

**PROGRAMMABLE CONTROLLERS
MELSEC-F**

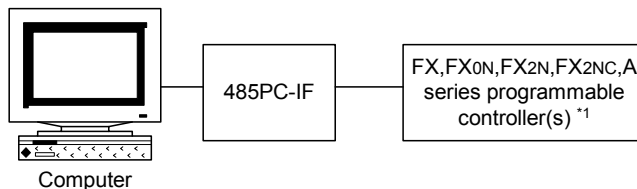
FX-485PC-IF RS485 Interface Unit Hardware Manual

This manual contains text, diagrams and explanations which will guide the reader in the correct installation and operation of the FX-485PC-IF RS485 Interface Unit. It should be read and understood before attempting to install or use the unit. Further information can be found in the FX Communication User's manual.

If in doubt at any stage during the installation of the FX-485PC-IF Interface Unit always consult a professional electrical engineer who is qualified and trained to the local and national standards.

1. Introduction

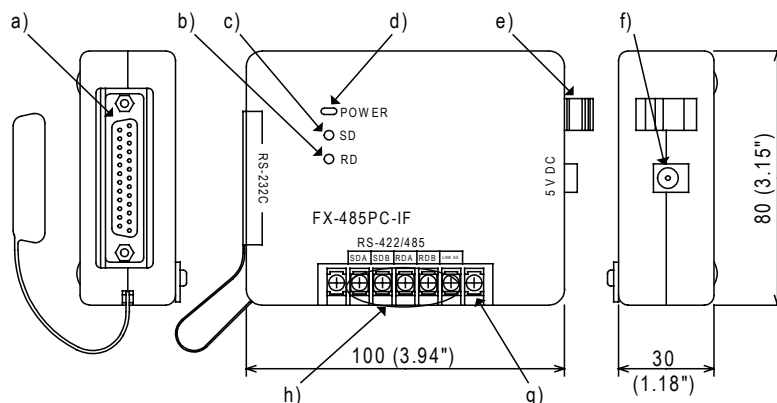
The interface unit FX-485PC-IF (hereinafter referred to as "485PC-IF") can exchange signal of RS232C and RS485 (RS422) for computer link.



*1 Each programmable controller requires necessary adaptor or unit for supporting computer link. For system configuration of computer link, refer to FX communication user's manual. For A series, refer to A series manual.

1.1 External Dimensions

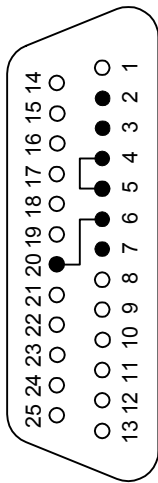
Dimensions: mm (inches) Weight: Approx. 0.3kg (0.66lbs) Accessories: Terminating resistor ($330\Omega \times 2$, $110\Omega \times 1$)



- | | |
|--|---|
| a) RS232C connector: | Used for connection between 485PC-IF and computer. |
| b) RD LED: | Lit when the programmable controller sends data to the computer. |
| c) SD LED: | Lit when the programmable controller receives data from the computer. |
| d) POWER LED: | Lit when 5V is supplied to the power feed jack f). |
| e) Power supply cable grip: | Safety grip to prevent disconnection of 5 V power supply. |
| f) Power feed jack: | Jack for connecting power supply unit. $\oplus \text{---} \ominus$ For using a plug with specifications, refer to section 3.2. |
| g) Terminal cover mounting screws (M3 (0.12")) | |
| h) Terminal for RS422/485: | Used in connection 485PC-IF and programmable controller(s). |

| Terminal | Description |
|----------------|---|
| SDA | This terminal is used when the programmable controller receives data from the computer. |
| SDB | |
| RDA | This terminal is used when the programmable controller sends data to the computer. |
| RDB | |
| LINK SG | Signal ground |

1.2 RS232C Connector Pin Layout (D-SUB 25 Pin)



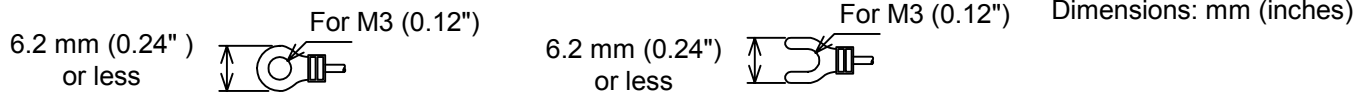
| Pin No. | Signal Name | Description |
|----------|-------------|---|
| 1 | NC | No connection |
| 2 | SD (TXD) | Send data (485PC-IF → RS232C device(computer)) |
| 3 | RD (RXD) | Receive data (RS232C device(computer) → 485PC-IF) |
| 4 | RS (RTS) | No used (These pins are connected inside 485PC-IF. In some cases computer may require connection.) |
| 5 | CS (CTS) | |
| 6 | DR (DSR) | No used (This pin is connected to ER (DTR) inside 485PC-IF. In some cases computer may require connection.) |
| 7 | SG | Signal ground |
| 8 to 19 | NC | No connection |
| 20 | ER (DTR) | No used (This pin is connected to DR (DSR) inside 485PC-IF. In some cases computer may require connection.) |
| 21 to 25 | NC | No connection |

2. Wiring



Caution for wiring

- The terminal screws for the terminal block of the RS485 are M3 screws and therefore the crimp style terminal (see drawing) suitable for use with these screws should be fitted to the cable for wiring.



- The terminal tightening torque is 0.5 to 0.8 Nm (5 to 8 kgf.cm), and tighten securely to avoid malfunction.

2.1 Connecting to a Computer (RS232C)

| 485PC-IF | | Computer | |
|-------------|---------|-------------|--|
| Signal Name | Pin No. | Signal Name | |
| SD (TXD) | 2 | SD (TXD) | |
| RD (RXD) | 3 | RD (RXD) | |
| RS (RTS) | 4 | RS (RTS) | |
| CS (CTS) | 5 | CS (CTS) | |
| DR (DSR) | 6 | DR (DSR) | |
| SG | 7 | SG | |
| ER (DTR) | 20 | ER (DTR) | |



Note

RS (RTS) and CS (CTS), DR(DSR) and ER (DTR) signals are not used, but are connected inside the 485PC-IF, connect wiring depending on the need of the computer.

2.2 Connecting to a Programmable Controller(s) (RS485/RS422)

2.2.1 Selection of Wiring

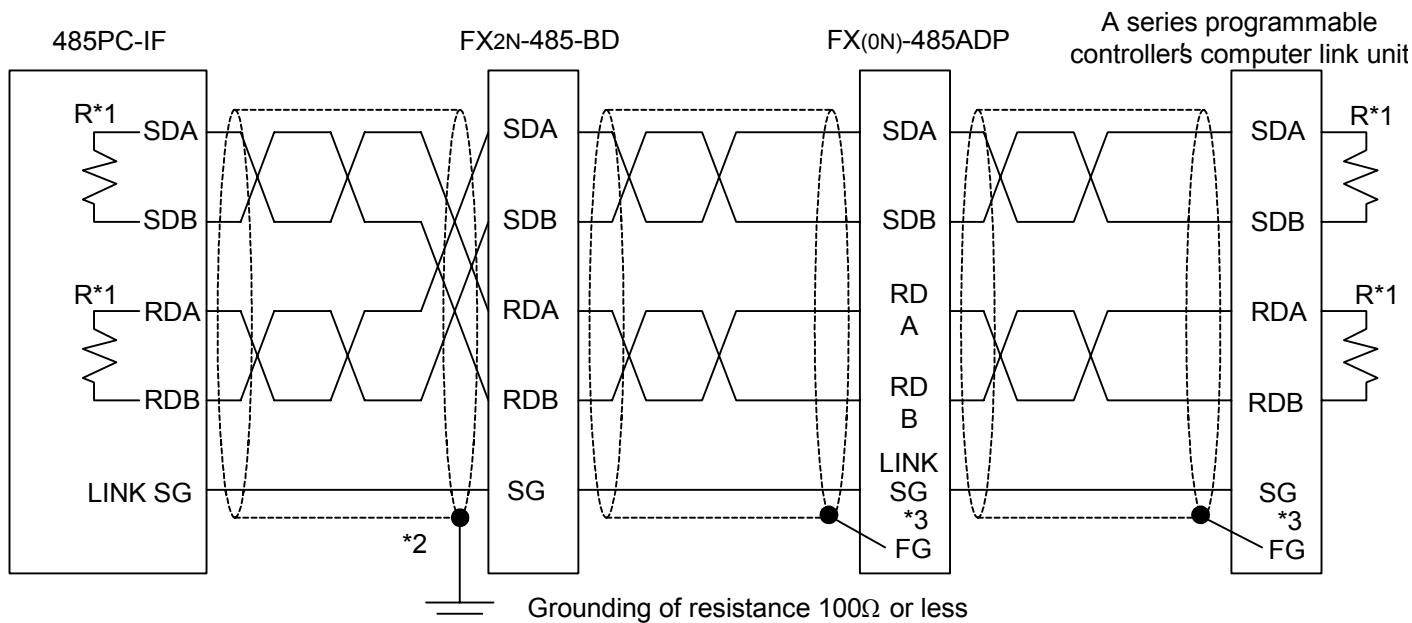
Wiring of RS485 is one-pair wiring or two-pair wiring. The wiring method is decided according to the usage. Please select the wiring method from the table below. For message wait and on-demand function, please see FX Communication User's Manual.

| Using Computer Link | One-pair wiring (Refer to section 2.2.3) | Two-pair wiring (Refer to section 2.2.2) |
|---|---|---|
| If is necessary to set the message wait to 70ms or less | × | ○ |
| If is not necessary to set the message wait to 70ms or less | ◎*1 | ○ |
| Use on-demand function | × | ○ |

◎ Recommendation, ○ OK, × Can not use

*1 When using 485PC-IF with this wiring method remember to take account for/or ignore the "echo" of the commands sent from computer.

2.2.2 Two-pair Wiring

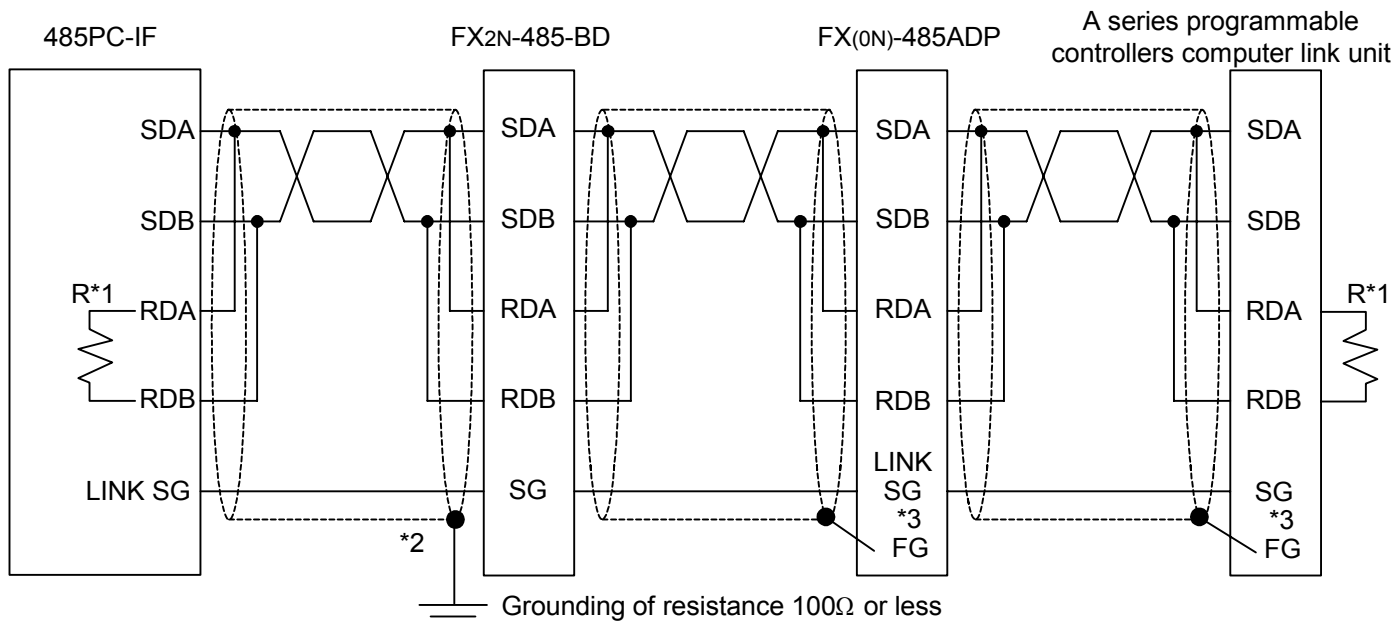


*1 R is the terminating resistor. Connect the terminating resistor (330Ω) between terminals SDA and SDB, and terminals RDA and RDB.

*2 The shield of the shielded twisted-pair cable must be connected to ground (100Ω or less). When using parallel link, ground both side. When using no protocol or dedicated protocol, ground one side.

*3 Connect terminal FG to each terminal of the programmable controller main body grounded with resistance of 100Ω or less. However, for the computer link unit of the A series programmable controller, see the manual of the computer link unit.

2.2.3 One-pair Wiring



*1 R is the terminating resistor. Connect the terminating resistor (110Ω) between terminals RDA and RDB.

*2 The shield of the shielded twisted-pair cable must be connected to ground (100Ω or less).

*3 Connect terminal FG to each terminal of the programmable controller main body grounded with resistance of 100Ω or less. However, for the computer link unit of the A series programmable controller, see the manual of the computer link unit.

3. Specifications

3.1 General Specifications

General specifications other than the those-mentioned below are the same as for the FX or FX_{2N} series programmable controller.

| Items | Description |
|------------------------------|--|
| Dielectric withstand voltage | 500 V AC > 1 min, tested between terminals in batch and case |
| Insulation Resistance | 5 MΩ > 500 V DC, tested between terminals in batch and case |

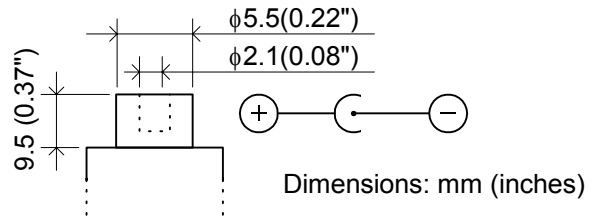
3.2 Power Supply Specifications

| Items | Description |
|---------------------|-----------------|
| Power source | 5 V DC \pm 5% |
| Current consumption | Max. 260 mA |



Note

Use a plug with specifications as shown right.



3.3 Performance Specifications

| Items | Description |
|-----------------------|---|
| Transmission standard | RS232C Conforming to RS232C |
| | RS485/422 Conforming to RS485 and RS232C |
| Communication method | Full-duplex communication |
| Transmission distance | RS232C Max. 15 m |
| | RS485/422 Max. 500 m |
| Supported baud rate | 300 to 19,200 bps |
| Isolation | Photo coupler isolation and transformer isolation (between programmable controller and communication signal) |

4. Diagnostics

For diagnostics of computer link, please see FX Communication User's Manual.

4.1 POWER LED Check

| LED Status | Description |
|------------|---|
| Lit | Power source is OK. |
| Otherwise | Check power supply unit and connection. |

4.2 SD LED and RD LED Check

Check the status of the SD LED and the RD LED.

| Location | LED Status | Check Point |
|---|-------------------|---|
| Sending data from computer to programmable controller(s). | SD LED is lit | Wiring between computer and 485PC-IF is OK. |
| | SD LED is not lit | Check wiring between computer and 485PC-IF. Check that data has been sent from computer. |
| Sending data from programmable controller to computer. | RD LED is lit | Wiring between programmable controller and 485PC-IF is OK. |
| | RD LED is not lit | Check wiring between programmable controller and 485PC-IF. Check setting of programmable controller(s) for computer link. |

Guidelines for the safety of the user and protection of the FX-485PC-IF RS485 Interface Unit

- 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 FX-485PC-IF 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 FX-485PC-IF 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 examples 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 your specific application.

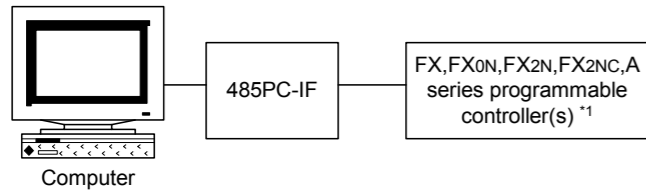
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1. Introduction

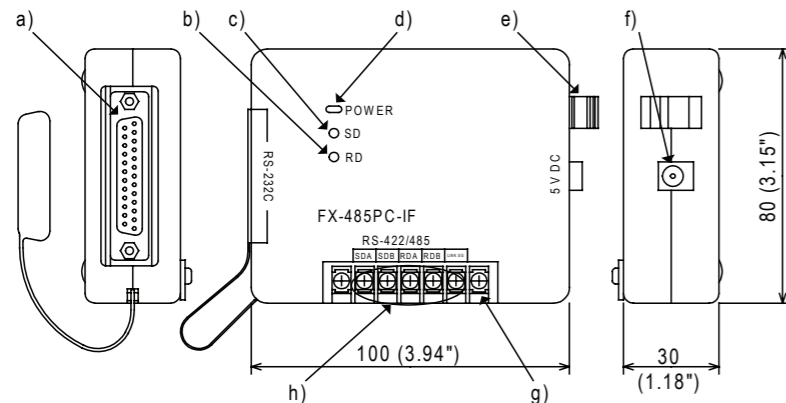
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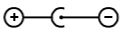


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For system configuration of computer link, refer to FX communication user's manual.
For A series, refer to A series manual.

1.1 External Dimensions

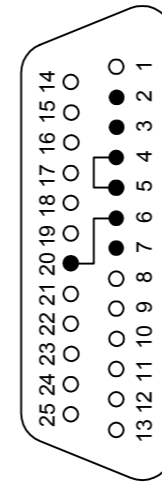
Dimensions: mm (inches) Weight: Approx. 0.3kg (0.66lbs) Accessories: Terminating resistor (330Ω × 2, 110Ω × 1)



- a) RS232C connector: Used for connection between 485PC-IF and computer.
- b) RD LED: Lit when the programmable controller sends data to the computer.
- c) SD LED: Lit when the programmable controller receives data from the computer.
- d) POWER LED: Lit when 5V is supplied to the power feed jack f).
- e) Power supply cable grip: Safety grip to prevent disconnection of 5 V power supply.
- f) Power feed jack: Jack for connecting power supply unit.  For using a plug with specifications, refer to section 3.2.
- g) Terminal cover mounting screws (M3 (0.12"))
- h) Terminal for RS422/485: Used in connection 485PC-IF and programmable controller(s).

| Terminal | Description |
|----------|---|
| SDA | This terminal is used when the programmable controller receives data from the computer. |
| SDB | |
| RDA | This terminal is used when the programmable controller sends data to the computer. |
| RDB | |
| LINK SG | Signal ground |

1.2 RS232C Connector Pin Layout (D-SUB 25 Pin)



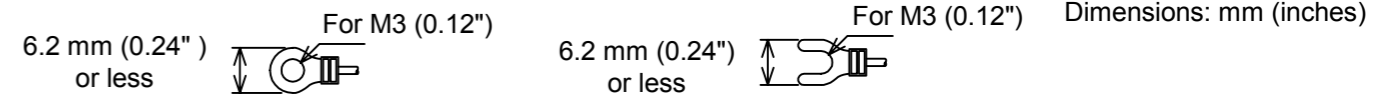
| Pin No. | Signal Name | Description |
|----------|-------------|---|
| 1 | NC | No connection |
| 2 | SD (TXD) | Send data (485PC-IF → RS232C device(computer)) |
| 3 | RD (RXD) | Receive data (RS232C device(computer) → 485PC-IF) |
| 4 | RS (RTS) | No used (These pins are connected inside 485PC-IF. In some cases computer may require connection.) |
| 5 | CS (CTS) | |
| 6 | DR (DSR) | No used (This pin is connected to ER (DTR) inside 485PC-IF. In some cases computer may require connection.) |
| 7 | SG | Signal ground |
| 8 to 19 | NC | No connection |
| 20 | ER (DTR) | No used (This pin is connected to DR (DSR) inside 485PC-IF. In some cases computer may require connection.) |
| 21 to 25 | NC | No connection |

2. Wiring



Caution for wiring

- The terminal screws for the terminal block of the RS485 are M3 screws and therefore the crimp style terminal (see drawing) suitable for use with these screws should be fitted to the cable for wiring.



- The terminal tightening torque is 0.5 to 0.8 Nm (5 to 8 kgf.cm), and tighten securely to avoid malfunction.

2.1 Connecting to a Computer (RS232C)

| 485PC-IF | | Computer | |
|-------------|---------|-------------|---------|
| Signal Name | Pin No. | Signal Name | Pin No. |
| SD (TXD) | 2 | SD (TXD) | |
| RD (RXD) | 3 | RD (RXD) | |
| RS (RTS) | 4 | RS (RTS) | |
| CS (CTS) | 5 | CS (CTS) | |
| DR (DSR) | 6 | DR (DSR) | |
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Note

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2.2 Connecting to a Programmable Controller(s) (RS485/RS422)

2.2.1 Selection of Wiring

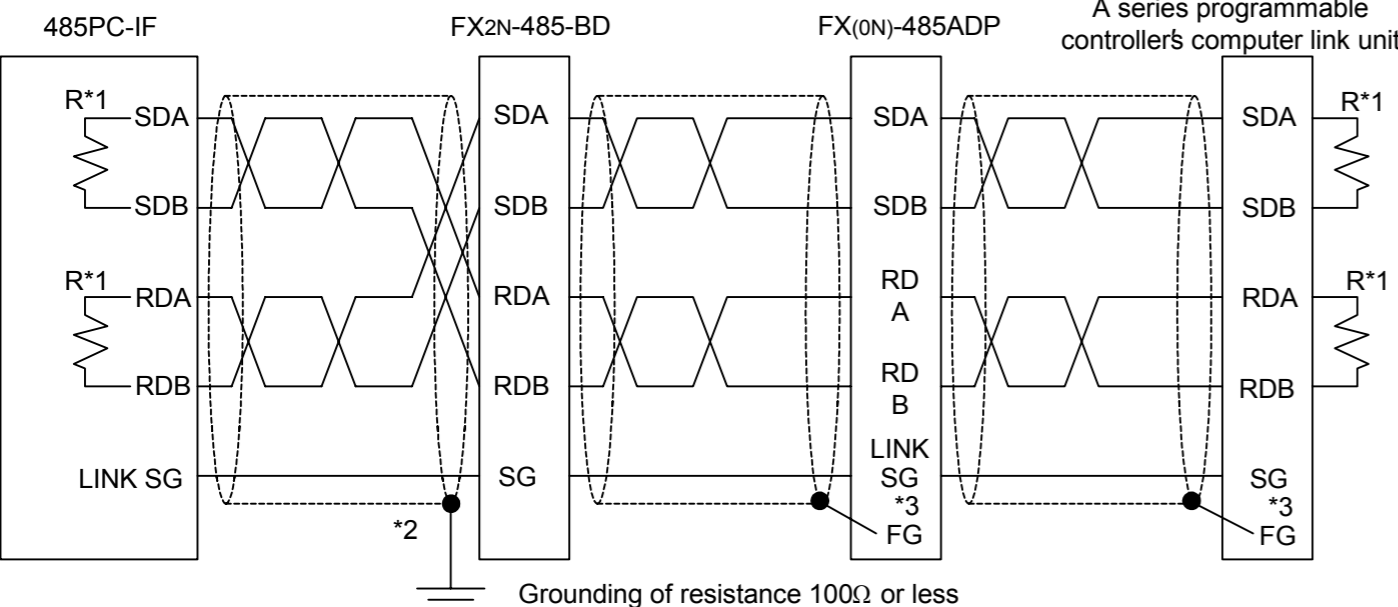
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| Using Computer Link | One-pair wiring (Refer to section 2.2.3) | Two-pair wiring (Refer to section 2.2.2) |
|---|--|--|
| If is necessary to set the message wait to 70ms or less | × | ○ |
| If is not necessary to set the message wait to 70ms or less | ◎*1 | ○ |
| Use on-demand function | × | ○ |

◎ Recommendation, ○ OK, × Can not use

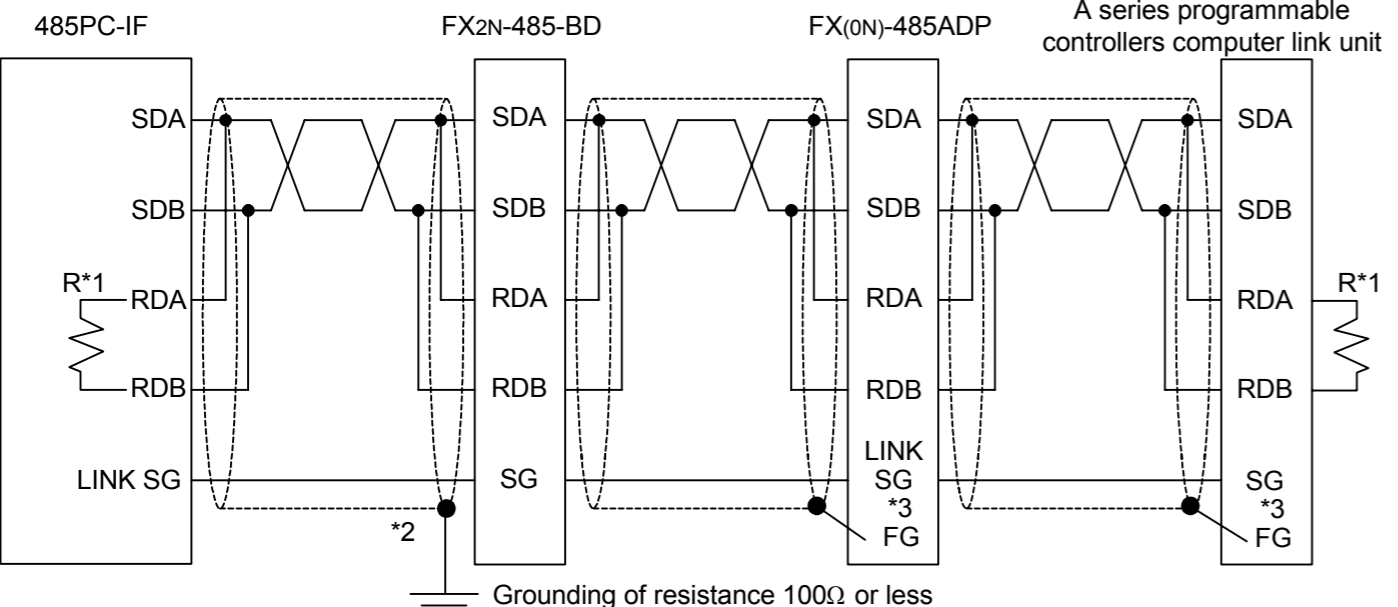
*1 When using 485PC-IF with this wiring method remember to take account for/or ignore the "echo" of the commands sent from computer.

2.2.2 Two-pair Wiring



- *1 R is the terminating resistor. Connect the terminating resistor (330Ω) between terminals SDA and SDB, and terminals RDA and RDB.
- *2 The shield of the shielded twisted-pair cable must be connected to ground (100Ω or less). When using parallel link, ground both side. When using no protocol or dedicated protocol, ground one side.
- *3 Connect terminal FG to each terminal of the programmable controller main body grounded with resistance of 100Ω or less. However, for the computer link unit of the A series programmable controller, see the manual of the computer link unit.

2.2.3 One-pair Wiring



- *1 R is the terminating resistor. Connect the terminating resistor (110Ω) between terminals RDA and RDB.
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3. Specifications

3.1 General Specifications

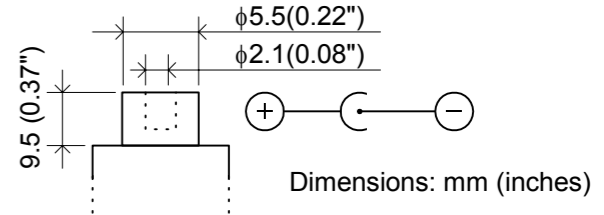
General specifications other than the those-mentioned below are the same as for the FX or FX_{2N} series programmable controller.

| Items | Description |
|------------------------------|--|
| Dielectric withstand voltage | 500 V AC > 1 min, tested between terminals in batch and case |
| Insulation Resistance | 5 MΩ > 500 V DC, tested between terminals in batch and case |

3.2 Power Supply Specifications

| Items | Description |
|---------------------|-------------|
| Power source | 5 V DC ± 5% |
| Current consumption | Max. 260 mA |

Note
 Use a plug with specifications as shown right.



3.3 Performance Specifications

| Items | Description | |
|-----------------------|--|--------------------------------|
| Transmission standard | RS232C | Conforming to RS232C |
| | RS485/422 | Conforming to RS485 and RS232C |
| Communication method | Full-duplex communication | |
| Transmission distance | RS232C | Max. 15 m |
| | RS485/422 | Max. 500 m |
| Supported baud rate | 300 to 19,200 bps | |
| Isolation | Photo coupler isolation and transformer isolation (between programmable controller and communication signal) | |

4. Diagnostics

For diagnostics of computer link, please see FX Communication User's Manual.

4.1 POWER LED Check

| LED Status | Description |
|------------|---|
| Lit | Power source is OK. |
| Otherwise | Check power supply unit and connection. |

4.2 SD LED and RD LED Check

Check the status of the SD LED and the RD LED.

| Location | LED Status | Check Point |
|---|-------------------|---|
| Sending data form computer to programmable controller(s). | SD LED is lit | Wiring between computer and 485PC-IF is OK. |
| | SD LED is not lit | Check wiring between computer and 485PC-IF. Check that data has been sent from computer. |
| Sending data form programmable controller to computer. | RD LED is lit | Wiring between programmable controller and 485PC-IF is OK. |
| | RD LED is not lit | Check wiring between programmable controller and 485PC-IF. Check setting of programmable controller(s) for computer link. |

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