

User Manual for Communication

HMI

**GP/LP Series
(DANFOSS)**

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.

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 product and its proper use, and should be kept in a place where it will be easy to access.

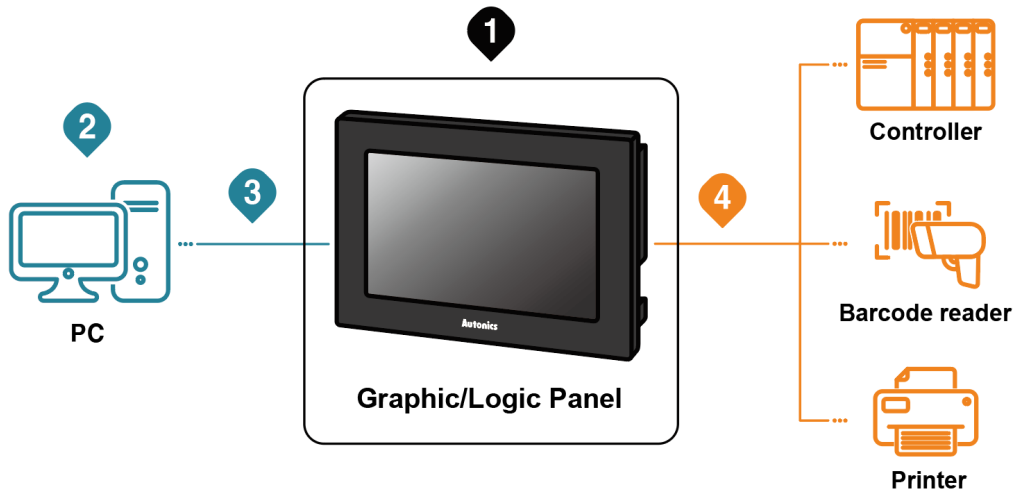
User Manual Guide

- 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. Please visit our website (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 our website.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our website.
- Inner device of this user manual for communication is based on GP.
If you use LP, refer to "LP user manual" for inner device of LP.

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 Graphic/Logic panel device specification, installation, maintenance, management, firmware update and system configuration

| | | |
|-----------------|----------|--|
| Hardware Manual | A Series | GP-A Series User Manual, LP-A Series User Manual |
| | S Series | GP-S070 User Manual, GP-S044/057 User Manual, LP-S070 User Manual, LP-S044 User Manual |

2 Project drawing, programming

| | | |
|-----------------|-------------|---|
| Software Manual | Drawing | atDesigner User Manual, GP Editor User Manual |
| | Programming | atLogic User Manual, atLogic Programming Manual |

3 Project Upload/Download

| | | |
|-----------------|----------|--|
| Hardware Manual | A Series | GP-A Series User Manual, LP-A Series User Manual |
| | S Series | GP-S070 User Manual, GP-S044/057 User Manual, LP-S070 User Manual, LP-S044 User Manual |

4 Connected device setting, communication setting

| | | |
|-----------------|-------------|--|
| Software Manual | Drawing | atDesigner User Manual, GP Editor User Manual |
| | Programming | atLogic User Manual, atLogic Programming Manual |
| Hardware Manual | A Series | GP-A Series User Manual, LP-A Series User Manual |
| | S Series | GP-S070 User Manual, GP-S044/057 User Manual, LP-S070 User Manual, LP-S044 User Manual |

4 Check connectable device, connection cable model name and protocol

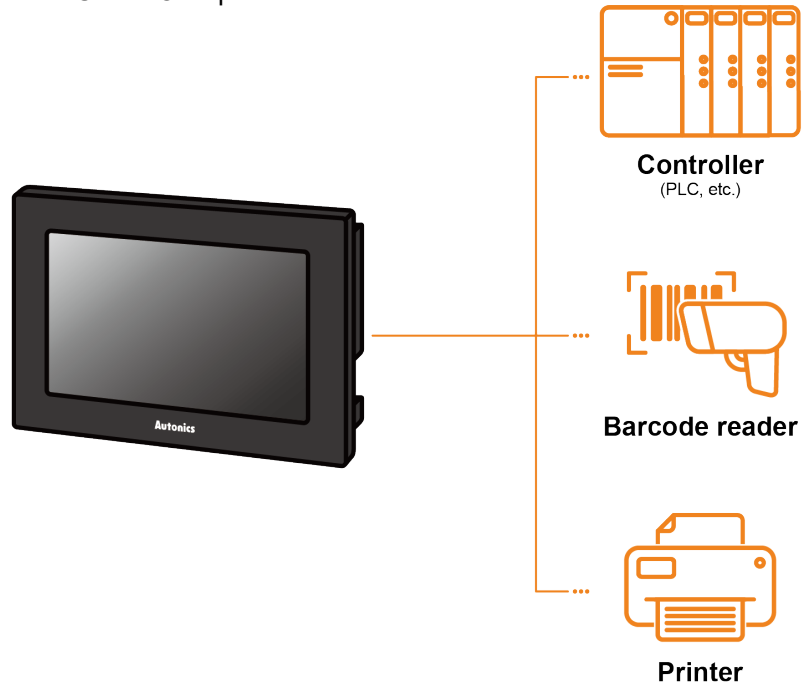
| | |
|----------------------|----------------------------|
| Communication Manual | GP/LP Communication Manual |
|----------------------|----------------------------|

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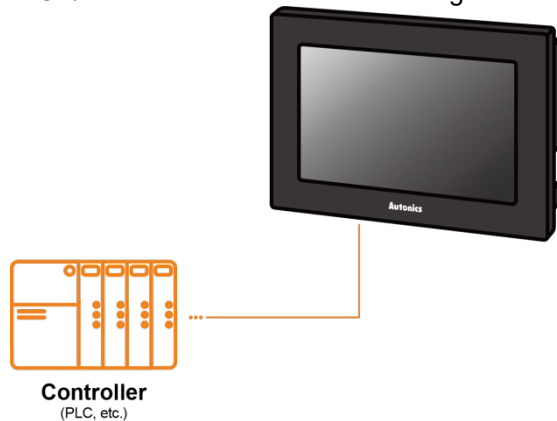
1 System Organization

GP/LP can be connected with various controller, barcode reader and printer via RS232C, RS422, Ethernet, CAN and USB HOST port.



1.1 1:1 Communication

A GP/LP can communicate with a single controller A.



(1) Communication configuration by GP/LP model

The communication configuration by GP/LP model is listed below.

For detailed information about the communication configuration, please refer to 'GP/LP User Manual'.

- GP/LP-S Series

| Series | Chanel | Connecting port | Description |
|------------------------|--------|-----------------|---|
| GP/LP-S044, GP-S057 | CH1 | RS232C/RS422 | Direct communication available |
| | CH2 | RS422/RS485 | Link device ^{※1} communication available |
| GP/LP-S070 | CH1 | RS232C/RS422 | Direct communication available Link device ^{※1} communication available |
| | CH2 | RS422/RS485 | Direct communication available Link device ^{※1} communication available |

- GP/LP-A Series

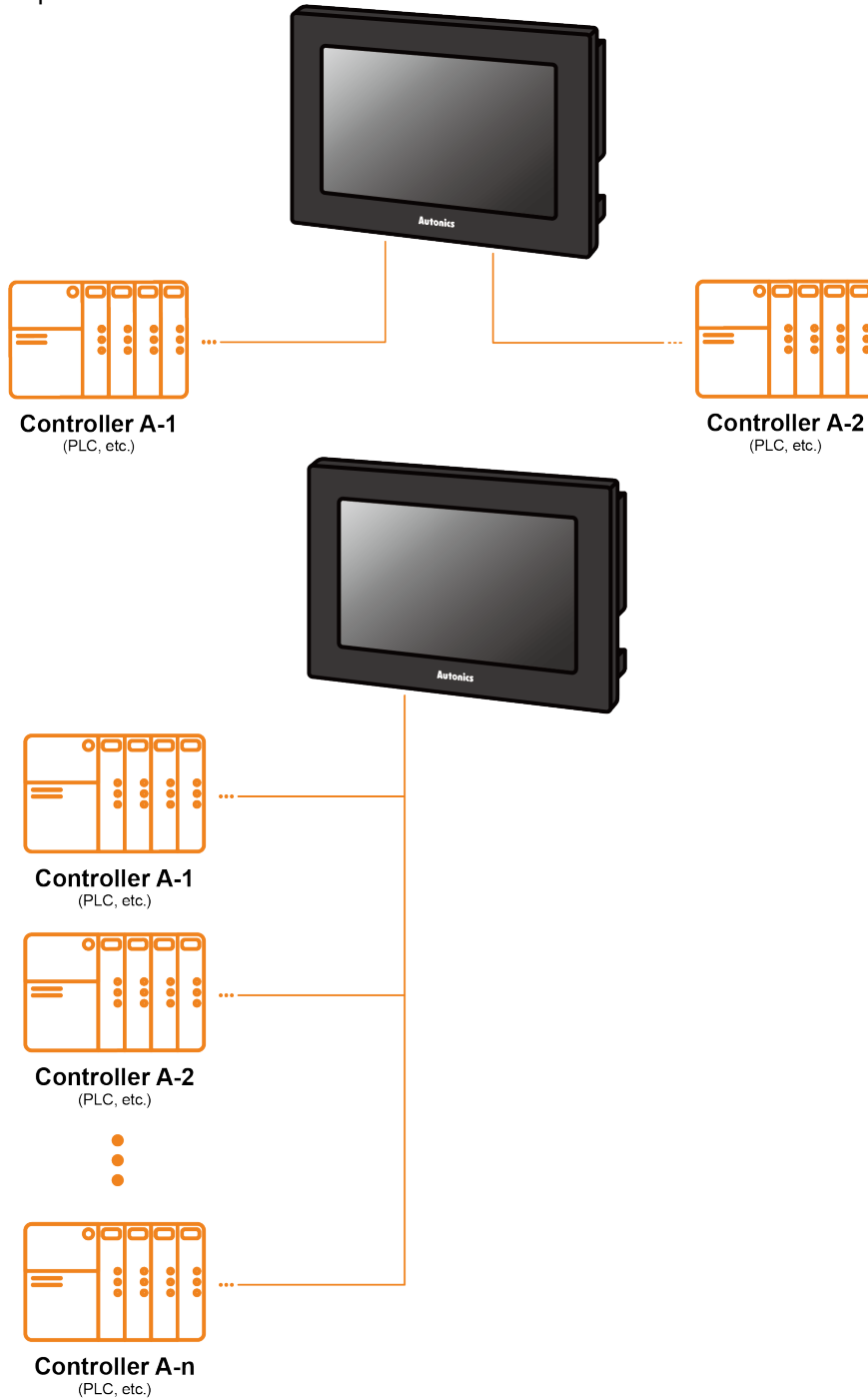
| Series | Connecting port | Description |
|------------|--|---|
| GP/LP-A070 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port | Direct communication available Link device ^{※1} communication available |
| GP/LP-A104 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN ^{※2} port | Direct communication available Link device ^{※1} communication available |

※1: Please refer to 'GP Editor User Manual' for Link device instruction.

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

1.2 1:N Communication of Same Controllers

1:N communication stands for one LP communicating with multiple of controllers. The GP/LP observes the connected controllers or relays data between controllers. A GP/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.



(1) Communication configuration by GP/LP model

The communication configuration by GP/LP model is listed below. For detailed information about the communication configuration, please refer to 'GP/LP User Manual'.

- GP/LP-S Series

| Series | Chanel | Connecting port | Description |
|------------------------|---------------|-----------------|---|
| GP/LP-S044, GP-S057 | CH1 | - | Multiple connection unavailable |
| | CH2 | RS422 | Link device ^{※1} communication available |
| GP/LP-S070 | CH1 or CH2 | RS422 | Direct communication available Link device ^{※1} communication available |

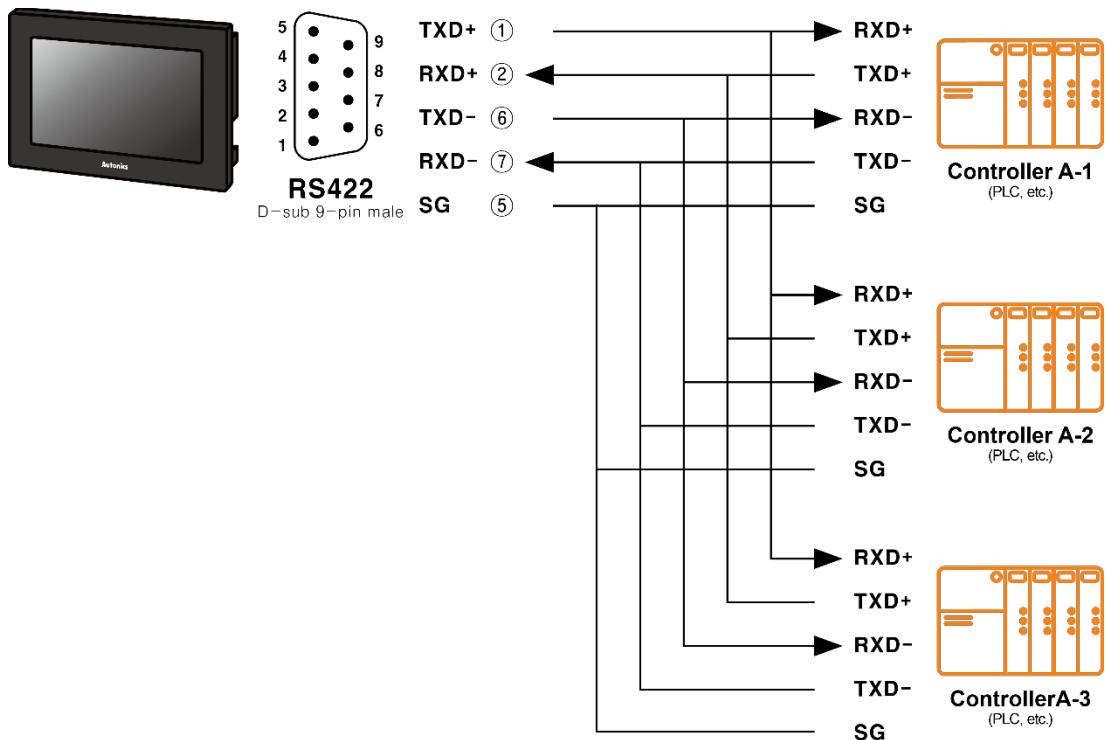
- GP/LP-A Series

| Series | Connecting port | Description |
|------------|--|---|
| GP/LP-A070 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port | Direct communication available Link device ^{※1} communication available |
| GP/LP-A104 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN ^{※2} port | Direct communication available Link device ^{※1} communication available |

※1: Please refer to 'GP Editor User Manual' for Link device instruction.

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

(2) RS422 communication connection diagram



1.3 1:N Communication of Different Controllers

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

1.3.1 1:1:1 Communication

A GP/LP can communicate with a single controller A and a single controller B. The GP/LP relays communications between the controller A and B.



(1) Communication configuration by GP/LP model

The communication configuration by GP/LP model is listed below.

For detailed information about the communication configuration, please refer to 'GP/LP User Manual'.

- GP/LP-S Series

| Series | Chanel | Connecting port | Description |
|------------------------|------------------|-----------------|---|
| GP/LP-S044, GP-S057 | CH1 | RS232C/RS422 | Direct communication available |
| | CH2 | RS422/RS485 | Link device* ¹ communication available |
| GP/LP-S070 | CH1 or CH2 | RS422/RS485 | Direct communication available Link device* ¹ communication available |

- GP/LP-A Series

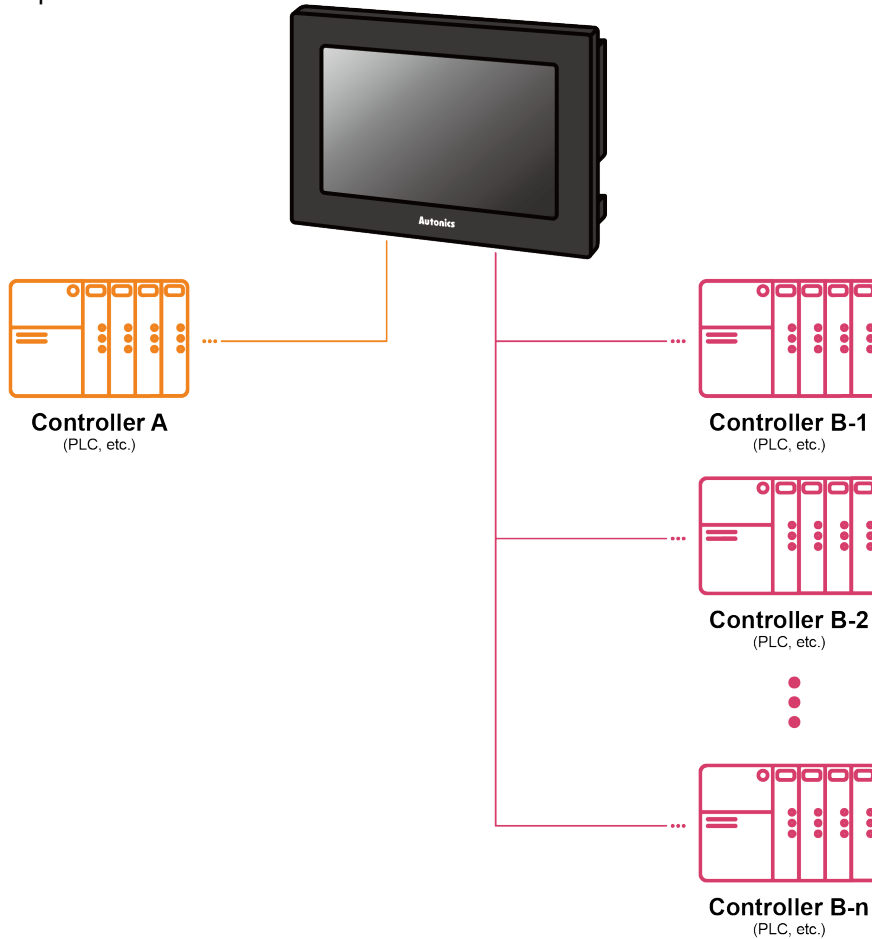
| Series | Connecting port | Description |
|------------|--|---|
| GP/LP-A070 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port | Direct communication available Link device* ¹ communication available |
| GP/LP-A104 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN* ² port | Direct communication available Link device* ¹ communication available |

※1: Please refer to 'GP Editor User Manual' for Link device instruction.

※2: Only Autonics' ARD Series can be connected to CAN*² port.

1.3.2 1:1:N Communication

A GP/LP can communicate with a single controller A and the multiple of controller Bs..
 The GP/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.



(1) Communication configuration by GP/LP model

The communication configuration by GP/LP model is listed below.
 For detailed information about the communication configuration, please refer to 'GP/LP User Manual'.

- GP/LP-S Series

| Series | Chanel | Connecting port | Description |
|------------------------|---------------|-----------------|---|
| GP/LP-S044, GP-S057 | CH1 | RS232C | Single direct communication available |
| | CH2 | RS422/RS485 | Link device ^{*1} multiple communication available |
| GP/LP-S070 | CH1 or CH2 | RS232C | Single direct communication available Link device ^{*1} single communication available |
| | | RS422/RS485 | Multiple direct communication available Link device ^{*1} multiple communication available |

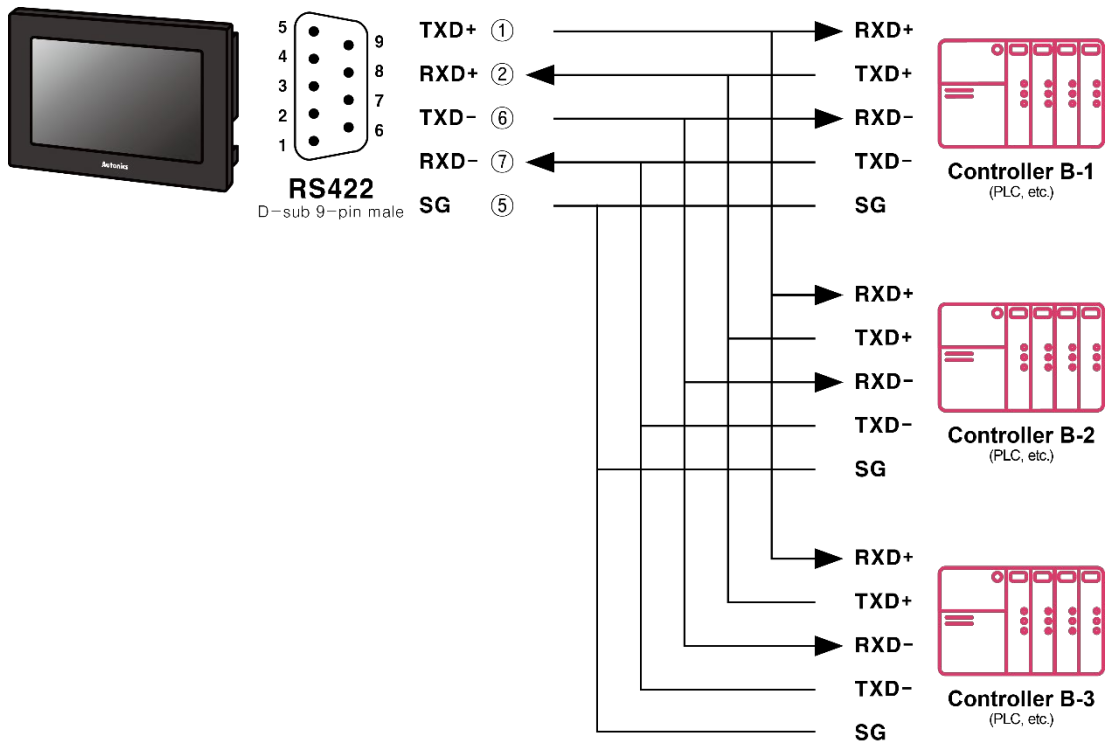
- GP/LP-A Series

| Series | Connecting port | Description |
|------------|--|---|
| GP/LP-A070 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port | Direct communication available Link device*1 communication available |
| GP/LP-A104 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN*2 port | Direct communication available Link device*1 communication available |

※1: Please refer to 'GP Editor User Manual' for Link device instruction.

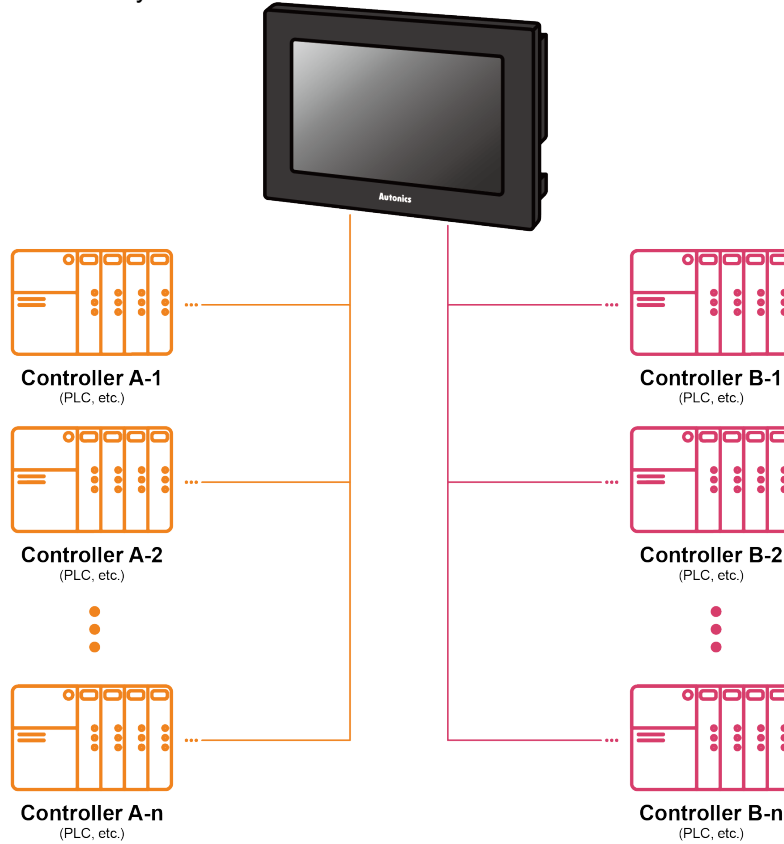
※2: Only Autonics' ARD Series can be connected to CAN port.

(2) RS422 communication connection diagram



1.3.3 N:1:N Communication

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



(1) Communication configuration by GP/LP model

The communication configuration by GP/LP model is listed below.
For detailed information about the communication configuration, please refer to 'GP/LP User Manual'.

- GP/LP-S Series

| Series | Chanel | Connecting port | Description |
|------------|------------|-----------------|---|
| GP/LP-S070 | CH1 or CH2 | RS232C/RS422 | Multiple direct communication available Link device ^{※1} multiple communication available |

- GP/LP-A Series

| Series | Connecting port | Description |
|------------|--|---|
| GP/LP-A070 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port | Direct communication available Link device ^{※1} communication available |
| GP/LP-A104 | RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN ^{※2} port | Direct communication available Link device ^{※1} communication available |

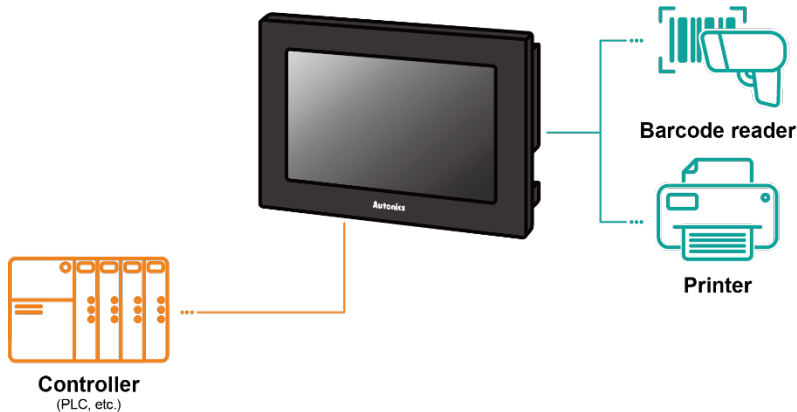
※1: Please refer to 'GP Editor User Manual' for Link device instruction.

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

1.4 Barcode Reader, Printer Communication

A GP/LP 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.

- GP/LP-S Series: printing alarm log
- GP/LP-A Series: print alarm log and screen



1.4.1 Communication Configuration

1.4.1.1 Barcode Reader

(1) Connected communication port

- GP/LP-S Series

| Series | Connected device | Communication port | | |
|------------------------|------------------|--------------------|--------|----------|
| | | RS232C* | RS422* | USB Host |
| GP/LP-S044, GP-S057 | Controller | ○ | ○ | - |
| | Barcode reader | ○ | ○ | - |
| GP/LP-S070 | Controller | ○ | ○ | - |
| | Barcode reader | ○ | ○ | - |

- GP/LP-A Series

| Series | Connected device | Communication port | | |
|--------------------------|------------------|--------------------|--------|----------|
| | | RS232C* | RS422* | USB Host |
| GP/LP-A070 GP/LP-A104 | Controller | ○ | ○ | - |
| | Barcode reader | ○ | ○ | ○ |

※RS232C/422 converter allows to opposite communication.

(2) Configuration method

1st Set the items related to the use of bar codes in the project in the drawing program, GP Editor/atDesigner.

| Series | Description | Drawing program menu |
|---------|---|--|
| GP/LP-S | Device setting for data storage | Common > Barcode |
| | System device setting for action control | Common > System Information > System Signal 1 |
| GP/LP-A | Device setting for connection port/data storage | Project > Project Property > Special Device Setting |

※For detailed information about system device setting, please refer to 'GP Editor/atDesigner User Manual'.

2nd Download the set project in the drawing program , GP Editor/atDesigner, to GP/LP device.

3rd Make communication settings for each port in the GP/LP system menu.

※For detailed information about communication setting, please refer to 'GP/LP User Manual'.

(3) 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 |

1.4.1.2 Printer**(1) Connected communication port**

- GP/LP-S Series

| Series | Connected device | Communication port | | |
|------------------------|------------------|--------------------|--------|----------|
| | | RS232C※ | RS422※ | USB Host |
| GP/LP-S044, GP-S057 | Controller | ○ | ○ | - |
| | Printer | ○ | ○ | - |
| GP/LP-S070 | Controller | ○ | ○ | - |
| | Printer | ○ | ○ | - |

- GP/LP-A Series

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

(2) Configuration method

1st Set screen printing/alarm log printing device and touch key/switch in drawing program, GP Editor/atDesigner.

| Series | Description | Drawing program menu |
|---------|--|---|
| GP/LP-S | System device setting for action control | Common > System Information > System Signal |
| GP/LP-A | Device setting for screen print control | Project window > Right-click menu of the screen to print > Screen Printer Setting |
| | Device setting for alarm log print | Project window > Alarm History > Use Print |

2nd Download the set project in the drawing program , GP Editor/atDesigner, to GP/LP device.

3rd Make communication settings for each port in the GP/LP system menu.

※ For detailed information about communication setting, please refer to 'GP/LP User Manual'.

(3) 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 |

2 Communication Configuration by Devices

2.1 DANFOSS FC Series

GP/LP is able to communicate with FC200 of DANFOSS.

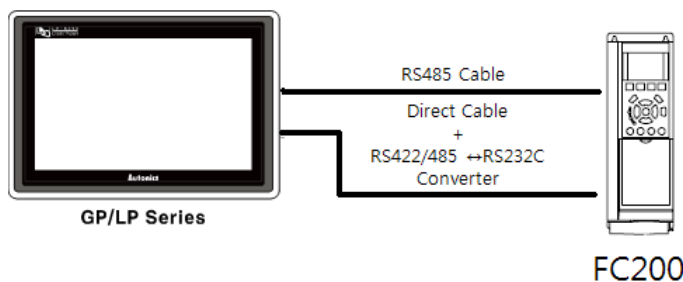
2.1.1 Connection Support Products

| Controller Type | Communication method | Communication type |
|-----------------|----------------------|---------------------|
| DANFOSS FC200 | RS485 | CPU direct (Loader) |

2.1.2 Connectable GP/LP Model

| Connected devices | Connection method | GP/LP model | | | | | | | | |
|-------------------|-------------------|-----------------------|----------------------|---------|------------|------------|--------------|-----------------|-----------------|----------------|
| | | GP-2480 (under V2.70) | GP-2480 (over V3.00) | GP-S057 | GP/LP-S044 | GP/LP-S070 | GP-S057 (V2) | GP/LP-S044 (V2) | GP/LP-S070 (V2) | GP/LP-A Series |
| FC Series | Modbus | x | x | x | x | x | x | x | x | x |
| | Modbus (TYPE A) | x | x | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

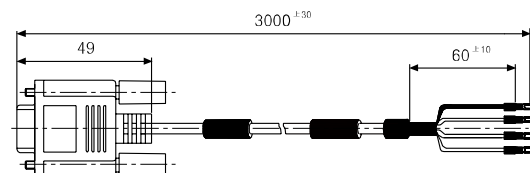
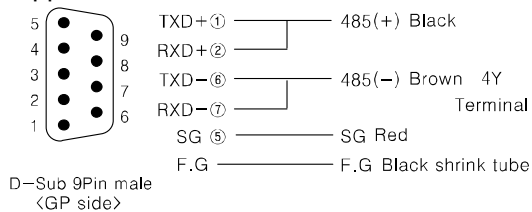
2.1.3 System Organization



DANFOSS FC200 executes RS485 communication and it executes also RS232C communication with RS485/232 converter.

2.1.4 Communication Cable

- Applied cable: C3M5P03-D9M0-T4Y0



2.1.5 Communication Configuration

The below table is for communication configuration of DANFOSS FC200 with GP/LP.

| No | Item | Description | | Note |
|----|--------------------|-------------|--------|------------|
| 1 | Communication mode | Modbus RTU | | |
| 2 | Baud rate | 9600 bps | | Fixed |
| 3 | Data type | Data length | 8 bit | Fixed |
| | | Parity | NONE | Fixed |
| | | Stop bit | 1 bit | Fixed |
| 4 | Address | CH1 | 1~ 247 | Selectable |
| | | CH2 | 0~ 31 | |

Configure the address in GP/LP according to the above settings.

Please refer to the user manual of corresponding GP/LP product for the address configuration.

2.1.6 Available Device

The device range differs depending on the PLC model and the number of I/O contacts.

The available PLC model in GP/LP are as follows.

For detailed information about each device, please refer to the manuals provided by each manufacturer and

For detailed information about GP/LP internal device, please refer to 'atLogic Programing Manual'.

| Type | Device | Mark | Range | |
|------|------------------|------|--------|--------|
| | | | Start | End |
| Bit | Bit device area | 0 | 000001 | 000065 |
| Word | Word device area | 4 | 400001 | 400990 |
| | Word device area | 4 | 401000 | 401990 |
| | Word device area | 4 | 402000 | 402990 |
| | Word device area | 4 | 403000 | 403990 |
| | Word device area | 4 | 404000 | 404990 |
| | Word device area | 4 | 449000 | 449990 |
| | Word device area | 4 | 450000 | 450000 |
| | Word device area | 4 | 450010 | 450010 |
| | Word device area | 4 | 450210 | 450210 |

2.1.7 Monitorable Device in GP/LP

The device range differs depending on the PLC model and the number of I/O contacts.

The available PLC model in GP/LP are as follows.

For detailed information about each device, please refer to the manuals provided by each manufacturer and

For detailed information about GP/LP internal device, please refer to 'atLogic Programing Manual'.

| Type | Mark | Device | Note |
|------|------|------------------|------|
| Bit | 0 | Bit device area | |
| Word | 4 | Word device area | |

Make Life Easy: Autonics

* Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.

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