

4 4.4. RS-232/RS-422/485 Converters

Converters, Repeaters and Hubs



PCISA-7520R/PCISA-7520AR

PCISA-7520R: Isolated RS-232 to RS-485 Converter Card
 PCISA-7520AR: Isolated RS-232 to RS-422/485 Converter Card

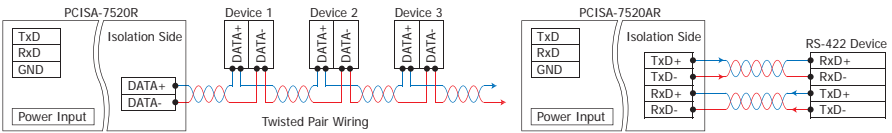
Features

- No External Power Supply required
- No Driver installation required
- Auto Switching Baud Rate, 300 – 115200 bps
- 3000 V_{DC} Isolation Protection
- ESD Protection for the RS-232/422/485 Data Line
- Transmission Speed of up to 115200 bps
- Can be used in an ISA Bus, a PCI Bus or any system with an RS-232 Interface

Introduction

The PCISA-7520A series is exactly the same as I-7520A series except for the PCI and ISA Interface and is designed for easy installation. The PCISA-7520A series is equipped with both an RS-232 serial port and an RS-485 serial port. The RS-232 port is designed to communicate with the local Host PC, the RS-485 is designed to communicate with the remote IO module.

Applications



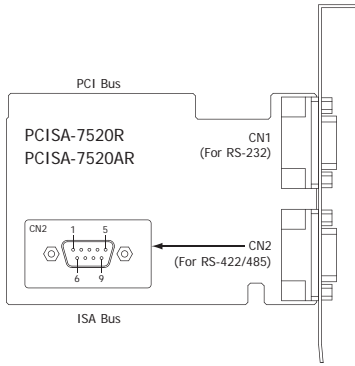
Specifications

| Models | PCISA-7520R | PCISA-7520AR |
|---|---|------------------------|
| Interface | | |
| Serial Interface | RS-232 | TxD, RxD, GND |
| | RS-422 | - |
| | RS-485 | Data+, Data- |
| The RS-422 and RS-485 cannot be used simultaneously | | |
| 2-wire Cabling/4-wire Cabling | Belden 8941 (2P twisted-pair cable)/Belden 8942 (4P twisted-pair cable), when different cables are used, the transmission distance may change | |
| Transfer Distance | Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps | |
| Max. Devices Supported | 256 (Without repeater) | |
| Self-Tuner Asic Inside | Yes | |
| Speed | 300 – 115200 bps | |
| ESD Protection | Yes | |
| Isolated Voltage | 3000 V _{DC} on the RS-232 side | |
| Connection | RS-232 | 9-Pin Female D-Sub x 1 |
| | RS-422/485 | 9-Pin Male D-Sub x 1 |
| Power | | |
| Input Voltage Range | +5 V _{DC} from the PC | |
| Power Consumption | 1.0 W | |
| Mechanical | | |
| Dimensions (L x W x D) | 118 mm x 72 mm x 22 mm | |
| Environment | | |
| Operating Temperature | 0 °C – +50 °C | |
| Storage Temperature | -20 °C – +70 °C | |
| Humidity | 0 – 90% RH, non-condensing | |

RS-232/RS-422/485 Converters

PCISA-7520R/PCISA-7520AR

Pin Assignments



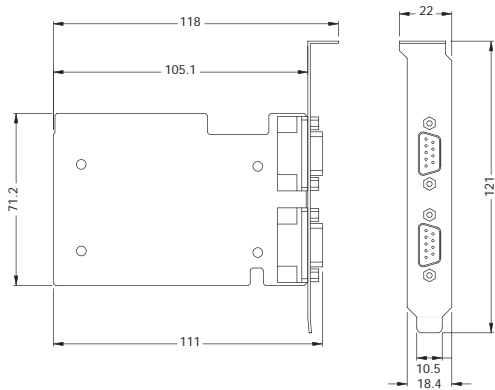
PCISA-7520R

| Pin | 2-wire for RS-485 |
|-----|-------------------|
| 01 | DATA+ |
| 02 | |
| 03 | |
| 04 | NC |
| 05 | |
| 06 | DATA- |
| 07 | |
| 08 | NC |
| 09 | |

PCISA-7520AR

| Pin | 2-wire for RS-485 | 4-wire for RS-422 |
|-----|-------------------|-------------------|
| 01 | DATA+ | Tx+ |
| 02 | | |
| 03 | | |
| 04 | NC | Rx+ |
| 05 | NC | |
| 06 | DATA- | Tx- |
| 07 | | |
| 08 | NC | Rx- |
| 09 | | |

Dimensions (Unit: mm)



Ordering Information

| | |
|-----------------|---|
| PCISA-7520R CR | Isolated RS-232 to RS-485 Converter Card (RoHS) |
| PCISA-7520AR CR | Isolated RS-232 to RS-422/485 Converter Card (RoHS) |

Accessories

| | |
|------------|--------------------------------------|
| I-7510 CR | Isolated RS-485 Repeater (RoHS) |
| I-7510A CR | Isolated RS-422/485 Repeater (RoHS) |
| CA-0915 | 9-Pin Male-Female D-Sub Cable, 1.5 m |



I-7520/I-7520A I-7520R/I-7520AR

I-7520: Isolated RS-232 to RS-485 Converter
 I-7520A: Isolated RS-232 to RS-422/485 Converter
 I-7520R: RS-232 to Isolated RS-485 Converter
 I-7520AR: RS-232 to Isolated RS-422/485 Converter

Features

- Auto Switching Baud Rate, 300–115200 bps
- 3000 V_{DC} Isolation Protection on the RS-485 side
- ESD Protection for the RS-232/422/485 Data Line
- Transmission Speed of up to 115200 bps
- Power Input of +10 – +30 V_{DC}
- Supports Operating Temperatures from -25 °C – +75 °C
- DIN-Rail



Introduction

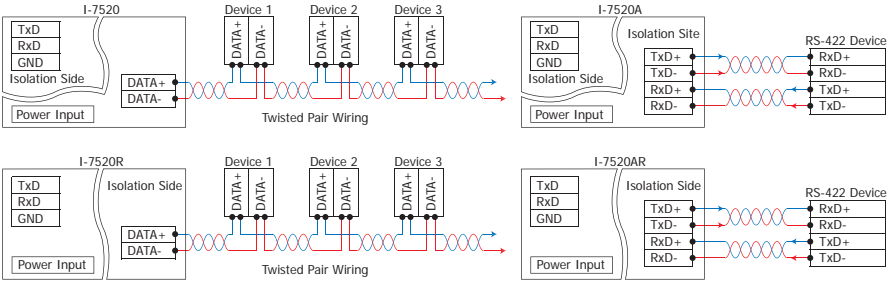
Most industrial computer systems provide standard RS-232 serial ports. Though widely accepted, RS-232 has limited transmission speed, range, and networking capabilities. The RS-422 and RS-485 standards overcome these limitations by using differential voltage lines for data and control signals, which transparently converts RS-232 signals into isolated RS-422 or RS-485 signal with no need to change any hardware or software. The I-7520/I-7520A lets you easily build an industrial grade, long-distance communication system using standard PC hardware.

The design of the isolation between the I-7520 and the I-7520R/AR is different. If the user wants to supply power from the PLC/PC, the I-7520R/AR should be used, otherwise the isolation will be broken. Refer to the I-7000 bus converter manual for detailed information.

Specifications

| Models | I-7520 | I-7520R | I-7520A | I-7520AR |
|---------------------------------------|---|---------------------------------|----------------|---|
| Interface | | | | |
| Serial Interface | RS-232 | TxD, RxD, GND | | |
| | RS-422 | - | | TxD+, TxD-, RxD+, RxD- The RS-422 and RS-485 cannot be used simultaneously |
| | RS-485 | Data+, Data- | | |
| 2-wire Cabling/4-wire Cabling | Belden 8941 (2P twisted-pair cable)/Belden 8942 (4P twisted-pair cable), if different cables are used, the transmission distance may change | | | |
| Transfer Distance | Max. 1,200 m for at speed 9.6 kbps; Max. 400 m at 115.2 kbps | | | |
| Max. Devices Supported | 256 (Without repeater) | | | |
| Self-Tuner ASIC Inside | Yes | | | |
| Speed | 300 – 115200 bps | | | |
| ESD Protection | Yes | | | |
| 3000 V _{DC} Isolated Voltage | On RS-232 side | On RS-485 side | On RS-232 side | On RS-485 side |
| Connection | RS-232 | 9-Pin Female D-Sub | | |
| | RS-422/485 | Removable 10-Pin Terminal Block | | |
| LED Indicators | | | | |
| Power/Communication | Yes | | | |
| Power | | | | |
| Input Voltage Range | +10 V _{DC} – +30 V _{DC} (Non-isolated) | | | |
| Power Consumption | 1.2 W | | | |
| Mechanical | | | | |
| Casing | Plastic | | | |
| Flammability | Fire Retardant Materials (UL94-V0 Level) | | | |
| Dimensions (W x H x D) | 72 mm x 118 mm x 35 mm | | | |
| Installation | DIN-Rail | | | |
| Environment | | | | |
| Operating Temperature | -25 °C – +75 °C | | | |
| Storage Temperature | -30 °C – +75 °C | | | |
| Humidity | 10 – 90% RH, non-condensing | | | |

Applications



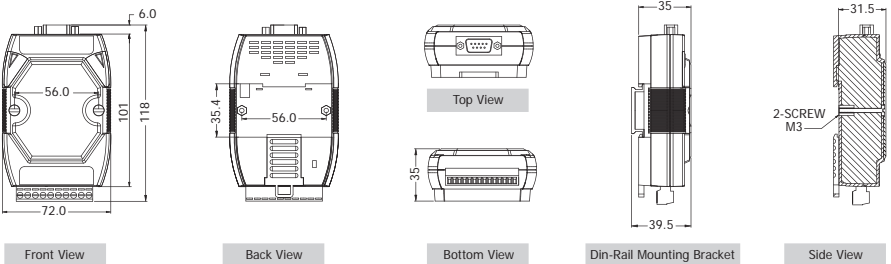
Pin Assignments

| I-7520/I-7520R | | | | |
|----------------|----------------|----------------|--------------|----------------|
| Terminal No. | Pin Assignment | Pin Assignment | Terminal No. | Pin Assignment |
| RS-485 01 | DATA+ | | 05 | 09 |
| 02 | DATA- | | 04 | 08 |
| 03 | -- | | 03 | 07 |
| 04 | -- | | 02 | 06 |
| 05 | -- | | 01 | 01 |
| 06 | -- | | | |
| 07 | -- | | | |
| 08 | -- | | | |
| 09 | (R)+Vs | | | |
| 10 | (B)GND | | | |



| I-7520A/I-7520AR | | | | |
|------------------|----------------|----------------|--------------|----------------|
| Terminal No. | Pin Assignment | Pin Assignment | Terminal No. | Pin Assignment |
| RS-485 01 | DATA1+ | | 05 | 09 |
| 02 | DATA1- | | 04 | 08 |
| 03 | -- | | 03 | 07 |
| 04 | TxD+ | | 02 | 06 |
| RS-422/485 05 | TxD- | | 01 | 01 |
| 06 | RxD+/DATA2+ | | | |
| 07 | RxD-/DATA2- | | | |
| 08 | -- | | | |
| 09 | (R)+Vs | | | |
| 10 | (B)GND | | | |

Dimensions (Unit: mm)



Ordering Information

| | |
|---------------|---|
| I-7520 CR | Isolated RS-232 to RS-485 Converter (RoHS) |
| I-7520A CR | Isolated RS-232 to RS-422/485 Converter (RoHS) |
| I-7520-G CR | Isolated RS-232 to RS-485 Converter (Gray Cover) (RoHS) |
| I-7520A-G CR | Isolated RS-232 to RS-422/485 Converter (Gray Cover) (RoHS) |
| I-7520R CR | RS-232 to Isolated RS-485 Converter (RoHS) |
| I-7520AR CR | RS-232 to Isolated RS-422/485 Converter (RoHS) |
| I-7520R-G CR | RS-232 to Isolated RS-485 Converter (Gray Cover) (RoHS) |
| I-7520AR-G CR | RS-232 to Isolated RS-422/485 Converter (Gray Cover) (RoHS) |

Accessories

| | |
|------------|--|
| GPSU06U-6 | 24 V _{DC} /0.25 A, 6 W Power Supply |
| DIN-KA52F | 24 V _{DC} /1.04 A, 25 W Power Supply with Din-Rail Mounting |
| I-7510 CR | Isolated RS-485 Repeater (RoHS) |
| I-7510A CR | Isolated RS-422/485 Repeater (RoHS) |
| CA-0915 | 9-Pin Male-Female D-Sub Cable, 1.5 m |



I-7551

Isolated RS-232 to RS-232 Repeater

Features

- 3000 V_{DC} 3-way Isolation Protection
- ESD Protection
- Transmission Speed of up to 115200 bps
- Power Input of +10 ~ +30 V_{DC}
- Supports Operating Temperatures from -25 °C ~ +75 °C
- DIN-Rail



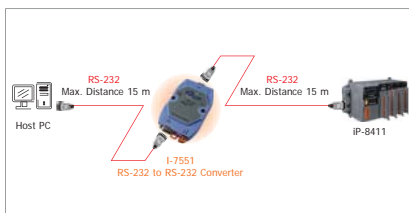
Introduction

The I-7551 Photo coupler provides a complete full-duplex (including control signal) electrical isolation channel between two RS-232 devices. This isolation is an important consideration if a system uses different power sources, has noisy signals, or must operate at different ground potentials.

The I-7551 provides the option of reconfiguring which control signal is used. CTS can be selected instead of DSR, and RTS instead of DTR.

The I-7551 incorporates two DC-to-DC converters, the isolation site of the I-7551 is located in the input and output interface circuit. In other words, the I-7551 is 3-way isolation RS-232 to RS-232 repeater.

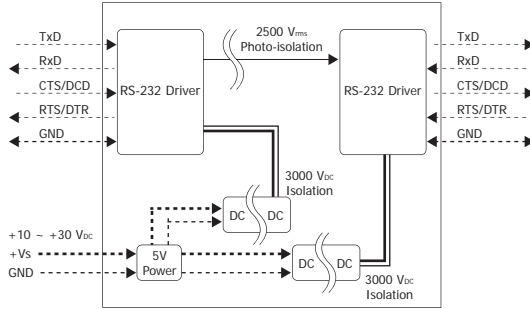
Applications



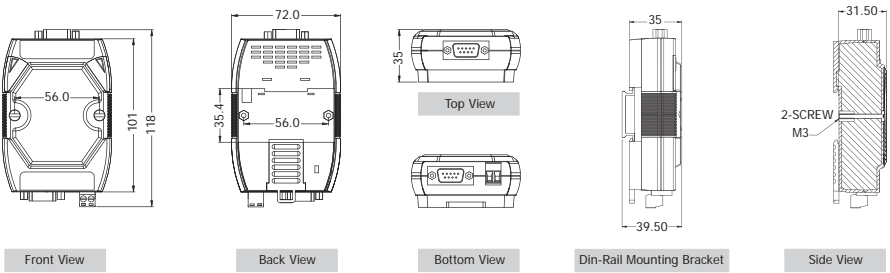
Specifications

| Interface | |
|--|---|
| Input | TxD, RxD, CTS, RTS, GND or TxD, RxD, DSR, DTR, GND Jumpers JP1 and JP2 are used to select the RS-232 input source type |
| Output | TxD, RxD, CTS, RTS, GND or TxD, RxD, DSR, DTR, GND |
| 2-wire Cabling/4-wire Cabling | Belden 8941 (2P twisted-pair cable)/Belden 8942 (4P twisted-pair cable), if different cables are used, the transmission distance may change |
| Transfer Distance | Max. 15 M at 115200 bps |
| Speed | 300 ~ 115200 bps |
| ESD Protection | Yes |
| 3000 V _{DC} Three Way Isolated Protection | Yes |
| Connection | RS-232 Input: 9-Pin Female D-Sub RS-232 Output: 9-Pin Male D-Sub |
| LED Indicators | |
| Power/Communication | Yes |
| Power | |
| Input Voltage Range | +10 V _{DC} ~ +30 V _{DC} (Non-isolated) |
| Power Consumption | 1.2 W |
| Mechanical | |
| Casing | Plastic |
| Flammability | Fire Retardant Materials (UL94-V0 Level) |
| Dimensions (W x H x D) | 72 mm x 118 mm x 35 mm |
| Installation | DIN-Rail |
| Environment | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +75 °C |
| Humidity | 10 ~ 90% RH, non-condensing |

Internal I/O Structure



Dimensions (Unit: mm)



Pin Assignments



| Pin Assignment | Terminal No. | Pin Assignment | Pin Assignment | Terminal No. | Pin Assignment |
|----------------|--------------|----------------|----------------|--------------|----------------|
| GND | 01 | 06 | DTR | GND | 05 |
| TxD | 02 | 07 | CTS | DTR | 04 |
| RxD | 03 | 08 | RTS | TxD | 03 |
| DSR | 04 | 09 | DSR | RxD | 02 |
| -- | 05 | -- | -- | -- | 01 |

RS-232 Input: Female DB-9 Connector

RS-232 Output: Male DB-9 Connector

Ordering Information

| | |
|-------------|--|
| I-7551 CR | Isolated RS-232 to RS-232 Repeater (RoHS) |
| I-7551-G CR | Isolated RS-232 to RS-232 Repeater (Gray Cover) (RoHS) |

Accessories

| | |
|-----------|---|
| GPSU06U-6 | 24 Vdc/0.25 A, 6 W Power Supply |
| DIN-KA52F | 24 Vdc/1.04 A, 25 W Power Supply with Din-Rail Mounting |