



## Color LCD Logic Panel

### LP-A Series

### PRODUCT MANUAL

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

#### Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

**⚠ Warning** Failure to follow instructions may result in serious injury or death.

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.**(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)  
Failure to follow this instruction may result in personal injury, economic loss or fire.
- 02. Do not use or store the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**  
Failure to follow this instruction may result in explosion or fire.
- 03. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or shortening the life cycle of the product.
- 04. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.
- 05. Check 'Cautions during Power Wiring' and 'I/O Wiring' before wiring.**  
Failure to follow this instruction may result in fire.
- 06. In preparation for product damage, communication error, or malfunction, install external emergency stop circuit, forward/reverse interlock circuit, limit switch, emergency stop switch, or other protection circuit.**  
Failure to follow this instruction may result in personal injury, economic loss or fire.
- 07. Since Lithium battery is embedded in the product, do not disassemble or burn the unit.**  
Failure to follow this instruction may result in fire.
- 08. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire.
- 09. Please contact to us for battery replacement.**  
Using an unauthentic battery may result in fire or product damage.

**⚠ Caution** Failure to follow instructions may result in injury or product damage.

- 01. Use a dry cloth to clean the unit, and do not use water or organic solvent.**  
Failure to follow this instruction may result in fire.
- 02. When connecting the power input, use within AWG 20 to 12 cable and tighten the terminal screw with a tightening torque of 0.5 to 0.8 N m.**  
Failure to follow this instruction may result in fire or malfunction due to contact failure.
- 03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.**  
Failure to follow this instruction may result in fire or product damage.
- 04. Do not touch the front LCD screen over 2 points at the same time.**  
Failure to follow this instruction may result in malfunction.
- 05. Do not put any heavy object on the front screen.**  
Failure to follow this instruction may result in malfunction due to deformation of LCD and touch panel.

#### Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- Power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Operate the product after supplying power to the product, input/output equipment, and load. If operate product before supplying power, it may result in output error or malfunction.
- Use a USB cable within 2 m.
- Keep away from high voltage lines or power lines to prevent inductive noise.  
Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Make a required space around the unit for radiation of heat, and do not block ventilation openings.
- Do not push the touch panel with a hard and sharp object or push the panel with excessive force. It may result in fire or malfunction.
- When skin is smeared with liquid crystal from the broken LCD, rinse with running water for over 15 minutes. If it gets into the eyes, rinse eyes with running water for over 15 minutes and contact a doctor.

- When changing the battery, contact Autonics service center to change it. Using unauthentic battery may result in fire or product damage.
- LCD performance may vary depending on the usage environment. Check the environmental conditions, and do not install the device in places where direct sunlight or high temperatures may be present.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000m
  - Pollution degree 2
  - Installation category II

## Product Components

- Logic panel + built in battery
- Instruction manual
- Power connector
- 7.0 inch: 4 fixing brackets
- 10.4 inch: 6 fixing brackets, CAN connector
- Sold separately: communication cable

## Sold Separately

- Communication cable
- Terminal block connector: D350000381

## Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

LP - A ① - ② ③ ④ ⑤ - ⑥ ⑦ ⑧

### ① Screen size

070: 7.0 inch  
104: 10.4 inch

### ② Display color

9: 16,777,216 color

### ③ Interface

Series	⑤	RS232C	RS422	CAN	Micro SD	USB HOST	USB Device	Ethernet
LP-A070	6	1	1	-	-	1	1	1
	7	2	-	-	-			
LP-A104	8	1	1	1	1	1	1	1
	9	2	-	1	1			

### ⑥ Module

C: All-in-one



### ⑦ I/O configuration

5: 7.0 inch - input 16-point, output 16-point  
6: 10.4 inch - input 32-point, output 32-point

### ⑧ I/O connector type

R: Ribbon cable connector  
T: Terminal block connector

## Specifications

	LP-A070-T9D□-C5□	LP-A104-T9D□-C6□
Screen size	7.0 inch	10.4 inch
LCD type	TFT Color LCD	
Resolution	800×480 pixel	800×600 pixel
Pixel pitch (W×H)	0.19 × 0.19 mm	0.26 × 0.26 mm
Display area	154.4×93.44 mm	211.2×158.4 mm
Display color	16,777,216 colors	
LCD view angle (top/bottom/left/right)	Within 50°/60°/65°/65° of each	Within 60°/70°/80°/70° of each
Backlight	White LED	
Backlight life cycle	≥ 50,000 hours <sup>(1)</sup>	
Luminance adjustment	Adjustable by software	
Touch	Analog resistive film method	
Touch panel resolution	800 × 480 cell	800 × 600 cell
Touch panel life cycle	≥ 1 million times	
Sound	Magnetic buzzer (≥ 85 dB)	
Input	16-point	32-point
Insulation method	Photo coupler insulation	
Rated input voltage	24 VDC≒	
Max. allowable voltage	28.8 VDC≒ (using the ambient temperature below 45°C)	
Input format	Source input	
Rated input current	X0 to X8: ≈ 10 mA X9 to XF: ≈ 4 mA	X0 to X8: ≈ 10 mA × 2 X9 to X1F: ≈ 4 mA × 2
Voltage range	19.2-28.8 VDC≒	
Input resistance	X0 to X8: 3.3 kΩ X9 to XF: 5.6 kΩ	X0 to X8: 3.3 kΩ × 2 X9 to X1F: 5.6 kΩ × 2
Response time	0.5 ms	
Number of commons	2-point	
Common method	16-point/1COM	16-point/1COM, 16-point/1COM
Applicable wire	Stranded wire 0.3 to 0.7 mm <sup>2</sup>	
Output	16-point	32-point
Output terminals	Terminal block or ribbon cable	
Power supply	24 VDC≒	
Insulation method	Photocoupler isolation	
Rated load voltage	24 VDC≒	
Load voltage range	19.2-28.8 VDC≒	
Output format	Sink output	
Max. load current	0.1 A/1-point, 1.6 A/1COM	
Min. load current	1 mA	
Max. voltage falling when ON	≤ 0.2 VDC≒	
Output delay time	0.5 ms	
Leakage current when OFF	≤ 0.1 mA	
Clamp voltage	45 V	
Output type	Transistor output	
Number of commons	2-point	
Common method	16-point/1COM	16-point/1COM, 16-point/1COM
External connection	16-pin connector (shared with input)	16-pin connector × 2 (shared with input)
Applicable wire	Stranded wire 0.3 to 0.7 mm <sup>2</sup>	
Certification	CE  	
Unit weight (package)	≈ 540 g (≈ 742 g)	≈ 1.10 kg (≈ 1.66 kg)

(1) Based on 25 °C, time until brightness reaches 50% when continuously ON

Command	Basic command: 28, application command: 236
Program capacity	16 K step (above firmware v2.60)
Program area	64 MB
Processing speed	Average: approx. 1μs/basic command, application command
I/O control method	Batch processing
Computer control method	Repeated-doubling method, interrupt processing
Device range	Refer to 'LP-A Series user manual'
Special function	Positioning function, motion controller, high speed counter
Serial interface	RS232C, RS422 (Half Duplex)
USB interface	Host: USB 2.0 (Type A) × 1, Device: USB 2.0 (mini-B) × 1
USB HOST power supply	5 VDC≒ ± 5%
USB HOST output current	500 mA
USB comm. distance	Host: < 2 m, Device: < 2 m
Ethernet interface	Ethernet: IEEE802.3(U), 10/100Base-T, connector: RJ45
CAN interface	24V CAN transceiver
External storage	Micro SD max. 32 GB (FAT16/32)
Printer	PCL3 GUI protocol (USB Host)
Processor	ATMEL ARM Cortex-A5 Single core (536 MHz)
RAM	DDR2 133 MHz 256 MB
Flash	256 MB
Backup memory	SRAM 1MB (lithium battery(1/2 AA))
Backup type	Logging/alarm, non-volatile device
Battery life cycle	5 years at 25°C
Clock	RTC embedded

Supportive interface can be different up to model. Please refer to 'Ordering Information' for the supportive interface per model and 'LP-A Series user manual' and 'GP/LP user manual for communication' for the detailed information about each interface.

Memory for user screen	64MB			
Number of user screen	100 pages			
System menu language	Korean, English			
Font	Bitmap font: 8 × 8, 8 × 16, 16 × 16, 32 × 32 pixel Vector font: 5 to 625 pixel			
Font magnification	Bitmap fonts: 1 to 8 times width / height			
Number of display characters (character × line)	Characters	Pixel	LP-A070	LP-A104
	English / Numbers	6 × 8	133 × 60	133 × 75
	Korean / Chinese characters	8 × 8	100 × 60	100 × 75
		16 × 16	50 × 30	50 × 37

Power supply	24 VDC≒		
Permissible voltage range	90 to 110% of power supply		
Allowable momentary outage time	≤ 10 ms		
Power consumption		LP-A070	LP-A104
	Power consumption	≤ 7.2 W	≤ 8 W
	Excluding external supply power	≤ 6 W	≤ 7 W
	Backlight OFF (standby mode)	≤ 4.5 W	≤ 5 W
Backlight ON (based on 20% brightness)	≤ 5 W	≤ 5.5 W	
Inrush current	≤ 20 A		
Insulated resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≒ megger)		
Surge voltage	± 500 V		
Ground	3rd grounding (≤ 100 Ω)		
Cooling method	Natural air cooling		
Noise immunity	The square wave noise (pulse width: 1μs) by the noise simulator ± 0.5 kV		
Static discharge endurance	Contact discharge ± 5 kV		
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min		
Vibration	0.75 double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes		
Shock	147 m/s <sup>2</sup> (approx. 15 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s <sup>2</sup> (approx. 10 G) in each X, Y, Z direction for 3 times		
Ambient temperature	0 to 50°C, storage: -20 to 60°C (a non freezing or condensation environment)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (a non freezing or condensation environment)		
Protection structure	IP65 (front panel, IEC standard)		
Material	Case: ABS flame retardant		

## Software

Visit Autonics web site to download software and manuals.

### ■ atDesigner

atDesigner is a dedicated screen editor software used to create, edit, and monitor the screen data of LP/GP-A devices. All data arrangement, layout, shapes, properties can be edited using atDesigner. The screen data, project admin account, security level, language, and script can all.

### ■ atLogic

atLogic is for create, edit, and debug programs for LP series logic panels.

### ■ Firmware

Please refer to 'LP-A Series user manual' for firmware upgrade.

## Manuals

For the detailed information and instructions, please refer to the manuals, and be sure to follow cautions written in the technical descriptions. Visit Autonics website to download manuals.

### ■ LP-A Series user manual

It describes general information about installation and system of GP-A Series.

### ■ atDesigner user manual

It describes how to design user screen and how to use HMI function.

### ■ atLogic user manual, atLogic programming manual

It describes how to install and use atLogic, program, and commands for LP Series.

### ■ GP/LP user manual for communication

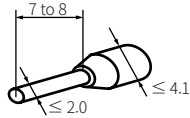
It describes how to connect with external devices such as PLC.

## Cautions during Wiring

- Mount the power connector to the proper direction. When install the device, be sure that the rear side is excluded max. 12 mm for mounting the power connector.
- Do not apply power before power line connection.
- Check power polarity.
- For power supply, use the wire of which is within AWG 20 to 12, and use the wire of which is over AWG 16 (1.2 mm<sup>2</sup>) for grounding.
- Tighten the terminal screw with 0.5 to 0.8 N m torque.
- Ground resistance should be less than 100 Ω and ground it separately.

### Wire Ferrule Spec.

- Unit: mm, Use the UL approved wire ferrule.

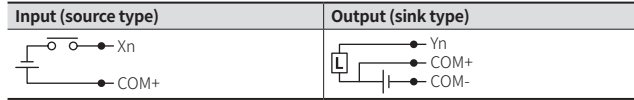


## I/O Connection Diagram

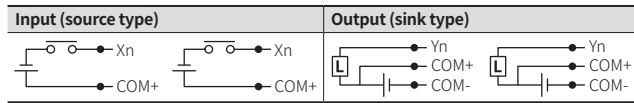
For the detailed information about pin number and others, please refer to 'LP-A user manual'.

- Hirose connector: HIF3BA-20PA-2.54DSA  
Applicable connector socket: HIF3BA-20D-2.54R

### 7.0 inch

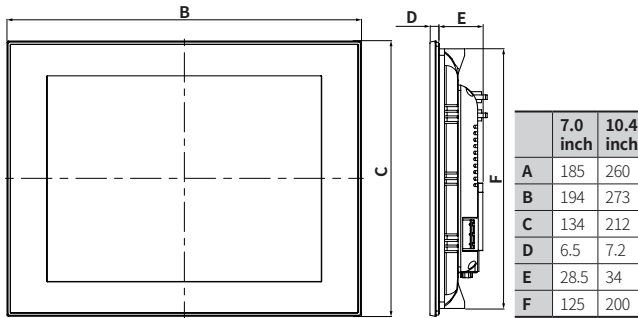
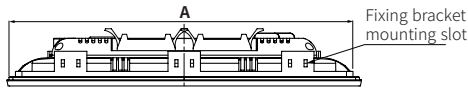


### 10.4 inch

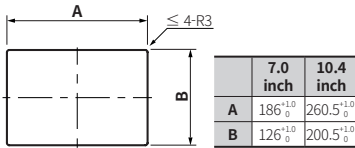


## Dimensions

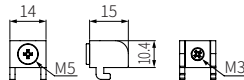
- Unit: mm, For the detailed drawings, follow the Autonics website.



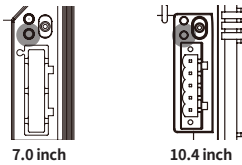
- Panel cut-out



- Fixing bracket



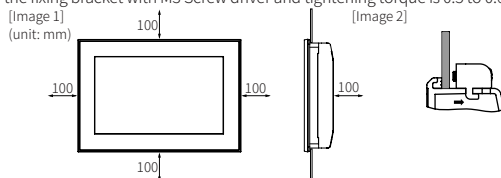
## Program Status Indicator



Indicator	Program status	
	Color	Status
Green	ON	Run
Green	Flashing	Pause
Red	Flashing	Error
7.0 inch: orange 10.4 inch: red	ON	atLogic debugging

## Installation

- Set the product in panel. (panel thickness: ≤ 4 mm)  
When installing the product on panel, make 100 mm of space from upper, lower, right, left side of the product, on panel and back side of panel. It is for preventing effect of electromagnetic waves and heat from other controllers. [Image 1]
- Set fixing brackets in the fixing bracket mounting slots. [Image 2]
- Tighten the fixing bracket with M3 Screw driver and tightening torque is 0.5 to 0.6 N m.



## Interface

Interface is different up to the model.

For the detailed information about each interface, refer to the 'LP-A Series user manual' and 'GP/LP user manual for communication'.

### Serial port (RS232C/RS422)

RS232C		RS422		
Port	Pin function	Port	Pin function	
	1	-	1	TXD+
	2	RXD	2	RXD+
	3	TXD	3	-
	4	DTR	4	-
	5	SG	5	SG
	6	DSR	6	TXD-
	7	-	7	RXD-
	8	-	8	-
	9	-	9	-
D-sub 9 Pin Male		D-sub 9 Pin Female		

### USB port

Type	Port	Function
USB Host		<ul style="list-style-type: none"> <li>Coping data between storage and LP</li> <li>Firmware upgrade</li> <li>Connecting external device (bar-code reader, printer, etc.)</li> <li>External memory: max. 32GB (supported file system: FAT16/32)</li> </ul>
USB Device		<ul style="list-style-type: none"> <li>atDesigner project upload/download</li> </ul>

Use a USB cable within 2 m.

### Ethernet port

It is available to upload/download project file by connecting PC and atDesigner, and monitor PLC which supports Ethernet communication protocol.

### CAN port

Number	Color	Function	Configuration
1	Black	24VDC≐(-)	
2	Blue	CAN_L	
3	None	SHIELD	
4	White	CAN_H	
5	Red	24VDC≐(+)	

### Micro SD

External memory: max. 32 GB (supported file system: FAT16/32)