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MITSUBISHI
PROGRAMMABLE CONTROLLERS
MELSEC-F

FX0N

FX0N-232ADP COMMUNICATION ADAPTER

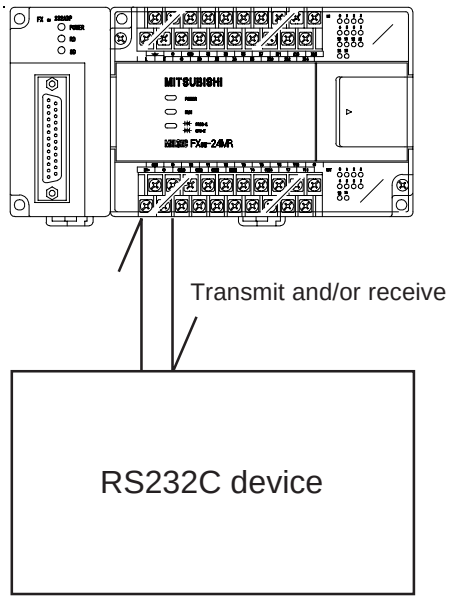
USER'S GUIDE

JY992D51301C

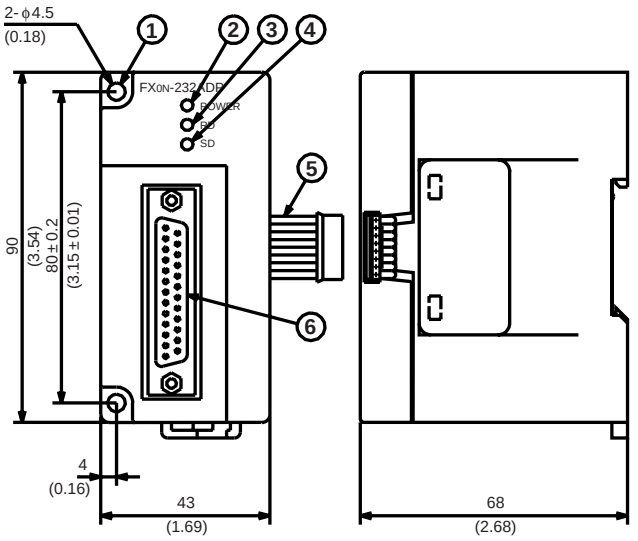
This manual contains text,diagrams and explanations which will guide the reader in the correct installation and operation of the FX0N-232ADP and should be read and understood before attempting to install or use the unit.
Further information can be found in the FX SERIES PROGRAMMING MANUAL and FX0/FX0N HARDWARE MANUAL.

1 INTRODUCTION

- The FX0N-232ADP type RS232C adapter (hereinafter called 232ADP) is connected to the FX0N series PC to exchange serial data with a personal computer, barcode reader, printer, and other various RS232C devices.
- Only one 232ADP unit can be connected to one base unit to the serial port provided at the left side.
- The buffer size and location are specified by an RS instruction in the PC.



EXTERNAL DIMENSIONS



① MOUNTING HOLE

② POWER LED
Lit up by the DC 5 V power supplied from the base unit.

③ RD-LED
Lit when receiving data from the RS232C device connected to the product.

④ SD-LED
Lit when transmitting data to the RS232C device connected to the product.

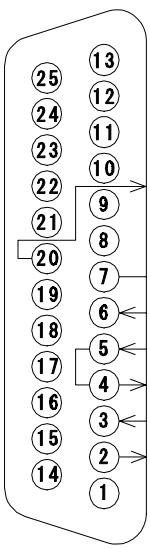
⑤ Connection cable
Used for connection with FX0N PC.

⑥ RS232C connector
Used for connection between the product and RS232C device.

• DIN rail width : 35 Weight : approx.0.1 kg (0.11 lbs)
All dimensions are in mm (inch)

2 TERMINAL LAYOUTS

The connector is a 25-pin D-SUB type, and the pin configuration is as shown below.



Pins 4, 5 are not used.Short-circuited inside.

ER(DTR)Send request (Data Terminal Ready)

NC
SG(Signal Ground)
DR(DSR)Send enable (Data Set Ready)
CS (CTS) Send enable
RS (RTS) Send request
RD (RXD) Receive data
SD (TXD) Send data
NC

Pin No.	Function
1	No connection
2	Send data (232ADP to RS232C device)
3	Receive data (RS232C device to 232ADP)
4 • 5	Not used ; Connected internally
6	Shows RS232C device is ready to receive
7	Signal ground
8	No connection
20	Signal requesting preparation for data sending to RS232C device.

3 INSTALLATION NOTES AND USAGE

Performance specification

Transmission standard	Conforming to RS232C, 25pin D-SUB, connector used	
Isolation method	Photo coupler isolation	
Transmission distance	15m or less (shielded cable recommended)	
Current consumption	DC 5V less than 200mA from base unit	
Control flags and data registers	M8121:Send wait flag M8122:Send flag M8123:Receive completion M8161:8 bits/16 bits changeover	D8120:System configuration D8122:Remainder of send data D8123:Amount of received data D8124:Header byte D8125:Terminator byte

General specification

Ambient Temperature	0 to 55°C in operation -20 to 70 °C in storage
Ambient Humidity	35 to 85% RH (no condensation) in operation
Vibration Resistance	Conforming to JIS C 0911, 10 to 55Hz 0.5mm (max.2G),2 hours each in 3 axial
Impact Resistance	Conforming to JIS C 0912, 10 G three times each in 3 axial directions
Operating Ambience	Free from corrosive gas or excessive dust

- For data transmission to be effective it is necessary to match the communication format between the product and the RS232C device, such as Baud rate and parity.

Communication format D8120 (bit mapping)

Bit	Description	0(OFF)	1(ON)
b 0	Data length	7bit	8bit
b 1 b 2	Parity	(00) : None	
		(01) : Odd	
		(11) : Even	
b 3	Stop	1bit	2bit
b 4 b 5 b 6 b 7	Baud rate (bps)	(0011) : 300	
		(0100) : 600	
		(0101) : 1,200	
		(0110) : 2,400	
		(0111) : 4,800	
		(1000) : 9,600	
		(1001) : 19,200	

Bit	Description	0(OFF)	1(ON)
b 8	Header	None	D8124 *1
b 9	Terminator	None	D8125 *2
b10	Control line	None	H/W
b11	Mode (Control line)	Ordinary mode	Single line mode
b12 b13 b14 b15	Not used	- - -	- - -

*1 The default value is STX (02H: changeable).

*2 The default value is ETX (03H: changeable).

- The communication format is set by special data register D8120.
  Setting the communication format using D8120 is effective only at the time the RS instruction is driven, and therefore any change after driving is not actually accepted.

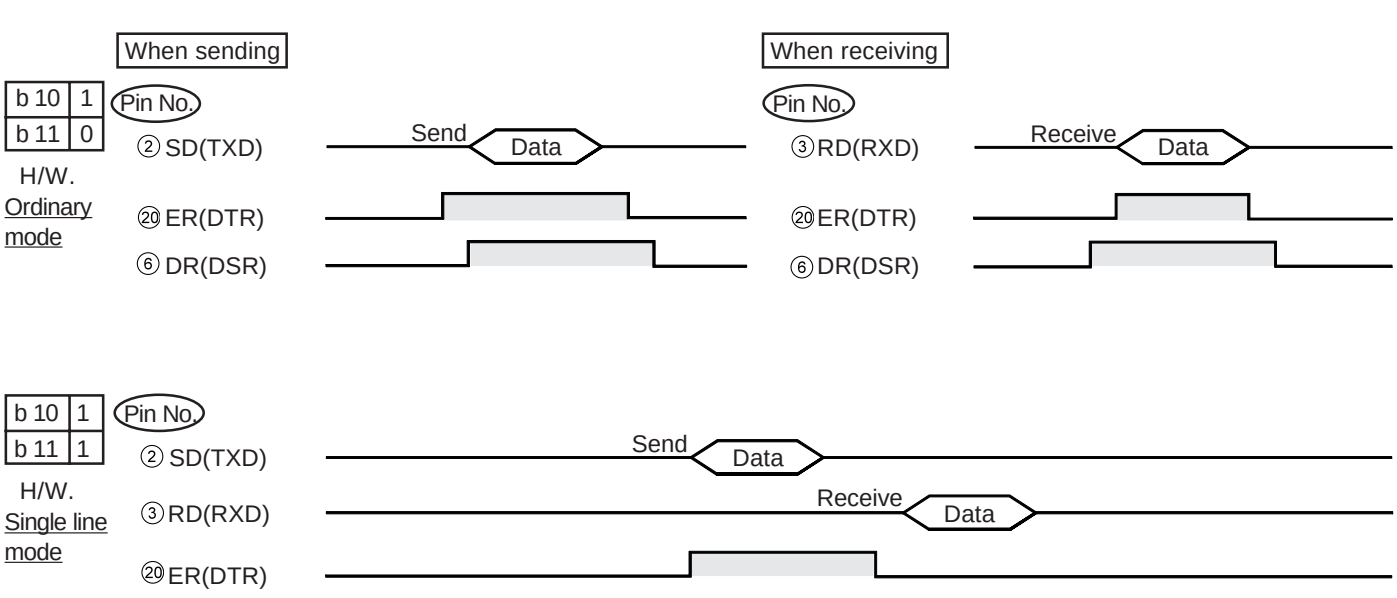
- An example of setting D8120 is shown below.

b15 b0
H138F= 0001 0011 1000 1111(binary)

The settings for the above program are as right.

Data length	8 bit
Parity	Even
Stop	2 bit
Baud rate	9,600
Header	Used
Terminator	Used
Control line	H/W
Mode	Ordinary mode

- The control line is set by b10.
  b10 = 0 :No hardware handshaking.Send and receive are controlled by software protocol.
  b10 = 1 :Hardware handshaking.Signal lines ER(DTR)and DR(DSR)are used to control send and receive of data.



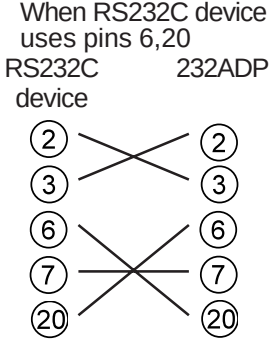
4 WIRING

- The connections of RS232C devices varies with each device being used.
  Check the specification of the device, and connect.

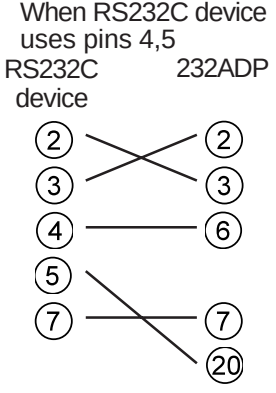
Connection examples

- Terminal specification device

When RS232C device uses pins 6,20

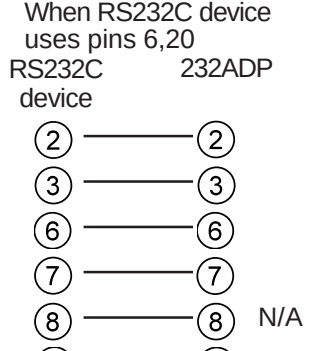


When RS232C device uses pins 4,5

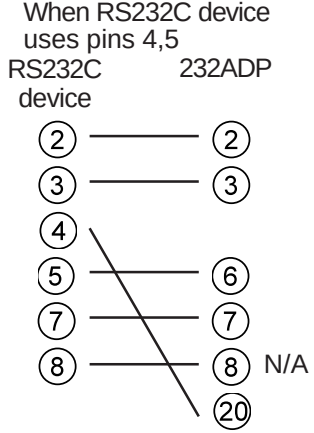


- Modem specification device

When RS232C device uses pins 6,20



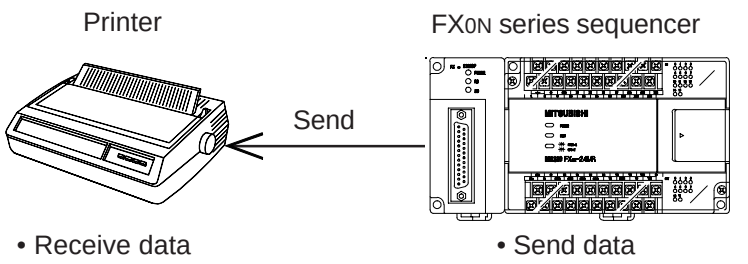
When RS232C device uses pins 4,5



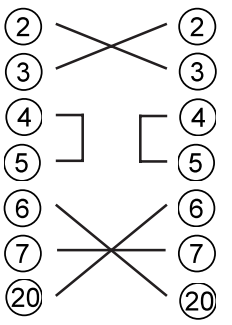
NOTE:The FX0N-232ADP does not monitor the CD pin (pin 8).

5 PROGRAM EXAMPLES

- Connecting 232ADP and a printer,and printing out the data sent from the PC.



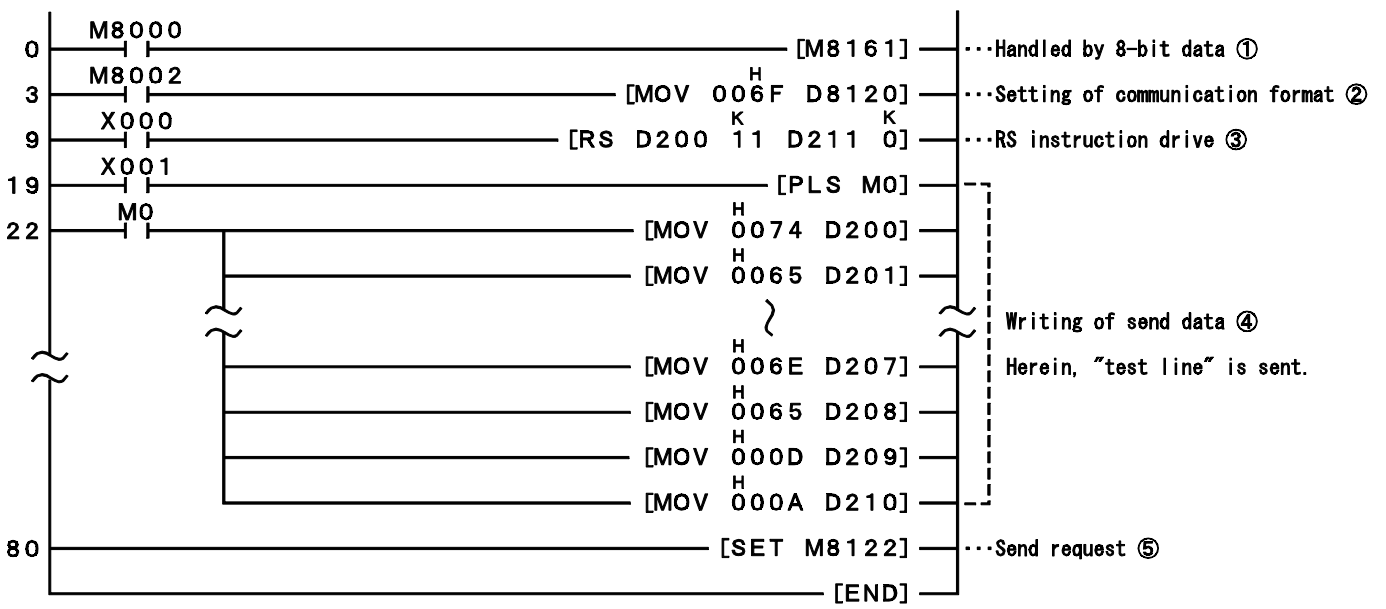
Common pin out for printer communication



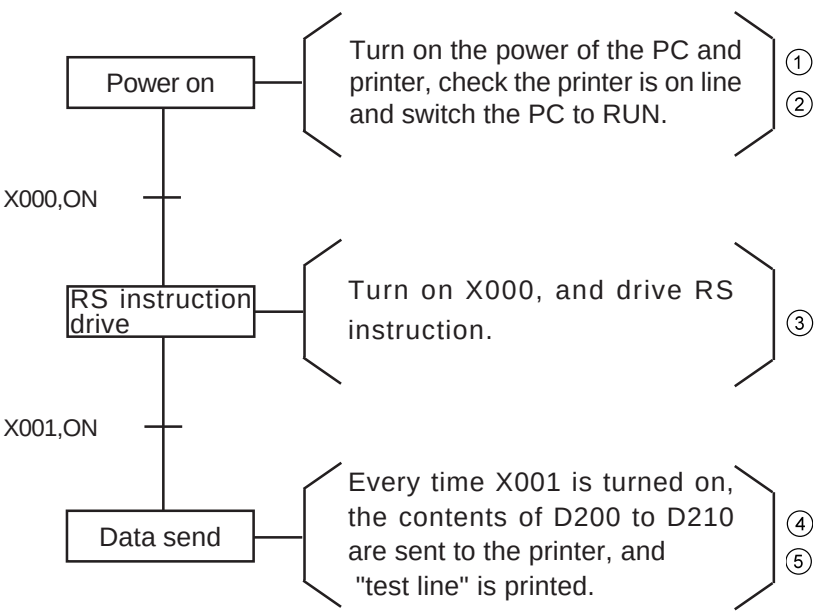
- The communication format of the serial printer is as follows.

Data length	8 bit
Parity	Even
Stop bit	2 bit
Baud rate	2400bps

Sequence program



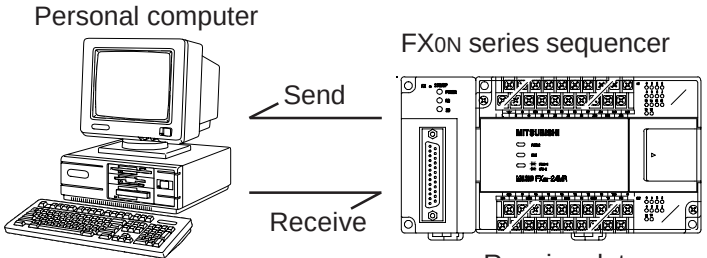
Operation



- In this example, CR (H000D) and LF (H000A) are written at the end of the message.The printer moves down one line for each message.
  CR: Carriage Return
  LF: Line Feed

Note:It may be necessary to set the DIP switches of your printer.
Check your printer manual for how to configure the serial communications.

- Connect 232ADP and a personal computer,and exchange data with the PC.



- Use the communication cable suited to the connector pin configuration of the personal computer.
  (For representative wiring see section 4.)

Preparation of software

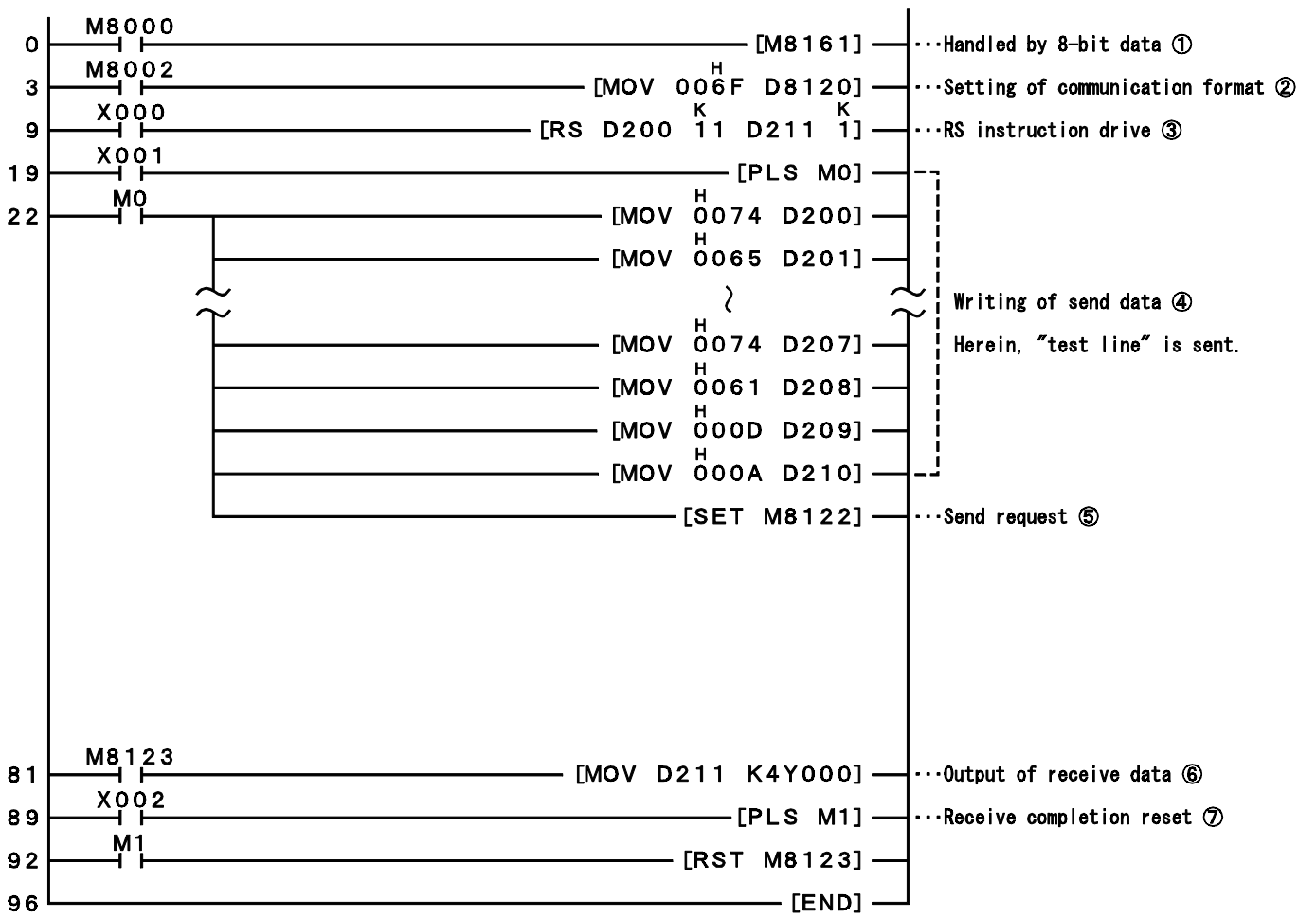
- Use ordinary communication software (terminal emulator) or dedicated program in the personal computer.

The communication format of the PC for this example is as follows.

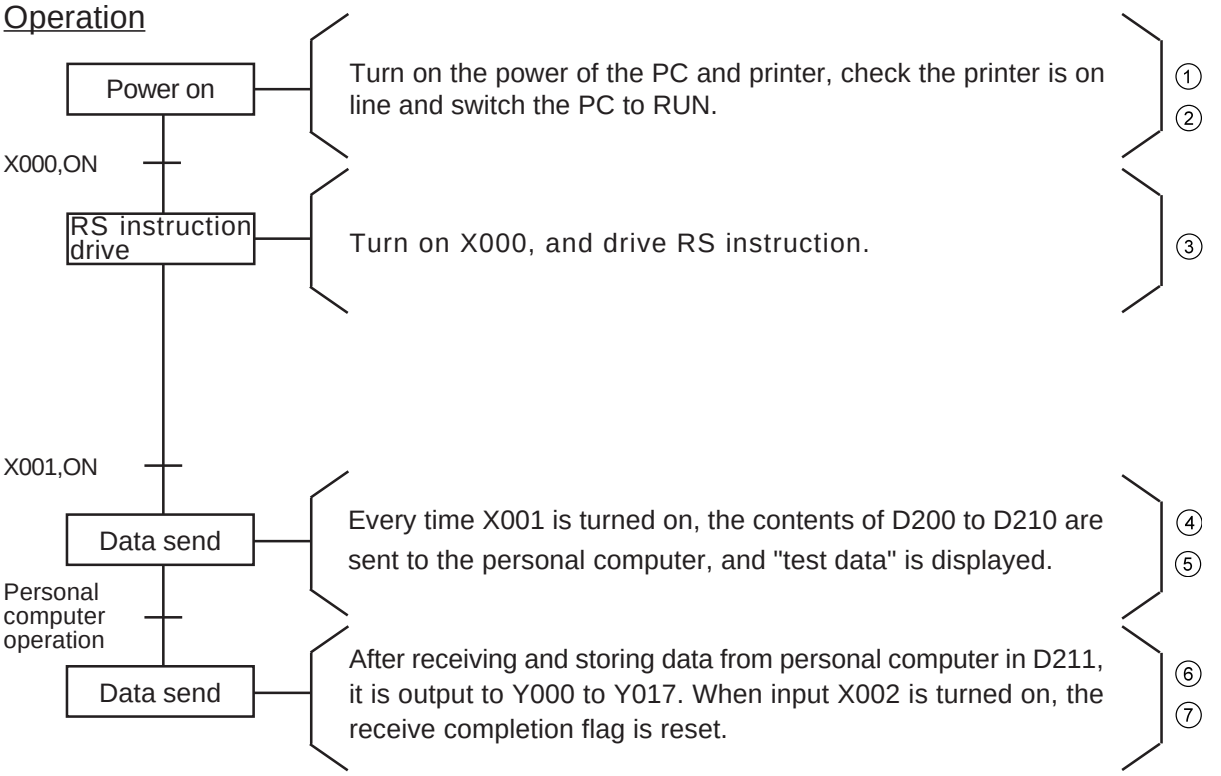
Data length	8 bit
Parity	Even
Stop bit	1 bit
Baud rate	2400

If the communication format of the software cannot be adjusted to this setting, adjust the PC and the software to be the same.

Sequence program



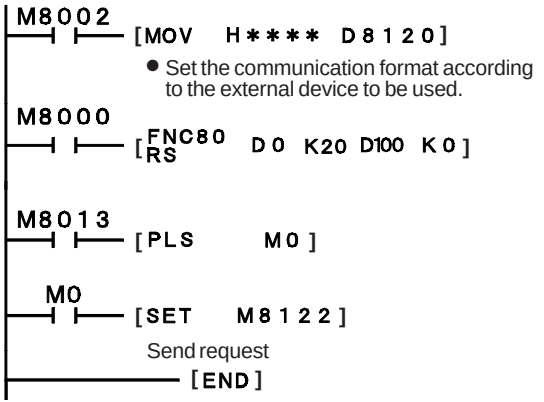
Operation



6 DIAGNOSTICS

- If data transfer does not perform correctly when using the 232ADP, check the operation using the following programs.

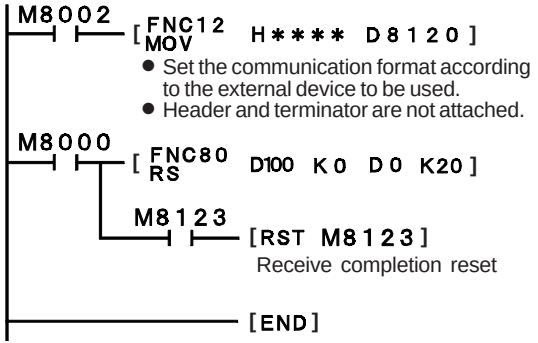
- Program when sending



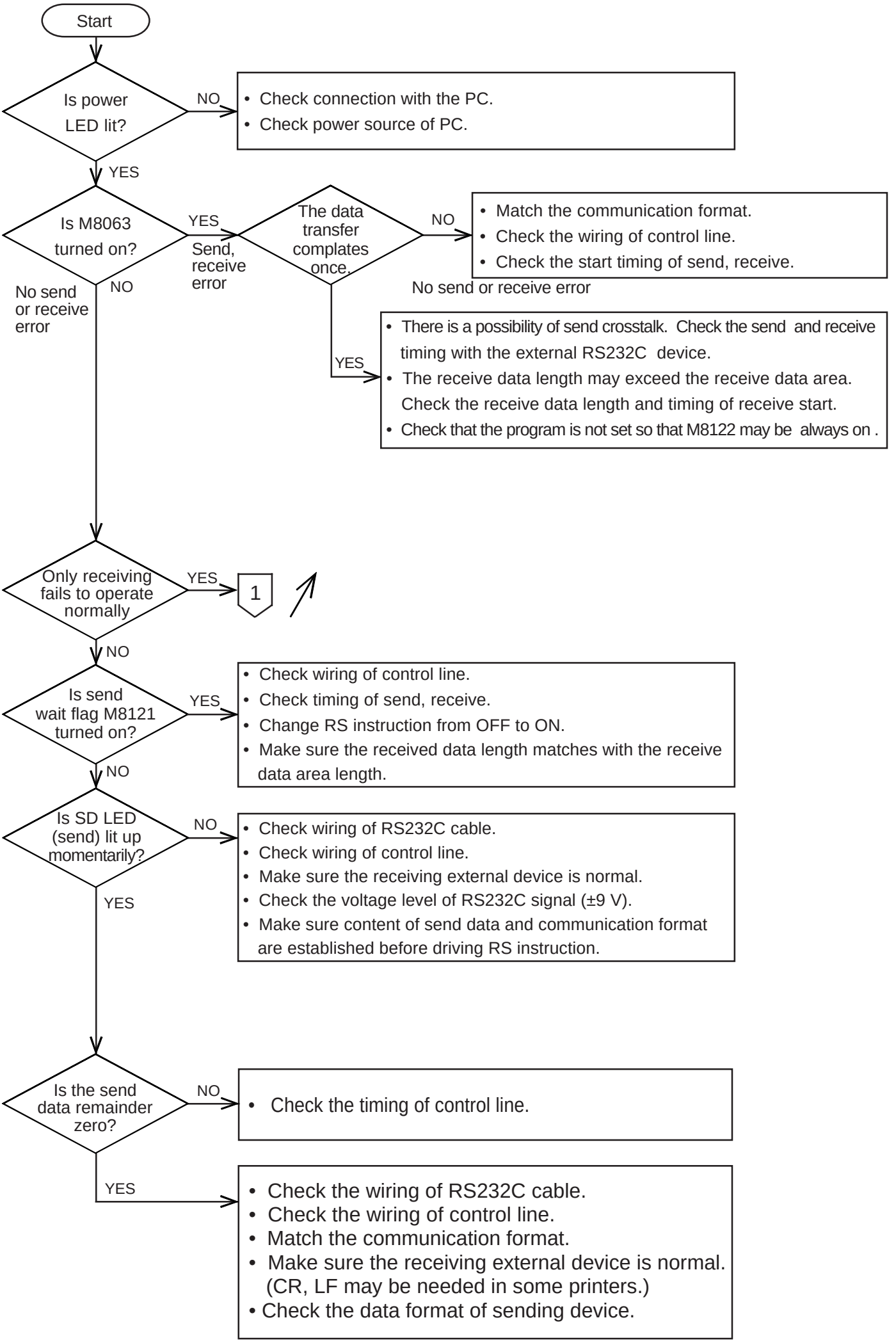
* Write the data to be sent to D 0 to D 19 before operating.

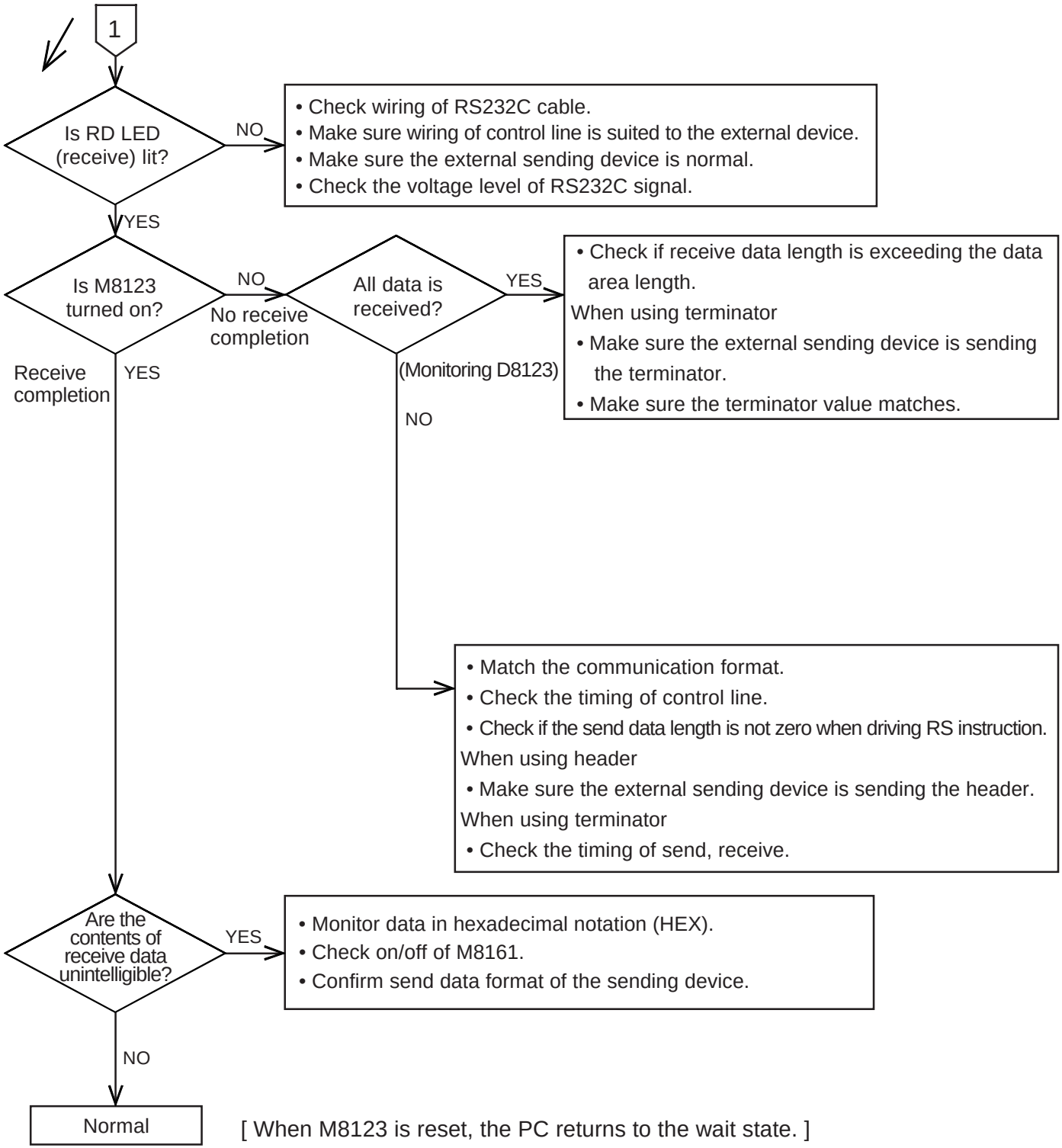
- If sending and receiving using these programs is successful, it is considered that the operation failure was due to sequence program or communication protocol error.

- Program when receiving



- If not operating normally when using these programs, eliminate the cause using the flow diagrams shown following.


Start
Is power LED lit?
NO
• Check connection with the PC.
• Check power source of PC.
YES
Is M8063 turned on?
YES
Send, receive error
The data transfer complates once.
NO
• Match the communication format.
• Check the wiring of control line.
• Check the start timing of send, receive.
No send or receive error
NO
No send or receive error
YES
• There is a possibility of send crosstalk. Check the send and receive timing with the external RS232C device.
• The receive data length may exceed the receive data area. Check the receive data length and timing of receive start.
• Check that the program is not set so that M8122 may be always on .
Only receiving fails to operate normally
YES
1
NO
Is send wait flag M8121 turned on?
YES
• Check wiring of control line.
• Check timing of send, receive.
• Change RS instruction from OFF to ON.
• Make sure the received data length matches with the receive data area length.
NO
Is SD LED (send) lit up momentarily?
NO
• Check wiring of RS232C cable.
• Check wiring of control line.
• Make sure the receiving external device is normal.
• Check the voltage level of RS232C signal (±9 V).
• Make sure content of send data and communication format are established before driving RS instruction.
YES
Is the send data remainder zero?
NO
• Check the timing of control line.
YES
• Check the wiring of RS232C cable.
• Check the wiring of control line.
• Match the communication format.
• Make sure the receiving external device is normal. (CR, LF may be needed in some printers.)
• Check the data format of sending device.



[When M8123 is reset, the PC returns to the wait state.]

Guidelines for the safety of the user and protection of the FX0N-232ADP

- This manual has been written to be used by trained and competent personnel. This is defined by the European directives for machinery, low voltage and EMC.
- If in doubt at any stage during the installation of the FX0N-232ADP always consult a professional electrical engineer who is qualified and trained to the local and national standards.If in doubt about the operation or use of the FX0N-232ADP please consult the nearest Mitsubishi Electric distributor.
- Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
- All example and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.
- Owing to the very great variety in possible application of this equipment, you must satisfy yourself as to its suitability for to your specific application.

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