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 female 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 µm, 800 MHz	G.652
		62.5/125 µm, 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

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 55032/35
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	UL 61010-2-201
Vibration	IEC 60068-2-6
Hazardous Locations	IEX 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

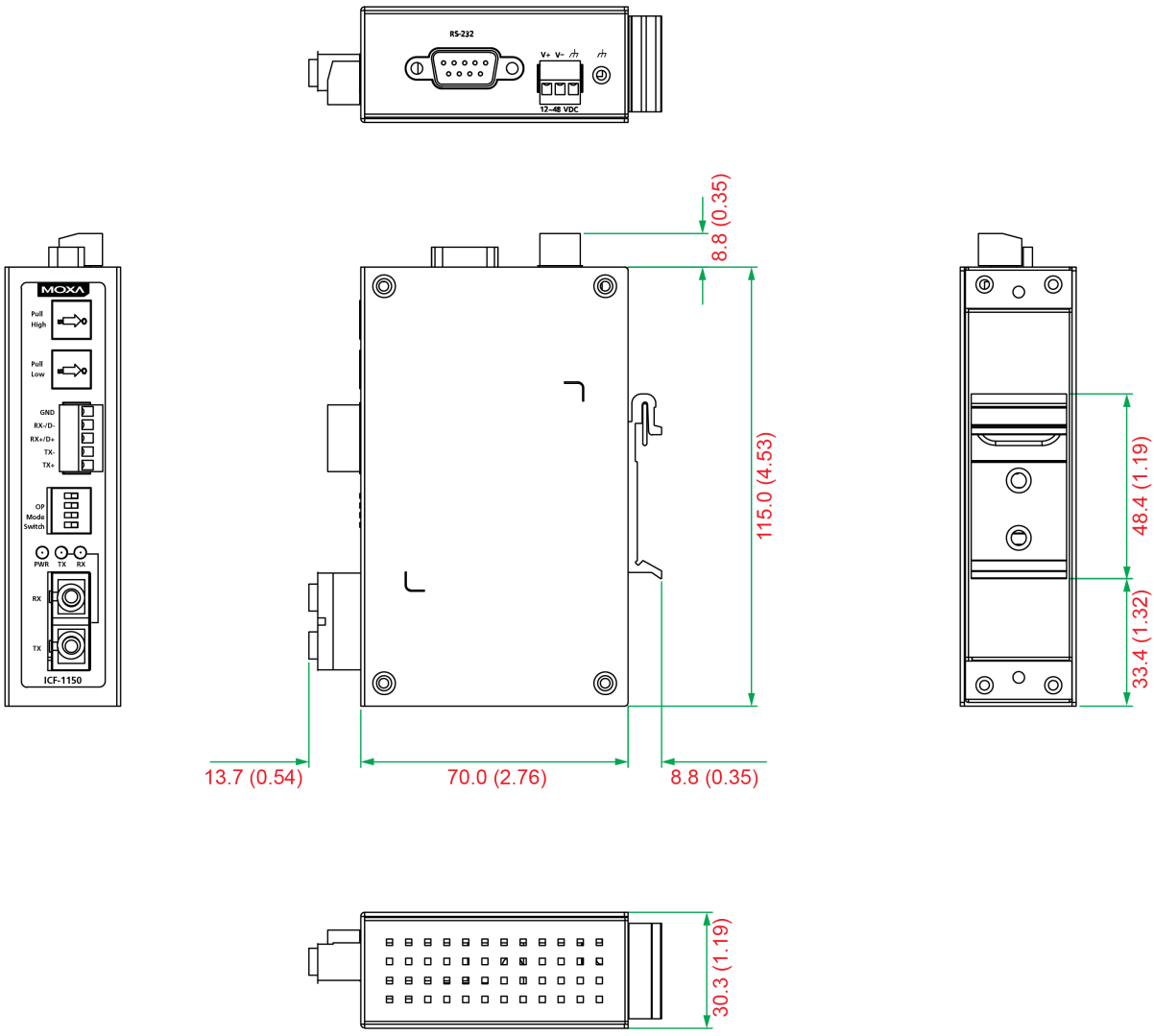
Warranty Period	5 years
Details	See www.moxa.com/warranty

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

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

Cables

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