

MELSEC iQ-R

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

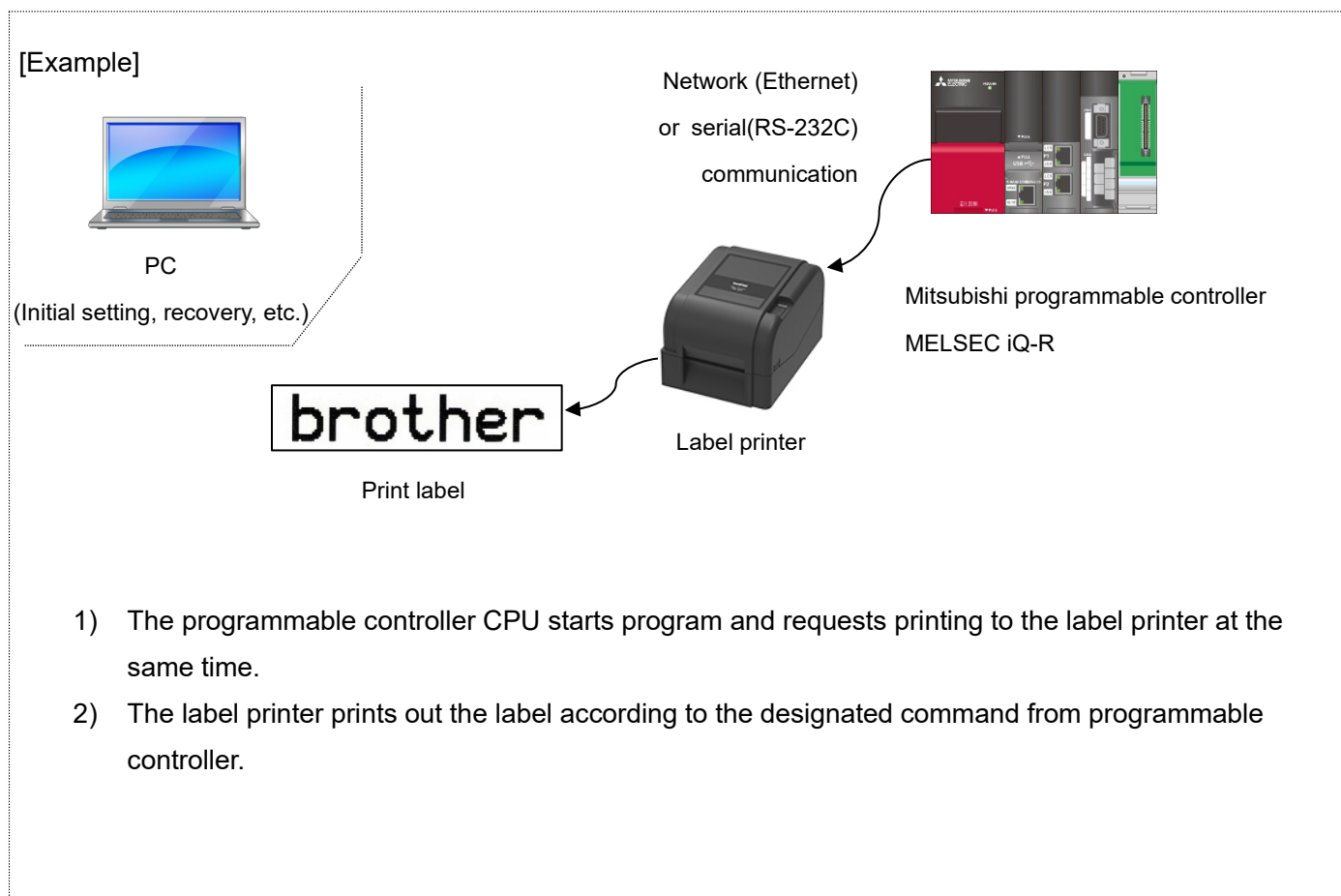
6.2. For Ethernet connection

2. Outline

2.1. Outline of "Sample program"

The sample program in this manual uses the MELSEC iQ-R 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

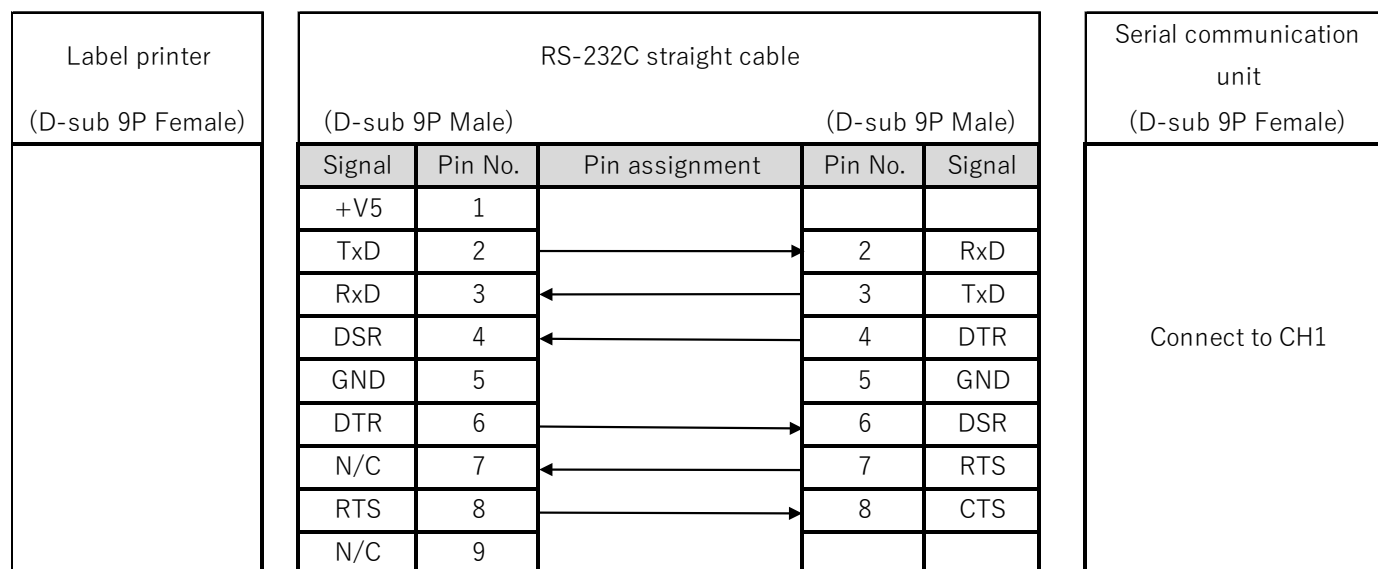
* Any printers other than above list, which has FBPL command and interface of serial or Ethernet, have capability to connect with the programmable controller.

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

2.2.1. RS-232C serial port pinout

Use a straight cable to communicate with the programmable controller.



2.2.2. Ethernet connection device

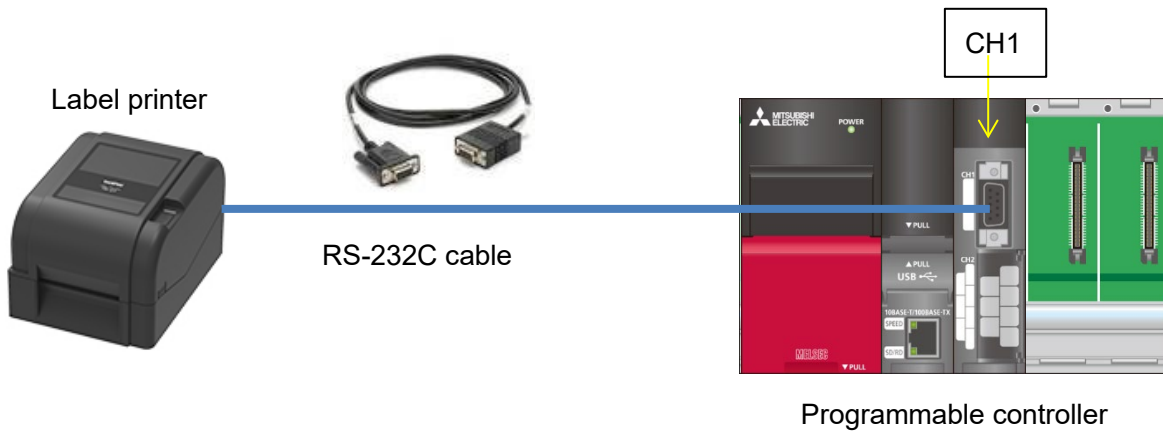
- Hub
Switching hub supporting 100BASE-TX (or repeater hub)

- 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.



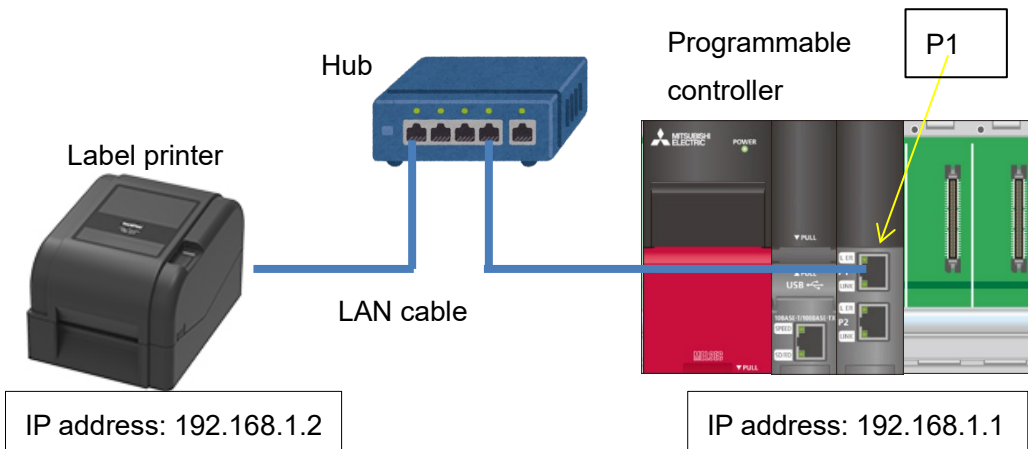
■ Programmable controller module and development tool

Module	Module type	Model	Slot No.
	CPU	R08CPU	-
	Serial communication	RJ71C24	0
	Power supply	R61P	-
Base module	-	R38B	-

* This program is created by GX Works3 Version 1.050C.

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

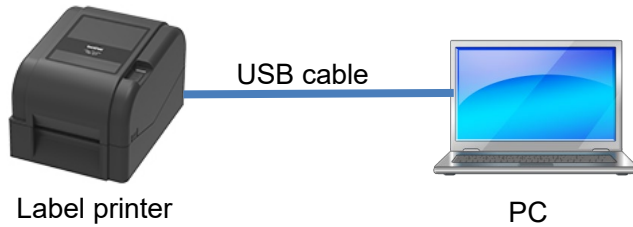
Module	Module type	Model	Slot No.
	CPU	R08CPU	-
	Network (Ethernet)	RJ71EN71	0
	Power supply	R61P	-
Base module	-	R38B	-

* This program is created by GX Works3 Version 1.050C.

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

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

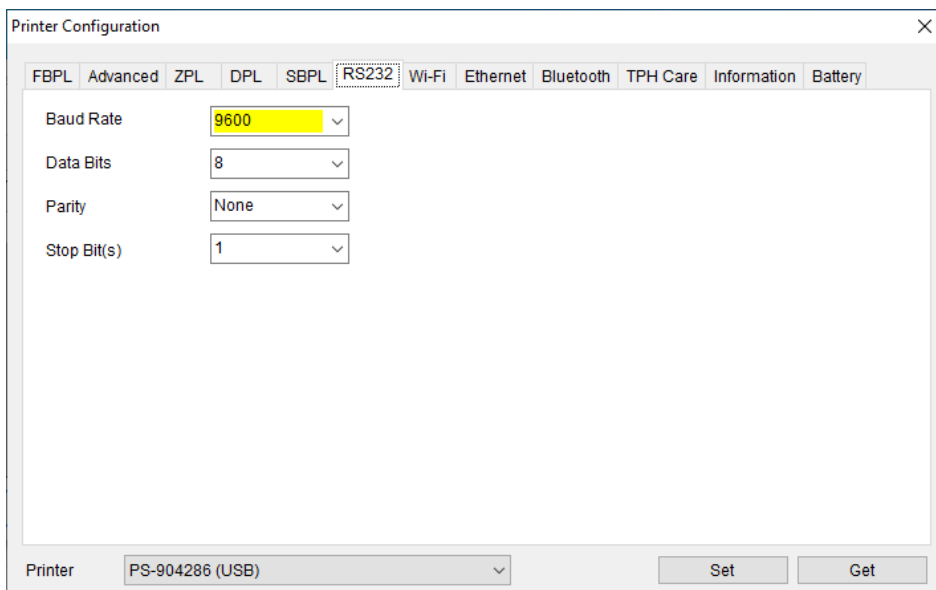
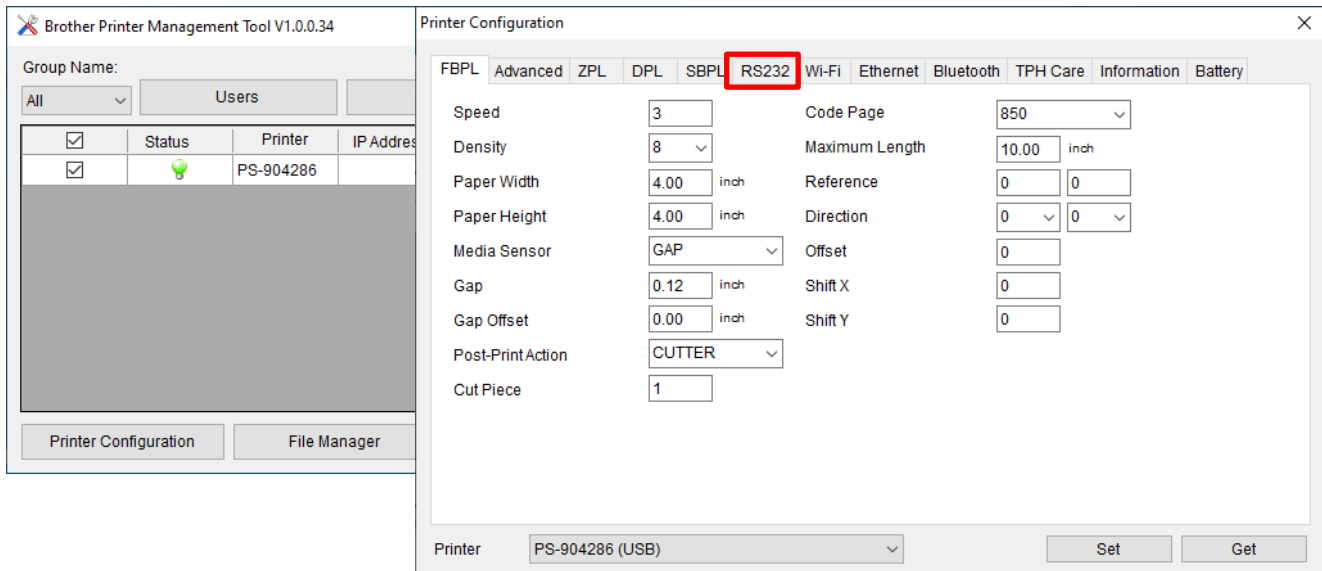
You can download the latest version of software from Brother support website. Also, you can check the latest information of the supported OS and firmware version of each software in the Brother support website.

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

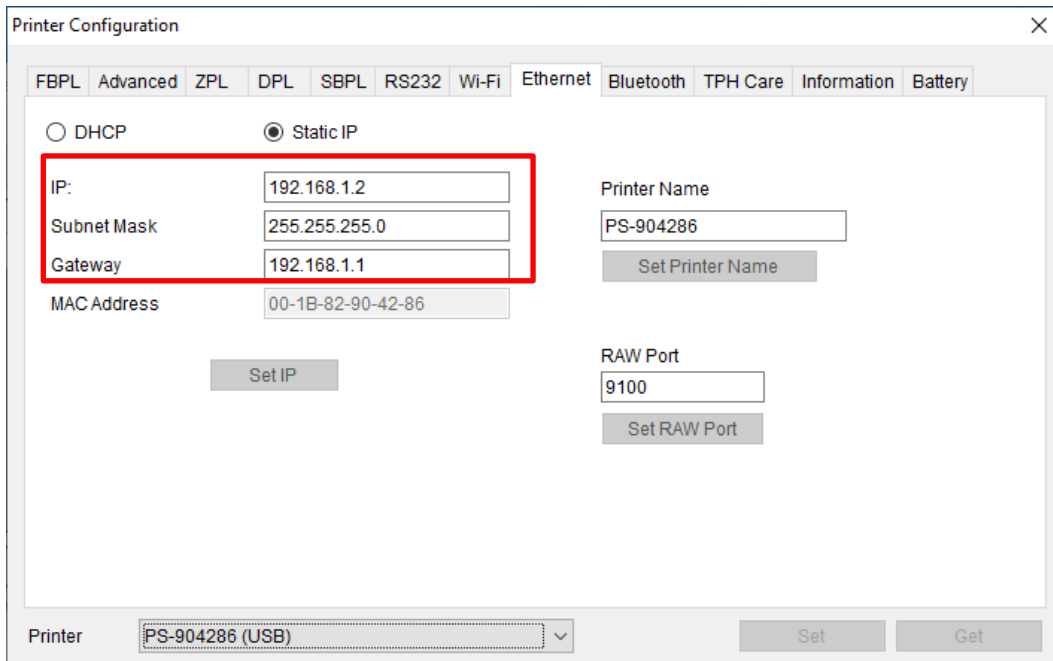
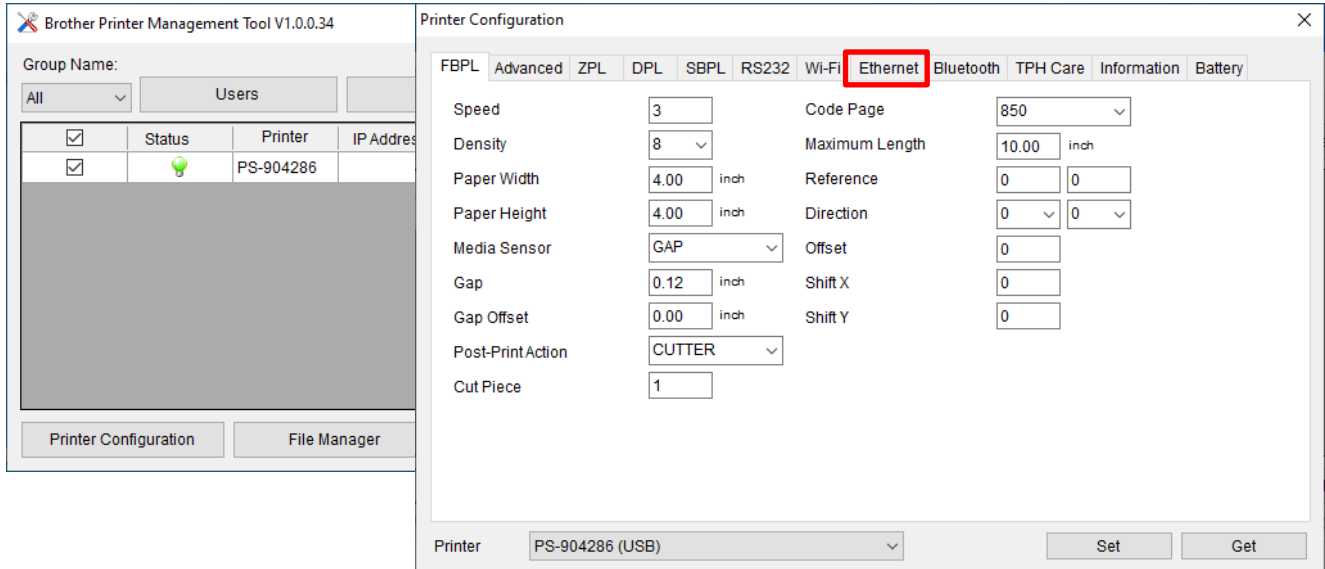
Start the BPM tool, press the [Printer Configuration] button, and select the [Ethernet] tab to perform the Ethernet communication setting.

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-R 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.

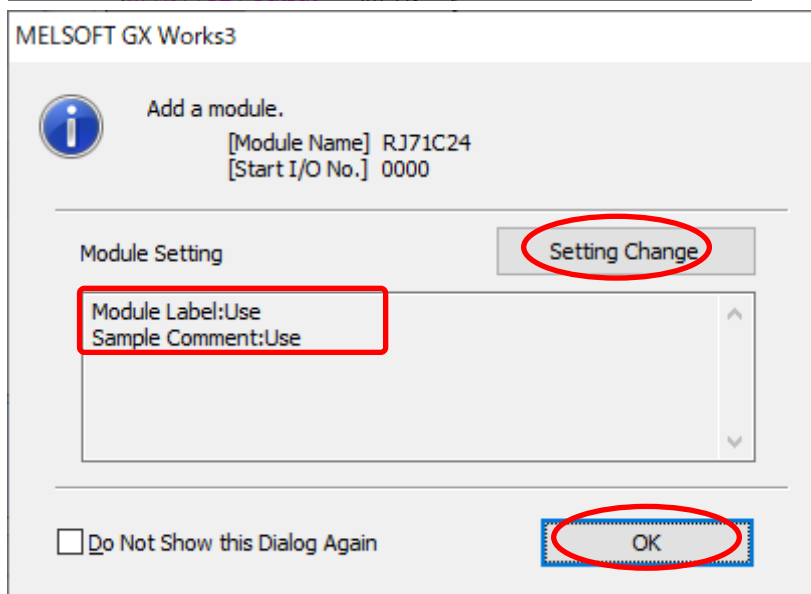
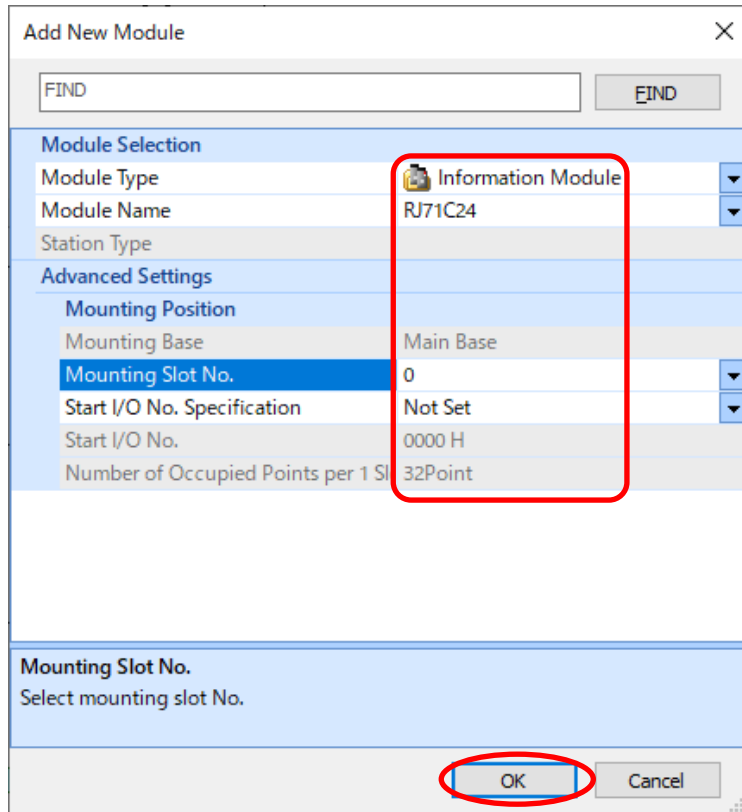
4.1. For serial connection

- CPU parameter setting

The setting remains as default condition.

- Registration of module labels for serial communication module

Select [Navigation window] → [Parameter] → [Module information], and right-click [Add New Module].



Set as shown above.

■ Serial communication module (CH1) parameter setting

0000:RJ71C24 Module Parameter

Setting Item List

Input the Setting Item to Search

Setting Item

Item	CH1	CH2
Various control specification	Set the various control specification.	
TEST MODE setting	No specification	
Communication protocol setting	Nonprocedural protocol	MELSOFT connection
Communication speed setting	9600bps	Automatically set
transmission setting	Set the transmission method.	
Operation setting	Independent	Independent
Data bit	8	7
Parity bit	None	None
Odd/even parity	Odd	Odd
Stop bit	1	1
Sumcheck code	None	None
Online change	Disable	Disable
Setting change	Disable	Disable
Station Number Settings (CH1, 2 common: 0 to 31)	0	
MODBUS Station Number Settings	1	1
signal setting	Set the ON/OFF status of the RS/DTR signal.	
RTS (RS) signal status designation	ON	ON
DTR (ER) signal status designation	ON	ON
transmission control setting	Set transmission control method.	
Transmission control	DTR/DSR control	DTR/DSR control
DC1/DC3 control	Control disabled	Control disabled
DC2/DC4 control	Control disabled	Control disabled
DC1 code	11	11
DC2 code	11	11

Explanation

Set the various control specification.

Item List Find Result

Check Restore the Default Settings

Item	CH1	CH2
communication control specification	Set the communication method.	
Word/byte units designation	Byte specification	Word specification
CD terminal check designation	Do not check	Do not check
Communication method designation	Full-duplex communication	Full-duplex communication
Echo back enable/prohibit specification	Echo back enable	Echo back enable
NULL character automatic removal designation	Auto delete disabled	Auto delete disabled
Enable/Disable the received data specification	Receive enable	Receive enable

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.

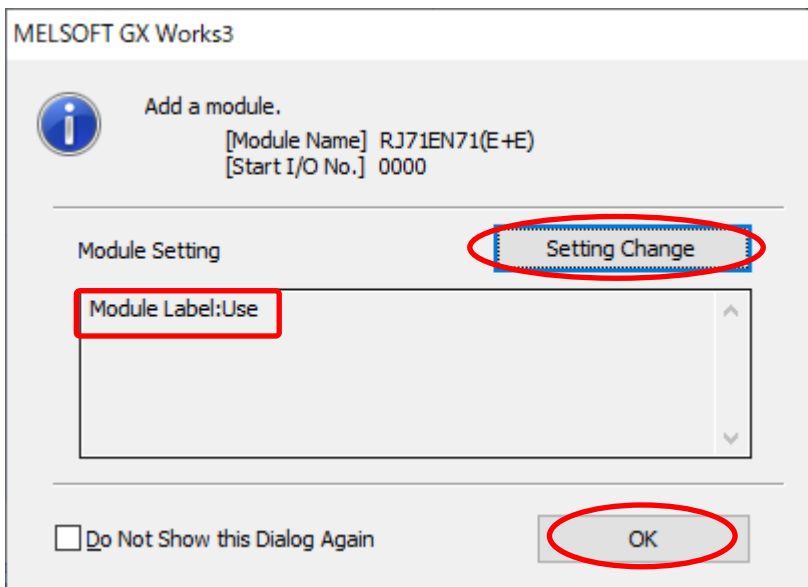
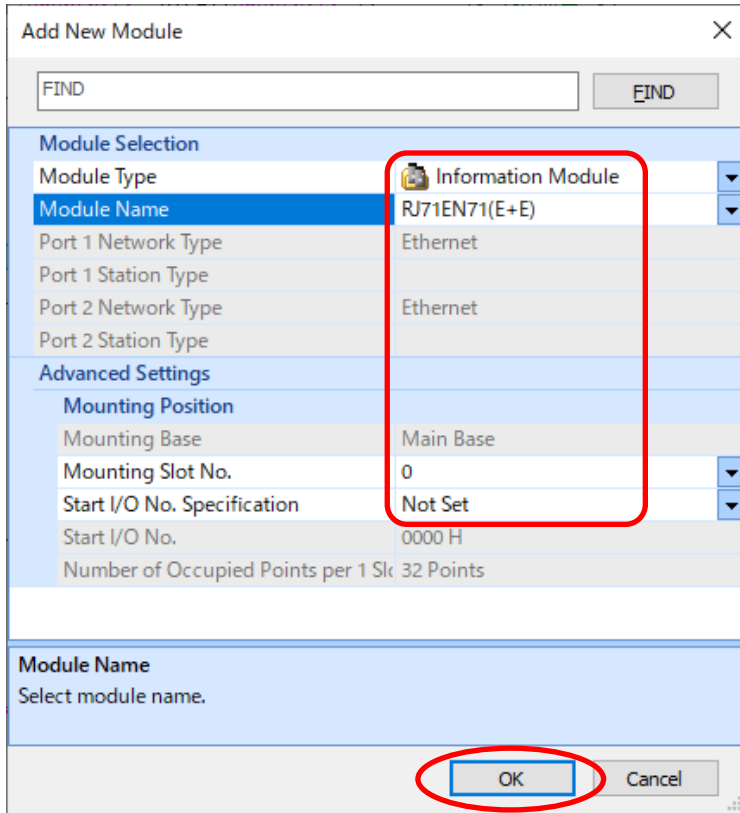
4.2. For Ethernet connection

- CPU parameter setting

The setting remains as default condition.

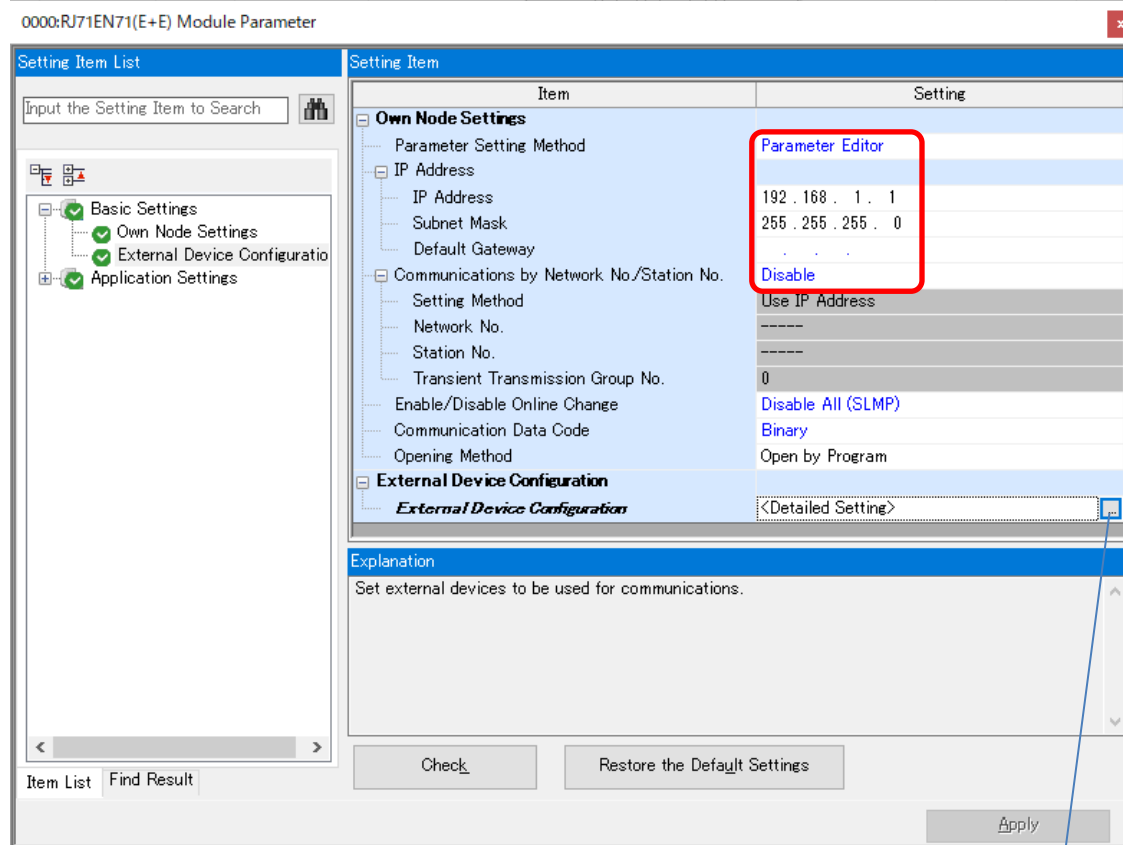
- Registration of module labels for network module

Select [Navigation window] → [Parameter] → [Module information], and right-click [Add New Module].



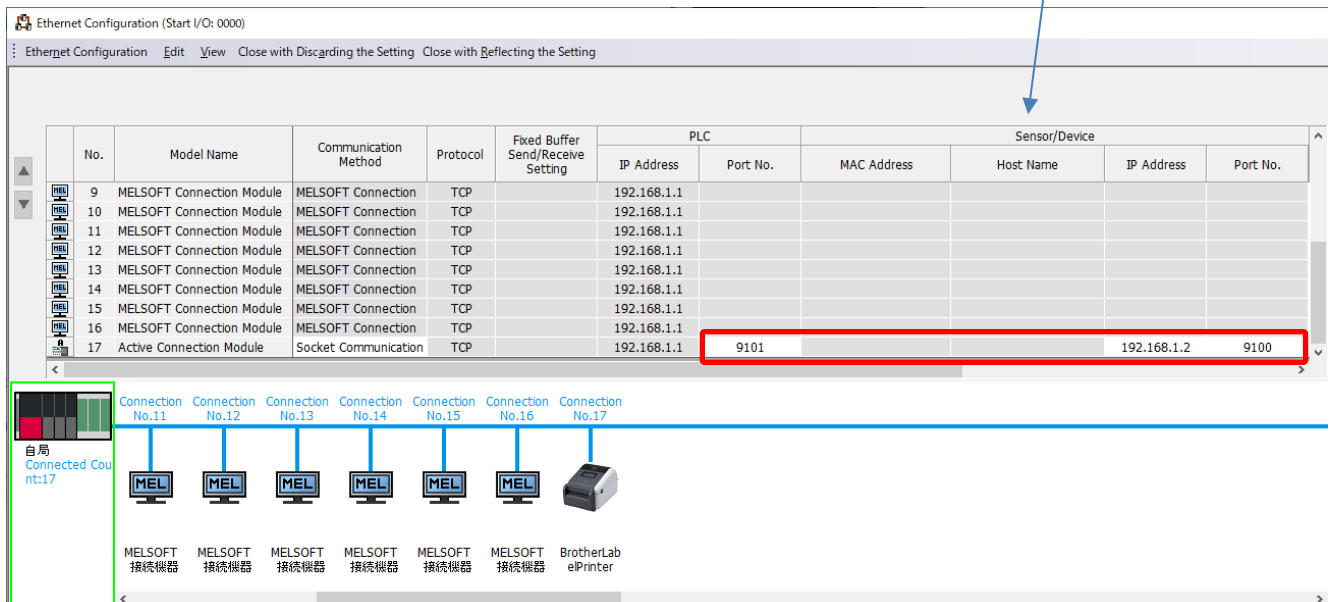
Set as shown above.

■ 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.17.

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_r_ot.gx3
Program name	SETPRINT
Development tool	GX Works3 Version 1.050C
Use language	Ladder, ST language, FB
Use FB	For serial communication module M+RJ71C24_Output

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

6.1.2. Label variable definition

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

No.	Label name	Data type	Initial value	Usage
1	SendData	POINTER		Data transmission by serial communication module
2	uSerialCH	WORD	1	Communication channel number of the serial communication module
3	uTransErrCode	WORD	0	Transmission error code
4	wTransDataSize	INT		Transmission data length
5	wSendData[128]	INT		Transmission data buffer
6	bTransExecFlg	BOOL		Data transmission in execution
7	bStartSend	BOOL		Transmission start
8	bSend_OK	BOOL	0	Transmission success
9	bSend_NG	BOOL	0	Transmission failure

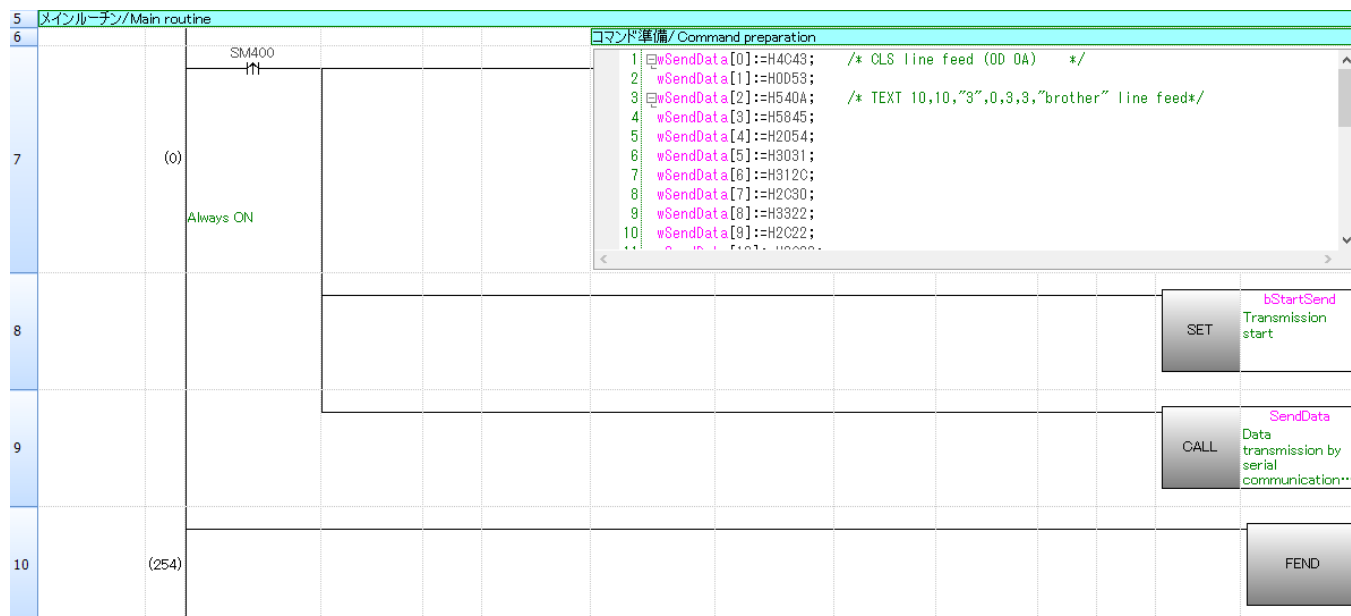
* Data type

POINTER	Pointer
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



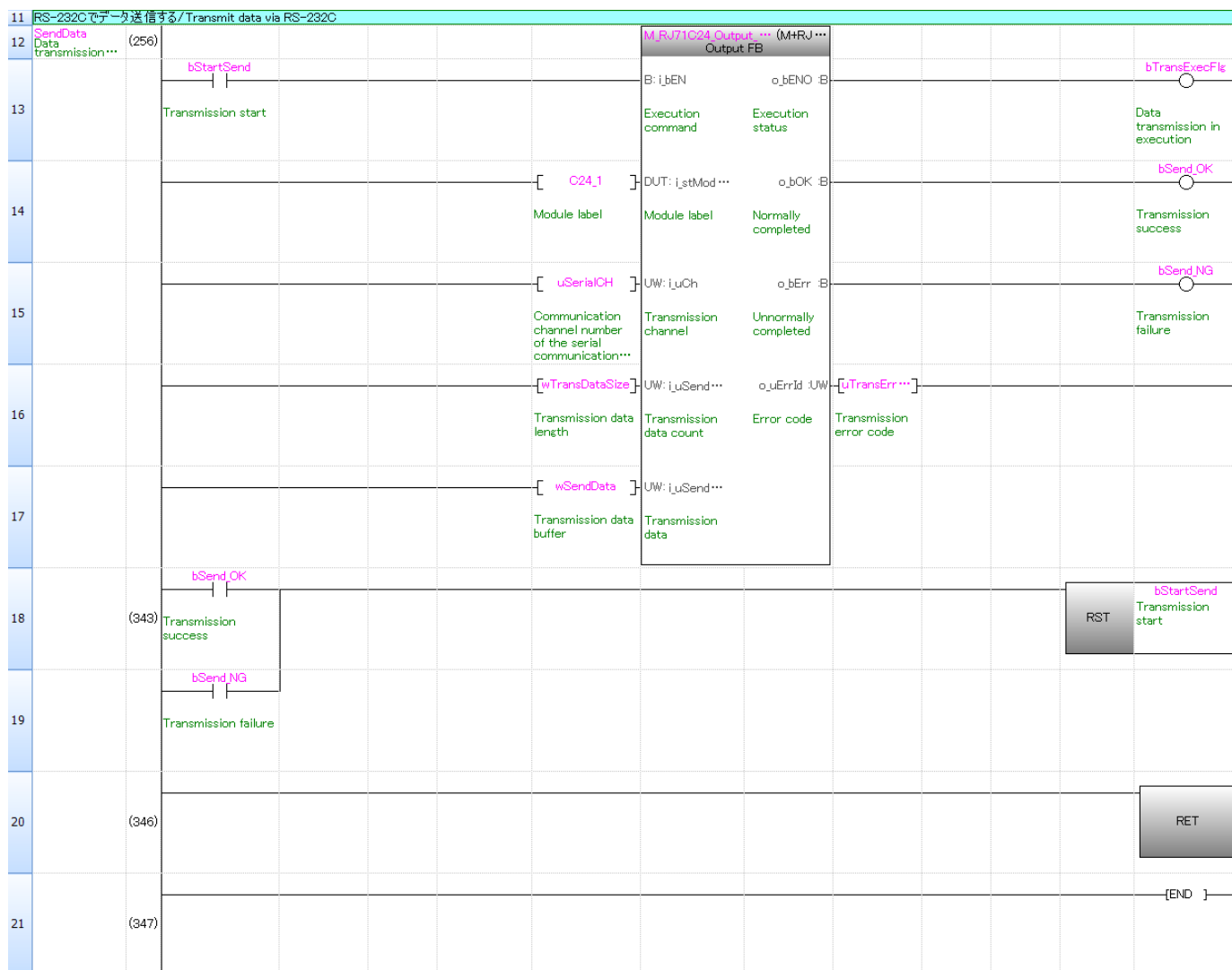
Row number 7: Prepares the command in wSendData.

Row number 9: Sends the prepared command.

All command data in the ST language is as follows.

```
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+RJ71C24_Output, refer to "MELSEC iQ-R Serial Communication 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_r_ot.gx3
Program name	SETPRINT
Development tool	GX Works3 Version 1.050C
Use language	Ladder, ST language, FB
Use FB	For network module M+RJ71EN71_EE_Refresh_Data M+RJ71EN71_EE_ConnectionOpen M+RJ71EN71_EE_Send_Socket M+RJ71EN71_EE_ConnectionClose

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

6.2.2. Label variable definition

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

No.	Label name	Data type	Initial value	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	bRunRefresh	BOOL		Refresh in execution
6	bStartOpen	BOOL		Socket open start
7	bStartOpenFB	BOOL		Socket open start FB
8	bRunOpen	BOOL		Socket open in execution
9	bOpen_OK	BOOL		Socket open success
10	bOpen_NG	BOOL		Socket open failure
11	bStartSend	BOOL		Transmission start flag
12	bRunSend	BOOL		Transmission processing in execution
13	bSend_OK	BOOL		Transmission success
14	bSend_NG	BOOL		Transmission failure
15	bStartClose	BOOL		Socket close start
16	bStartCloseFB	BOOL		Socket close start FB
17	bRunClose	BOOL		Socket close in execution
18	bClose_OK	BOOL		Socket close success
19	bClose_NG	BOOL		Socket close failure

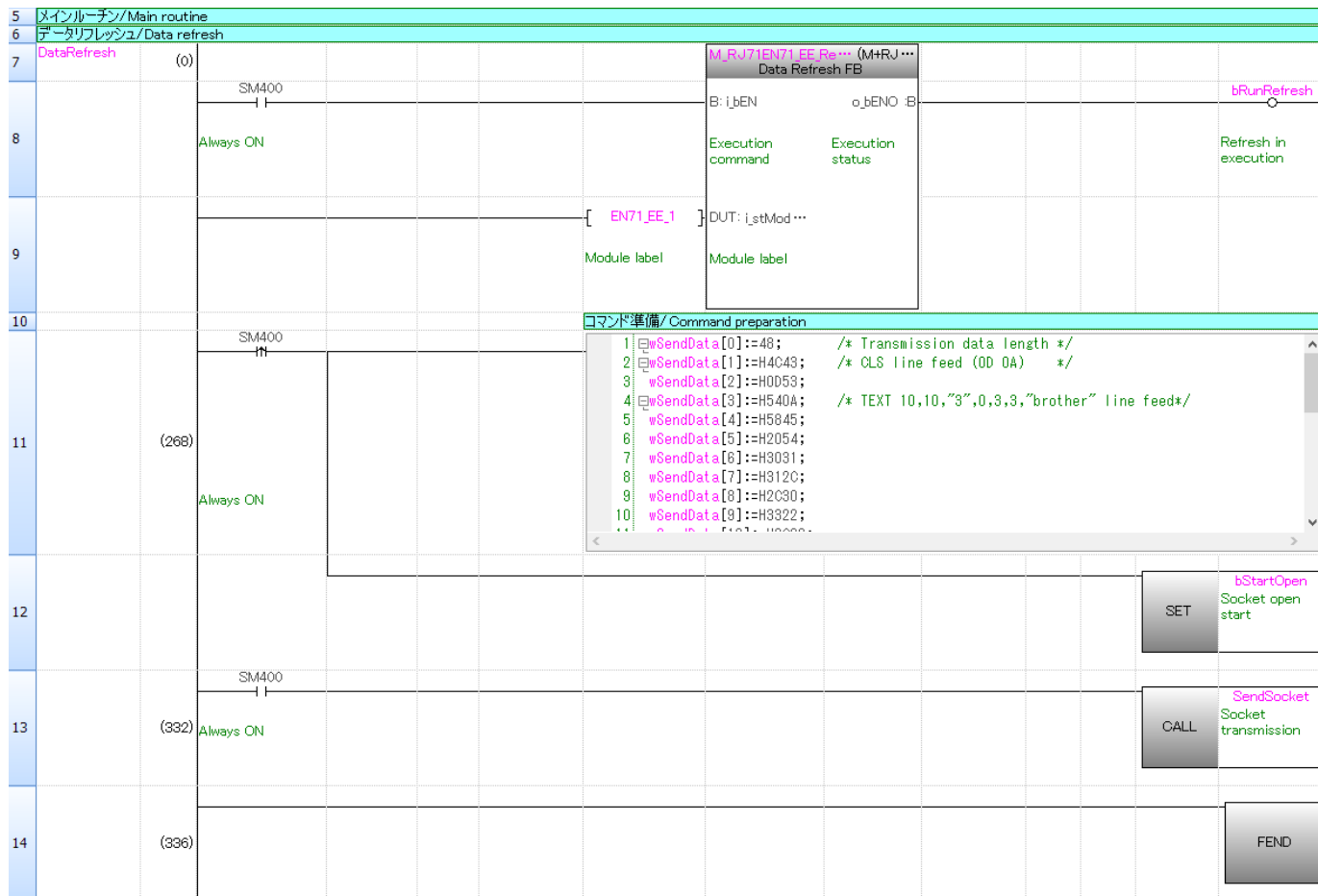
* Data type

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



Transfer the contents of the buffer memory in the RJ71EN71 network part to the module label.

For the operation of M+RJ71EN71_EE_Refresh_Data, refer to "MELSEC iQ-R Ethernet, CC-Link IE, and MELSECNET/H Function Block Reference" for the Mitsubishi Electric programmable controller.

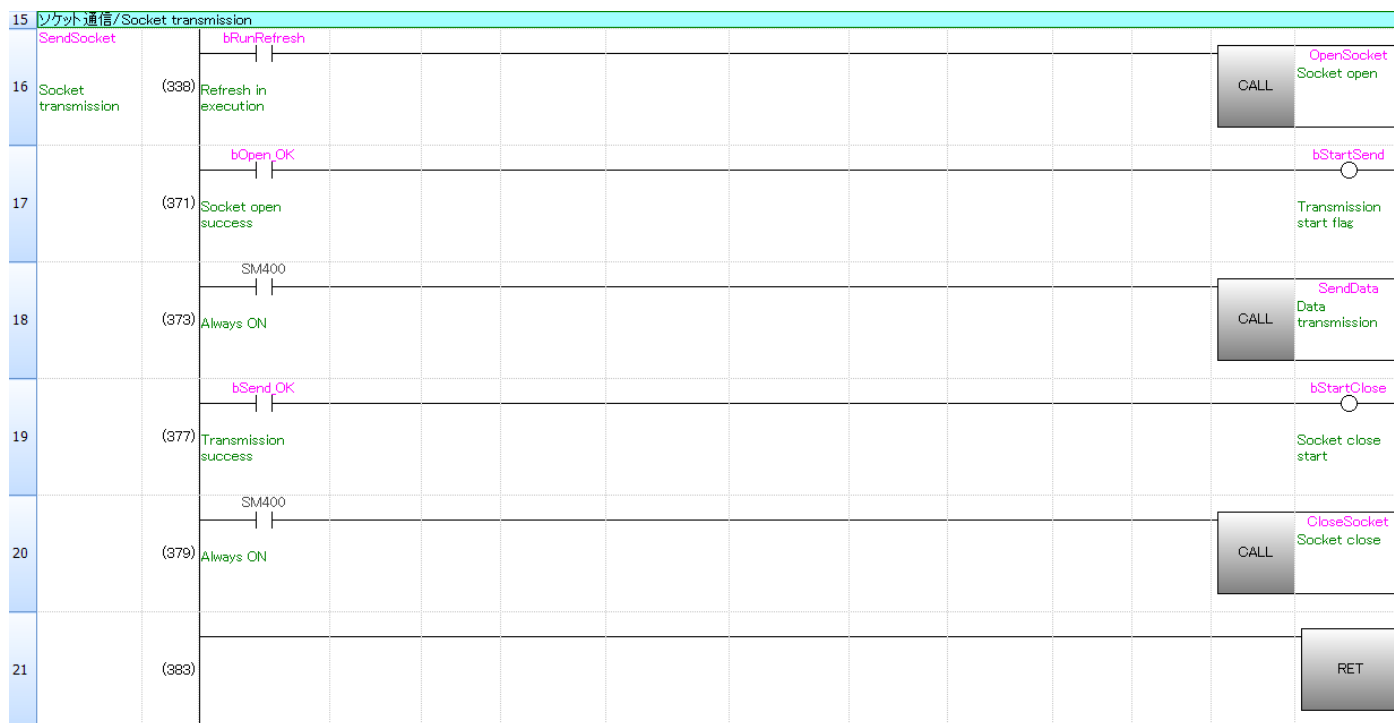
Row number 11: Prepares the command in wSendData.

Row number 13: Sends the prepared command.

All command data in the ST language is as follows.

```
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 16: Calls Sub-routine OpenSocket when bRunRefresh is ON.

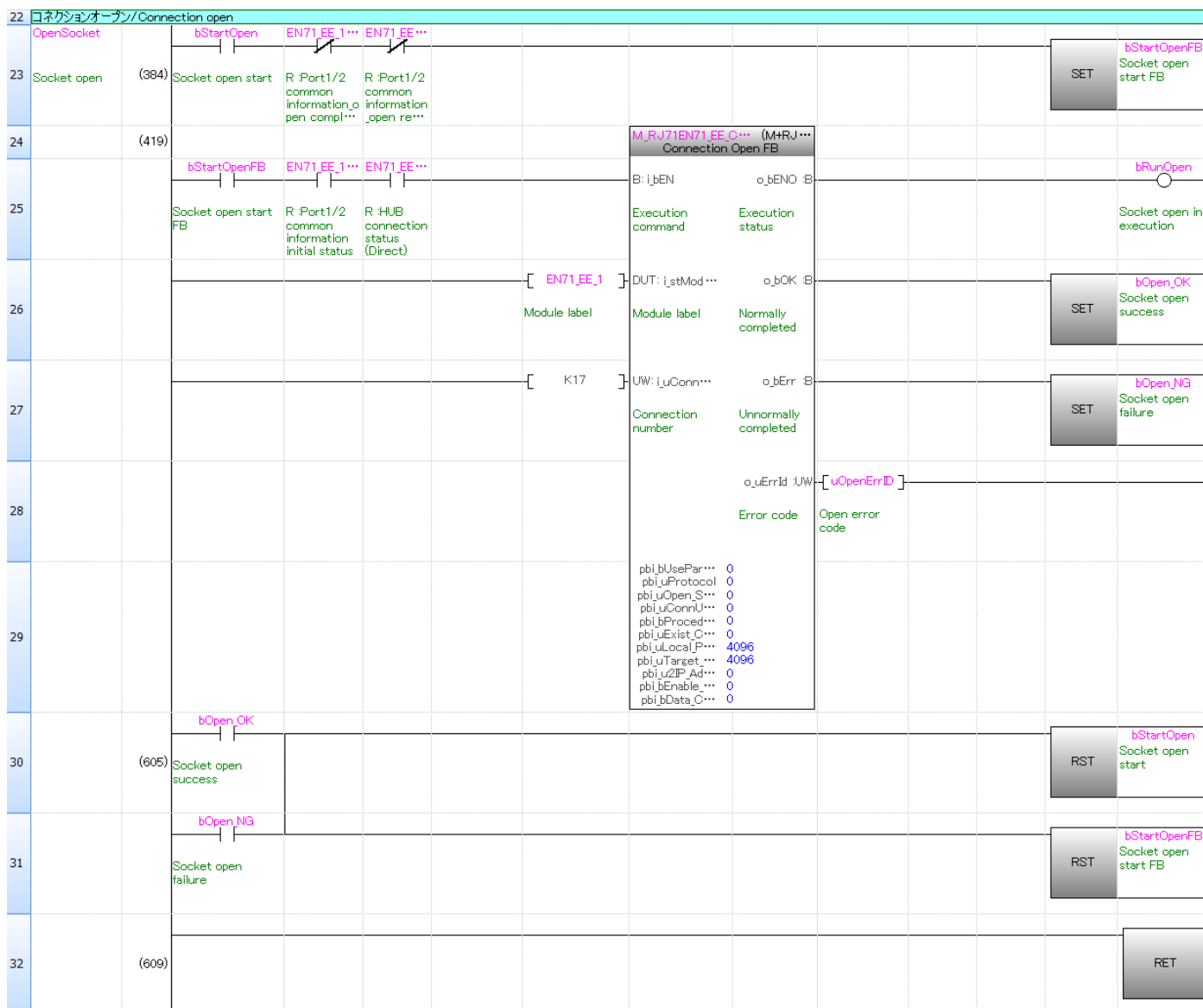
Row number 17: Turns ON bStartSend when bOpenOK is ON (Socket open success).

Row number 18: Calls Sub-routine SendData. when SM400 (Always ON) is ON.

Row number 19: Turns ON bStartClose when bSendOK is ON (Transmission success).

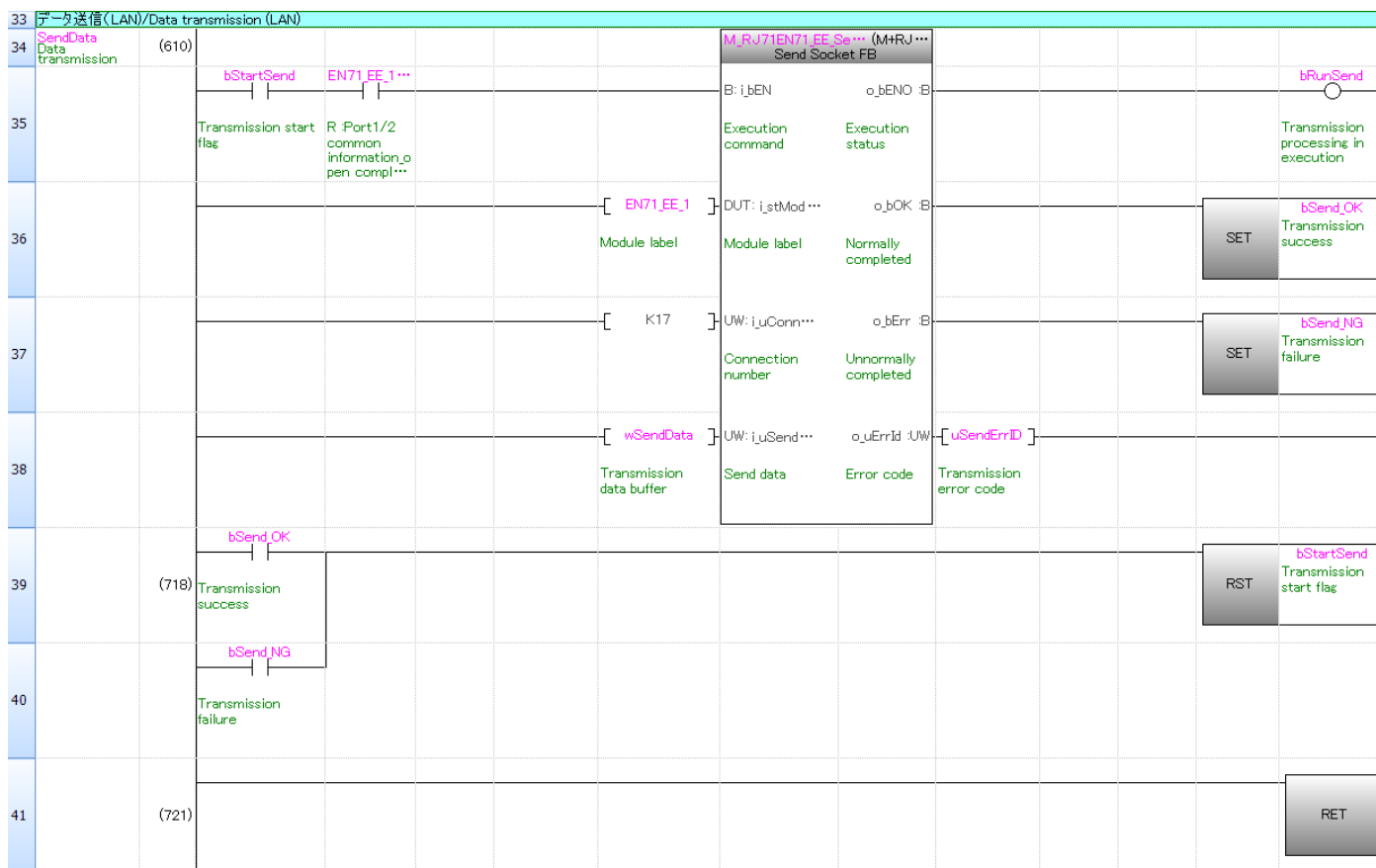
Row number 20: Calls Sub-routine CloseSocket when SM400 (Always ON) is ON.

6.2.3.3. Socket communication connection open



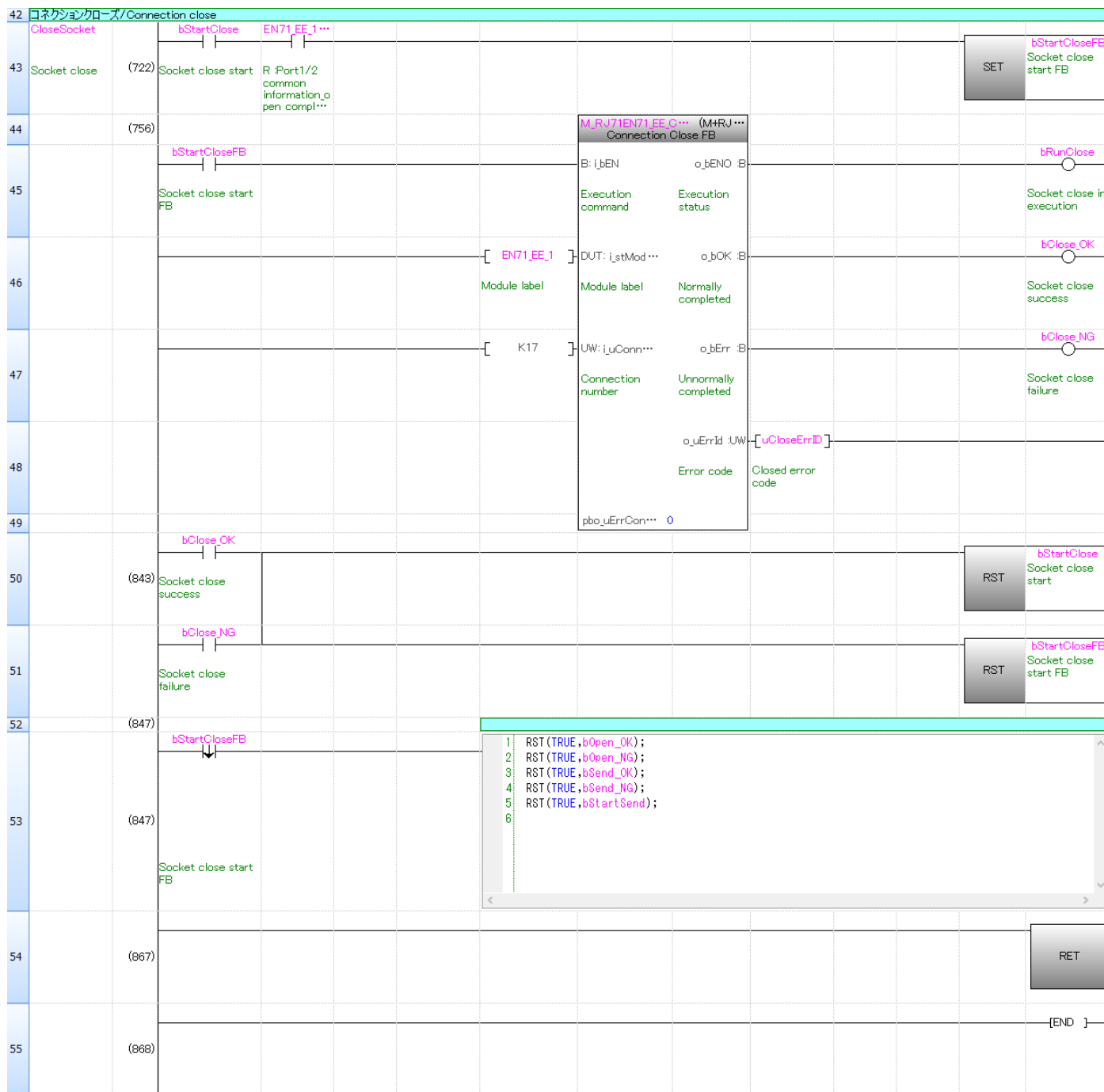
For the operation of M+RJ71EN71_EE_ConnectionOpen FB, refer to "MELSEC iQ-R Ethernet, CC-Link IE, and MELSECNET/H Function Block Reference" for the Mitsubishi Electric programmable controller. In addition, the above program is quoted from "7.1 Communication Examples of Ethernet" in "MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)" for the Mitsubishi Electric programmable controller. For details, refer to that manual.

6.2.3.4. Socket communication data transmission



For the operation of M+RJ71EN71_EE_Send_Socket FB, refer to "MELSEC iQ-R Ethernet, CC-Link IE, and MELSECNET/H Function Block Reference" for the Mitsubishi Electric programmable controller. In addition, the above program is quoted from "7.1 Communication Examples of Ethernet" in "MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)" for the Mitsubishi Electric programmable controller. For details, refer to that manual.

6.2.3.5. Socket communication connection close



For the operation of M+RJ71EN71_EE_ConnectionClose FB, refer to "MELSEC iQ-R Ethernet, CC-Link IE, and MELSECNET/H Function Block Reference" for the Mitsubishi Electric programmable controller. In addition, the above program is quoted from "7.1 Communication Examples of Ethernet" in "MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)" for the Mitsubishi Electric programmable controller. For details, refer to that manual.

[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 product 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 ".

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Product and support information

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

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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)



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