

User Manual for Communication

HMI

**GP/LP Series
(Universal)**

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.

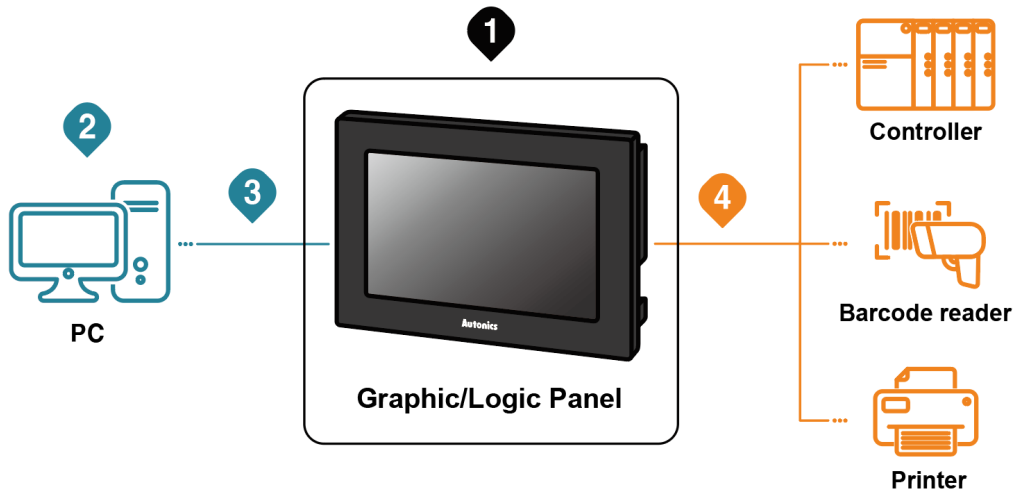
User Manual Guide

- 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

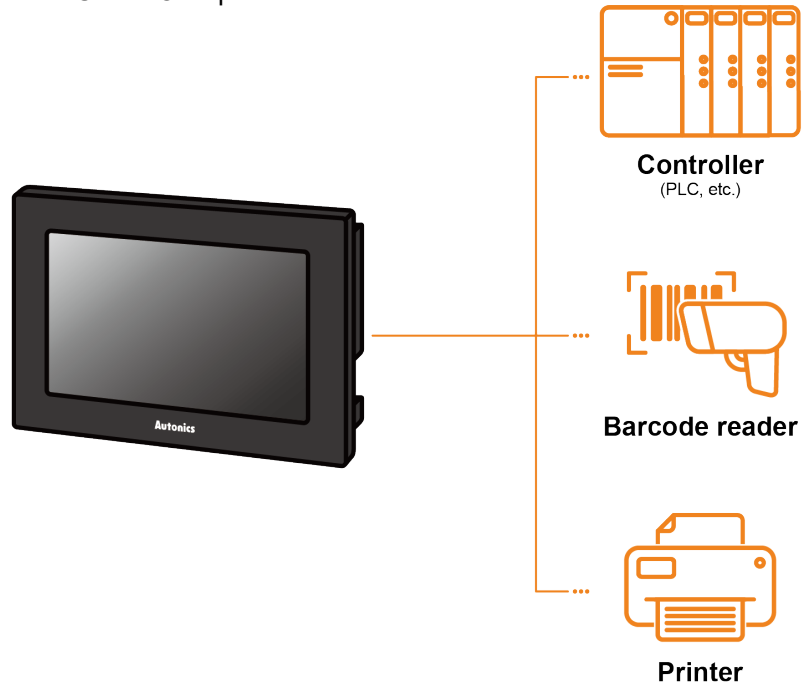
Communication Manual	GP/LP Communication Manual
----------------------	----------------------------

Table of Contents

Preface	3
User Manual Guide	4
User Manual Symbols	5
Reference Manual for Each Configuration.....	6
Table of Contents	7
1 System Organization	9
1.1 1:1 Communication.....	1 0
1.2 1:N Communication of Same Controllers.....	1 1
1.3 1:N Communication of Different Controllers.....	1 3
1.3.1 1:1:1 Communication	1 3
1.3.2 1:1:N Communication.....	1 4
1.3.3 N:1:N Communication	1 6
1.4 Barcode Reader, Printer Communication.....	1 7
1.4.1 Communication Configuration.....	1 7
2 Communication Configuration by Devices.....	2 1
2.1 Universal (General Communication)	2 1
2.1.1 Connectable GP/LP Model.....	2 1
2.1.2 System Organization.....	2 1
2.1.3 Cable Wiring for Communication Port.....	2 2
2.1.4 Communication Configuration.....	2 3
2.1.5 Universal Protocol	2 4
2.1.6 Communication Frame Organization	2 5
2.1.7 Universal Function Example	2 8

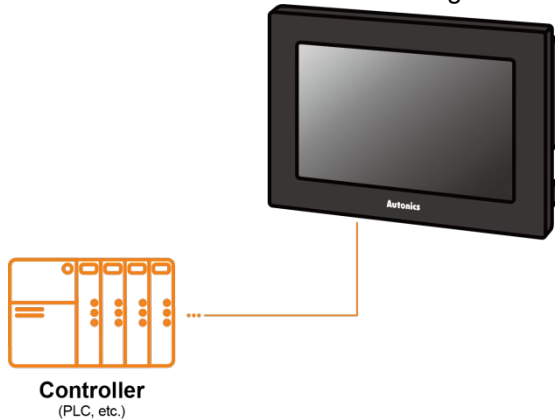
1 System Organization

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

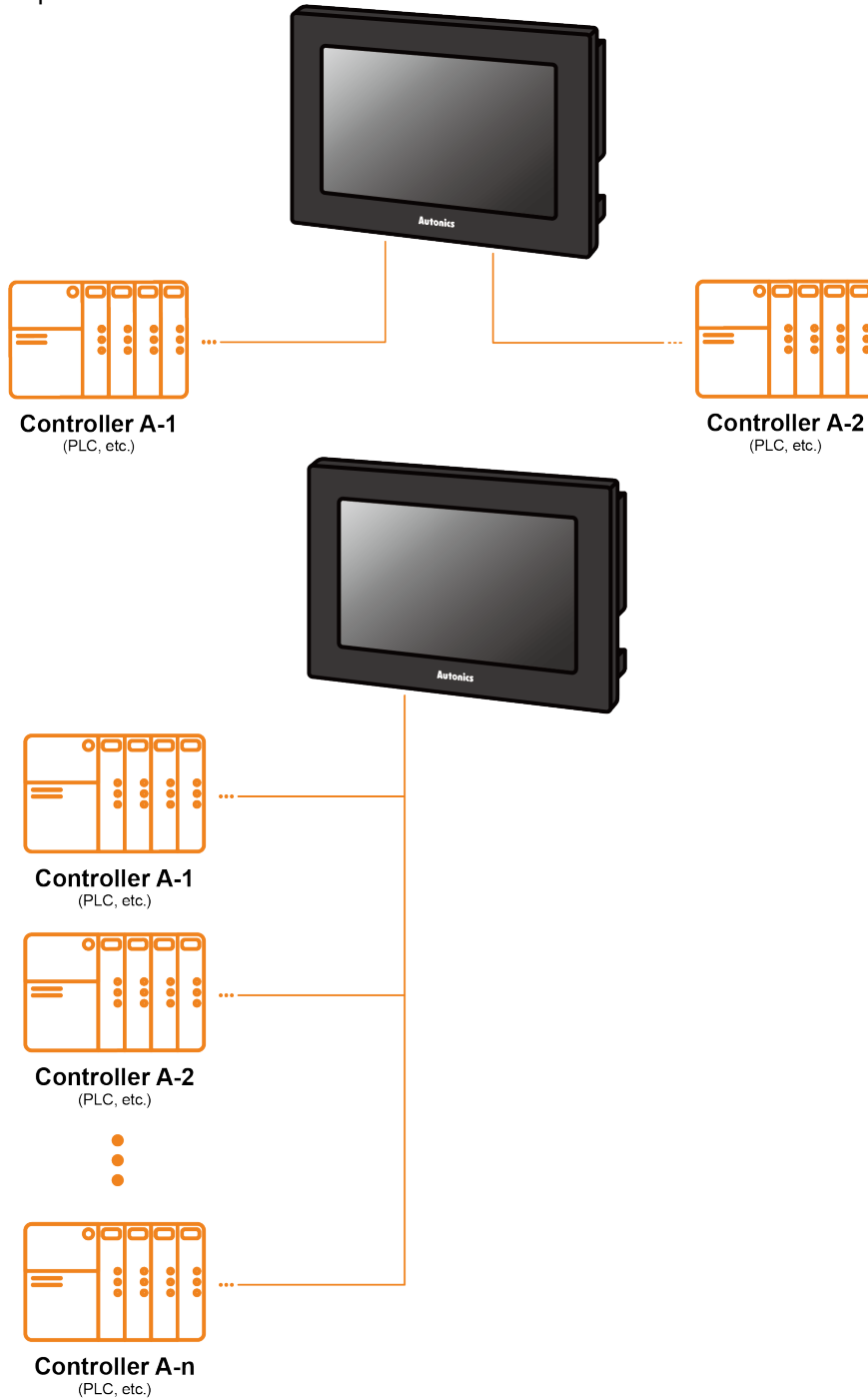
Series	Connecting port	Description
GP/LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device ^{※1} communication available
GP/LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN ^{※2} port	Direct communication available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

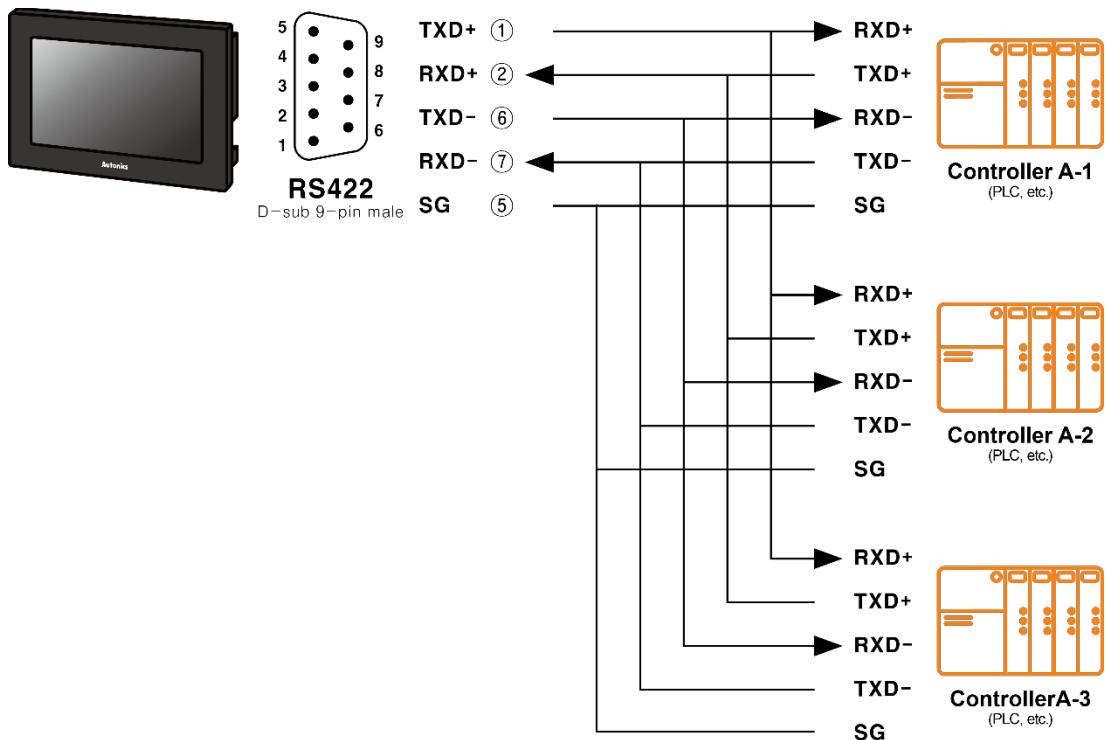
- GP/LP-A Series

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

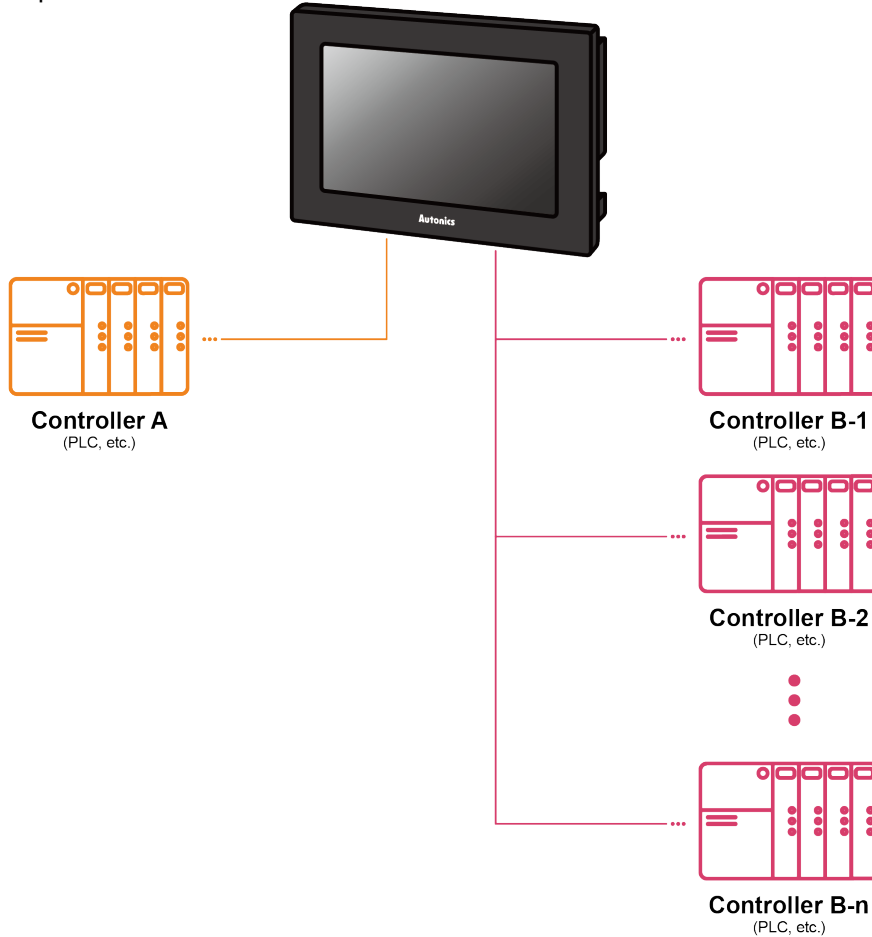
Series	Connecting port	Description
GP/LP-A070	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port	Direct communication available Link device*1 communication available
GP/LP-A104	RS422 or RS232C-A port, RS232C or RS232C-B port, Ethernet port, CAN*2 port	Direct communication available Link device*1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

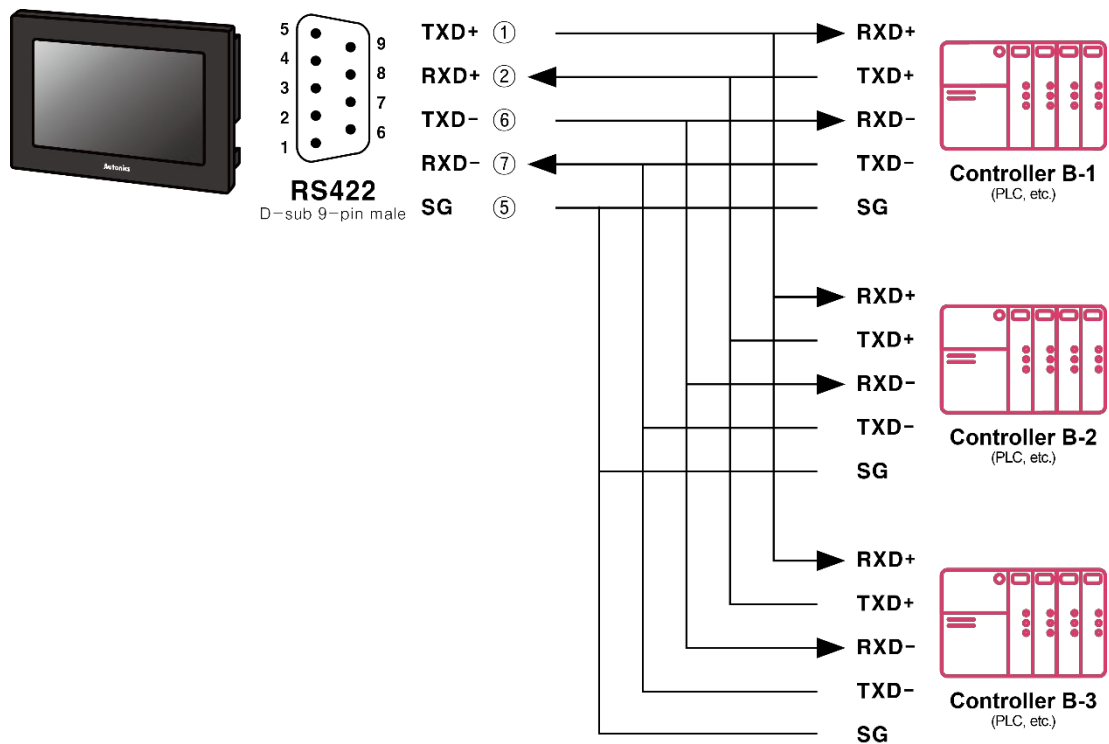
- GP/LP-A Series

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.

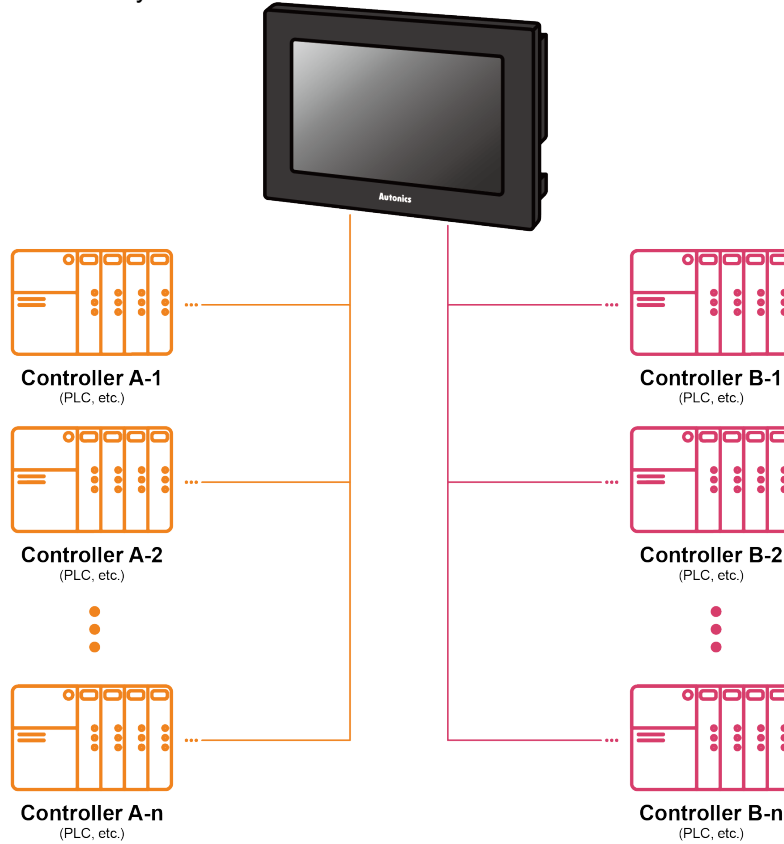
※2: Only Autonics' ARD Series can be connected to CAN port.

(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

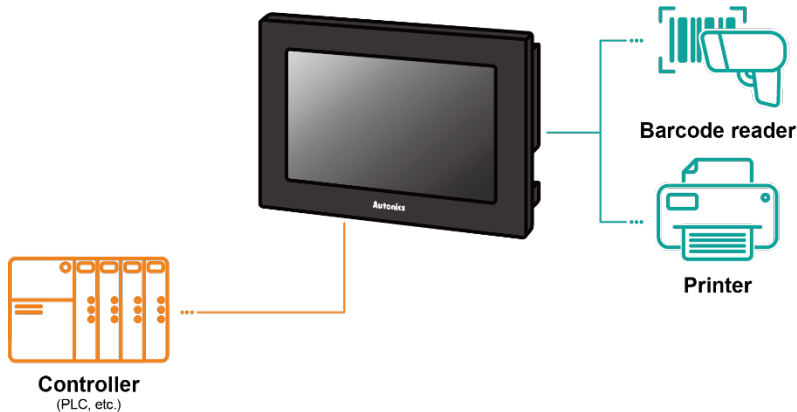
※1: Please refer to 'GP Editor User Manual' for Link device instruction.

※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 Universal (General Communication)

Universal indicates general purpose of communication, Modbus Slave communication is supported in GP/LP.

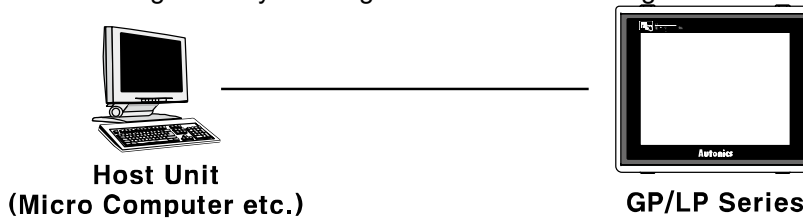
2.1.1 Connectable GP/LP Model

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
UNIVERSAL	Modbus (Slave)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

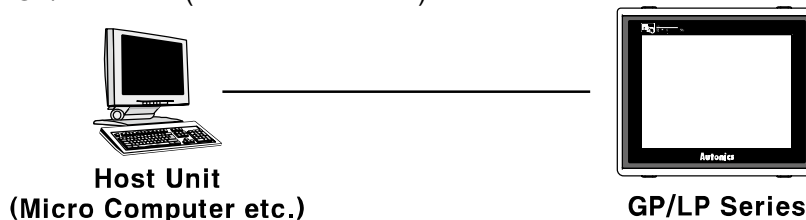
2.1.2 System Organization

Microcomputer using as host unit is able to execute slave communicate with GP/LP through RS-232C or RS-422(RS-485) communication port. Host unit read and write inner register(UB, UW) of GP/LP as communication commander. Host unit as master transmits command to GP/LP and GP/LP as slave executes designated operation according to transmitted command and sends respond message.

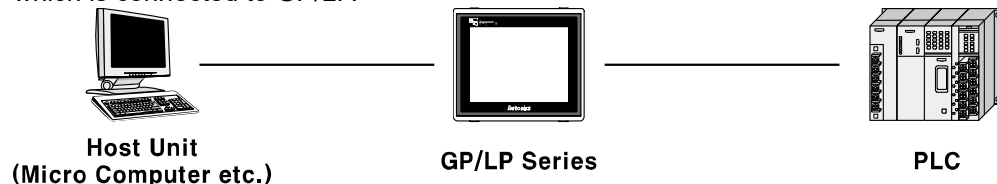
The following is the system organization for connecting with GP/LP and host unit.



- Universal 1:1 Communication**
 Universal 1:1 indicates communication between one host unit and one GP/LP to monitor GP/LP status. (It is able to extend.)



- Universal 1:1:1 Communication**
 Universal 1:1:1 indicates communication between one host unit, one GP/LP and one PLC which is connected to GP/LP.



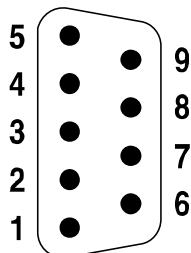
2.1.3 Cable Wiring for Communication Port

2.1.3.1 RS232C

(1) Transmission specification

No	Item	Description	
1	Communication method	Full Duplex	
2	Sync method	Asynchronous	
3	Connection distance	Approx. 15m	
4	Connection type	1:1	
5	Baud rate	300/600/1200/3200/4800/9600/19200/38400/57600/115200bps	
6	Data type	Data length	7, 8 bit
		Parity	None, Odd, Even
		Stop bit	1, 2 bit

(2) Connector pin number and function



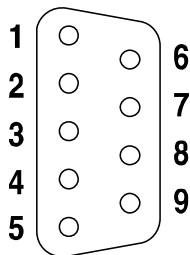
No	Function	No	Function
1	-	6	DSR
2	RXD	7	-
3	TXD	8	-
4	DTR	9	-
5	SG		

2.1.3.2 RS422

(1) Transmission specification

No	Item	Description	
1	Communication method	Full Duplex	
2	Sync method	Asynchronous	
3	Connection distance	Approx. 15m	
4	Connection type	1:1,1:N	
5	Baud rate	300/600/1200/3200/4800/9600/19200/38400/57600bps	
6	Data type	Data length	7, 8 bit
		Parity	None, Odd, Even
		Stop bit	1, 2 bit

(2) Connector pin number and function



GP-2480				GP-S044, GP-S057, GP-S070 LP-S044, LP-S070 GP-A070, GP-A104 LP-A070, LP-A104			
No	Function	No	Function	No	Function	No	Function
1	TXD+	6	TXD-	1	TXD+	6	TXD-
2	RXD+	7	RXD-	2	RXD+	7	RXD-
3	RTS-	8	RTS+	3	-	8	-
4	CTS+	9	CTS-	4	-	9	-
5	SG			5	SG		

2.1.4 Communication Configuration

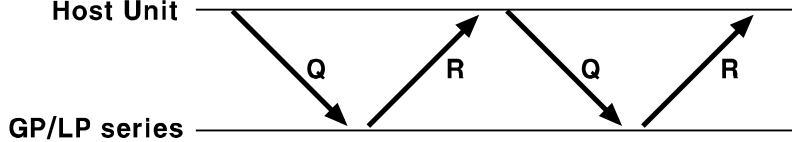
The following table is for communication configuration of host unit.

No	Item	Description	Note	
1	Communication mode	RTU	Not used	
2	Baud rate	38400 bps	Fixed	
3	Data type	Data length	8 bit	Fixed
		Parity	None	Fixed
		Stop bit	1 bit	Fixed
4	Address	1 to 31	Designate in GP/LP	

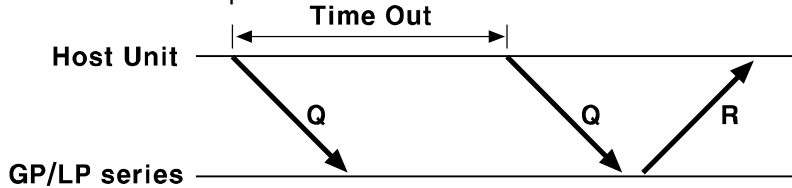
2.1.5 Universal Protocol

Modbus RTU is a standard. It communicates with host unit as master, GP/LP as slave. In host unit, it transmits Query to GP/LP, GP/LP executes designated operation according to received command and send response. When it receives Query of master and slave does not respond because of detection of error including parity, CRC or communication error, master re-transmits Query as timeout.

- Normal communication



- When there is no response



※ For more details, refer to general modbus protocol manual.

2.1.5.1 Available Address

It uses UB, UW device as GP/LP inner memory.

Type	Device	Range				Enable Read/Write
		S Series		A Series		
		Start	End	Start	End	
Bit	Coil	UB150	UB4095F	UB810	UB4095F	Write
	Input status	UB0	UB4095F	UB0	UB4095F	Read
Word	Input register	UW0	UW6047	UW0	UW65535	Read
	Holding register	UW15	UW6047	UW81	UW65535	Write

2.1.5.2 Available Function Code

There are several functions for using Modbus. Available functions in GP/LP general-purpose communication are four as below.

Code	Function	Read/Write	Description
01	Read Coils	Read	Read the corresponding address
15	Force Multiple Coils	Write	Write the corresponding address
03	Read Holding Register	Read	Read the corresponding address
16	Preset Multiple Register	Write	Write the corresponding address

Additional function code will be upgraded.

2.1.6 Communication Frame Organization

2.1.6.1 Query Master Part

Address	Function code	Data area	CRC	
			L	H
①	②	③	④	

Item	Description
①Address	It is slave address (HEX) receiving a message from master. Setting range is 0 to 255. If it is 0, it is broadcast query, which sends message to every slave.
②Function code (HEX)	Slave executes designated function according to function code. Available set code is 01(Read Coils), 15(Force Multiple Coils), 03(Read Holding Register) and 16(Force Multiple Register).
③Data area (HEX)	Transmit data related with function code. Data organization consists of (Upper 1byte) + (Lower 1byte) of the appropriate address. The length of area is variable and it is able to communicate without data.
④CRC(HEX)	It is error check area. It calculates using CRC-16 code. It consists of 2byte. (Lower 1byte of CRC) + (Upper 1byte of CRC)

(1) Read Coils(Func01-01H)

Slave Address	Function (Command)	Starting Address		No. of Points (Number of data)		Error Check (CRC16)	
		Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)	Lo(Lower)	Hi(Upper)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

(2) Force Multiple Coils(Func15-0FH)

Slave Address	Function (Command)	Starting Address		No. of Coils		Byte Count
		Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)	
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

Data	Data	Data	Data	Error Check (CRC16)	
				Lo(Lower)	Hi(Upper)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

(3) Read Holding Registers(Func03-03H)

Slave Address	Function (Command)	Starting Address		No. of Points (Number of data)		Error Check (CRC16)	
		Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)	Lo(Lower)	Hi(Upper)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

(4) Preset Multiple Registers(Func16-10H)

Slave Address	Function (Command)	Starting Address		No. of Points (Number of register)		Byte Count
		Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)	
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

Data	Data	Data	Data	Error Check (CRC16)	
				Hi(Upper)	Lo(Lower)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

2.1.6.2 Response Slave Part

Address	Function code	Data area	CRC	
			L	H

① ② ③ ④

Item	Description
①Address	It is slave address (HEX) for confirmation about Query.
②Function code(HEX)	Transmits same function code sent by Master for confirmation about Query.
③Data area (HEX)	Transmits data related with function code. The length is variable.
④CRC(HEX)	It is error check area. It calculates using CRC-16 code. It consists of 2byte. (Lower 1byte of CRC) + (Upper 1byte of CRC).

(1) Read Coils(Func01-01H)

Slave Address	Function (Command)	Byte Count	Data	Data	Data	Data
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

Error Check (CRC16)	
Lo(Lower)	Hi(Upper)
1Byte	1Byte

(2) Force Multiple Coils(Func15-0FH)

Slave Address	Function (Command)	Starting Address		No. of Coil		Error Check (CRC16)	
		Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)	Lo(Lower)	Hi(Upper)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

(3) Read Holding Registers(Func03-03H)

Slave Address	Function (Command)	Byte Count	Data		Data	
			Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

Data		Error Check (CRC16)	
Lo(Lower)	Lo(Lower)	Hi(Upper)	Hi(Upper)
1Byte	1Byte	1Byte	1Byte

(4) Preset Multiple Registers (Func16-10H)

Slave Address	Function (Command)	Starting Address		No. of Resigter		Error Check (CRC16)	
		Hi(Upper)	Lo(Lower)	Hi(Upper)	Lo(Lower)	Lo(Lower)	Hi(Upper)
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

2.1.6.3 Error

Address	Function code	Error code	CRC	
			L	H

① ② ③ ④

Item	Description
①Address	It is slave address (HEX) for confirmation about Query.
②Function code (HEX)	It is transmitted when Slave cannot process requirement of Master. It transmits after set the most upper bit of function code Master transmitted as 1.
③Error code ^{※1} (HEX)	Transmits the specific error code.
④CRC(HEX)	It is error check area. It calculates using CRC-16 code. It consists of 2byte. (Lower 1byte of CRC) + (Upper 1byte of CRC).

※ Error code value

Code	Name	Description
01	Negative function	Operation function code not supported to slave
02	Negative function	Address not existing in slave
03	Negative data	Data which cannot be written in slave

2.1.7 Universal Function Example

2.1.7.1 01 (Read Coils)

It reads contents of sequent coil. There is no Broadcast (Address designation of Slave as 0). Available address is 000000 to 65535, it accords slave UB00000 to UB4095F.



Ex.

When reading 5 register data from UB0180 to UB0184 of GP/LP with address no.31

GP, LP	
Address	Data
UB0180	ON
UB0181	OFF
UB0182	OFF
UB0183	ON
UB0184	ON

▪ Query

Address	Function code	Start address		Number of read register		CRC	
0x1F	0x01	0x01	0x20	0x00	0x05	0xFF	0X81
①	②	③	④	⑤	⑥	⑦	⑧

Item	Description
① Address	Slave address is 31, 31=(HEX)0X1F
② Function code	01
③ Start address upper byte	Start address is UB180.
④ Start address lower byte	UB180(288) = Upper(Hex)0x01 + Lower(Hex)0x20
⑤ Number of read register upper byte	Total number of byte on data area
⑥ Number of read register lower byte	Total number of data to write: 5, 5 = (Hex)0x05
⑦ CRC lower byte	
⑧ CRC upper byte	



Note

How to calculate integer 0 type address by UB address value of GP/LP
Displays as below after divided integer type address value by 16.

Device display	Address/16	Quotient	Remainder(displays hexadecimal)
	UB	Decimal	Hexadecimal(4bit)



Ex.

When calculating 3000 address as UB

Device display	Address/16	Quotient	Remainder(displays hexadecimal)
	3000	187	8

Therefore, address value 3000 corresponds to UB 1878.

▪ Response

Address	Function code	The number of data byte	Data	CRC	
0x1F	0x01	0x01	0x19	0x96	0x6A

①

②

③

④

⑤

⑦

Item	Description
①Address	Address of slave
②Function code	01
③The number of data byte	Total number of byte on data area Total number of data to write: 5 word = 1 byte. 1 = (Hex)0x01
④Data	
⑤, ⑦CRC	Lower byte
	Upper byte

2.1.7.2 15 (Force Multiple Coils)

It writes contents of sequent coil. When designating (Broadcast) slave station as 0, it writes in same address of slave.

Available address is 000240 to 65535, it accords slave UB00150 to UB4094F of GP/LP.



Ex.

In case of writing next data in UB1000 to UB1004 of GP with station no. 05

Address	Data
UB1000	OFF (0)
UB1001	ON (1)
UB1002	OFF (0)
UB1003	ON (1)
UB1004	ON (1)

▪ Query

Address	Function code	Start address		The number of register		The number of data byte	Alternation data	CRC	
0x05	0x0F	0x06	0x40	0x00	0x05	0x01	0x1A	0xEE	0xC7
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

Item	Description
① Address	Address station is 05, 05 = (Hex)0x05
② Function code	15. 15 = (Hex)0x0F
③ Start address upper byte	Start address is UB1000. UB1000(1600)=Upper(Hex)0x06 + Lower(Hex)0x40
④ Start address lower byte	
⑤ The number of register upper byte	Total number of data to write 5 = Upper(Hex)0x00 + Lower(Hex)0x05
⑥ The number of register lower byte	
⑦ The number of data byte	Total number of byte on data area Total number of data to write: 5. It is 5bit, it displays as 1byte. 1 = (Hex)0x01
⑧ Alternation data byte	Data value to write on UB1000
⑩ CRC lower byte	-
⑨ CRC upper byte	-

- Response

Address	Function code	Start address		The number of register		CRC	
0x05	0x0F	0x06	0x40	0x00	0x05	0x95	0x10

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Item	Description
①Address	Slave address is 05, 05 = (Hex)0x05
②Function code	15. 15 = (Hex)0x0F
③Start address upper byte	Start address is UB1000. 1000 = Upper(Hex)0x06 + Lower(Hex)0x40
④Start address lower byte	
⑤The number of register upper byte	Total number of data to write 5 = Upper(Hex)0x00 + Lower(Hex)0x05
⑥The number of register lower byte	
⑦CRC lower byte	-
⑧CRC upper byte	-

2.1.7.3 03 (Read Holding Register)

It reads contents of sequent holding register. There is no Broadcast(Station designation of Slave as 0). Available address is 00000 to 06047, it accords slave UW0000 to UW6047 of GP/LP.



Ex.

In case of reading 5 register data from UW0000 to UW0004 of GP/LP with station no.31

GP		
Address	Data (DEC)	Data (HEX)
UW0000	10	H000A
UW0001	20	H0014
UW0002	30	H001E
UW0003	40	H0028
UW0004	50	H0032

▪ Query

Address	Function code	Start address		The number of read register		CRC	
0x1F	0x03	0x00	0x00	0x00	0x05	0xE6	0x71
①	②	③	④	⑤	⑥	⑦	⑧

Item	Description
①Address	Slave address is 31, 31=(HEX)0X1F
②Function code	03
③Start address upper byte	It conforms 0000
④Start address lower byte	
⑤The number of read register upper byte	Total 5.5=upper(HEX)0X00+lower(HEX)0X05
⑥The number of read register lower byte	
⑦CRC lower byte	
⑧CRC upper byte	

Response

Address	Function code	The number of data byte	Data 1		Data 2		Data 3	
0x1F	0x03	0x0A	0x00	0x0A	0x00	0x14	0x00	0x1E
①	②	③	④	⑤	⑥	⑦	⑧	⑨

Data 4		Data 5		CRC	
0x00	0x28	0x00	0x32	0x8F	0xD6
⑩	⑪	⑫	⑬	⑭	⑮

Item	Description
①Address	Slave address
②Function code	03
③The number of data byte	The total number of byte of data area. Total 5Word=10byte
④, ⑥Data1	Upper byte of UW0000
	Lower byte of UW0000
⑥, ⑦Data2	Upper byte of UW0001
	Lower byte of UW0001
⑧, ⑨Data3	Upper byte of UW0002
	Lower byte of UW0002
⑩, ⑪Data4	Upper byte of UW0003
	Lower byte of UW0003
⑫, ⑬Data5	Upper byte of UW0004
	Lower byte of UW0004
⑭, ⑮CRC	Lower byte
	Upper byte

2.1.7.4 16 (Preset Multiple Register)

It writes contents of sequent holding register. When designating(Broadcast) slave address as 0, it writes in same address of slave.

Available address is 00015 to 06047, it accords slave UW0015 to UW6047 of GP/LP.



Ex.

In case of writing next data in UW100 to UW104 of GP/LP with address no.05.

Data (DEC)	Data (HEX)
123	H007B
234	H00EA
345	H0159
456	H01C8
567	H0237

Query

Address	Function code	Start address		The number of register	The number of data byte		Alternation data 1	
0x05	0x10	0x00	0x64	0x00	0x05	0x0A	0x00	0x7B
①	②	③	④	⑤	⑥	⑦	⑧	⑨

Alternation data 2		Alternation data 3		Alternation data 4		Alternation data 5		CRC	
0x00	0xEA	0x01	0x59	0x01	0xC8	0x02	0x37	0xA6	0xC9
⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲

Item	Description
①Address	Slave address is 05, 05 = (Hex)0x05
②Function code	16. 16 = (Hex)0x10
③Start address upper byte	Start address is UW100. 100 = upper (Hex)0x00 + lower (Hex)0x64
④Start address lower byte	
⑤The number of register upper byte	The total number of data to write. 5 = upper (Hex)0x00 + lower (Hex)0x05
⑥The number of register lower byte	
⑦The number of data byte	The total number of byte of data area. The total number of data to write: 5 Word = 10 byte. 10 = (Hex)0x0A
⑧Alternation data 1 upper byte	Upper byte value of data to write in UW100
⑨Alternation data 1 lower byte	Lower byte value of data to write in UW100
⑩Alternation data 2 upper byte	Upper byte value of data to write in UW101
⑪Alternation data 2 lower byte	Lower byte value of data to write in UW101
⑫Alternation data 3 upper byte	Upper byte value of data to write in UW102
⑬Alternation data 3 lower byte	Lower byte value of data to write in UW102

Item	Description
⑭ Alternation data 4 upper byte	Upper byte value of data to write in UW103
⑮ Alternation data 4 lower byte	Lower byte value of data to write in UW103
⑯ Alternation data 5 upper byte	Upper byte value of data to write in UW104
⑰ Alternation data 5 lower byte	Lower byte value of data to write in UW104
⑱ CRC lower byte	
⑲ CRC upper byte	

Response

Address	Function code	Start address		The number of register		CRC	
0x05	0x10	0x00	0x64	0x00	0x05	0x40	0x51

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Item	Description
① Address	Slave address is 05, 05 = (Hex)0x05
② Function code	16. 16 = (Hex)0x10
③ Start address upper byte	Start address is UW100. 100 = upper (Hex)0x00 + lower (Hex)0x64
④ Start address lower byte	
⑤ The number of register upper byte	The total number of data to write. 5 = upper (Hex)0x00 + lower (Hex)0x05
⑥ The number of register lower byte	
⑦ CRC lower byte	
⑧ CRC upper byte	

2.1.7.5 Exception Response

It transmits function code response after set the most upper bit of function code master transmitted as 1.



Ex.

In case of reading 5 data of input register UW0000 to UW0004 with address no.5.

▪ Query

Address	Function code	Start address		The number of read register		CRC	
0x05	0x04	0x00	0x00	0x00	0x05	0x31	0x8D
①	②	③	④	⑤	⑥	⑦	⑧

Item	Description
① Address	Slave address is 05, 05 = (Hex)0x05
② Function code	04. It is not available code.
③ Start address upper byte	0000 is a real address for 30001.
④ Start address lower byte	
⑤ The number of read register upper byte	
⑥ The number of read register lower byte	
⑦ CRC lower byte	
⑧ CRC upper byte	

▪ Response

Address	Function code	Error code	CRC	
0x05	0x84	0x01	0x83	0x06
①	②	③	④	⑤

Item	Description
① Address	Slave address is 05, 05 = (Hex)0x05
② Function code	84. The top bit is 1 in function code 04 transmitted by master.
③ Error code	01. Operation function code error not supported to slave.
④ CRC lower byte	
⑤ CRC upper byte	

Make Life Easy: Autonics

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

MTA-GPLPC_Universal-V1.0-1907US