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
- 3-way isolation protection (for I models only)
- -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 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: 127 mA @ 12 VDC ICF-1150I Series: 163 mA @ 12 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: 163 mA @ 12 VDC ICF-1150I Series: 127 mA @ 12 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 55032/24
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: 0.5 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	-IEX models: IECEx

MTBF

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

Warranty

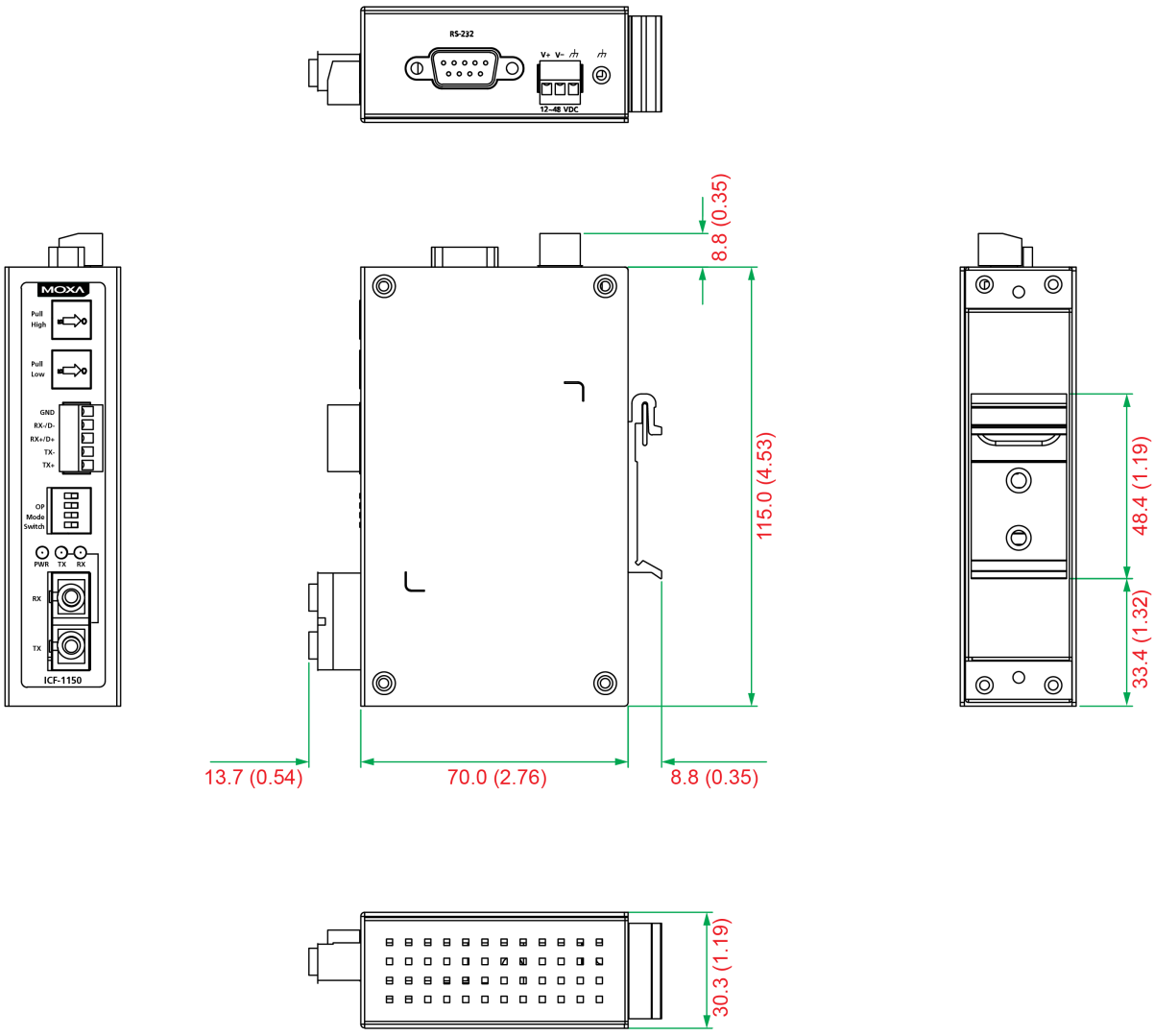
Warranty Period	5 years
Details	See www.moxa.com/warranty

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)

Cables

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

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

TCF-90 Series

Port-powered RS-232 to fiber converters

Features and Benefits

- Uses either external power or power over serial
- Extends RS-232 transmission up to 40 km with single-mode (TCF-90-S) or 5 km with multi-mode (TCF-90-M)
- Reduces signal interference
- Protects against electrical interference and chemical corrosion
- Compact size

Certifications

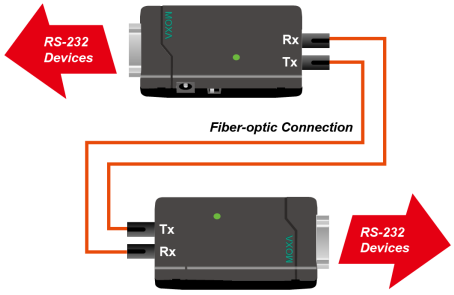
Introduction

The TCF-90 is a compact media converter that transmits RS-232 signals over optical fiber. Power is derived from either the serial port or an external power source. The TCF-90 extends RS-232 transmission up to 5 km with multi-mode fiber, or up to 40 km with single-mode fiber. A pair of TCF-90 converters can be used to connect two RS-232 devices with optical fiber in full-duplex mode. The optical fiber isolates the data signals from dangerous increases in ground potential, ground loops, and electrical EMI/RFI noise, and it enhances data security by eliminating the harmful effects of RF radiation and susceptibility to electromagnetic radiation.

Self-Powered RS-232 to Optical Fiber

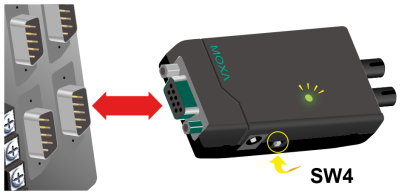
Connecting RS-232 devices to the TCF-90 is easy. The ST-type optical-fiber connector is designed especially for data communication applications that transmit data either between or within buildings. The TCF-90 can be used for industrial applications and for applications that require secure data transfer.

The RS-232 port on the TCF-90 uses a DB9 female socket to connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Although the TCF-90 can obtain enough power from the three data/handshake lines, whether the signal is high or low, we strongly recommend setting either the RTS or DTR signal to ON.



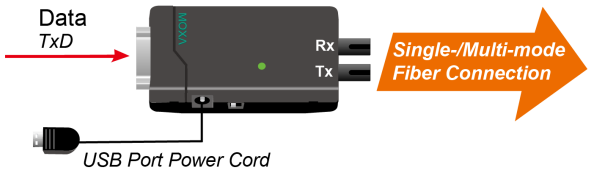
LED Port Power Indicator

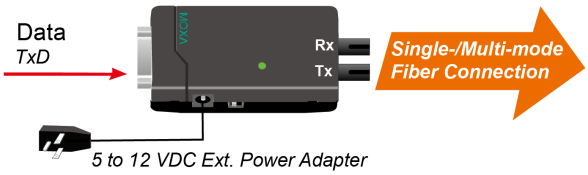
It's easy enough to use a multimeter to test if the serial device is supplying the TCF-90 with enough power through the serial connection, but the TCF-90 can do the testing for you. Connect the TCF-90 to the device's RS-232 port and set the SW4 switch to Test mode. If the port power LED indicator lights up, the TCF-90 is receiving enough power. If the LED does NOT light up, you will need to attach an external power source to the TCF-90.



Optional External Power Source

In most circumstances, the TCF-90 should be able to operate without using an external power source. However, an external USB power cord or DC power supply can be used in situations where the handshake lines are not available, both the RTS/DTR signals are set to OFF, or the attached device's serial interface chip provides less power than required.





Specifications

Serial Interface

No. of Ports	2
Serial Standards	RS-232
Baudrate	50 bps to 921.6 kbps (supports non-standard baudrates)
Flow Control	ADDC® (automatic data direction control) for RS-485
Optical Fiber	TCF-90-M-ST: 100BaseFX ports (multi-mode ST connector) TCF-90-S-ST: 100BaseFX ports (single-mode ST connector)

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 -5	0 to -5
	RX Range (dBm)	0 to -20	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.

Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Power Parameters

Input Current	20 mA @ 12 VDC
Input Voltage	5 to 12 VDC
No. of Power Inputs	1
Overload Current Protection	Supported
Power Consumption	20 mA @ 12 VDC
Source of Input Power	Power input jack

Physical Characteristics

Housing	Plastic
IP Rating	IP30
Dimensions	42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)
Weight	150 g (0.33 lb)
Installation	Desktop

Environmental Limits

Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature (package included)	-20 to 75°C (-4 to 167°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: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 0.5 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 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 60068-2-14 IEC 60068-2-2 IEC 60068-2-3
Safety	EN 60950-1, IEC 60950-1
Vibration	IEC 60068-2-6

MTBF

Time	2,272,562 hrs
Standards	Telcordia (Bellcore), GB

Warranty

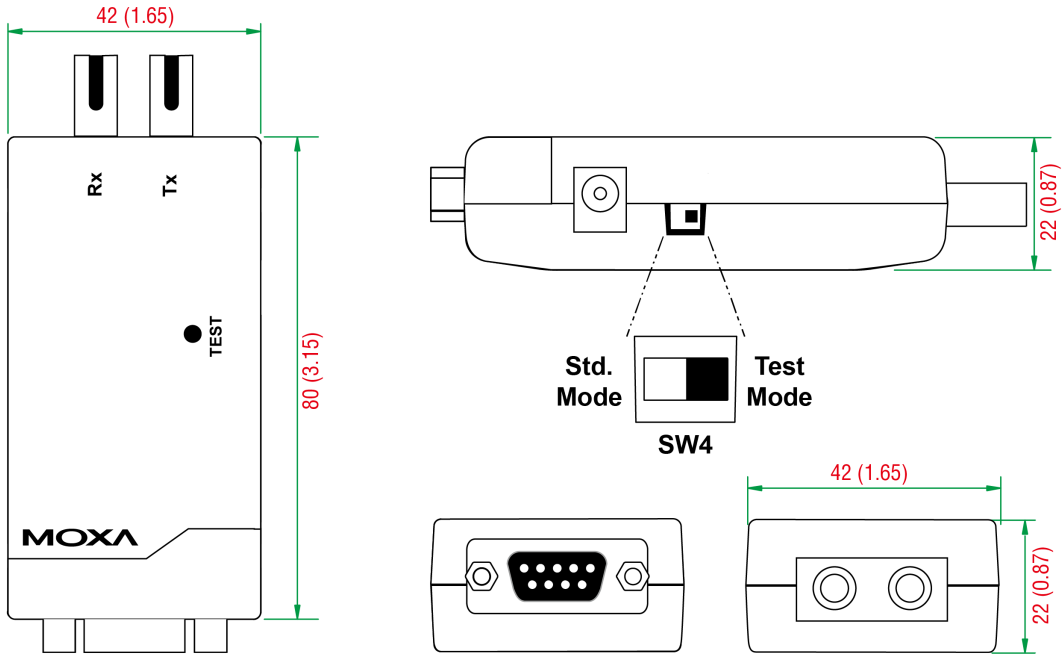
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x TCF-90 Series converter
Cable	1 x USB power cord, 50 cm
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Fiber Module Type
TCF-90-M-ST	Multi-mode ST
TCF-90-S-ST	Single-mode ST

Accessories (sold separately)

DIN-Rail Mounting Kits

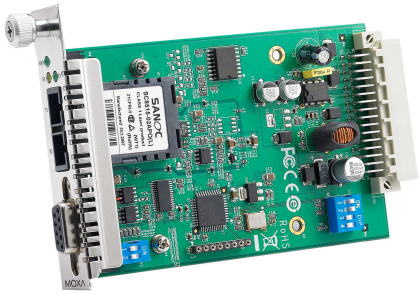
DK35A	DIN-rail mounting kit, 35 mm

Power Cords

CBL-PJTB-10	Non-locking barrel plug to bare-wire cable

TCF-142-RM Series

RS-232/422/485 to fiber slide-in modules for the NRack System™



Features and Benefits

- Extends RS-232/422/485 transmission up to 40 km with single-mode or 5 km with multi-mode
- 1 or 150 kilo-ohm adjustable pull high/low resistor
- Supports ring and point-to-point transmission

Certifications

Introduction

The TCF-142-RM Series slide-in modules are serial-to-fiber converters that work with the TRC-190 chassis. The modules convert from the RS-232, RS-422, or RS-485 signal to a fiber-optic signal.

Automatic Baudrate Detection

The TCF-142-RM Series can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any problem.

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
Optical Fiber	TCF-142-M-SC-RM: 100BaseFX ports (multi-mode SC connector) TCF-142-M-ST-RM: 100BaseFX ports (multi-mode ST connector) TCF-142-S-SC-RM: 100BaseFX ports (single-mode SC connector) TCF-142-S-ST-RM: 100BaseFX ports (single-mode ST connector)

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 -5	0 to -5
	RX Range (dBm)	0 to -20	0 to -25

Low-Speed Fiber Module		Multi-Mode	Single-Mode
Fiber Cable Requirements		50/125 µm, 800 MHz	G.652
		62.5/125 µm, 500 MHz	
	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	1 kilo-ohm, 150 kilo-ohms
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	150 mA @ 12 VDC
Overload Current Protection	Supported
Power Consumption	150 mA @ 12 VDC

Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions	86.8 x 136.5 x 21 mm (3.42 x 5.37 x 0.83 in)
Weight	105 g (0.23 lb)

Environmental Limits

Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature (package included)	-20 to 75°C (-4 to 167°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: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 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

MTBF

Time	514,926 hrs
Standards	Telcordia (Bellcore), GB

Warranty

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

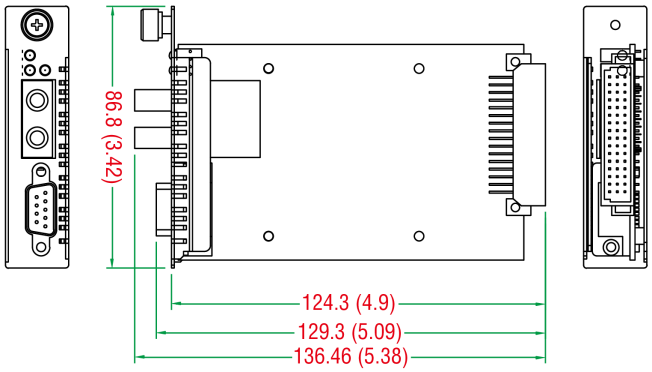
Package Contents

Device	1 x TCF-142-RM Series converter
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

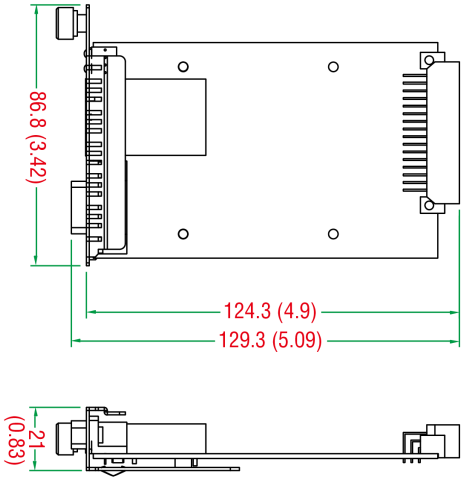
TCF-142-M/S-ST-RM Series

Unit: mm (inch)



TCF-142-M/S-SC-RM Series

Unit: mm (inch)



Ordering Information

Model Name	Fiber Module Type
TCF-142-M-ST-RM	Multi-mode ST
TCF-142-M-SC-RM	Multi-mode SC
TCF-142-S-ST-RM	Single-mode ST
TCF-142-S-SC-RM	Single-mode SC

TCF-142 Series

RS-232/422/485 to fiber converters

Features and Benefits

- Ring and point-to-point transmission
- Extends RS-232/422/485 transmission up to 40 km with single-mode (TCF-142-S) or 5 km with multi-mode (TCF-142-M)
- Decreases signal interference
- Protects against electrical interference and chemical corrosion
- Supports baudrates up to 921.6 kbps
- Wide-temperature models available for -40 to 75°C environments

Certifications

Introduction

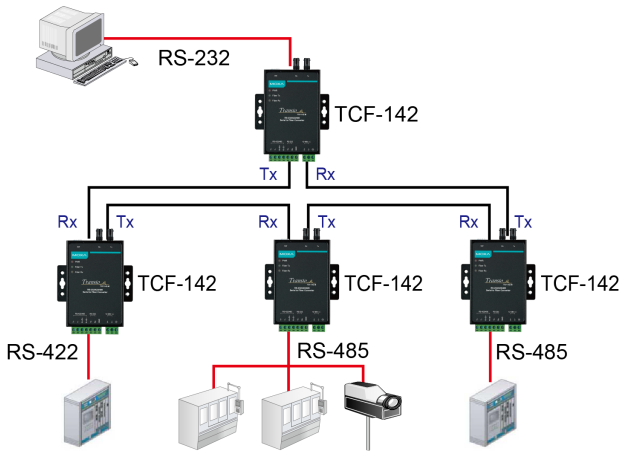
The TCF-142 media converters are equipped with a multiple interface circuit that can handle RS-232 or RS-422/485 serial interfaces and multi-mode or single-mode fiber. TCF-142 converters are used to extend serial transmission up to 5 km (TCF-142-M with multi-mode fiber) or up to 40 km (TCF-142-S with single-mode fiber). The TCF-142 converters can be configured to convert either RS-232 signals, or RS-422/485 signals, but not both at the same time.

Automatic Baudrate Detection

The TCF-142 converters can automatically detect the serial baudrate, which is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any data loss.

Ring Operation

The TCF-142 converters can be used to connect serial devices to a fiber ring. To form the ring, connect the Tx port of one TCF-142 to the Rx port of a neighboring converter. Once the ring is set up, simply use the DIP switches to configure the TCF-142 converters for ring mode. 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. With the TCF-142, you can set up fiber rings that have a total circumference of up to 100 km.



Automatic Data Direction Control (ADDC®)

ADDC® is a patented hardware data flow solution developed by Moxa to handle RS-485 data direction control. ADDC® senses and controls RS-485 data direction automatically, making it unnecessary to use the handshaking signal.

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

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 -5	0 to -5
	RX Range (dBm)	0 to -20	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	1 kilo-ohm, 150 kilo-ohms
RS-485 Data Direction Control	ADDC® (automatic data direction control)
Terminator for RS-485	N/A, 120 ohms, 120 kilo-ohms
Connector	7-pin terminal block
Latency	300 ns

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

No. of Power Inputs	1
Input Current	140 mA @ 12 VDC
Input Voltage	12 to 48 VDC
Overload Current Protection	Supported
Power Connector	Terminal block
Power Consumption	140 mA @ 12 VDC

Physical Characteristics

IP Rating	IP30
Housing	Metal
Dimensions (with ears)	90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in)
Dimensions (without ears)	67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)

Weight	320 g (0.71 lb)
Installation	Wall mounting

Environmental Limits

Operating Temperature	Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°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: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV IEC 61000-4-5 Surge: Power: 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

MTBF

Time	780,480 hrs
Standards	Telcordia (Bellcore), GB

Warranty

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

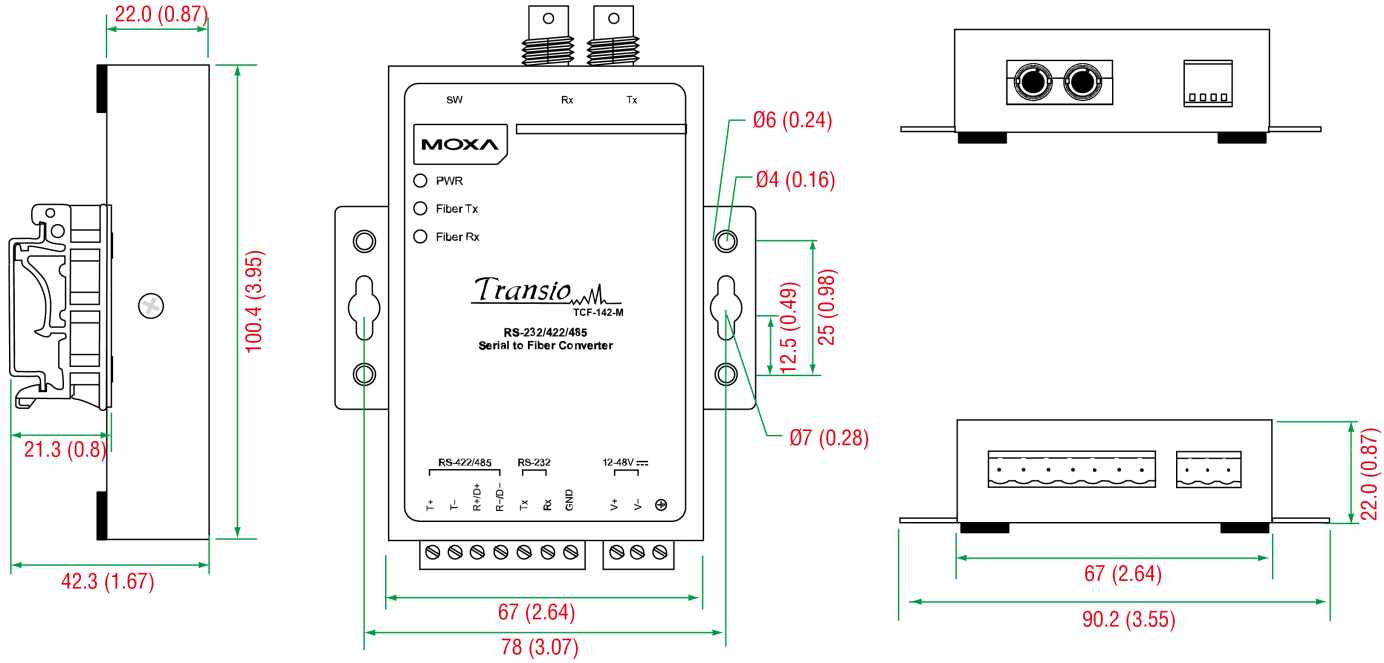
Package Contents

Device	1 x TCF-142 Series converter
Installation Kit	1 x rubber stand
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

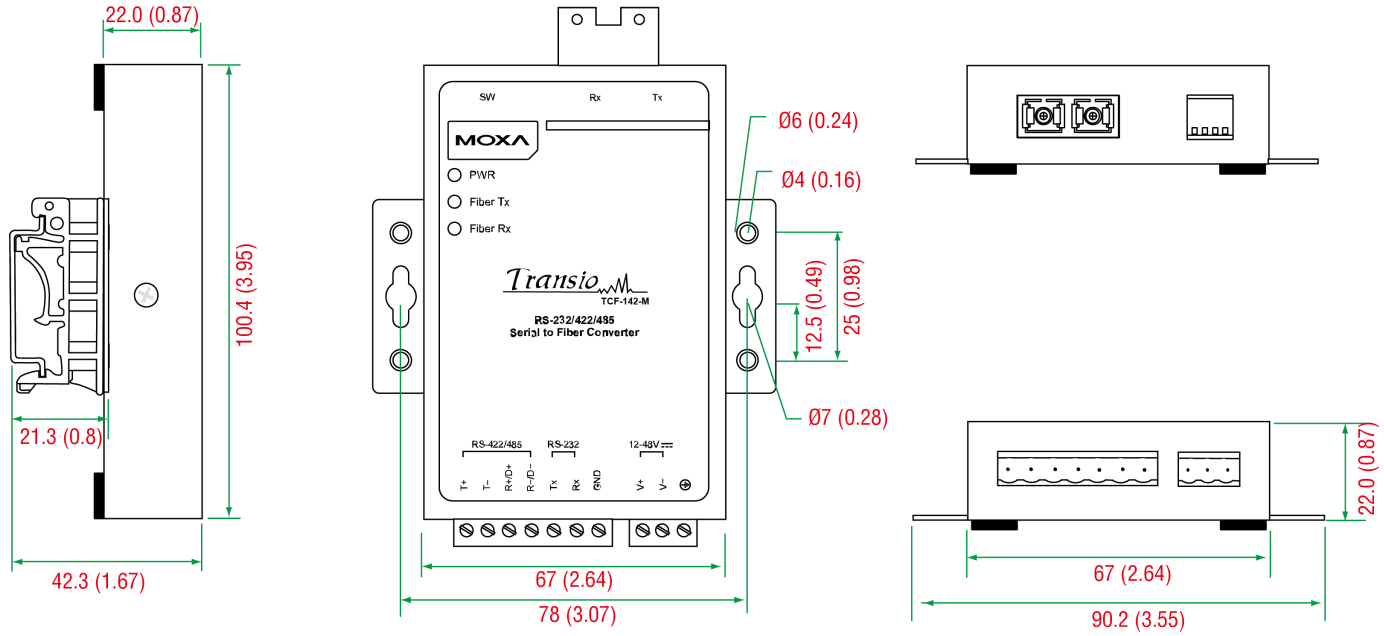
TCF-142-M/S-ST

Unit: mm (inch)



TCF-142-M/S-SC

Unit: mm (inch)



Ordering Information

Model Name	Operating Temp.	Fiber Module Type
TCF-142-M-ST	0 to 60°C	Multi-mode ST
TCF-142-M-SC	0 to 60°C	Multi-mode SC
TCF-142-S-ST	0 to 60°C	Single-mode ST
TCF-142-S-SC	0 to 60°C	Single-mode SC

Model Name	Operating Temp.	Fiber Module Type
TCF-142-M-ST-T	-40 to 75°C	Multi-mode ST
TCF-142-M-SC-T	-40 to 75°C	Multi-mode SC
TCF-142-S-ST-T	-40 to 75°C	Single-mode ST
TCF-142-S-SC-T	-40 to 75°C	Single-mode SC

Accessories (sold separately)

DIN-Rail Mounting Kits

DK35A	DIN-rail mounting kit, 35 mm

Power Adapters

PWR-12125-USJP-S1	Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, United States/Japan (US/JP) plug, 0 to 40°C operating temperature
PWR-12125-WPAU-S1	Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, Australia (AU) plug, 0 to 40°C operating temperature
PWR-12125-WPCN-S1	Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, China (CN) plug, 0 to 40°C operating temperature
PWR-12125-WPEU-S1	Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, Continental Europe (EU) plug, 0 to 40°C operating temperature
PWR-12125-WPUK-S1	Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, United Kingdom (UK) plug, 0 to 40°C operating temperature

Power Cords

CBL-PJTB-10	Non-locking barrel plug to bare-wire cable

TRC-190 Series

19-inch rackmount chassis media converters

Features and Benefits

- 19-inch chassis for rackmount use
- 19 slots for high-density applications
- Supports dual power inputs with redundancy
- Fanless chassis design reduces servicing costs

Certifications

Introduction

The TRC-190 rackmount chassis provides 19 slots for media converter modules from the CSM-200 Series of Ethernet-to-fiber modules and TCF-142-RM Series of serial-to-fiber modules. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion AC or DC module available to enhance reliability. The PWR-190-AC and PWR-190-DC-48 power modules can be installed at the same time.

Specifications

Power Parameters

Input Voltage	TRC-190-AC: 110 to 240 VAC TRC-190-DC-48: 36 to 53 VDC Redundant dual inputs
No. of Power Inputs	2
Overload Current Protection	Supported
Power Consumption	TRC-190-AC: 0.9 A @ 110 VAC TRC-190-DC-48: 2.1 A @ 48 VDC

Physical Characteristics

Dimensions	440 x 260 x 88 mm (17.32 x 10.24 x 3.46 in)
Installation	19-inch rack mounting
IP Rating	IP30
Weight	5200 g (11.4 lb)

Environmental Limits

Ambient Relative Humidity	5 to 95% (non-condensing)
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature (package included)	-20 to 75°C (-4 to 167°F)

Standards and Certifications

EMC	EN 55032/24
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 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

MTBF

Time	1,055,112 hrs
Standards	Telcordia (Bellcore), GB

Warranty

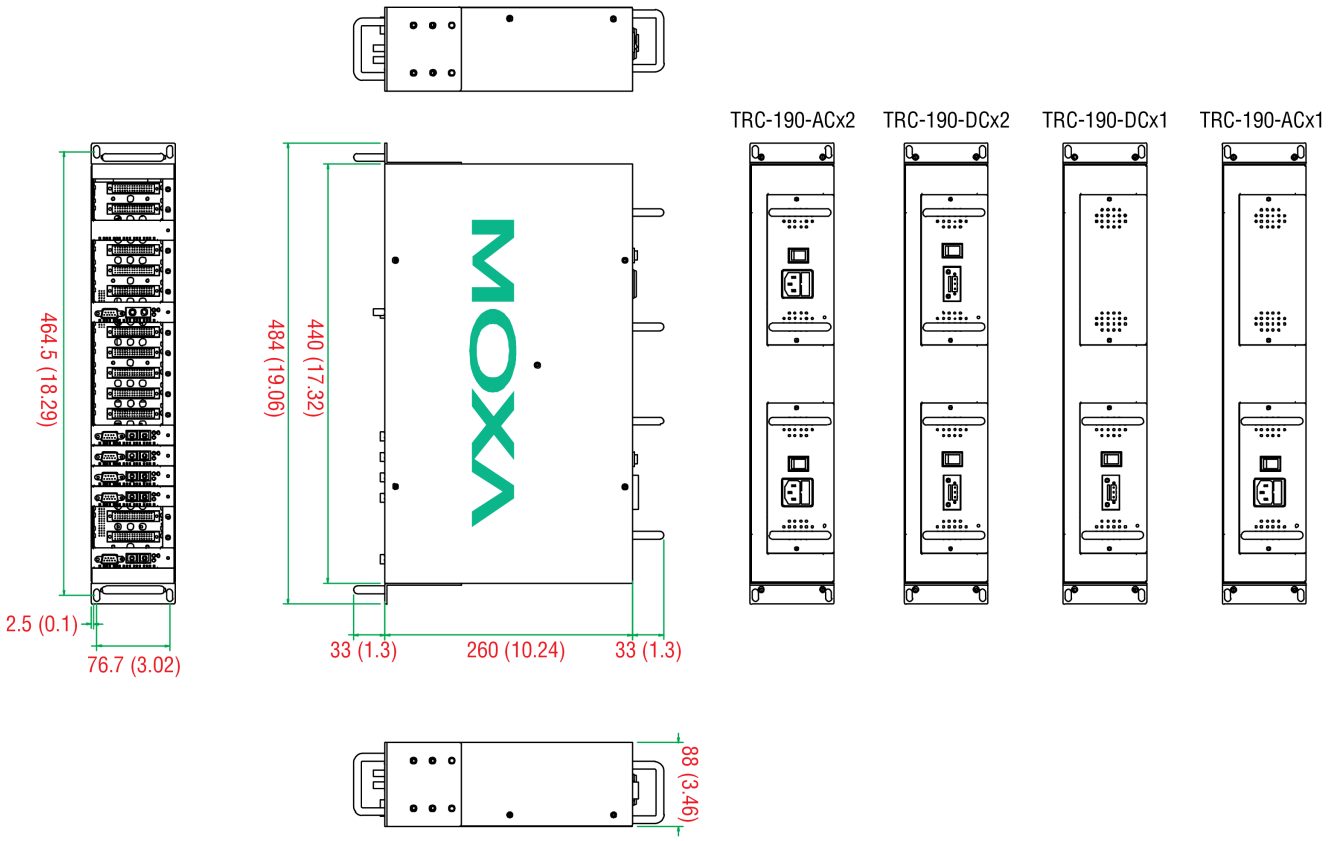
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x TRC-190 Series converter
Bracket	18 x faceplate and screws
Power Supply	1 x power cord
Documentation	1 x quick installation guide 1 x warranty card
Note	This product requires additional modules (sold separately) to function.

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Input Voltage
TRC-190-AC	100-240 VAC (47-63 Hz)
TRC-190-DC-48	36-53 VDC

Accessories (sold separately)

Brackets

Plate-1	TRC-190 bracket accessory package, 9 brackets, 9 screws (FMS M3 X 6)
BKT-PWR	TRC-190 DIN-rail accessory package, 2 L-shaped metal plates, 8 screws (FMS M4 x 6mm)

Communication Modules

TCF-142-M-SC-RM	RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM	RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM	RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM	RS-232/422/485 to single-mode fiber slide-in module converter, ST connector
CSM-200-1213	10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214	10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218	10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
CSM-400-1213	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode ST connector, -20 to 55°C
CSM-400-1213-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode ST connector, -40 to 75°C

CSM-400-1214	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode SC connector, -20 to 55°C
CSM-400-1214-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode SC connector, -40 to 75°C
CSM-400-1218	10/100BaseT(X) to 100BaseFX slide-in management module converter, single-mode SC connector, -20 to 55°C
CSM-400-1218-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, single-mode SC connector, -40 to 75°C
CSM-400-1224	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-A single-mode SC connector, -20 to 55°C
CSM-400-1224-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-A single-mode SC connector, -40 to 75°C
CSM-400-1225	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-B single-mode SC connector, -20 to 55°C
CSM-400-1225-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-B single-mode SC connector, -40 to 75°C

Power Cords

PWC-C13AU-3B-183	Power cord with Australian (AU) plug, 1.83 m
PWC-C13CN-3B-183	Power cord with three-prong China (CN) plug, 1.83 m
PWC-C13EU-3B-183	Power cord with Continental Europe (EU) plug, 1.83 m
PWC-C13JP-3B-183	Power cord with Japan (JP) plug, 7A/125V, 1.83 m
PWC-C13UK-3B-183	Power cord with United Kingdom (UK) plug, 1.83 m
PWC-C13US-3B-183	Power cord with United States (US) plug, 1.83 m

Power Supplies

PWR-190-AC	110 to 240 VAC power supply for the TRC-190-AC
PWR-190-DC-48	36 to 53 VDC power supply for the TRC-190-DC-48

TRC-2190 Series

18-slot rackmount chassis managed media converters

Features and Benefits

- 19-inch chassis for rackmount use
- 18 slots for high-density applications
- Supports dual power inputs with redundancy
- Fanless chassis design reduces servicing costs
- SNMP/web console for easy management
- -20 to 55°C operating temperature range

Certifications

Introduction

The TRC-2190 Series provides 18 slots for media converter modules from the CSM-400 Series of Ethernet-to-fiber management modules. It also supports SNMP/web console for remote management and monitoring. A TRC-2190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-2190 Series' power input module supports a fanless chassis design, as well as a -20 to 55°C operating temperature range.

Specifications

Ethernet Interface	
10/100BaseT(X) Ports (RJ45 connector)	2

Ethernet Software Features	
Industrial Protocols	SNMPv1/v2c, SNMPv1/v2c Trap
Management	DHCP Client, IPv4/IPv6, SNMPv1/v2c, Syslog, TCP/IP, Telnet, TFTP, UDP, Web Console
MIB	MIB-II
Security	HTTPS/SSL, Local Account Accessibility, TACACS+, RADIUS, SSH
Time Management	NTP Client

Power Parameters	
Input Voltage	TRC-2190-AC: 110 to 240 VAC, TRC-2190-DC-48V: 36 to 53 VDC
No. of Power Inputs	2
Overload Current Protection	Supported
Power Consumption	TRC-2190-AC: 0.9 mA @ 110 VAC TRC-2190-DC-48V: 2.1 mA @ 48 VDC

Physical Characteristics	
IP Rating	IP30
Dimensions	440 x 260 x 77 mm (18.6 x 11 x 3.3 in)

Weight	5.2 g (11.4 lb)
Installation	19-inch rack mounting

Environmental Limits

Operating Temperature	-20 to 55°C (-4 to 131°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: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 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 60068-2-14 IEC 60068-2-2 IEC 60068-2-3
Safety	EN 60950-1, IEC 60950-1
Vibration	IEC 60068-2-6

MTBF

Time	1,055,112 hrs
Standards	Telcordia (Bellcore), GB

Warranty

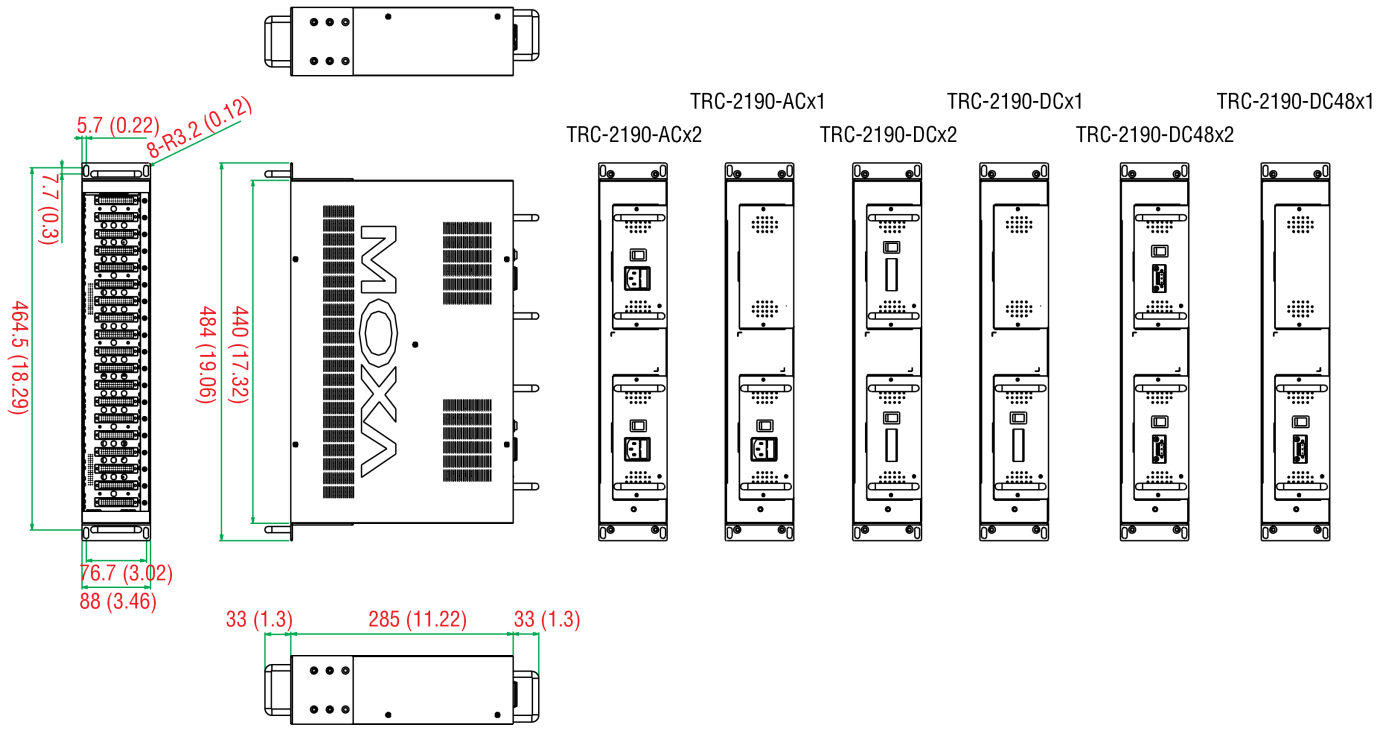
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x TRC-2190 Series converter
Documentation	1 x quick installation guide 1 x warranty card
Note	This product requires additional modules (sold separately) to function.

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Input Voltage
TRC-2190-AC	100-240 VAC (47-63 Hz)
TRC-2190-DC-48V	36-53 VDC

Accessories (sold separately)

Brackets

Plate-1	TRC-190 bracket accessory package, 9 brackets, 9 screws (FMS M3 X 6)
BKT-PWR	TRC-190 DIN-rail accessory package, 2 L-shaped metal plates, 8 screws (FMS M4 x 6mm)

Communication Modules

TCF-142-M-SC-RM	RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM	RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM	RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM	RS-232/422/485 to single-mode fiber slide-in module converter, ST connector
CSM-200-1213	10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214	10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218	10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
CSM-400-1213	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode ST connector, -20 to 55°C
CSM-400-1213-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode ST connector, -40 to 75°C
CSM-400-1214	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode SC connector, -20 to 55°C
CSM-400-1214-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, multi-mode SC connector, -40 to 75°C

CSM-400-1218	10/100BaseT(X) to 100BaseFX slide-in management module converter, single-mode SC connector, -20 to 55°C
CSM-400-1218-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, single-mode SC connector, -40 to 75°C
CSM-400-1224	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-A single-mode SC connector, -20 to 55°C
CSM-400-1224-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-A single-mode SC connector, -40 to 75°C
CSM-400-1225	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-B single-mode SC connector, -20 to 55°C
CSM-400-1225-T	10/100BaseT(X) to 100BaseFX slide-in management module converter, WDM-B single-mode SC connector, -40 to 75°C

Power Cords

PWC-C13AU-3B-183	Power cord with Australian (AU) plug, 1.83 m
PWC-C13CN-3B-183	Power cord with three-prong China (CN) plug, 1.83 m
PWC-C13EU-3B-183	Power cord with Continental Europe (EU) plug, 1.83 m
PWC-C13JP-3B-183	Power cord with Japan (JP) plug, 7A/125V, 1.83 m
PWC-C13UK-3B-183	Power cord with United Kingdom (UK) plug, 1.83 m
PWC-C13US-3B-183	Power cord with United States (US) plug, 1.83 m

Power Supplies

PWR-2190-AC	110 to 240 VAC power supply for the TRC-2190-AC
PWR-2190-DC-48	36 to 53 VDC power supply for the PWR-2190-DC-48