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

IFC-Serial
RS-232/422/485 Fiber Converter

UL60950-1 CE FC EN61000-6-2 EN61000-6-4 PROFIBUS

These converters are capable of selecting interface modes for connection to RS-232 (3 wire), RS-485 (2 wire, half duplex) or RS-422/485 (4 wire, full duplex) and feature a three-way communication plus a second independent RS-232 communication channel. Additionally, the terminal block offers an alarm relay contact and two redundant DC power inputs. IFC Series converters are also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range. With all these specifically designed features, IFC Series are reliable and ideal solutions for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The product is protocol transparent that can be applied to RS485/422/232 networks, such as MODBUS to achieve reliable network (See Figure 2).

Features

- Supports 2 fiber link (IFC-FDC)
- Supports 1 fiber link (IFC-Serial)
- Supports dual channel communication, including Triple-Way communication, and Two-Way communication
- Extend serial transmission distance up to 2km, 30km, 60km
- Supports several topology , cable redundancy (Figure 3), ring redundancy (Figure 4), daisy chain (Figure 5), point to point (IFC-FDC)
- Supports point to point (Figure 7) (IFC-Serial)
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent, suitable for all serial (RS485/422/232) transmission protocol, such as Modbus...
- Baudrate up to 1024kpbs for serial port
- Auto baudrate, no need to set baudrate
- 2.5KV isolation for serial port (RS485/422/232)
- UL60950-1, CE, FCC, heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment
- Adjustable pull high/low resistor and terminator for RS-422/485 transmission

Specifications

FieldBus Protocol	Protocol transparent	Protocol applicable to all operations available on RS485/422/232, such as Modbus,…
Data Flow	Dual Channel Communication	Both of Triple-Way and Two-Way Communication Way (Figure 1 or 6)
Optical Interface	Connector	SC, ST
	Fiber Port	2 fiber ports (IFC-FDC) 1 fiber port (IFC-Serial)
	Fiber Type	MM 2km, SM 30km, 60km Bidi 20KM
	Wavelength	MM 1310nm, SM 1310 Bidi: Mode A : TX1310nm/RX1550nm Mode B : TX1550nm/RX1310nm
	Point to Point Transmission	Full duplex
	Ring Transmission	Full duplex, self-healing operation
Fiber port Topology		Cable redundancy(Figure 3), ring redundancy(Figure 4), daisy chain(Figure 5), point to point (IFC-FDC)
		Point to point(Figure 7) (IFC-Serial)
Electrical Interface	Serial Port Connector	RS-232(DB9), RS-422/RS-485(5 pin terminal block)
		RS-485 : 4, 2 wires, RS-422 : 4 wires
	RS-485 direction	Automatically detection
	Serial port Baudrate	50 to 1024kpbs Auto baudrate, no need to set baudrate
	Serial port isolation	2.5KV isolation for serial signals EMC/noise isolation, to reduce mutual interference between serial port device
	Pull high resistor	Selected by 10 position rotary switch
	Pull low resistor	Selected by 10 position rotary switch
	120 ohm terminator	Built-in 120 ohm terminator (Selected by Dip Switch)

Environmental	Operating Temperature	-10 ~ 60°C (IFC-FDC, IFC-Serial) -40 ~ 75°C (IFC-FDC-E, IFC-Serial-E)
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications		PWR1, PWR2, Alarm, Master, TD, RD, Fiber Link, Fiber2 Link (IFC-FDC only), Ring
Alarm Relay		Alarm exists for power, fiber link or ring protection Relay output with carry capacity 1A @ 24VDC
Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 58VDC)
	Power Consumption	6W (IFC-FDC) 5W (IFC-Serial)
	Power Reversal Protection	Yes
	Over Current Protection : Signal Short Together Protected	
	Terminal Block for Power and Alarm : Terminal Block : V1+, V1-, V2+, V2-, Alarm NC, Alarm COM, Alarm NO	
Mechanical	Water & Dust Proof	IP30 Protection, Fanless
	Dimensions	106 x 38.6 x 142.1mm (D x W x H)
	Mounting	DIN-Rail, or wall mounting (Optional)
	Weight	0.64kg (IFC-FDC) 0.63kg (IFC-Serial)
Certification	Safety	UL60950-1
	EMC	CE
	EMI	FCC Part 15 Subpart B Class A, CE
	Immunity for Heavy Industrial Environment	EN61000-6-2
	Emission for Heavy Industrial Environment	EN61000-6-4

Certification	EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 ESD Level 3
		EN61000-4-3 RS Level 3
		EN61000-4-4 EFT Level 3
		EN61000-4-5 Surge Level 3
		EN61000-4-6 CS Level 3

Certification	Free Fall	IEC 60068-2-32
	Vibration	IEC 60068-2-6
	Shock	IEC 60068-2-27
	Green	RoHS
	MTBF	739,886 Hours (IFC-FDC) 847,029 Hours (IFC-Serial) (MIL-HDBK-217)

Application & Topology (IFC-FDC)

Figure 1 : Dual Channel Data Flow

Channel 1 : Triple Way
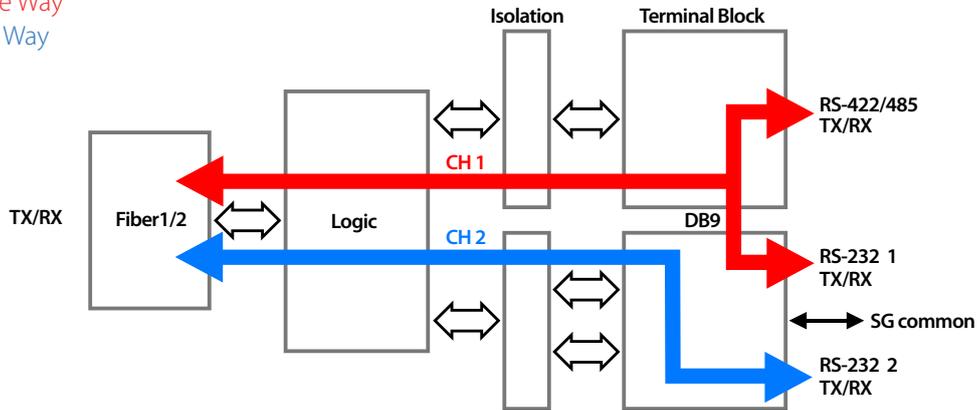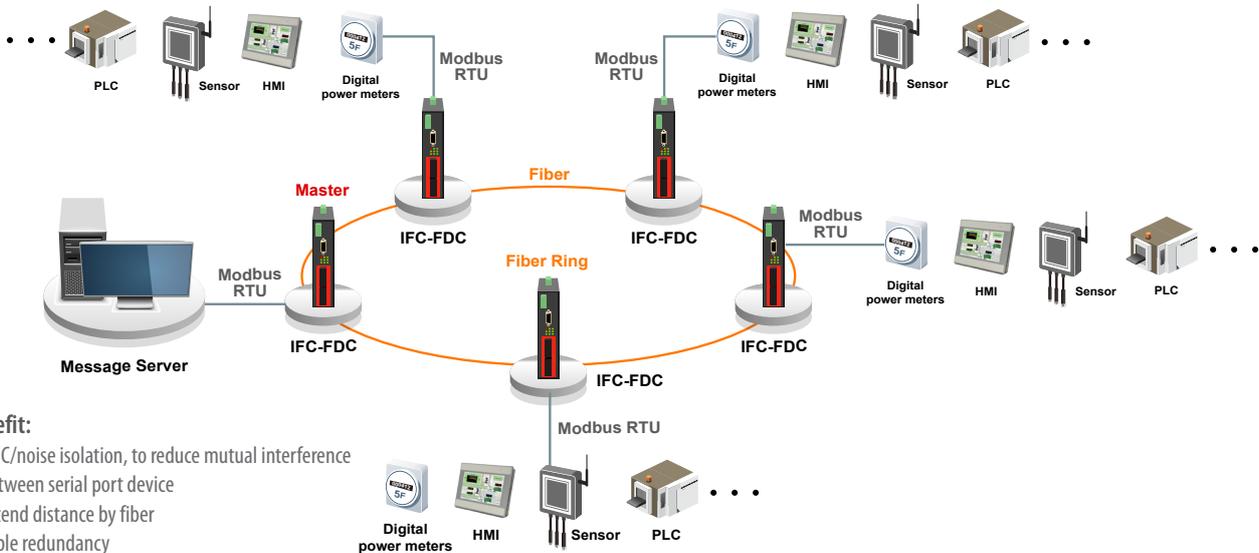Channel 2 : Two Way

Figure 2 : Application for Modbus Network

Benefit:
1. EMC/noise isolation, to reduce mutual interference between serial port device
2. Extend distance by fiber
3. Cable redundancy
4. Achieve a reliable network environment

Figure 3 : Fiber Cable Redundancy topology & application

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Industrial Serial Fiber Converter

Figure 4 : Fiber Ring Redundancy topology & application

IFC-FDC

IFC-FDC

RS-232/422/485

RS-232/422/485

Fiber

Master

RS-232/422/485

Fiber Ring

RS-232/422/485

IFC-FDC

IFC-FDC

IFC-FDC

RS-232/422/485
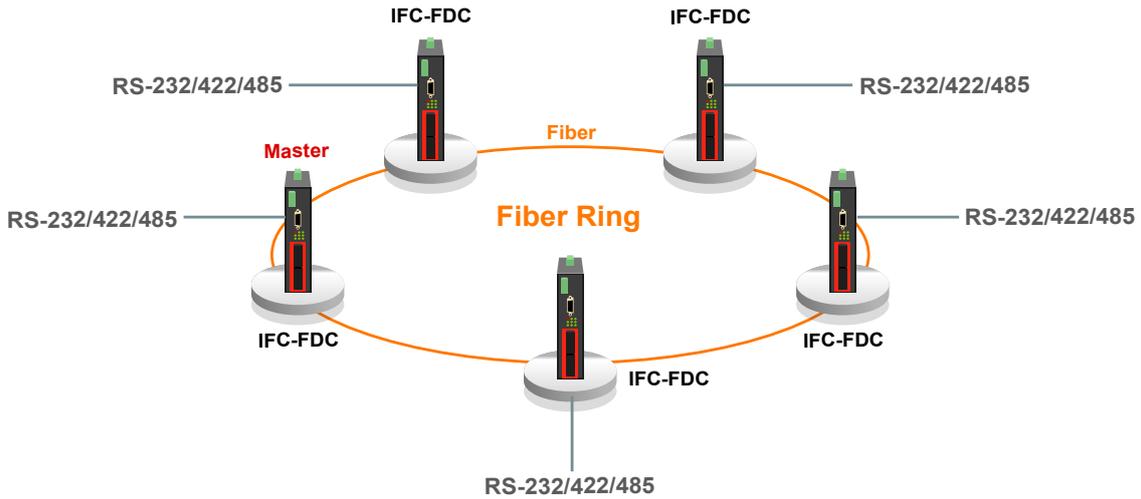
Figure 5 : Fiber Daisy Chain topology & application

IFC-FDC

IFC-FDC

IFC-FDC

IFC-FDC

RS-232/422/485

Fiber

Fiber

Fiber

OPC Server

RS-232/422/485

RS-232/422/485

RS-232/422/485

RS-232/422/485
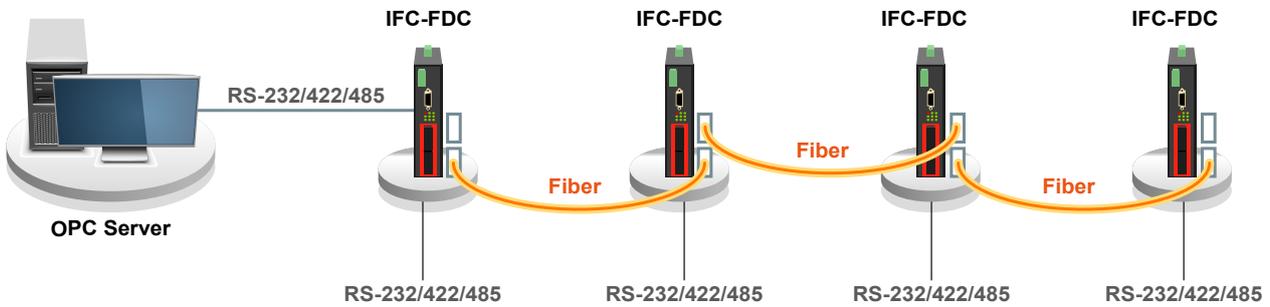
Application & Topology (IFC-Serial)

Figure 6 : Dual Channel Data Flow

Channel 1 : Triple Way
Channel 2 : Two Way

Isolation

Terminal Block

RS-422/485
TX/RX

CH 1
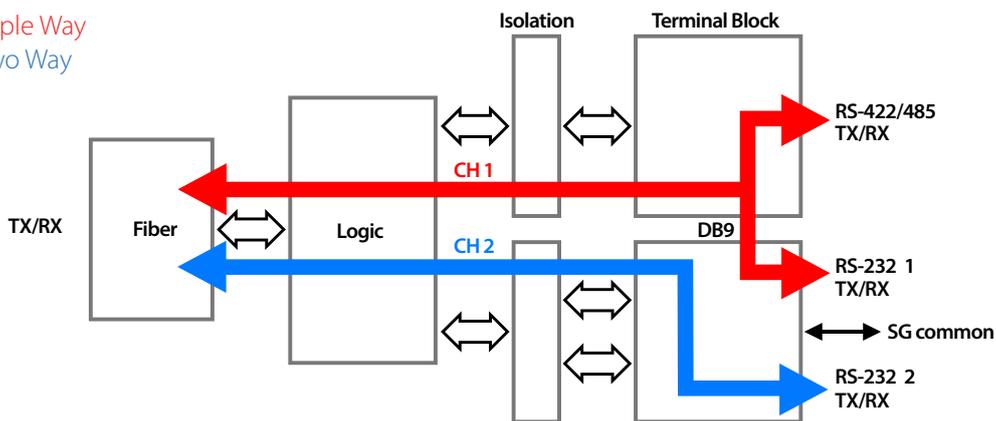
TX/RX

Fiber

Logic

CH 2

DB9

RS-232 1
TX/RX

SG common

RS-232 2
TX/RX

Figure 7 : Fiber Point to Point topology & application

RS485/422/232

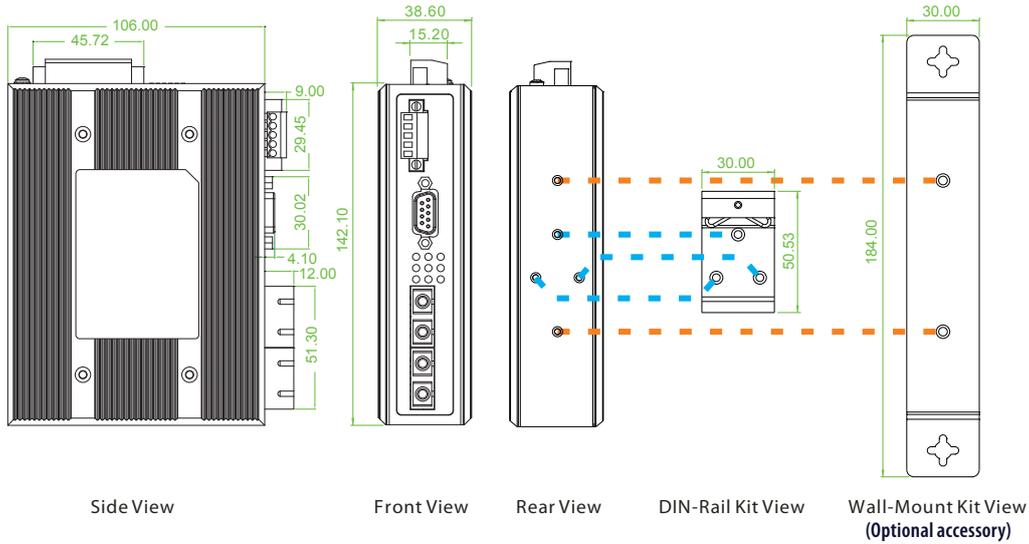**Fiber**

RS485/422/232

IFC-Serial
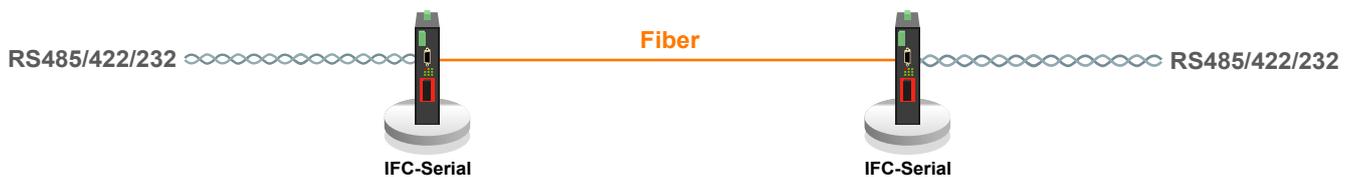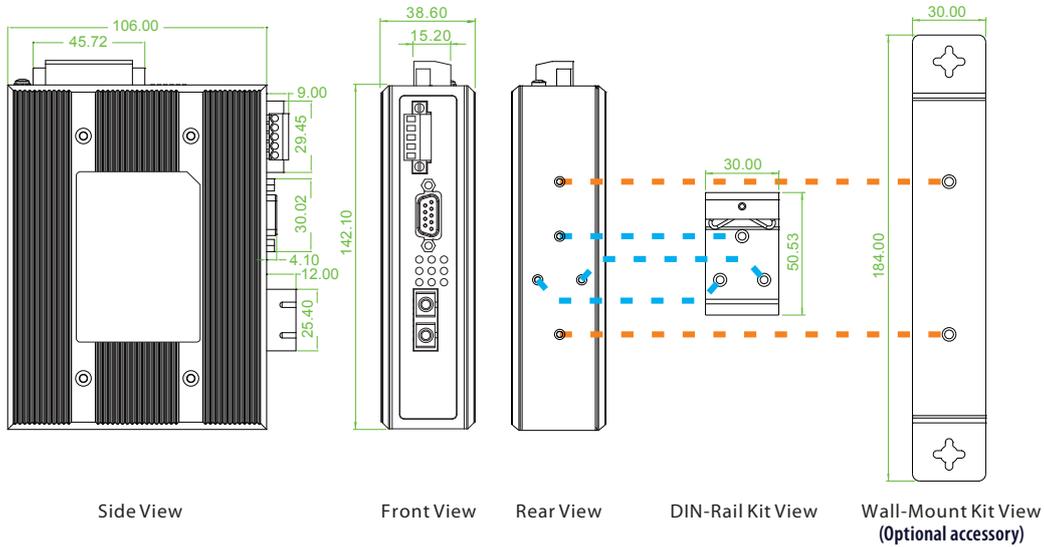
IFC-Serial

Benefit:

1. Reduce mutual interference between serial port device
2. Extend distance by fiber
3. Achieve a reliable network environment
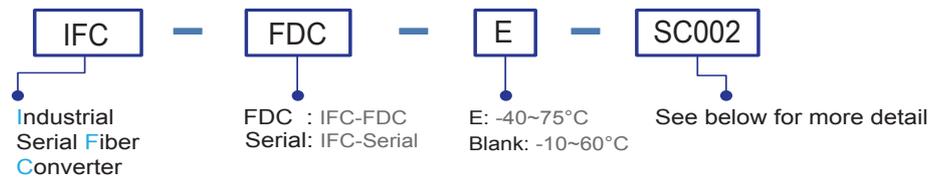
Dimensions

▶ IFC-FDC

Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View **(Optional accessory)**

▶ IFC-Serial

Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View **(Optional accessory)**

<div style="float:right">**8**
Industrial Serial Fiber Converter</div>

Ordering Information

Model Name	Dual Channel	Serial (ModBus or others)			Fiber		Power Input	Certification				Operating Temperature
		RS232	RS422/485	Isolation 2.5KV	SC/ST	Daisy Chain	Redundant	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE	FCC	
IFC-FDC	V	2	1	V	2	V	12/24/48VDC	V	V	V	V	-10~60℃
IFC-FDC-E	V	2	1	V	2	V	12/24/48VDC	V	V	V	V	-40~75℃
IFC-Serial	V	2	1	V	1		12/24/48VDC	V	V	V	V	-10~60℃
IFC-Serial-E	V	2	1	V	1		12/24/48VDC	V	V	V	V	-40~75℃

Model Naming Rule

IFC – FDC – E – SC002

- **I**ndustrial **S**erial **F**iber **C**onverter
- FDC : IFC-FDC / Serial: IFC-Serial
- E: -40~75°C / Blank: -10~60°C
- See below for more detail

Connector Type	Connectivity Distance
SC, ST	002: M/M 2km 030: S/M 30km 050: S/M 50km 020AB: 20KM Bidi (20KM 1x mode A + 1x Mode B) (for IFC-FDC) 020A: 20KM Bidi mode A (for IFC-Serial) 020B: 20KM Bidi mode B (for IFC-Serial) Mode A: TX 1310nm/RX1550nm Mode B: TX 1550nm/RX1310nm

IFC – FDC – □ – □□□□□
Temperature / Connector Type / Connectivity Distance
Example: IFC – FDC – E – SC002

■ **Package List**
- One device of the series
- Quickly installation guide
- Din Rail with screws
- Terminal block

Optional Accessories
■ **Wall Mount kit Accessories**

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm