ICF-1150 Series

Quick Installation Guide

First Edition, November 2008

P/N: 1802011500010

Overview

Introduction

The ICF-1150 series fiber converters are equipped with a multiple interface circuit that can handle RS-232 and RS-422/485 serial interfaces, as well as multi-mode or single-mode fiber. The ICF-1150 converters are used to extend serial transmission distance up to 5 km (ICF-1150-M, with multi-mode fiber) or up to 40 km (ICF-1150-S, with single-mode fiber).

Why Convert Serial to Fiber?

Fiber communication not only extends the communication distance, but also provides many advantageous features. IMMUNITY FROM ELECTRICAL INTERFERENCE: Fiber is not affected by electromagnetic interference or radio frequency interference. It provides a clean communication path and is immune to cross-talk. INSULATION: Optical fiber is an insulator; the glass fiber eliminates the need for using electric currents as the communication medium. SECURITY: Fiber cannot be tapped by conventional electric means and is very difficult to tap into optically. Furthermore, radio and satellite communication signals can be captured easily for decoding. RELIABILITY & MAINTENANCE: Fiber is immune to adverse temperature and moisture conditions, does not corrode or lose its signal, and is not affected by short circuits, power surges, or static electricity.

Reverse Power Protection

The Reverse Power Protection feature provides extra protection against accidentally connecting the power cables to the wrong terminal. The converter is designed to detect automatically which power wire is positive and which is negative, and then adjust the power supply accordingly.

3-Way Communication

The ICF-1150 series supports 2 serial ports. The D-sub connector is for RS-232 communication and the removable terminal block is for RS-422 or RS-485 communication. The 3 ports (2 serial ports and one fiber port) are completely independent. When the ICF-1150 series converters receive data from any port, it will send data out through the other 2 ports. For example, when the ICF-1150 series converters receive a command from the remote Master via the fiber port, it will convert the command and transmit it via the RS-232 port and RS-422/485 port at the same time. So if the user is trying to monitor a system running on the 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.

ATTENTION

ICF-1150 is designed to receive data from one port and send data to the other ports.

If ICF-1150 receive data from 2 ports at the same time, that may cause the data error on all the RX ports.

Rotary Switch for Pull High/Low Resistor Setting

Since the RS-485 port can support multi-drop connection or daisy-chain connection, system engineers can connect meters, RTUs, readers, or many other devices together on the same bus. The impedance of the data line will rise according to the number of serial devices on the same bus. To get the system working, the ICF-1150 has a setting for tuning the pull high/low resistor. Just turn the dial to find the best resistor value for the system without removing the ICF-1150 from the DIN-rail. (The default settings are 1K for both switches.)

Pull High/Low Resistor

Position	0	1	2	3	4	5	6	7	8	9
Ohm	150K	10K	4.7K	3.3K	1K	909	822	770	500	485

DIP Switch for Selectable Terminator

The termination resistor for many products of this type is set by a jumper located inside the product's casing. To disable or change the resistor's strength, the user must open the casing to reset the jumper. Moxa offers a more user-friendly solution that allows users to set the termination resistor with a DIP switch located outside the ICF-1150 converter's casing.

No Configuration Required for Baudrate Settings

The ICF-1150 works under any baudrate from 50 bps to 921.6 Kbps. The ICF-1150 simply converts the signal back and forth between serial (RS-232, RS-422, or RS-485) and fiber. Since the ICF-1150 does not need to interpret the signal, it does not need to know the baudrate of the transmitting device. For this reason, the ICF-1150 does not have any DIP switches or jumpers for setting the baudrate.

Ring Mode

To allow one half-duplex serial device to communicate with multiple half-duplex devices connected to a fiber ring, you should configure the ICF-1150 for "ring mode" by setting DIP switch "SW3" to the "On" position. The Tx port of a particular ICF-1150 unit connects to the neighboring converter's Rx port to form the ring. Note that when one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signal. Users should ensure that the total fiber ring length is less than 100 km when using either single-mode models or multi-mode models.

Features

- "Ring" or "Point to Point" transmission
- Extend RS-232/422/485 transmission distance:
    - ➢ up to 40 km with single-mode—ICF-1150-S series
    - ➢ up to 5 km with multi-mode—ICF-1150-M series
- Support baudrate up to 921.6 Kbps
- Provide 3-way galvanic isolation (for –I models)
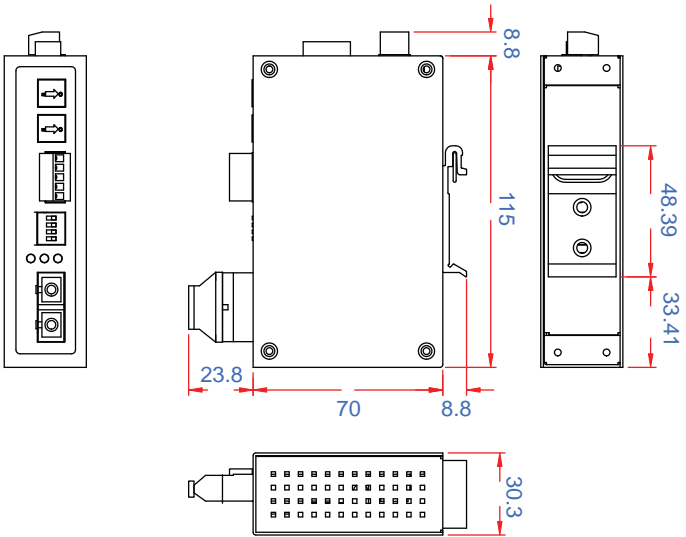- Wide operating temperature from -40 to 85°C (for "T" models)

Package Checklist

Before installing the ICF-1150, verify that the package contains the following items:

- ICF-1150 Fiber Converter
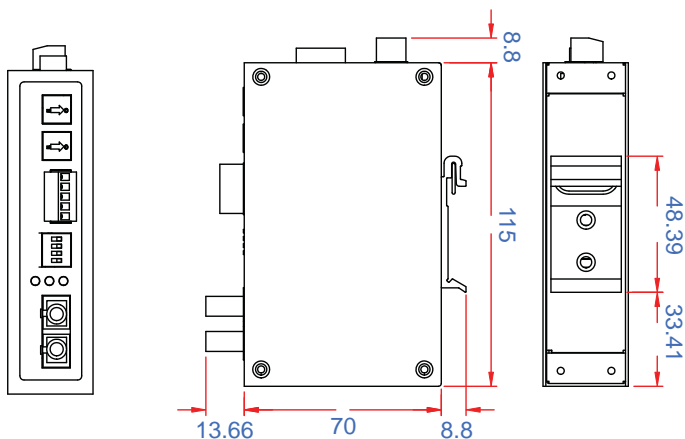- Quick Installation Guide
- Warranty Card

NOTE: *Please notify your sales representative if any of the above items are missing or damaged.*
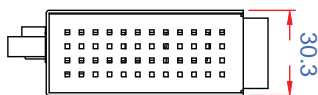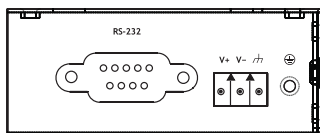
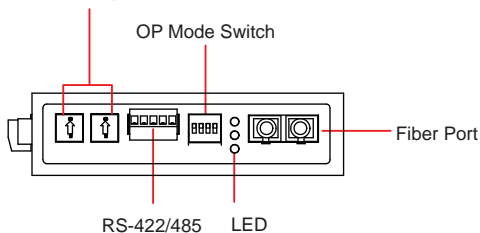# Mounting Dimensions (Unit : mm)

ICF-1150-SC

ICF-1150-ST

Top View

Front View

Rotary Switch for Pull High/Low Resistor

OP Mode Switch

Fiber Port

RS-422/485   LED

ATTENTION **Electrostatic Discharge Warning!**

To protect the product from damage due to electrostatic discharge, we recommend wearing a grounding device when handling your ICF-1150 series.


Mounting

The aluminum DIN-Rail attachment plate should be fixed to the back panel of the ICF-1150 when you take it out of the box. If you need to reattach the DIN-Rail attachment plate to the ICF-1150, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

STEP 1:

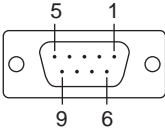Insert the top of the DIN-Rail into the slot just below the stiff metal spring.

STEP 2:

The DIN-Rail attachment unit will snap into place as shown below.
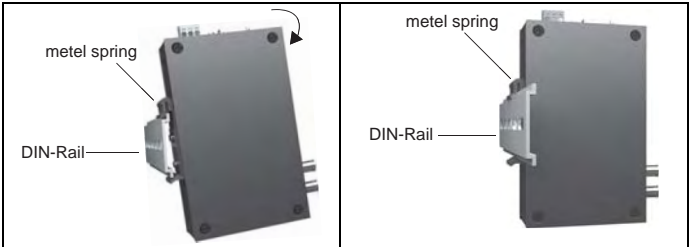
To remove the ICF-1150 series from the DIN-Rail, simply reverse Steps 1 and 2 above.

Pin Assignment

Pin	RS-232
1	Null
2	TxD
3	RxD
4	Null
5	GND
6	Null
7	Null
8	Null
9	---
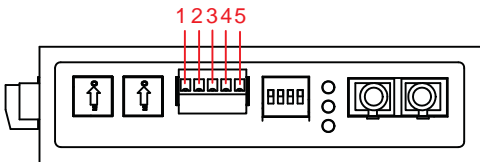
	RS-422	4-wire RS-485	2-wire RS-485
1	GND	GND	GND
2	Rx-	Rx-	Data -
3	Rx +	Rx +	Data +
4	Tx -	Tx -	
5	Tx +	Tx +	

Fiber Cable

SC-Port Pinouts

Rx

Tx
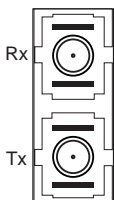
SC-Port to SC-Port Cable Wiring

A

B

A

B

Cable Wiring

A ——————————— A
B ——————————— B

ST-Port Pinouts

Rx

Tx
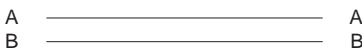
ST-Port to ST-Port Cable Wiring

A

B

A

B

Cable Wiring

A ——————————— A
B ——————————— B
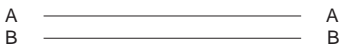
⚠️ **ATTENTION**

This is a Class 1 laser/LED product. Do not stare into the laser beam.

Switch Settings

There are 4-DIP switches on the front panel of the ICF-1150.

Setting	Switch 1	Switch 2
RS-422	ON	OFF
2-wire RS-485	OFF	ON
4-wire RS-485	OFF (default)	OFF (default)

Fiber Mode	Switch 3
Ring Mode	ON
Point to Point mode	OFF (default)

120Ω Terminator	Switch 4
Enable	ON
Disable	OFF (default)

For Fiber Ring Users:

If the Rx LEDs of the converter glow continuously, remove the fiber cable and connect again, then the system will not have the same condition.

NOTE: "Ring Mode" can only be used for half-duplex applications.

LED Indicators

There are 3 LEDs on the front panel of the ICF-1150.

LED	Color	Function
PWR	Green	Steady ON: Power is ON
Fiber Tx	Green	When sending serial data from the fiber port
Fiber Rx	Yellow	When receiving data from the fiber port

Specifications

Serial Communication
Signals for RS-232	TxD, RxD, SGND
Signals for RS-422	TxD+, TxD-, RxD+, RxD-, SGND
Signals for 4-wire RS-485	TxD+, TxD-, RxD+, RxD-, SGND
Signals for 2-wire RS-485	Data+, Data-, SGND
Baudrate	50 bps to 921.6 Kbps
ESD protection	15 KV ESD

Fiber Communication
Connector type	ST or SC
Distance	Single-mode fiber for 40 km
	Multi-mode fiber for 5 km
Support Cable :	8.3/125, 8.7/125, 9/125 or 10/125 μm (single mode)
	50/125, 62.5/125, or 100/140 μm (multimode)
Wavelength	ICF-1150-S: 1310 nm
	ICF-1150-M: 850 nm
TX Output	ICF-1150-S: > -5 dBm
	ICF-1150-M: > -5 dBm
RX Sensitivity	ICF-1150-S: -25 dBm
	ICF-1150-M: -20 dBm
Point-to-Point Transmission	Half or Full duplex
Multi-drop Transmission	Half duplex, fiber ring

Environmental
Operating Temperature	0 to 60°C (32 to 142°F), 5 to 95 % RH
	-40 to 85°C (-40 to 167°F) for –T Model
Storage Temperature	-40 to 85°C (-4 to 185°F), 5 to 95 % RH

Power
Input Power Voltage	12 to 48 VDC
Power Line Protection	4 KV Burst (EFT), EN61000-4-4
	2 KV Surge, EN61000-4-5
Reverse Power Protection	Protects against V+/V- reversal
Over Current Protection	Protects against 2 signals shorted together: 1.1A
Power Consumption	ICF-1150-S/M-SC/ST: 127 mA @ 12V

ICF-1150I- S/M-SC/ST: 163 mA @ 12V

Mechanical

Dimensions (W × D × H)	30.3 × 70 × 115 mm
Material	Aluminum (1 mm)
Gross Weight	135g

Regulatory Approvals

CE	Class B
FCC	Part 15 sub Class B
TÜV	EN 60950-1
EMI	EN55022 1998, Class B
EMS	EN61000-4-2 (ESD), Criteria B, Level 4
	EN61000-4-3 (RS), Criteria A, Level 3
	EN61000-4-4 (EFT), Criteria B, Level 4
	EN61000-4-5 (Surge), Criteria A, Level 3
	EN61000-4-6 (CS), Criteria A, Level 3
	En61000-4-8 (PFMF), Criteria A, Level 5
Free fall	IEC 60068-2-32
MTBF	792085 hrs

Technical Support Contact Information

www.moxa.com/support

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