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LG Industrial Systems

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LG HMI Systems **PMU series**



LG Industrial Systems

www.lgjs.com



As providing the screens with 256 colors and upgraded HMI system configurations, we've enhanced its functional and competitive strength.

High-speed communication

- 32-bit processor adopted for high-speed graphic process
- Maximum communication speed: 115,200bps

Easy operation

- Direct input of controller address and variable libraries support
- Recipe function for batch processing of parameter data
- Data logging for running data back-up

Various image functions

- Various products: 4 products/7 features (12.1", 10.4", 7.5", 5.7")
- Screen configuration with 256 colors
- Various image functions available (background bitmap, transparent bitmap, etc.)
- Various network configurations thanks to various communication drivers and communication functions

Fast

Easy

Variety

Product name		PMU-830	PMU-730		PMU-530	PMU-330			
Item		PMU-830TT	PMU-730TT	PMU-730ST	PMU-530ST	PMU-330TT	PMU-330ST	PMU-330BT	
Features									
Display	Display component	TFT Color	TFT Color	STN Color	STN Color	TFT Color	STN Color	STN Mono	
	Display color	256 Colors							Blue & White
	Screen resolution	800 X 600	640 X 480		640 X 480	320 X 240			
	Touch resolution	1 X 1(Dot)	20 X 20 (Dot)		1 X 1(Dot)	20 X 20 (Dot)			
	Touch cell	800 X 600	32 X 24		640 X 480	16 X 12			
	Touch type	Analog	Matrix		Analog	Matrix			
	Screen size	12.1"	10.4"		7.5"	5.5"	5.7"		
	Maximum bitmap size (256 colors)	800 X 600	640 X 480		640 X 480	320 X 240		320 X 240 ^{*1}	
	Diagram type	Circle, Straight line, Oval, Square, Polygon							
	Graph type	Bar, Trend, Meter, Pie, Polygon, XY Chart							
Displaying letter	English, Chinese, Japanese, Korean								
Brightness	135cd/m ²	200cd/m ²	230cd/m ²	83cd/m ²	250cd/m ²	75cd/m ²	220cd/m ²		
Interface	RS-232C ^{*2}	Built-in							
	RS-422 ^{*2}	Built-in							
	Fnet	Option							
	Ethernet	Option (under development)							
	Profibus-DP	Option (under development)							
Memory	DeviceNet	Option							
	Printer port	Built-in			Option				
	Screen data save	4MB	4MB	2MB	2MB	2MB	1MB	1MB	
	System buffer	2048 Word							
Size (WxHxD)	Logging/Recipe	256K							
	Appearance size	305 X 239 X 55			240 X 170 X 62		206 X 136 X 64		
	Panel cut size	294 X 228			231 X 161		198 X 128		

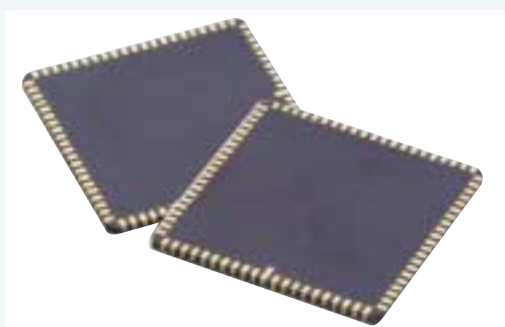
*1 Monochromatic bitmap use only

*2 Simultaneous use of RS-232C and RS-422 ports is not allowed



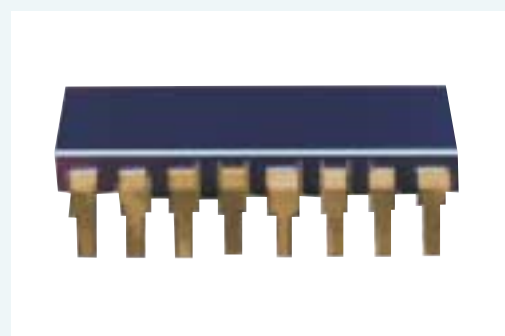
PMU-30 series

32-bit RISC CPU enables a high-speed processing



- 256 colors support
- Equivalent process speed in bitmap and general diagram
- Improved calculation speed with multi-thread process
- Max. 115,200bps baud rate support

Extended memory capacity



- Uses flash memory (battery back-up not required)
- Screen save memory with 1~4MB
- Enhanced memory efficiency
- 2048-word buffering for data process
- 256K memory for data logging and recipe
- Screen save and logging memory extension possible (when required)

Various network configurations

- Built-in RS-232C/422 communication ports
- Connecting to PLC enables communication diagnosis
- 1:N communication using RS-422 port
- Built-in printer port (PMU-730/830)
- N:1 communication using Fnet
- Ethernet, Profibus-DP, DeviceNet and CC link communication available (option module is under development)

Numeric display

- Numeric data display: DEC, HEX and BCD type
- Displays data with 8 different colors depending on the numeric range variance
- Data, read from controller, can be displayed after calculation
- ASCII CODE, read from PLC or controller, can be displayed with characters



Data input function

- Min/max value of data setting
- Input range limit
- Data input using TENKEY
- Password encrypted



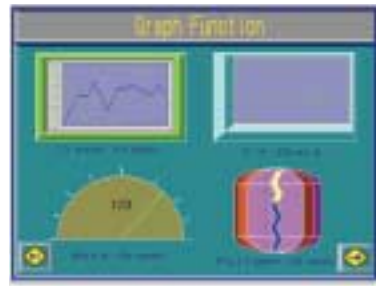
Touch and lamp function

- **Caption**
Displays 2 letters according to the status (ON/OFF) of devices when using touch/lamp tag
- **Touch color**
Displays the status (ON/OFF) of device with colors after operation of touch button with lamp function.
- **Data lamp**
Displays lamp with 8 colors, according to data range, while monitoring data
- Maximum 10 functions can be set up with one touch tag





Graph function



- **Trend graph**
 - Input value change is visually shown with the time axis
 - 10 data can be set up with one graph
 - Logging data and recipe data trend available
- **Meter graph**
 - Sets the lowest/highest value of data and displays current data in rate
 - Preset warning color is shown when data are out of range
 - Analog data (voltage, current) display

Recipe function



- Running data of each work are stored in PMU
- When work changes, running data are batch-transferred to the controller
- Converts the setup data into MS EXCEL format
- High-performance under a varied and small volume production environment

Data logging



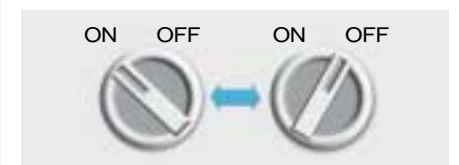
- The data generated during operation are stored in PMU
- Periodic or conditional data logging
- The data stored in PMU can be saved in PC using PMU Editor
- Converts logging data in PC into an MS EXCEL report

Various bitmap functions

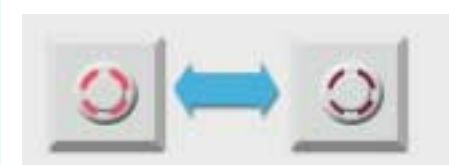
- **256-color bitmap support**
 - A realistic screen with 256 colors
 - A 256-color bitmap file display available
 - Spectacular graphics using various colors
 - Various functions using bitmap



- **Bitmap touch**
Calls other bitmap according to the status (ON/OFF) of device after touch operation



- **Bitmap lamp**
Displays other bitmap according to the bit status (ON/OFF) while monitoring it



- **Background bitmap**
Draws pictures on screen with a background bitmap of the same screen resolution



- **Transparent bitmap and lettering function**
Does not display the unnecessary part of bitmap and background letters





PMU-830

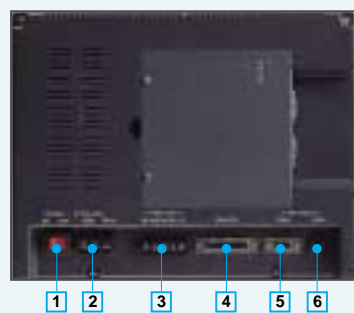
New Standard of Deluxe Type HMI



Features

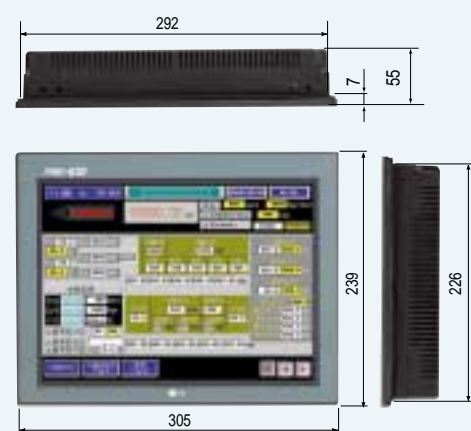
- 12.1" TFT 256 colors
- 32-bit RISC CPU
- 800x600 screen resolution
- 4MB flash memory for saving screen data
- Built-in RS-232C/422 communication port
- Built-in printer port
- Analog touch type
- Data logging function
- Recipe function

Specifications



NO	Name	Specifications
1	Switch	Main power switch
2	Power port	Main power port of PMU (AC85~265V)
3	RS-422 port	5-pin RS-422 serial communication port
4	Printer connector	Printer connection connector
5	RS-232C port	9-pin RS-232C serial communication port
6	PS2 connector	Program downloading port

Size (mm)



PMU-730

Standard and High Performance HMI



Features

- 32-bit RISC CPU
- 640x480 screen resolution
- 4MB/2MB flash memory for saving screen data
- Built-in RS-232C/422 communication port
- Built-in printer port
- Data logging function
- Recipe function

Specifications



NO	Name	Specifications
1	Switch	Main power switch
2	Power port	Main power port of PMU (AC85~265V)
3	RS-422 port	5-pin RS-422 serial communication port
4	Printer connector	Printer connection connector
5	RS-232C port	9-pin RS-232C serial communication port
6	PS2 connector	Program downloading port

Size (mm)





PMU-530

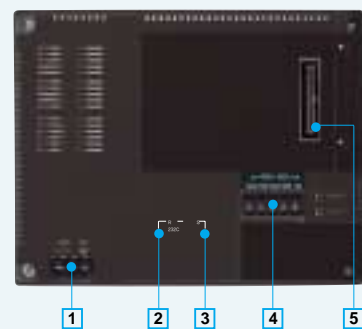
Different Size and Best Fit



Features

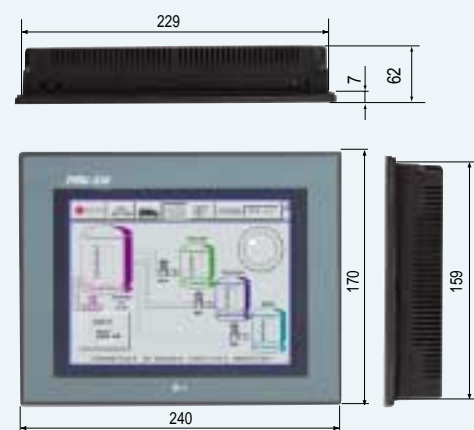
- 7.5" STN 256 colors
- 32-bit RISC CPU
- 640x480 screen resolution
- 2MB flash memory for saving screen data
- Analog touch type
- Data logging function
- Recipe function

Specifications



NO	Name	Specifications
1	Power port	Main power port (AC85~265V)
2	PS2 connector	Program downloading port
3	RS-232C port	9-pin RS-232C serial communication port
4	RS-422 port	5-pin RS-422 serial communication port
5	Option card connector	Printer and memory extension connection port

Size (mm)



PMU-330

Economical and Wide Range of HMI



Features

- 32-bit RISC CPU
- 320x240 screen resolution
- 2MB/1MB flash memory for saving screen data
- Data logging function
- Recipe function

Specifications



NO	Name	Specifications
1	Option card connector	-
2	Serial communication port	RS-232C: 2 (RX), 3 (TX), 5 (SG) RS-422: 11 (RX+), 12 (RX-), 13 (TX+), 14 (TX-), 15 (SG)
3	PS2 connector	Program downloading port
4	Power port	Main power port (AC85 ~ 265V)

Size (mm)





PMU-Editor

Powerful Functions and Convenient Interfaces



Features

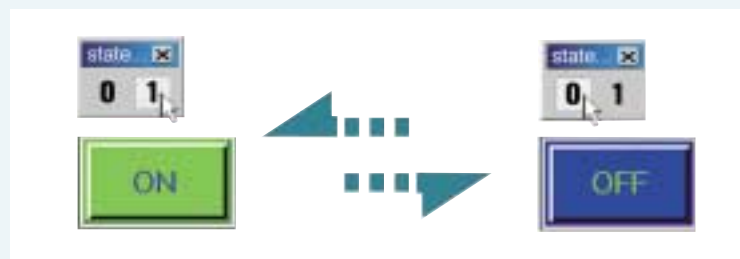
- Runs on Windows 95/98/NT/2000/XP
- Project integrating environment for convenient use
- OS and font downloading for version upgrade
- Screen magnification support for detailed graphic design
- Assigns direct/indirect devices
- Provides various libraries for the elements of system configuration
- Simulation by connecting to PMU
- Data can be converted into MS EXCEL format

PMU-Editor functions

- **Simulation**
Tag ON/OFF, data input and monitoring are possible without connecting to PLC



- **Simulation on drawing**
If the status of a bit tag (ON/OFF) changes while drawing the screen, the screen changes can be displayed on PC monitor



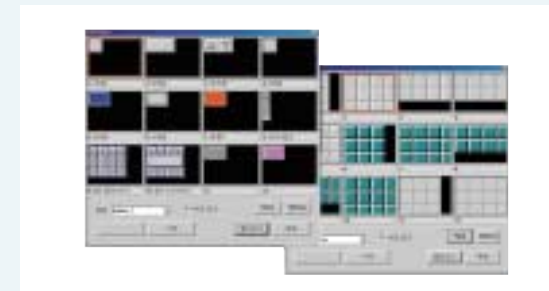
- **OS and font downloading**
When you upgrade the OS of PMU, OS and font file can be downloaded without disassembling the hardware



- **Cross reference function**
Displays a list of the PLC addresses where the item is referenced. You can modify and batch change PLC addresses if need be



- **Various built-in libraries**
 - Various built-in libraries make it easy to configure the screen
 - According to the customer's needs, library registering is available



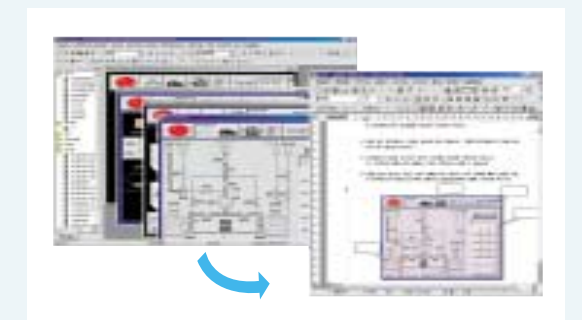
- **PLC address display with a tag**
PLC addresses of registered tag in the screen are displayed on screen



- **Thumbnail function**
This function makes you see the screen you draw at a glance



- **Screen capture**
Screen capture available without any other software



- **Finding a specific address**
Available to find a registered tag and its position in the screen
- **Automatic saving function**
As setting up the automatic saving time, it saves data at every saving period
- **Data conversion function (EXCEL)**
Data such as tag list, logging data, parameter shift data and warning can be converted into MS EXCEL file



Network Configuration

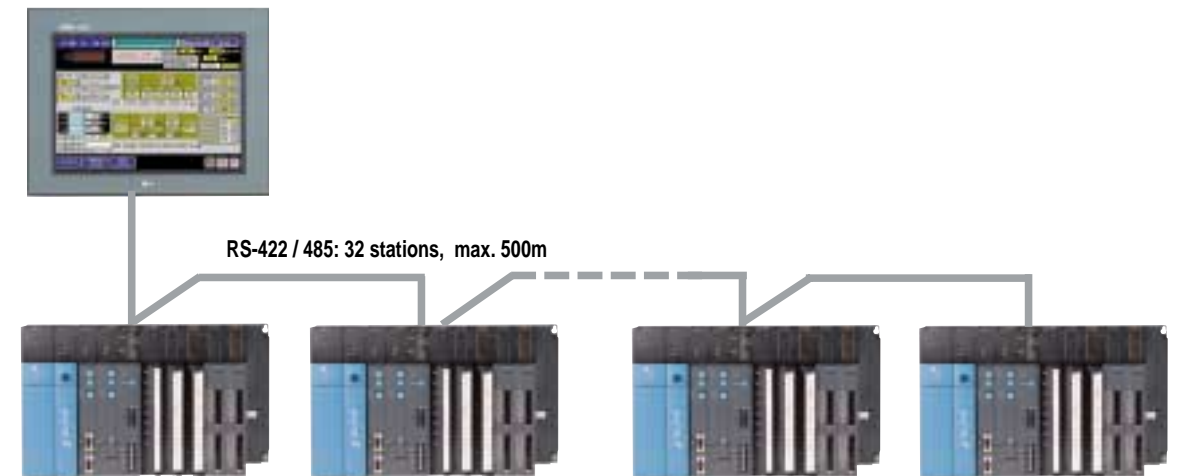
1:1 Serial communication (Master)

One PLC connection to one PMU: PMU functions as Master



1:N Serial Communication

Connects more than one PLCs to one PMU



* 1:N communication by using RS-422/485 should be organized as choosing identical PLC types

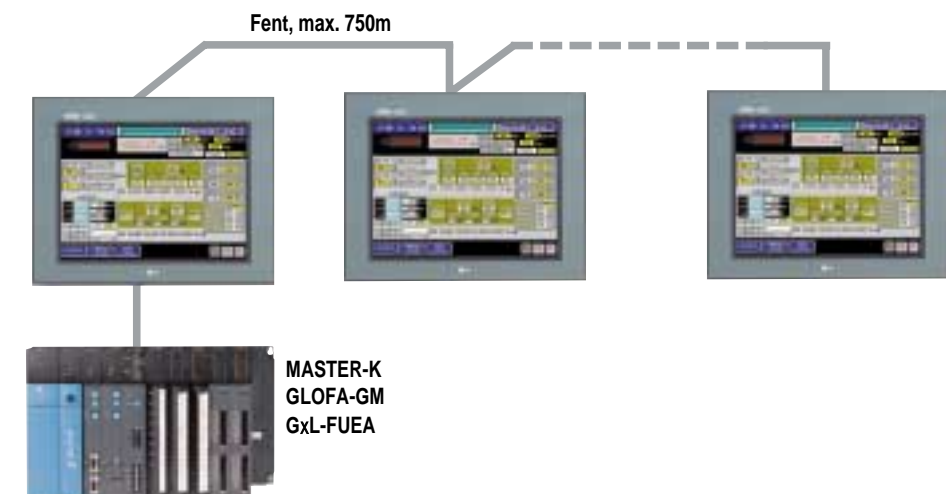
1:1 Serial communication (Slave)

One PLC connection to one PMU: PMU functions as Slave



N:1 Communication

Connecting more than one PMUs to one PLC



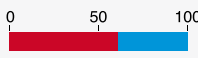
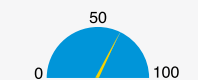
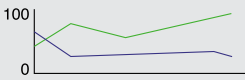
* Fnet option board should be installed on PMU for N:1 communication.



PMU functions and Tag Types

Applicable Equipments

Tag types in PMU

Tag	Functions	
Numeric	Number display on screen	
Touch	Touch	Controlling device by touching screen
	Bitmap	Touch function using bitmap
Lamp	Lamp	Display 1 bit ON/OFF information with color
	Bitmap	Lamp function using bitmap
Clock	RTC data display on screen	
String	After converting ASCII code into letters, display them on screen	
Message	Message display on screen	
Alarm	Display alarms on screen and manage their history	
Key display	Input data display	
Graph1	Bar graph and pie graph:	
	Data display with bar, pie or polygon shape	
Graph2	Trend graph: Time-varying data display	
Window	Calling out window screen	
Calculation	Arithmetic and logic calculation	
Animation	Calling out symbol, images or subsidiary screen	
ExNumeric	Numeric data display with recipe or logging data	
ExMessage	Message display with recipe or logging data	
ExString	String display with recipe or logging data	
ExGraph2	Trend graph with recipe or logging data	

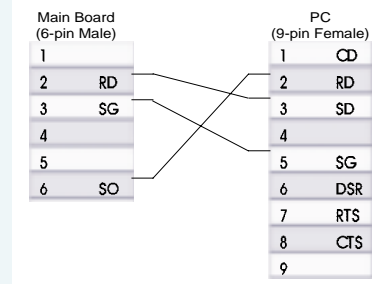
PMU model	PMU option	Manufacturer	Type	Model name	Loader	Link	
830 730 530 330	Built-in serial communication	LGIS	PLC	MASTER-K	○	○	
				GLOFA-GM	○	○	
				GOLDSEC-M	○	○	
				STARCON-MF	-	○	
		Samsung	Inverter	iG5	RS-485		
				iS5	RS-485 option board		
				iH	RS-485 option board		
		Mitsubishi	PLC	SPC	○	-	
				FARA-N	○	○	
				FARA-N70/700	○	-	
		Fuji	PLC	MELSEC-A	○	○	
				MELSEC-QnA	○	○	
				MELSEC-Q	○	○	
				MELSEC-A0J2	○	○	
		Omron	PLC	MELSEC-FX	○	○	
				MICREX-F	-	○	
		Siemens	PLC	SYSMAC-C, CS1	-	○	
				3964R	-	○	
		AB	PLC	S7-300/400 MPI	○	-	
				S7-200 PPI	○	-	
				SLC500[5/03,04]	○	-	
		Yaskawa	PLC	PLC-5	○	-	
				Prolog-8	○	-	
		Modicon	PLC	MP-920	○	-	
				CP-9200SH	○	-	
		KDT	PLC	Cymon	○	○	
		Koyo	PLC	DL-205/305/405	-	○	
		GE Fanuc	PLC	90-30[SBO-X]	-	○	
POSCON	PLC	POSFA ph1d-1a/2a	-	○			
Yokokawa	PLC	FA-M3	-	○			
Delta	PLC	DVP-ES	-	○			
PMO-□□□ F	LGIS	PLC	MASTER-K	GxL-FUEA			
			GLOFA-GM				
PMO-□□□ E	Ethernet	Under development					
PMO-□□□ P	Profibus-DP						
PMO-□□□ D	DeviceNet						
PMO-□□□ C	CC Link						



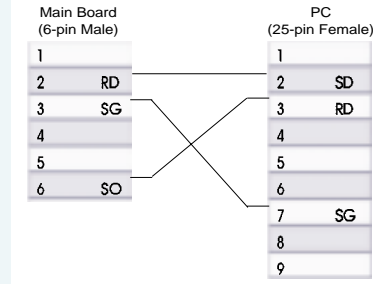
Cable Connections

Downloading cable

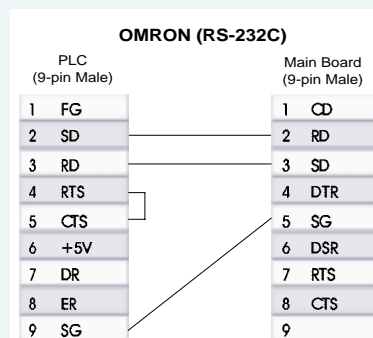
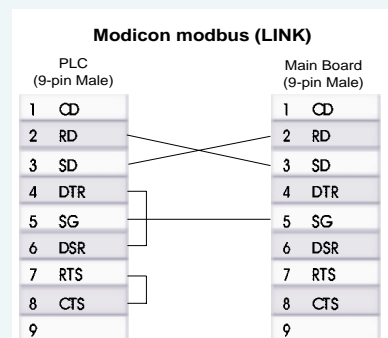
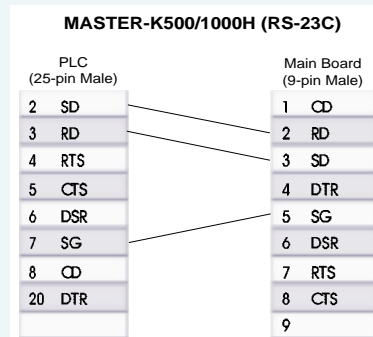
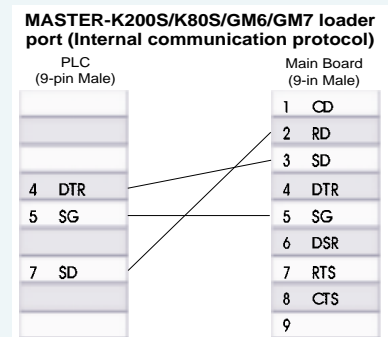
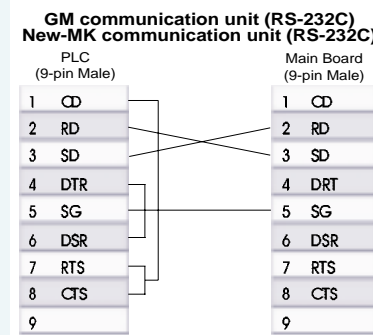
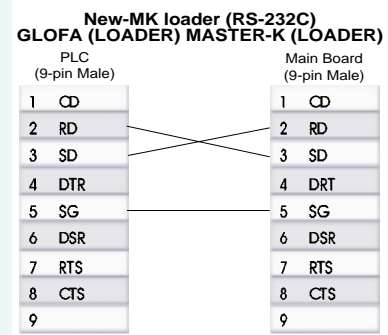
▶ Connection cable between 6-pin downloading port (PMU main board) and 9-pin port (PC)



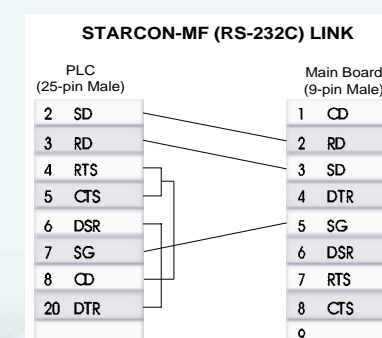
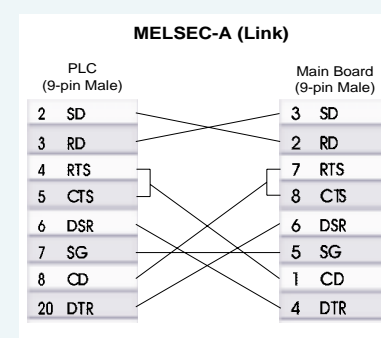
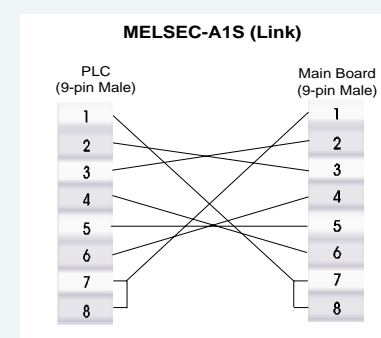
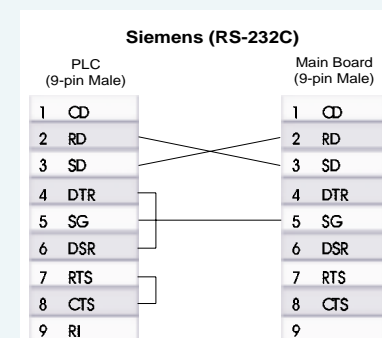
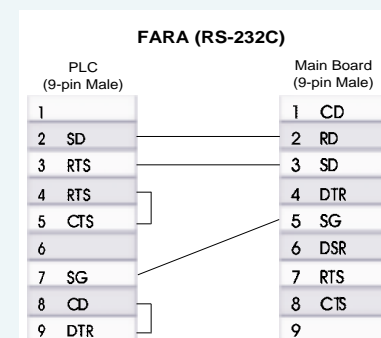
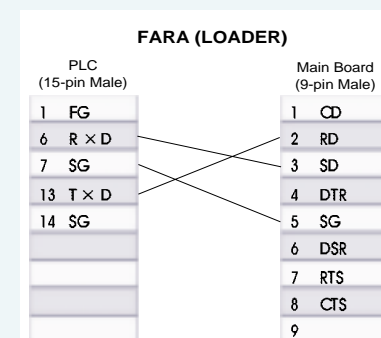
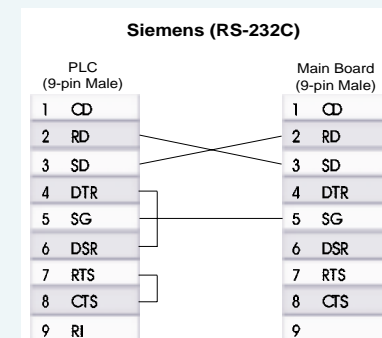
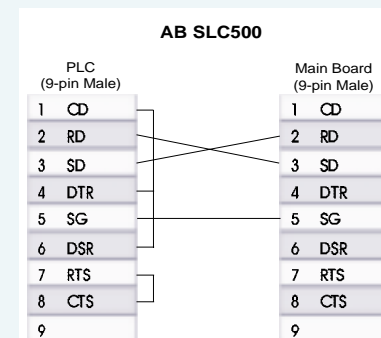
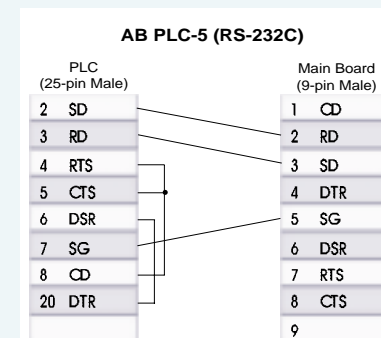
▶ Connection cable between 6-pin downloading port (PMU main board) and 25-pin port (PC)



PLC connection diagram



PLC connection diagram





Equipment Configuration

PMU-830

Configuration	Model	Content
Main board	PMU 830	12.1" TFT 256-color display 800x600 screen resolution

PMU-730

Configuration	Model	Content
Main board	PMU-730TT	10.4" TFT 256-color display 640x480 screen resolution
	PMU-730ST	10.4" STN 256-color display 640x480 screen resolution
Communication card *	PMO-730F	Fnet communication card
	PMO-730E	Ethernet communication card
	PMO-730D	DeviceNet communication card
	PMO-730P	Profibus-DP communication card
	PMO-730C	CC Link communication card

PMU-330

Configuration	Model	Content
Main board	PMU-330TT	5.5" TFT 256-color display 320x240 screen resolution
	PMU-330ST	5.7" STN 256-color display 320x240 screen resolution
Communication card *	PMO-330F	Fnet communication card
	PMO-330E	Ethernet communication card
	PMO-330D	DeviceNet communication card
	PMO-330P	Profibus-DP communication card
	PMO-330C	CC Link communication card

Common

Configuration	Model	Content
Cable	PMC-550S	Program downloading cable
	PMC-422C	GOLDSEC-M loader communication cable
Software	PMU-Editor	Software for PMU-830/730/530/330

* Communication cards for PMU-730 are compatible with PMU-830 (under development).

Standard Options

Classification	830	730	530	330	other	
Processor	32-bit RISC Processor					
Memory	Screen save	4MB	4MB/2MB	2MB	2MB/1MB	Flash Memory
	Buffer Logging	2048 Word 256K				RAM RAM
Screen resolution	800 x 600	640 x 480		320 x 240	Pixel	
Display color	256 colors	256/Mono				
Touch resolution	1 x 1	20 x 20	1 x 1	20 x 20	Pixel	
Touch cell	800 x 600	32 x 24	640 x 480	16 x 12	Per 1 screen	
Touch type	Analog	Matrix	Analog	Matrix		
Maximum bitmap registration size	800 x 600	640 x 480		320 x 240	Color Mono	
Displaying letter	English, Chinese, Japanese, Korean					
Communication	RS-232C	Built-in			Simultaneous use not allowed	
	RS-422	Built-in				
	Fnet	Option			Under development	
	Ethernet	Option				
	Profibus-DP	Option				
DeviceNet	Option					
CC link	Option					
Printer port	Built-in		Option		PCL-3	
Appearance size	305 x 239 x 55		240 x 170 x 62	206 x 136 x 64	WxHxD	
Panel cut size	294 x 228		231 x 161	198 x 128	WxH	
Software	PMU-EDITOR					
Power voltage	85 ~ 264V (AC)		18 ~ 28V (AC)		47~63Hz (AC)	
Power consumption	20W		12W		Option excluded	
Internal noise	1200Vp-p		900Vp-p		Impulse noise	
Ambient temperature	0 ~ 50°C					
Storage temperature	-10 ~ 60°C					
Ambient humidity	Below 85% RH					
Insulation resistance	10MΩ				500V DC	
Internal vibration	10 ≤ F ≤ 25Hz				X, Y, Z (IG)	
Internal shock	10 G					
Full waterproof	IP65F					
Grounding	Class 3 grounding					



Automation Equipment SYSTEM

Automation of production lines

It's the first step toward becoming a successful business

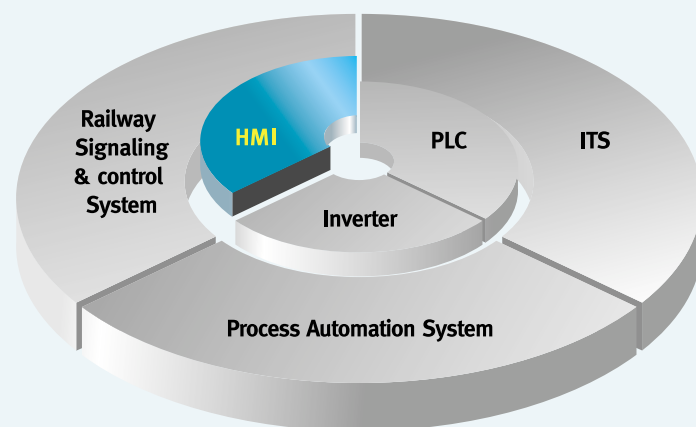


LGIS provides the most up-to-date controllers and systems based on the accumulated experience in the field of electric & electronic technology and automation system installation.

Ever since we started manufacturing PLC (Programmable Logic Controller) and inverter for the first time in Korea, our LGIS automation equipment division has been leading the Korean automation industry. We provide the optimal automation environment with various machine modules and large-scale process controls. Further more, we have obtained a range of international quality standard certificates such as CE and UL.

In the area of process control, we have independently developed Korea's first DCS (Distributed Control System). It plays a pivotal role in process automation by integrating control and monitoring systems of various industrial sites. We supply high-tech process control systems that are verified through outstanding sales records.

As for the field of traffic control, we also provide (based on our state-of-the-art IT development and experience of having supplied the most number of systems in Korea) traffic control systems on the railway and road with reinforced safety and reliability for people to travel safely and pleasantly.



Project records

2001	<ul style="list-style-type: none"> Set the sales record of 500,000 inverter units Awarded 1st turnkey project for railway signaling & control in thailand (First time in Korea/Biggest export project: App. 17 billion won) Supplied main boiler control system to Honam Thermal Power Plant #2 in Korea (System model: MASTER P-3000) Supplied burner control system to Yeongnam Thermal Power Plant #1 in the first time in Korea Supplied PLC GLOFA System to Daewoo Motor's Gunsan automobile Assembly Factory in Korea
2000	<ul style="list-style-type: none"> Supplied inverter systems to Seoul subway lines #1 & 2 in Korea Supplied inverter systems to Incheon international Airport's fuel facility & buildings in Korea
1999	<ul style="list-style-type: none"> Supplied water treatment control system and water resources management system to KOWACO (Seoul metropolitan wide area water works #5 project) in Korea Developed & supplied database-type electronic interlocking system in the first time in Korea
1996-1997	<ul style="list-style-type: none"> Supplied the main control system to all the steel factories of pohang iron & steel Co. (#1 & #2 steel mills) Installed Korea's first advanced real-time traffic responsive control system (Seoul, Korea) Exported Korea's first real-time traffic control system and red-light traffic enforcement system (Dalian, China)
1995	<ul style="list-style-type: none"> Manufactured & supplied the ATC (Automatic Train Control) and CTC (Centralized traffic control) systems to Gyeongbu high-speed railroad in Korea
1994-1999	<ul style="list-style-type: none"> Supplied the largest number of data logging systems to Pyeongtaek Thermal Power Plant #1, #2, #3, #4, Ulsan Thermal Power Plant #4, #5, #6 and Incheon Thermal Power Plant #3, #4 in Korea
1994-2001	<ul style="list-style-type: none"> Supplied main control systems to the energy centers of Pohang Iron & Steel co. and Gwangyang Iron & Steel co.
1993	<ul style="list-style-type: none"> Developed and supplied the first made-in-Korea TTC (Total Traffic Control) systems to the Korean national railroad (Metropolitan railroad)
1992-1996	<ul style="list-style-type: none"> Supplied main control systems to all the sintering factories (plants #1,#2,#3,#4) of pohang iron & steel co.
1988-1995	<ul style="list-style-type: none"> Supplied the water treatment control systems to the five water purification plants of Seoul (Gwangam, Amsa, Yeongdeungpo, Dduk-do, Seonyu), Korea
1987	<ul style="list-style-type: none"> Supplied the group type interlocking equipment and CTC (Centralized Traffic Control) systems to the Korean national railroad (Gyeongbu Line)

Research & Development

2001	<ul style="list-style-type: none"> Obtained the KEPCO standard certificate for high-efficiency inverters for the first time in Korea
2000	<ul style="list-style-type: none"> Developed new DCS (Distributed Control System) "MASTER P-3000NT" Developed RTU (Remote Terminal Unit) "MASTER-RTU"
1999	<ul style="list-style-type: none"> Developed high functional DCS (Distributed Control System) "MASTER P-2000"
1997	<ul style="list-style-type: none"> Get to development of ATC & CTC systems for Korean-made high-speed rail technology (G7)
1996	<ul style="list-style-type: none"> Awarded the KT (Korea Good Technology) mark for the real-time traffic control and management system Introduced the international standard PLC GLOFA series for the first time in Korea Obtained the ISO9001 for inverters for the first time in Korea
1995	<ul style="list-style-type: none"> Awarded the new media grand prize for the DCS (Distributed control system) "MASTER P-3000" Developed an open type DCS (Distributed control system) "MASTER P-3000"
1994	<ul style="list-style-type: none"> Awarded the KT (Korea Good Technology) mark for inverters for the first time in Korea Obtained the ISO9001 for PLC units for the first time in Korea Obtained the ISO9001 for process control business and traffic control business
1993	<ul style="list-style-type: none"> Awarded the KT (Korea Good Technology) Mark for the DCS (Distributed Control System)
1992	<ul style="list-style-type: none"> Developed an artificial intelligent traffic controller for the first time in Korea Obtained the UL certificate for inverters for the first time in Korea
1991	<ul style="list-style-type: none"> Awarded the jang young shil award, the most prestigious award for the fields of R&D in Korea, for DCS (Distributed Control System)
1990	<ul style="list-style-type: none"> Developed Korea's first monitoring system
1989	<ul style="list-style-type: none"> Developed the first Korean made DCS (Distributed Control System)
1985	<ul style="list-style-type: none"> Developed inverters for the first time in Korea
1984	<ul style="list-style-type: none"> Developed PLC units for the first time in Korea