Make Life Easy :

User Manual

Logic Panel

LP-A Series

Thank you for purchasing an Autonics product.

This user manual contains information about the product and its proper use,

and should be kept in a place where it will be easy to access.

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Preface

Thank you for purchasing Autonics product.

Please familiarize yourself with the information contained in the Safety Considerations section before using this product.

This user manual contains information about the porduct and its proper use, and should be kept in a place where it will be easy to access.

User Manual Guide

- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- A user manual is not provided as part of the product package.
  Visit our web site (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through out homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.

User Manual Symbols

Symbol	Description
Note	Supplementary information for a particular feature.
Warning	Failure to follow instructions can result in serious injury or death.
Caution	Failure to follow instructions can lead to a minor injury or product damage.
Ex.	An example of the concerned feature's use.
※1	Annotation mark.

Reference Manual for Each Configuration
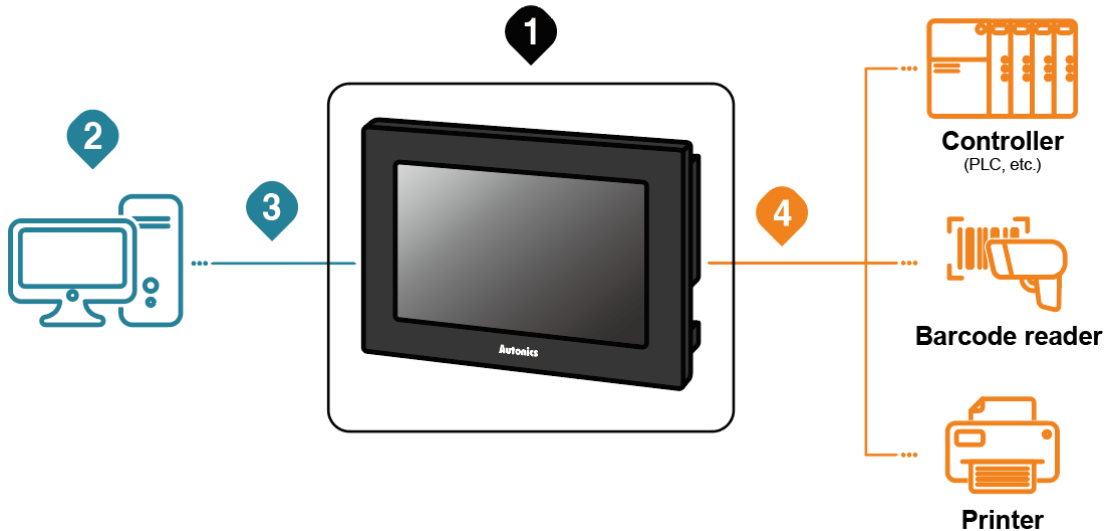
1 **Logic panel device specification, installation, maintenance, management, firmware update and system configuration**

Hardware Manual	LP-A Series User Manual

2 **Project drawing, programming**

Software Manual	Drawing	atDesigner User Manual
	Programming	atLogic User Manual, atLogic Programming Manual

3 **Project Upload/Download**

Hardware Manual	LP-A Series User Manual

4 **Connected device setting, communication setting**

Software Manual	Drawing	atDesigner User Manual
	Programming	atLogic User Manual, atLogic Programming Manual
Hardware Manual	LP-A Series User Manual	

4 **Check connectable device, connection cable model name and protocol**

Communication Manual	GP/LP Communication Manual

Safety Considerations

- Following these safety considerations will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.

- Safety considerations are categorized as Warnings and Cautions, as defined below:

⚠ **Warning**	**Warning**	Failure to follow the instructions may lead to a serious injury or accident.

⚠ **Caution**	**Caution**	Failure to follow the instructions may lead to a minor injury or accident.

⚠ Warning

- 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.

- Do not use 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.

- Use the unit within the rated specifications.
  Failure to follow this instruction may result in fire or shortening the life cycle of the product.

- Do not connect, repair, or inspect the unit while connected to a power source.
  Failure to follow this instruction may result in fire.

- Check 'Power Wiring', 'Serial Interface', and 'Input/Output Wiring' before wiring.
  Failure to follow this instruction may result in fire.

- 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.

- Do not disassemble or modify the unit.
  Failure to follow this instruction may result in fire.

- Since Lithium battery is embedded in the product, do not disassemble or burn the unit.
  Failure to follow this instruction may result in fire.

- Please contact us for battery replacement.

⚠ **Caution**

- Use dry cloth to clean the unit, and do not use water or organic solvent.
  Failure to follow this instruction may result in fire.

- When connecting the power input, use AWG 23 cable or over and tighten the terminal screw with a tightening torque of 0.5 to 0.8N.m.
  Failure to follow this instruction may result in fire or malfunction due to contact failure.

- 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.

- Do not push over 2 point at the same time.
  Failure to follow this instruction may result in malfunction.

- 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.

The specifications are subject to change and some models may be discontinued without notice.

Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, website).

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.

- 24VDC 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.

- 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.

- This unit may be used in the following environments.
  ①Indoors (in the environment condition rated in 'Specifications')

  ②Altitude max. 2,000m

  ③Pollution degree 2

  ④Installation category II

Table of Contents

1   Overview

1.1   What is LP?

LP (Logic Panel) is a device made to cope with complicated industrial field with a single panel by adding function of PLC (Programmable Logic Controller) and I/O to existing human-machine interface (HMI).

By integrating the display unit and the controller, it is possible to visually display and control the status of various equipment installed in a limited space, thereby achieving cost reduction, wiring reduction, space saving, and ease of operation.

The variables of the controller can be expressed in various ways through graphic objects called 'objects'.
For example, if the monitored physical variable is temperature, you can use the numerical display object to display the temperature as a numerical value or use the real-time trend graph to monitor the trend of temperature change over time.
The LP's user screen is a combination of these objects and other graphic object.

The LP user screen and user data (PLC Logic) are edited using the dedicated software atDesigner and atLogic.
Download the created data to LP, after editing data such as shape, layout, and attributes of various objects with atDesigner, and programming the PLC logic with atLogic, LP monitors or controls the control device according to the screen data.

1.2   Features

- Horizontal/Vertical installation
  Possible to install horizontally/vertically according to user's environment.

- Communication and multi-monitoring between heterogeneous controller
  Simultaneous monitoring two different types of controller and relay the communication
  between controllers.

- Basic I/O mounted
  LP-A070: 16 inputs, 16 outputs
  LP-A104: 32 inputs, 32 outputs

- Controller's device monitoring
  Monitoring device of the connected controllers from GP's system menu without user screen
  data.

- Multi communication ports
  Supporting the RS232C / RS422 / Ethernet / CAN(LP-A104) communication.

- Connecting to printers and barcode reader
  Allowed to print alarm logs by connecting to printers.
  Allowed to read barcode by connecting to barcode reader.

- Touch interface
  Easy to control objects on the screen without other input devices due to equipped
  touchscreen.
  Possible to be touched by not only hand but also glove, pen tip, or etc. with resistive type
  touchscreen.

- Easy to use space
  Integrated display and system unit make easier to utilize space with lesser restricts on
  installation.

- Supporting various languages
  Supporting Korean and English for the system language.
  Using multilingual table function, switching language of user screen.

- Using user screen drawing program 'atDesigner'
  Various objects can be used to display data in different ways depending on the purpose.
  The intuitive UI makes it easier to use the program.

- Supporting various fonts
  Supporting various bitmap fonts and vector fonts. Users are allowed to select the fonts.

1.3   Ordering Information

1.3.1   LP-A070 Series

LP - A 070 - T 9 D 6 - C 5 R
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

Item		Description
①Item	LP	Logic Panel
②Series	A	A Series
③Screen size	070	7 inch
④Display unit	T	TFT Color LCD
⑤Color	9	16,777,216 colors
⑥Power supply	D	24VDC
⑦Interface	6	RS232C, RS422, USB Device, USB Host, Ethernet
	7	RS232C: 2, USB Device, USB Host, Ethernet
⑧Module type	C	Integrated type
⑨Number of I/O	5	IN: 16-point, OUT: 16-point
⑩I/O connector type	R	Ribbon cable connector
	T	Terminal block connector

1.3.2   LP-A104 Series

LP - A 104 - T 9 D 8 - C 6 R
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

Item		Description
①Item	LP	Logic Panel
②Series	A	A Series
③Screen size	104	10.4 inch
④Display unit	T	TFT Color LCD
⑤Color	9	16,777,216 colors
⑥Power supply	D	24VDC
⑦Interface	8	RS232C, RS422, USB Device, USB Host, Ethernet, CAN, Micro SD
	9	RS232C: 2, USB Device, USB Host, Ethernet, CAN, Micro SD
⑧Module type	C	Integrated type
⑨Number of I/O	6	IN: 32-point, OUT: 32-point
⑩I/O connector type	R	Ribbon cable connector
	T	Terminal block connector

1.4 Specifications

1.4.1 LP-A070 Series

1.4.1.1 General Specifications

Model	LP-A070-T9D6-C5R(T)	LP-A070-T9D7-C5R(T)
Power supply	24VDC⎓	
Allowable voltage range	90 to 110% of power supply	
Power consumption	Max. 7.2W	
Serial Interface	Each port of RS232C, RS422	Two ports of RS232C
USB Interface	Each of USB Host, USB Device (USB2.0)	
Ethernet Interface	IEEE802.3(U), 10/100Base-T	
Real-time controller	RTC embedded	
Battery life cycle	3 years at 25℃	
Insulated resistance	Over 100MΩ (500VDC megger)	
Ground	3rd grounding (max. 100Ω)	
Noise immunity	±0.5kV the square wave noise (pulse width: 1 μs) by the noise simulator	
Withstanding voltage	500VAC 50/60Hz for 1 min	
Vibra tion	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 minute) in each X, Y, Z direction for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Shock	Mechanical	300m/s² (approx. 30G) in each X, Y, Z direction for 3 times
	Malfunction	100m/s² (approx. 10G) in each X, Y, Z direction for 3 times
Envir onm ent	Ambient temp.	0 to 50℃, storage: -20 to 60℃
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH
Protection structure	IP65(front panel, IEC standard)	
Accessory	Fixing bracket: 4, battery (included)	
Approval	CE ⓀⒸ	
Weight[1]	Approx. 742g (approx. 540g)	

※1: The weight includes packaging. The weight in parenthesis is for unit only.

※Environment resistance is rated at no freezing or condensation.

1.4.1.2   Performance Specifications

Display performance	
LCD type	TFT Color LCD
Resolution	800×480 dot
Display area	152.4×94.44mm
Color	16,777,216 color
LCD view angle	Within 50°/60°/65°/65° of each top/bottom/left/right
Backlight	White LED
Luminance	Max. 300cd/m2
Luminance adjustment	Adjustable by software

Graphic drawing performance	
Language※1	Korean, English
Text	Bitmap ASCII and vector font
Memory for user screen	64MB
Number of user screen	100pages
Touch switch	Analog touch (resistive type)

Interface type	
LP-A070-T9D6-C5R(T)	RS232C, RS422, USB Host, USB Device, Ethernet
LP-A070-T9D7-C5R(T)	RS232C: 2, USB Host, USB Device, Ethernet

Input		Output	
Input point	16-point	Output point	16-point
Insulation method	Photo coupler insulation	Power supply	24VDC
Rated input voltage	24VDC	Insulation method	Photo coupler insulation
Rated input current	Contact X0 to X8: approx. 10mA Contact X9 to XF: approx. 4mA	Rated load voltage	24VDC
Voltage range	19.2 to 28.8VDC	Allowable load voltage range	19.2 to 28.8VDC
Input resistance	Contact X0 to X8: 3.3kΩ Contact X9 to XF: 5.6kΩ	Max. load current	0.1A/1 point 1.6A/COM
Response time	0.5ms	Max. voltage falling when ON	Max. 0.2VDC
Common method	16-point/1 COM	Common method	16-point/1 COM
Acceptable wire	0.3 to 0.7mm2	Acceptable wire	0.3 to 0.7mm2

Control performance	
Command	Basic command: 28, application command: 236
Program capacity	8K step
Processing time	Average: approx. 1 μs/basic command, application command
I/O control type	Batch processing
Computer control mode	Repeated-doubling method, interrupt processing
Device range	Refer to '9.1 Device'.
Embedded special function	Positioning function, High speed counter

※1: Supported language can be added.

1.4.2 LP-A104 Series

1.4.2.1 General Specifications

Model	LP-A104-T9D8-C6R(T)	LP-A104-T9D9-C6R(T)
Power supply	24VDC⎓	
Allowable voltage range	90 to 110% of power supply	
Power consumption	Max. 8W	
Serial Interface	Each of RS232C, RS422	Each of RS232C, RS422
USB Interface	Each of USB Host, USB Device (USB2.0)	
Ethernet Interface	IEEE802.3(U), 10/100Base-TX	
CAN Interface	CAN transceiver for 24V systems	
External storage	Micro SD up to 32GB (FAT16/32)	
Real-time controller	RTC embedded	
Battery life cycle	3 years at 25℃	
Insulated resistance	Over 100MΩ (500VDCmegger)	
Ground	3rd grounding (max. 100Ω)	
Noise immunity	±0.5kV the square wave noise (pulse width: 1 μs) by the noise simulator	
Withstanding voltage	500VAC 50/60Hz for 1 minute	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 minute) in each X, Y, Z direction for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Shock	Mechanical	300m/s² (approx. 30G) in each X, Y, Z direction for 3 times
	Malfunction	100m/s² (approx. 10G) in each X, Y, Z direction for 3 times
Environment	Ambient temp.	0 to 50℃, storage: -20 to 60℃
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH
Protection structure	IP65(front panel, IEC standard)	
Accessory	Fixing bracket: 6, battery (included)	
Approval	CE K	
Weight[※1]	Approx. 1.66kg(approx. 1.10kg)	

※1: The weight includes packaging. The weight in parenthesis is for unit only.

※Environment resistance is rated at no freezing or condensation.

1.4.2.2 Performance Specifications

Display performance	
LCD type	TFT Color LCD
Resolution	800×600 dot
Display area	211.2×158.4mm
Color	16,777,216 color
LCD view angle	Within 60°/70°/70°/70°of each top/bottom/left/right
Backlight	White LED
Luminance	Max. 350cd/m2
Luminance adjustment	Adjustable by software

Graphic drawing performance	
Language※1	Korean, English
Text	Bitmap ASCII and vector font
Memory for user screen	64MB
Number of user screen	100page
Touch switch	Analog touch (resistive type)

Interface type	
LP-A104-T9D8-C6R(T)	RS232C, RS422, USB Host, USB Device, Ethernet, CAN, Micro SD
LP-A104-T9D9-C6R(T)	RS232C: 2, USB Host, USB Device, Ethernet, CAN, Micro SD

Input		Output	
Input point	32-point	Output point	32-point
Insulation method	Photo coupler insulation	Power supply	24VDC
Rated input voltage	24VDC	Insulation method	Photo coupler insulation
Rated input current	Contact X0 to X8: approx. 10mA Contact X9 to X1F: approx. 4mA	Rated load voltage	24VDC
Voltage range	19.2 to 28.8VDC	Allowable load voltage range	19.2 to 28.8VDC
Input resistance	Contact X0 to X8: 3.3kΩ Contact X9 to X1F: 5.6kΩ	Max. load current	0.1A/1 point 1.6A/COM
Response time	0.5ms	Max. voltage falling when ON	Max. 0.2VDC
Common method	16-point/1COM, 16-point/1COM	Common method	16-point/1COM, 16-point/1COM
Acceptable wire	0.3 to 0.7mm2	Acceptable wire	0.3 to 0.7mm2

Control performance	
Command	Basic command: 28, application command: 236
Program capacity	8K step
Processing time	Average: approx. 1 μs/basic command, application command
I/O control type	Batch processing
Computer control mode	Repeated-doubling method, interrupt processing
Device range	Refer to '9.1 Device'.
Embedded special function	Positioning function, High speed counter

※1: Supported language can be added.

1.5   Functions

1.5.1   Drawing Functions

Function		Description
Drawing software		atDesigner
Drawing memory		64MB
Figure		Line/multi line/Rectangle/Round rectangle/Polygon/Circle/Fan/Chord/Arc/Rectangle scale/Circle scale/Semicircle scale/Image/Text
Object	Lamp	Displaying the value of the designated device in bit/word/multi lamp
	Switch	Switching the status of the designated device or object with bit/word/change screen/special/multi switch
	Numeric input/display	Displaying the value of the designated device/Inputting the value to the designated device in number (DEC,HEX, OCT, BIN, REAL)
	Text input/display	Displaying the value of the designated device/Inputting the value to the designated device in text (ASCII/Unicode)
	Call window	Calling a window screen according to the conditions on the value of the designated device
	Message	Displaying a message according to the conditions on the value of the designated device
	Graph	Displaying the value of the designated device in bar/pie/panel meter/statistic/RealTime trend/Logging trend/RealTime distribution/Logging distribution graph
	Clock	Displaying time or date of the time
	Recipe Editor	Editing recipe (project)
	Logging table	Displaying the logging data (project) in a table
	System logging table	Displaying the system logging data (project) in a table
	Alarm explorer	Displaying the alarm group of alarm history (project) in a table
	Alarm list	Displaying the data of alarm history (project) in a table
	Data list viewer/editor	Displaying/Editing the value of consecutive word device in a table
	Option list	Displaying the data of the designated device/Inputting data to the designated device in a combo box
	Move cord.	Displaying the object/Moving coordinate of the object according to the value of the designated device
Project	Link device	Reading/Writing the data between GP and controller (PLC) as long as setting according to the status of bit/ cycle condition
	Flow alarm	Displaying alarm in the flowing text at the set position, when meeting the alarming condition
	Alarm history	Saving data of alarming time, device, and information, when the value of the designated alarm-observing device meets the set condition
	Scheduler	Executing a function (bit on/off/reversal, work value changing, script) according to the set condition (device/ cycle)
	Recipe	Reading the value of the multiple devices/Writing the value to the multiple devices at once
	Logging	Saving the value of the designated device, when meeting the condition (device/cycle)
	System logging	Saving system operation information of GP in a log file
	Script	Writing Lua script by user

1.5.2 Logic Functions

Function		Description
Logic software		atLogic
Edit		Manage ladder/mnemonic editor, insert/delete line, manage rung, manage rung command, search, replace, find step
Tool		Ladder tool: arrow, erase, vertical line, horizontal line, normally open contact, normally closed contact, rising input contact, falling input contact, output instruction, rising output contact, falling output contact, application command, not instruction, register user function, user function
		Program diagnosis tool: Program optimization, program diagnose
View		Ladder/Mnemonic, device/variable name, decimal/hexadecimal view, device/UW view, used devices, zoom in/out, font settings, color settings, toolbar
Online		Connect, disconnect, download, upload, change mode, start monitoring, stop monitoring, read information, change password, verify, change present value, forced I/O settings, system device, program delete, firmware download, communication options
Debug		Run, stop run, trace, insert/remove break point, stop debugging, debug-step, debug-line, debug-scan, run step in/out, run debug-bit/word, time chart
window		Cascade, horizontal/vertical tile, arrange icon, external program connection
Help		Program information
Workspace	Program	Ladder/Mnemonic program editor
	Parameter	Common: input/output while debugging, operating condition for extended module, default filter value, time driven operation, time interrupt, watchdog, device latch range setting
		Extension: input filter, external interrupt
		Motion: common setting, operation setting, pattern setting
		High speed counter
	Variable/ Comment	Manage and set Variable/Comment by bit/word device
	Monitoring	Monitor and register monitoring device by bit/word device

1.6 Unit Description

1.6.1 LP-A070
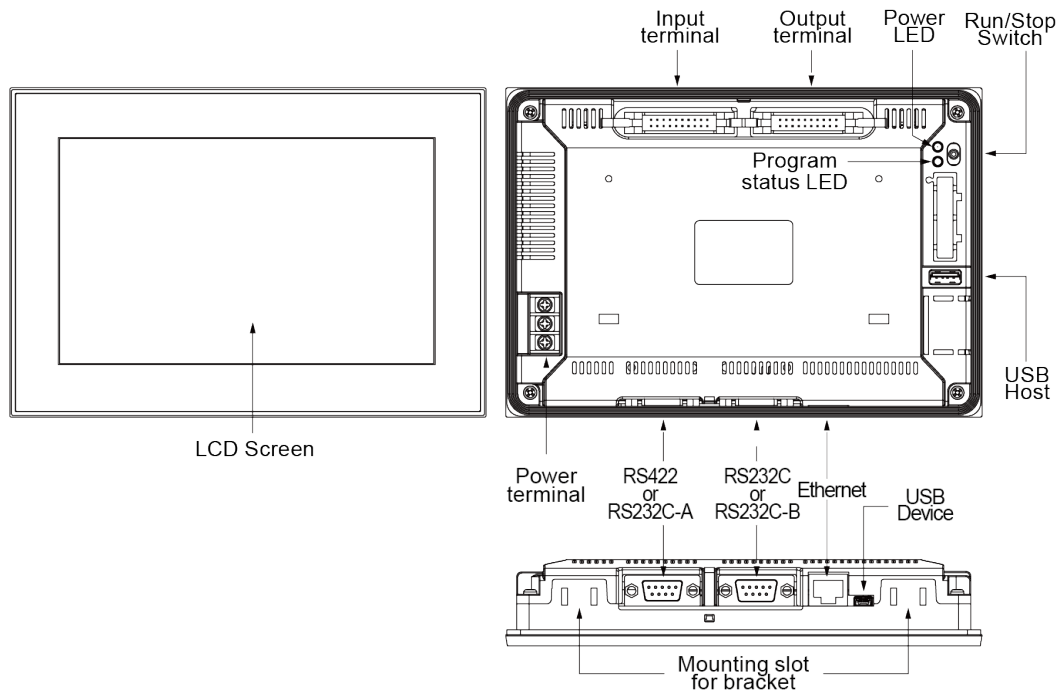
LCD Screen

Input terminal
Output terminal
Power LED
Run/Stop Switch
Program status LED
USB Host

Power terminal
RS422 or RS232C-A
RS232C or RS232C-B
Ethernet
USB Device

Mounting slot for bracket

- Program status LED

LED Color	LED Status	Program Status
Green	On	Run
Green	Flashing	Pause
Red	Flashing	Error
Orange	On	atLogic debugging

1.6.2 LP-A104
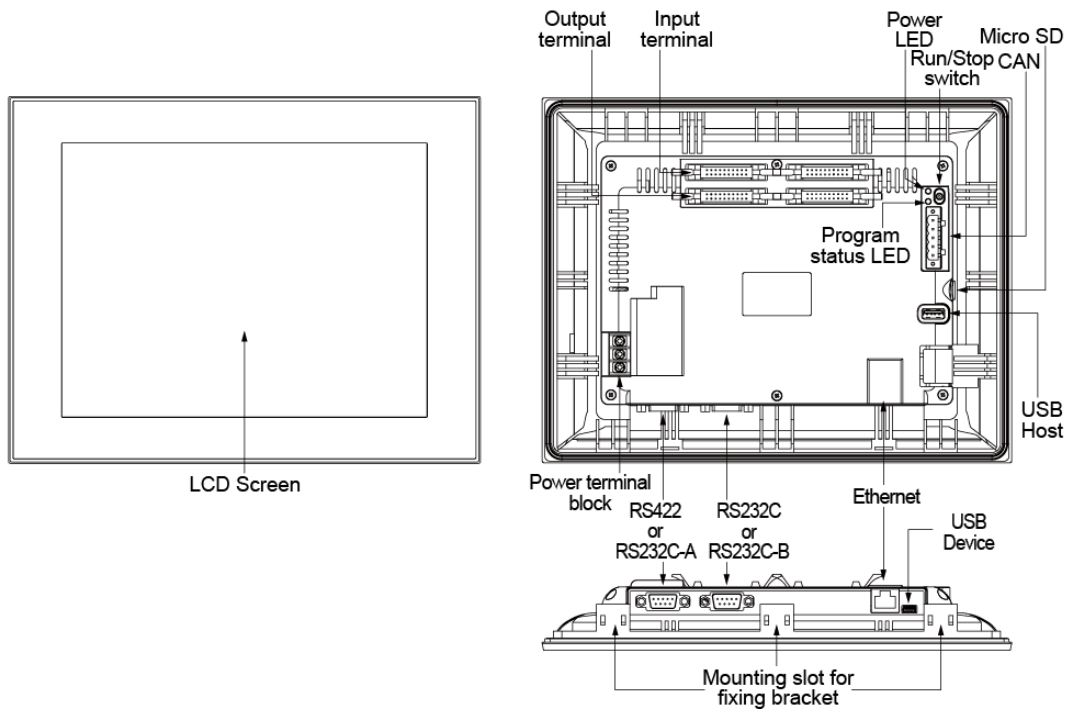
■ Program status LED
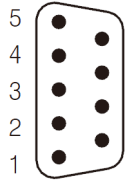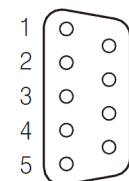
LED Color	LED Status	Program Status
Green	On	Run
Green	Flashing	Pause
Red	Flashing	Error
Red	On	atLogic debugging

1.7   Communication Interface

1.7.1   Serial Interface   `LP-A070` `LP-A104`

All LP capable devices, including PC, PLC, serial printer, barcode reader, and various dedicated controllers, can be connected in to both, RS232C and RS422.
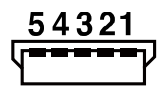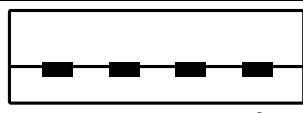
(1) Serial port

Port	Pin	Function	Port	Pin	Function
RS232C **RS232C-A** **RS232C-B** D-Sub 9Pin Male	1	Non-Used	**RS422** D-Sub 9Pin Female	1	TXD+
	2	RXD		2	RXD+
	3	TXD		3	Non-Used
	4	DTR		4	Non-Used
	5	SG		5	SG
	6	DSR		6	TXD-
	7	Non-Used		7	RXD-
	8	Non-Used		8	Non-Used
	9	Non-Used		9	Non-Used

(2) Serial port specification

Item	Specification
Interface	RS232C/RS422
Speed	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps
Data length	7, 8 Bit
Stop bit	1, 2 Bit
Parity	ODD, EVEN
Flow control	XON/XOFF, DSR/DTR, NONE

1.7.2   USB Interface   `LP-A070` `LP-A104`

USB Device	Pin	Function	USB HOST	Pin	Function
5 4 3 2 1 **Mini-B**	1	5V	**4 3 2 1** **Type A**	1	5V
	2	D-		2	D-
	3	D+		3	D+
	4	-		4	GND
	5	GND		-	-
Uploading/Downloading a atDesigner project file Used as external storage by connecting to PC			Transferring/Copying data between storage and GP-A070 Firmware upgrade Barcode reader Printer		

USB HOST can cover up to 32GB of external storage.
It supports only external storage of FAT16 and FAT32 file system

1.7.3   Ethernet Interface   LP-A070   LP-A104

Downloading the drawing data of atDesigner by connecting with PC.
Also possible to communicate with some PLC that can be connected by Ethernet communication.
In case of connecting with LAN cable and Hub, use direct cable and in case of connecting to computer directly, use cross cable.

(1) Direct cable

PC1		Cable color		PC2	
Signal	**Pin no.**			**Pin no.**	**Signal**
Tx+	1	White	Orange	1	Rx+
Tx-	2	Orange		2	Rx-
Rx+	3	White	Green	3	Tx+
	4	Blue		4	
	5	White	Blue	5	
Rx-	6	Green		6	Tx-
	7	White	Brown	7	
	8	Brown		8	

Tx: Transmit Data

Rx: Receive Data

(2) Cross cable

PC1		Cable color		PC2	
Signal	**Pin no.**			**Pin no.**	**Signal**
Tx+	1	White	Orange	1	Rx+
Tx-	2	Orange			Rx-
Rx+	3	White	Green	3	Tx+
	4	Blue			
	5	White	Blue	5	
Rx-	6	Green			Tx-
	7	White	Brown	7	
	8	Brown			

Tx: Transmit Data

Rx: Receive Data

1.7.4   CAN Interface `LP-A104`

It is allowed to connect with ARD Series, Autonics' Field network devices,using CAN communication.

No.	Color	Use	Arrangement
1	Black	24VDC(-)	
2	Blue	CAN_L	
3	None	SHIELD	
4	White	CAN_H	
5	Red	24VDC(+)	

Max. memory size per slave is 8byte.

- Digital module (ARM-D): 64 point

- Analog module (ARM-A): 16 bit, 4 point

Max. number of connectable slave is 63.
The address 0 is not used and the 1 to 63 is used.

※Even though the max. number of connectable slave is 63, please connect max. 8 for stabilizing the system.

1.7.5   Micro SD `LP-A104`

Micro SD can cover up to 32GB of external storage.
It supports only external storage of FAT16 and FAT32 file system

1.8   Dimension

1.8.1   LP-A070

(unit: mm)

185

194   6.5   28.5

134

125

● **Panel cut out**

186 $^{+1.1}_{0}$ Max. 4-R3

126 $^{+1.0}_{0}$
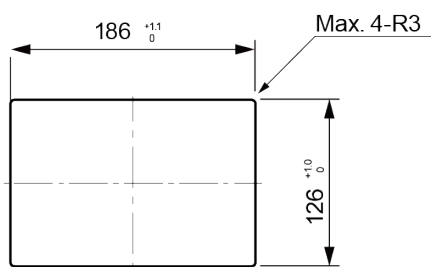
※Panel thickness : max. 4mm

1.8.2   LP-A104

(unit: mm)
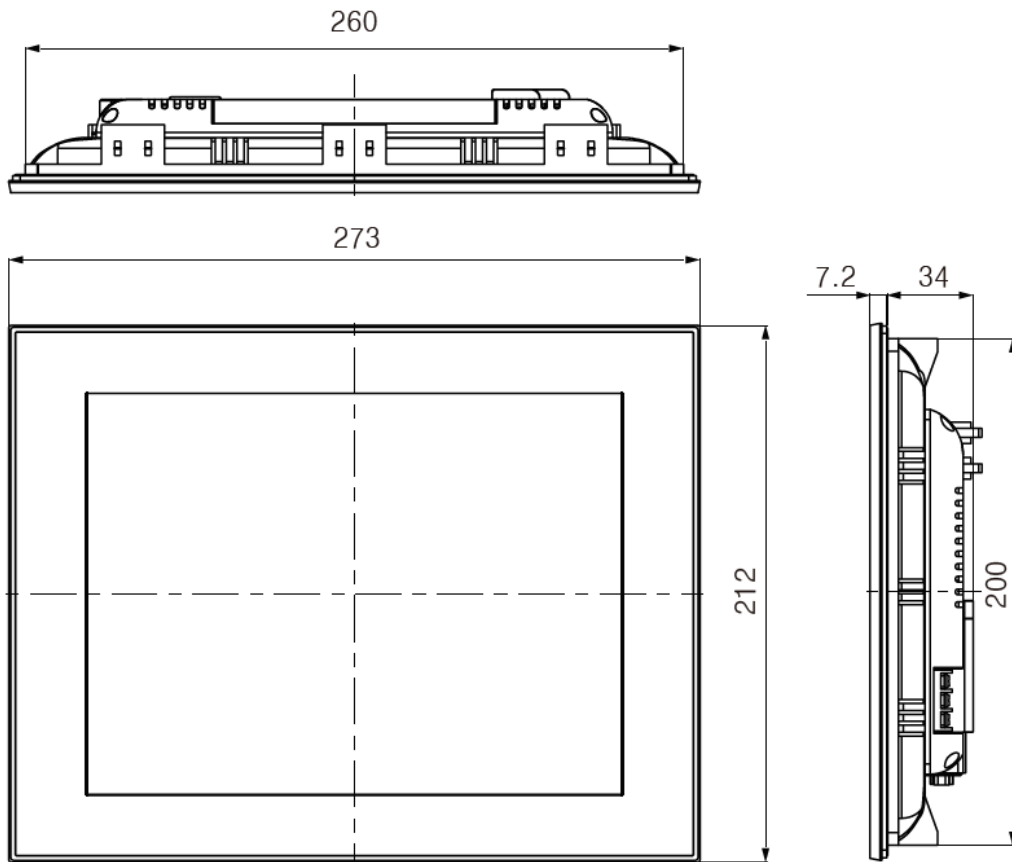
● **Panel cut out**
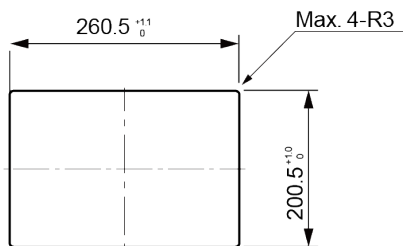
※Panel thickness : max. 4mm

1.8.3   Common

● **Fixing bracket**

15
M4

14

10.4
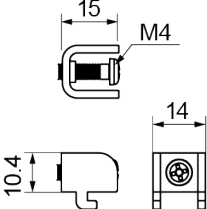
2   Installation

2.1   Device Installation

1st   Set LP product in panel.

2nd Set fixing brackets in slots.
(LP-A070: 2 slots is in upper side, 2 slots is in lower side,
LP-A104: 3 slots is in upper side, 3 slots is in lower side)

3rd   Tighten fixing bracket with M4 Screw driver and tightening torque is 0.3 to 0.5N·m.

M4 Screw driver
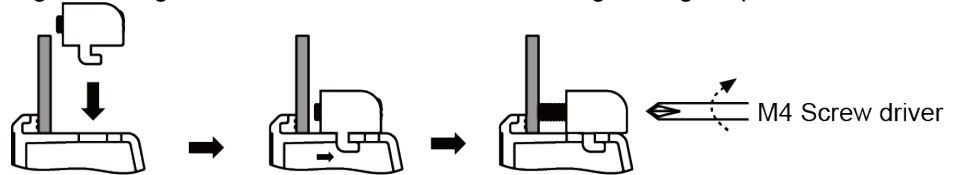
⚠ **Caution**

When installing LP product on panel, make 100mm of space from upper, lower, right, left side of the product on the panel and back side of panel. It is for preventing effect of electromagnetic waves and heat from other controllers.

(unit: mm)
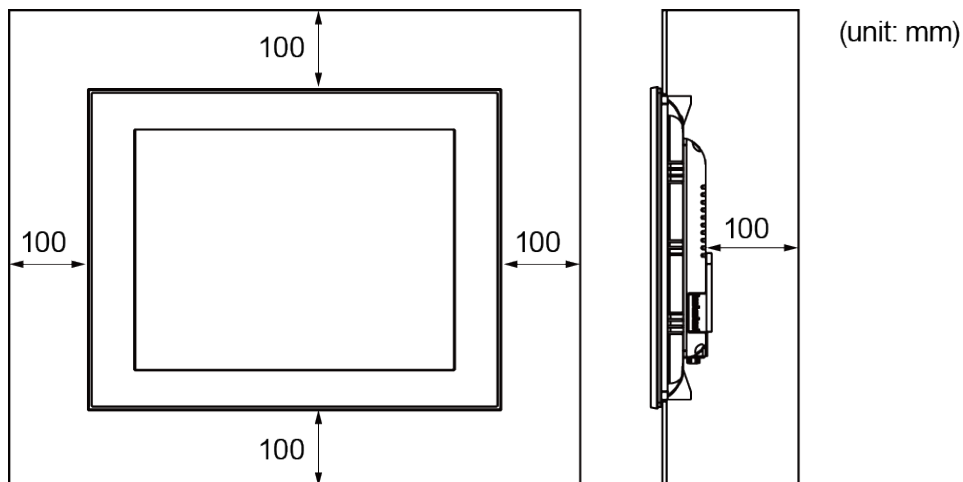
2.2   Power Wiring

- For power supply, use the wire of which cross section is at least 0.75mm² and use the wire of which cross section is at least 1.25mm² for grounding.

- Use round terminal with at least 3mm of internal diameter and less than 6mm of external diameter.

- Do not apply power before power line connection.

- Check power polarity.

- Tighten the terminal screw with 0.5 to 0.8N·m torque

- Ground resistance should be less than 100Ω and ground it separately.
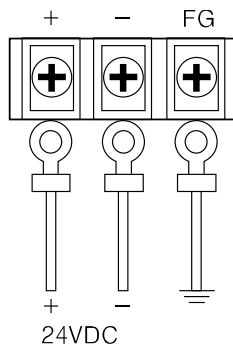
Caution

Caution for power wiring

- Before connecting power line, must check power polarity.

- Do not connect the power when the power is supplied.

- Observe following allowable voltage change range of power voltage.

Power voltage	24VDC
Allowable voltage change range	21.6 to 26.4VDC

- When connecting power, supply power with the power supply which has inner protection circuit. If the power supply which does not have inner protection circuit is used, protection circuits such as fuse must be installed before using this.

2.3   Ground Wiring
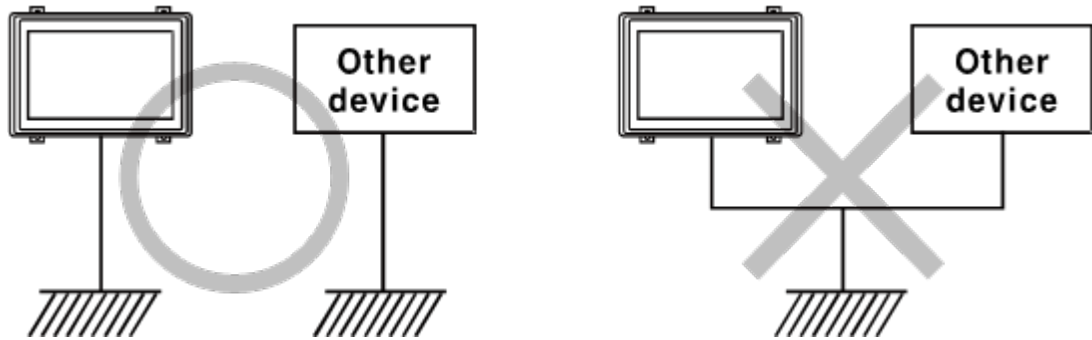
⚠ **Caution**

Caution for ground wiring

- Connect max. 100Ω of ground resistance.

- Diameter of cable for ground wiring connection should be over than 2 ㎟.

- As above figure, separate from other device's ground wire.

2.4　Input Wiring

2.4.1　LP-A070

Use an appropriate diameter wire considering the amount of current required for input/output wiring.

(1)　Input terminal

The internal input module of LP-A070 series is NPN open collector (source type).

LP-A070-T9D6(7)-C5R input wiring	LP-A070-T9D6(7)-C5T input wiring

(2)　Wiring according to the input device type
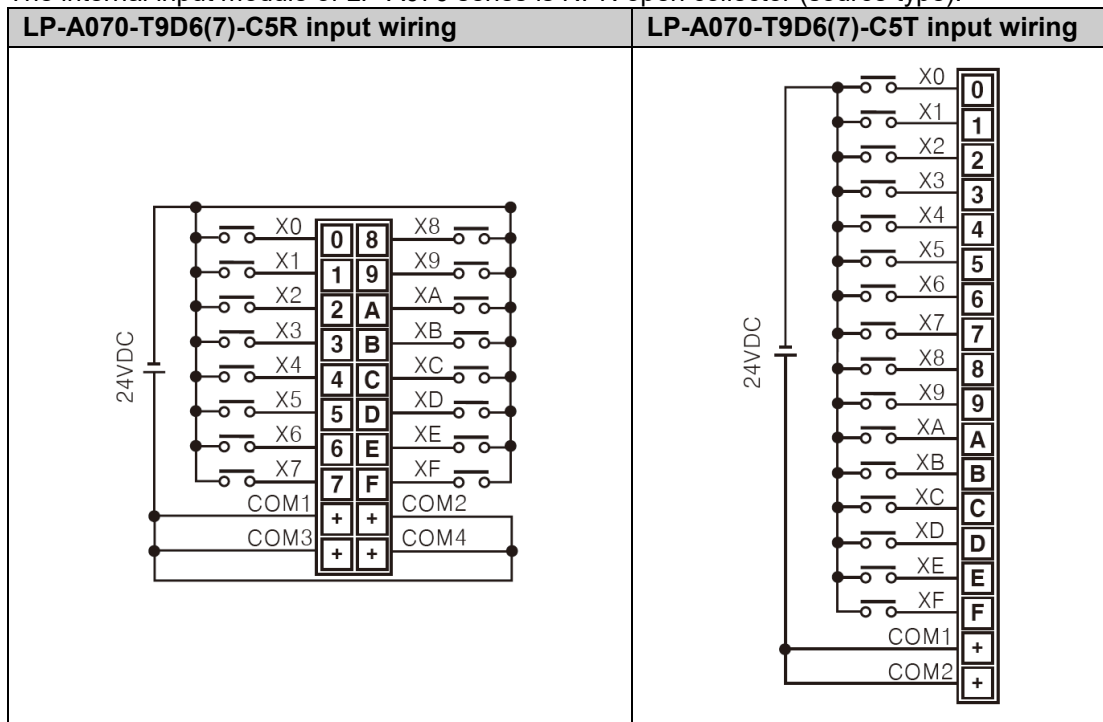
Connection with relay output type	Connection with NPN open collector output type
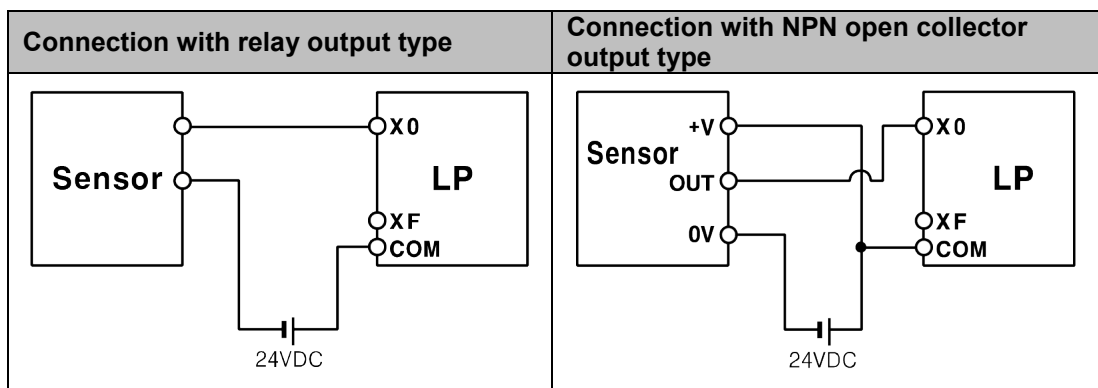
2.4.2　LP-A104

Use an appropriate diameter wire considering the amount of current required for input/output wiring.

(1) Input terminal

The internal input module of LP-A104 series is NPN open collector (source type).

LP-A104-T9D8(9)-C6R input wiring	
LP-A104-T9D8(9)-C6T input wiring	

(2) Wiring according to the input device type
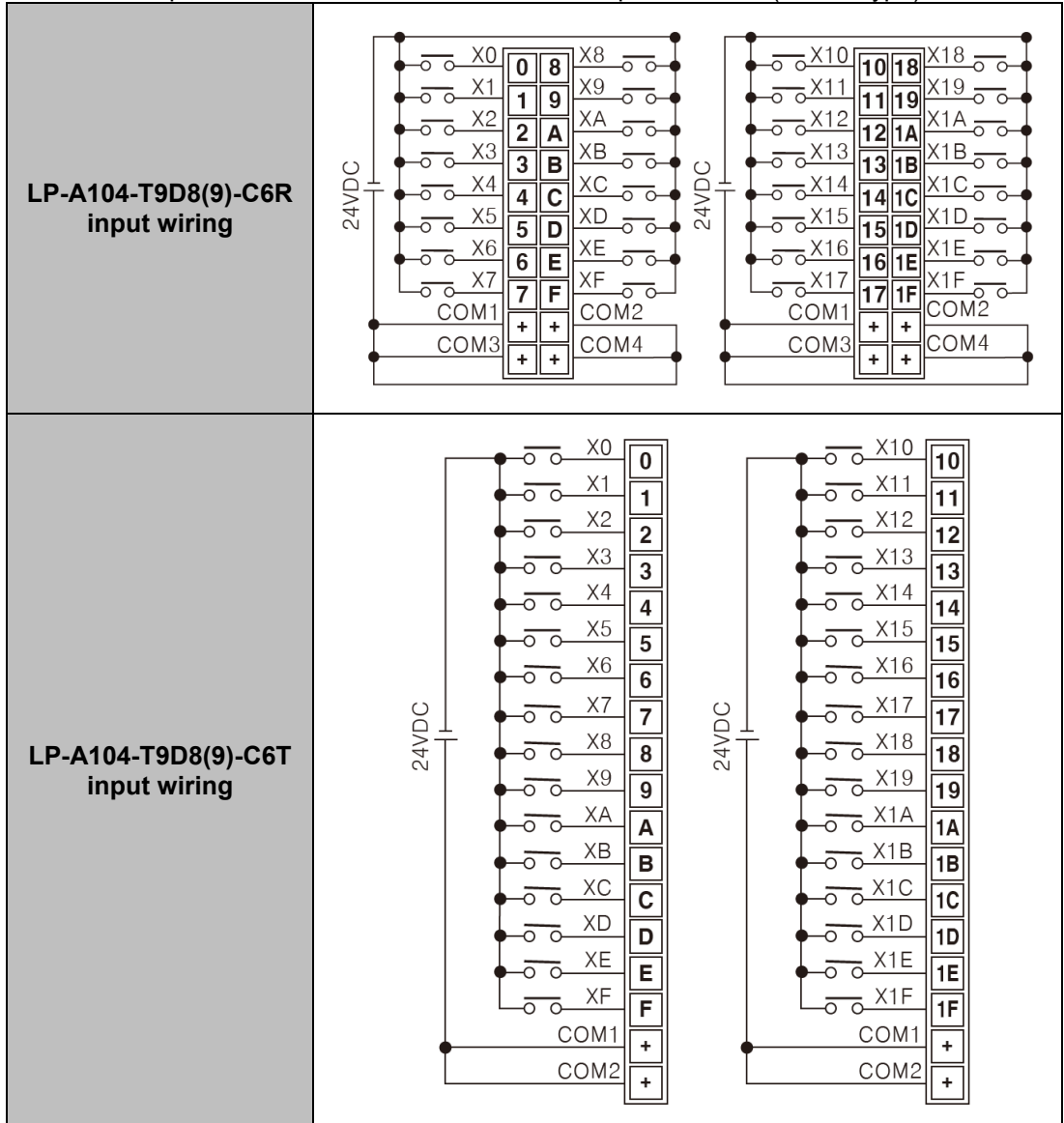
Connection with relay output type	Connection with NPN open collector output type
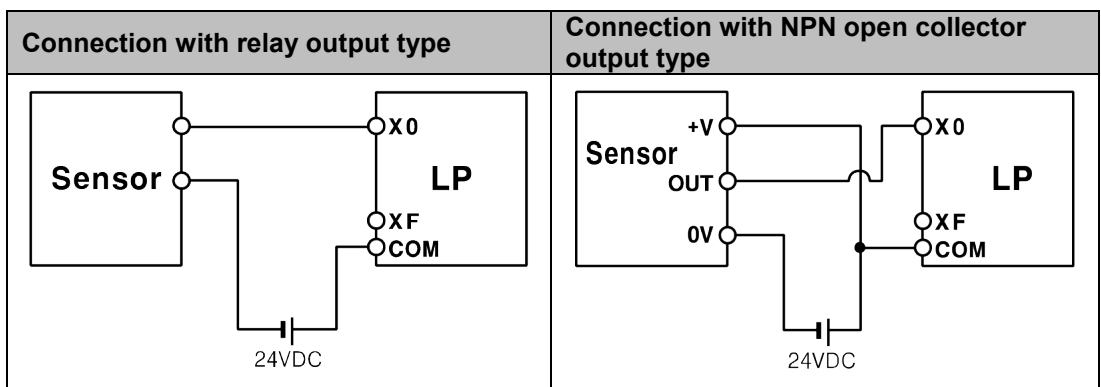
2.5 Output Wiring

2.5.1 LP-A070

The internal output module of LP-A070 series is NPN open collector (sink type).
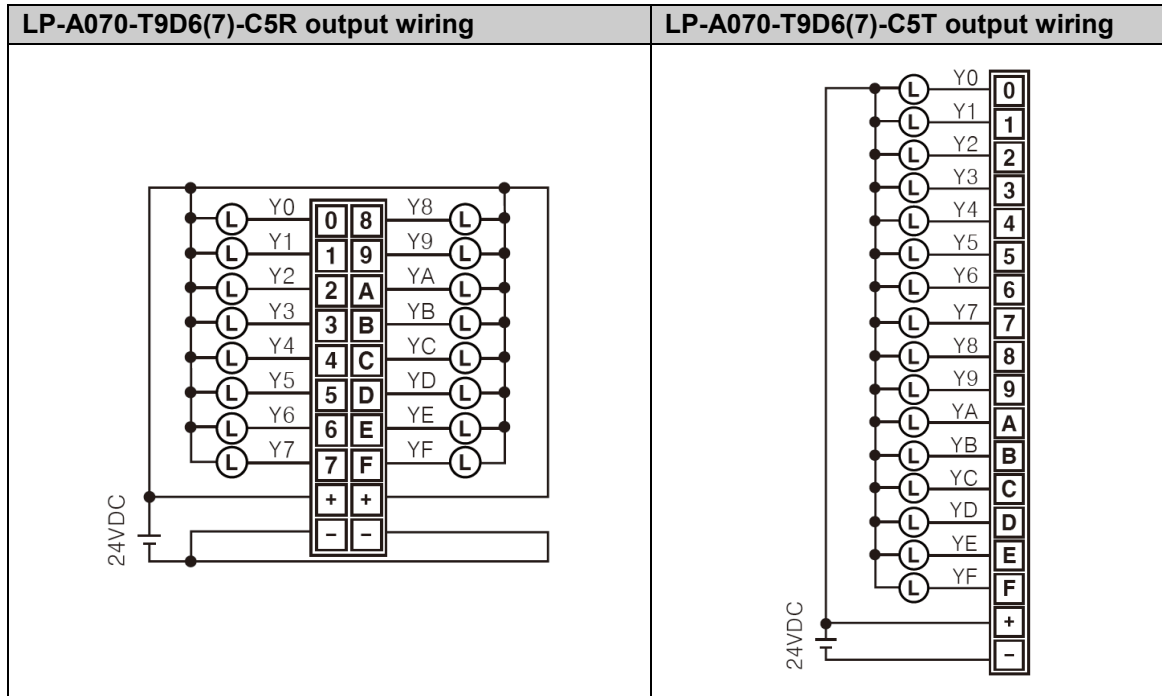
LP-A070-T9D6(7)-C5R output wiring	LP-A070-T9D6(7)-C5T output wiring

⚠️ **Caution**

- Separate the colors of the input/output wiring and do not wire to the same duct.
- Wire at least 100 mm away from power lines and other high voltage lines.

2.5.2   LP-A104

The internal output module of LP-A104 series is NPN open collector (sink type).
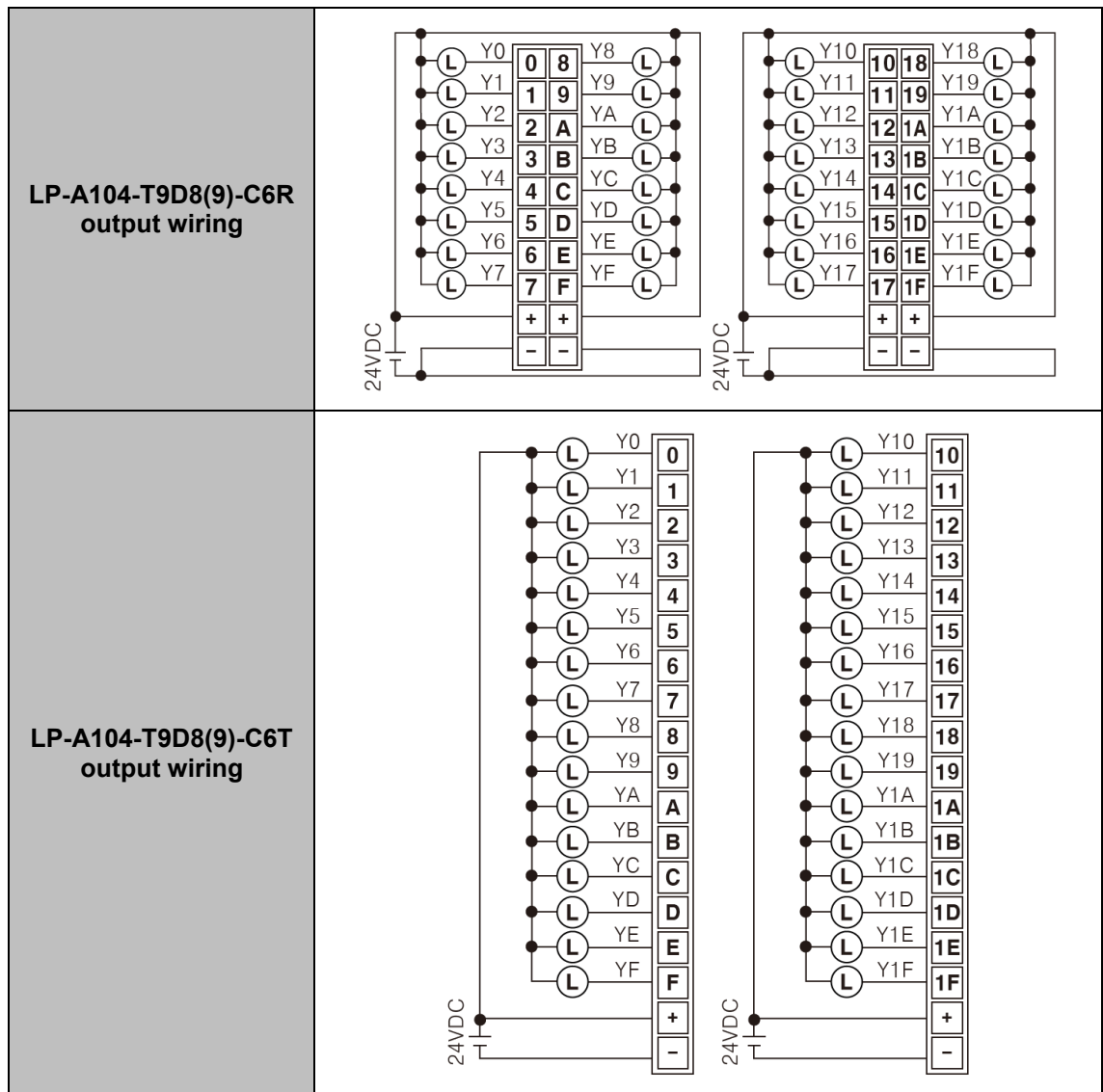
LP-A104-T9D8(9)-C6R output wiring	
LP-A104-T9D8(9)-C6T output wiring	

⚠ **Caution**

- Separate the colors of the input/output wiring and do not wire to the same duct.

- Wire at least 100 mm away from power lines and other high voltage lines.

3   System Organization

LP can be connected with various controller, barcode reader and printer via RS232C, RS422, Ethernet, CAN amd USB HOST port.
Please refer to 'GP/LP communication manual' for communication setting method for each PLC.
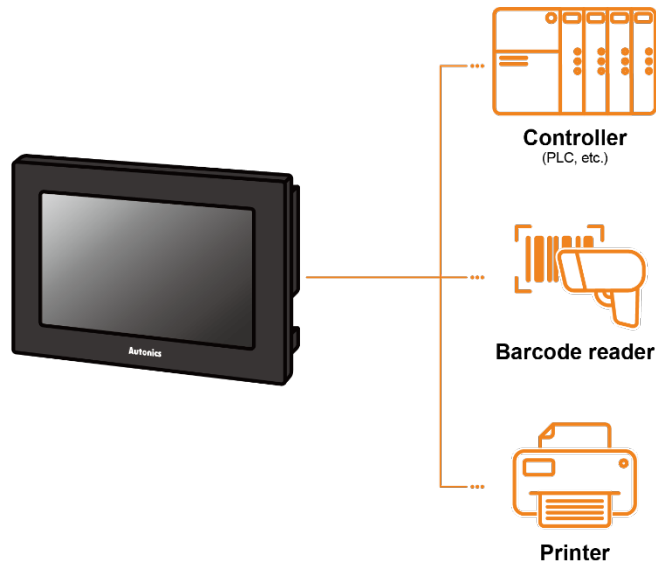
3.1   1:1 Communication

A LP can communicate with a single controller A.

Series	Connecting port	Description
LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device communication available
LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN※ port	Direct communication available Link device communication available

※Only Autonics' ARD Series can be connected to CAN port.

3.2 1:N Communication of Same Controllers

1:N communication stands for one LP communicating with multiple of controllers.
The LP observes the connected controllers or relays data between controllers.
A LP can communicate with the multiple of controller As.
The controller has to be able to set address of each device, and the address should not be duplicated.

Controller A-1
(PLC, etc.)

Controller A-2
(PLC, etc.)

Controller A-n
(PLC, etc.)

Series	Connecting port	Description
LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device communication available
LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN※ port	Direct communication available Link device communication available

※Only Autonics' ARD Series can be connected to CAN port.

3.3   1:N Communication of Different Controllers

1:N communication stands for one LP communicating with multiple of controllers.
The LP observes the connected controllers or relays data between controllers.
The LP can communicate with the multiple of different controllers.

3.3.1   1:1:1 Communication

A GP can communicate with a signle controller A and a signle controller B.
The GP relays communications between the controller A and B.

Controller A
(PLC, etc.)

Controller B
(PLC, etc.)

Series	Connecting port	Description
LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device communication available
LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN※ port	Direct communication available Link device communication available

※Only Autonics' ARD Series can be connected to CAN port.

3.3.2   1:1:N Communication

A LP can communicate with a single controller A and the multiple of controller Bs..
The LP relays communication between the controller A and B.
The controller has to be able to set address of each device, and the address should not be duplicated.

Controller A
(PLC, etc.)

Controller B-1
(PLC, etc.)

Controller B-2
(PLC, etc.)

Controller B-n
(PLC, etc.)

Series	Connecting port	Description
LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device communication available
LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN※ port	Direct communication available Link device communication available

※Only Autonics' ARD Series can be connected to CAN port.

3.3.3   N:1:N Communication

A LP can communicate with the multiple of controller As and Bs.
The LP relays comnmunication between the controller A and B.

Controller A-1
(PLC, etc.)

Controller A-2
(PLC, etc.)

Controller A-n
(PLC, etc.)

Controller B-1
(PLC, etc.)

Controller B-2
(PLC, etc.)

Controller B-n
(PLC, etc.)

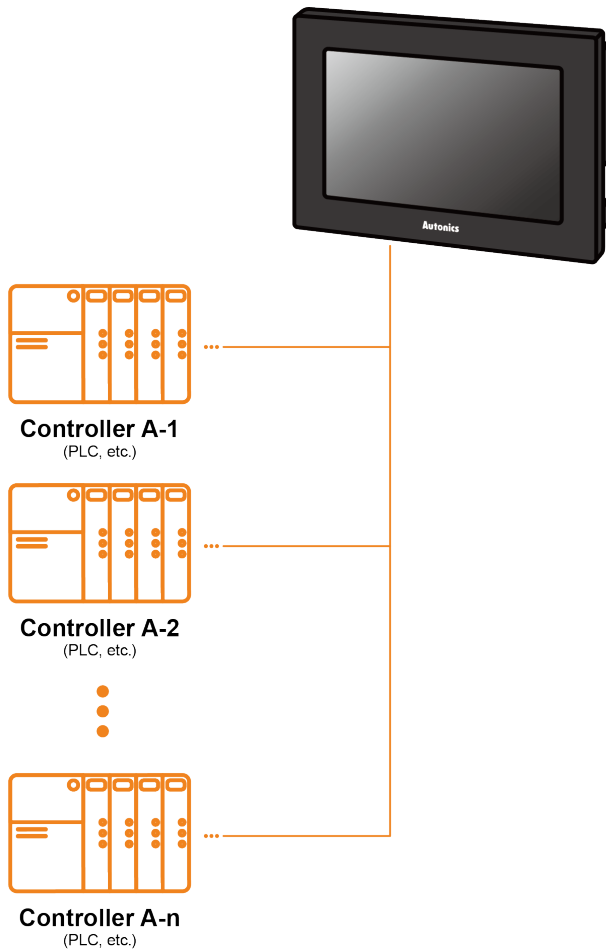| Series	Connecting port	Description
LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device communication available
LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN※ port	Direct communication available Link device communication available

※Only Autonics' ARD Series can be connected to CAN port.

3.4　Barcode Reader, Printer Communication

A GP can communicate with the barcode reader and printer.
Connect the barcode reader to utilize the barcode data.
Connect the printer to print the alarm log or the screen.
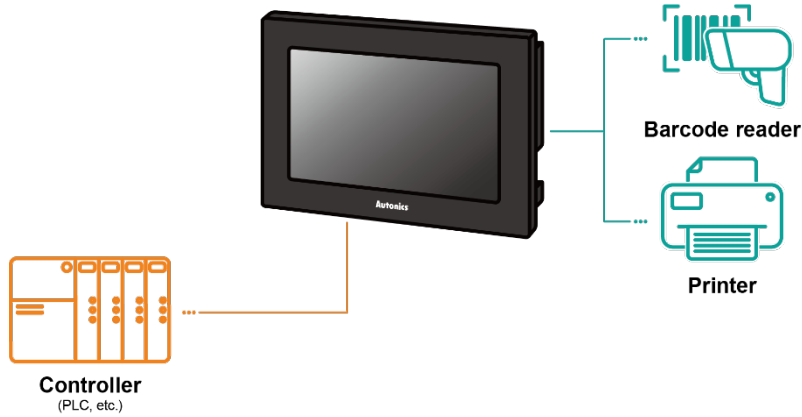
3.4.1　Barcode Reader

(1) Connected communication port

Series	Connected device	Communication port		
		RS232C※	RS422※	USB Host
LP-A070, LP-A104	Controller	○	○	-
	Barcode reader	○	○	○

※RS232C/422 converter allows to opposite communication.

(2) Communication specification

Item	Specification
Baud rate	300, 600, 1200, 3200, 4800, 9600, 19200, 38400, 57600, 115200bps
Data length	7, 8 bit
Parity	None, Odd, Even
Stop bit	1, 2 bit
Flow control	DSR/DTR, XON/XOFF

3.4.2   Printer

(1) Connected communication port

Series	Connected device	Communication port		
		RS232C※	**RS422**※	**USB Host**
LP -A070, LP-A104	Controller	○	○	-
	Printer	-	-	○

※RS232C/422 converter allows to opposite communication.

(2) Communication specification

Item	Specification
Baud rate	300, 600, 1200, 3200, 4800, 9600, 19200, 38400, 57600 bps
Data length	7, 8 bit
Parity	None, Odd, Even
Stop bit	1, 2 bit
Flow control	DSR/DTR, XON/XOFF

4 Operating LP

Describes the operation procedure form when the power is supplied on LP to when the user screen displays.

4.1 Power Supplying Checklist

Please chec the following list belowm before supplying the power on LP.

No	Checklist	Description
1	Installation status	Check all the mounting brackets are properly installed. LP-A070: 4, LP-A104: 6
		Check the mounting brackets are tightened with appropriate torque and solid state
2	Ground	Check the ground is separated from other devices.
		Check the 3rd grounding.
3	Power cable	Check the wiring connections for polarity.
		Check the terminal screw tightness.
4	Power	Check the power supply voltage within rated range.
		Check the power is installed separately from other devices.

4.2 Operation Procedure

Make sure that the connection status of LP with RS-232C/RS422 connector, LAN cable, USB and etc.

⬇

Supply power on the LP

⬇

The boot screen is displayed.

⬇ ⬇ ⬇

Displays the error message depending on system setting when the connection problem occurs with external device.	Move to the user screen set as start screen initial settings.	Displays the 'No user screen' message, if there is no user screen.

Touch top-left

⬇

Enter system information menu for system setting.

Touch 'X' on top-right

⬇

Quit system information menu and return to user screen.

5 System Setting Menu

It is allowed to set up and check the LP's system preferences downloaded project setting and monitor the device in the system information menu.

The system information menu will show by touching top left side of the user screen.
The factory default of the system information menu call button is set to top-left.
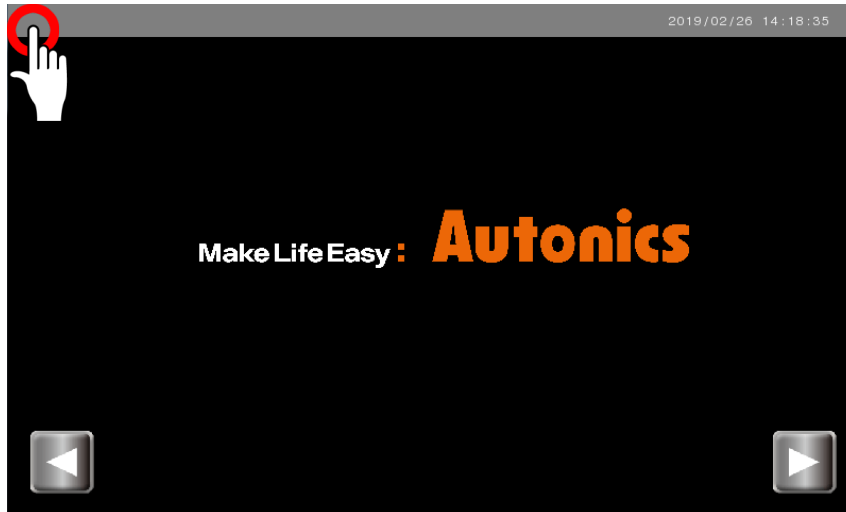
5.1 Configuration of System Setting Menu

Selecting the system setting menu will display the submenu.
The details of the system setting menu are listed below.

Menu		Function
Monitoring Project	Device Monitoring	Monitor or set values of connected controller's device and GP internal device.
	Project Info	Check the information of the project downloaded in current GP.
Project Data	Screen	Set the contents related to the user screen, such as screen switching device, start screen, boot screen, screensaver and etc.
	Key Window	Set the DEC/HEX/ASCII/REAL Keypad.
	Data Storage	Set the save directory and management method for backup data, and screen capture image.
	Auxiliary Setting	Check the number of image colors and screen display format (horizontal / vertical), and set backlight off time, LATCH, system setting menu button position.
	User Language	Check the multilingual table of the project downloaded in current GP.
	Scheduler	Check the list of schedulers set in the project downloaded in current GP.
	Logging	Check the list of logs set in the project downloaded in current GP.
	System Logging	Set the logging function to monitor the system status of the GP unit.
	Printing	Print the alarm log to connected printer.
	Data Management	Manage USB memory data connected to GP internal memory.
Data Security	Firmware Upgrade	Upgrade the firmware
	User Screen	Check the screen in use in a project downloaded in current GP.

Menu		Function
Security Environment	Multilingual Table	Check the details of the multilingual table of the project downloaded in current GP
	Log in	If the security level for each object and screen is set in the project that is downloaded in current GP, Use GP by logging in with the security level user account.
	Password	Set GP communication password and whether to use.
	Communication	Set communication for each channel.
Preferences Monitoring	Local Ethernet	Set the Ethernet address of the GP.
	Brightness	Set the screen brightness.
	Clock	Set the date and time.
	Language	Set the GP's system language.
	Screen Test	Diagnose screen colors, pixels, patterns and font displays.
	Touch Calibration	Calibrate the touch point location.
	Battery	Check the battery remaining.
	System Information	Check system information and disk capacity of GP device.
	Initialize	Delete the project saved in the GP device.
	Device Monitoring	Monitor or set values of connected controller's device and GP internal device.
Parameter	Motion Control	Check the details in 'Parameter'-'Motion setting'-'Common Setting' in atLogic.
	Action List	Check the details in 'Parameter'-'Motion setting'-'Operation List' in atLogic.
	Pattern List	Check the details in 'Parameter'-'Motion setting'-'Pattern List' in atLogic.
	HI Count	Check the details in 'Parameter'-'High Speed Counter' in atLogic.

5.2 Operating System Setting Menu
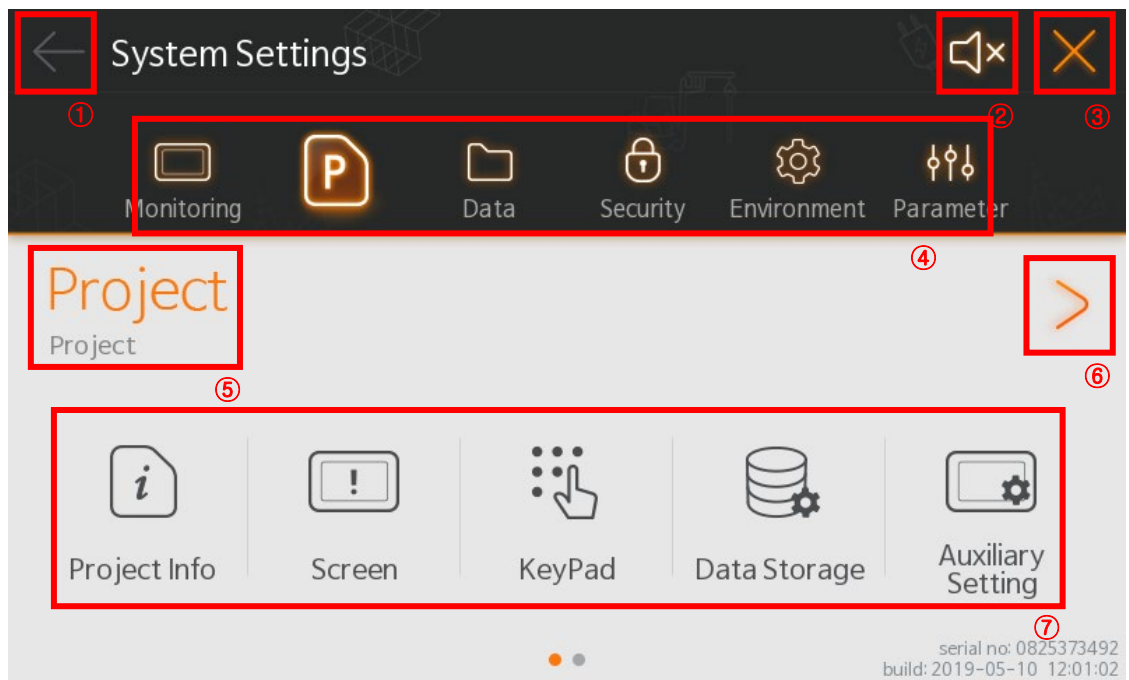
No.	Function and operation
①	Return to previous section.
②	Turn ON/OFF screen touch sound.
③	Quit system setting menu and return to user screen.
④	System setting menu
⑤	Display the currently opened system setting menu.
⑥	Display the submenu on the next page. For LP-A070 Series, this button is enabled and the submenu is divided in to several pages. For LP-A104 Series, all submenus can be checked on one page.
⑦	Submenu of the currently opened system setting menu.

5.3 System Setting Menu Detailed Settings

Describe the details for each system setting menu.

5.3.1 Monitoring

5.3.1.1 Device Monitoring

Monitor or set values of connectied controllers's device and LP internal device.
the monitorable devices vary depending on the connected device. Please refer to 'GP/LP communication manual' for details.

(1) Device monitoring

Touch 'Device' at the top right of the device monitoring screen, and the screen to select the device to monitor will appear.
Select the device to monitor from the device selection screen and touch 'Save' to monitor the device selected in the device monitoring screen.

Item	Description
Channel	Select the channel for the device to be monitored. Select 'Internal' to monitor GP internal devices.
Address	For controller with address, select the address.
Device	Select the device to be monitored.
Device address	Select the address of the device to be monitored.
Save	Save the selected device information and return to the device monitoring screen.

(2) Device value setting

When the device to be monitored is selected, the selected device and device value are displayed on the device monitoring screen. Device value can be set by touching device value.
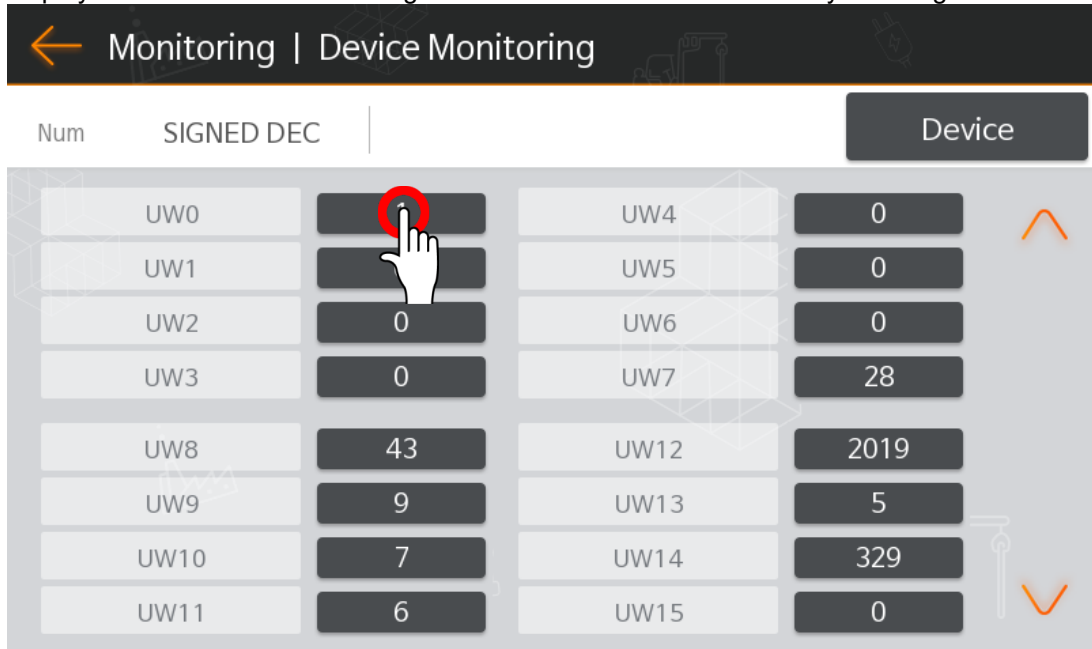
5.3.1.2 I/O Monitoring

Monitor I/O status in LP.
When green light turns ON, I/O status is ON, turns OFF as gray I/O status is OFF.

| ON | OFF |

5.3.2 Project

5.3.2.1 Project Info

Check the information of the project downloaded in current GP.
atDesigner displays the filled out information when the project is created.

5.3.2.2 Screen

Set the contents related to the use screen, such as screen switching device, start screen, boot screen, screensaver and etc.

Item		Description
Change Screen by Device	Change Screen by Device	Set whether to use the screen switching function. When checked, the sub item is activated.
	Window Change Device	Set the device to specify the base screen number and display the screen corresponding to the device value. When the value of the set device is changed, it moves to the screen number of the device value. If the input device value does not exist on a base screen, an error window will occur and the current screen (current device value) will be remained.
	Current Window Device	Set the word device address to display the current screen number.
	Global Window 1/2 Device	Set the device to specify the window screen number to display the window screen corresponding to the device value. .If the value of the set device changes, the window screen of the device value is called. If a non exist window screen number is entered, the input value will be ignored and the window screen will not be called.
Start Window No.	Start Window No.	After the GP console is booted and the boot screen is displayed, set the start screen number of the user screen. The start screen is the screen that appears when the GP device is first started or when monitoring is started after download completion.
Booting Window	Booting Window	Set whether to use the GP console boot screen. When checked, the sub item is activated.
	Window No.	Select the screen number to use as the boot screen in the base screen of the project.
	Delay	Set the delay time of the boot screen. The unit is seconds.
Screen Saver	Screen Saver	Set whether to use the GP screen saver. When checked, the sub item is activated.

Item		Description
	Window No.	Select the screen number to be used as a screen saver in the base screen of the project.
	Wait Time	If there is no input in the GP device, the screen saver will run when the set waiting time (minutes) has elapsed.
	Auto log out	When checked, it automatically logs out when returning from the screensaver to the user screen.

5.3.2.3　Key Window

Set the key window to be used for the screen input device. It can be set individually for each input data type. It can be changed by touching the right button of the kepad type.
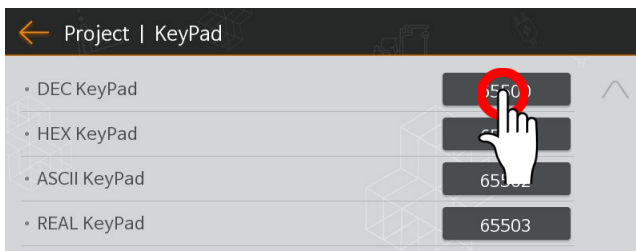
5.3.2.4 Data Storage

Set the save directory and management method for backup data and screen capture image.

Item		Description
Backup Data Storage Setting	Alarm Data	Set the directory to save the alarm log data. Setting range: disable, Internal memory, USB memory and Micro SD (LP-A104)
	Delete Oldest File for Full Area	If the alarm data storage is full, the oldest data file will be deleted in order.
	Logging Data	Set the directory to save the logging data. Setting range: disable, Internal memory, USB memory and Micro SD (LP-A104)
	Delete Oldest File for Full Area	If the alarm data storage is full, the oldest data file will be deleted in order.
	Recipe data	Set the directory to save the logging data. Setting range: disable, Internal memory, USB memory and Micro SD (LP-A104)
	Delete Oldest File for Full Area	If the logging data storage is full, the oldest data file will be deleted in order.
Screen Capture	Save Method	Set the screen capture image saving method. Setting range: Save to file, Printing When set to 'Save to file' the sub-item will be activated. When set to 'Printing', it prints directly without saving the screen capture image.
	Capture Path	Set the directory to save the screen capture image. Setting range: disable, Internal memory, USB memory and Micro SD (LP-A104)
	Delete Oldest File for Full Area	If the screen capture image storage is full, the oldest data file will be deleted in order.

※ Screen capture is a special device and operates when bit switch with device addres UB830is 'ON'.

5.3.2.5 Auxiliary Setting

Check the number of image colors and screen display format (horizontal / vertical), and set backlight off time, LATCH, system setting menu button position.

Item	Description
Image Color No.	The number of colors in the image to use in the project. It will be downloaded as set up by atDesigner and can only be checked.
Window Type	Screen orientation It will be downloaded as set up by atDesigner and can only be checked.
Backlight OFF Time	If there is no touch operation for the set time on the GP main screen, turn off the backlight of the main unit. Touch the screen to turn the backlight back on.
System Menu Entering Setting	Set the position of the button to call the system setting menu screen of GP device. Up to two can be selected.

5.3.2.6 User Language

Check the multilingual table of the project downloaded in current LP.
Language switching devices, available languages, number of each language, fonts for each language can be checked by bitmap table and vector table.

Multi-language tables you to change the language of your project at the touch of a button.
For detailed information about using and setting Multi-language table, please refer to 'atDesigner user manual'.

5.3.2.7 Scheduler

Check the list of schedulers set in the project downloaded in current LP.

Check the contents of the fornt and back columns by touching the ◀▶ button in the first row of the scheduler list table.

Scheduler is a list of schedules that are set to execute certain actions when certain conditions are met.
For detailed information about using and setting scheduler, please refer to 'atDesigner user.

5.3.2.8 Logging

Check the list of logs set in the project downloaded in current LP.

Check the contents of the fornt and back columns by touching the ◀▶ button in the first row of the logging list table.

Logging is a function to save the device value when the set conditions are met. Use to monitor the device.
For detailed information about using and setting logging, please refer to 'atDesigner user manual'.

5.3.2.9　System Logging

Set the logging function to monitor the system status of the LP unit.

Item		Description
Enable System Logging	Enable System Logging	Set whether to use the system logging function. When checked, the sub item is activated.
	Log Target Function	Select the log target function. Setting range: system, bit switch, word switch, communication, alarm log, recipe and etc. (such as screen capture)
Backup storage device	Backup Storage	Set the directory to save system logging data. Setting range: disable, internal memory, USB memory, Micro SD(GP-A104)
	Auto Backup When Using All Storage Area	If the data storage is full, the oldest data file will be deleted in order.
Backup Start Device		Display the backup execution device. When the set bit device turns ON, the system logging data backup starts.

5.3.2.10　Printing

Print the alarm log to connected printer.
Touch "Print" at the bottom center of the screen to print the alarm history to the connected printer.
If there is no connected printer, there will be no action.

5.3.3　Data

5.3.3.1　Managing Data

Manage data of USB memory LP-A070, GP-A104) and Micro SD (LP-A104) connected to LP internal memory.
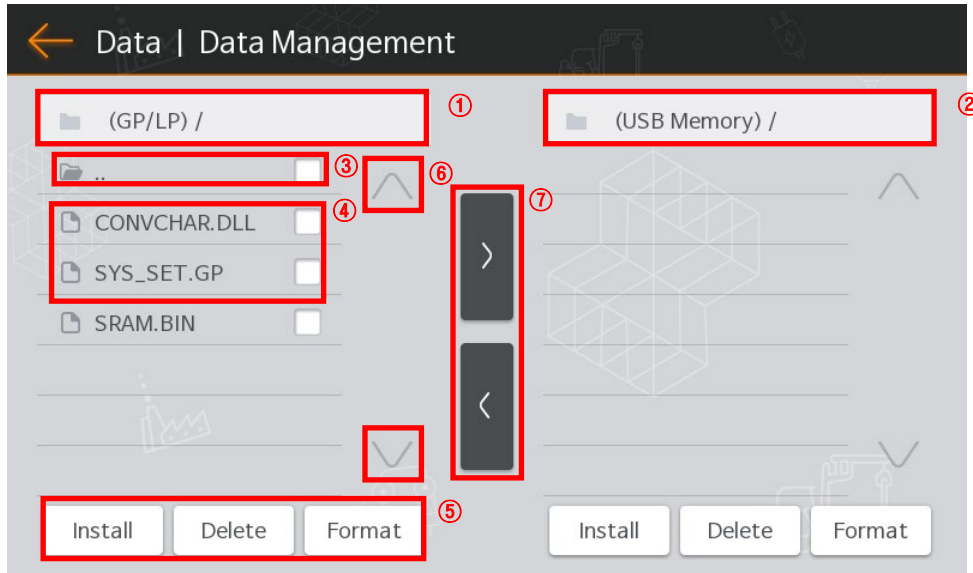
Item		Description
①	(GP/LP)/	Manage the files saved in LP internal memory.
②	(USB Memory)/	Manage the files saved in USB memory.
③	Upper folder	Go to upper folder.
④	Files	It is a list of files in folder. Install or delete by touching the file. If you touch 'Delete' while checking the right box, the selected files will be deleted in batch.
⑤	Installation	Install the selected project installation file in LP device.
	Delete	Delete the selected folder / file.
	Format	Format the LP internal memory / USB memory.
⑥	Page move button	Go to the front / back page of the folder / file list.
⑦	File move button	Moves files between LP internal memory / USB memory.

5.3.3.2　Firmware Upgrade

Upgrade the firmware.
To upgrade the firmware on the system setting screen, USB memory which contain the downloaded firmware file is required.
For detailed information about firmware upgrade, please refer to '7.3 Firmware Upgrade'.

5.3.3.3　User Screen

Check the screen in use in a project downloaded in current LP.
Display basic screen (base screen), window screen, keypad screen, screen list of overlap screen.

5.3.3.4　Multilingual Table

Check the details of the multilingual table of the project.
Displays a list of saved contents for each language.

5.3.4 Security

5.3.4.1 Log In

If the security level for each object and screen is set in the project that is downloaded in current LP, Use LP by loging in with the security level user account.
Touch the ID / Password field, enter your ID / Password, and touch 'Log in' to log in.
For detailed information about account setting, please refer to 'atDesigner user manual'.

5.3.4.2 Password

Set LP communication password and whether to use.
If the password has been set in the device, it is possible to set to enter the password in project upload / download, firmware upgrade, exiting screen saver.

5.3.5   Environment

5.3.5.1   Communication

Select communication interface and set communication features for each channel type.
Project setting is downloaded from atDesigner, but communication setting can also be modified from the LP device.

Touch the 'interface (①)' for each channel to select the communication interface, then touch the 'Settings (②)' button to set the communication details.
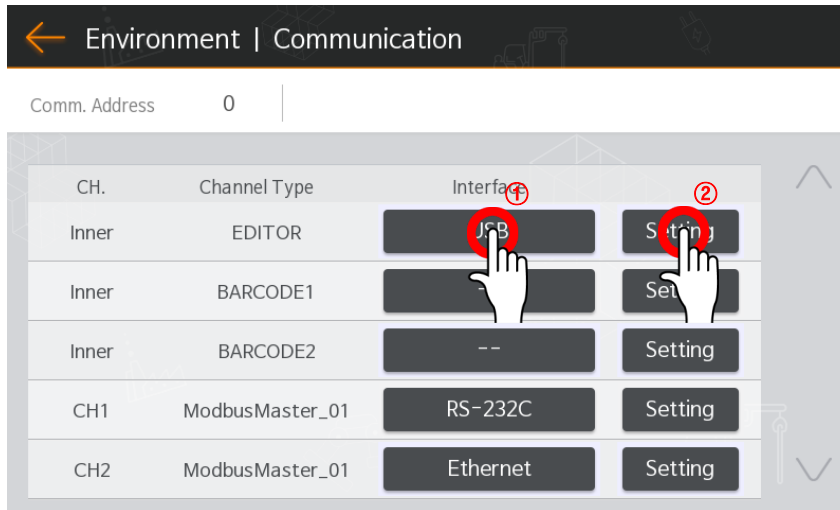
Item		Description
Inner (Internal channel)	EDITOR	LP-A070 LP-A104 Sets the port to be connected to atDesigner (PC). Interface setting range: RS-232C, Ethernet, USB, Not used
	DEVICE-NET	LP-A104 Set CAN communication port. It can be connected with Autonics ARD Series. Interface setting range: CAN, Not used
	BARCODE1	LP-A070 LP-A104 The serial barcode setting for atDesigner is downloaded. (Project Properties - Special Device Settings) Interface setting range: RS-422/485, RS-232C, Not used
	BARCODE2	LP-A070 LP-A104 The USB barcode setting for atDesigner is downloaded. (Project Properties - Special Device Settings) Interface setting range: USB, Not used
CH1, CH2, ... (External channel)	Protocol name	LP-A070 LP-A104 The connected device set in project setting for atDesigner is downloaded. (Project properties - Device settings – Connected device settings) Interface Settings Range: The configurable buttons are enabled according to the protocol.

The detailed settings for each interface are listed below.

- RS-422/485

  Set the same value of communication specifications between controller and LP.

Item	Specification
Time out	Setting range: 0~65535
Wait Time	Setting range: 0~65535
Retry	Setting range: 0~65535
Baud Rate	Setting range: 300, 600, 900, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data Bit	Setting range: 7, 8 bit
Flow Control	Setting range: NONE, XON/XOFF, DSR/DTR
Parity Bit	Setting range: NONE, ODD, EVEN
Stop Bit	Setting range: 1, 2 bit

- RS-232C

  Set the same value of communication specifications between controller and LP.

Item	Specification
Baud Rate	Setting range: 300, 600, 900, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data Bit	Setting range: 7, 8 bit
Flow Control	Setting range: NONE, XON/XOFF, DSR/DTR
Parity Bit	Setting range: NONE, ODD, EVEN
Stop Bit	Setting range: 1, 2 bit

- Ethernet

  Set the same value of communication specifications between controller and LP.

Item	Specification
Port	Setting range: 0~65535

- USB

  Fixed 'Communication mode: HID interface'.

- DEVICE-NET(CAN)

  Fixed 'Communication mode: 500kbps'.

5.3.5.2   Local Ethernet

Set the Ethernet address of the LP.

Item	Description
IP Address	Set the IP address of the LP device.
Subnet Mask	Set the subnet mask of LP device.
Gateway Address	Set the gateway address of the LP device.
MAC Address	Displays the MAC address of the LP device.

5.3.5.3   Brightness

Set the screen brightness.
A bar graph in the center of the screen and a number below the graph indicate the current screen brightness.
The longer the bar is filled, the brighter the higher the number.
Touch the '-, +' button to adjust the brightness.

5.3.5.4   Clock

Set the date and time.
The date and time set by atDesigner will be downloaded, but also can be modified in the GP unit.
Touch '-, +' button for each item to edit the number and touch 'Save' button to set the date / time.

5.3.5.5   Language

Set the GP's system language.
Supported languages are Korean (Ko-KR), English (en-US) and can be added further.
After selecting the language, touch the back button '←' to change and apply the language.

5.3.5.6   Screen Test

Diagnose screen colors, pixels, patterns and font displays.
Touch the 'start screen diagnosis' button at the center of the screen to display the screen in the order shown below, and touch any part of the screen to move on to the next screen.
The diagnosis screen allows to check the color, pixel and font display for any abnormalities.
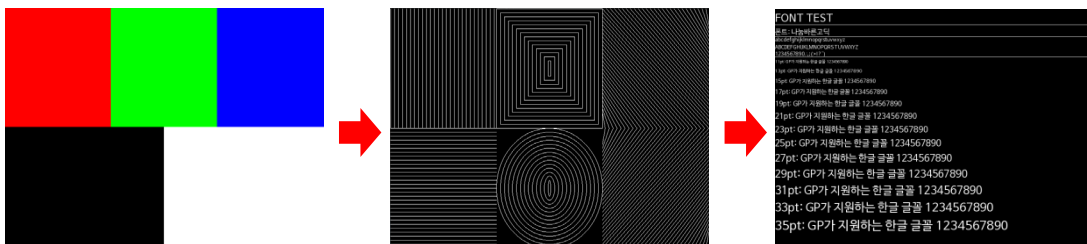
5.3.5.7 Touch Calibration

Calibrate the touch point location.
Touch the 'start touch calibration' button at the center of the screen to display a small white +
point.
+ Press until the point moves to the next position, calibrating the total of 9 points.
When the calibration is complete, the 'Save' and 'Close' buttons will appear.
Touch 'Save' to save and complete touch calibration, or 'Close' to complete without saving
calibration.

5.3.5.8 Battery

Check the battery remaining.
The LP's battery is used for user set-up status, data backup in the latch area, and time-keeping
in case of sudden power failure or other power failure.
Replace the battery periodically to make sure that it does not exceed 5%.
For detailed information about battery replacement, please refer to '7.1 Battery Replacement'.

5.3.5.9 System Information

Check system information and disk capacity of LP device.

■ System information

Item	Description
Device name	Shows the device name of LP. This can be modified by touching 'Change' button.
Model name	Shows the model name of LP.
Firmware version	Shows the current firmware version of LP.
Release date	Shows the date the firmware was released.

■ Disk capacity

Project, GP internal storage device, USB memory, Micro SD (LP-A104) can be checked.

Remaining space and total space are displayed only when external memory (USB, Micro

SD) is inserted. Clicking the Remove External Memory button disables the external memory.
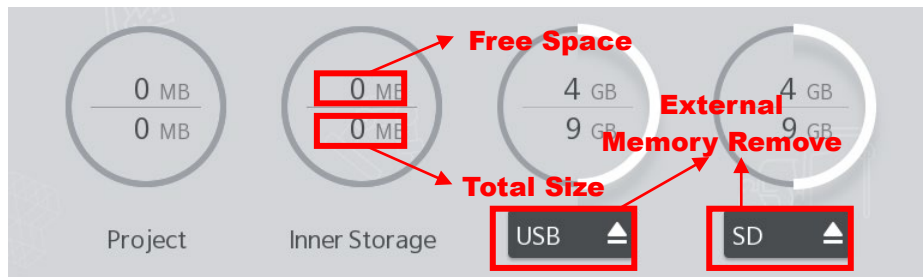
5.3.5.10 Initialize

Delete the project saved in the LP device.
Touching the Factory reset menu will show a screen asking whether the system is initialized.
Touching 'Confirm' will lead to initialization, and it will be rebooted after completion.
Do not turn off power while the system is initialized.

5.3.6 Parameter

5.3.6.1 Motion Control

Check the details in 'Parameter'-'Motion Setting'-'Common Setting' in atLogic.
'Common Setting' is the basic setting for using motion, and it sets CH1, CH2 operation.
For detailed information about motion controllers' function, please refer to 'atLogic user manual, atLogic programming manual'.

5.3.6.2 Action List

Check the details in 'Parameter'-'Motion Setting'-'Operation List' in atLogic.
'Operation List' is an item to set motion of motion control cycle.
For detailed information about motion controllers' function, please refer to 'atLogic user manual, atLogic programming manual'.

5.3.6.3 Pattern List

Check the details in 'Parameter'-'Motion Setting'-'Pattern List' in atLogic.
'Pattern List' is an item to set the Operation list to be able to be executed repeatedly and in pattern form by grouping the several motions.
For detailed information about motion controllers' function, please refer to 'atLogic user manual, atLogic programming manual'.

5.3.6.4 HI Count

Check the details in 'Parameter'-'High Speed Counter' in atLogic.
'High Speed Counter' is an item to set the default action for using the high speed counter function.
For detailed information about high speed counter's function, please refer to 'atLogic user manual, atLogic programming manual'.

6   Troubleshooting

Malfunction that may occur during LP use and the corresponding troubleshoots.

6.1   Malfunction and Troubleshooting

Malfunction	Troubleshooting
In case of error with program writing, reading and monitoring	Troubleshooting in case of communication failure
In case of time error or reset after power failure	Battery Replacement

(1) Troubleshooting in case of communication failure

Follow the checklist in numerical order and if the problem is no resolved, please contact our technical consultation center.

Checklist
Is the communication setting correct?
Does the wiring and specification of the communication cable comply with our regulation? ※

※ Use the cable (sold separately) sold by us to connect the LP to the external device and PC.

For detailed information about the communication cable for each device, please refer to 'GP/LP Communication manual'.

7 Repair / Maintenance / Inspection

7.1 Battery Replacement

The LP's battery is used for user setup, data backup in the latch area and time keeping in case of sudden power outage or other power failure.
Regular replacement is required to prevent discharge.

(1) Battery discharge phenomenon

- Time is abnormal after power failure
- Time is reset after power failure
- Data in latch area is reset after power failure

(2) Battery remaining indicator

The remaining battery power can be checked through the LP [System Settings] - [Preferences] - [Battery] menu. Replace the battery when the remaining battery power is less than 5%

(3) Special register related battery

Device	Detail	Function
F0002C	Current backup battery error	Turns ON when the battery voltage is blow the reference value
F0002D	Maintain backup battery error	When the current backup battery error turns ON at least once during operation, it remains ON until the main device is restarted

7.2 Maintenance

7.2.1 Routine Maintenance

The inspections are required for every day/week.

Checklist	Details	Criteria	Solution
Environment	Temperature	Within 0 to 50℃	Control ambient temperature
	Humidity	Within 35 to 85% RH	Control ambient temperature
	Vibration	No vibration	Establish anti-vibration measures
GP's attached status	Check the bracket screw loosening	Attached without shaking	Tighten the screw
Comm. Cable connection status	Check the cable connecting screw loosening	Cable connection must be securely tightened	Tighten the screw Use genuine cable

7.2.2　Regular Maintenance

The inspections are required for monthely.

Checklist	Details	Criteria	Solution
Power supply voltage	Measure the power supply voltage	Within the allowable voltage range	Replace the power supply
Battery	Battery remaining status	Over 5% of battery remaining	Replace the battery
Waterproof rubber ring	Waterproof rubber ring condition	Rubber ring should be corroded	Replace the front case
Leakage and dustproof	Leakage and dustproof condition	No leakage and dusts must not to be accumulated	Establish leakage and dustproof measures
Flammable gas	Flammable gas exposure	Not to be exposed to flammable gas	Establish flammable gas measures

⚠ **Caution**

Caution for regular maintenance

- Make sure to use a standard measuring devices, when inspecting the power supply voltage.
- When replacing the product, make sure to turn the power off.
- When removing dust or dirt, use a dry cloth that does not contain water or detergent.

7.3   Firmware Upgrade

The LP firmware can be upgraded by user.
There are two ways to upgrade the firmware: using atDesigner, or using USB memory.

7.3.1   Firmware Upgrade with atDesigner

Upgrade the firmware by connecting with atDesigner.
The firmware upgrade method is as follow below.

1st   Visit our website (www.autoniocs.com) and download the firmware file.

2nd Click "Download firmware" from the [Communication] ribbon menu.

3rd   When the 'Firmware download' window appears, click "Find files" under 'Select firmware file' to open the firmware file downloaded form the website.

4th   Check the information of the firmware file opened in 'Firmware information'.

5th   Enter the password in case of the password is set in the LP device.

6th   Click "Communication Option" to connect LP to upgrade the firmware.
For GP connection method, refer to '8.1.3 Connecting atDesigner and GP Device'.

7th   When the LP is complete, click "Download firmware".

7.3.2   Firmware Upgrade wit USB Memory

Upgrade the firmware using USB memory.
The firmware upgrade method is as follow below.

1st   Visit our website (www.autoniocs.com) and download the firmware file.

2nd Save the downloaded firmware file to USB memory.

3rd   Connect the USB memory containg the firmware file to LP.

4th   Touch the upper left corner of the LP screen to call up the system setup menu.
The upper left corner of the screen is the factory default for the system setting menu call button position.

5th   Touch the 'Firmware Upgrade' menu in the [Data] menu.

⚠ **Caution**

Do not turn OFF the LP's power or remove USB memoriy during the firmware upgrade.

8   Software

8.1   atDesigner

8.1.1   atDesigner Overview

atDesigner is dedicated software for GP/LP-A Series that can edits all data for user screens and projects.

It is allowed to edit data such as shapes, layouts and properites of various objects and figures on the screen, and set the project user account, security level, language, script, etc. and download to GP/LP.

8.1.2   atDesigner Feature

- Support the Windows TruType and various bitmap fonts

- Support GP/LP device firmware download

- GP/LP S Series project to GP/LP-A Series project conversion function

- Convenient user interface and screen composition

    : Title bar, ribbon menu, project window, toolbar/library/undo List, work area, message window, status bar

- Various editing functions for grouping, sorting, object selection, drawing

- Provide various libraries

    - Image library, Object library, Screen library, Key window library

- Overlap screen to increase screen creation efficiency and save data capacity

- Automatically execute the drawing project, data validity search when downloading to GP/LP device

- Test project that is currently in production with simulator

- Provide help with program usage

8.1.3   Connecting atDesigner and GP Device

Connect atDesigner and GP-A Series to download/upload projects and upgrade firmware. The communication between PC and GP-A series uses serial interface (RS-232C), Ethernet, USB interface.
the method for connecting atDesigner and GP deive is as follow below.

1st Connect the PC and the GP with one of the serial communication cable, LAN cable, USB mini cable.

2nd Turn on the PC and after boot is completed, turn on the GP device.

3rd When the GP finishes booting, touch the upper left corner of the screen to call up the system setup menu.
The upper left corner of the screen is the factory default for the system setting menu call button position.

4th Touch "Communication Settings" in the [Preferences] menu.

5th Touch the interface of the internal channel / EDITOR row to select the interface that matches the connected cable.

6th Touch "Settings" to set detailed specifications for each interface.

- RS-232C

Item	Specification
Communication speed	115200 bps (Must be set to the same as atDesigner. atDesigner specification is fixed as 115200 bps.)
Data bit	7bit, 8bit
Flow control	NONE, XON/XOFF, DSR/DTR
Parity bit	NONE, ODD, EVEN
Stop bit	1bit, 2bit

- Ethernet

Item	Specification
Port number	0 to 65535 (Must be set to the same as atDesigner.)

7th Run atDesigner.

8th Click "Communication Options" on the [Communication] Ribbon.

9th When 'Communication Options' window appears, select the interface to which your PC and GP are connected in 'Connection method' and click 'Search'.

10th When the list of GPs currently connected to the PC appears in the lower list, click the GP to be connected with atDesigner and check the communication settings in 'Detailed settings' and modify them.

11th When the detailed setup is completed, click "OK" to connect atDesigner and GP.

12th Click "Download" under [Communications] to download the project from atDesigner to GP, or click "Upload" to upload it from GP to atDesigner.

8.2   atLogic(Formerly, SmartStudio)

8.2.1   atLogic Overview
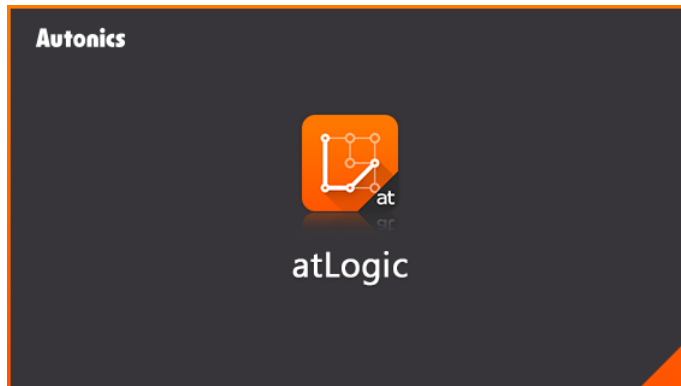
atLogic is the exculsive software to write program and debug for LP series.

Applying the interface of Microsoft Windows makes easier to use atLogic for the first time user.

The ladder program and mnemonic program are supported as a program editor, which allows user to select convenient editing tool and use two editors to edit programs simultaneously.

8.2.2   atLogic Feature

- Supports multi project to 5 projects at the same time and write or edit programs

- Provide ladder program editor and mnemonic program editor.

- Several monitor function
  : variable monitor, device monitor, system monitor, time chart, etc.

- Convenient user interface
  Easy adaptation for atLogic by same basic function of Microsoft window.

- Various message window
  Supports various message window for edit or check program easily.

- Real time switching ladder and mnemonic program
  Switching ladder or mnemonic program in real time and it is available to write or edit at two editors simultaneously.

8.2.3   Connecting atLogic and LP Device

Connect atLogic and LP-A Series to download/upload projects and upgrade firmware. The communication between PC and LP-A series uses serial interface (RS-232C), Ethernet, USB interface.
the method for connecting atLogic and LP deive is as follow below.

1st Connect the PC and the LP with one of the serial communication cable, LAN cable, USB mini cable.

2nd Turn on the PC and after boot is completed, turn on the LP device.

3rd When the LP finishes booting, touch the upper left corner of the screen to call up the system setup menu.
The upper left corner of the screen is the factory default for the system setting menu call button position.

4th Touch "Communication Settings" in the [Environment] menu.

5th Touch the interface of the internal channel / EDITOR row to select the interface that matches the connected cable.

6th Touch "Settings" to set detailed specifications for each interface.

- RS-232C

Item	Specification
Communication speed	115200 bps (Must be set to the same as atLogic. atLogic specification is fixed as 115200 bps.)
Data bit	7bit, 8bit
Flow control	NONE, XON/XOFF, DSR/DTR
Parity bit	NONE, ODD, EVEN
Stop bit	1bit, 2bit

- Ethernet

Item	Specification
Port number	0 to 65535

7th Run atLogic.

8th Click "Communication Options" on the [Online] menu.

9th When 'Communication Options' window appears, select the interface to which PC and LP are connected in 'Connection Type', set 'Setting Item' at the bottom, and click 'Confirm'.

10th Click "Connect" from the [Online] menu of the toolbar to connect atLogic and LP.

11th To download the project from atLogic to LP, click "Download" under [Online], and click "Upload" to upload from LP to atLogic.

9   Appendix

9.1   Device

9.1.1   Device Component Description

- GP read device [UB, UW]
  This area is used to display the status of the graphic panel.

- GP write device [UB, UW]
  This area is used to control the functions of the graphic panel.

- GP user device [UB, UW]
  This area is used when using the functions of the graphic panel and universal communication.

9.1.2   Device Range

9.1.2.1   Bit Device Range

notation	Name	Range	UB corresponding address	Size
UB	READ AREA	UB0000000~UB000080F	UB0000000~UB000080F	1,296bit
UB	WRITE AREA	UB0000810~UB000099F	UB0000810~UB000099F	304bit
UB	USER AREA	UB0001000~UB128999F	UB0001000~UB128999F	2,062,400bit

9.1.2.2   Word Device Range

notation	Name	Range	UB corresponding address	Size
UW	READ AREA	UW000000~UW000080	UW000000~UW000080	0008 Word
UW	WRITE AREA	UW0000081~UW0000099	UW0000081~UW0000099	00019Word
UW	USER AREA	UW0000100~UW0128999	UW0000100~UW0128999	128,900Word

9.1.3   List of System Device

9.1.3.1   Read Only Area

UW area	Read Only area	Bit	Description
UW0	Current screen display device	-	-
UW1	Overlap 1 screen number	-	-
UW2	Overlap 2 screen number	-	-
UW3	Master overlap screen number	-	-
UW4	Global window 1 screen number	-	-
UW5	Global window 2 screen number	-	-
UW6	Input object ID number	-	-
UW7	Time sec (seconds)	-	-
UW8	Time min (minutes)	-	-
UW9	Time hour (hours)	-	-
UW10	Date day (day)	-	-
UW11	Date month (month)	-	-
UW12	Date year (year)	-	-
UW13	Date (day of the week)	-	-
UW14	System Read Only signal 1	Bit 0	Always ON
		Bit 1	Always OFF
		Bit 2	0.5 sec clock
		Bit 3	1 sec clock
		Bit 4	2 sec clock
		Bit 5	5 sec clock
		Bit 6	10 sec clock
		Bit 7	30 sec clock
		Bit 8	60 sec clock
		Bit A	Turns ON when the battery is Low
UW15	System Read Only signal 2	Bit 0	USB memory mounted: ON, USB memory discarded: OFF
		Bit 4	MicroSD mounted: ON, Micro SD discarded: OFF
UW16	System Read Only signal 3	Bit 1~F	Each bit is matched to channel 1 to 15 when there is no external device connected to each channel or a connection problem, the corresponding bit turns ON
UW17	System Read Only signal 4	Bit 0	Keep ON while one of the history alarm monitoring devices turned ON
		Bit 1	Keep ON while one of the flow alarm monitoring devices is turned ON
UW18	System Read Only signal 5	-	Reserved area
UW19	System Read Only signal 6	Bit 0	Turns ON in case of no mobile disk to store history alarm backup data
		Bit 1	Turns ON in case of no mobile disk to store the logging data
		Bit 2	Turns ON in case of no mobile disk to store the system logging data
		Bit 3	Turns ON in case of no mobile disk to store the recipe data

UW area	Read Only area	Bit	Description
		Bit 4	Turns ON in case of no mobile disk to store the screen capture data
UW20	System Read Only signal 7	-	Logged in account number
UW21	System Read Only signal 8	-	Logged in account screen security level
UW22~29	System Read Only signal 9~16	-	Logged in account ID
UW30	System Read Only signal 17	-	Reserved area
UW31	System Read Only signal 18	-	Reserved area
UW32	System Read Only signal 19	-	Reserved area
UW33~34	System Read Only signal 20~21	-	User internal memory total capacity (Unit: KB) Low: 20, High: 21
UW35~36	System Read Only signal 22~23	-	USB memory total capacity Low: 22, High: 23
UW37~38	System Read Only signal 24~25	-	MicroSD memory total capacity Low: 24, High: 25
UW39	System Read Only signal 26	-	Reserved area
UW40	System Read Only signal 27	-	Reserved area
UW41	System Read Only signal 28	-	Counter value at 1 second interval (0~65535)
UW42	System Read Only signal 29	-	Counter value at 2 seconds interval (0~65535)
UW43	System Read Only signal 30	-	Counter value at 5 seconds interval (0~65535)
UW44	System Read Only signal 31	-	Counter value at 10 seconds interval (0~65535)
UW45~80	Read Only area reserve	-	-

9.1.3.2 Read/Write Area

UW area	Read / Write area	Bit	Description
UW81	System Read / Write signal 1	Bit 0	ON: buzzer function enabled OFF: buzzer function disabled
		Bit 1	Control buzzer ON: buzzer ON, OFF: buzzer OFF
		Bit 4	Control backlight ON: backlight ON, OFF: backlight OFF
		Bit 5	When turns ON, backlight is turned OFF or OFF after the time set in the system preferences, or when touch area is touched, backlight ON
UW82	System Read / Write signal 2	Bit 1~F	Each bit is matched to channels 1 to 15. In case of no external device is connected to each channel or there is a problem with the connection, the corresponding bit is ON and an error message appears
UW83	System Read / Write signal 3	Bit 0	When turns ON, capture the current screen (Capture window, key window, overlap, system message, etc. as current status)
		Bit 1	When turns ON, all alarm history and occurrence count are deleted
		Bit 2	When turns ON, print the history alarm

9.1.3.3 User Area

UW area	Read area	Write area
UW100	User area	User area
...		
UW128999		

9.1.4   List of Bit Special Device

9.1.4.1   System Mode

Name	Function	Initial value	R/W	GP device	LP device
Run mode	・ Turns ON in run mode ・ Turns OFF when run mode is changed	OFF	R	UB744000	F00000
Stop mode	・ Turns ON in stop mode ・ Turns OFF when stop mode is changed	OFF	R	UB744001	F00001
Pause mode	・ Turns ON in pause mode ・ Turns OFF when pause mode is changed	OFF	R	UB744002	F00002
Debug mode	・ Turns ON in debug mode ・ Turns OFF when debug mode is changed	OFF	R	UB744003	F00003

9.1.4.2   System Signal

Name	Function	Initial value	R/W	GP device	LP device
Always ON	・ Always ON when PLC is run, debug mode ・ Always OFF when PLC mode is not run, debug mode	OFF	R	UB744010	F00010
Always OFF	・ Always OFF when PLC is run, debug mode ・ Always ON when PLC is not run, debug mode	OFF	R	UB744011	F00011
1 Scan ON	・ Turns ON only for the first 1 scan when PLC is run mode ・ Turns OFF after the 2nd scan when PLC is run mode	OFF	R	UB744012	F00012
1 Scan OFF	・ Turns OFF only for the first 1 scan when PLC is run mode ・ Turns ON after the 2nd scan when PLC is run mode	OFF	R	UB744013	F00013
Scan pulse	Reverse every scan when PLC is run mode	OFF	R	UB744014	F00014
Time sync pulse	Synchronized pulse in RTC time	OFF	R	UB744015	F00015

9.1.4.3 System Status

Name	Function	Initial value	R/W	GP device	LP device
Forced input activating	• Turns ON when forced input device is registered • Turns OFF when forced input device is released	OFF	R	UB744020	F00020
Forced output activating	• Turns ON when forced output device is registered • Turns OFF when forced output device is released	OFF	R	UB744021	F00021
Periodic operating	• Turns ON during periodic operation • Turns OFF when periodic operation stops	OFF	R	UB744024	F00024
Backup battery error (current)	• Turns ON when the backup battery voltage is below the reference value • Turns OFF when the backup battery voltage is above the reference value	OFF	R	UB744025	F00025
Backup battery error (maintain)	• Keep ON when Backup battery error (current) is ON • Turns OFF when program is changed or mode is changed	OFF	R	UB74402C	F0002C

9.1.4.4 System Error

Name	Function	Initial value	R/W	GP device	LP device
Error occur	• Turns ON when one or more of defined errors occur • Turns OFF when error is cleared	OFF	R	UB744030	F00030
PLC program error	• Turns ON when program related error occurs • Turns OFF when program error is cleared • Turns OFF when operation stops • Turns OFF when program is changed • Turns OFF when mode is changed	OFF	R	UB744034	F00034
Periodic calculation error	• Turns ON when the scan time exceeds periodic setting time • Turns OFF when the scan time is less than periodic setting time	OFF	R	UB744035	F00035
Time setting error	• Turns ON when time is not written normally • Turns OFF when time is written normally by RTC	OFF	R	UB744036	F00036
Communication error	• Turns ON when communication error occurs • Turns OFF when communication is made normally	OFF	R	UB744038	F00038

Name	Function	Initial value	R/W	GP device	LP device
I/O setting value error	• Turns ON when internal device contains the unavailable range, in case of check the use internal device for setting the I/O contact in atLogic's parameter extension slot • Keep status until user sets OFF	OFF	R	UB744039	F00039
Watchdog timer error	• Turns ON when watchdog timer error occurs • Turns OFF when watchdog timer error is cleared	OFF	R	UB74403A	F0003A

9.1.4.5 Module Status

Name	Function	Initial value	R/W	GP device	LP device
Use SLOT0 internal device	• Turns ON when SLOT0 parameter uses more than one internal device • Turns OFF when SLOT0 parameter does not use internal device	OFF	R	UB744040	F00040
Use SLOT 1 internal device	• Turns ON when SLOT1 parameter uses more than one internal device • Turns OFF when SLOT1 parameter does not use internal device	OFF	R	UB744041	F00041
Use SLOT 2 internal device	• Turns ON when SLOT2 parameter uses more than one internal device • Turns OFF when SLOT2 parameter does not use internal device	OFF	R	UB744042	F00042
Use SLOT 3 internal device	• Turns ON when SLOT3 parameter uses more than one internal device • Turns OFF when SLOT3 parameter does not use internal device	OFF	R	UB744043	F00043
Use SLOT 4 internal device	• Turns ON when SLOT4 parameter uses more than one internal device • Turns OFF when SLOT4 parameter does not use internal device	OFF	R	UB744044	F00044
Use SLOT 5 internal device	• Turns ON when SLOT5 parameter uses more than one internal device • Turns OFF when SLOT5 parameter does not use internal device	OFF	R	UB744045	F00045
Use SLOT 6 internal device	• Turns ON when SLOT6 parameter uses more than one internal device • Turns OFF when SLOT6 parameter does not use internal device	OFF	R	UB744046	F00046
Use SLOT 7 internal device	• Turns ON when SLOT7 parameter uses more than one internal device • Turns OFF when SLOT7 parameter does not use internal device	OFF	R	UB744047	F00047
Use SLOT 8 internal device	• Turns ON when SLOT8 parameter uses more than one internal device • Turns OFF when SLOT8 parameter	OFF	R	UB744048	F00048

Name	Function	Initial value	R/W	GP device	LP device
	does not use internal device				
Use SLOT 9 internal device	• Turns ON when SLOT9 parameter uses more than one internal device • Turns OFF when SLOT9 parameter does not use internal device	OFF	R	UB744049	F00049
Use SLOT 10 internal device	• Turns ON when SLOT10 parameter uses more than one internal device • Turns OFF when SLOT10 parameter does not use internal device	OFF	R	UB74404A	F0004A
Use SLOT 11 internal device	• Turns ON when SLOT11 parameter uses more than one internal device • Turns OFF when SLOT11 parameter does not use internal device	OFF	R	UB74404B	F0004B
Use SLOT 12 internal device	• Turns ON when SLOT12 parameter uses more than one internal device • Turns OFF when SLOT12 parameter does not use internal device	OFF	R	UB74404C	F0004C
Use SLOT 13 internal device	• Turns ON when SLOT13 parameter uses more than one internal device • Turns OFF when SLOT0 parameter does not use internal device	OFF	R	UB74404D	F0004D
Use SLOT 14 internal device	• Turns ON when SLOT14 parameter uses more than one internal device • Turns OFF when SLOT14 parameter does not use internal device	OFF	R	UB74404E	F0004E
Use SLOT 15 internal device	• Turns ON when SLOT15 parameter uses more than one internal device • Turns OFF when SLOT15 parameter does not use internal device	OFF	R	UB74404F	F0004F

9.1.4.6 System Clock

Name	Function	Initial value	R/W	GP device	LP device
10ms clock	Generate 10ms system clock		R	UB744050	F00050
20ms clock	Generate 20ms system clock		R	UB744051	F00051
50ms clock	Generate 50ms system clock		R	UB744052	F00052
100ms clock	Generate 100ms system clock		R	UB744053	F00053
200ms clock	Generate 200ms system clock		R	UB744054	F00054
500ms clock	Generate 500ms system clock		R	UB744055	F00055
1s clock	Generate 1s system clock		R	UB744056	F00056
2s clock	Generate 2s system clock		R	UB744057	F00057
5s clock	Generate 5s system clock		R	UB744058	F00058
10s clock	Generate 10s system clock		R	UB744059	F00059
60s clock	Generate 60s system clock		R	UB74405A	F0005A

9.1.4.7 Calculation

Name	Function	Initial value	R/W	GP device	LP device
Zero flag	• Turns ON when calculation result is 0 • Turns OFF when calculation result is not 0	OFF	R	UB744060	F00060
Carry flag	• Turns ON when carry occurs in calculation result • Turns OFF when carry does not occur in calculation result	OFF	R	UB744061	F00061
Borrow flag	• Turns ON when borrow occurs in calculation result • Turns OFF when borrow does not occur in calculation result • Turns OFF when program is changed or mode is changed	OFF	R	UB744062	F00062
Calculation error flag (current)	• Turns ON when calculation error occurs during scanning • Turns OFF when the mode is changed except STOP mode • Turns OFF when there is no calculation error after completing one scan • Turns OFF when program download or power reset	OFF	R	UB744068	F00068
Calculation error flag (maintain)	• Keep ON when calculation error occurs during scanning	OFF	R	UB744069	F00069

Name	Function	Initial value	R/W	GP device	LP device
	▪ Turns OFF when power is reset				

9.1.4.8 System Setting

Name	Function	Initial value	R/W	GP device	LP device
Set all output prohibit	▪ When it is ON, the port out is prohibited, all output ports are OFF	OFF	W	UB744070	F00070
Set output reset prohibit	▪ When it is ON, the output reset is prohibited	OFF	W	UB744071	F00071
Start periodic operation	▪ When it is ON, the periodic operation is set and periodic operation starts depending on periodic operation word setting ▪ When it is OFF, operate at the minimum scan speed as possible	OFF	W	UB744074	F00074
Change periodic operation time	▪ When it is ON, change periodic operation time	OFF	W	UB744075	F00075
Change periodic interrupt time	▪ When it is ON, change periodic interrupt time	OFF	W	UB744076	F00076
Keep output status during stop	▪ Turns ON when output status is maintained ▪ Turns OFF when output status is not maintained	OFF		UB744077	F00077
Extension module function activate condition	▪ Reset when 'extended module operating condition' for parameter common setting of atLogic checked and downloaded 'operates only in run mode'. ▪ Set when 'extended module operating condition' for parameter common setting of atLogic is checked and downloaded 'operates in stop mode'. ▪ When uploading from the LP device, the data is no retrieved from the parameter file but uploaded with the set by the special register.	OFF	W	UB744078	F00078
Default filter setting flag	▪ When it is SET, operate filters on all undefined modules in parameters as default values ▪ When it is RESET, operate without filters on all undefined modules	OFF	W	UB744079	F00079

9.1.4.9 Time Setting

Name	Function	Initial value	R/W	GP device	LP device
Time setting	• After turns ON, set as special register, no time change • Turns OFF after setting is completed, write as RTC and the special register time is in progress	OFF	W	UB64080	F00080
Time setting +/- 30 sec calibration	• When change OFF→ON in 0 to 29 sec, the time (sec) is changed to 00 • When change OFF→ON in 30 to 59 sec, the time (sec) is changed to 00 and the time (min) is increased by 1	OFF	W	UB64081	F00081

9.1.4.10 Module Setting

Name	Function	Initial value	R/W	GP device	LP device
Set SLOT0 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744090	F00090
Set SLOT1 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744091	F00091
Set SLOT2 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744092	F00092
Set SLOT3 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744093	F00093
Set SLOT4 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744094	F00094
Set SLOT5 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744095	F00095
Set SLOT6 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744096	F00096
Set SLOT7module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744097	F00097
Set SLOT8 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744098	F00098
Set SLOT9 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB744099	F00099
Set SLOT10 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB74409A	F0009A
Set SLOT11 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB74409B	F0009B
Set SLOT12 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB74409C	F0009C

Name	Function	Initial value	R/W	GP device	LP device
Set SLOT13 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB74409D	F0009D
Set SLOT14 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB74409E	F0009E
Set SLOT15 module function internal device enable	When bit is ON, the internal device value is written to module register	OFF	W	UB74409F	F0009F

9.1.4.11 Motion Control

(1) CH1 special device

Name	Function	R/W	GP device	LP device
CH1 axis usage	・ 1: enable ・ 0: disable	R	UB744100	F00100
CH1 currently moving (acceleration, deceleration, constant)	・ 1: enable moving ・ 0: disable moving	R	UB744101	F00101
CH1 axis accelerating	・ 1: enable acceleration ・ 0: disable acceleration	R	UB744102	F00102
CH1 operating in specified speed	・ 1: enable operating in specified speed ・ 0: disable operating in specified speed	R	UB744103	F00103
CH1 axis decelerating	・ 1: enable deceleration ・ 0: disable deceleration	R	UB744104	F00104
CH1 dwelling	・ 1: enable dwelling ・ 0: disable dwelling	R	UB744105	F00105
CH1 operation completed	・ 1: operation completed ・ 0: operation not completed	R	UB744106	F00106
CH1 axis S/W lower limit detection	・ 1: enable S/W lower limit detection ・ 0: disable S/W lower limit detection	R	UB744107	F00107
CH1 axis S/W upper limit detection	・ 1: enable S/W upper limit detection ・ 0: disable S/W upper limit detection	R	UB744108	F00108
CH1 axis H/W lower limit detection	・ 1: enable H/W lower limit detection ・ 0: disable H/W lower limit detection	R	UB744109	F00109
CH1 axis H/W upper limit detection	・ 1: enable H/W upper limit detection ・ 0: disable H/W upper limit detection	R	UB74410A	F0010A
Motion CH1 use error	・ 1: error occur ・ 0: no error	R	UB744110	F00110
Motion CH1 emergency stop error	・ 1: error occur ・ 0: no error	R	UB74411F	F0011F
MTSRS operation specification flag (operation list end)	・ 1: enable operation list end ・ 0: disable operation list end	R	UB744400	F00400
MTSRS operation specification flag (group end)	・ 1: enable group end ・ 0: disable group end	R	UB744401	F00401

(2) CH2 special device

Name	Function	R/W	GP device	LP device
CH2 axis usage	• 1: enable • 0: disable	R	UB744120	F00120
CH2 currently moving (acceleration, deceleration, constant)	• 1: enable moving • 0: disable moving	R	UB744121	F00121
CH2 axis accelerating	• 1: enable acceleration • 0: disable acceleration	R	UB744122	F00122
CH2 operating in specified speed	• 1: enable operating in specified speed • 0: disable operating in specified speed	R	UB744123	F00123
CH2 axis decelerating	• 1: enable deceleration • 0: disable deceleration	R	UB744124	F00124
CH2 dwelling	• 1: enable dwelling • 0: disable dwelling	R	UB744125	F00125
CH2 operation completed	• 1: operation completed • 0: operation not completed	R	UB744126	F00126
CH2 axis S/W lower limit detection	• 1: enable S/W lower limit detection • 0: disable S/W lower limit detection	R	UB744127	F00127
CH2 axis S/W upper limit detection	• 1: enable S/W upper limit detection • 0: disable S/W upper limit detection	R	UB744128	F00128
CH2 axis H/W lower limit detection	• 1: enable H/W lower limit detection • 0: disable H/W lower limit detection	R	UB744129	F00129
CH2 axis H/W upper limit detection	• 1: enable H/W upper limit detection • 0: disable H/W upper limit detection	R	UB74412A	F0012A
Motion CH2 use error	• 1: error occur • 0: no error	R	UB744130	F00130
Motion CH2 emergency stop error	• 1: error occur • 0: no error	R	UB74413F	F0013F
MTSRS operation specification flag (operation list end)	• 1: enable operation list end • 0: disable operation list end	R	UB744402	F00402
MTSRS operation specification flag (group end)	• 1: enable group end • 0: disable group end	R	UB744403	F00403

(3) Jog special device

Name	Function	R/W	GP device	LP device
CH1 Jog CW operation	• ON rise: Jog acceleration in CW, constant speed start • OFF fall: Jog deceleration and stop in CW	R/W	UB744501	F00500
CH1 Jog CCW operation	• ON rise: Jog acceleration in CCW, constant speed start • OFF fall: Jog deceleration and stop in CCW	R/W	UB744502	F00501
CH2 Jog CW operation	• ON rise: Jog acceleration in CW, constant speed start • OFF fall: Jog deceleration and stop in CW	R/W	UB744503	F00502
CH2 Jog CCW operation	• ON rise: Jog acceleration in CCW, constant speed start • OFF fall: Jog deceleration and stop in CCW	R/W	UB744504	F00503

9.1.4.12   High Speed Counter

(1) CH1 special device

Name	Function	R/W	GP device	LP device
High speed counter CH1 activation status	▪ 1: enable ▪ 0: disable	R	UB744300	F00300
High speed counter CH1 up counting or down counting status	▪ 1: enable ▪ 0: disable	R	UB744301	F00301
High speed counter CH1 match value 1 match status	▪ 1: match ▪ 0: not match	R	UB744303	F00303
High speed counter CH1 match value 2 match status	▪ 1: match ▪ 0: not match	R	UB744304	F00304
High speed counter CH1 current value overflow status	▪ 1: overflow ▪ 0: not overflow	R	UB744308	F00308

(2) CH2 special device

Name	Function	R/W	GP device	LP device
High speed counter CH2 activation status	▪ 1: enable ▪ 0: disable	R	UB744310	F00310
High speed counter CH2 up counting or down counting status	▪ 1: enable ▪ 0: disable	R	UB744311	F00311
High speed counter CH2 match value 1 match status	▪ 1: match ▪ 0: not match	R	UB744313	F00313
High speed counter CH2 match value 2 match status	▪ 1: match ▪ 0: not match	R	UB744314	F00314
High speed counter CH2 current value overflow status	▪ 1: overflow ▪ 0: not overflow	R	UB744318	F00318

9.1.5   List of Word Special Device

9.1.5.1   PLC Model Classification

Name	Function	R/W	GP device	LP device
PLC series and model code	• Upper 2 digits: series code • Lower 2 digits: model code	R	UW74500	F100
System version	Displays firmware version in 5 word range	R	UW74501	F101
Release date (Year)	Version released year	R	UW74506	F106
Release date (Month, Day)	Version released month, day Upper 2 digits are the month, lower 2 digits are the day	R	UW74507	F107

9.1.5.2   Scan Time

Name	Function	R/W	GP device	LP device
Current scan time	Current scan running time (update every scan)	R	UW74510	F110
Minimum scan time	Minimum scan time during operation (clear at PLC mode change or program change)	R	UW74511	F111
Maximum scan time	Maximum scan time during operation (clear at PLC mode change or program change)	R	UW74512	F112
Average scan time	Display average scan time	R	UW74513	F113
Scan time count	Count and display every scan time	R	UW74514	F114

9.1.5.3   Calculation

Name	Function	R/W	GP device	LP device
Calculation error occur step (current)	Replace the current step or program where calculation error occur or reset when PLC mode is changed	R	UW74520	F120
Calculation error occur step (maintain)	Replace the first occurrence step or program where calculation error occur or reset when PLC mode is changed	R	UW74521	F121

9.1.5.4   Step

Name	Function	R/W	GP device	LP device
Error step	Currently stopped step due to error	R	UW74530	F130
Brake step	Braked step during the debug mode operation Reset when program is changed or PLC mode is changed	R	UW74531	F131

9.1.5.5 Diagnosis

Name	Function	R/W	GP device	LP device
Self-diagnosis error code	Display self-diagnosis error code	R	UW74540	F140

UW74540(F140)	Type	Cause
0X0010	Watchdog error	Scan time exceeds watchdog timer setting
0X0020	Memory error	When the memory specific area is inaccessible
0x0021	Battery error	When the battery value is below the specified value
0x0022	RTC setting error	RTC cannot be set and RTC operation error
0X0030	Program command error	When the program contains commands that cannot be decoded or that do not match the format
0X0031	Program sequence error	When there is no command to program flow such as user function, label name, END, RET, IRET
0X0040	Parameter setting error	When there is a problem with common parameter setting or expansion slot setting
0X0041	Periodic operation error	When operation exceeds the set periodic operation time
0X0050	Extension module setting error	When the hardware is configured differently from the previous parameter setting during the power is turned on again or the mode is changed
0X0051	Extension module detachment error	When detaching an expansion module in RUN mode
0x0060	Communication failure error	When receiving NAK and non-decryption data format
0x0061	Communication format error	When downloading or uploading format (such as out of range) and CHECK SUM is abnormal

9.1.5.6 Time

Name	Function	R/W	GP device	LP device
Time setting (Year)	Save the year setting value as BCD data	W	UW74550	F150
Time setting (Month)	Save the month setting value as BCD data	W	UW74551	F151
Time setting (Day)	Save the day setting value as BCD data	W	UW74552	F152
Time setting (Hour)	Save the hour setting value as BCD data	W	UW74553	F153
Time setting (Minute)	Save the minute setting value as BCD data	W	UW74554	F154
Time setting (Second)	Save the second setting value as BCD data	W	UW74555	F155
Time setting (day of the week)	Save the day of the week setting value as BCD data 0: Sunday, 1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday	W	UW74556	F156

9.1.5.7 Input Filter Setting

Name	Function	R/W	GP device	LP device
Input filter setting	Set the default input filter value in ms, When the value is 0, do not set filter value, Apply to all modules that do not have filter settings	R/W	UW74560	F160

9.1.5.8 Periodic Operation Time Setting

Name	Function	R/W	GP device	LP device
Periodic operation time setting	When the periodic operation setting flag is ON, the periodic operation starts in this register setting time	R/W	UW74561	F161
Watchdog timer value setting	0 to 65535(unit: ms)	R/W	UW74562	F162

9.1.5.9 Periodic Interrupt

Name	Function	R/W	GP device	LP device
Periodic interrupt cycle setting 1	Periodic interrupt cycle setting 1	R/W	UW74570	F170
Periodic interrupt cycle setting 2	Periodic interrupt cycle setting 2	R/W	UW74571	F171
Periodic interrupt cycle setting 3	Periodic interrupt cycle setting 3	R/W	UW74572	F172
Periodic interrupt cycle setting 4	Periodic interrupt cycle setting 4	R/W	UW74574	F174
Periodic interrupt cycle setting 5	Periodic interrupt cycle setting 5	R/W	UW74575	F175
Periodic interrupt cycle setting 6	Periodic interrupt cycle setting 6	R/W	UW74576	F176
Periodic interrupt cycle setting 7	Periodic interrupt cycle setting 7	R/W	UW74577	F177
Periodic interrupt cycle setting 8	Periodic interrupt cycle setting 8	R/W	UW74578	F178

9.1.5.10 Motion Control

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Current position	Current position of CH1	R	UW74460	F60
Current speed	Current speed of CH1	R	UW74462	F62
Operation number	Current operation number of CH1	R	UW74464	F64
Pattern number	Current pattern number of CH1	R	UW74465	F65
Origin position	Current origin position of CH1	R	UW74466	F66
Setting speed	Setting speed of CH1	R	UW74468	F68
Check error	Check error code of CH1	R	UW74420	F20

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Current position	Current position of CH2	R	UW74470	F70
Current speed	Current speed of CH2	R	UW74472	F72
Operation number	Current operation number of CH2	R	UW74474	F74
Pattern number	Current pattern number of CH2	R	UW74475	F75
Origin position	Current origin position of CH2	R	UW74476	F76
Setting speed	Setting speed of CH2	R	UW74478	F78
Check error	Check error code of CH2	R	UW74421	F21

9.1.5.11 High Speed Counter

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Current position counting mode	1-phase:1, 2 2-phase: 1,2,3,4 disable: -1	R	UW74590	F190
Current counting value	High speed counter CH1 current counting value	R	UW74592	F192
Match value 1	High speed counter CH1 match value 1	R	UW74596	F196
Match value 2	High speed counter CH1 match value 2	R	UW74598	F198
current phase type	0: NO USE (Normal input), 1: CH1 - phase1, 2: CH2 - phase1, 3: CH1,CH2 - phase1, 4: phase2	R	UW74612	F212
CH1 total counting number	Total pulse input number after counting starts (64 bit) Current total counter number = Total counting number + Current HNCNT counting number	R	UW74620	F220

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Current position counting mode	1-phase: 1, 2 disable: -1	R	UW74591	F191
Current counting value	High speed counter CH2 current counting value	R	UW74602	F202
Match value 1	High speed counter CH2 match value 1	R	UW74606	F206
Match value 2	High speed counter CH2 match value 2	R	UW74608	F208
CH2 total counting number	Total pulse input number after counting starts (64 bit) Current total counter number = Total counting number + Current HNCNT counting number	R	UW74628	F228

9.1.6   UW Correspondence Table

Description		Bit range	Word range	GP device (UB)	GP device (UW)
X	Input device	X0~X999F	X0~X999	UB750000~ UB75999F	UW75000~ UW75999
Y	Output device	Y0~Y999F	Y0~Y999	UB760000~ UB76999F	UW76000~ UW76999
M	Auxiliary device	M0~M14999	M0~M14999F	UB830000~ UB97999F	UW83000~ UW97999
S	Step device	S0.00~S999.99		UB980000~ UB98999F	
D	Data device		D0~D28999		UW129000~ UW129299
T	Timer contact	T0~T255		UB770000~ UB77015F	
T	Timer current value		T0~T255		UW78000~ UW78999
T	Timer set value		T0~T255		UW79000~ UW79999
C	Counter contact	C0~C255		UB770000~ UB77015F	
C	Counter current value		C0~C255		UW81000~ UW81999
C	Counter set value		C0~C255		UW82000~ UW82999
Z	Index device	Z0~Z299F	Z0~Z299	UB747000~ UB74999F	UW74700~ UW74999
F	Special device	F0~F299F	F0~F299	UB744000~ UB74699F	UW74400~ UW74699
V	Virtual device	V0~V299F	V0~V299	UB741000~ UB74399F	UW74100~ UW74399
L	Link device	L0~L9999F	L0~L9999	UB990000~ UB99999F	UW99000~ UW99999
R	File device	R0~R3999F	R0~R3999	UB020000~ UB05999F	UW02000~ UW05999

9.2 CAN Memory Mapping

9.2.1 Overview

Due to the characteristic of DeviceNet, there is only a part that sets the output value of the output device.
However, since the LP must knowthe current value even if it is output device, it consists of 'output device command area' for setting the output value and 'output device current value area' for checking the current value.
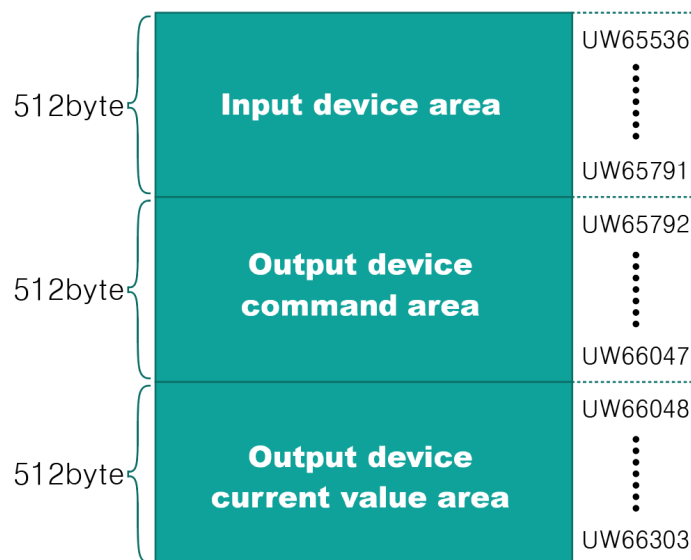
(1) Input device area

- Area where modules for input from Slave connected to DeviceNet are assigned

- Size: 512byte=(max. number of connectable Slaves (63)+1)×Memory size per Slave (8byte)

- Address: UW65536 ~ UW65791

(2) Output device command area

- Area assigned to set the output value on the module for the output of Slave connected to DeviceNet

- Size: 512byte=(max. number of connectable Slaves (63)+1)×Memory size per Slave (8byte)

- Address: UW65792 ~ UW66047

(3) Output device current value area

- Area assigned to read the current value of the module for the output of Slave connected to DeviceNet

- Size: 512byte=(max. number of connectable Slaves (63)+1)×Memory size per Slave (8byte)

- Address: UW66048 ~ UW66303

512byte	Input device area	UW65536 ⋮ UW65791
512byte	Output device command area	UW65792 ⋮ UW66047
512byte	Output device current value area	UW66048 ⋮ UW66303

9.2.2　Memory Mapping Table

(1) Input device area

Module type	Module address	UW start address	UW end address
IN	0	65536	65539
IN	1	65540	65543
IN	2	65544	65547
IN	3	65548	65551
IN	4	65552	65555
IN	5	65556	65559
IN	6	65560	65563
IN	7	65564	65567
IN	8	65568	65571
IN	9	65572	65575
IN	10	65576	65579
IN	11	65580	65583
IN	12	65584	65587
IN	13	65588	65591
IN	14	65592	65595
IN	15	65596	65599
IN	16	65600	65603
IN	17	65604	65607
IN	18	65608	65611
IN	19	65612	65615
IN	20	65616	65619
IN	21	65620	65623
IN	22	65624	65627
IN	23	65628	65631
IN	24	65632	65635
IN	25	65636	65639
IN	26	65640	65643
IN	27	65644	65647
IN	28	65648	65651
IN	29	65652	65655
IN	30	65656	65659
IN	31	65660	65663
IN	32	65664	65667
IN	33	65668	65671
IN	34	65672	65675
IN	35	65676	65679

Module type	Module address	UW start address	UW end address
IN	36	65680	65683
IN	37	65684	65687
IN	38	65688	65691
IN	39	65692	65695
IN	40	65696	65699
IN	41	65700	65703
IN	42	65704	65707
IN	43	65708	65711
IN	44	65712	65715
IN	45	65716	65719
IN	46	65720	65723
IN	47	65724	65727
IN	48	65728	65731
IN	49	65732	65735
IN	50	65736	65739
IN	51	65740	65743
IN	52	65744	65747
IN	53	65748	65751
IN	54	65752	65755
IN	55	65756	65759
IN	56	65760	65763
IN	57	65764	65767
IN	58	65768	65771
IN	59	65772	65775
IN	60	65776	65779
IN	61	65780	65783
IN	62	65784	65787
IN	63	65788	65791

※Module address 0 is not used.

※Maximum number of connectable slaves is 64, but connect only up to 8 units for system stabilization.

(2) Output device command range

Module type	Module address	UW start address	UW end address
OUT(command)	0	65792	65795
OUT(command)	1	65796	65799
OUT(command)	2	65800	65803
OUT(command)	3	65804	65807
OUT(command)	4	65808	65811
OUT(command)	5	65812	65815
OUT(command)	6	65816	65819
OUT(command)	7	65820	65823
OUT(command)	8	65824	65827
OUT(command)	9	65828	65831
OUT(command)	10	65832	65835
OUT(command)	11	65836	65839
OUT(command)	12	65840	65843
OUT(command)	13	65844	65847
OUT(command)	14	65848	65851
OUT(command)	15	65852	65855
OUT(command)	16	65856	65859
OUT(command)	17	65860	65863
OUT(command)	18	65864	65867
OUT(command)	19	65868	65871
OUT(command)	20	65872	65875
OUT(command)	21	65876	65879
OUT(command)	22	65880	65883
OUT(command)	23	65884	65887
OUT(command)	24	65888	65891
OUT(command)	25	65892	65895
OUT(command)	26	65896	65899
OUT(command)	27	65900	65903
OUT(command)	28	65904	65907
OUT(command)	29	65908	65911
OUT(command)	30	65912	65915
OUT(command)	31	65916	65919
OUT(command)	32	65920	65923
OUT(command)	33	65924	65927
OUT(command)	34	65928	65931
OUT(command)	35	65932	65935
OUT(command)	36	65936	65939

Module type	Module address	UW start address	UW end address
OUT(command)	37	65940	65943
OUT(command)	38	65944	65947
OUT(command)	39	65948	65951
OUT(command)	40	65952	65955
OUT(command)	41	65956	65959
OUT(command)	42	65960	65963
OUT(command)	43	65964	65967
OUT(command)	44	65968	65971
OUT(command)	45	65972	65975
OUT(command)	46	65976	65979
OUT(command)	47	65980	65983
OUT(command)	48	65984	65987
OUT(command)	49	65988	65991
OUT(command)	50	65992	65995
OUT(command)	51	65996	65999
OUT(command)	52	66000	66003
OUT(command)	53	66004	66007
OUT(command)	54	66008	66011
OUT(command)	55	66012	66015
OUT(command)	56	66016	66019
OUT(command)	57	66020	66023
OUT(command)	58	66024	66027
OUT(command)	59	66028	66031
OUT(command)	60	66032	66035
OUT(command)	61	66036	66039
OUT(command)	62	66040	66043
OUT(command)	63	66044	66047

※Module address 0 is not used.

※Maximum number of connectable slaves is 64, but connect only up to 8 units for system stabilization.

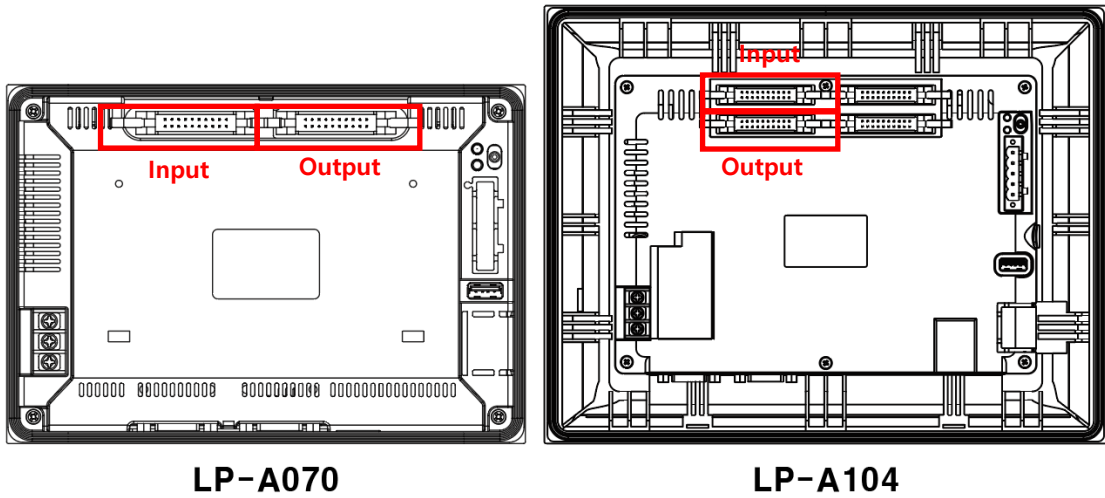### (3) Output device current value range

Module type	Module address	UW start address	UW end address
OUT(current value)	0	66048	66051
OUT(current value)	1	66052	66055
OUT(current value)	2	66056	66059
OUT(current value)	3	66060	66063
OUT(current value)	4	66064	66067
OUT(current value)	5	66068	66071
OUT(current value)	6	66072	66075
OUT(current value)	7	66076	66079
OUT(current value)	8	66080	66083
OUT(current value)	9	66084	66087
OUT(current value)	10	66088	66091
OUT(current value)	11	66092	66095
OUT(current value)	12	66096	66099
OUT(current value)	13	66100	66103
OUT(current value)	14	66104	66107
OUT(current value)	15	66108	66111
OUT(current value)	16	66112	66115
OUT(current value)	17	66116	66119
OUT(current value)	18	66120	66123
OUT(current value)	19	66124	66127
OUT(current value)	20	66128	66131
OUT(current value)	21	66132	66135
OUT(current value)	22	66136	66139
OUT(current value)	23	66140	66143
OUT(current value)	24	66144	66147
OUT(current value)	25	66148	66151
OUT(current value)	26	66152	66155
OUT(current value)	27	66156	66159
OUT(current value)	28	66160	66163
OUT(current value)	29	66164	66167
OUT(current value)	30	66168	66171
OUT(current value)	31	66172	66175
OUT(current value)	32	66176	66179
OUT(current value)	33	66180	66183
OUT(current value)	34	66184	66187
OUT(current value)	35	66188	66191
OUT(current value)	36	66192	66195

Module type	Module address	UW start address	UW end address
OUT(current value)	37	66196	66199
OUT(current value)	38	66200	66203
OUT(current value)	39	66204	66207
OUT(current value)	40	66208	66211
OUT(current value)	41	66212	66215
OUT(current value)	42	66216	66219
OUT(current value)	43	66220	66223
OUT(current value)	44	66224	66227
OUT(current value)	45	66228	66231
OUT(current value)	46	66232	66235
OUT(current value)	47	66236	66239
OUT(current value)	48	66240	66243
OUT(current value)	49	66244	66247
OUT(current value)	50	66248	66251
OUT(current value)	51	66252	66255
OUT(current value)	52	66256	66259
OUT(current value)	53	66260	66263
OUT(current value)	54	66264	66267
OUT(current value)	55	66268	66271
OUT(current value)	56	66272	66275
OUT(current value)	57	66276	66279
OUT(current value)	58	66280	66283
OUT(current value)	59	66284	66287
OUT(current value)	60	66288	66291
OUT(current value)	61	66292	66295
OUT(current value)	62	66296	66299
OUT(current value)	63	66300	66303

※Module address 0 is not used.

※Maximum number of connectable slaves is 64, but connect only up to 8 units for system stabilization

9.3   Motion Control I/O Signal allocation

LP-A070   LP-A104

(1) I/O pin arrangement

Input	Output

(2) I/O signal

Signal name	Input contact number		Description
Lower limit signal	CH1	X0	Detect CH1 lower limit, when there is signal at input contact.
	CH2	X3	Detect CH2 lower limit, when there is signal at input contact.
Upper limit signal	CH1	X1	Detect CH1 upper limit, when there is signal at input contact.
	CH2	X4	Detect CH2 upper limit, when there is signal at input contact.
Origin limit signal	CH1	X2	Detect CH1 origin limit, when there is signal at input contact.
	CH2	X5	Detect CH2 origin limit, when there is signal at input contact.
Position select signal	CH1	Y2	Output CH1 position select signal.
	CH2	Y3	Output CH2 position select signal.
PWM signal	CH1	Y0	Output CH1 PWM signal.
	CH2	Y1	Output CH2 PWM signal.

Note

- The number of the input contact points use the same number regardless of the ribbon type and the terminal type.

- Products uses a 1-Pulse input method. Be careful when connecting the motion controller.

- When the motion controller function and the high speed counter function are used at the same time, X0 to X5 are occupied by the motion controller and cannot be used as the input port of the high-speed counter.

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