

Quick Installation Guide

IFC-FDC

IFC-FDC-E

RS-485 / RS-422 / RS-232 Daisy Chain Fiber Converter



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Introduction

The IFC-FDC is a dual fiber converter for serial transmission. The fibers may be cascaded to form a daisy chain, or looped to form a ring. Ring topology provides added protection in case of a single fiber link breakdown.

Features

- ❖ Extends serial transmissions to 2km, 30km or 60km
- ❖ Supports fiber daisy chain or ring connections
- ❖ Redundant dual power inputs (12, 24, 48VDC)
- ❖ Supports dual fiber link redundancy
- ❖ Supports RS-422, RS-485(2/4 wire), RS-232 transmission to dual fiber connections.
- ❖ Enhanced serial baud rate up to 1024kbps
- ❖ 2.5KV isolation for serial signals
- ❖ Supports relay output for power or link failure warning
- ❖ Hardened housing with IP30 protection
- ❖ Fan-less and DIN-Rail design for harsh industrial environments
- ❖ Selectable terminator and adjustable pull high/low resistor for RS-422/485 transmission

Specifications

Optical Interface

- ❖ Connector : SC or ST
- ❖ Fiber Optical rate : 50.00Mbps
- ❖ Fiber Port : Two fiber ports
- ❖ Fiber Type : MM 2km or SM 30km/60km
- ❖ Wavelength : MM 1310nm, SM 1310, 1550nm
- ❖ Point to Point Transmission : Half or Full duplex
- ❖ Ring Transmission : Half / Full duplex, self-healing

Specifications (cont.)

Electrical Interface

- ❖ Serial Connectors : RS-422/RS-485(5 pin terminal)
RS-232(DB9 Female)
RS-485 : 4w, 2w, RS-422 : 4w
- ❖ RS-485 direction : Automatically detected
- ❖ Copper Baud rate : 50 up to 1024Kbps
- ❖ Serial Isolation : 2.5KV for serial signals
- ❖ Surge Protection : 8KV ESD for serial signals
- ❖ Pull High : selected by 10 position rotary switch
- ❖ Pull Low : selected by 10 position rotary switch
- ❖ 120 ohm terminator : Option by Dip switch

Power

- ❖ Power Input : 12, 24, 48 VDC (9.6 ~ 58VDC)
- ❖ Power Reversal Protection : Yes
- ❖ Over Current Protection : Signal Short Together Protected
- ❖ Terminal Block for Power and Alarm : Yes

Mechanical

- ❖ Water & Dust Proof : IP30 Protection
- ❖ Dimensions : 106 x 39 x 142mm (D x W x H)
- ❖ Mounting : DIN-Rail, Wall Mount
- ❖ Weight : 720g (1.5 lb)

Environmental

- ❖ Operating Temperature :
- ❖ 0°C ~ 60°C, -40°C ~ 75°C (wide temp. for IFC-FDC-E)
- ❖ Storage Temperature: -40°C ~ 85°C
- ❖ Humidity : 5 ~ 95% Rel

Connectors

A 7-pin connector rests on top of the IFC-FDC and provides connections for dual DC power input as well as for the alarm relay contacts.

Power

IFC-FDC supports dual power inputs for redundant operation. PWR1 and PWR2 are the designations for the individual power inputs. Follow the DC voltage polarity as indicated for the connector markings.

Alarm

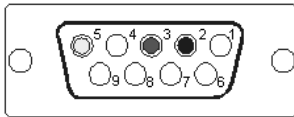
This is one electrical relay that can be wired into an alarm circuit. From the common pin (COM), the relay can be connects as Normally Open (NO) or Normally Closed (NC).

RS-485/422 Serial

A 5-pin connector provides the balanced transmit and receive for RS-485/422 along with an isolated ground connection. For 2-wire RS-485, make connections only to RX- and RX+ pair.

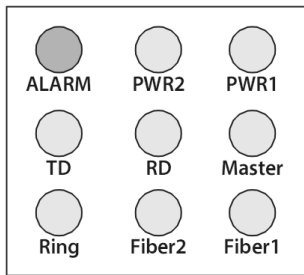
RS-232

A female DB9 provides two RS-232 channel connections with isolated ground. The first channel, using pins 2 (TD), 3 (RD) and 5 (SG) mirror the RS-485 channel. Both of these may transmit simultaneously, but only one can receive at one time. The second RS-232 channel uses the non-standard pin assignment of pin 7 (RD), pin 8 (TD) and pin 5 (SG). This second RS-232 channel can run completely independently of the main RS-485 channel at up to 115.2k.



LED Indicators

The IFC-FDC has a nine LED matrix, with the following indications.



Alarm: This red LED will light if the power or fiber has an alarm condition. Alarm conditions are also dependent on the setting of DIP switch poles no. 1 & 2.

PWR2: This green LED will light if power is connected and active at the PWR2 terminal connection.

PWR1: This green LED will light if power is connected and active at the PWR1 terminal connection.

TD and RD: These green LEDs represent binary '1' (mark) when off or binary '0' (space) when lit for either transmit or receive signals.

Master: This green LED is lit when DIP switch no. 3 is on, the mode is set to 'master'.

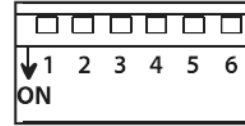
Ring: When connected in a ring topology and with no fiber faults, this green LED will be illuminated.

Fiber 2: This green LED will light when the 2nd fiber port has an optical link.

Fiber 1: This green LED will light when the 1st fiber port has an optical link.

Operation Mode Switch

IFC-FDC uses a 6-pole DIP switch for configuration. Each switch has the following functions.

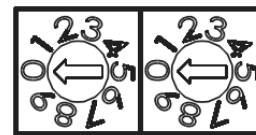


- Power Alarm:** When 'On' this switch will enable alarm relay if either power input loses power. If only using single power input, leave this switch 'Off'.
- Fiber Alarm:** When 'On' this switch will enable alarm relay if either fiber port loses link. If only one fiber port is being used, leave this switch 'Off'.
- Mode:** IFC-FDC can operate in point to point, point to point with redundant fiber link, with fiber cascaded or with fiber forming a ring topology. In each case, one unit will be configured as a 'master' (this switch 'On') and any other unit(s) will be configured as 'slave' (this switch 'Off').
- 2W/4W:** This switch determines if the RS-485 will operate in 4-wire mode (switch 'Off') or in 2-wire half duplex (switch 'On').
- Ring Alarm:** When operating in ring topology, enabling this switch 'On' will provide an alarm indication if the fiber ring connection has a fault. Leave this switch 'Off' for non-ring applications.
- Termination:** In RS-485 communications, termination at the ends of copper links is required to avoid electrical reflections that would cause data errors. This switch, when 'On', will enable a 120 ohm terminator on the RS-485.

Pull High / Pull Low

Pull up or pull down resistors are established to fail-safe bias of each data line/wire when the lines are not being driven by any device. The lines will be biased to known voltages and nodes will not interpret the noise from un-driven lines as actual data.

The IFC-FDC uses rotary switches to select from ten different bias resistor values. The factory default setting is at position 4 and provides bias resistors of 1KΩ in the pull high and pull low positions. When changing the rotary switches, it is important to maintain the same setting on both switches.



Pull High Pull Low

| Position | Resistance (Ohms) |
|----------|-------------------|
| 0 | 100K |
| 1 | 9.9K |
| 2 | 5K |
| 3 | 3.3K |
| 4 | 1K (default) |
| 5 | 920 |
| 6 | 840 |
| 7 | 774 |
| 8 | 500 |
| 9 | 475 |