ADVANCED AND EVER ADVANCING **MITSUBISHI ELECTRIC**

MITSUBISHI

GRAPHIC OPERATION TERMINALS

MELSEC-**GOT**

F940

HARDWARE MANUAL

F940GOT-SWD-E/LWD-E

[Connection System Manual]

F940GOT-SWD-E/LWD-E

HARDWARE MANUAL

(Connection System Manual)

Manual number :   JY992D79201
Manual revision :   A
Date   :   March 1999

Guidelines for the safety of the user and protection of the F940GOT-SWD-E/LWD-E

This manual provides information for the installation and use of the Graphic Operation Terminal F940GOT. The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows;

a) Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, (trained and qualified to the local and national standards required to fulfill that role). These engineers should be fully aware of safety with regards to automated equipment.

b) Any commissioning or service engineer must be of a competent nature, trained and qualified to the local and national standards required to fulfill that job. These engineers should also be trained in the use and maintenance of the completed product. This includes being completely familiar with all associated documentation for the said product. All maintenance should be carried out in accordance with established safety practices.

c) All operators of the compliance product should be trained to use that product in a safe and coordinated manner in compliance to established safety practices. The operators should also be familiar with all documentation which is connected with the actual operation of the completed equipment.

Note: The term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.

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Note's on the symbology used in this manual

At various times through out this manual certain symbols will be used to highlight points of information which are intended to ensure the users personal safety and protect the integrity of the equipment. Whenever any of the following symbols are encountered, its associated note must be read and understood. Each of the symbols used will now be listed with a brief description of its meaning.

Hardware warnings

1) Indicates that the identified danger **WILL** cause physical and property damage.

2) Indicates that the identified danger **POSSIBLY** cause physical and property damage.

3) Indicates a point of further interest or further explanation.

Software warnings

1) Indicates special care must be taken when using this element of software.

2) Indicates a special point of which the user of the associate software element should be aware.

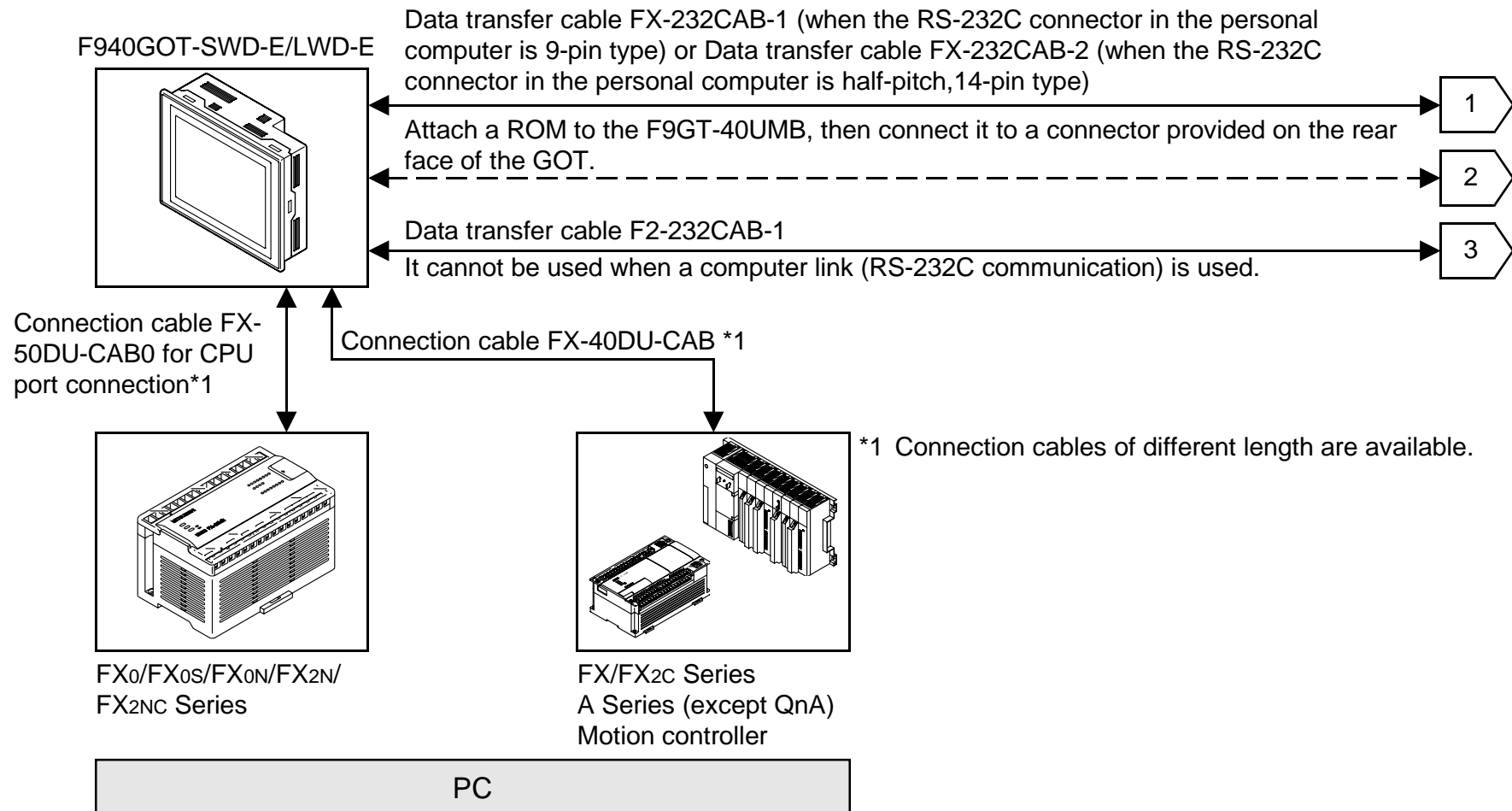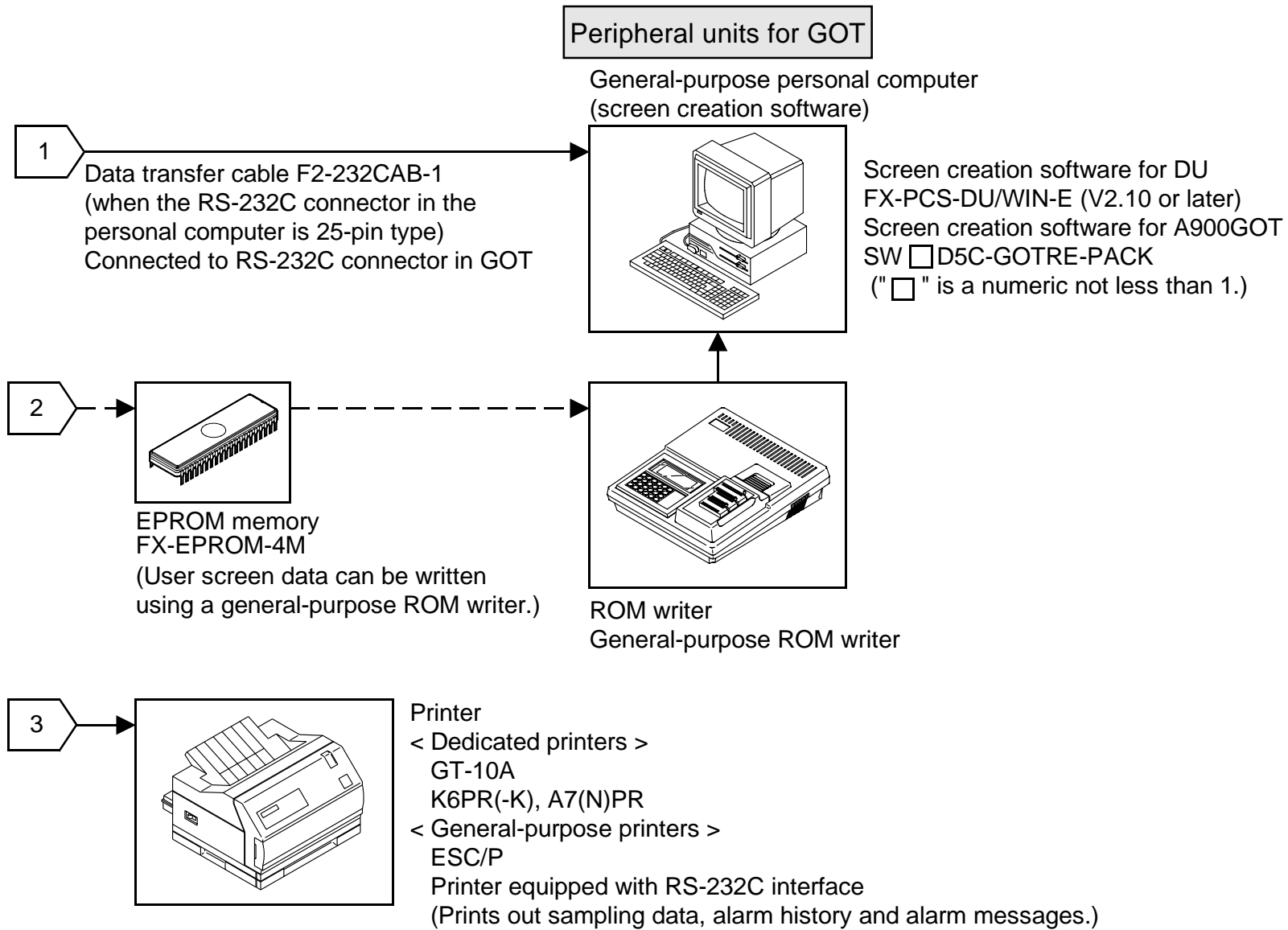3) Indicates a point of interest or further explanation.

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Table of Contents

1.   System configuration

The system configuration to use the GOT is described below.

1.1   When the GOT is directly connected to the PLC
(When the GOT is connected via a computer link unit, refer to Section 2.)

F940GOT-SWD-E/LWD-E

Data transfer cable FX-232CAB-1 (when the RS-232C connector in the personal computer is 9-pin type) or Data transfer cable FX-232CAB-2 (when the RS-232C connector in the personal computer is half-pitch,14-pin type)

1

Attach a ROM to the F9GT-40UMB, then connect it to a connector provided on the rear face of the GOT.

2

Data transfer cable F2-232CAB-1

3

It cannot be used when a computer link (RS-232C communication) is used.

Connection cable FX-50DU-CAB0 for CPU port connection*1

Connection cable FX-40DU-CAB *1

*1 Connection cables of different length are available.

FX0/FX0S/FX0N/FX2N/
FX2NC Series

FX/FX2C Series
A Series (except QnA)
Motion controller

PC

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1-1

Peripheral units for GOT

General-purpose personal computer
(screen creation software)

1 Data transfer cable F2-232CAB-1
(when the RS-232C connector in the
personal computer is 25-pin type)
Connected to RS-232C connector in GOT

Screen creation software for DU
FX-PCS-DU/WIN-E (V2.10 or later)
Screen creation software for A900GOT
SW ☐D5C-GOTRE-PACK
 (" ☐ " is a numeric not less than 1.)

2 EPROM memory
FX-EPROM-4M
(User screen data can be written
using a general-purpose ROM writer.)

ROM writer
General-purpose ROM writer

3 Printer
< Dedicated printers >
  GT-10A
  K6PR(-K), A7(N)PR
< General-purpose printers >
  ESC/P
  Printer equipped with RS-232C interface
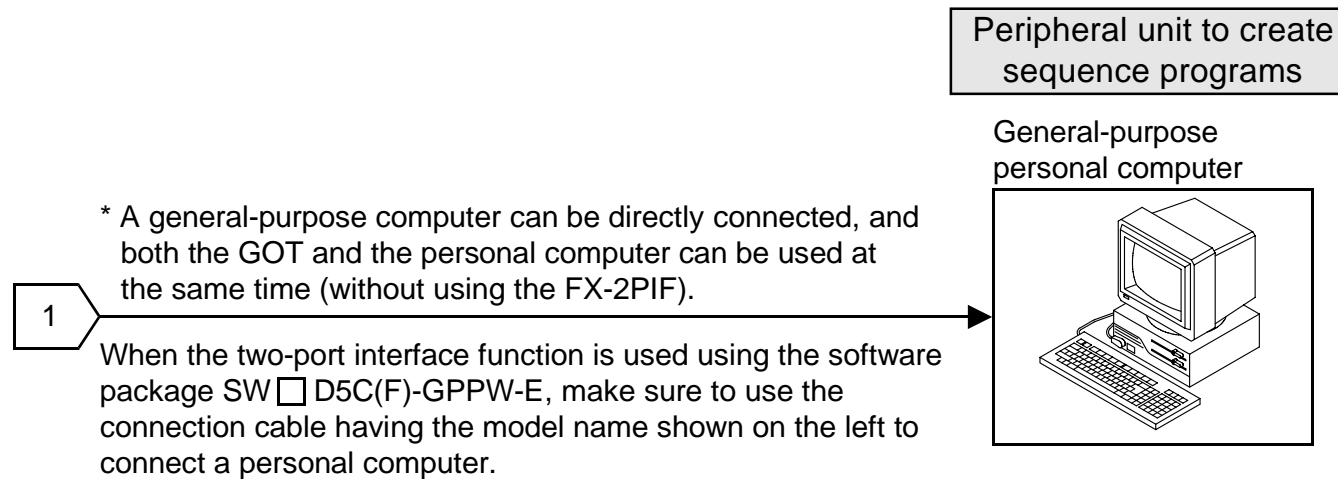 (Prints out sampling data, alarm history and alarm messages.)

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The figure below shows connection to peripheral units used to create sequence programs.

1.2   When built-in two-port interface function is used
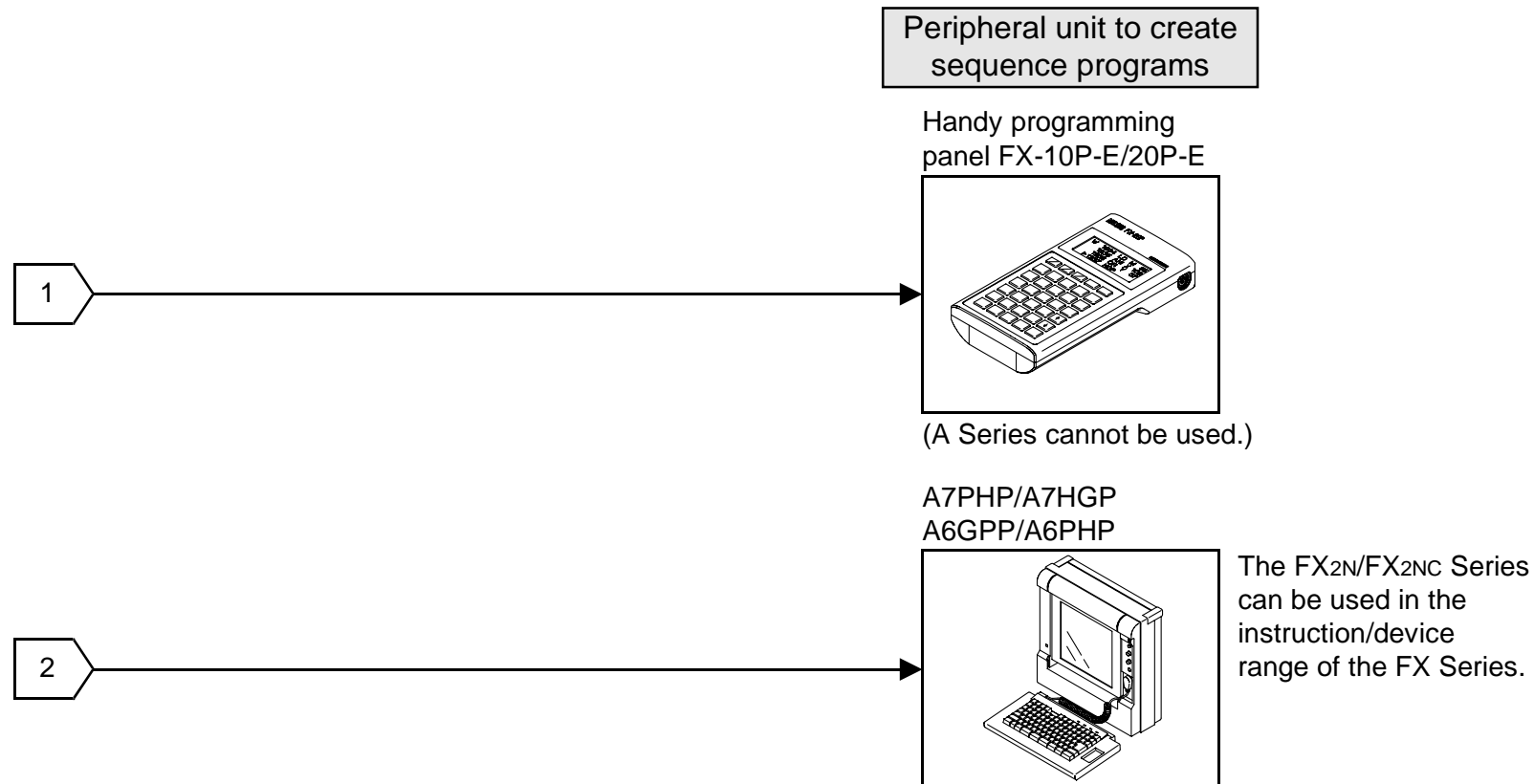
F940GOT-SWD-E/LWD-E

When the two-port interface function is used, the operation environment should be set.
(Refer to the description on "SERIAL PORT" on the SET-UP MODE screen.)

Data transfer cable FX-232CAB-1
(when the RS-232C connector in the personal computer is 9-pin type)

Data transfer cable F2-232CAB-2
(when the RS-232C connector in the personal computer is half-pitch, 14-pin type)
Connected to RS-232C connector in GOT

1

Connection cable FX-50DU-CAB0 for CPU port connection*1

Connection cable FX-40DU-CAB *1

*1 Connection cables of different length are available.

FX0/FX0S/FX0N/FX2N/
FX2NC Series

FX/FX2C Series
A Series (except QnA)
Motion controller

PC

Peripheral unit to create
sequence programs

General-purpose
personal computer

* A general-purpose computer can be directly connected, and
  both the GOT and the personal computer can be used at
  the same time (without using the FX-2PIF).

1

When the two-port interface function is used using the software
package SW ☐ D5C(F)-GPPW-E, make sure to use the
connection cable having the model name shown on the left to
connect a personal computer.

Note:

This two-port interface function is effective in CPU port connection (via the RS-422). This function is not available in computer link connection (via the RS-422 or the RS-232C) and CPU port connection (via the RS-232C).
And even in CPU port connection (via the RS-422), this function is not available when two or more GOT units are connected.

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When the two-port interface FX-2PIF is used

F940GOT-SWD-E/LWD-E

Two-port interface
FX-2PIF

Connection cable FX-40DU-CAB/EN

Program cable FX-20P-CAB

1

Data transfer cable AC30R4

2

Data transfer cable FX-422CAB or
Data transfer cable FX-422CAB-150

Data transfer cable
FX-422CAB0

FX0/FX0S/FX0N/FX2N/
FX2NC Series

FX/FX2C/ Series

A Series (except QnA)

Peripheral unit to create
sequence programs

Handy programming
panel FX-10P-E/20P-E

1

(A Series cannot be used.)

A7PHP/A7HGP
A6GPP/A6PHP

2

The FX2N/FX2NC Series
can be used in the
instruction/device
range of the FX Series.

Note:

The two-port interface FX-2PIF is available in CPU port connection (via the RS-422). This interface is not available in computer link connection (via the RS-422 or the RS-232C) and CPU port connection (via the RS-232C).
And even in CPU port connection (via the RS-422), this interface is not available when two or more GOT units are connected.

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2.   Connection to personal computer

Use the following cable to connect a personal computer.

b)

a)

c)
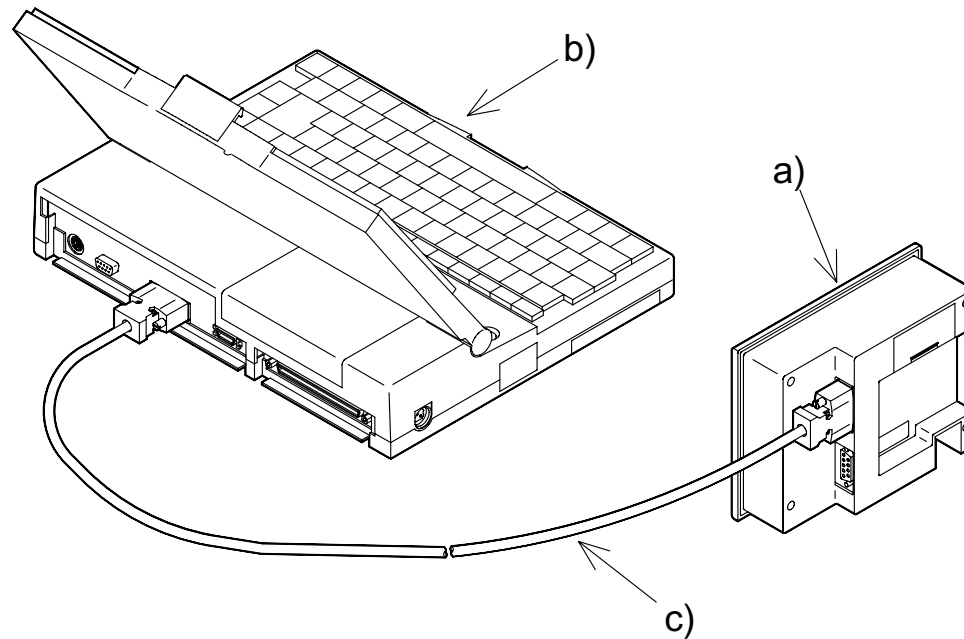
a) F940GOT

b) Personal computer

c) FX-232CAB-1, FX-232CAB-2 or F2-232CAB-1

2.1   Pin assignment and connection diagram of transfer cables

- Transfer cable FX-232CAB-1
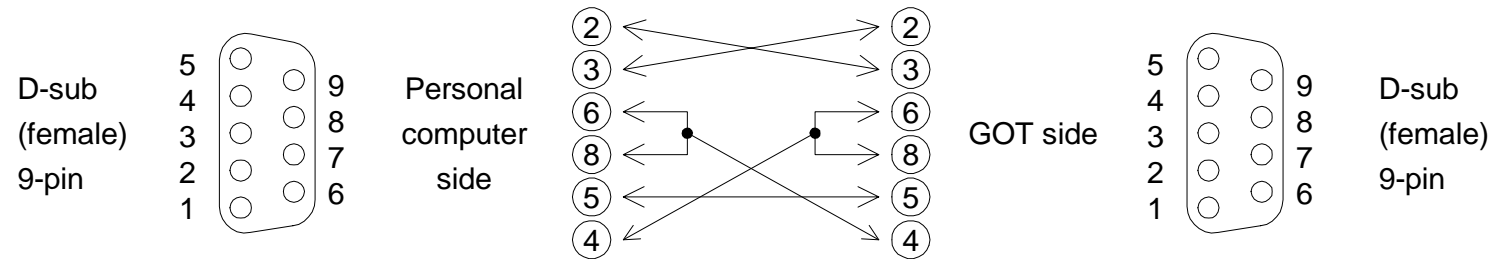
- Transfer cable FX-232CAB-2
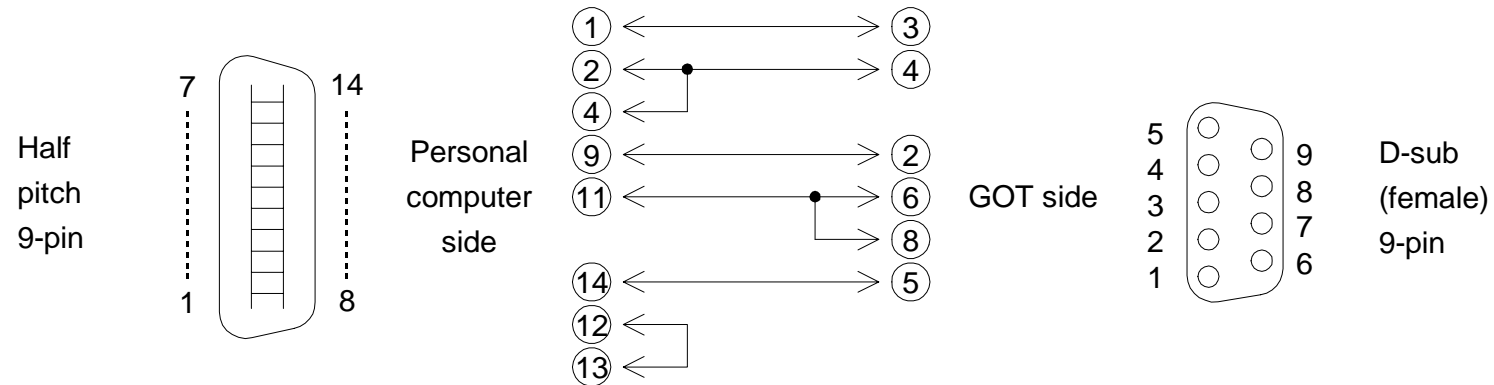
- Transfer cable F2-232CAB-1
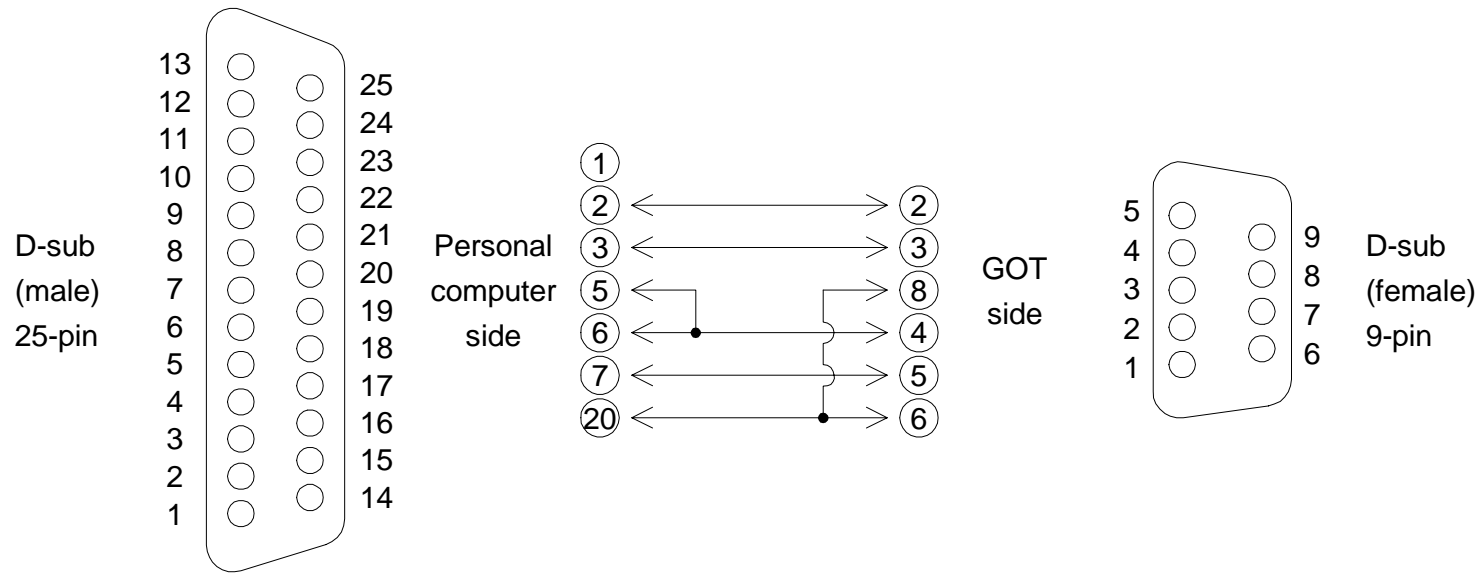
MEMO

3.   CPU port connection

Use either of the following cables to connect the PLC directly.

3.1   Connection to FX/A Series

1) When connecting the FX/FX2C/A Series
2) When connecting the FX0/FX0S/FX0N/FX2N/FX2NC Series

1)   2)

a)

b)

a)

c)

d)

e), g)

f)
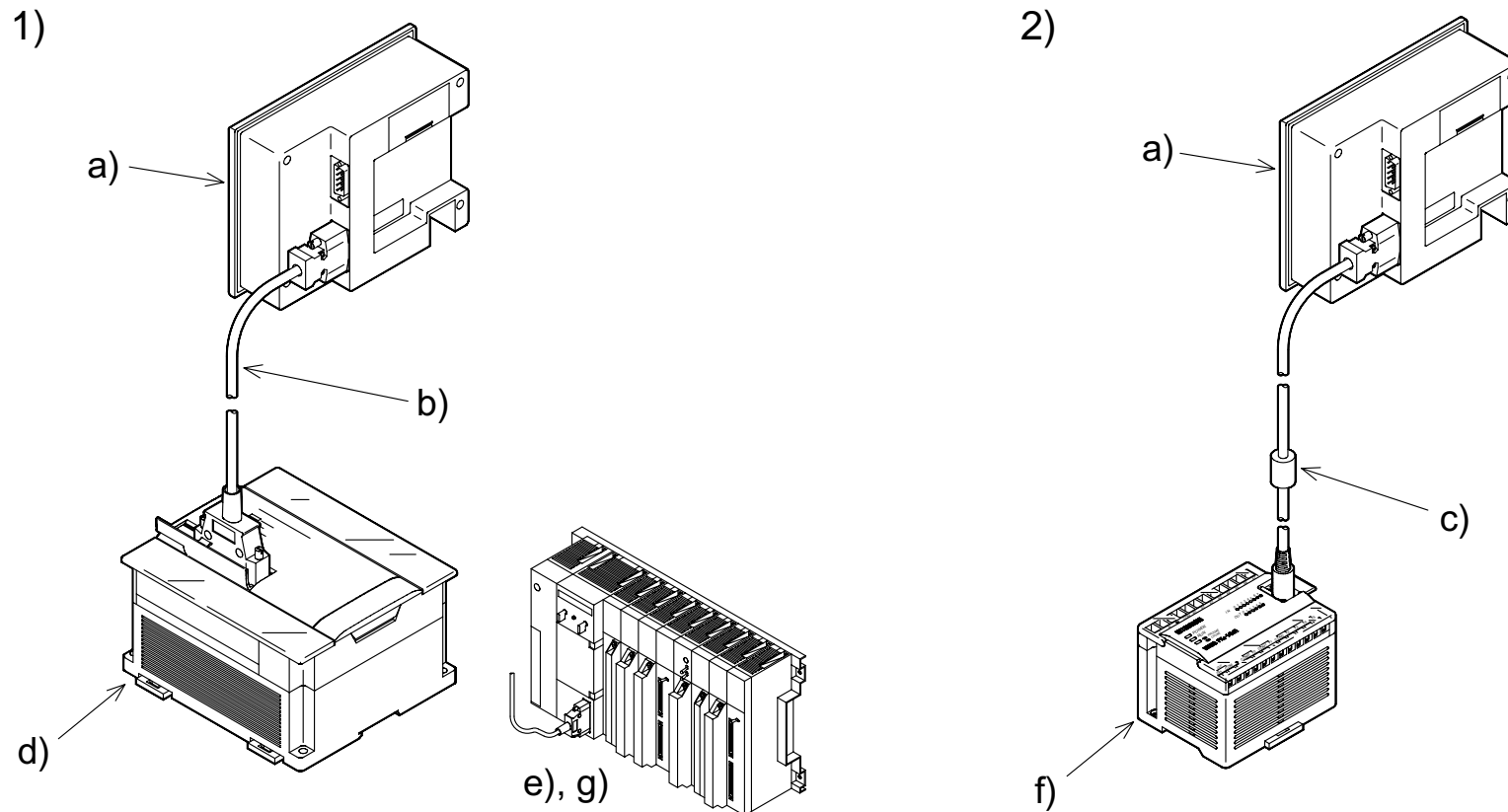
*   When the screen mode is selected while a cable is not connected, a communication
     error occurs.

a) F940GOT

b)   FX-40DU-CAB, FX-40DU-CAB-10M or FX-50DU-CABL

c) FX-50DU-CAB0, FX-50DU-CAB0-1M, FX-50DU-CAB0-10M,
    FX-50DU-CAB0-20M, FX-50DU-CAB0-30M or FX-50DU-CAB0L

d)   FX/FX2C Series PLC

e) A Series PLC
    AnN, AnA, AnS, AnSJ, AnSH, A1SJH, A2C, A2CJ, A0J2H, AnU, AnUS, A2USH or A1FX
    CPU

f)   FX0/FX0S/FX0N/FX2N/FX2NC Series PLC

g) Motion controller
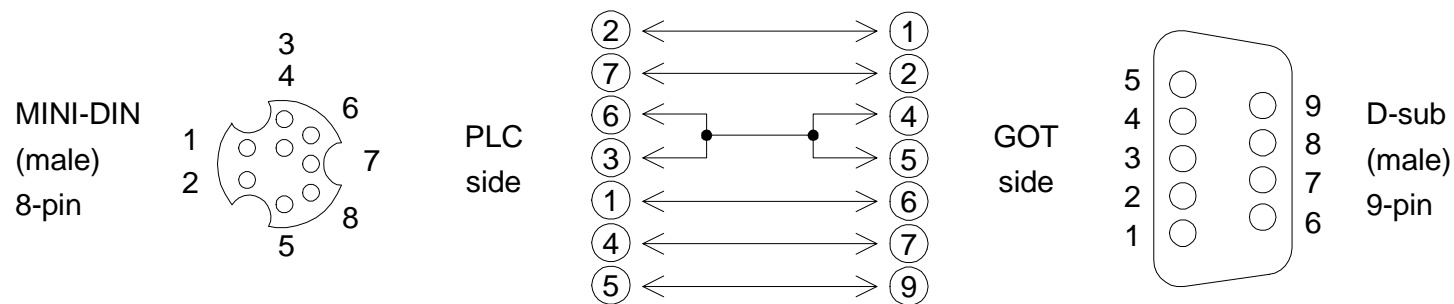   A171SCPU-S3, A171SHCPU, A172SHCPU or A272UHCPU

3.2   Connection diagram

Pin assignment and connection diagram of connection cables (The connection cables are offered as options.)

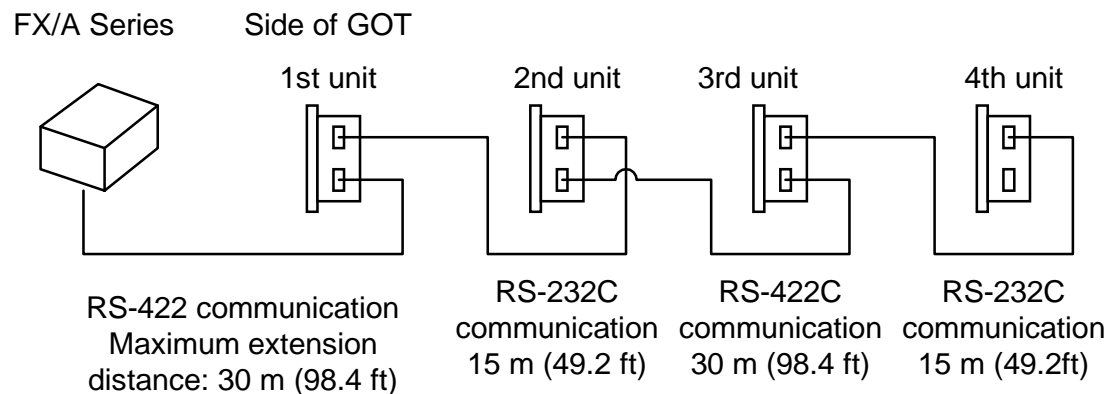- Connection cable FX-40DU-CAB (L, -10M) or FX-50DU-CABL
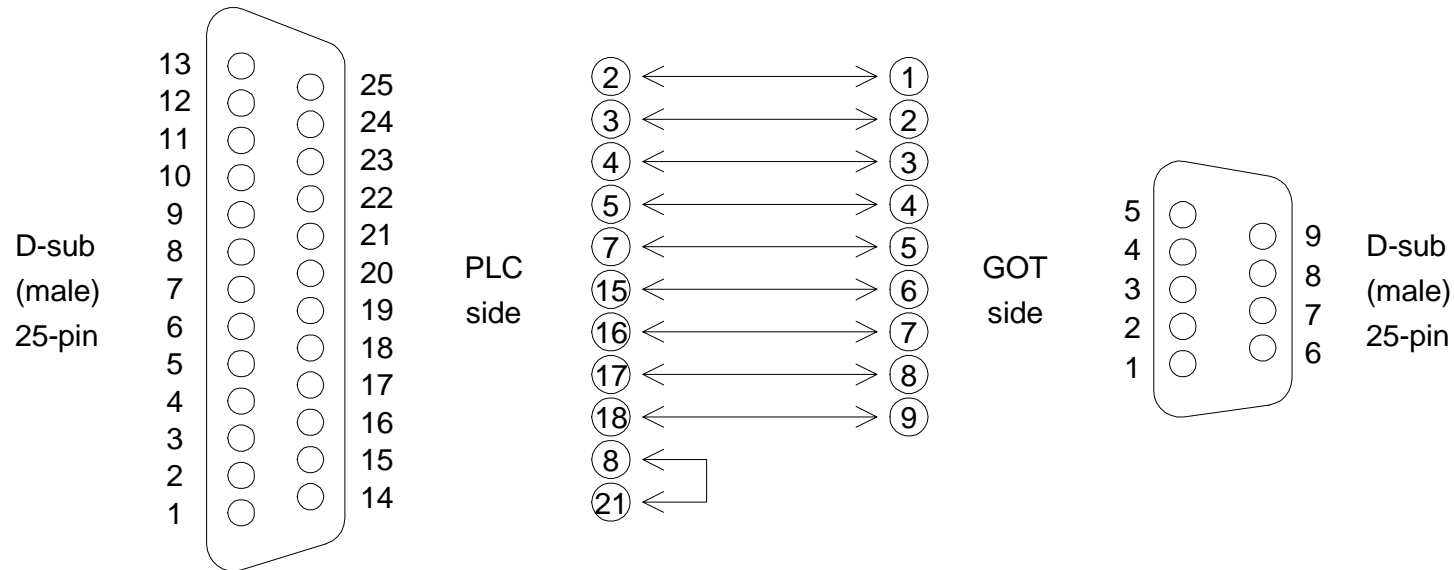
- Connection cable FX-50DU-CAB0 (L, -1M, -10M, -20M, -30M)

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3.3   Connection of two or more GOT units

- When the CPU in the FX/A Series PLC is directly connected, up to four GOT units can be connected to one PLC (1-to-N connection).
As the connection type, select "CPU PORT (RS232C)" or "CPU PORT (RS422)" in "CON-NECTION" on the PLC TYPE screen.

System configuration

FX/A Series   Side of GOT

1st unit   2nd unit   3rd unit   4th unit

RS-422 communication   RS-232C   RS-422   RS-232C
Maximum extension   communication   communication   communication
distance: 30 m (98.4 ft)   15 m (49.2 ft)   30 m (98.4 ft)   15 m (49.2ft)

Note:

While the GOT display is used, peripheral units of the GOT and peripheral units used to create sequence programs cannot be used except when the following system configuration is realized using the FX2N -422-BD in the FX2N Series. Cables to connect such peripheral units should be disconnected while the GOT display is used.

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Connection cable examples:

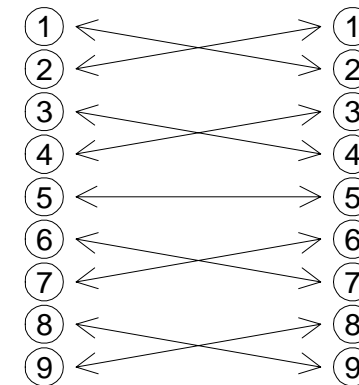Connection diagram

1st GOT: FX-50DU-CAB0
        (equivalent to connection cable for PLC)

2nd GOT: FX-232CAB-1

3rd GOT: Cable created by user
        (Refer to the connection diagram.)

4th GOT: FX-232CAB-1

Communication speed: The communication speed with the PLC becomes slower as the number of connected GOT units becomes larger.

When the speed in the case one GOT unit is connected is regarded as "1",
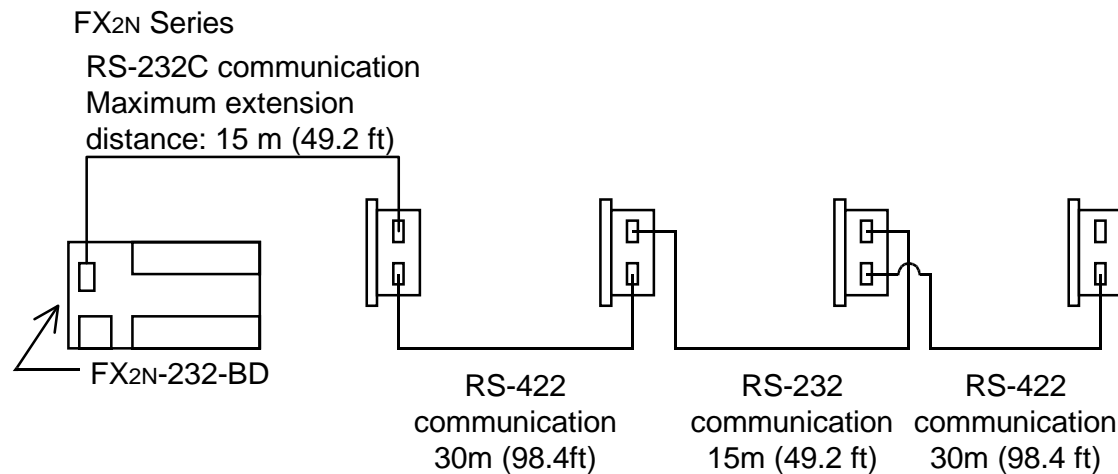
Speed in 1st unit x 2 = Speed in 2nd unit (1/2 of speed in 1st unit)

Speed in 2nd unit x 2 = Speed in 3rd unit (1/4 of speed in 1st unit)

Speed in 3rd unit x 2 = Speed in 4th unit (1/8 of speed in 1st unit)

- In this case, peripheral units used to create sequence programs can be connected using programming connectors in the FX2N unit.

- In the case of the FX2N Series, communication can be performed by CPU port connection (RS-232C communication) using the FX2N-232-BD.
  In this case also, In the case of the FX2N Series, communication can be performed by CPU port connection (RS-232C communication) using the FX2N-232-BD.
  In this case also, up to four GOT units can be connected to one PLC (1-to-N connection).
  Up to four GOT units can be connected to one PLC (1-to-N connection).
  To connect peripheral units used to create sequence programs, use programming connectors in the FX2N main unit.

System configuration

FX2N Series

RS-232C communication
Maximum extension
distance: 15 m (49.2 ft)

FX2N-232-BD

RS-422
communication
30m (98.4ft)

RS-232
communication
15m (49.2 ft)

RS-422
communication
30m (98.4 ft)

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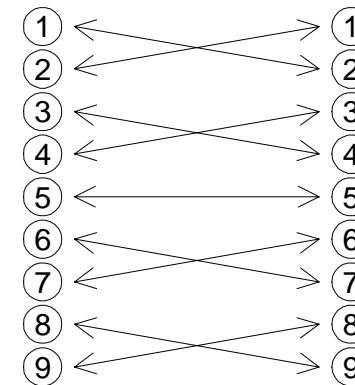
Connection cable examples:

Connection diagram

1st GOT: FX-232CAB-1

2nd GOT: Cable created by user
(Refer to the connection diagram.)

3rd GOT: FX-232CAB-1

4th GOT: Cable created by user
(Refer to the connection diagram.)

Communication speed: The communication speed with the PLC becomes slower as the number of connected GOT units becomes larger.

When the speed in the case one GOT unit is connected is regarded as "1",

Speed in 1st unit x 2 = Speed in 2nd unit (1/2 of speed in 1st unit)

Speed in 2nd unit x 2 = Speed in 3rd unit (1/4 of speed in 1st unit)

Speed in 3rd unit x 2 = Speed in 4th unit (1/8 of speed in 1st unit)

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4. Computer link port connection (MELSEC A Series)

The GOT can be connected to the MELSEC A Series via a computer link unit as shown below.
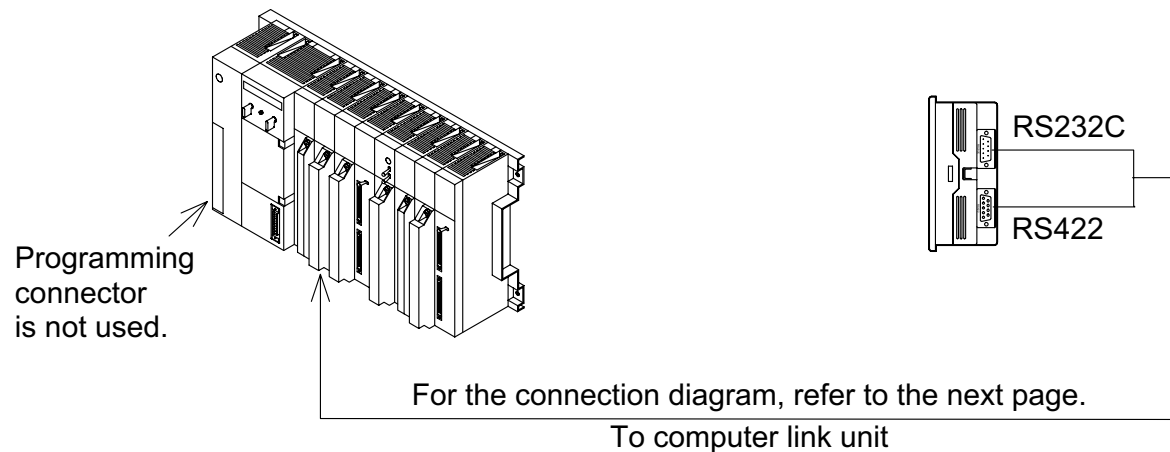
- Applicable PLC units and computer link units

< A Series >

AJ71UC24   A1SJ71UC24-R2/R4/PRF   A1SJ71C24-R2/R4/PRF

A1SCPU24-R2   A2CCPUC24 (PRF)

For the communication setting for the computer link unit, refer to the F940GOT Operation Manual offered separately.
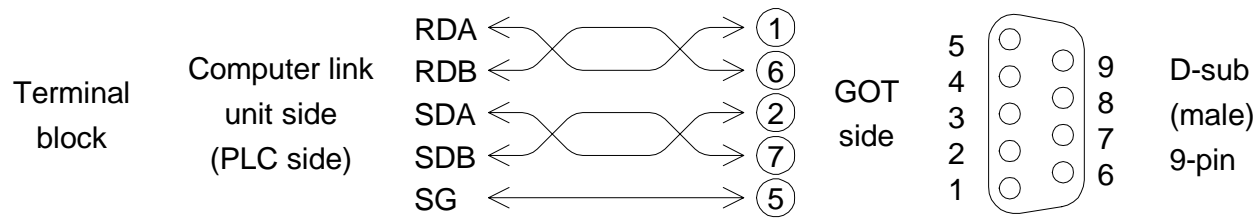
- System configuration

Programming
connector
is not used.

RS232C

RS422

For the connection diagram, refer to the next page.
To computer link unit

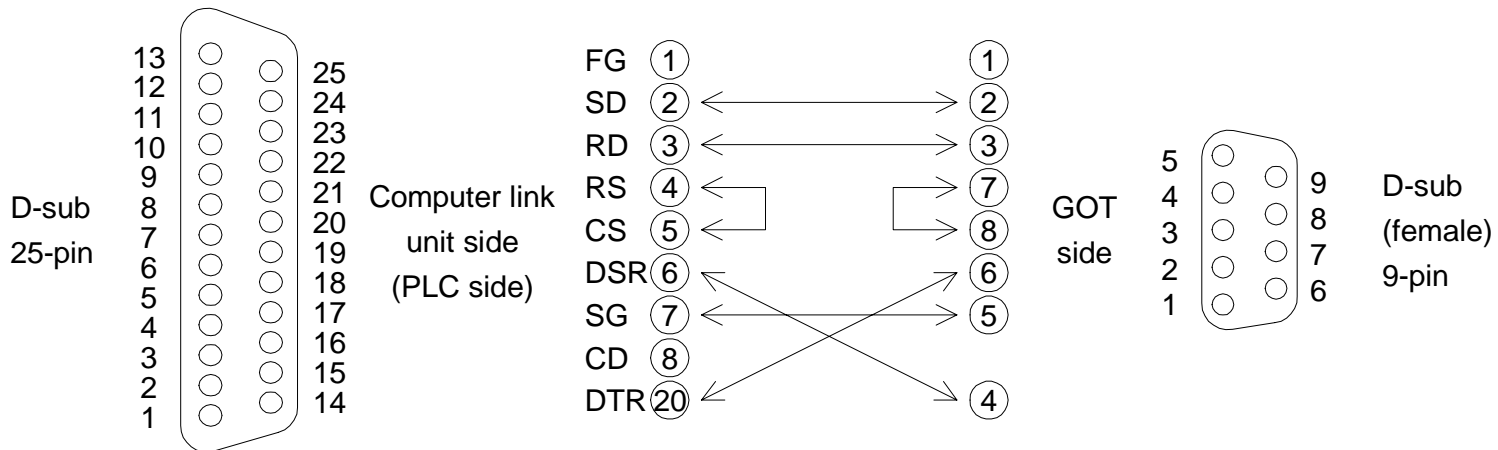## 4.1 Connection diagram

- Connect the GOT to the computer link unit (PLC) as shown below.

  < For RS-422 communication >

  < For RS-232C communication > The connection cable F2-232CAB is also available.

< For RS-232C communication >

D-sub
9-pin

```
5  ◯   ◯  9
4  ◯   ◯  8
3  ◯   ◯  7
2  ◯   ◯  6
1  ◯   
```

Computer link
unit side
(PLC side)

```
CD  ①                        ①
RD  ②  ⟵⟶                    ②
SD  ③  ⟵                     ③
DTR ④  ⟵                     ④
SG  ⑤  ⟵⟶                    ⑤
DSR ⑥  ⟵                     ⑥
RS  ⑦  ⟵                     ⑦
CS  ⑧  ⟵                     ⑧
```

GOT
side

```
5  ◯   ◯  9
4  ◯   ◯  8
3  ◯   ◯  7
2  ◯   ◯  6
1  ◯   
```

D-sub
(female)
9-pin
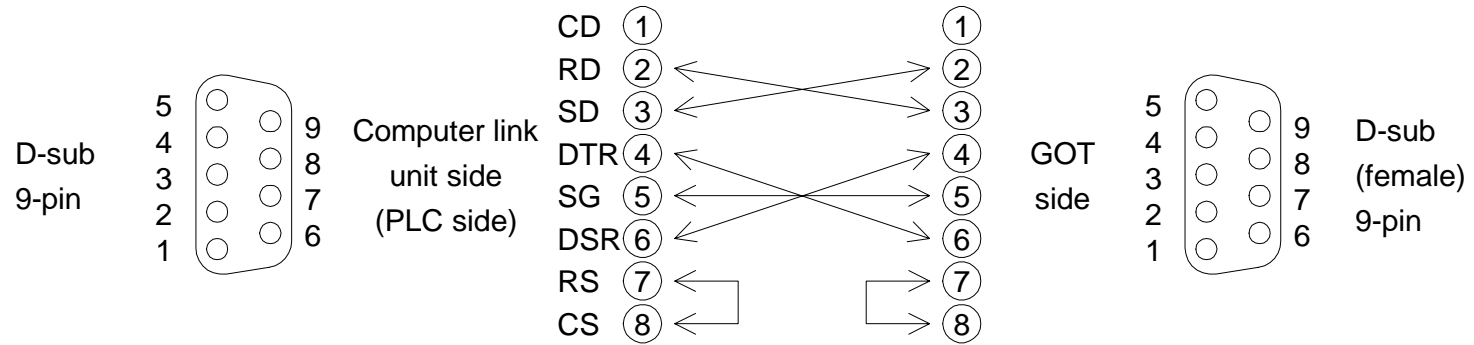
MEMO

5.   Connection to SYSMAC C Series

The GOT can be connected to the SYSMAC C Series manufactured by OMRON via a host link unit as shown below.

- Applicable PLC units and host link units

  < SYSMAC C Series >

  A host link unit or a CPU equipped with an interface for host link is required.

  For the setting of the host link unit, refer to the F940GOT Operation Manual offered separately.
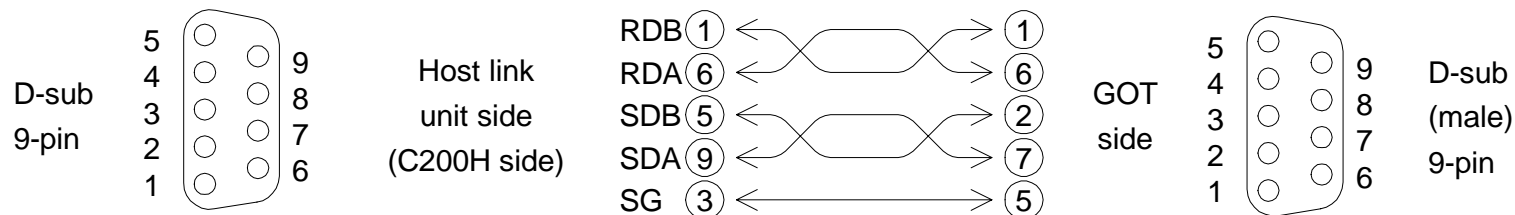
- System configuration

RS232C

RS422
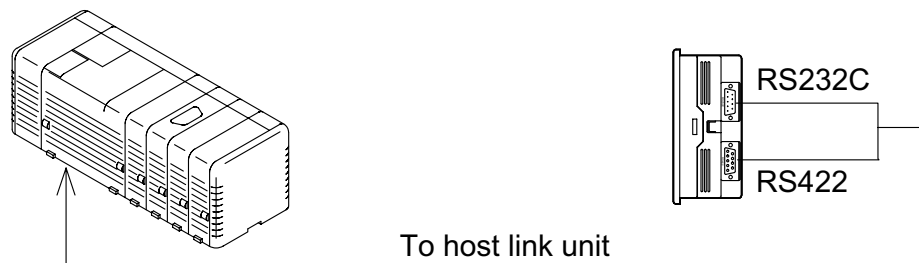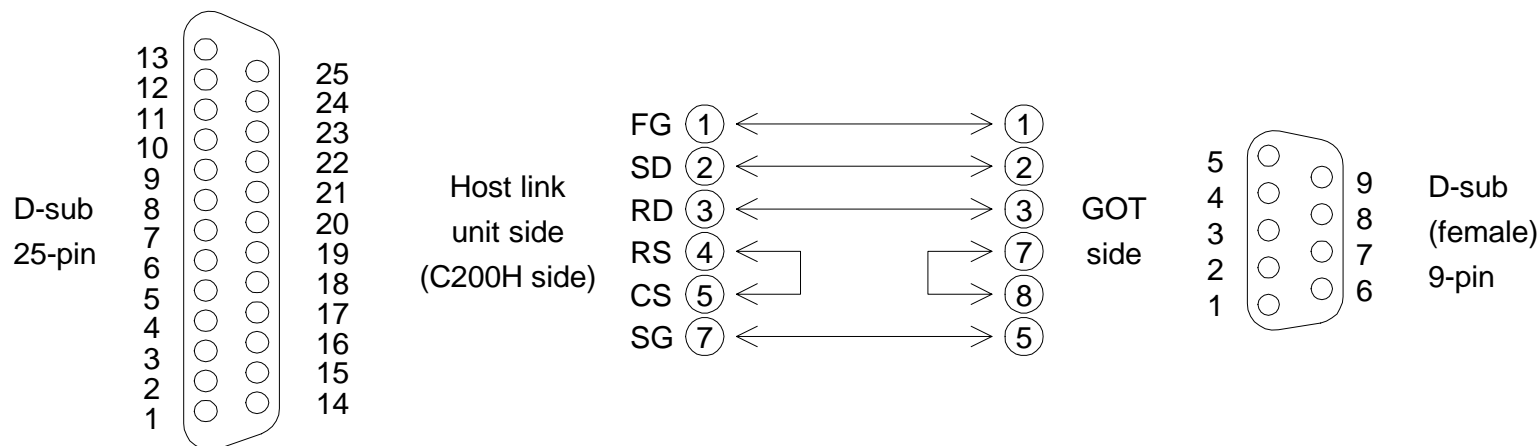
To host link unit

5.1   Connection diagram

- Connect the GOT to the host link unit (SYSMAC C Series) as shown below.
  For connection of a model not shown in the examples below, refer to the manual of the C Series link unit.
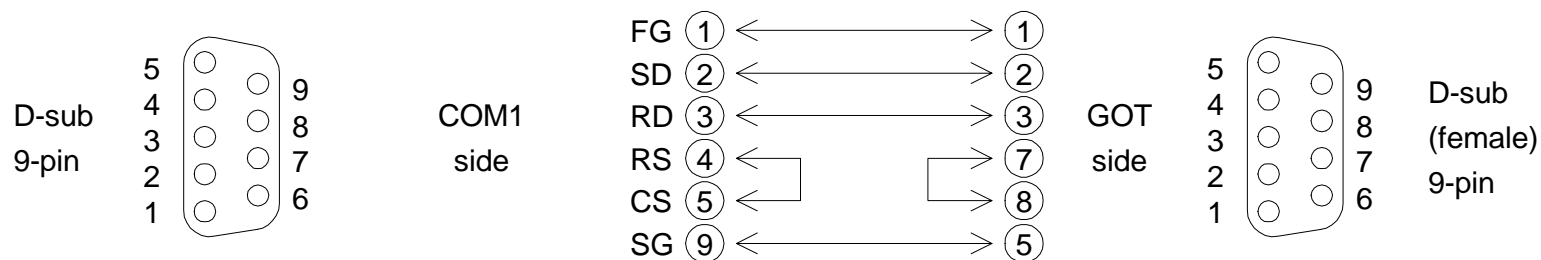
< For RS-422 communication > Example of connection to C200H-LK202-V1

< For RS-232C communication > Example of connection to C200H-LK201-V1

![MITSUBISHI logo]

< For RS-232C communication >
Example of connection to CQM1 (in which RS-232C port is built in)

FG (1)	←——————→	(1)
SD (2)	←——————→	(2)
RD (3)	←——————→	(3)
RS (4)	←———	(7)
CS (5)	←———	(8)
SG (9)	←——————→	(5)

D-sub 9-pin — COM1 side — GOT side — D-sub (female) 9-pin

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6. Connection to FLEX-PC N Series

The GOT can be connected to the FLEX-PC N Series manufactured by FUJI Electric via a link unit shown below.
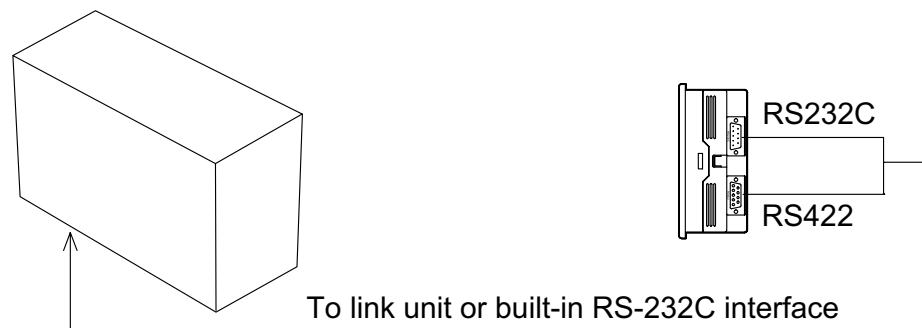
- Connection type ──── Link port connection (RS-422) Select the connection type using
                           ──── Link port connection (RS-232C) the operation environment setting
                           ──── CPU port connection (RS-232C) described in the next section or
                                                        the screen creation software.

- Applicable PLC units and link units

  < FLEX-PC N Series >

  A link unit (general-purpose RS-232C/RS485 interface module) is required to be connected. Or a CPU in which an RS-232C interface is built in is required.
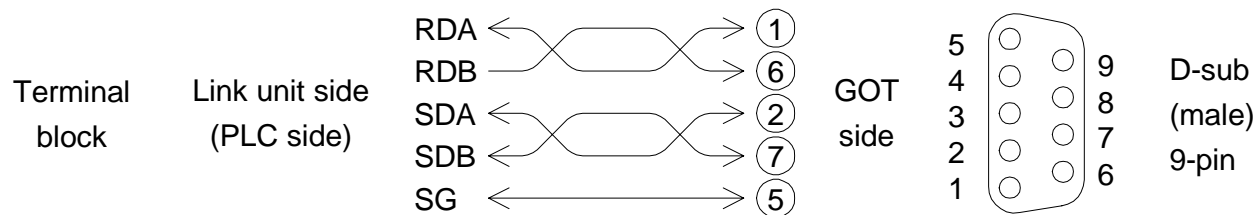
- System configuration

To link unit or built-in RS-232C interface

- Link unit

  - NB Series
    NB-RS1-AC, NB-RS1-DC

  - NJ Series
    NJ-RS2, NJ-RS4

  - NS Series
    NS-RS1
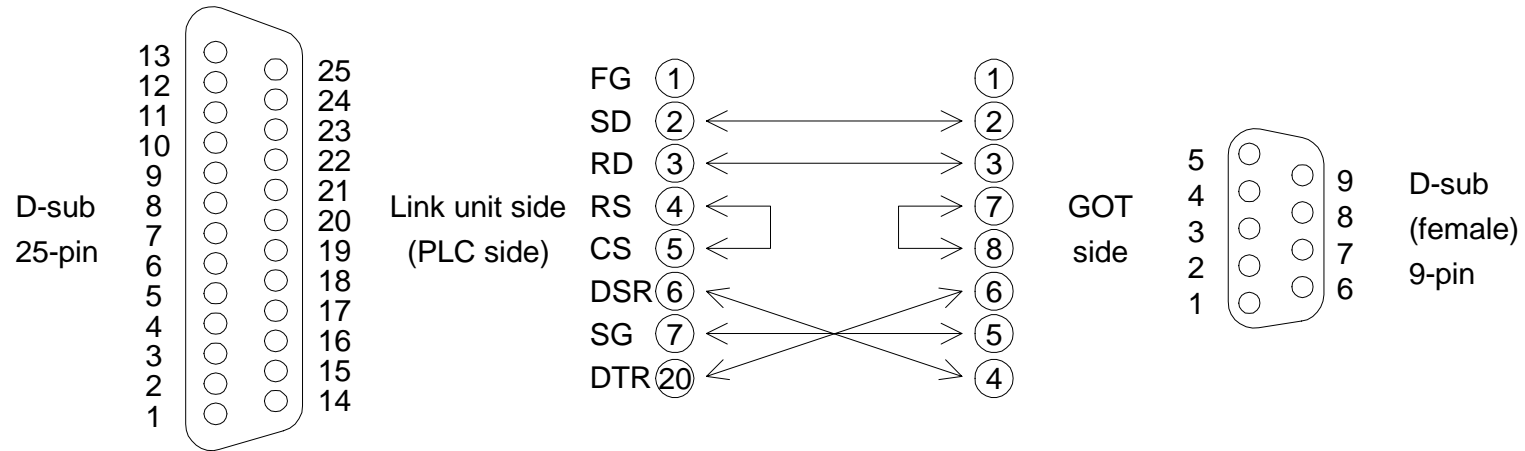
  - CPU in which RS-232C interface is built in NJ-CPU-B16

6.1   Connection diagram

Connect the GOT and the link unit (PLC) as shown below.

< For link port connection (RS-422) >

< For link port connection (RS-232C) >

Link unit side (PLC side)			GOT side	
FG	1			1
SD	2	←→		2
RD	3	←→		3
RS	4	←		7
CS	5	←		8
DSR	6	←		6
SG	7	×→		5
DTR	20	×→		4

D-sub 25-pin

D-sub (female) 9-pin

< For connection of built-in RS-232C interface >

PLC side			GOT side	
RD	2	×→		2
SD	3	×→		3
RS	4	←		7
CS	5	←		8
SG	7	←→		5

D-sub 15-pin

D-sub (female) 9-pin
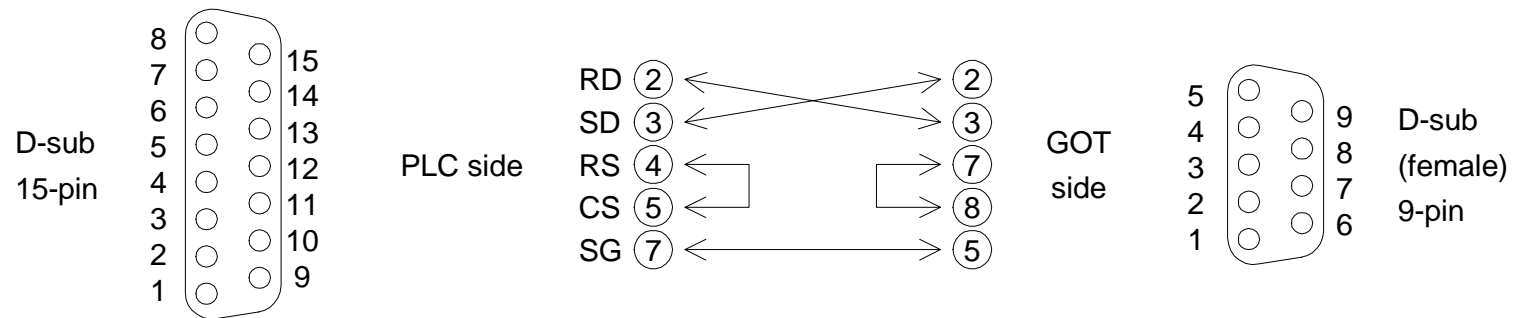

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7.   Connection by general-purpose communication

The GOT can be connected to a general controller such as micro computer board.
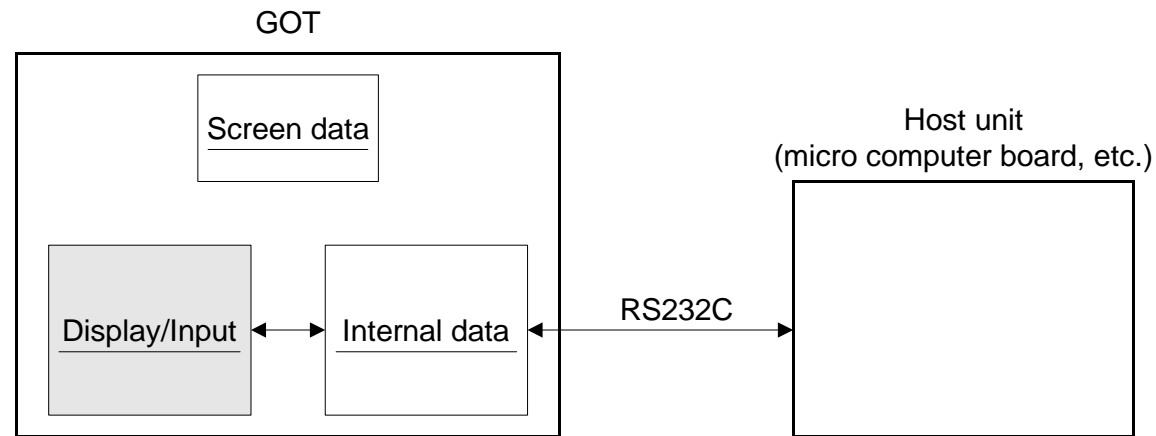(The connected controller is hereafter referred to as "host (unit)".)

7.1   Outline

In genera-purpose communication, the host unit is connected to the GOT via the RS-232C and functions as the parent station in communication. Inside the GOT, there is a data area to hold word data and bit data. The host unit can read and write the data area using communication commands.

The contents of display and control in the GOT are determined by the screen data created using the screen creation software in the personal computer. The screen data specifies the layout of objects displayed on the screen, and specifies actions to be performed by pressing of touch keys.

The GOT is equipped with the function to display the word data in the form of numbers and bar graphs, the function to access the data for changing the status of the bit data using switches, etc.
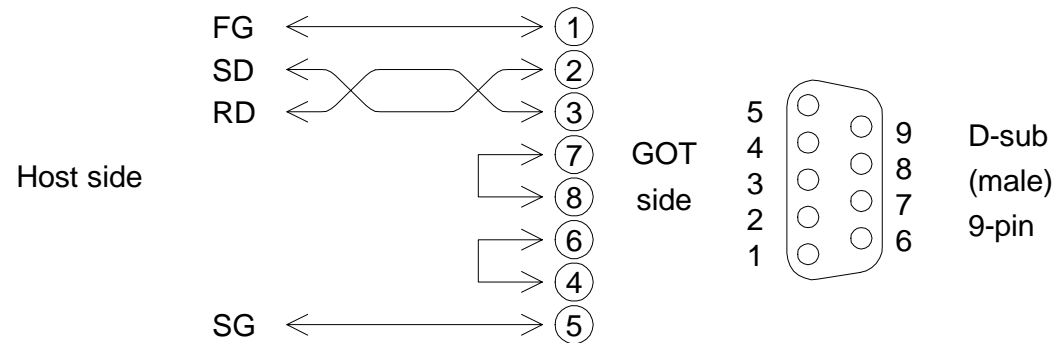The target of access is the data area inside the GOT. The data location to be accessed is specified by the screen data.

Accordingly, to display the data stored in the host unit on the screen, the host unit should transfer the data to the data area inside the GOT using write commands. The transfer destination is a location specified by the screen data. The data change result by manipulation of keys can be transferred from the data area inside the GOT to the host unit if the host unit gives read commands. In general-purpose communication, interrupt codes can be sent as change triggers.

GOT

| Screen data |

| Display/Input | ◄──► | Internal data | ◄──── RS232C ────► | Host unit (micro computer board, etc.) |

7.2   Connection diagram

Connect the GOT and the host unit as shown below.

*   The control lines RTS, CTS, DTR and DSR are not used.

7.3   Communication setting

The setting related to communication can be performed using the screen creation software or the GOT main body.

To use general-purpose communication,

- Screen creation software: Set the connected personal computer to "General-Purpose Communication".

- GOT main body: Select "SET-UP MODE", "PLC SYSTEM" and "GENERAL-PURPOSE COMMUNICATION" in this order.

To set the baud rate, the data length, the stop bit length and the parity,

- Screen creation software: Select "Others", "System Settings" and "DU Serial Printer Settings"

- GOT main body: Select "SET-UP MODE" and "SERIAL PORT (RS-232C)" in this order.

Set each parameter to an either value shown below.

Baud rate	19,200 / 9,600 / 4,800 / 2,400 / 1,200 / 600 or 300 bps
Data length	8 or 7 bits
Stop bit length	1 or 2 bits
Parity	Even, odd or none

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