Communication Unit Supporting Code Scanner
WB9Z-CU100

PLC Connection
User's Manual

IDEC CORPORATION

Introduction

Attention

- IDEC Corporation holds all rights related to this manual. Unauthorized duplication, reproduction, sales, transfers, or leasing without the express consent of IDEC is prohibited.
- Information contained in this manual may be changed or updated without notice.
- Every effort has been made to ensure the accuracy of the information contained in this manual. However, if you do note any errors or inconsistencies please contact the dealer from which you purchased the product or an IDEC sales representative.

Trademarks

MELSEC, GX Works2, GX Works3, and SLMP are all registered trademarks of Mitsubishi Electric Corporation.

General terms, abbreviations, and terminology used in this manual

The general terms, abbreviations, and terminology used in this manual are as follows.

Item	Definition
Communication unit	Indicates "WB9Z-CU100".
PoE	Stands for Power over Ethernet. Technology to supply power using Ethernet cables.
Receive buffer	This is a storage area for temporarily storing received data.
Transmit buffer	This is a storage area for temporarily storing data before transmission.
Control character	ASCII code 00H - 1FH, 7FH. In this document, ☐ is used for expressing these values.
Prefix	This is character data attached to the beginning of output data or a communication command.
Suffix	This is character data appended to the end of output data or a communication command.
Our website	www.idec.com/

Graphic Symbol Glossary

This manual uses the following graphic symbols to simplify explanations:

Notes

Graphic Symbol	Description
⚠ **Warning**	Failure to operate the product in accordance with the information provided may result in severe personal injury or death.
⚠ **Caution**	Failure to operate the product in accordance with the information provided may result in personal injury or damage to equipment.
⚠	Notes information that should be carefully noted. Failure to operate the product in accordance with the information provided may affect the appearance and performance of the main unit as well as any peripheral devices.
📝	Denotes additional information that may prove useful for using a given function.

Related manuals

Manuals related to the Communication Unit are as follows. Refer to them together with this manual.
All related manuals are available for download from our website.

Type	Manual name	Details
B-2024	Communication Unit Supporting Code Scanner WB9Z-CU100 PLC Connection Use's Manua (this manual)	Explains the Ethernet protocol-based PLC connection.
B-1945	Instruction Sheet: WB2F 2D Code Scanner	Included with the product.
B-1946	Instruction Sheet: WB9Z-CU100 Communication Unit	Included with the product.
B-1952	WB2F 2D Code Scanner User's Manual	Gives an overview of the functions and capabilities of the WB2F, and instructions on its use.
B-1960	WB2F 2D Code Scanner PLC Connection User's Manual	Explains about PLC Connection.
B-1964	Communication Unit Supporting Code Scanner WB9Z-CU100 User's Manual	Gives an overview of the functions and capabilities of the communication unit as well as instructions on its use.

Contents

3 Setting and Wiring **3-1**

Index **A-1**

Revision history **A-2**

1 Overview

This chapter provides an overview of the PLC connection function (Ethernet), its limitations, supported models, supported PLC, supported code scanners and its settings items.

1.1 PLC connection

The PLC connection is a device in which the read result of symbols is directly written to the data memory of a PLC (Programmable Logic Controller).

Because the communication unit supports the PLC and code scanner communication protocols, there is no need to create a special program in the PLC for communication.

Communication between the communication unit and the PLC utilizes Ethernet, while communication between the communication unit and the code scanner utilizes RS-232.

Code scanner	**Communication unit**	**PLC**
Code scanner protocol (RS-232)	PLC communication protocol (Ethernet)	
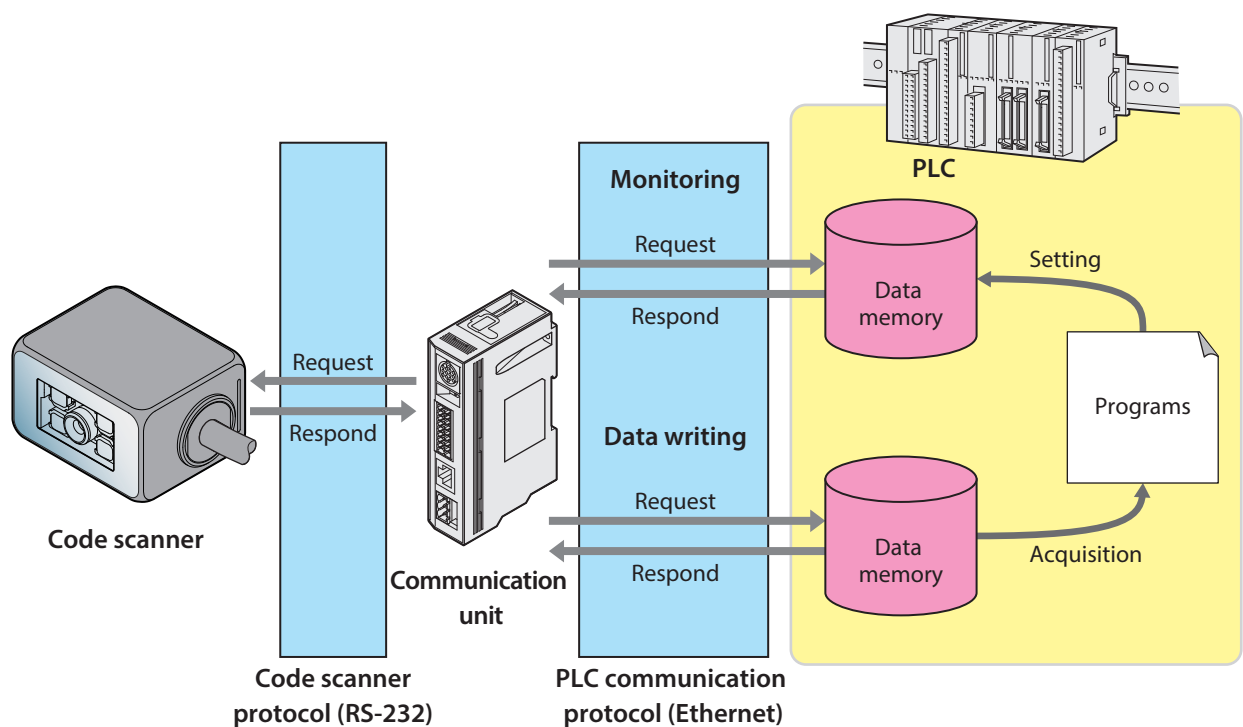
✎ **What is data memory?**

It is the general storage area incorporated in PLC, allowing read and write.

The data exchange between the Code scanner and PLC uses data memory.

The name and size corresponding to the data memory depends on the PLC.

For details, refer to ☞ [1. 5 Applicable Code scanner] on page 1-3.

1.2　Limitation

Follow the limiations below when using the PLC connection.

- The maximum volume of symbol data transmittable to the PLC is 256 bytes.

- The maximum amount of symbol data which can be received from the code scanner is 256 bytes.

- The function does not support the reading of symbol data containing a NULL(0x00)".

- Reading operation is available only at single read.

- The communication unit's setting values cannot be obtained or changed via Ethernet.

- The code scanner's setting values cannot be obtained or changed via Ethernet.

1.3　Applicable Models

The Communication Unit that supports the function is as follows:

Model	Version of main application	Remarks
WB9Z-CU100	A-001.010.00 and higher	March 2018 release version

1.4　Applicable PLC

The function is supported by the following PLCs:

Manufacturer	Series	Model	Connection method	Protocol
Mitsubishi Electric	MELSEC iQ-R	RJ71EN71	Ethernet	SLMP (ST model, TCP/IP)
		RnCPU[*1]		
		RnENCPU		
		RnPCPU		
		RnSFCPU-SET		
	MELSEC iQ-F	FX5U CPU (FX5U-32MT/ES)[*1]		
		FX5UC CPU		
	MELSEC Q	QJ71E71-100[*1, *2]		
		QnUDVCPU		
		QnUDECPU		
		QnUDPVCPU		
		Q12DCCPU-V		
	MELSEC L	LnCPU[*1]		
		LnCPU-BT		

*1 　　In IDEC, the operation check is performed by these models.

　　　　For the other models, please perform the operation check at the customer's side before use.

*2 　　Devices with serial number 15042 (first five digits) and higher

1.5 Applicable Code scanner

The function is supported by the following Code scanner:

Manufacturer	Series	Model	Connection method	Protocol
IDEC	WB series	WB2F-100S1B[*1]	RS-232	WB series communication commands (Communication command function: Initial setting values)

*1   In IDEC, the operation check is performed by these models.

1.6 Setting Parameters (WB9Z-CU100)

The setting parameters and setting values necessary for the PLC connection are as follows:
Adjust the setting according to the using environment.

> • All the settings of the Communication unit should be performed before using the PLC connection.
> • Please configure the communication unit's settings via the maintenance port (USB port).
> • Do not access or change any settings that are not listed here.
> • Do not access or change any settings in reserved areas.
> • When the setting values have been changed, save the setting value by "Save Set Values" on the control command.
>   Turning OFF the power, resetting, or changing the operation mode without performing "Save Set Values" will return to the setting value that existed before change.
> • You will need to perform a general system restart after the setting values are saved.
> • The communication unit has three power supply systems: external power, PoE and maintenance port (USB port).
>   To turn OFF the power, you will need to cut off all three systems.

> When configuring settings that specify ASCII code for the setting value, be aware of the following points.
> • NUL (00H) cannot be used as a setting value.
> • The characters up to the first NUL (00H) are considered the data and any data after that is not valid.
> Setting value (hex) of bold face is default value (Setting at the time of factory shipments).

Item	Sub item	Address (hex)	Size (dec)	Default (hex)	Setting value (hex)	Remarks
RS-232 setting	Communication speed	8100	1	03	00 : 1,200bps 01 : 2,400bps 02 : 4,800bps **03 : 9,600bps** 04 : 19,200bps 05 : 38,400bps 06 : 57,600bps 07 : 115,200bps 0a : 600bps	After saving, the settings are reflected when the power is turned on.
	Data length	8101	1	01	00 : 7bits **01 : 8bits**	
	Parity	8102	1	01	00 : NONE **01 : EVEN** 02 : ODD	
	Stop bits	8103	1	00	**00 : 1stop** 01 : 2stop	

Item	Sub item	Address (hex)	Size (dec)	Default (hex)	Setting value (hex)	Remarks
RS-232 setting	Flow control	8104	1	00	**00 : NONE** 01 : CTS/RTS	After saving, the settings are reflected when the power is turned on.
	Reserved	8105 - 810F	11	-	-	
Reserved		8110 - 811F	16	-	-	
Ethernet setting	Reserved	8200	1	-	-	
	Reserved	8201	1	-	-	
	IP address	8202	4	64	00000000-FFFFFFFF : IP address	After saving, the settings will be reflected upon resetting. IP address of the communication unit (WB9Z-CU100). Initial value is 192.168.1.100.
		8203		01		
		8204		A8		
		8205		C0		
	Default gateway	8206	4	01	00000000-FFFFFFFF : Default gateway	After saving, the settings will be reflected upon resetting. Initial value is 192.168.1.1.
		8207		01		
		8208		A8		
		8209		C0		
	Subnet mask	820A	4	00	00000000-FFFFFFFF : Subnet mask	After saving, the settings will be reflected upon resetting. Initial value is 255.255.255.0.
		820B		FF		
		820C		FF		
		820D		FF		
	TCP server port	820E	2	B8	0000-FFFF : port number	After saving, the settings will be reflected upon resetting. Listen port when the communication unit (WB9Z-CU100) is running a TCP/IP server. Initial value 3000
		820F		0B		
	Reserved	8210 - 8219	10	-	-	
	Remote TCP client IP address	821A	4	32	00000000-FFFFFFFF : IP address	After saving, the settings will be reflected upon resetting. IP address for connection destination when the communication unit (WB9Z-CU100) is running a TCP/IP client. Initial value is 192.168.1.50.
		821B		01		
		821C		A8		
		821D		C0		
	Reserved	821E - 8221	4	-	-	
	Remote TCP client port	8222	2	48	0000-FFFF : port number	After saving, the settings will be reflected upon resetting. Connection port when the communication unit (WB9Z-CU100) is running a TCP/IP client. Initial value 3400
		8223		0D		
	Reserved	8224	1	-	-	
	Reserved	8225	1	-	-	
	TCP client port	8226	2	00	0000-FFFF : port number	After saving, the settings will be reflected upon resetting. Own port when the communication unit (WB9Z-CU100) is running a TCP/IP client. Initial value 0 (Automatic assignment)
		8227		00		
	Reserved	8228 - 823F	24	-	-	

Item	Sub item	Address (hex)	Size (dec)	Default (hex)	Setting value (hex)	Remarks
Ethernet setting	RS-232 character timeout automatic setting	8240	1	01	00 : Disabled (manual) **01 : Enabled (auto)**	When Enabled (auto) is selected, data received on scanner port from Ethernet port, the time to transmit is automatically calculated from the RS-232 communication speed.
	RS-232 character Timeout	8241	1	05	02 - FF : Setting value by 10 ms step	Enables to freely set the time to send data received on via scanner port to the Ethernet port.
	Reserved	8242 - 827F	62	-	-	
Reserved		8280 - 84FF	352	-	-	
PLC Connection - PLC	Function enabled	8500	1	00	**00 : Disabled** 01 : Enabled	If enabled, it will begin the process to establish a connection with connected external devices at start up. New settings will be reflected after saving and resetting the device.
	Protocol Select	8501	1	00	**00 : SLMP (ST model, TCP/IP)**	Select the communication protocol of the external device that is to be connected to the WB9Z-CU100
	Reserved	8502	1	-	-	
	Reserved	8503	1	-	-	
	Monitoring cycle	8504 8505 8506 8507	4	64 00 00 00	0000000A-0000FFFF : Setting Value × 1 ms (10ms to 65,535ms)	Configure the monitoring interval for the special area.
	Timeout	8508 8509 850A 850B	4	C8 00 00 00	0000000A-0000FFFF : Setting Value × 1 ms (10ms to 65,535ms)	Configures response timeout from a PLC.
	Retry Count	850C	1	05	01 - FF : Times	Sets the number of command retransmissions to a PLC.
	Symbol data storage endian	850D	1	00	**00 : Lower→Upper** 01 : Upper→Lower	To configure the order of stocked data in data memory of PLC.
	Reserved	850E	1	-	-	
	Reserved	850F	1	-	-	
	Special Area Start Address	8510 8511 8512 8513	4	00 00 00 00	00000000 - FFFFFFFF : Special Area Start Address	When configuring the settings ensure that the special area and the scanner information area do not overlap. The special area requires 4 words (8 bytes) of data memory.
	Scanner Information Area Start Address	8514 8515 8516 8517	4	10 00 00 00	00000000 - FFFFFFFF : Scanner Information Area Start Address	
	Reserved	8518 - 853F	40	-	-	

Item	Sub item	Address (hex)	Size (dec)	Default (hex)	Setting value (hex)	Remarks
PLC Connection - PLC	Protocol Parameter [0]	8540 8541	2	0000	0000 - FFFF : Protocol Parameter	The meaning of the setting depends on each protocol selected. For details, refer to ☞ [3 Setting and Wiring] on page 3-1.
	Protocol Parameter [1]	8542 8543	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [2]	8544 8545	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [3]	8546 8547	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [4]	8548 8549	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [5]	854A 854B	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [6]	854C 854D	2	0000	0000 - FFFF : Protocol parameter	
	Protocol Parameter [7]	854E 854F	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [8]	8550 8551	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [9]	8552 8553	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [10]	8554 8555	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [11]	8556 8557	2	0000	0000 - FFFF : Protocol parameter	
	Protocol Parameter [12]	8558 8559	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [13]	855A 855B	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [14]	855C 855D	2	0000	0000 - FFFF : Protocol Parameter	
	Protocol Parameter [15]	855E 855F	2	0000	0000 - FFFF : Protocol Parameter	
	Reserved	8560 - 857F	32	-	-	
PLC Connection - Code Scanner	Reserved	8580	1	-	-	
	Protocol Select	8581	1	00	00 : WB2F communication command	Configures the protocol for the connected code scanner.
	Reserved	8582	1	-	-	
	Reserved	8583	1	-	-	
	Timeout (normal)	8584 8585 8586 8587	4	F4 01 00 00	0000000A-0000FFFF : Setting Value × 1 ms (10ms to 65,535ms)	Sets the time until code scanner response timeout. (other than for reading) Initial value 500ms
	Timeout (reading)	8588 8589 858A 858B	4	88 13 00 00	0000000A-0000FFFF : Setting Value × 1 ms (10ms to 65,535ms)	Sets the time until code scanner response timeout. (for reading) Initial value 5,000ms
	Reserved	858C - 85AF	36	-	-	
	Global Suffix	85B0 85B1 85B2 85B3 85B4 85B5 85B6 85B7	8	0D 0A 00 00 00 00 00 00	00 - FF : ASCII code 00 - FF : ASCII code 00 - FF : ASCII code 00 - FF : ASCII code 00 - FF : ASCII code 00 - FF : ASCII code 00 - FF : ASCII code 00 - FF : ASCII code	Designates a suffix identical to the suffix appended to the code scanner's symbol reading results. The communication unit determines that code scanner symbol reading is complete when it receives this value.
	Reserved	85B8 - 85FF	72	-	-	

2 Operation Specifications

This chapter describes the operation specification of the PLC connection.

2.1 Overview

The communication unit periodically reads the PLC data memory. When the data memory which is being read has any change, the function assigned to the data memory is performed. A command is also sent to the connected code scanner. This mechanism allows to perform each function of the code scanner only by setting the data memory of PLC to the specified value.

2.2 Assigning Data Memory

The communication unit performs reading and writing to the "Special area" and the "Scanner Information Area" assigned to the PLC data memory. When using this function, set where to assign these two areas in the data memory. For details of the setting, refer to

2. 3   Special Area

With the special memory area starting address as a header, the following functions shown in the table below are assigned to the data memory.By setting the corresponding bit of the correspoding address to "1", each function can be performed. The communication unit performs the requested function, and then performs zero clear of the special area.

The zero clear after the function is executed targets not only the corresponding bit of the corresponding address, but the special area entirely.

Address (OFFSET)	bit	Function	Contents
0	0	Reserved	
	1		
	2		
	3		
	4		
	5		
	6		
	7	Reserved	
	8	Symbol read stop	Stops the symbol reading
	9	Symbol read start	Starts the symbol reading.
	10 - 15	Reserved	
1	0	OK Output OFF	Stops the OK Output.
	1	OK Output ON	Starts the OK Output (the operation logic and operation time follows the setting value.)
	2	NG Output OFF	Stops the NG Output.
	3	NG Output ON	Starts the NG Output (the operation logic and operation time follows the setting value.)
	4 - 7	Reserved	
	8	Status LED (Red) OFF	Sets the Status LED (Red) to the OFF state.
	9	Status LED (Red) ON	Sets the Status LED (Red) to the ON state (the lighting pattern and the lighting time follows the setting value.)
	10	Status LED (Orange) OFF	Sets the Status LED (Orange) to OFF state.
	11	Status LED (Orange) ON	Sets the Status LED (Orange) to ON state (the lighting pattern and the lighting time follows the setting value.)
	12	Status LED (Green) OFF	Sets the Status LED (Green) to OFF state.
	13	Status LED (Green) ON	Sets the Status LED (Green) to ON state (the lighting pattern and the lighting time follows the setting value.)
	14	Reserved	
	15	Reserved	
2	0-15	Reserved	
3	0-15	Reserved	

When multiple bits are set to 1 at the same time, the lowest one is preferably executed for both address and bit. The other functions are ignored.

e.g.   When the following thee bits are set to 1 at the same time:
- [Bit 8 of Address 0]
- [Bit 9 of Address 0]
- [Bit 0 of Address 1]

The function only assigned to Bit 8 of Address 0 is executed.

e.g.   When the following three bits are set to 1 at the same time:
- [Bit 0 of Address 0]
- [Bit 9 of Address 0]
- [Bit 0 of Address 1]

The function only assigned to Bit 0 of Address 0 is executed.

2. 4   Scanner Information Area

With the scanner information area starting address as a header, the functions shown in the table below are assigned to the data memory of PLC.The communication unit writes the symbol data and the data length in the scanner information area.

Address (OFFSET)	bit	Function	Contents
0	0 - 15	Data length	Writes the data length of the symbol data.
1	0 - 7	Data [0]	
1	8 - 15	Data [1]	
2	0 - 7	Data [2]	
2	8 - 15	Data [3]	Writes the read symbol data. The storage order of the symbol data follows the setting values.
3	0 - 7	Data [4]	
3	8 - 15	Data [5]	
⋮	⋮	⋮	

The symbol data quantity is variable. Assure an adequate area of expected data length or more.

e.g. Storage example to the scanner information area

The below shows an example of storing data into the scanner information area.

The setting of the symbol data storage order can change the storage order to the data memory.

[Condition]

Scanner information area starting address: 100

Data memory Data length: 16 bits

Symbol data: "ABCDEFGHI[CR][LF]"11 bytes

Position	0	1	2	3	4	5	6	7	8	9	10
ASCII	A	B	C	D	E	F	G	H	I	[CR]	[LF]
HEX	41H	42H	43H	44H	45H	46H	47H	48H	49H	0DH	0AH

• [Storing image] (Symbol data storing order: Lower→Upper)

Address	Upper byte	Lower byte	Remarks
100	000BH		<- Number of symbol data: 11 bytes
101	42H	41H	<- Stored in the order of lower byte and upper byte.
102	44H	43H	
103	46H	45H	
104	48H	47H	
105	0DH	49H	
106	00H	0AH	<- The upper byte is padded with 00H .

• [Storage image] (symbol data storage order:Upper→Lower

Address	Upper byte	Lower byte	Remarks
100	000BH		<- Number of symbol data: 11 bytes
101	41H	42H	<- Stored in the order of upper byte and lower byte.
102	43H	44H	
103	45H	46H	
104	47H	48H	
105	49H	0DH	
106	0AH	00H	<- The lower byte is padded with 00H.

2. 5　Start and End

The PLC connection can be started and ended in the following conditions:

Start condition

With Address "8500 (PLC connection – function Enabled) in the setting parameter of the communication unit set and stored to "01 (Enable), turn the power from OFF to ON.

End condition

With Address "8500 (PLC connection – function Enabled) in the setting parameter of the communication unit set and stored to "00 (Disabled), turn the power from OFF to ON.

> ⚠ The communication unit has three power supply systems: external power, PoE and maintenance port (USB port).
> To turn off the power, you will need to cut off all three systems.

2.6　Operation Sequence

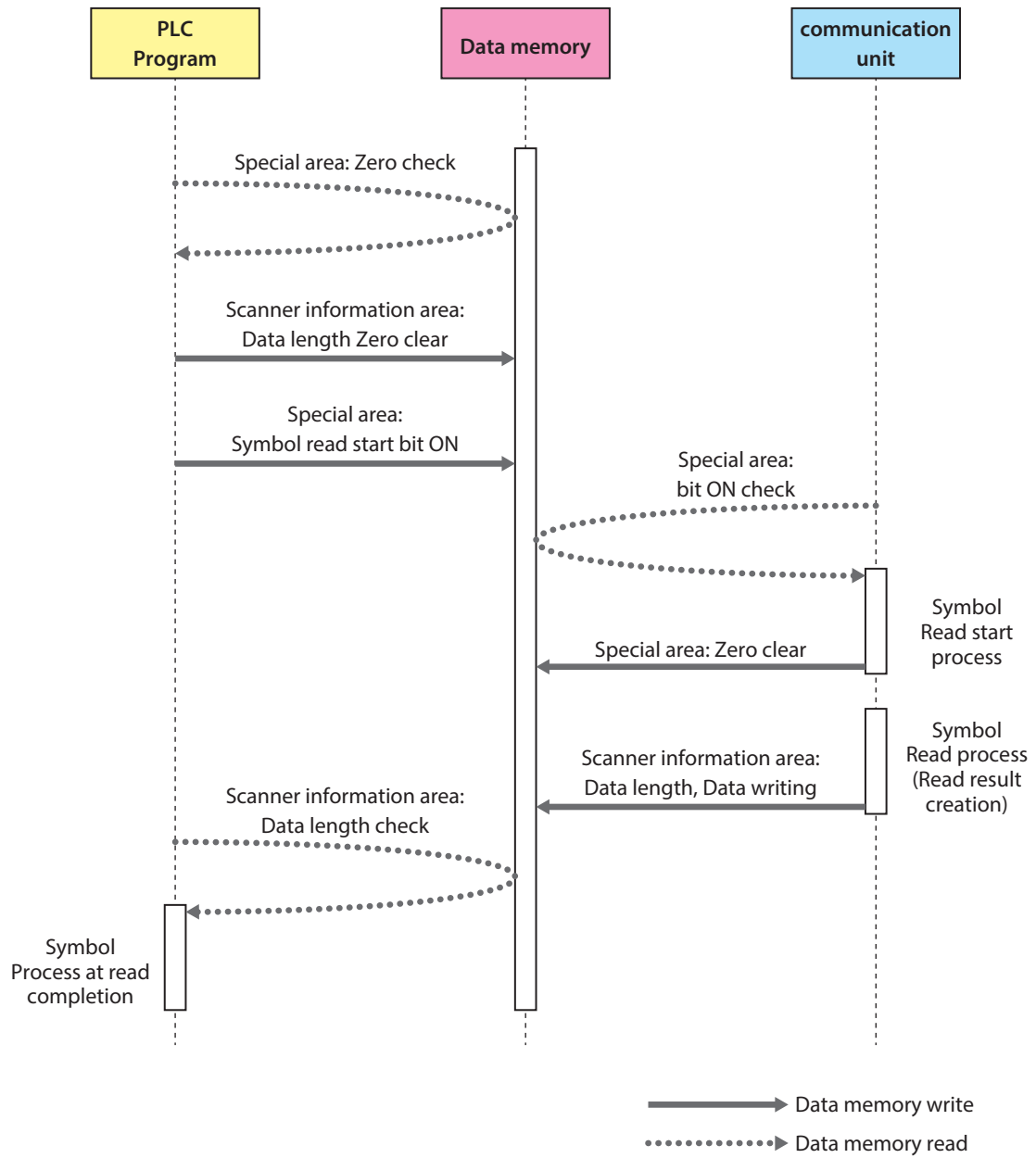The communication unit repeatedly performs the following four operations:

1 When symbol reading is completed, the writing of symbol data to the scanner information area is performed.

2 When the execution of the requested function is completed, the zero clear of the special area is performed.

3 When the bit in the special area is 1, and there is a request of function execution, the assigned function is performed.

4 If the above 1 to 3 is not applicable, reading of the special area is performed.
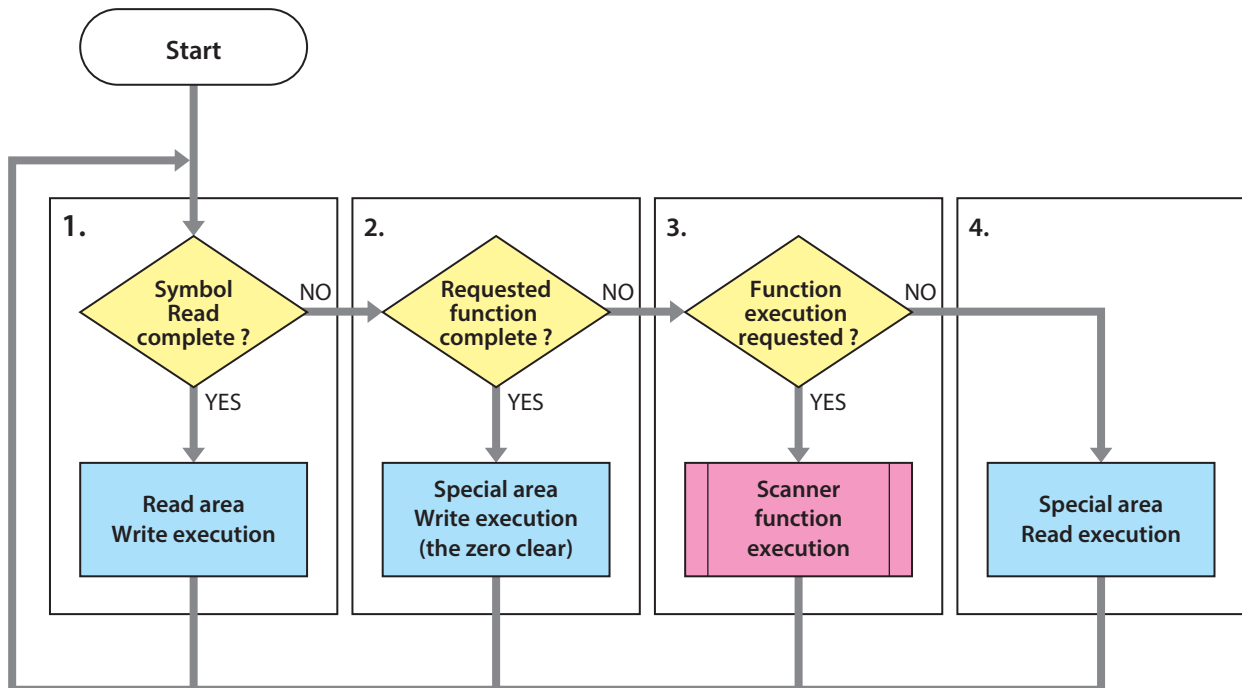
When creating a PLC program, note the following:

(1) After checking that the special area is all "0", make the bit in the special area to "1".
(On the PLC program, even when the different bit is 1 in the different timing, it is regarded that plural bits are set to 1 at the same time depending on the communication timing.)

(2) Before requesting to start reading the symbol, perform zero clear for the scanner information area (data length).

(3) If the connection between the code scanner and PLC cannot be established after the specified times of retry, the process is transferred to the "Special Area Read".

(4) When the bit in the special area is "1" when the communication is restored, the corresponding function is performed.
(Even for the function requested by the PLC program before the communication was unsuccessful, when the bit in the special area is "1" when the communication is established, the function is performed.)

e.g. PLC program and access to the data memory of communication unit

```
┌─────────────┐        ┌─────────────┐        ┌─────────────┐
│    PLC      │        │ Data memory │        │communication│
│  Program    │        │             │        │    unit     │
└─────────────┘        └─────────────┘        └─────────────┘
       ┆                      ┆                      ┆
       ┆    Special area: Zero check                 ┆
       ┆ ·························· ◄                  ┆
       ┆                      ┆                      ┆
       ┆    Scanner information area:                ┆
       ┆    Data length Zero clear                   ┆
       ┆ ─────────────────────►                      ┆
       ┆                      ┆                      ┆
       ┆    Special area:                            ┆
       ┆    Symbol read start bit ON                 ┆
       ┆ ─────────────────────►                      ┆
       ┆                      ┆   Special area:       ┆
       ┆                      ┆   bit ON check        ┆
       ┆                      ┆ ····················· ◄
       ┆                      ┆                      ┆  Symbol
       ┆                      ◄──────────────────────  Read start
       ┆               Special area: Zero clear       ┆  process
       ┆                      ┆                      ┆
       ┆                      ┆                      ┆  Symbol
       ┆    Scanner information area:                 ┆  Read process
       ┆    Data length, Data writing                 ┆  (Read result
       ┆                      ◄──────────────────────  creation)
       ┆  Scanner information area:                   ┆
       ┆  Data length check   ┆                       ┆
       ◄·······················                       ┆
   Symbol                      ┆                      ┆
   Process at read             ┆                      ┆
   completion                  ┆                      ┆
```

Legend:
- ─────────────► Data memory write
- ·············► Data memory read

3 Setting and Wiring

This chapter explains set-up and wiring for the communication unit, PLC and code scanner.

3.1 Set-up Procedure

3.1.1 Overview

Set up the communication unit, PLC and code scanner and then connect each.
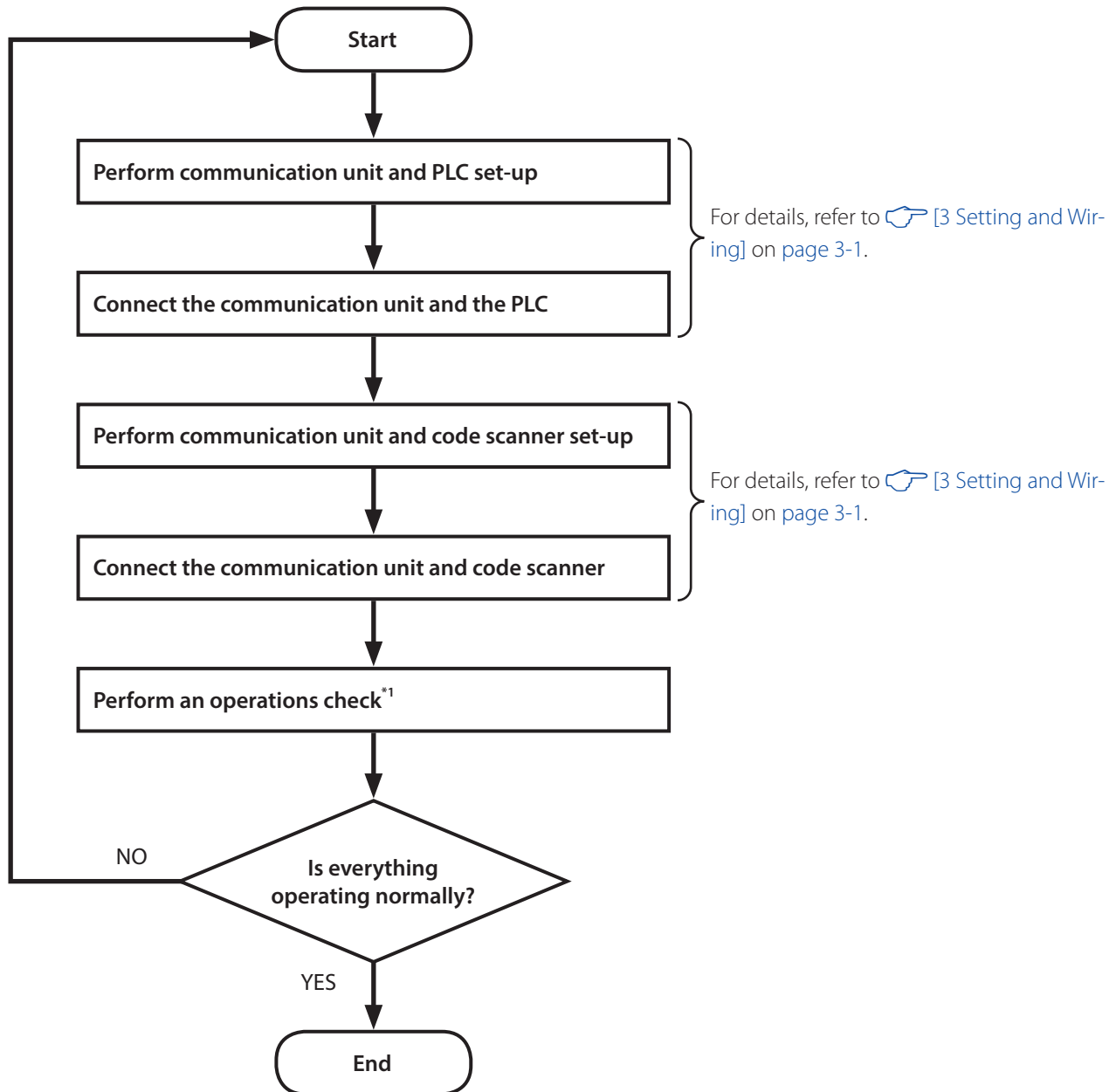Communication between the communication unit and the PLC utilizes a LAN cable (Ethernet), while communication between the communication unit and the code scanner utilizes a DIN connector (RS-232).

DIN connector connection (RS-232)

Ethernet

Code scanner

Communication unit

PLC
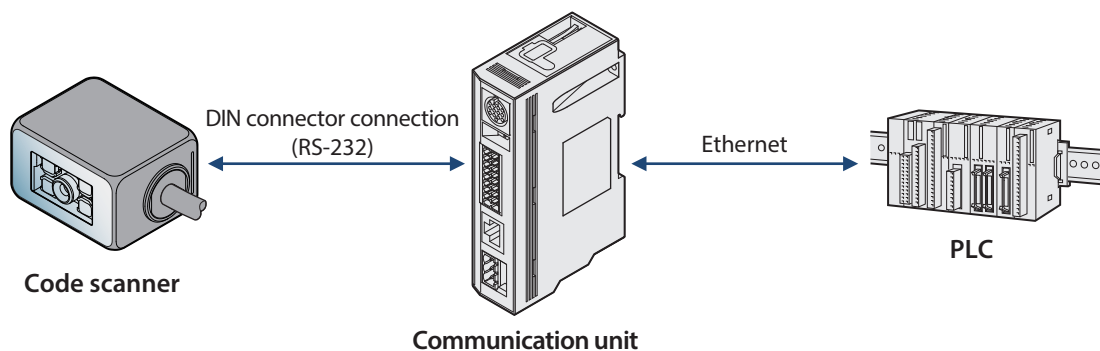
> Please refer to the appropriate manuals for the specifications of, as well as explanations of how to set up, the communication unit, PLC and code scanner.

3. 1. 2   Set-up Process

The process from set-up to operation of the PLC connection function is represented below.

*1   Before performing an operations check, switch the power for each device OFF and then back ON.

The communication unit has three power supply systems: external power, PoE and maintenance port (USB port).
To turn OFF the power, you will need to cut off all three systems.

3.2　MC Protocol Setting

3.2.1　Mitsubishi Electric (SLMP-Compatible Devices)

● **Overview**

Data is sent and received between the communication unit and the SLMP-compatible MELSEC sequencer.

SLMP stands for "SeamLess Message Protocol," and it is a shared protocol for seamlessly transmitting data between applications without worrying about network layers or boundaries in-between the CC-Link family network and generic Ethernet devices.

Under the following conditions, the communication unit is able to send and receive data with SLMP-compatible devices. The communication unit is operated as a TCP/IP client.

Protocol	Format 4, 4C frame, Check sum
Series supported [*1]	MELSEC iQ-R/iQ-F/Q/L series
Connection method	RS-232/RS-422
Data memory	Data register

*1 For the details of supporting devices, refer to　[1. 4 Applicable PLC] on page 1-2.

● **Communication Unit (WB9Z-CU100) Setting examples**

In order for the communication unit and the MELSEC sequencer to send and receive data, the communication unit's network settings and the PLC connection function settings need to be configured.
When selecting the MC protocol, the protocol parameters [0]to [15] means the following setting respecitvely.

Protocol Parameter [0]	Not used
Protocol Parameter [1]	No. of the network requested
Protocol Parameter [2]	No. of the station requested
Protocol Parameter [3]	I/O No. of the unit requested
Protocol Parameter [4]	Not used
Protocol Parameter [5]	Not used
Protocol Parameter [6]	Watchdog timer
Protocol Parameter [7] to [15]	Not used

Here describes the setting examples of the communication unit:

Item	Sub item	MC protocol Parameter	Address (hex)	Size (dec)	Setting example (hex)	Remarks
Ethernet setting	IP address		8202	4	64	C0A80164 : IP address 192.168.1.100
			8203		01	
			8204		A8	
			8205		C0	
	Default gateway		8206	4	01	C0A80101 : Default gateway : 192.168.1.1
			8207		01	
			8208		A8	
			8209		C0	
	Subnet mask		820A	4	00	FFFFFF00 : Subnet mask : 255.255.255.0
			820B		FF	
			820C		FF	
			820D		FF	
	TCP server port		820E	2	B8	0BB8 : 3000
			820F		0B	
	Remote TCP client IP address		821A	4	32	C0A80132 : IP address : 192.168.1.50
			821B		01	
			821C		A8	
			821D		C0	
	Remote TCP client port		8222	2	48	0D48 : 3400
			8223		0D	
	TCP client port		8226	2	00	0000 : 0 (Automatic assignment)
			8227		00	
PLC Connection - PLC	Function enabled		8500	1	00	01 : Enabled
	Protocol Select		8501	1	00	00 : SLMP (ST model, TCP/IP)
	Monitoring cycle		8504	4	64	00000064 : 100ms
			8505		00	
			8506		00	
			8507		00	
	Timeout		8508	4	C8	000000C8 : 200ms
			8509		00	
			850A		00	
			850B		00	
	Retry Count		850C	1	05	05 : 5Times
	Symbol data storage endian		850D	1	00	00 : Lower→Upper
	Special Area Start Address		8510	4	00	00000000 : D0
			8511		00	
			8512		00	
			8513		00	
	Scanner Information Area Start Address		8514	4	10	00000010 : D16
			8515		00	
			8516		00	
			8517		00	

Item	Sub item	MC protocol Parameter	Address (hex)	Size (dec)	Setting example (hex)	Remarks
PLC Connection - PLC	Protocol Parameter [0]		8540	2	0000	Set to 0000.
			8541			
	Protocol Parameter [1]		8542	2	0000	0000 : No. of the network requested 0
			8543			
	Protocol Parameter [2]		8544	2	0000	00FF : No. of the station requested FF
			8545			
	Protocol Parameter [3]		8546	2	0000	03FF : I/O No. of the unit requested 03FF
			8547			
	Protocol Parameter [4]		8548	2	0000	Set to 0000.
			8549			
	Protocol Parameter [5]		854A	2	0000	Set to 0000.
			854B			
	Protocol Parameter [6]		854C	2	0000	0000 : Watchdog timer
			854D			

The protocol parameters for SLMP configuration are those that are given in the SLMP item names.

● PLC Setting example

The following table shows the setting example of the MELSEQ-L Series CPU Unit L02CPU.

Parameter			Setting example	Remarks
Built-in Ethernet Port Setting	IP Address Setting	IP Address	192.168.1.50	Please change to suit the operating environment.
		Subnet Mask Pattern	255.255.255.0	
		Default Router IP Address	192.168.1.1	
	Open Setting	Protocol	TCP	
		Open System	MC Protocol	
		TCP Connection	-	Cannot be configured
		Host Station Port No.	3400	Please change to suit the operating environment.
		Destination IP Address	-	Cannot be configured
		Destination Port No.	-	
		Start Device to Store Predefined Protocol Operation Status	-	

The above setting is available by GX Works2. Here is the step.

Double-click on [Project], [Parameter], [PLC Parameter] within the navigation window to pull up the L-Parameter Settings; then, select the [Start Device to Store Predefined Protocol Operation Status] tab and perform settings configuration.

Afterwards, pull up the Open Setting window and configure the individual parameters.
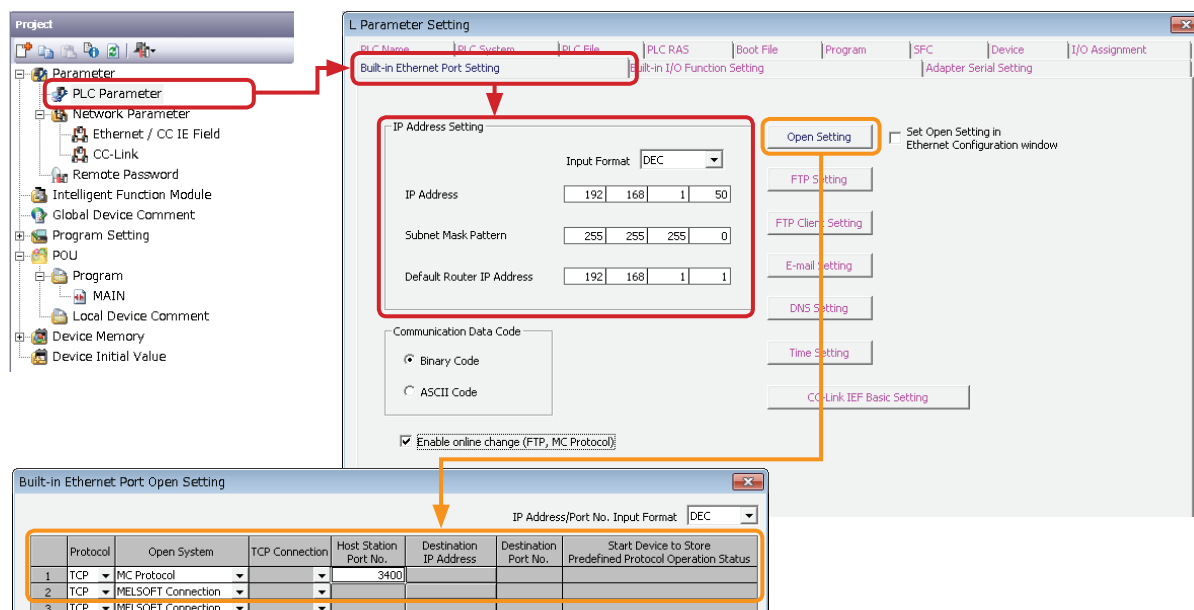
● PLC Setting example 2

The following table shows the setting example of the MELSEQ-L Series CPU Unit L02CPU.

Parameter				Setting example	Remarks
Module Parameter	Own Node Settings	IP Address	IP Address	192.168.1.50	Please change to suit the operating environment.
			Subnet Mask	255.255.255.0	
			Default Gateway	-	
		Enable/Disable Online Change		Disable All (SLMP)	
		Communication Data Code		Binary	
		Opening Method		Do Not Open by Program	
	CC-Link IEF Basic Setting	To Use or Not to Use CC-Link IEF Basic Setting		Disable	No need configuration.
		Network Configuration Settings		-	
		Refresh Settings		-	
	External Device Configuration	Model Name		SLMP Connection Module	
		Communication Method		SLMP	
		Protocol		TCP	
		Fixed Buffer Send/Receive Setting		-	Cannot be configured
		PLC	IP Address	192.168.1.50	Please change to suit the operating environment.
			Port No.	3400	
		Sensor/Device	MAC Address	-	Cannot be configured
			Host Name	-	
			IP Address	-	
			Port No.	-	
			Subnet Mask	-	
			Default Gateway	-	
		Existence Confirmation		KeepAlive	

The above setting is available by GX Works3. Here is the step.

Double-click on [Project], [Parameter], [R04CPU], [Module Parameter] within the navigation window to pull up the Settings Items window, and then perform individual parameter configuration.

Afterwards, open the Partner Connection Device Configuration Settings and configure the individual parameters.

● **Wiring example**

A communication unit (WB9Z-CU100) and L02CPU wiring example is shown below.
Please refer to the diagram when performing wiring. Please also make sure that the power is OFF when performing wiring.

e.g.   Communication Unit (WB9Z-CU100) and L02CPU Wiring

WB9Z-CU100

Ethernet port

L02CPU

Ethernet

Built-in Ethernet port
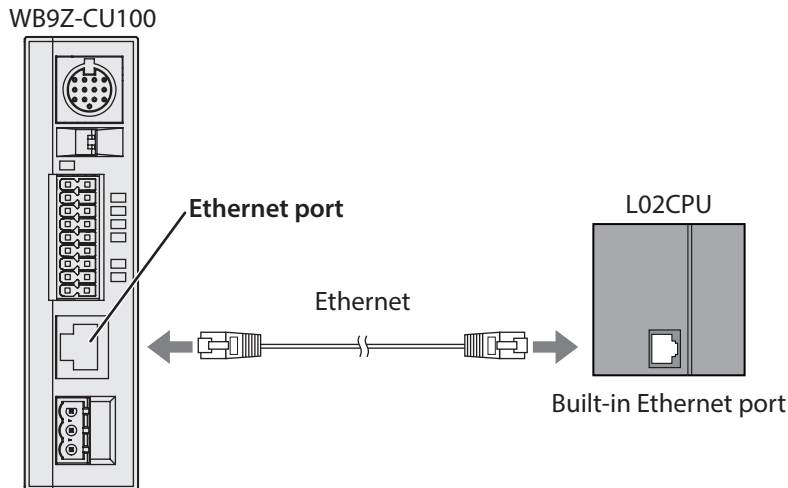
⚠ **Caution**   Before performing wiring, please make sure to carefully read the user's manuals for the communication unit (WB9Z-CU100) and the L02CPU.

Connection via an Ethernet hub is also possible.

- Please use a cable which is Category 5 or higher.
- Please use a cable no longer than 100m.
- If cable length exceeds 30m, please use a shield cable.

3.3　Code Scanner Setting

3.3.1　IDEC (WB2F)

● Overview

Data is sent and received between the communication unit and the code scanner (WB2F).

Under the following conditions, the communication unit is able to send and receive data with WB2F.

Protocol	WB series communication commands[*1]
Series supported	WB2F-100S1B
Connection method	RS-232
Data memory	• The WB2F can only be used in slave mode. • Please use the default values as the setting values for the following WB2F functions. 　- Command alias function 　- Communication command function 　- PLC connection function • WB2F reading operations support a single read only. • While data is being transmitted, please do not use the WB2F READ/ENTER button, perform external input or input communication commands via USB.

*1　WB series communication commands are the communication protocol used for IDEC code scanner WB series and external device communication.

● Communication unit (WB9Z-CU100) setting example

In order for the communication unit and the WB2F to send and receive data, RS-232 for the WB9Z-CU100 and the PLC connection function settings need to be configured.
Here describes the setting examples of the communication unit:

Item	Sub Item	Address (hex)	Size (dec)	Setting example (hex)	Remarks
RS-232 setting	Communication speed	8100	1	03	03 : 9,600bps
	Data length	8101	1	01	01 : 8bits
	Parity	8102	1	01	01 : EVEN
	Stop bits	8103	1	00	00 : 1bit
	Flow control	8104	1	00	00 : NONE
PLC Connection - Code Scanner	Protocol Select	8581	1	00	00 : WB2F communication command
	Timeout (normal)	8584	4	F4	000001F4 : 500ms
		8585		01	
		8586		00	
		8587		00	
	Timeout (reading)	8588	4	88	00001388 : 5,000ms
		8589		13	
		858A		00	
		858B		00	
	Global Suffix	85B0	8	0D	0D : CR(Carriage Return)
		85B1		0A	0A : LF(Line Feed)
		85B2		00	00 : NUL(Null)
		85B3		00	00 : NUL(Null)
		85B4		00	00 : NUL(Null)
		85B5		00	00 : NUL(Null)
		85B6		00	00 : NUL(Null)
		85B7		00	00 : NUL(Null)

● **Code Scanner setting example**

Here describes the setting examples of the code scanner (WB2F) :

Item	Sub item	Address (hex)	Size (dec)	Default (hex)	Setting value (hex)
RS-232 settings	Communication speed	0100	1	03	03 : 9,600bps
	Data length	0101	1	01	01 : 8bits
	Parity	0102	1	01	01 : EVEN
	Stop bits	0103	1	00	00 : 1bit
	Flow control	0104	1	00	00 : None
Symbol Reading	Symbol Reading	0200	1	00	00 : Single read
	Reading Timeout	0201	1	14	14 : 1,400ms
	Preventing Double Read Time	0202	1	14	14 : 1,400ms
	Reading start when power on	0204	1	00	01 : Enabled
	Decode Timeout	0207	1	05	05 : 5ms
	Number of symbols read	020E	1	01	01 : 1
	Output mode	020F	1	00	00 : Output
	Reading Result Output Port	0210	1	00	00 : RS-232
Output data additional information	Global Prefix	1000	1	00	00 : Disabled
	Global Suffix	1001	1	01	01 : Enabled
	Output addition when reading failed	100F	1	01	01 : Enabled
	No response when reading failed	1010	1	00	00 : Disabled
	Global Suffix data	1048	8	0D	0D : CR(Carriage Return)
		1049		0A	0A : LF(Line Feed)
		104A		00	00 : NUL(Null)
		104B		00	00 : NUL(Null)
		104C		00	00 : NUL(Null)
		104D		00	00 : NUL(Null)
		104E		00	00 : NUL(Null)
		104F		00	00 : NUL(Null)
	Output string data when reading failed	1050	8	3F	3F : ?
		1051		00	00 : NUL(Null)
		1052		00	00 : NUL(Null)
		1053		00	00 : NUL(Null)
		1054		00	00 : NUL(Null)
		1055		00	00 : NUL(Null)
		1056		00	00 : NUL(Null)
		1057		00	00 : NUL(Null)
Command alias	Function enabled	2000	1	00	00 : Disabled
Communication command Function	Check digit addition	2101	1	00	00 : Disabled
	Uppercase response	2102	1	00	00 : Disabled (lowercase)
	Prefix	2104	4	5E	5E : ^
		2105		00	00 : NUL(Null)
		2106		00	00 : NUL(Null)
		2107		00	00 : NUL(Null)
	Suffix	2108	4	0D	0D : CR(Carriage Return)
		2109		0A	0A : LF(Line Feed)
		210A		00	00 : NUL(Null)
		210B		00	00 : NUL(Null)
PLC Connection	Function enabled	2200	1	00	00 : Disabled

The above setting configuration can be achieved using the WB2F Support Tool.

For information on how to use this tool and for other details, please refer to the WB2F Support Tool User's Manual.

● **Wiring example**

A communication unit (WB9Z-CU100) and WB2F wiring example is shown below.

Please refer to the diagram when performing wiring. Please also make sure that the power is OFF when performing wiring

e.g.   Communication Unit (WB9Z-CU100) and WB2F Wiring
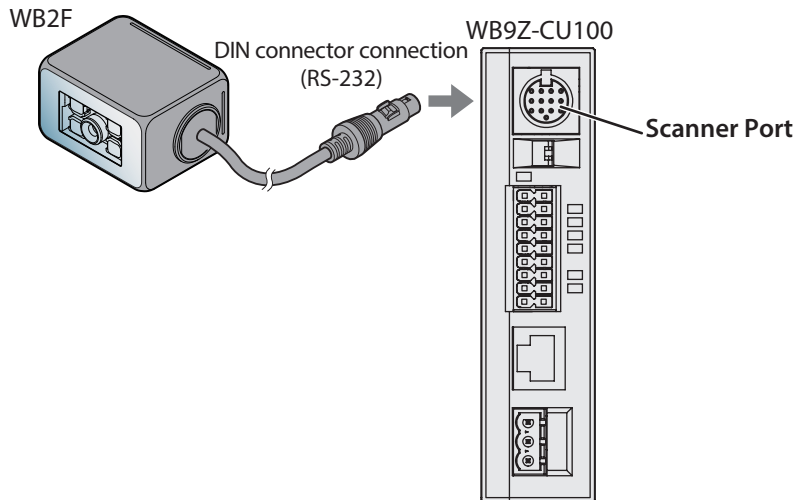
| ⚠ **Caution** | Before performing wiring, please make sure to carefully read the user's manuals for the communication unit (WB9Z-CU100) and the WB2F. |

Index

Revision history

Edition	Published	Revised content	
		Page	Points
1st Edition	2018.6	-	

Communication Unit Supporting Code Scanner WB9Z-CU100

PLC Connection User's Manual

IDEC CORPORATION

IDEC CORPORATION

www.idec.com

Head Office
6-64, Nishi-Miyahara-2-Chome, Yodogawa-ku, Osaka 532-0004, Japan

B-2024(0) JUNE 2018

IDEC

IDEC

IDEC CORPORATION