

# ICF-1180I Series

## Industrial PROFIBUS-to-fiber converters



- > Fiber cable test function validates fiber communication
- > Auto baudrate detection and data speed up to 12 Mbps
- > PROFIBUS bus fail prevents corrupted datagram in functioning segment
- > Fiber inverse feature
- > Alarm by relay output
- > 2 kV galvanic isolation protection
- > Dual power inputs for redundancy (Reverse power protection)
- > Extends PROFIBUS transmission distance up to 45 km
- > Wide temperature model available for -40 to 75°C environments
- > Supports Fiber Signal Intensity Diagnosis



### Overview

The ICF-1180I series industrial PROFIBUS-to-fiber converters are used to convert PROFIBUS signals from copper to optical fiber. The converters are used to extend serial transmission up to 4 km (multi-mode fiber) or up to 45 km (single-mode fiber). The ICF-1180I

provides 2 kV isolation protection for the PROFIBUS system and dual power inputs to ensure that your PROFIBUS device will perform uninterrupted.

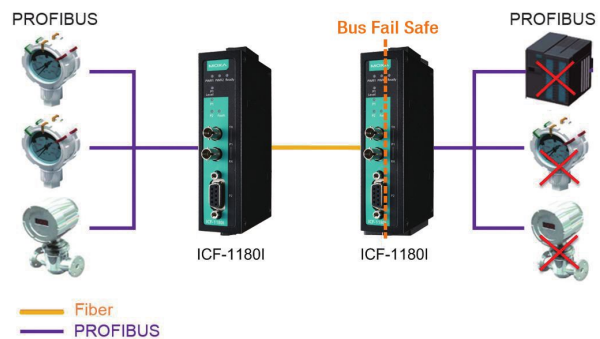
### Fiber Cable Test Function

Fiber-optic cables are usually deployed for long distance communication. To ensure proper communication across the fiber-optic cables, engineers use fiber sensors. With fiber cable test function through DIP switch adjustments, the ICF-1180I series converters

eliminate the need to rely on fiber-optic sensors. This function not only detects fiber communication abnormalities but also validates the format of the received packet. It can also determine which side (Tx or Rx) is causing the problem.

### PROFIBUS Fail Safe

When the PROFIBUS device malfunctions or the serial interface fails, it will generate electrical noise, resulting in bus failure. Traditional media converters will let the noise signal pass through the fiber and on to the other converter. This will disrupt data transmissions between the two buses and eventually communication ceases across the entire system. When this occurs, the engineer will not be able to easily locate the failed device because the entire PROFIBUS network is down. To avoid this situation, the ICF-1180I was designed to detect and recognize noise signals. If the bus fails on one side, the noise signal will not propagate through the ICF-1180I and affect additional bus segments. In addition, the ICF-1180I will also trigger an alarm notification to the field engineer on the location of the failure.



### Auto/Manual Baudrate Settings

The ICF-1180I series simply convert the signal back and forth between PROFIBUS and fiber. The ICF-1180I series work under baudrates between 9.6 kbps to 12 Mbps. Engineers do not need to know the baudrate of the connected PROFIBUS device; the ICF-1180I series

can automatically detect the baudrate of the PROFIBUS device and apply this baudrate directly. This is an extremely convenient feature. If necessary, baudrates can be set to a fixed value via DIP switches.

## Fiber Inverse Function

The ICF-1180I provides a fiber inverse function to choose fiber optic light ON or light OFF when sending logic signal '1'. For default setting, fiber optic is light OFF when sending logic signal '1'; in Fiber Inverse mode, fiber optic is light ON when sending logic signal '1'. This

feature provides greater compatibility when the ICF-1180I converter is integrated with PROFIBUS converters of other manufacturers. Please refer to third-party user manuals when using this feature.

## Fiber Link Monitor

The ICF-1180I series converters provide fiber link monitor function to detect the communication errors on either the fiber side or PROFIBUS

side. Once there is an error in communication, the corresponding LED will turn red, and the relay alarm will activate.

## Fiber Signal Intensity Diagnosis

In some circumstances, you may need to measure the receive level of the fiber optic port with a voltmeter, which can be connected while the device is operating (doing so will not affect data transmission). The measurement can be taken with a voltmeter and read on a PLC that

uses floating high impedance analog inputs, which allows you to do the following:

- Record the incoming optical power for later measurement (e.g., to indicate aging or damage).
- Carry out a good/bad test (limit value).

## Specifications

### Technology

**Standards:** IEC 61158-2 for PROFIBUS DP

### Interface

**P1 Port:** ST optical fiber

**P2 Port:** PROFIBUS DP (DB9 female)

**Relay Alarm:** One relay output with current carrying capacity of 2 A @ 30 VDC (Normal open)

**LED Indicators:** PWR1, PWR2, Ready, P1 Status, P2 Status

### DIP Switches:

DIP 1 to 4: Baudrate setting

DIP 5: Fiber link monitor

DIP 6: Fiber inverse function

DIP 7: Reserved

DIP 8: Fiber cable test function

### PROFIBUS Communication

**Data Rate:** 9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000, and 12000 kbps

**Auto Baudrate:** Yes

**Isolation Protection:** 2 kV

### Optical Fiber Side

#### Point-to-Point Transmission:

	Multi-mode	Single-mode
Wavelength	820 nm	1310 nm
Tx Output	-14 dBm	-7 dBm
Rx Sensitivity	-28 dBm	-29 dBm
Link Budget	14 dBm	21 dBm
Typical Distance	4 km	45 km

### Physical Characteristics

**Housing:** Metal

**Mounting:** DIN-Rail mounting, wall mounting (with optional kit)

**Dimensions:** 30.3 x 115 x 70 mm (1.19 x 4.53 x 2.76 in)

**Weight:** 180 g (0.39 lb)

### 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:** -40 to 75°C (-40 to 167°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

### Power Requirements

**Rated Voltage:** 12 to 48 VDC

**Rated Current:** 143 mA @ 24 V

**Connector:** Terminal Block

**Power Line Protection:** Level 3 (2 kV) Surge Protection

**Overcurrent Protection:** 1.1 A

### Standards and Certifications

**Safety:** UL 508

**Hazardous Location:** UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 EEx nC IIC, IECEx

**EMC:** EN 55022/24

**EMI:** CISPR 22, FCC Part 15B Class A

### EMS:

EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV

EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m

EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV

EN 61000-4-5 (Surge): Power: 2 kV; Signal: 2 kV

EN 61000-R[-35]C4-6 (CS): 150 kHz to 80 MHz: 10 V/m

EN 61000-4-8 (PFMF)

**Green Product:** RoHS, CRoHS, WEEE

**Freefall:** IEC 60068-2-32

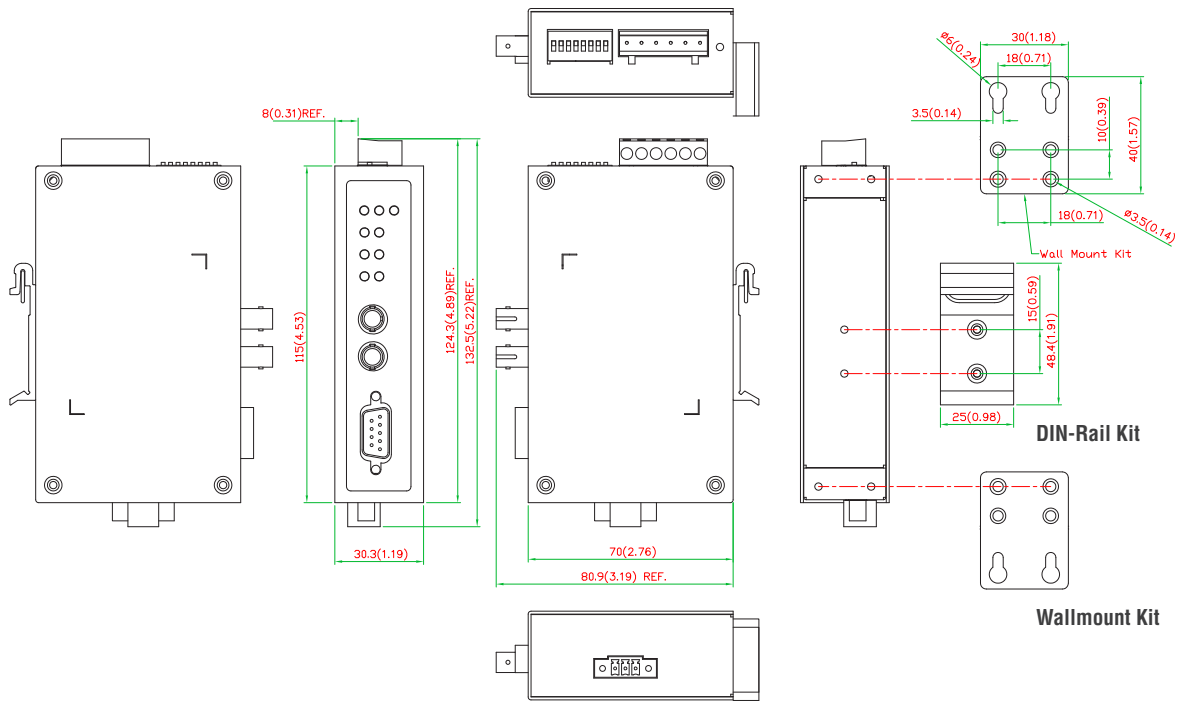
### Warranty

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

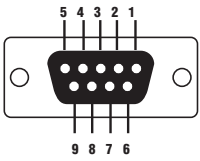
### Dimensions and Pin Assignment

Unit: mm (inch)



### Pin Assignment

#### PROFIBUS Connector (DB9 Female)



PIN	Signal Name
1	N-C
2	N-C
3	Profibus D+
4	RTS
5	Signal common
6	5 V
7	N-C
8	Profibus D-
9	N-C

### Ordering Information

#### Available Models

- ICF-1180I-M-ST:** PROFIBUS to fiber converter, multi-mode, ST connector, 0 to 60°C
- ICF-1180I-S-ST:** PROFIBUS to fiber converter, single-mode, ST connector, 0 to 60°C
- ICF-1180I-M-ST-T:** PROFIBUS to fiber converter, multi-mode, ST connector, -40 to 75°C
- ICF-1180I-S-ST-T:** PROFIBUS to fiber converter, single-mode, ST connector, -40 to 75°C

#### Package Checklist

- ICF-1180I series PROFIBUS-to-fiber converter
- Hardware installation guide (printed)
- Warranty card