

ICF-1150 Series

Industrial RS-232/422/485 to fiber converters



Features and Benefits

- 3-way communication: RS-232, RS-422/485, and fiber
- Rotary switch to change the pull high/low resistor value
- Extends RS-232/422/485 transmission up to 40 km with single-mode or 5 km with multi-mode
- -40 to 85°C wide-temperature range models available
- C1D2, ATEX, and IECEx certified for harsh industrial environments

Certifications



Introduction

The ICF-1150 serial-to-fiber converters transfer RS-232/RS-422/RS-485 signals to optical fiber ports to enhance transmission distance. When an ICF-1150 device receives data from any serial port, it sends the data through the optical fiber ports. These products not only support single-mode and multi-mode fiber for different transmission distances, models with isolation protection are also available to enhance noise immunity. The ICF-1150 products feature Three-Way Communication and a Rotary Switch for setting the pull high/low resistor for onsite installation.

Three-Way Communication

The ICF-1150 Series supports 2 serial ports, with a DB9 connector for RS-232 communication and a removable terminal block for RS-422 or RS-485 communication. The 3 ports (2 serial ports and one fiber port) are completely independent. When an ICF-1150 converter receives data from any one port, it will send the data through the other 2 ports. For example, once the ICF-1150 converter receives a command from the remote master through the fiber port, it will convert the signal and send the command through the RS-232 and RS-422/485 ports at the same time. If the user is monitoring a system running on an RS-485 network, there is no need to use an additional RS-232 to RS-485 converter to connect the laptop computer's serial port to the RS-485 bus.

Rotary Switch for Setting the Pull High/Low Resistor

The RS-485 interface supports multidrop or daisy-chain connections, which system engineers will use to connect serial devices such as meters, RTUs, and readers, together on the same bus. Since the number of serial devices on the same bus will cause the impedance of the data line to increase, the ICF-1150 allows users to tune the pull high/low resistor. Just rotate the switch to the appropriate value without removing the ICF-1150 from the DIN rail.

Specifications

Serial Interface

| | |
|------------------|--|
| No. of Ports | 2 |
| Serial Standards | RS-232, RS-422, RS-485 |
| Baudrate | 50 bps to 921.6 kbps (supports non-standard baudrates) |
| Flow Control | ADDC® (automatic data direction control) for RS-485 |
| Connector | DB9 male for RS-232 interface 5-pin terminal block for RS-422/485 interface Fiber ports for RS-232/422/485 interface |
| Isolation | 2 kV (I models) |

| | | | | |
|--|--|------------------|---------------------------|--------------|
| Optical Fiber | Low-Speed Fiber Module | | Multi-Mode | Single-Mode |
| | Fiber Cable Requirements | | 50/125 μ m, 800 MHz | G.652 |
| | | | 62.5/125 μ m, 500 MHz | |
| | Typical Distance | | 5 km | 40 km |
| | Wavelength | Typical (nm) | 850 | 1310 |
| | | TX Range (nm) | 840 to 860 | 1290 to 1330 |
| | | RX Range (nm) | 800 to 900 | 1100 to 1650 |
| | Optical Power | TX Range (dBm) | 0 to -8 | 0 to -8 |
| | | RX Range (dBm) | 0 to -25 | 0 to -25 |
| | | Link Budget (dB) | 15 | 20 |
| Dispersion Penalty (dB) | | 1 | 1 | |
| Note: When using a power meter to measure the fiber TX power, set the baudrate to 9,600 bps and send data (00, ..., 0h) to the serial converter's serial port. | | | | |
| Pull High/Low Resistor for RS-485 | 150 kilo-ohm, 10 kilo-ohm, 4.7 kilo-ohm, 3.3 kilo-ohm, 1 kilo-ohm, 909 ohm, 822 ohm, 770 ohm, 500 ohm, 485 ohm | | | |
| RS-485 Data Direction Control | ADDC® (automatic data direction control) | | | |
| Terminator for RS-485 | N/A, 120 ohms, 120 kilo-ohms | | | |
| Serial Signals | | | | |
| RS-232 | TxD, RxD, GND | | | |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND | | | |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND | | | |
| RS-485-2w | Data+, Data-, GND | | | |
| Power Parameters | | | | |
| Input Current | ICF-1150 Series: 264 mA @ 12 to 48 VDC ICF-1150I Series: 300 mA @ 12 to 48 VDC | | | |
| Input Voltage | 12 to 48 VDC | | | |
| No. of Power Inputs | 1 | | | |
| Overload Current Protection | Supported | | | |
| Power Connector | Terminal block | | | |
| Power Consumption | ICF-1150 Series: 264 mA @ 12 to 48 VDC ICF-1150I Series: 300 mA @ 12 to 48 VDC | | | |
| Physical Characteristics | | | | |
| Housing | Metal | | | |
| IP Rating | IP30 | | | |
| Dimensions | 30.3 x 70 x 115 mm (1.19 x 2.76 x 4.53 in) | | | |
| Weight | 330 g (0.73 lb) | | | |
| Installation | DIN-rail mounting | | | |

Environmental Limits

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|--|---|
| Operating Temperature | Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 85°C (-40 to 185°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |

Standards and Certifications

| | |
|-----------------------|---|
| EMC | EN 55032/24 |
| EMI | CISPR 32, FCC Part 15B Class A |
| EMS | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF |
| Environmental Testing | IEC 60068-2-1 IEC 60068-2-2 IEC 60068-2-3 |
| Safety | EN 60950-1, IEC 60950-1 |
| Vibration | IEC 60068-2-6 |
| Hazardous Locations | IEC Models: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2, IECEx All Other Models: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 |

MTBF

| | |
|-----------|--------------------------|
| Time | 792,085 hrs |
| Standards | Telcordia (Bellcore), GB |

Warranty

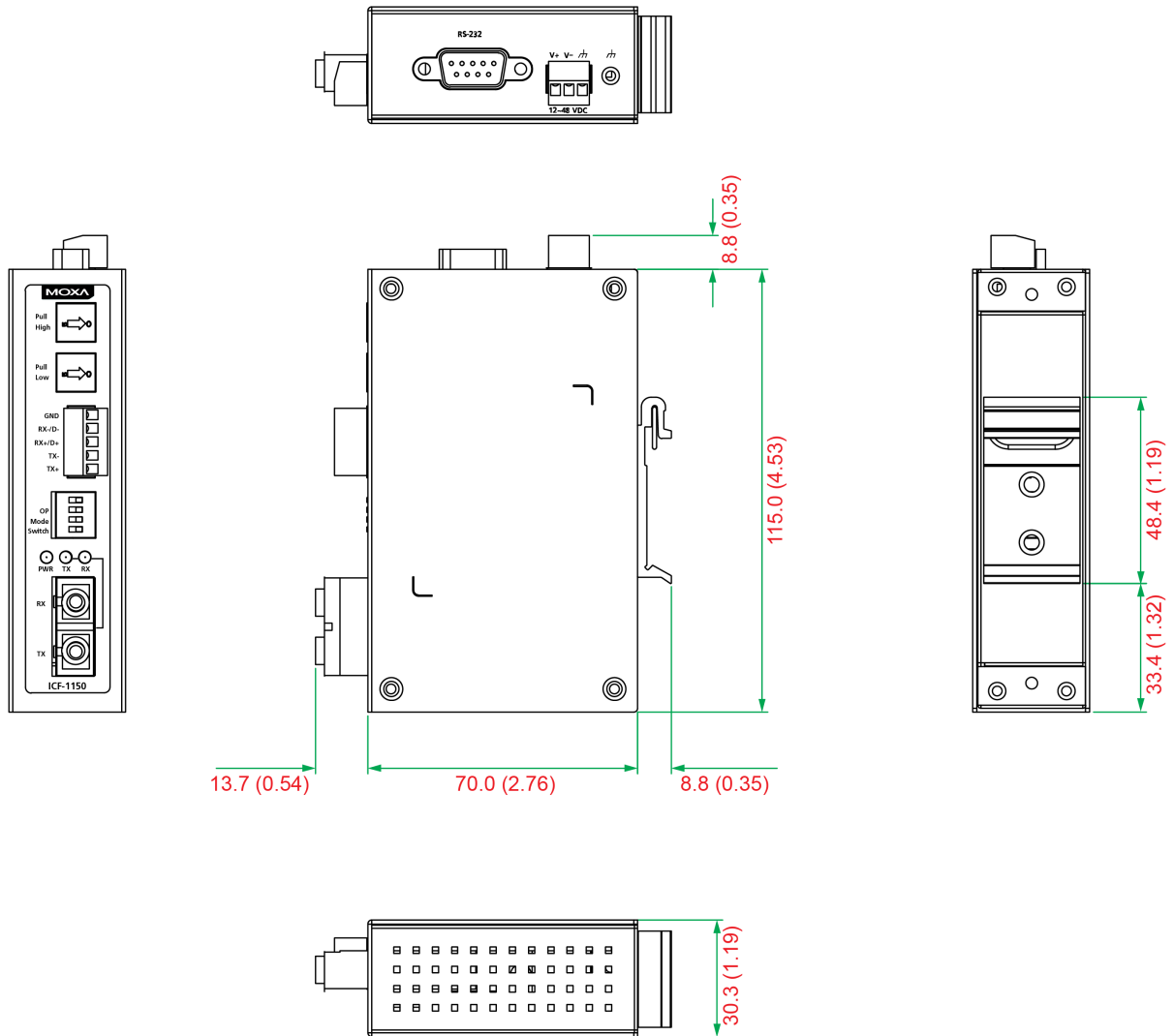
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|-----------------|--|
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |

Package Contents

| | |
|---------------|---|
| Device | 1 x ICF-1150 Series converter |
| Documentation | 1 x quick installation guide 1 x warranty card |

Dimensions

Unit: mm (inch)



Ordering Information

| Model Name | Isolation | Operating Temp. | Fiber Module Type | IECEx Supported |
|------------------|-----------|-----------------|-------------------|-----------------|
| ICF-1150-M-ST | - | 0 to 60°C | Multi-mode ST | - |
| ICF-1150-M-SC | - | 0 to 60°C | Multi-mode SC | - |
| ICF-1150-S-ST | - | 0 to 60°C | Single-mode ST | - |
| ICF-1150-S-SC | - | 0 to 60°C | Single-mode SC | - |
| ICF-1150-M-ST-T | - | -40 to 85°C | Multi-mode ST | - |
| ICF-1150-M-SC-T | - | -40 to 85°C | Multi-mode SC | - |
| ICF-1150-S-ST-T | - | -40 to 85°C | Single-mode ST | - |
| ICF-1150-S-SC-T | - | -40 to 85°C | Single-mode SC | - |
| ICF-1150I-M-ST | 2 kV | 0 to 60°C | Multi-mode ST | - |
| ICF-1150I-M-SC | 2 kV | 0 to 60°C | Multi-mode SC | - |
| ICF-1150I-S-ST | 2 kV | 0 to 60°C | Single-mode ST | - |
| ICF-1150I-S-SC | 2 kV | 0 to 60°C | Single-mode SC | - |
| ICF-1150I-M-ST-T | 2 kV | -40 to 85°C | Multi-mode ST | - |

| Model Name | Isolation | Operating Temp. | Fiber Module Type | IECEx Supported |
|----------------------|-----------|-----------------|-------------------|-----------------|
| ICF-1150I-M-SC-T | 2 kV | -40 to 85°C | Multi-mode SC | – |
| ICF-1150I-S-ST-T | 2 kV | -40 to 85°C | Single-mode ST | – |
| ICF-1150I-S-SC-T | 2 kV | -40 to 85°C | Single-mode SC | – |
| ICF-1150-M-ST-IEX | – | 0 to 60°C | Multi-mode ST | ✓ |
| ICF-1150-M-SC-IEX | – | 0 to 60°C | Multi-mode SC | ✓ |
| ICF-1150-S-ST-IEX | – | 0 to 60°C | Single-mode ST | ✓ |
| ICF-1150-S-SC-IEX | – | 0 to 60°C | Single-mode SC | ✓ |
| ICF-1150-M-ST-T-IEX | – | -40 to 85°C | Multi-mode ST | ✓ |
| ICF-1150-M-SC-T-IEX | – | -40 to 85°C | Multi-mode SC | ✓ |
| ICF-1150-S-ST-T-IEX | – | -40 to 85°C | Single-mode ST | ✓ |
| ICF-1150-S-SC-T-IEX | – | -40 to 85°C | Single-mode SC | ✓ |
| ICF-1150I-M-ST-IEX | 2 kV | 0 to 60°C | Multi-mode ST | ✓ |
| ICF-1150I-M-SC-IEX | 2 kV | 0 to 60°C | Multi-mode SC | ✓ |
| ICF-1150I-S-ST-IEX | 2 kV | 0 to 60°C | Single-mode ST | ✓ |
| ICF-1150I-S-SC-IEX | 2 kV | 0 to 60°C | Single-mode SC | ✓ |
| ICF-1150I-M-ST-T-IEX | 2 kV | -40 to 85°C | Multi-mode ST | ✓ |
| ICF-1150I-M-SC-T-IEX | 2 kV | -40 to 85°C | Multi-mode SC | ✓ |
| ICF-1150I-S-ST-T-IEX | 2 kV | -40 to 85°C | Single-mode ST | ✓ |
| ICF-1150I-S-SC-T-IEX | 2 kV | -40 to 85°C | Single-mode SC | ✓ |

Accessories (sold separately)

Power Supplies

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|---------|--|
| DR-4524 | 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC or 120 to 370 VDC input, -10 to 50° C operating temperature |
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Cables

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|--------------|--|
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |

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