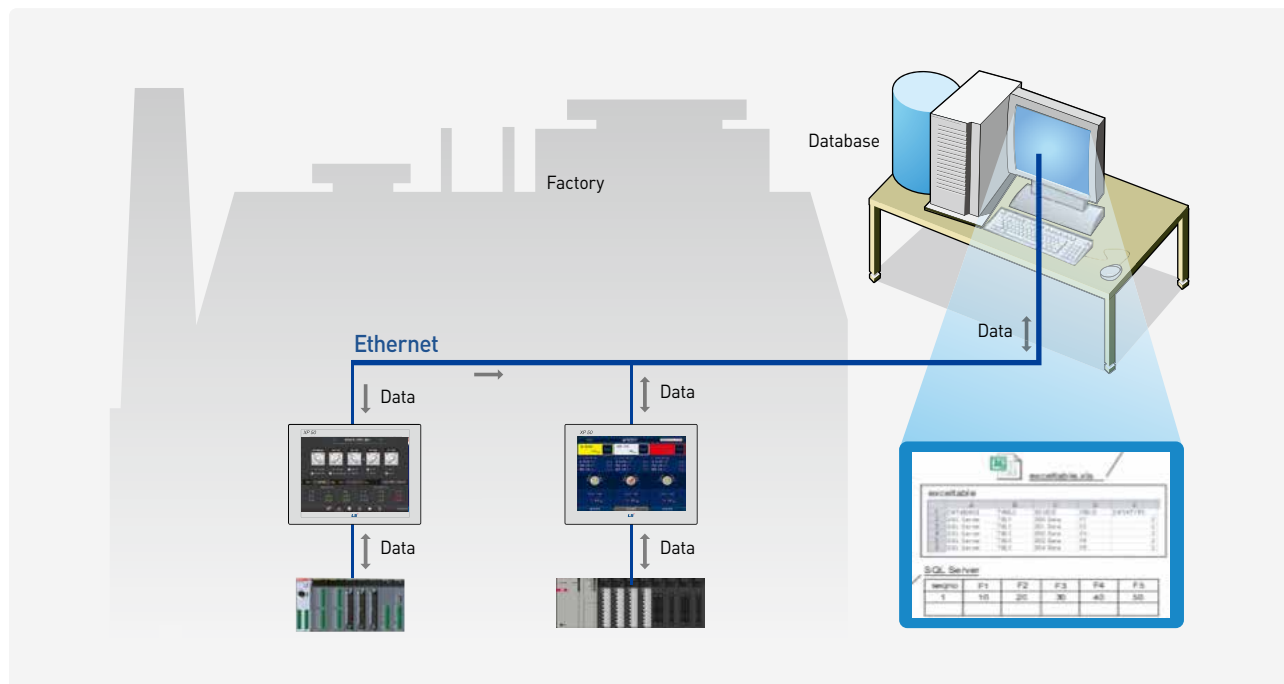
External Monitoring Function

※ Only the Ethernet-support models can use the function.

XP-Remote

- An XGT Panel screen can be monitored and controlled remotely with a PC.
- Up to 4 PCs can remote-access to a single XGT Panel. (Only one PC can access XP-VNC.)
- Remote PC control of XGT Panels can be authorized or restricted (When not authorized, it is impossible to control with the Remote PC).
- There is a synchronization mode and a non-synchronization mode, which allows users to monitor the XGT Panel and the Remote PC screen under the same or different conditions.
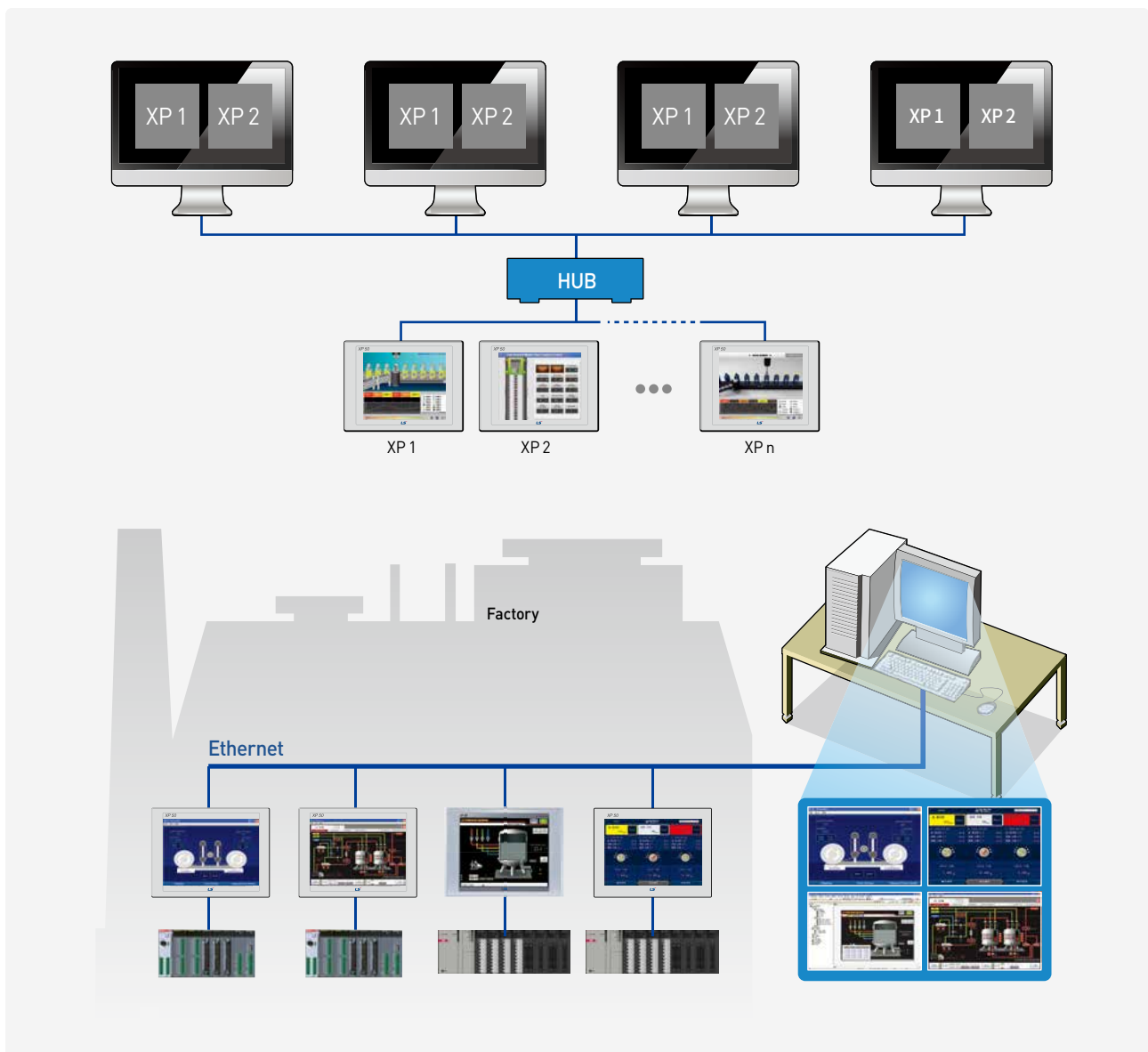
Web Server

- The screen currently viewed on a XGT Panel can be viewed on a web browser via Internet.
- It is accessible in any place where Internet is connected.
- It can be connected to multiple Internet Explorers.
  (Impossible to access the XP screen at the same time)
- It is possible to upload the logging and alarm backup files as csv files in the XGT Panel.
- It is possible to restrict access of specific users or groups.

※ The functions described above are available when a Web Server Program is
   installed to the XGT Panel using XP-Manager.
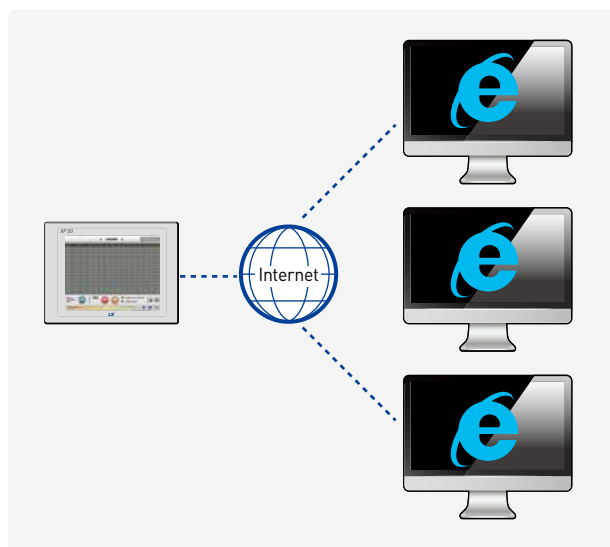
XP-VNC

- The screen currently shown in the XGT Panel can be viewed from the user's PC.
- Several XGT Panels can be monitored and controlled with one PC.
- After inserting the IP of XGT Panel to be accessed from XP-VNC (S/W for PC), the current screen of the XGT Panel can be monitored and controlled.
- It is possible to restrict PC control when the XGT Panel is under operation on site (VNC interlock device provided).
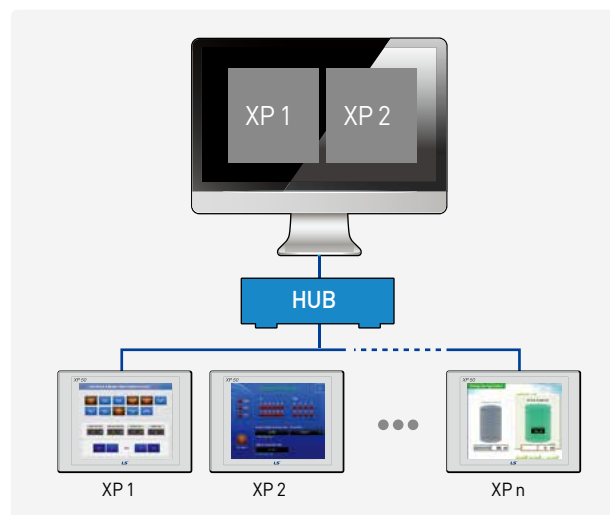
VNC Client

- All iXP2/iXP series models can be shown screen of another PC or HMI in your HMI.
  - To view another PC's screen, install universal VNC server (Ultra VNC, Real VNC and so on).
  - To view another HMI's screen, download VNC server to your HMI using XP-Manager.
- Add "VNC Viewer" object in your HMI project.
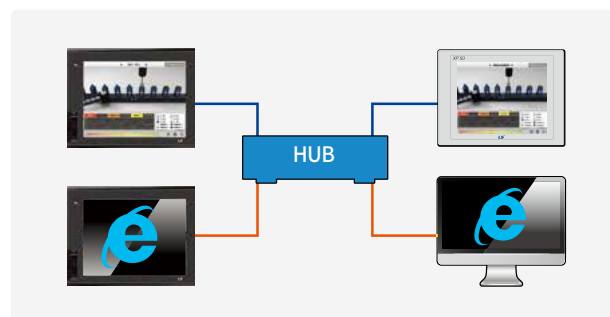
System Block Diagram

1 : 1 Serial/Ethernet Communication

One controller to one XGT Panel

※ In case of the 1:1 Ethernet communication, a cross cable should be used.

RS-232C
RS-422/485

Ethernet

N : 1 Serial Communication

One controller to multiple XGT Panels (serial)

※ Up to 16 XGT Panels can be connected, but the speed for screen refreshing varies according to the number of panels.

※ Connection available only to specific controllers (limited to PLCs)

Only RS-485 available

Simultaneous Connection with Multiple Controllers

4 kinds of controllers to one XGT Panel

※ Without the RS-422/485 and RS-232C, up to 4 controllers can be connected using only Ethernet.

※ When it comes to iXP2/iXP, up to 16 controllers can be connected.

Ethernet

HUB

XGK

XGI

RS-232C

RS-422/485

Master K

GLOFA
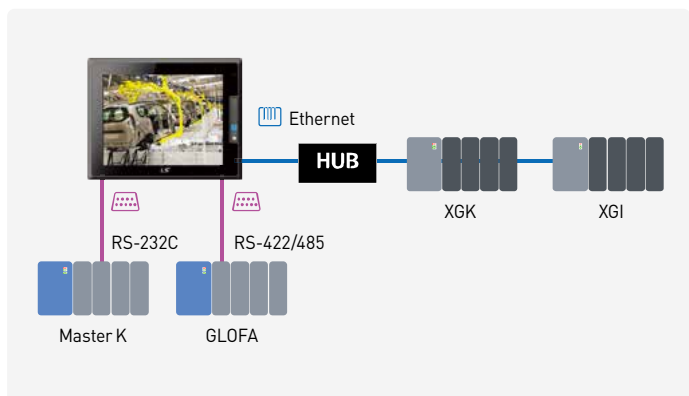
1 : N Serial Communication (Multi Drop)

Multiple controllers to one XGT Panel
※ When 1:N communication is applied, the same types of controllers should be used.

RS-422/485, 500m Max
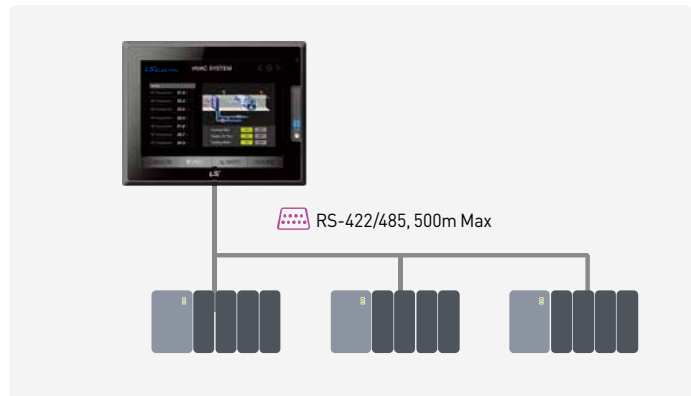
N:1 Ethernet Communication

One controller to multiple XGT Panels (Ethernet)
※ According to the controller type, the number of XGT Panels connected may vary.

HUB
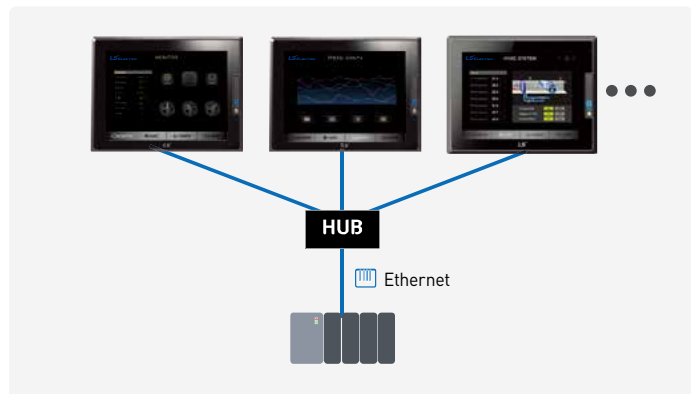
Ethernet

N:M Ethernet Communication

Multiple controllers to multiple XGT Panels

HUB

Ethernet
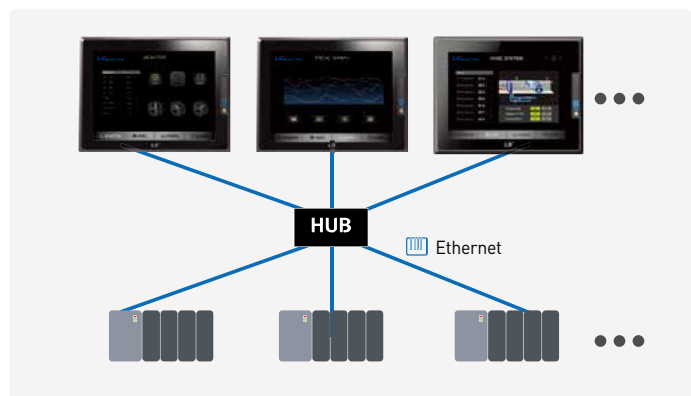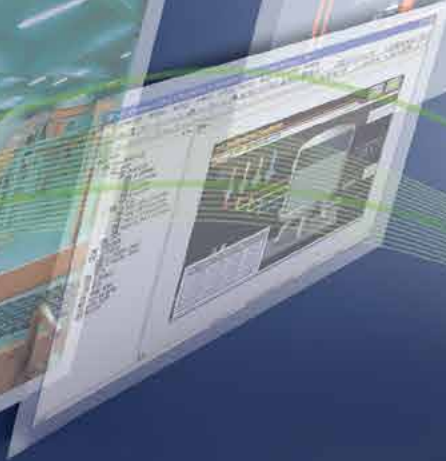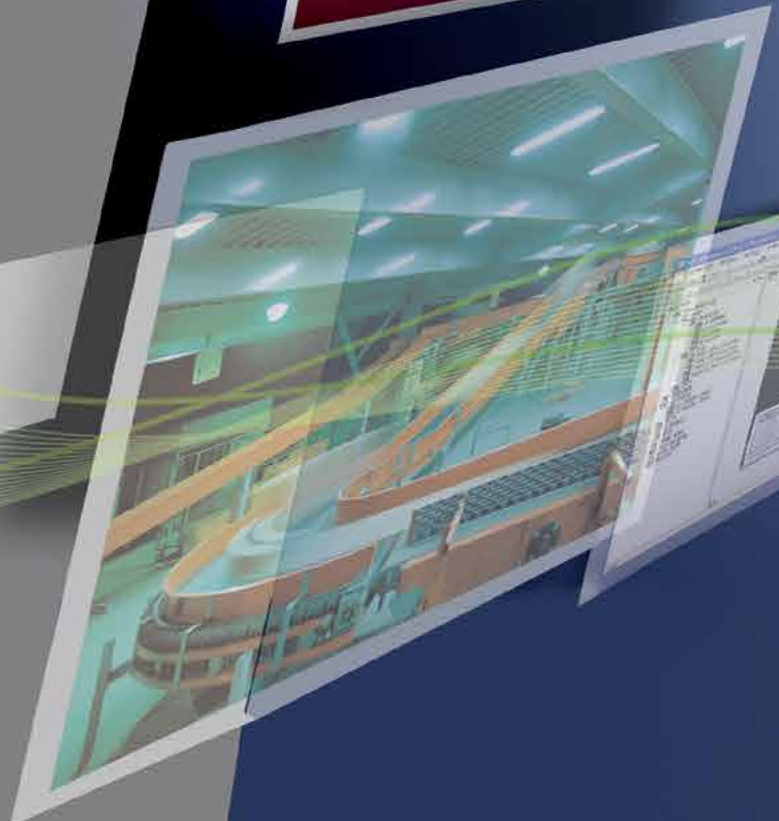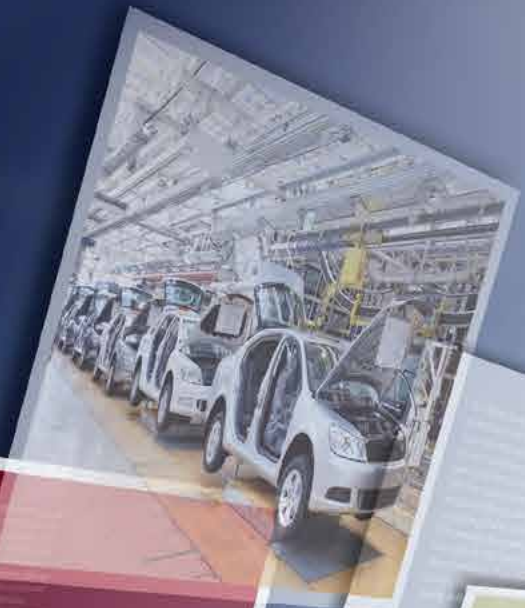
Our Solution

We are leaping as a global leader beyond the top enterprise in Korea in the field of automation solutions.

The LS ELECTRIC HMI solutions incorporate the core H/W and S/W technologies and services, which are optimized for client's environments at various industrial sites, ranging from unit machines to massive process control.

iXP2 Series

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

CE   KC   c (UL) US LISTED

[Unit: mm]

Dimensions

iXP2-0800

(237)
(228)
(145)
240±0.2
180±0.2
(105)
(158)
(167)
59.7±0.2
145

iXP2-1000

(267.5)
(258.5)
(180)
270.5±0.2
212.5±0.2
(138.4)
(200.5)
(209.5)
59.7±0.2
180

iXP2-1200

(310)
(301)
(210)
313±0.2
239±0.2
(160)
(227)
(236)
59.7±0.2
210

iXP2-1500

(391.9)
(383)
(280)
395±0.2
294±0.2
(200)
(282)
(290.9)
65.5±0.2
280

General Information

Item	Description				Standard
Ambient temperature	0℃~+50℃				
Storage temperature	-20℃~+60℃				
Ambient humidity	10~85%RH, without dew condensation				
Storage humidity	10~85%RH, without dew condensation				
Vibration resistance	Occasional Vibration			Counts	IEC 61131-2
	Frequency	Acceleration	Amplitude	10 times each direction (X, Y and Z)	
	5≤f＜9Hz	-	3.5mm		
	9≤f≤150Hz	9.8㎧	-		
	Continuous Vibration				
	Frequency	Acceleration	Amplitude		
	5≤f＜9Hz	-	1.75mm		
	9≤f≤150Hz	4.9㎧	-		
Shock resistance	Maximum shock acceleration: 147㎧(15g) Authorization time: 11㎳ Pulse waveform: Half-sine wave pulse (3 times each of X,Y and Z)				IEC 61131-2
Noise resistance	Square wave impulse noise	DC: ±1,200V AC: ±1,600V			LS ELECTRIC Standards
	Electrostatic discharge	±4kV (Contact discharge)			IEC 61131-2, IEC 61000-4-2
	Radiated electromagnetic field noise	80 ~ 100MHz, 10V/m			IEC 61131-2, IEC 61000-4-3
	Fast transient/Burst noise	Power module: 2.4 kV, Communication interface: 1.2kV			IEC 61131-2, IEC 61000-4-4
Operating ambience	Free from corrosive gas and excessive dust				
Altitude	2,000m (6,562ft) or below				
Pollution degree	2 or under				
Cooling method	Natural air-cooling				

Specifications

Item		iXP2-0800A/D	iXP2-1000A/D	iXP2-1200A/D	iXP2-1500A/D
Display type		TFT color LCD			
Screen size		8.4″	10.4″	12.1″	15″
Display resolution		800 X 600	1,024 X 768		
Color indication		24-bit color (16.7M colors)			
Backlight		LED method, automatic On / Off support			
Backlight lifetime		40,000 hour			
Touch panel		Capacitive touch			
Audio output		Magnetic buzzer (85dB)			
Processor		1GHz, Dual core			
Memory	Flash	1GB			
	Operating RAM	1GB			
	Backup RAM	1 Mbyte			
Backup data		Date / Time data, Logging / Alarm / Recipe data, Non-volatile devices			
Battery		CR2032(3.0V/210mAh, About 3years/25℃)			
Video output		1 X HDMI			
Ethernet		1 X 10Base-T / 100Base-TX, 1 X 10Base-T / 100Base-TX / 1000Base-T			
USB host		3 X USB 2.0 (Front X 1, Rear X 2)			
USB device		1 X USB 2.0 (Send / Receive front, PC and project data etc.)			
RS-232C		1 X RS-232C (DSUB 9 / Male type)			
RS-422/485		1 X RS-422/485 (Terminal block)			
Multi-language		Can display 12 languages simultaneously			
Animation		GIF format support			
Recipe		Support			
Data logging		Support			
Script launcher		Support			
Standard certification		CE, KC, UL, IECEx, ATEX, KCs			
Protection standard		IP66, Conform to the UL type 4x, NEMA 4x standard			
Explosion proof		Ex nA IIC T5 Gc, Ex tc IIIC T100℃ Dc IP64			
Dimensions (mm)		240 X 180 X 60	271 X 212 X 60	313 X 239 X 60	395 X 294 X 66
Panel cut (mm)		228.5 X 158.5	259.0 X 201.0	301.5 X 227.5	383.5 X 282.5
Power		iXP2-xxxxA : AC100 / 240V, iXP2-xxxxD : DC24V			
Power consumption (W)		25	25	30	30
Weight (Kg)		1.87	2.35	3.0	4.6

iXP Series

High-resolution and performance
- 1GHz high-performing CPU & quick screen refreshing speed
- 16,777,216. TFT color (24bit) support & high-luminance/resolution LCD
- Mass internal memory (User memory: 128MB, Data backup: 1MB)

User-oriented simple environment
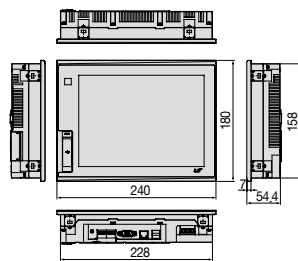- Various storage interfaces (USB/SD)
- Movement detection (presence sensor) system

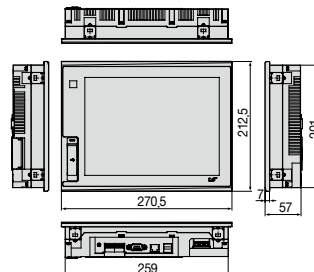CE KC c UL US LISTED
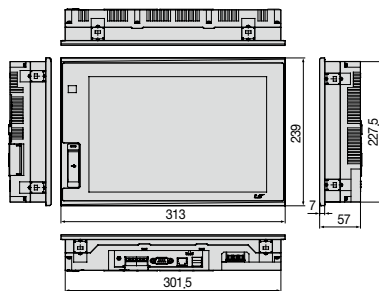
[Unit: mm]

Dimensions

iXP50-TTA
180 / 158 / 240 / 7 / 54,4 / 228

iXP70-TTA
212,5 / 201 / 270,5 / 7 / 57 / 259

iXP80-TTA
239 / 227,5 / 313 / 7 / 57 / 301,5

iXP90-TTA
294 / 282,5 / 395 / 7 / 60 / 383,5

General Information

Item	Description				Standard
Ambient Temperature	0°C~+50°C				
Storage Temperature	-20°C~+60°C				
Ambient Humidity	10~85%RH, without dew condensation				
Storage Humidity	10~85%RH, without dew condensation				
Vibration resistance	Occasional vibration			Counts	IEC 61131-2
	Frequency	Acceleration	Amplitude	10 times each direction (X, Y and Z)	
	5≤f＜9Hz	-	3.5mm		
	9≤f≤150Hz	9.8㎨	-		
	Continuous vibration				
	Frequency	Acceleration	Amplitude		
	5≤f＜9Hz	-	1.75mm		
	9≤f≤150Hz	4.9㎨	-		
Shock resistance	Maximum shock acceleration: 147㎨(15g) * Authorization time: 11ms * Pulse waveform: Half-sine wave (3 times each of X, Y and Z) *				IEC 61131-2
Vibration resistance	Square wave impulse noise	DC: ±1,200V AC: ±1,800V			LS ELECTRIC Standards
	Electrostatic discharge	±4kV (Contact discharge)			IEC 61131-2, IEC 61000-4-2
	Radiated electromagnetic field noise	80 ~ 100MHz, 10V/m			IEC 61131-2, IEC 61000-4-3
	Fast transient/Burst noise	Power Module: 2 kV, Communication Interface: 1kV			IEC 61131-2, IEC 61000-4-4
Operating ambience	Free from corrosive gas and excessive dust				
Altitude	2,000m (6,562ft) or below				
Pollution degree	2 or under				
Cooling method	Natural air-cooling				

Specifications

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

*SEWOO printer only

eXP Series

- 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
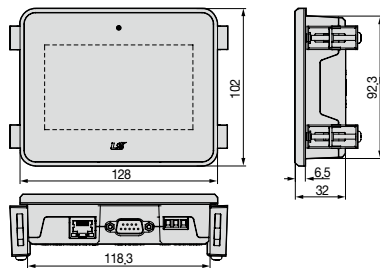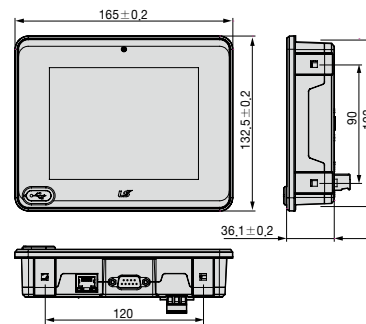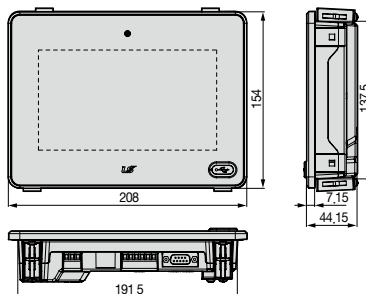
CE KC c(UL)us LISTED

[Unit: mm]

Dimensions

eXP20-TTA

102
128
118,3
92,3
6,5
32

eXP30-TTA

165±0,2
132,5±0,2
36,1±0,2
120
90
123

eXP40-TTA

154
208
191,5
137,5
7,15
44,15

eXP60-TTA

218
276
259,5
201,5
7,15
44,15

General Information

Item	Description			Standard
Ambient temperature	0°C~+50°C			
Storage temperature	-20°C~+60°C			
Ambient humidity	10~85%RH, without dew condensation			
Storage humidity	10~85%RH, without dew condensation			
Vibration resistance	Occasional Vibration		Counts	IEC 61131-2
	Frequency	Acceleration	Amplitude	
	5≤f＜9Hz	-	3.5mm	
	9≤f≤150Hz	9.8m/s²	-	10 times each direction (X, Y and Z)
	Continuous Vibration			
	Frequency	Acceleration	Amplitude	
	5≤f＜9Hz	-	1.75mm	
	9≤f≤150Hz	4.9m/s²	-	
Shock resistance	Maximum shock acceleration: 147m/s²(15g) Authorization time: 11㎳ Pulse waveform: Half-sine wave pulse (3 times each of X,Y and Z)			IEC 61131-2
Noise resistance	Square wave impulse noise	DC: ±1,200V		LS ELECTRIC Standards
	Electrostatic discharge	±4kV (Contact discharge)		IEC 61131-2, IEC 61000-4-2
	Radiated electromagnetic field noise	80 ~ 100MHz, 10V/m		IEC 61131-2, IEC 61000-4-3
	Fast transient/Burst noise	Power module: 2.4 kV, Communication interface: 1.2kV		IEC 61131-2, IEC 61000-4-4
Operating ambience	Free from corrosive gas and excessive dust			
Altitude	2,000m (6,562ft) or below			
Pollution degree	2 or under			
Cooling method	Natural air-cooling			

Specifications

Item		eXP20-TTA/DC,CERTI	eXP20-TTA/DC	eXP30-TTA(B)/DC	eXP30-TTE/DC	eXP40-TTE/DC	eXP40-TTA(B)/DC	eXP60-TTA(B)/DC
Display type		TFT color LCD						
Screen size		10.9cm (4.3inch)		10.9cm (4.3inch)		10.9cm (4.3inch)		25.9cm(10.2inch)
Display Resolution		480 x 272 pixel		640 x 480 pixel		800 x 600 pixel(WVGA)		
Color indication		24-bit Color(16.7M)		16-bit Color(65,536 Color)		24-bit Color(65,535 Color)		16-bit Color(65,536)
Indication degree		Left/Right:60 deg. Upper:40 deg. Lower:60 deg.						Left/Right:55 deg. Upper:35 deg. Lower:55 deg.
Backlight		LED Type (Supports backlight auto-off function)						
Backlight duration		30,000 hours		20,000 hours				
Touch panel		4-Wire Resistive, analog						
Audio output		Magnetic buzzer (85dB)						
Process		i.MX283(454MHz)						
Memory	Flash	128MB(Screen 64MB)						
	Operation RAM	128MB						
	Backup RAM	128KB						
Backup data		Date/Hour data, Logging/Alarm/Recipe data and nonvolatile device						
Battery duration		Approx. 3 years (Operating ambient temperature of 50°C)						
RTC		Time error Approx. 3 sec/1day(Operating ambient temperature of 25°C)						
Ethernet		1 channel, IEEE802.1a, 10Base-T/100Base-TX		-				1 channel, IEEE802.1a, 10Base-T/100Base-TX
USB Host		1 channel, USB 2.0 Host (mouse, keyboard, printer and USB memory driver is available)						
USB Device		-		1 channel, USB 2.0 Device (for download and upload project)				
RS-485, RS-232C		1channel, RS-232C (DSUB 9/Male Type)				2channels, RS-485, RS-232C (DSUB 9/Male Type)		
RS-422/485		1channel, RS-422/485 (DSUB 9/Male Type)				1channel, RS-422/485 mode (Terminal Type)		
Multi-language		Up to 12 language simultaneously						
Animation		GIF format is available						
Recipe		available						
Data logging		available						
Script executor		available						
Certifications		CE, UL, KC, UL Type4X (Separate product, CERTI)						
Protection standard		IP66						
Dimension (mm)		128x102x32		165.0x132.5x36.1		208.0 x 154.0 x 44.4		276.0 x 218.0 x 44.4
Panel cut (mm)		165.0 x 132.5 x 36.1		156.0 x 123.5		192.0 x 138.0		260.0 x 202.0
Rated voltage		DC24V						
Power consumption (W)		4.6W		7.2W		6.5W		10W
Weight(Kg)		0.3		0.42	0.39	0.62	0.63	1.08

List of Communication Drivers

Manufacturer	Driver name
LS ELECTRIC	GM CPU
	GM Cnet
	GM Enet
	MK CPU
	MK Cnet
	MK Enet
	XGK CPU
	XGK Cnet
	XGK Enet
	XGK CPU Enet
	XGK EtherNet/IP
	XGB CPU
	XGB Cnet
	XGB Enet
	XGB EtherNet/IP
	XGB Cnet - VCB Trip
	XGI/XGR CPU
	XGI/XGR Cnet
	XGI/XGR Enet
	XGI/XGR CPU Enet
	XGI/XGR EtherNet/IP
	XEC CPU
	XEC Cnet
	XEC Enet
	XEC EtherNet/IP
	XMC Enet
	Inverter (LS INV 485)
	Inverter (MODBUS)
	User Defined Protocol
	User Defined Protocol (Slave)
	XGT Servo
LS Mecapion	VS/VP Servo Drive
	MXQ Series
BACnet	BACnet IP Master
BYD Auto	BYD Auto dedicated
CAN in Automation	CANopen Slave
Control Techniques	CT Modbus RTU
DAEWON GSI	DAEWON GSI dedicated controller
Dasarobot	iM-SIGMA series
Delta Electronics	DVP Series
Digital Electoronics(Pro-face)	Memory Link
Fuji Electric Systems	MICREX-SX Series SIO
	MICREX-SX Ethernet
GE Intelligent Platforms	SNP
	SNP-X
HANYOUNG NUX	Temperature Controller
HIGEN Motors	Servo
Hitachi	H Series Ethernet
	H Series Link
HYUNDAI Elevator	SKY-RAV(Ethernet)
	SKY-RAV(Link)

Manufacturer	Driver name
KDT Systems	CIMON Serial Link
	BP Series Loader
	CP Series Loader
	XP Series Loader
KEYENCE	KV-700/1000/3000/5000/5500 Serial
	KV-700/1000/3000/5000/5500 Ethernet
KOYO Electronic	DirectNet
KTURBO	Turbo Blower
Lenze Automation	Lecom A/B
Mitsubishi Electric	MELSEC A-CPU
	MELSEC A-Link
	MELSEC FX-CPU
	MELSEC FX-Ethernet
	MELSEC FX-Link
	MELSEC Q-CPU
	MELSEC QnA-Link
	MELSEC QnA-Ethernet
	MELSEC QnU CPU Ethernet
	MELSEC iQ-R Ethernet
	MELSEC iQ-F Ethernet
	MELSEC iQ-F Link
	MELSERVO-J2
	MELSERVO-J3
OMRON	CS/CJ Series Ethernet
	CS/CJ Host Link
	C Series Host Link
	CS1 EthernNet/IP
	CJ2 EthernNet/IP
Panasotic Electric	FP Series
	MINAS Servo
Parker	Hi-Drive
PROFIBUS International	PROFIBUS DP Slave
Rockwell Automation	Compact/ControlLogix EtherNet/IP
	MicroLogix EtherNet/IP
	SLC500 Series DF1
	Compact/ControlLogix DF1
	MicroLogix DF1
	Micro800 Series (DF1)
RS Automation	EtherNet/IP Micro800 Series
	N/NX-CCU
Schneider Electric	NX-CCU+
	MODBUS RTU Master
	MODBUS RTU Slave
	MODBUS TCP Master
	MODBUS TCP Slave
	MODBUS ASCII Master
	MODBUS ASCII Slave
SEW EURODRIVE	MOVIDRIVE Serial
Siemens AG	S7 3964(R)/RK512
	S7 MPI(Adapter)
	S7 PPI

Manufacturer	Driver name
Siemens AG	S7 3964(R)/RK512
	S7 MPI(Adapter)
	S7 PPI
	LOGO Ethernet
	S7 1200/1500 Ethernet
	S7 300/400 Ethernet
Sprint Electric	DC Motor Drive Ethernet
YASKAWA Electric	MEMOBUS RTU Master
	MP Series Ethernet (Extension)
	YASKAWA: High-Speed Ethernet Server
YOKOKAWA Electric	FA-M3 Series
	FA-M3 Series-Ethernet
Beckhoff	ADS Ethernet
TSSI	VERID+ FingerPrint Reader
FATEC Automation Corporation	FATEK: FB Series Serial
	FATEK: FB Series Ethernet
TemcoLine	Thermometer Controller
Autonics	Thermometer Controler (TK Series)
Yudian	AIBus Protocol
RKC	CB Series Temperature Controller
	FB Series Temperature Controller
Azbil	Temperature Controller
Kolver	EDU 2AE/TOP/TA/MITO
Atras Copco.	MT Focus400
Sick AG	Sick AG: Flexi Soft
IAI	IAI: X-SEL Controller Serial
	IAI: ROBO Cylinder Controller Serial
FANUC	FANUC : Series 0i
Ingenia	Ingenia: EMCL Serial
AERZEN TURBO	AERZEN TURBO: Aerzen-Turbo 1(IG3)
	AERZEN TURBO: Aerzen-Turbo 2(IG5)
Kawasaki Heavy Industries	KAWASAKI: UNIVERSAL CONTROLLER(ETHERNET)
OPC	OPC UA Client

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Safety Instructions

• For your safety, please read user's manual thoroughly before operating.

• Contact the nearest authorized service facility for examination, repair, or adjustment.

• Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!

• Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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

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