

**MELSEC iQ-F**

**Brother**

**Label Printer Sample Program  
Reference Manual**

**Version 1.00**

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## Supported printers

Supported printers
TD-4420TN
TD-4520TN
TD-4650TNWB
TD-4650TNWBR
TD-4750TNWB
TD-4750TNWBR
TJ-4005DN
TJ-4010TN
TJ-4020TN
TJ-4021TN
TJ-4021TNR
TJ-4120TN
TJ-4121TN
TJ-4121TNR
TJ-4420TN
TJ-4422TN
TJ-4520TN
TJ-4522TN
TJ-4620TN

Available printers are depending on region or countries.

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## Revision history

### Reference manual revision history

Version	Revised day	Revised content
V1.00	2023/2/1	New creation

### Sample program revision history

Version	Revised day	Revised content
V1.00	2023/2/1	New creation

## 1. Introduction

### 1.1. Precondition

This manual explains the product under the precondition that the following knowledge has already acquired.

- Mitsubishi Electric programmable controller ladder program, ST language, and FB (Function Block) are fully understood
- Development tool GX Works3 operation method is fully understood

### 1.2. Guidance for using the manual

The content of the manual you need to be referred to differs depending on which communication method your system uses to connect the sequencer and the label printer.

#### 1.2.1. For system structure with serial connection

##### 2. Outline

###### 2.1. Outline of "Sample program"

###### 2.2. Label printer structure

###### 2.2.1. RS-232C connection cable connection information

###### 2.3. System structure

###### 2.3.1. For serial connection

##### 3. Label printer unit setting

###### 3.1. Device connection

###### 3.2. Use software

###### 3.3. Serial communication settings

##### 4. Setting at programmable controller side

###### 4.1. For serial connection

##### 5. Sequence program outline

###### 5.1. Function outline

###### 5.2. Program outline

##### 6. Sequence program explanation

###### 6.1. For serial connection

## 1.2.2. For system structure with Ethernet connection

### 2. Outline

#### 2.1. Outline of “Sample program”

#### 2.2. Label printer structure

##### 2.2.2. Ethernet connection device

#### 2.3. System structure

##### 2.3.2. For Ethernet connection

### 3. Label printer unit setting

#### 3.1. Device connection

#### 3.2. Use software

#### 3.4. Ethernet communication settings

### 4. Setting at programmable controller side

#### 4.2. For Ethernet connection

### 5. Sequence program outline

#### 5.1. Function outline

#### 5.2. Program outline

### 6. Sequence program explanation

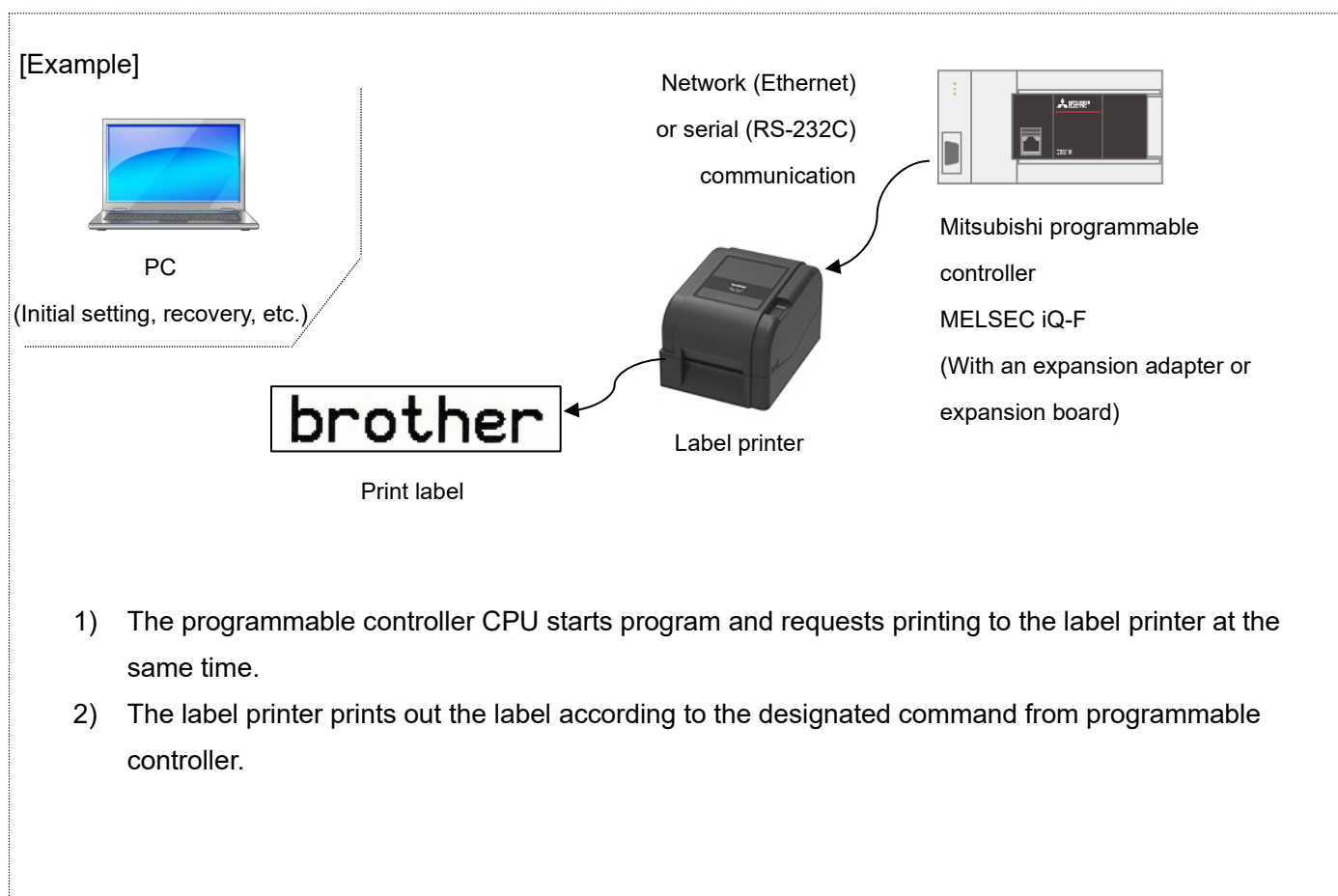
#### 6.2. For Ethernet connection

## 2. Outline

### 2.1. Outline of “Sample program”

The sample program in this manual uses the MELSEC iQ-F series programmable controller and prints out the text with Brother label printer.

In this sample program, the procedure for filling different information for each label from the programmable controller is provided.





## 2.2. Label printer structure

### ■ Label printer

The sample program is applied to the following Brother label printers.

Brother label printers
TD-4420TN
TD-4520TN
TD-4650TNWB
TD-4650TNWBR
TD-4750TNWB
TD-4750TNWBR
TJ-4005DN
TJ-4010TN
TJ-4020TN
TJ-4021TN
TJ-4021TNR
TJ-4120TN
TJ-4121TN
TJ-4121TNR
TJ-4420TN
TJ-4422TN
TJ-4520TN
TJ-4522TN
TJ-4620TN

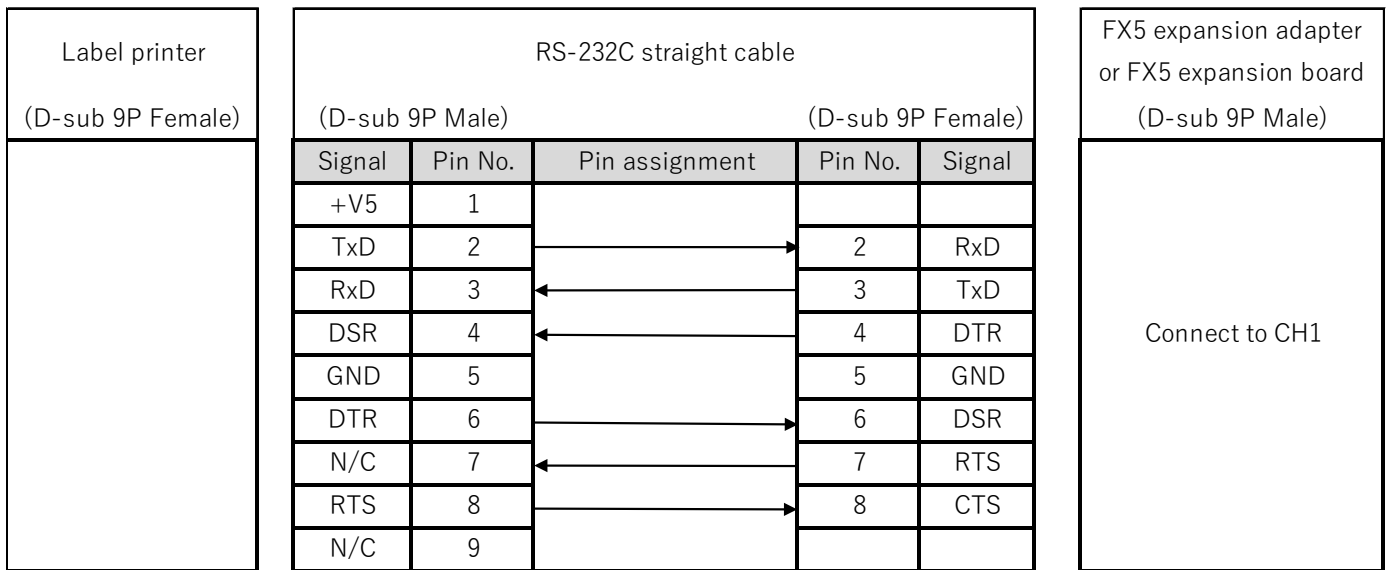
\* Any printers other than above list, which has FBPL command and interface of serial or Ethernet, have capability to connect with the programmable controller.

For the FBPL print command, refer to FBPL command reference in [Appendix A] Related Manual. For more detail, refer to the following URL.

[https://support.brother.com/g/s/es/dev/en/command/reference/index.html?c=eu\\_ot&lang=en&navi=offall&comple=on&redirect=on](https://support.brother.com/g/s/es/dev/en/command/reference/index.html?c=eu_ot&lang=en&navi=offall&comple=on&redirect=on)

### 2.2.1. RS-232C serial port pinout

Use a straight cable to communicate with the programmable controller.



### 2.2.2. Ethernet connection device

- Hub  
Switching hub supporting 100BASE-TX (or repeater hub)
  
- LAN cable  
Category 5 cable supporting 100BASE-TX

## 2.3. System structure

### 2.3.1. For serial connection

The following shows sample program system structure for serial connection in this manual.



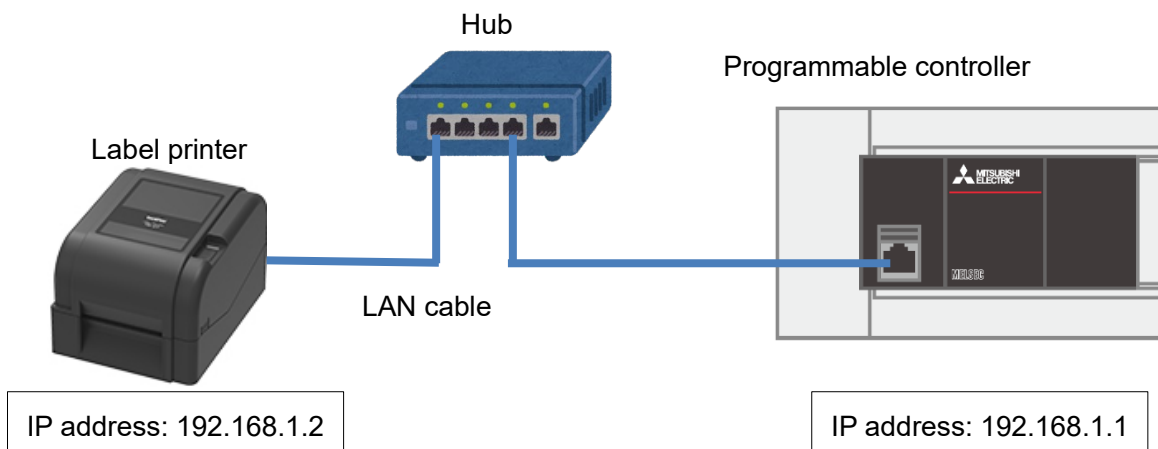
#### ■ Programmable controller module and development tool

	Module type	Model
Programmable controller module	CPU module	FX5U-32MR/ES
	Expansion adapter	FX5-232ADP

\* This program is created by GX Works3 Version 1.070Y.

### 2.3.2. For Ethernet connection

The following shows sample program system structure for Ethernet connection in this manual.



■ Programmable controller module and development tool

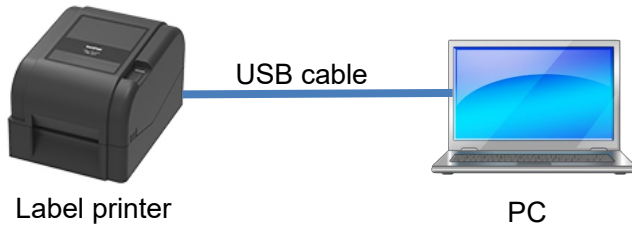
	Module type	Model
Programmable controller module	CPU module	FX5U-32MR/ES

\* This program is created by GX Works3 Version 1.070Y.

### 3. Label printer setting

#### 3.1. Device connection

PC device and connection is necessary to connect the programmable controller with the printer via serial or Ethernet to configure the communication settings at printer side. But once the setting is completed, there is no need to connect all the time.



- PC  
Use the PC installed with Windows series.
- USB cable type

Brother label printers		USB connector type
TD-4420TN	TJ-4021TNR	B type
TD-4520TN	TJ-4120TN	
TD-4650TNWB	TJ-4121TN	
TD-4650TNWBR	TJ-4121TNR	
TD-4750TNWB	TJ-4420TN	
TD-4750TNWBR	TJ-4422TN	
TJ-4005DN	TJ-4520TN	
TJ-4010TN	TJ-4522TN	
TJ-4020TN	TJ-4620TN	
TJ-4021TN		

\* Use a USB cable of 1.5m or shorter.

\* For the above label printers, connection operation check with the Mitsubishi programmable controller has already finished, but other models supporting the FBPL printing command are possible to be connected. For more detail, refer to the following URL.

([https://support.brother.com/g/s/es/dev/en/command/reference/index.html?c=eu\\_ot&lang=en&navi=offall&comple=on&redirect=on](https://support.brother.com/g/s/es/dev/en/command/reference/index.html?c=eu_ot&lang=en&navi=offall&comple=on&redirect=on))

### 3.2. Use software

To set the serial communication at printer side, it is necessary to install the following software into PC.

Software	Function
Printer driver	Driver software supporting each label printer
BPM tool	Tool for settings at printer side

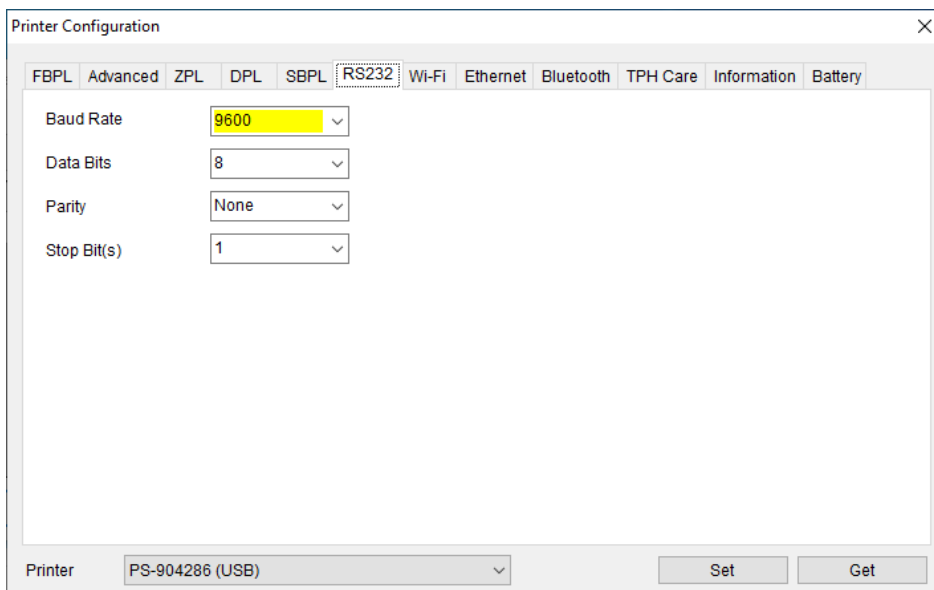
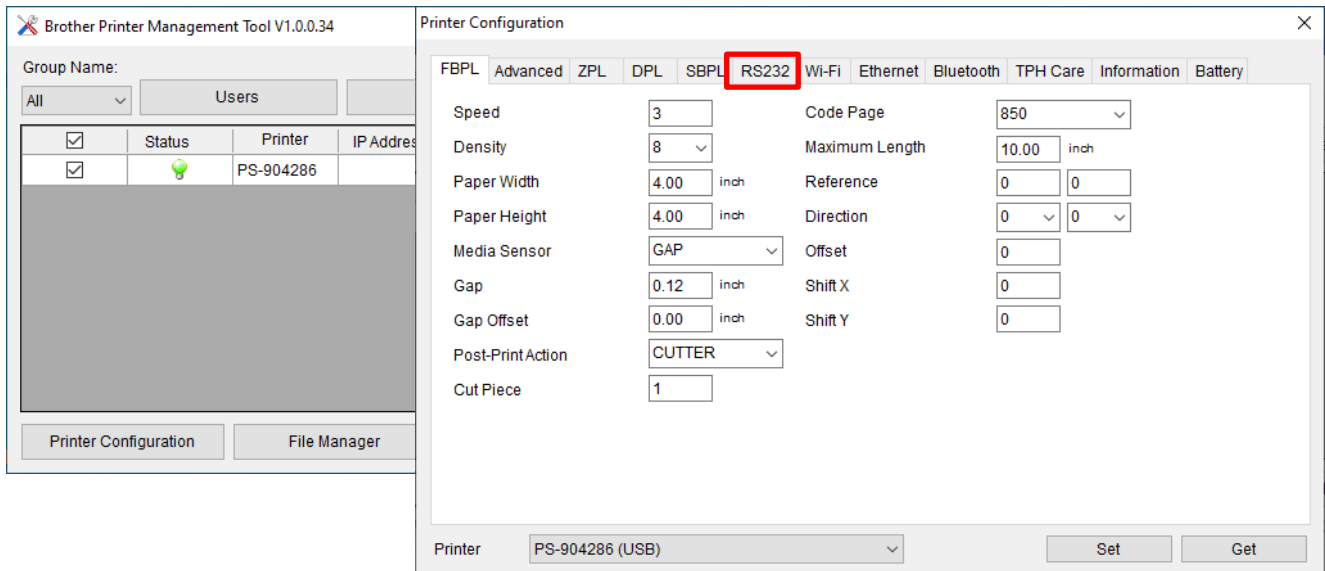
You can download the latest version of software from Brother support website. Also, you can check the latest information of the supported OS and firmware version of each software in the Brother support website.

**Brother support website URL** (<https://support.brother.com>)

### 3.3. Serial communication settings

Start the BPM tool, press the [Printer Configuration] button, and select the [RS232] tab to perform the serial communication setting.

In this sample setting, the following screen is displayed. (If you want to change the setting, change the setting at programmable controller side as well.)



### 3.4. Ethernet communication settings

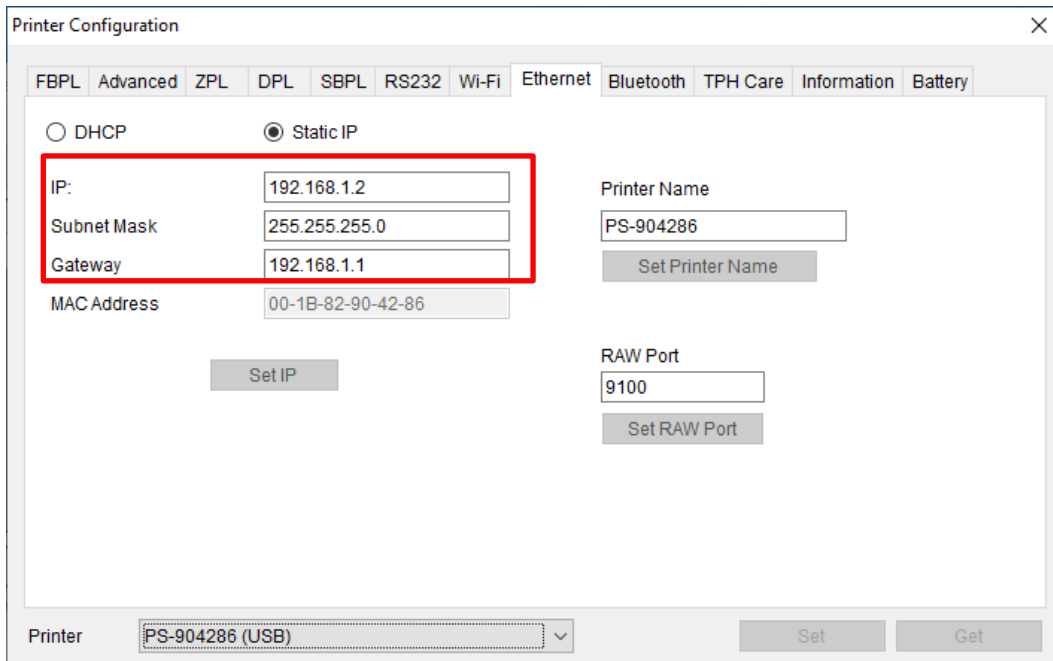
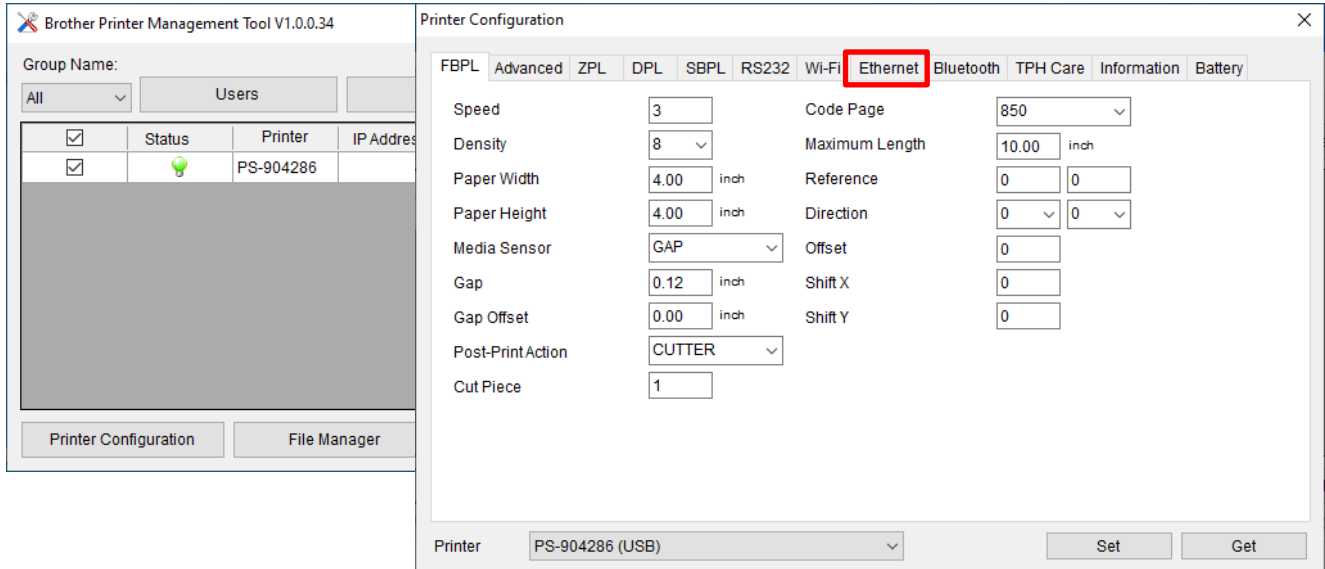
Start the BPM tool, press the [Printer Configuration] button, and select the [Ethernet] tab to perform the Ethernet communication setting.

In this sample setting, set the IP address as follows.

Click the “Set” button after changing to reflect the setting value.

In this sample setting, the following screen is displayed.

(If you want to change the setting, change the setting at programmable controller side as well.)



#### 4. Setting at programmable controller side (MELSEC iQ-F series)

The sample program display is shown as the following. After the setting by GX Works3, write the program and PLC parameter in the programmable controller.

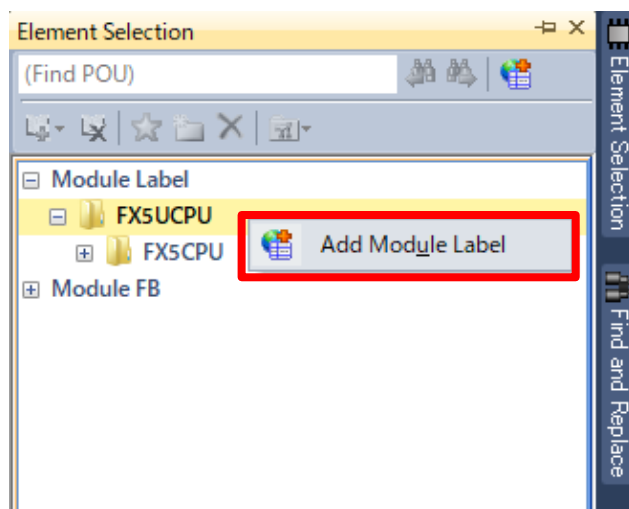
##### 4.1. For serial connection

- CPU parameter setting

The setting remains as default condition.

- Registration of module labels

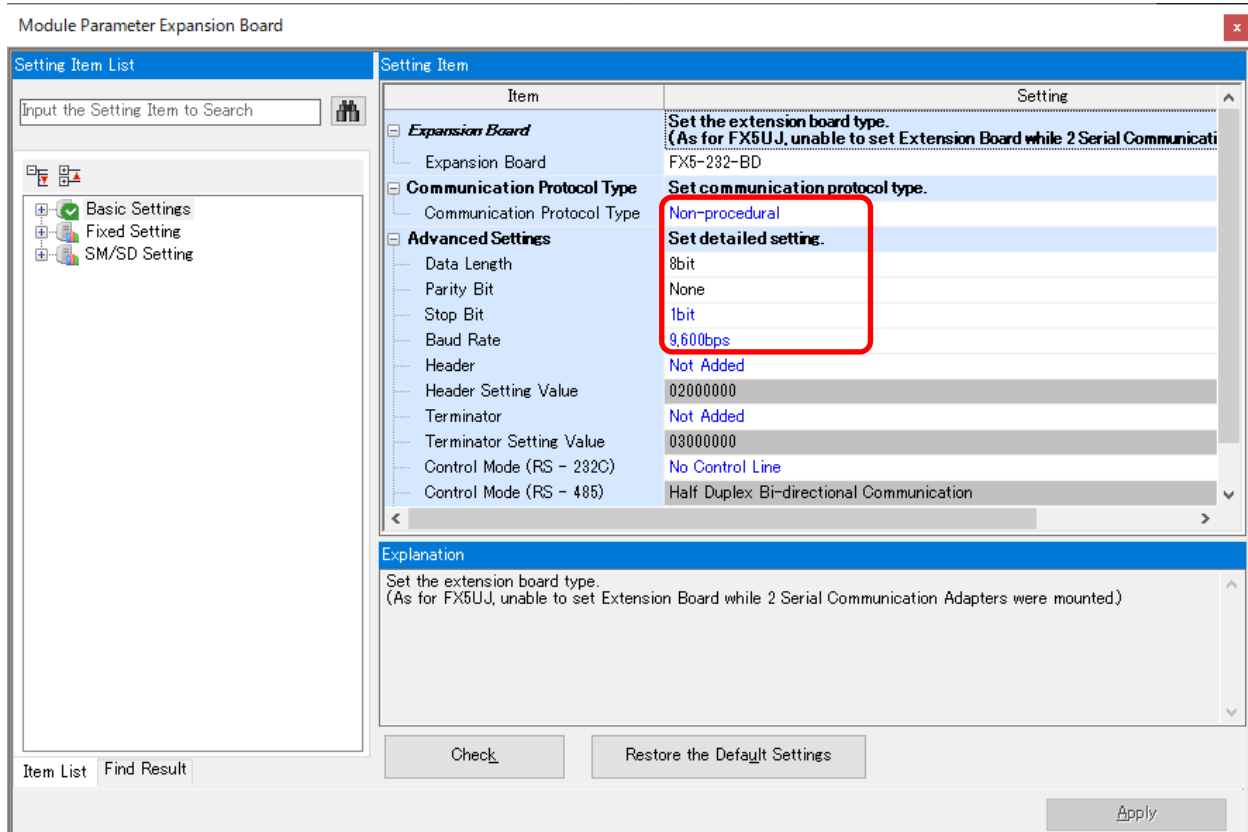
Select [Element Selection] → [Module] → [Module Label] → [FX5UCPU], and right-click [Add Module Label].



Set as shown above.



■ Parameter setting of FX expansion adapter (CH3) or FX expansion board (CH2)



The setting shall be the same as [Communication Settings](#) at label printer side.  
Parameters beside the above screen are the same as the default value.

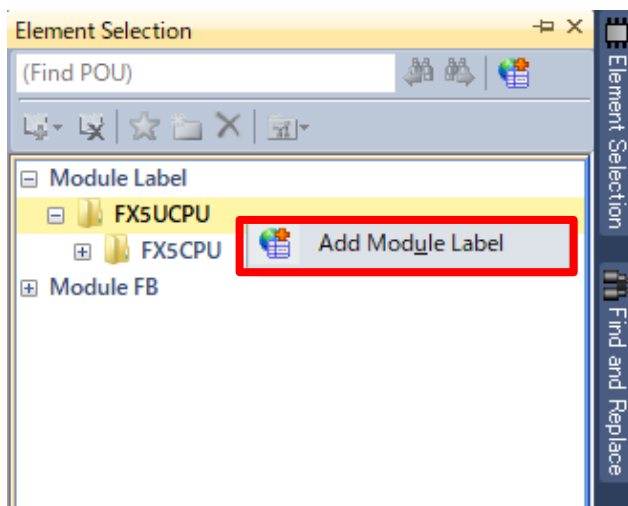
#### 4.2. For Ethernet connection

- CPU parameter setting

The setting remains as default condition.

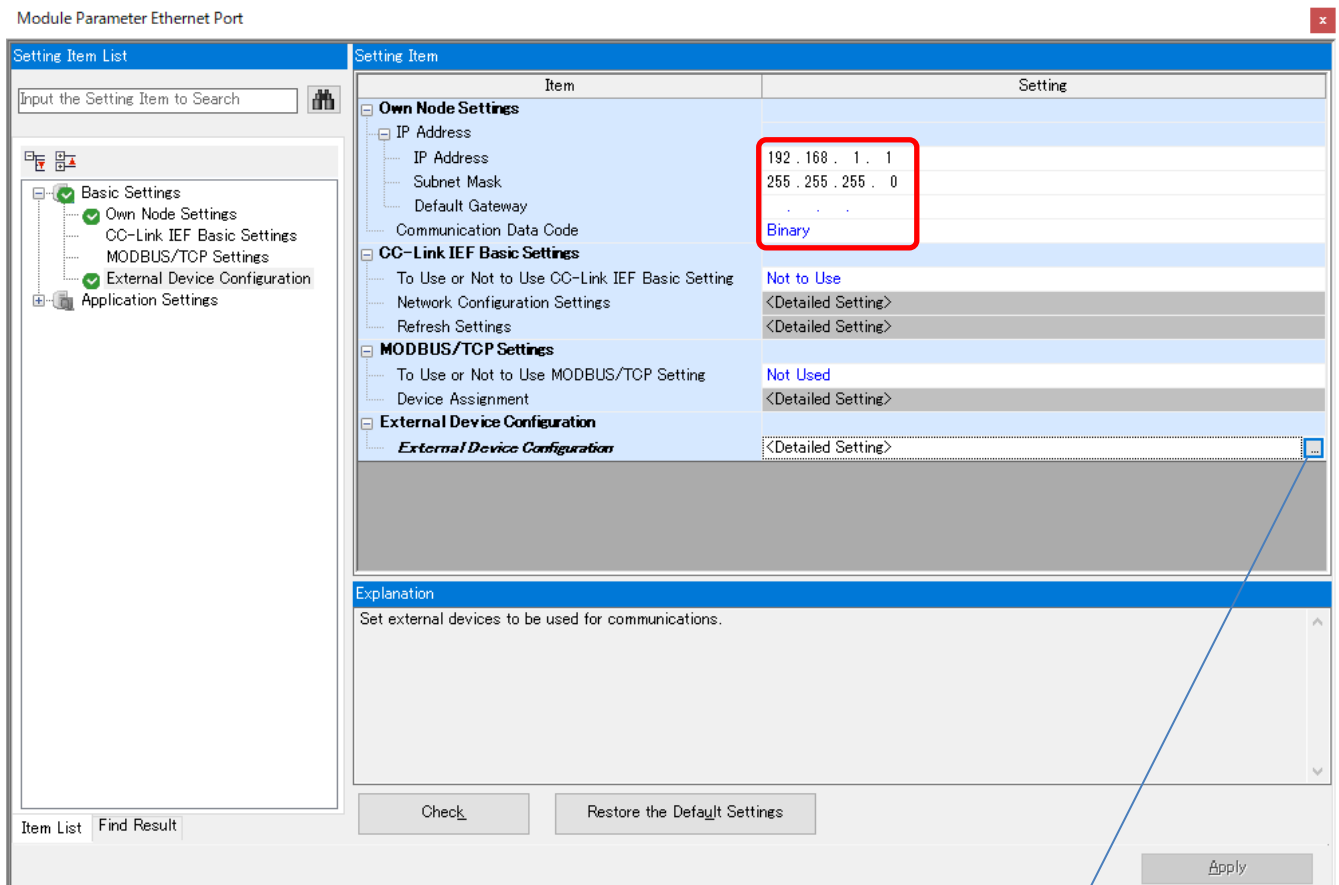
- Registration of module labels

Select [Element Selection] → [Module] → [Module Label] → [FX5UCPU], and right-click [Add Module Label].



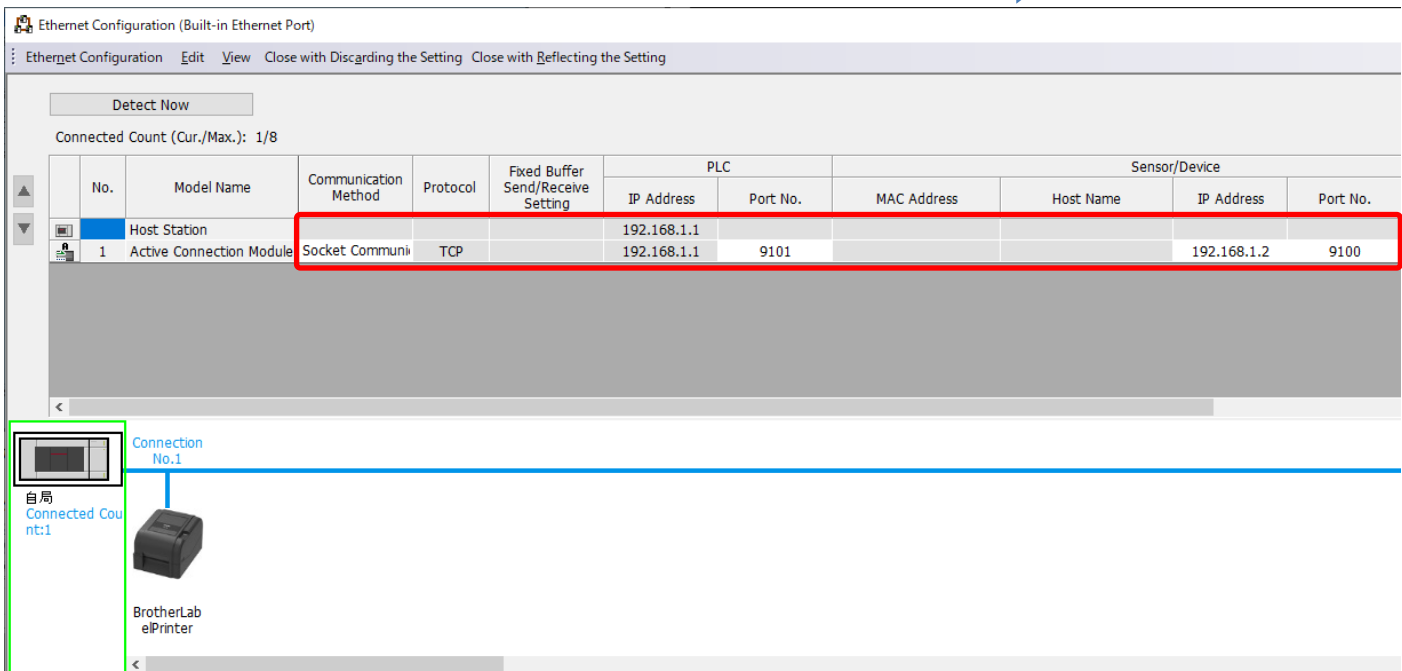
Set as shown above.

■ Network module (port 1) parameter setting (own node)



Parameters beside the above screen are the same as the default value.

■ Network module (port 1) parameter setting (target node)



Set it to be connection No.1.

## 5. Sequence program outline

### 5.1. Function outline

Based on the information from the Mitsubishi programmable controller (MELSEC), this chapter explains the use example of the print operation using Brother label printer.

### 5.2. Program outline

This program can transmit the following FBPL command to label printer just one time communication.

For the explanation of each command, refer to FBPL command reference in [\[Appendix A\]](#).

	Command	Content
1	CLS	Deletes image buffer.
2	TEXT 10,10,"3",0,3,3,"brother"	Arranges texts. Parameter: X-coordinate            10 Y-coordinate            10 Font name                "3" (16x24 fixed pitch dot font) Rotation angle           0 Horizontal double angle 3 Vertical double angle   3 Text string               "brother"
3	PRINT 1,1	Prints. Parameter: Number of print label sets    1 Number of print label copies 1

## 6. Sequence program explanation

### 6.1. For serial connection

#### 6.1.1. Use program

Project file name in this program	gw_ld-brother-tt-232_f_ot.gx3
Program name	SETPRINT
Development tool	GX Works3 Version 1.070Y
Use language	Ladder, ST language, FB
Use FB	For serial communication module M+FX5UCPU-SerialComm_Output

\* Project file target programmable controllers are set by the MELSEC iQ-F series.

#### 6.1.2. Label variable definition

Global labels used in this program are shown in the following.

No.	Label name	Data type	Usage
1	uTransErrCode	WORD	Transmission error code
2	wTransDataSize	INT	Transmission data length
3	wSendData[128]	INT	Transmission data buffer
4	bTransExecFlg	BOOL	Data transmission in execution
5	bStartSend	BOOL	Transmission start
6	bSend_OK	BOOL	Transmission success
7	bSend_NG	BOOL	Transmission failure

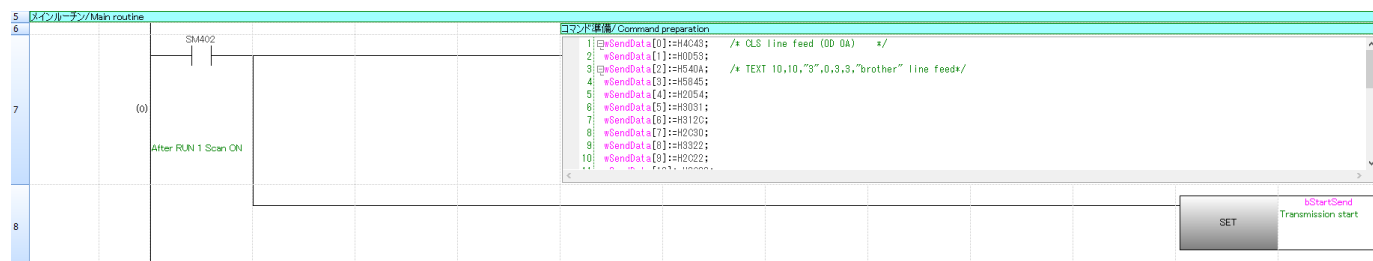
\* Data type

WORD	Word [without code]/bit stream [16 bit]
INT	Word [with code]
BOOL	Bit

### 6.1.3. Program detail

The following is the explanation of the program by function block.

#### 6.1.3.1. Main routine



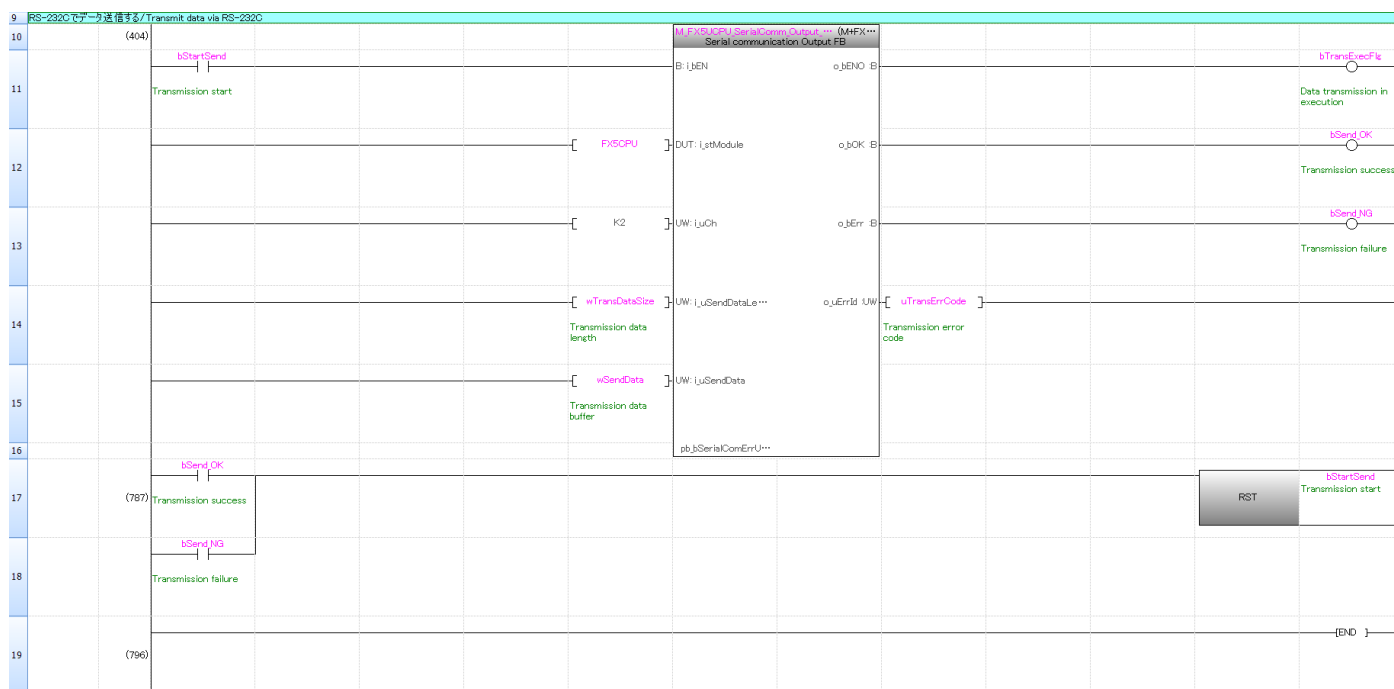
Row number 7: Prepares the command in wSendData.

All command data in the ST language is as follows.

Set the commands other than transmission data length in ASCII code.

```
wSendData[0]:=H4C43;          /* CLS  line feed (0D 0A) */
wSendData[1]:=H0D53;
wSendData[2]:=H540A;          /* TEXT 10,10,3,0,3,3, brother  line feed */
wSendData[3]:=H5845;
wSendData[4]:=H2054;
wSendData[5]:=H3031;
wSendData[6]:=H312C;
wSendData[7]:=H2C30;
wSendData[8]:=H3322;
wSendData[9]:=H2C22;
wSendData[10]:=H2C30;
wSendData[11]:=H2C33;
wSendData[12]:=H2C33;
wSendData[13]:=H6222;
wSendData[14]:=H6F72;
wSendData[15]:=H6874;
wSendData[16]:=H7265;
wSendData[17]:=H0D22;
wSendData[18]:=H500A;          /* PRINT 1,1  line feed */
wSendData[19]:=H4952;
wSendData[20]:=H544E;
wSendData[21]:=H3120;
wSendData[22]:=H312C;
wSendData[23]:=H0A0D;
wTransDataSize:=48;          /* transmission data length */
```

### 6.1.3.2. Transmission processing



The data is transmitted with the number of bytes which is shown in the transmit data length `wTransDataSize` stored in `wSendData [ ]`.

For the operation of `M+FX5UCPU-SerialComm_Output`, refer to “MELSEC iQ-F FX5 CPU Module Function Block Reference” for the Mitsubishi Electric programmable controller.



## 6.2. For Ethernet connection

### 6.2.1. Use program

Project file name in this program	gw_ld-brother-tt-e_f_ot.gx3
Program name	SETPRINT
Development tool	GX Works3 Version 1.070Y
Use language	Ladder, ST language, FB
Use FB	For network module M+FX5UCPU-EN_ConnectionOpen M+FX5UCPU-EN_Send_Socket M+FX5UCPU-EN_ConnectionClose

\* Project file target programmable controllers are set by the MELSEC iQ-F series.

## 6.2.2. Label variable definition

Global labels used in this program are shown in the following.

No.	Label name	Data type	Usage
1	uOpenErrID	WORD	Open error code
2	uSendErrID	WORD	Transmission error code
3	uCloseErrID	WORD	Closed error code
4	wSendData[128]	INT	Transmission data buffer
5	bStartOpen	BOOL	Socket open start
6	bStartOpenFB	BOOL	Socket open start FB
7	bRunOpen	BOOL	Socket open in execution
8	bOpen_OK	BOOL	Socket open success
9	bOpen_NG	BOOL	Socket open failure
10	bStartSend	BOOL	Transmission start flag
11	bRunSend	BOOL	Transmission processing in execution
12	bSend_OK	BOOL	Transmission success
13	bSend_NG	BOOL	Transmission failure
14	bStartClose	BOOL	Socket close start
15	bStartCloseFB	BOOL	Socket close start FB
16	bRunClose	BOOL	Socket close in execution
17	bClose_OK	BOOL	Socket close success
18	bClose_NG	BOOL	Socket close failure

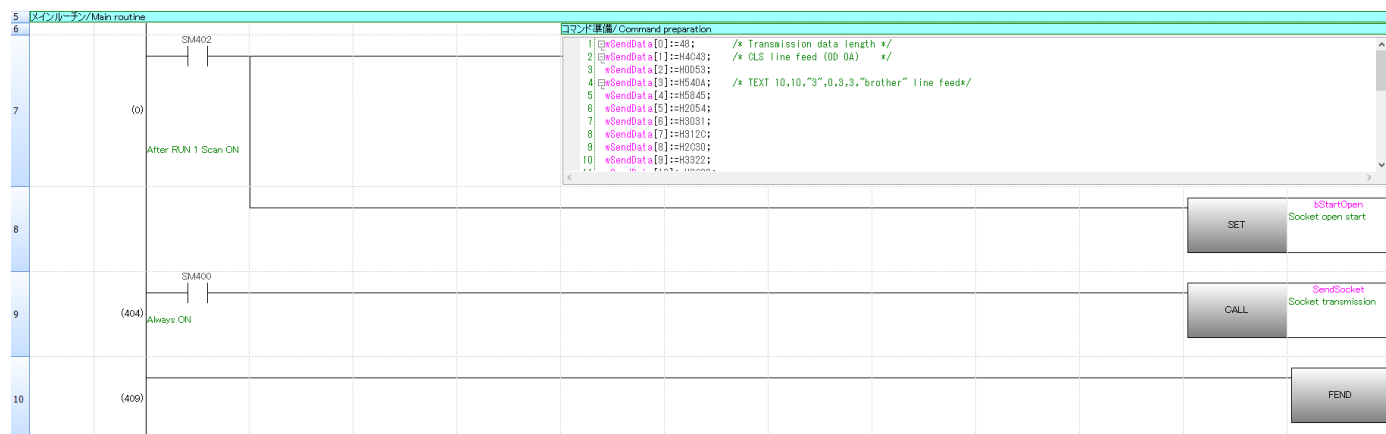
\* Data type

WORD	Word [without code]/bit stream [16 bit]
INT	Word [with code]
BOOL	Bit

## 6.2.3. Program detail

The following is the explanation of the program by function block.

### 6.2.3.1. Main routine



Row number 7: Prepares the command in wSendData.

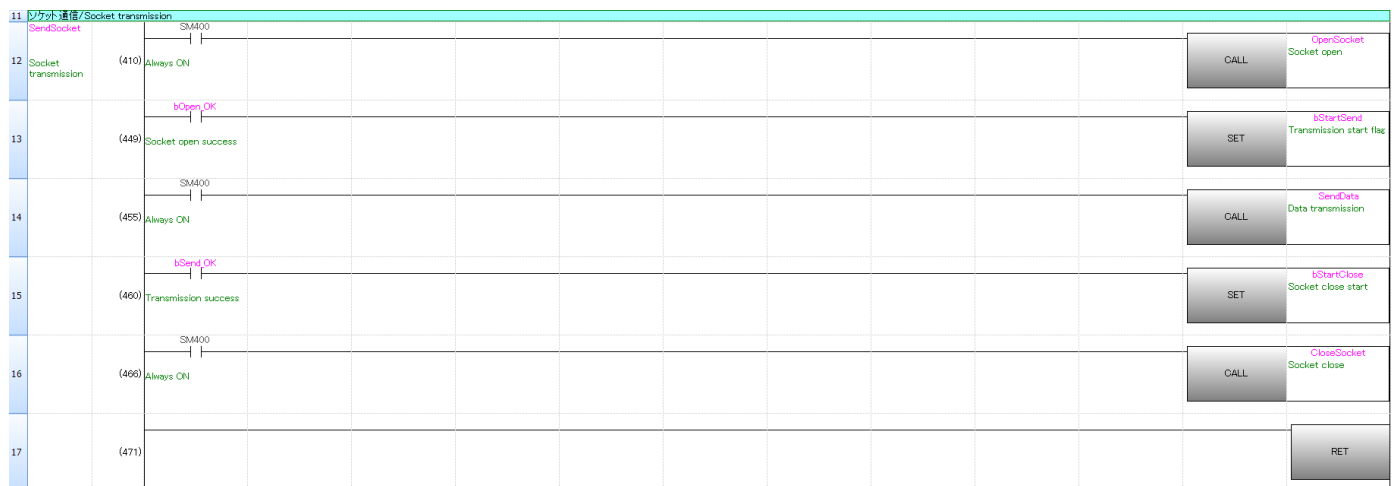
Row number 9: Sends the prepared command.

All command data in the ST language is as follows.

Set the commands other than transmission data length in ASCII code.

```
wSendData[0]:=48;           /* transmission data length */
wSendData[1]:=H4C43;       /* CLS line feed (0D 0A) */
wSendData[2]:=H0D53;
wSendData[3]:=H540A;       /* TEXT 10,10,3,0,3,3, brother line feed */
wSendData[4]:=H5845;
wSendData[5]:=H2054;
wSendData[6]:=H3031;
wSendData[7]:=H312C;
wSendData[8]:=H2C30;
wSendData[9]:=H3322;
wSendData[10]:=H2C22;
wSendData[11]:=H2C30;
wSendData[12]:=H2C33;
wSendData[13]:=H2C33;
wSendData[14]:=H6222;
wSendData[15]:=H6F72;
wSendData[16]:=H6874;
wSendData[17]:=H7265;
wSendData[18]:=H0D22;
wSendData[19]:=H500A;      /* PRINT 1,1 line feed */
wSendData[20]:=H4952;
wSendData[21]:=H544E;
wSendData[22]:=H3120;
wSendData[23]:=H312C;
wSendData[24]:=H0A0D;
```

### 6.2.3.2. Socket communication processing



Row number 12: Calls Sub-routine OpenSocket when SM400 (Always ON) is ON.

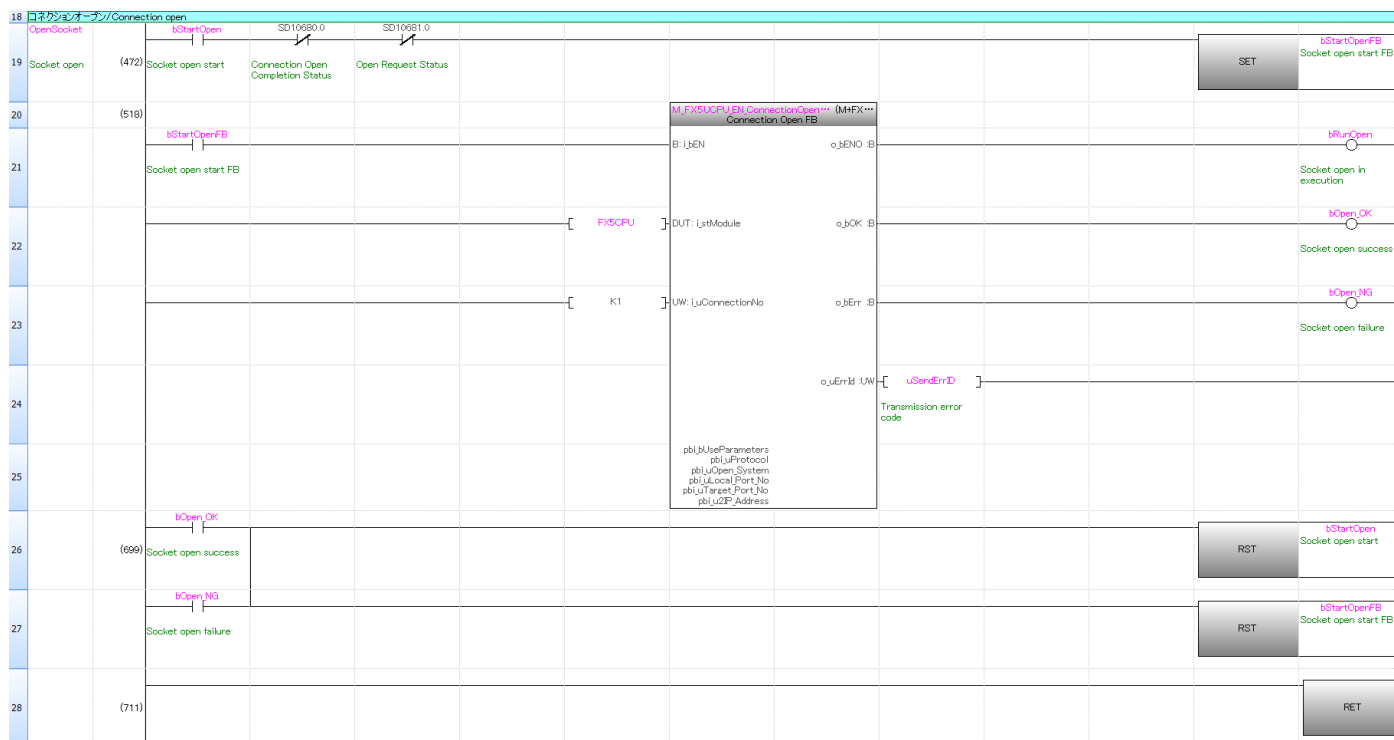
Row number 13: Turns ON bStartSend when bOpen\_OK is ON (Socket open success).

Row number 14: Calls Sub-routine SendData. when SM400 (Always ON) is ON.

Row number 15: Turns ON bStartClose when bSend\_OK is ON (Transmission success).

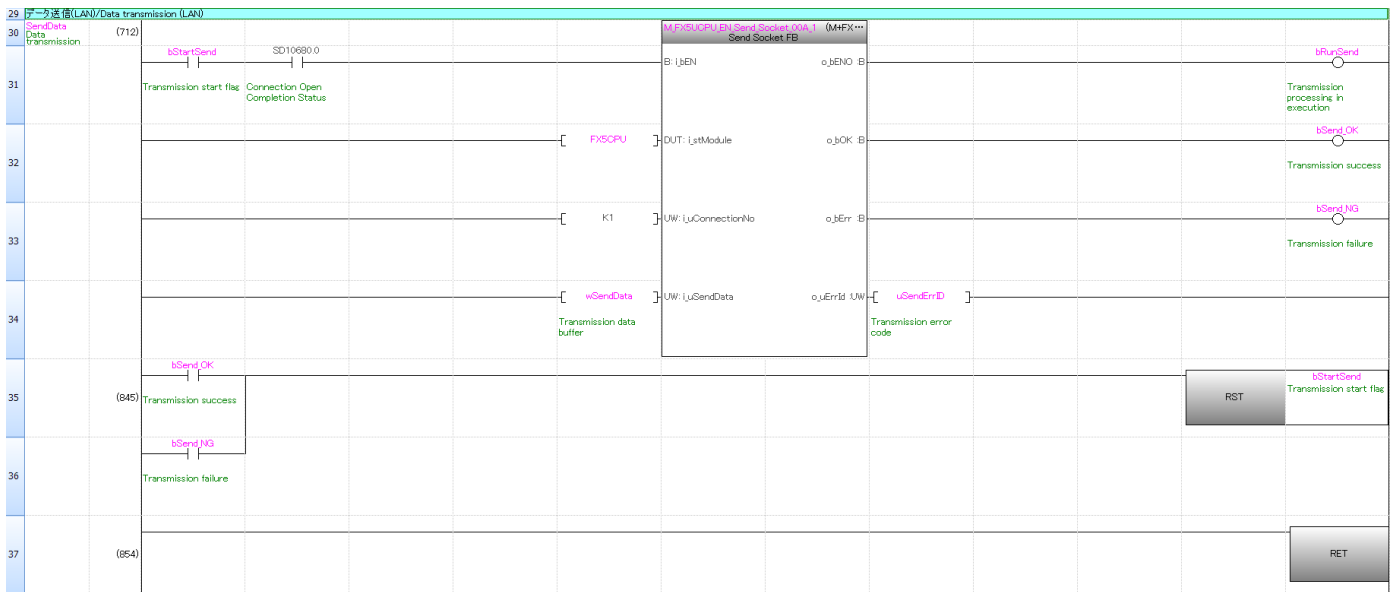
Row number 16: Calls Sub-routine CloseSocket when SM400 (Always ON) is ON.

### 6.2.3.3. Socket communication connection open



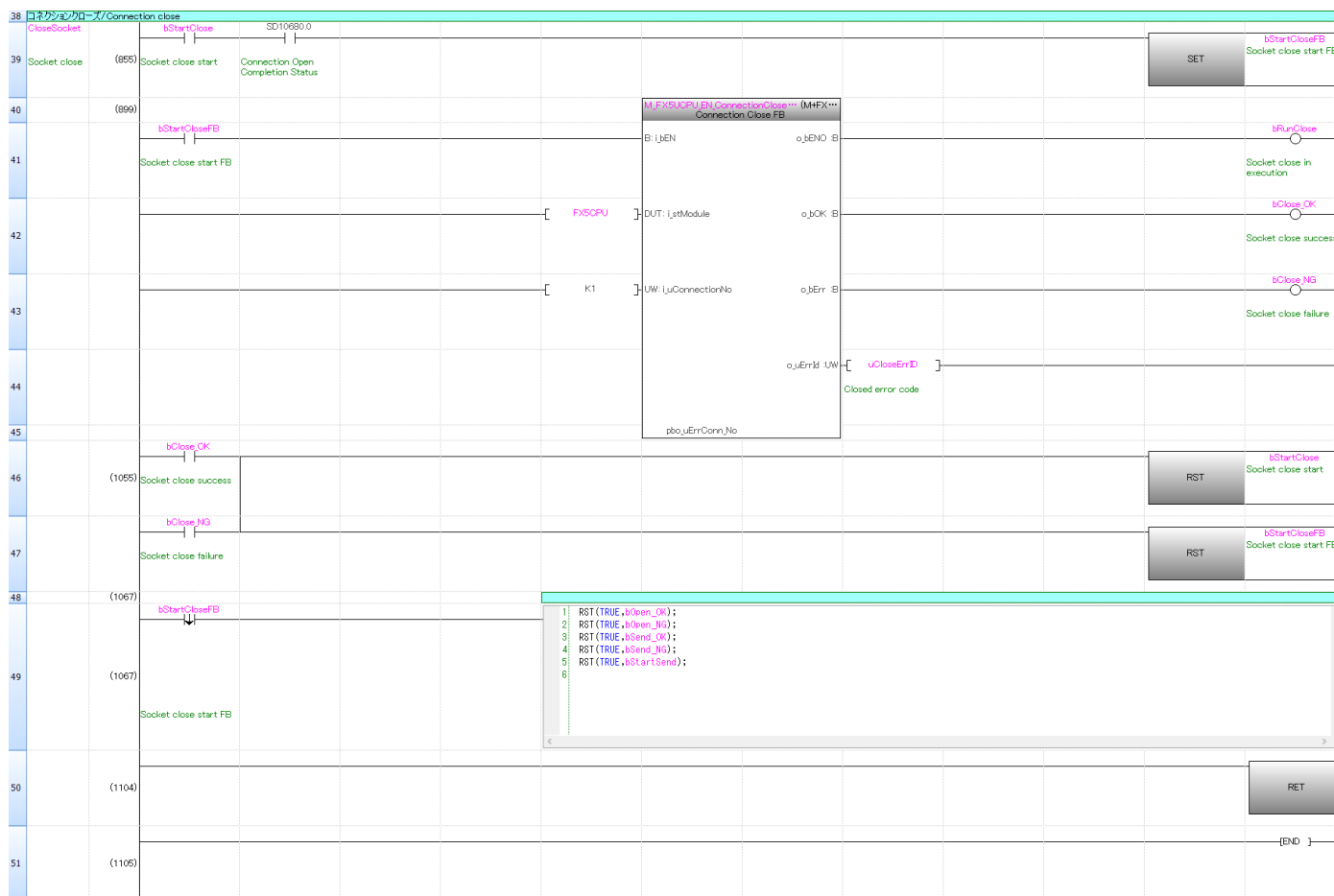
For the operation of M+FX5UCPU\_EN\_ConnectionOpen FB, refer to “MELSEC iQ-F FX5 Ethernet, EtherNet/IP, CC-Link IE Function Block Reference” for the Mitsubishi Electric programmable controller.

### 6.2.3.4. Socket communication data transmission



For the operation of M+FX5UCPU\_EN\_Send\_Socket\_FB, refer to “MELSEC iQ-F FX5 Ethernet, EtherNet/IP, CC-Link IE Function Block Reference” for the Mitsubishi Electric programmable controller.

### 6.2.3.5. Socket communication connection close



For the operation of M+FX5UCPU\_EN\_ConnectionClose FB, refer to “MELSEC iQ-F FX5 Ethernet, EtherNet/IP, CC-Link IE Function Block Reference” for the Mitsubishi Electric programmable controller.



## [Appendix A] Related Manual

Brother Label Printers (TD-4420TN, TD-4520TN, TD-4650TNWB, TD-4650TNWBR, TD-4750TNWB, TD-4750TNWBR, TJ-4005DN, TJ-4010TN, TJ-4020TN, TJ-4021TN, TJ-4021TNR, TJ-4120TN, TJ-4121TN, TJ-4121TNR, TJ-4420TN, TJ-4422TN, TJ-4520TN, TJ-4522TN, TJ-4620TN)

- User's Guide
- FBPL command reference

The above manuals are available to download from Brother support website.

<https://support.brother.com>

\* The sample print program of this manual creates print data referring to FBPL command reference.

\*\* For printing using the FBPL command, the printing method using a template is available in addition to the method by sending print data directly from the programmable controller as the sample print program of this manual.

In the printing method using the template, a template in the FBPL command format is created and transferred to the printer in advance, then the FBPL command is sent from the programmable controller (call the template in the printer and send only the data of a part to be changed) for printing. For this procedure, refer to "FBPL command reference".

[Contact window]

#### Product and support information

Find Brother global website and select in your country or region:

(<https://www.brother.com>)

#### Developer support

Top page: (<https://support.brother.com/g/s/es/dev/en/index.html>)

Contact form: ([https://secure6.brother.co.jp/dev/ContactUs\\_InputDisp.aspx](https://secure6.brother.co.jp/dev/ContactUs_InputDisp.aspx))



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