2002 -10

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T-solution
Leader in Electrics & Automation

LG HMI Systems PMU series

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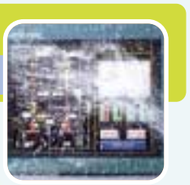


PMU series

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

High-speed communication

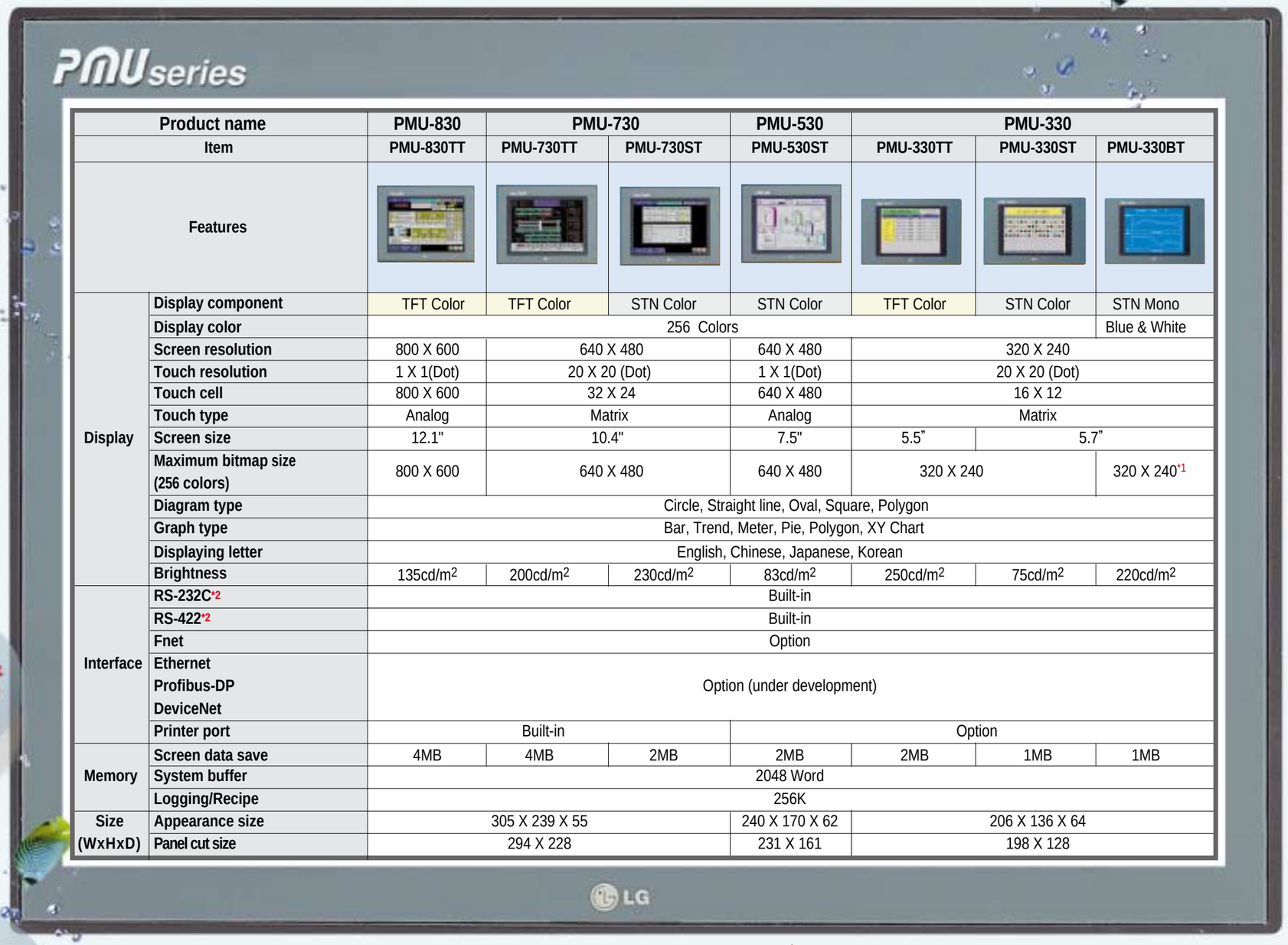
- 32-bit processor adopted for high-speed graphic process
- Maximum communication speed: 115,200bps

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

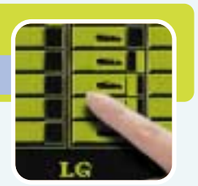
Various image functions

- 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



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 Profibus-DP DeviceNet	Option (under development)						
	Printer port	Built-in			Option			
Memory	Screen data save	4MB	4MB	2MB	2MB	2MB	1MB	1MB
	System buffer	2048 Word						
	Logging/Recipe	256K						
Size (WxHxD)	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-30series

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

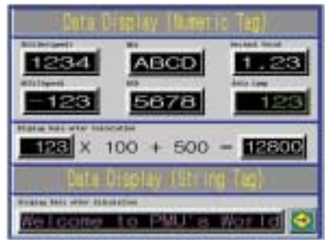
- Uses flash memory (battery back-up not required)
- Screen save memory with 1~4MB
- Enhanced memory efficiency
- 2048-word buffering for data process
- 256K memory for data logging and recipe
- Screen save and logging memory extension possible (when required)

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)

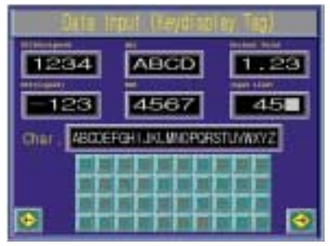
Numeric display

- 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



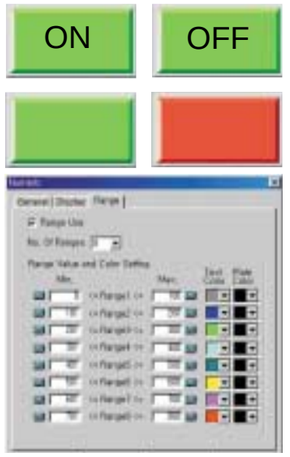
Data input function

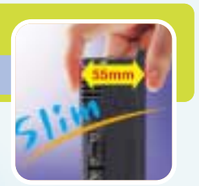
- Min/max value of data setting
- Input range limit
- Data input using TENKEY
- Password encrypted



Touch and lamp function

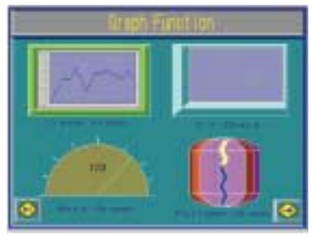
- **Caption**
  Displays 2 letters according to the status (ON/OFF) of devices when using touch/lamp tag
- **Touch color**
  Displays the status (ON/OFF) of device with colors after operation of touch button with lamp function.
- **Data lamp**
  Displays lamp with 8 colors, according to data range, while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





PMU-30series

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

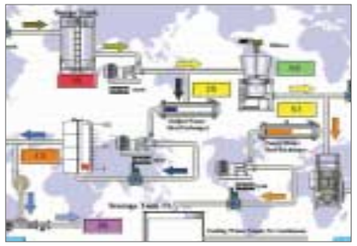
Various bitmap functions

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

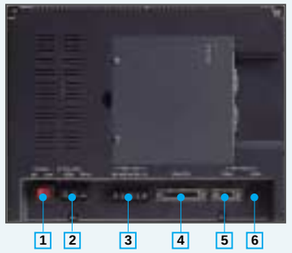
PMU-830

New Standard of Deluxe Type HMI

Features

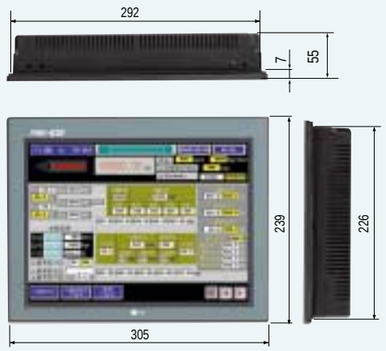
- 12.1" TFT 256 colors
- 32-bit RISC CPU
- 800x600 screen resolution
- 4MB flash memory for saving screen data
- Built-in RS-232C/422 communication port
- Built-in printer port
- Analog touch type
- Data logging function
- Recipe function

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

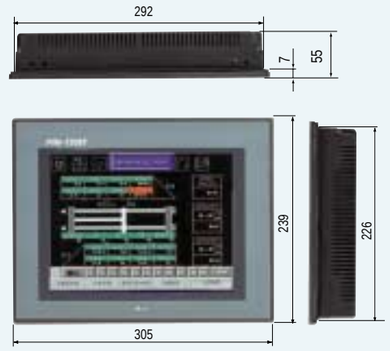
Features

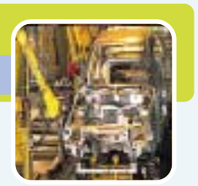
- 32-bit RISC CPU
- 640x480 screen resolution
- 4MB/2MB flash memory for saving screen data
- Built-in RS-232C/422 communication port
- Built-in printer port
- Data logging function
- Recipe function

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)





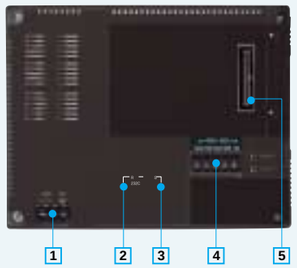
PMU-530

Different Size and Best Fit

Features

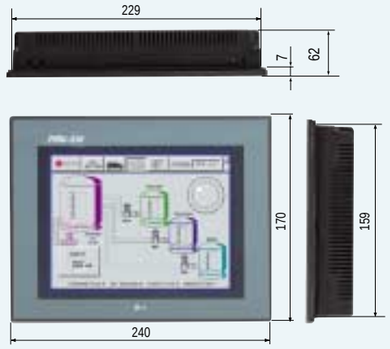
- 7.5" STN 256 colors
- 32-bit RISC CPU
- 640x480 screen resolution
- 2MB flash memory for saving screen data
- Analog touch type
- Data logging function
- Recipe function

Specifications



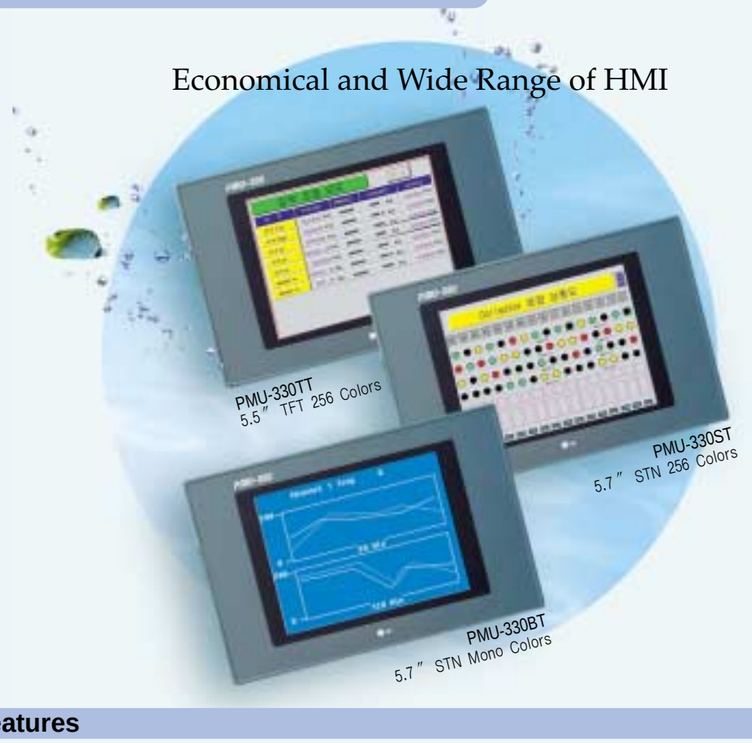
NO	Name	Specifications
1	Power port	Main power port (AC85~265V)
2	PS2 connector	Program downloading port
3	RS-232C port	9-pin RS-232C serial communication port
4	RS-422 port	5-pin RS-422 serial communication port
5	Option card connector	Printer and memory extension connection port

Size (mm)



PMU-330

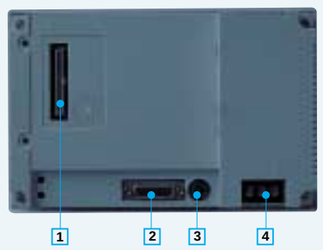
Economical and Wide Range of HMI



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 commuication 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

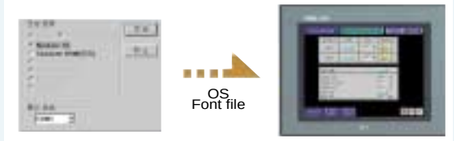
- Runs on Windows 95/98/NT/2000/XP
- Project integrating environment for convenient use
- OS and font downloading for version upgrade
- Screen magnification support for detailed graphic design
- Assigns direct/indirect devices
- Provides various libraries for the elements of system configuration
- Simulation 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



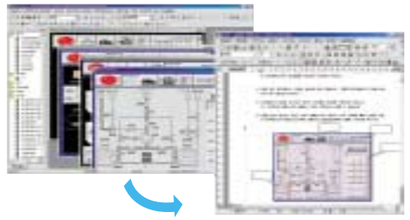
Cross reference function
Displays a list of the PLC addresses where the item is referenced. You can modify and batch change PLC addresses if need be

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

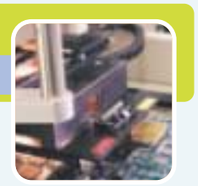
Screen capture
Screen capture available without any other software



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)

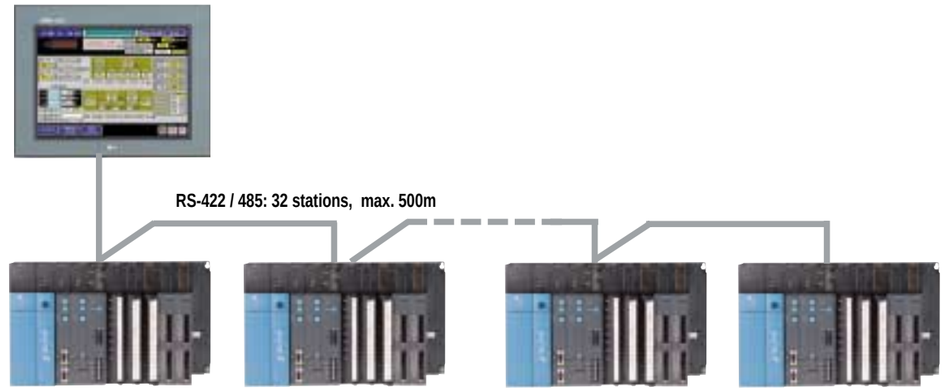
One PLC connection to one PMU: PMU functions as Master

1:1 Serial communication (Slave)

One PLC connection to one PMU: PMU functions as Slave

1:N Serial Communication

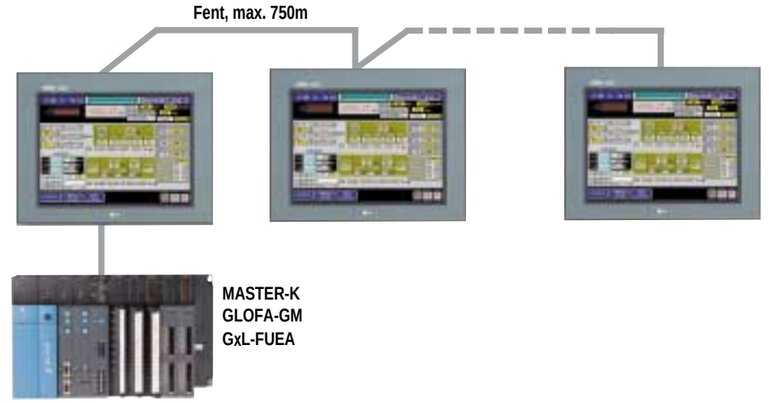
Connects more than one PLCs to one PMU



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

N:1 Communication

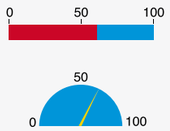
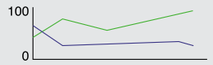
Connecting more than one PMUs to one PLC



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

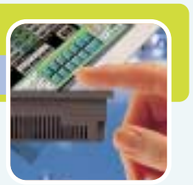
PMU functions and Tag Types

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

Applicable Equipments

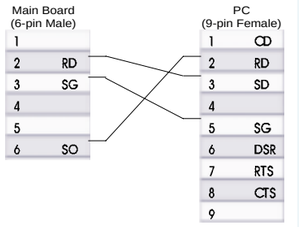
PMU model	PMU option	Manufacturer	Type	Model name	Loader	Link
830 730 530 330	Built-in serial communication	LGIS	PLC	MASTER-K	○	○
				GLOFA-GM	○	○
				GOLDSEC-M	○	○
				STARCON-MF	-	○
			Inverter	iG5	RS-485	
				iS5	RS-485 option board	
				iH	RS-485 option board	
		Samsung	PLC	SPC	○	-
				FARA-N	○	○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



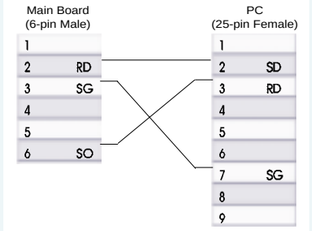
Cable Connections

Downloading cable

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

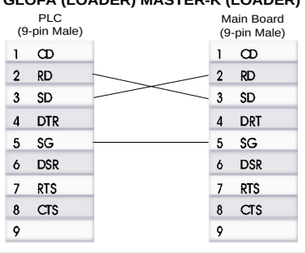


▶Connection cable between 6-pin downloading port (PMU main board) and 25-pin port (PC)

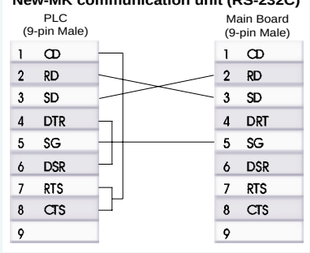


PLC connection diagram

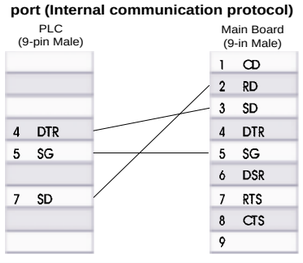
New-MK loader (RS-232C)
GLOFA (LOADER) MASTER-K (LOADER)



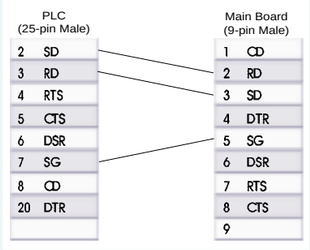
GM communication unit (RS-232C)
New-MK communication unit (RS-232C)



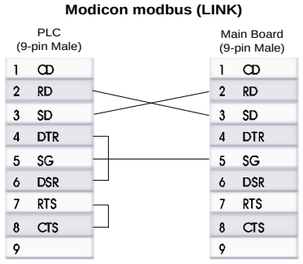
MASTER-K200S/K80S/GM6/GM7 loader port (Internal communication protocol)



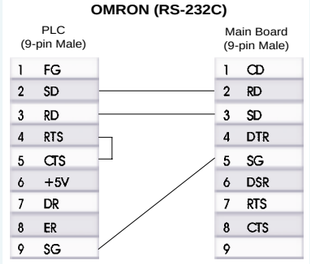
MASTER-K500/1000H (RS-23C)



Modicon modbus (LINK)

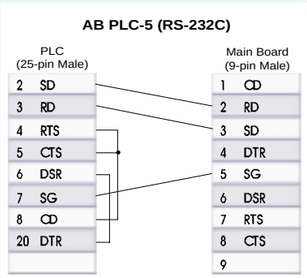


OMRON (RS-232C)

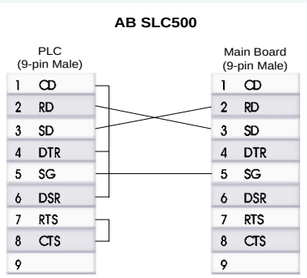


PLC connection diagram

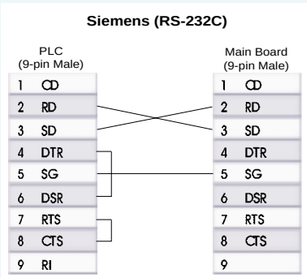
AB PLC-5 (RS-232C)



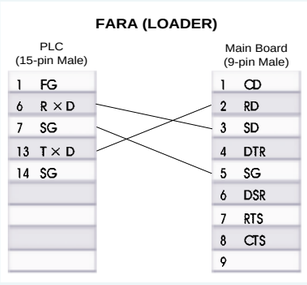
AB SLC500



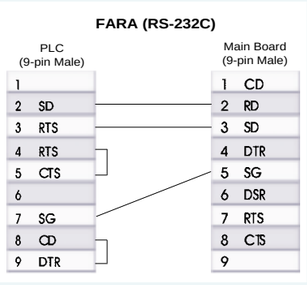
Siemens (RS-232C)



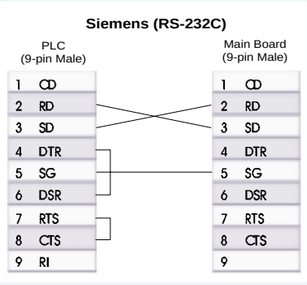
FARA (LOADER)



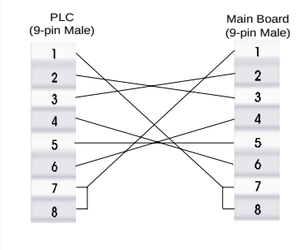
FARA (RS-232C)



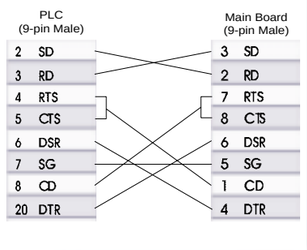
Siemens (RS-232C)



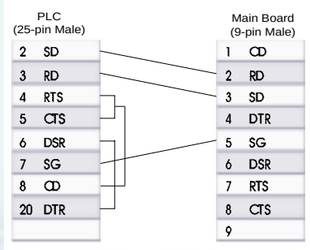
MELSEC-A1S (Link)

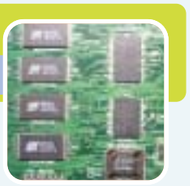


MELSEC-A (Link)



STARCON-MF (RS-232C) LINK





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

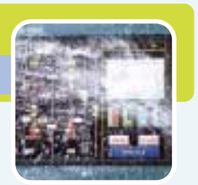
Configuration	Model	Content
Cable	PMC-550S	Program downloading cable
	PMC-422C	GOLDSEC-M loader communication cable
Software	PMU-Editor	Software for PMU-830/730/530/330

* 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	2048 Word				RAM
	Logging	256K				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				
	Ethernet	Option				Under development
	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℃		
Storage temperature	-10 ~ 60℃		
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

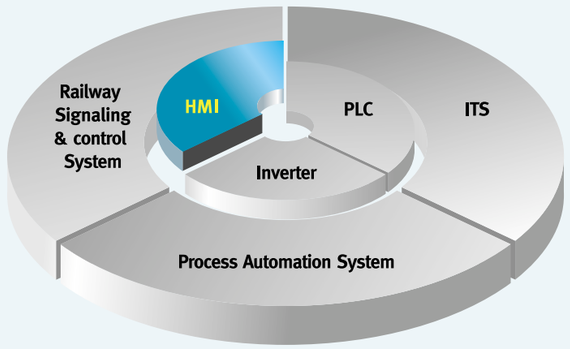
Automation of production lines
It's the first step toward becoming a successful business

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	• 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	• 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	• 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	• 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	• Manufactured & supplied the ATC (Automatic Train Control) and CTC (Centralized traffic control) systems to Gyeongbu high-speed railroad in Korea
1994~1999	• 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	• Supplied main control systems to the energy centers of Pohang Iron & Steel co. and Gwangyang Iron & Steel co.
1993	• Developed and supplied the first made-in-Korea TTC (Total Traffic Control) systems to the Korean national railroad (Metropolitan railroad)
1992~1996	• Supplied main control systems to all the sintering factories (plants #1,#2,#3,#4) of pohang iron & steel co.
1988~1995	• Supplied the water treatment control systems to the five water purification plants of Seoul (Gwangam, Amsa, Yeongdeungpo, Dduk-do, Seonyu), Korea
1987	• Supplied the group type interlocking equipment and CTC (Centralized Traffic Control) systems to the Korean national railroad (Gyeongbu Line)

Research & Development

2001	• Obtained the KEPCO standard certificate for high-efficiency inverters for the first time in Korea
2000	• Developed new DCS (Distributed Control System) "MASTER P-3000NT" • Developed RTU (Remote Terminal Unit) "MASTER-RTU"
1999	• Developed high functional DCS (Distributed Control System) "MASTER P-2000i"
1997	• Get to development of ATC & CTC systems for Korean-made high-speed rail technology (G7)
1996	• 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	• 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	• 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	• Awarded the KT (Korea Good Technology) Mark for the DCS (Distributed Control System)
1992	• 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	• Awarded the jang young shil award, the most prestigious award for the fields of R&D in Korea, for DCS (Distributed Control System)
1990	• Developed Korea's first monitoring system
1989	• Developed the first Korean made DCS (Distributed Control System)
1985	• Developed inverters for the first time in Korea
1984	• Developed PLC units for the first time in Korea