

RS-422/485 to Fiber Industrial Converter (IRF-612)

User's Guide



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FCC WARNING

This equipment has been tested and found to comply with the limits for class A device, pursuant to part 15 of FCC rules.

These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user's own expense.



CE

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.



Take special note to read and understand all content giving in the warning boxes



Warning

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ABOUT THIS GUIDE

Thank you for choosing IRF-612 (RS-422/485 to Fiber Converter). This device integrates copper and multi-mode/single mode fiber networks in one flexible package.

The IRF-612 Industrial Series (RS-422/485 to Fiber) Converter is a hardened with redundant DC power inputs to provide a reliable and economical solution for your industrial Ethernet environment. With its dry contact smart alarm, the IRF-612 issues an alarm function on the factory floor in the event of any malfunction. The IRF-612 has a wide operating temperature range from 0 to 70°C, and is designed to sustain higher than normal degrees of vibration and shock, making it suitable and safe for harsh industrial environments.

Purpose

This guide discusses how to install the IRF-612 Industrial Series Converter.

Terms/Usage

In this guide, the term "**Converter**" (first letter upper case) refers to the IRF-612 Industrial Fast Ethernet Converter, and "**converter**" (first letter lower case) generically refers to all other Ethernet converters.

INTRODUCTION

This chapter describes the features and specification of the Converter.

Features

- Complies with EIA/TIA-422 & 485 standards
- Supports data transfer rate up to 115.20kbps
- Relay output for power failure and link down
- Available with ST/SC connector for Multi-mode or SC connector for Single Mode
- Extends distance of up to 2km (6600 feet) multi-mode fiber and 120km (396000 feet) long-haul single mode fiber
- DIP switch for 4-wire full and 2-wire asynchronous transmission
- DIP switches to enable/disable alarm function
- LEDs for at-a-glance device status
- Suitable for industrial harsh environment
- Wide voltage range (9 ~ 48V DC)
- Redundant dual DC power inputs with Terminal Block
- FCC Class A & CE approved

IRF-612 INDUSTRIAL CONVERTER UNPACKING AND SETUP

This section and the following sections explain the setup and installation of the VOLKTEK IRF-612 Industrial Converter.

Unpacking

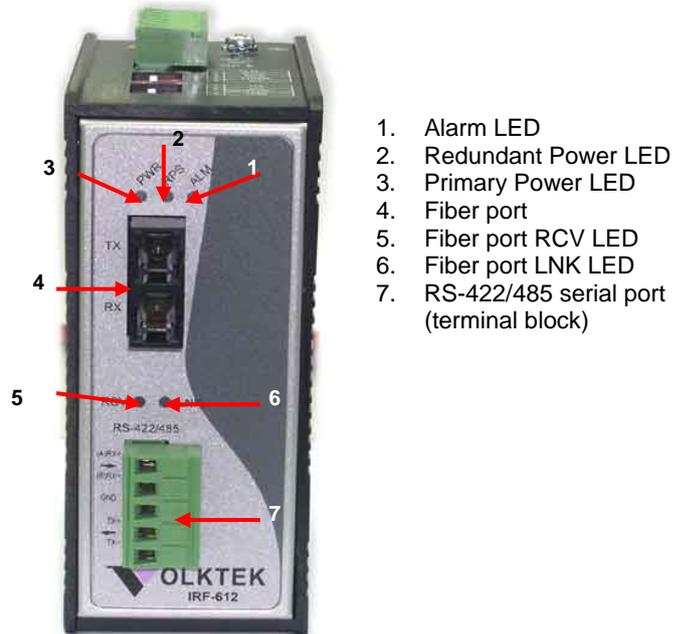
Open the box of the Converter and carefully unpack it. The box should contain the following items:

- ✓ *One IRF-612 (RS-422/485 to Fiber) Industrial Converter*
- ✓ *One DIN rail bracket*
- ✓ *Protective caps for unused ports*
- ✓ *Quick Installation Guide*
- ✓ *This User's Guide CD*

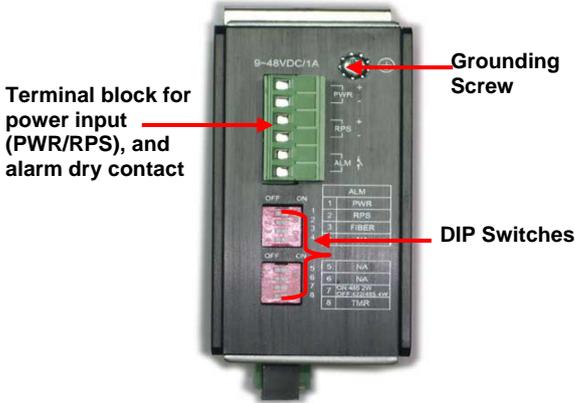
If any item is found missing or damaged, please contact your local reseller for replacement.

Layout of the IRF-612

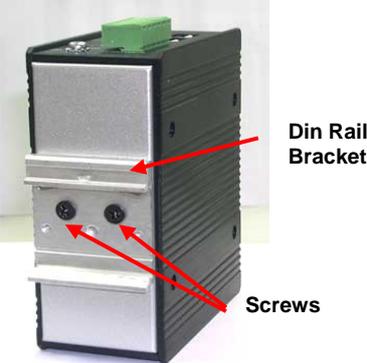
Front View of Converter



TOP View of Converter

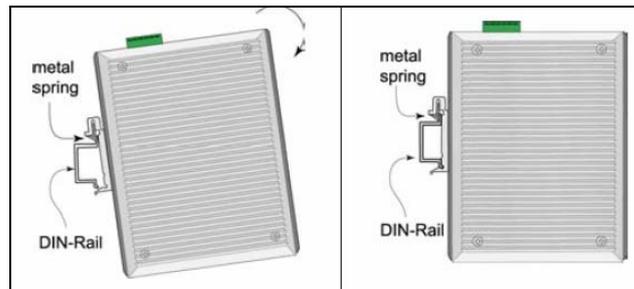


Back View of Converter



DIN Rail Mounting of the IRF-612

The aluminum DIN Rail attachment plate should already be affixed to the back panel of the Converter. If you need to attach the DIN Rail plate, assure that the stiff metal spring is situated towards the top. Attaching the Converter to the DIN rail is easy, just align, and attach the top rail, then press down and snap forward the Converter to snap in the bottom rail, as shown in the figures below.



The setup of the Converter can be performed using the following steps:

- The surface must support at least 1.00 Kg for the Converter.
- The power outlet should be within 1.82 meters (6 feet) of the Converter.
- Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.

- Make sure that there is proper heat dissipation from and adequate ventilation around the Converter. Do not place heavy objects on the Converter.

Grounding IRF-612



Be sure to disconnect the power cord before installing and/or wiring your IRF-612 Industrial Converter. Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat and causing serious damage to your equipment.

Users must pay attention to the following items.

- ✧ Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
- ✧ Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
- ✧ User can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that

shares similar electrical characteristics can be bundled together.

- ✧ Keep input and output wiring separated.
- ✧ It is strongly recommended that you label wiring to all devices in the system for clarity.

Grounding IRF-612 Industrial Converter will help eliminate the effects of noise due to electromagnetic interference (EMI). Always run the ground connection from the ground screw to the grounding surface prior to connecting DC power.



This product is intended to be mounted to a well-grounded mounting surface.

Redundant Power Inputs

Redundant Power Inputs: Both power inputs can be connected simultaneously to live DC power sources. If one power source fails, the other live source acts as a backup, and automatically supplies the Converter's power needs.

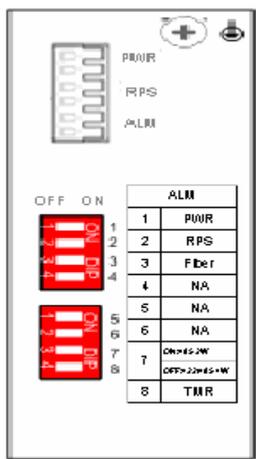
Configuring DC power Inputs

Configure DC power to the Terminal Block Receptor as

below.

 **DC Powered Switch:** Power is supplied through an external DC power source. Check the technical specification section for information about the DC power input voltage.

Since the switch does not include a power switch, plugging its power adapter into a power outlet will immediately power it on.



The plastic green colored contact power block (shown in the diagram to the left) is composed of six contacts and can be inserted and removed easily by hand to connect to the six pin terminal block receptor (male contacts located on the body of the Converter). The top two contacts (PWR) are designated for the primary DC input, while the middle two contacts (RPS) are for redundant DC input. The lower two contacts (ALM) are for connection to an external

power supply. To the upper right of the power block is the ground wire connection screw, and below the power block is the DIP switch control panel.

Procedure for Configuring DC Power:

During shipping, the removable green Contact Block may already be detached from the six pin terminal contact point. It may be easier to attach the DC wires to the green Contact Block if it has first been unplugged from the terminal contact point on the Converter.

- A. On the Power Contact Block, use a flathead screwdriver to loosen the screws reserved for primary power (labeled PWR +/-) and then insert negative and positive DC wires. Tighten until snug.
- B. For the backup DC connection, follow the same procedure as above. Attach DC power wires to the Contact Block (in the position marked RPS +/-)
- C. If not already inserted into the terminal block receptor into the Converter, do so now.
- D. Assure your DC power supply is stable and clean before applying DC power to the Converter.

External Alarm Contact

The IRF-612 Industrial Converter has one Alarm Contact located on the green Power Block Contact on the top panel. For detailed instructions on how to connect the

Alarm Contact power wires to the two lower contacts of the 6-contact terminal block connector, see the Connecting DC Power inputs in the section above (it is the same procedure).

You can connect the Fault circuit to any warning light which the user's factory or industry already has located in the control room or factory floor. When a fault occurs, the Converter will send a signal through the Alarm contact, to activate the external alarm or siren. The Alarm Contact has two terminals that form a Fault circuit for connecting to an alarm system.

An alarm will be signaled in the following situations:

1. Any link fail (ex: cable disconnected, device break down
2. PWR/RPS: Power failure
 - a. Power cord is disconnected, power supply malfunction, etc.
 - b. Input power is out of the range listed in the spec (9~ 48V)

Fiber Connection

When connecting fiber cable to the Converter, be sure the correct type – ST or SC - connector is used. Follow the steps below to properly connect fiber cable:

1. Remove and keep the ST/SC port rubber covers. When not connected to a fiber cable,

the rubber cover should be replaced to protect the optics.

2. Check that the fiber terminators are clean. You can clean the cable plugs by wiping them gently with a clean tissue or cotton ball moistened with a little ethanol. Dirty fiber terminators on fiber optic cables will impair the quality of the light transmitted through the cable and lead to degraded performance on the port.
3. Connect one end of the cable to the ST/SC port on the Converter and the other end to the ST/SC port on the other device.
4. Check the corresponding port LED on the Converter to be sure that the connection is valid. (Refer to the LED chart)

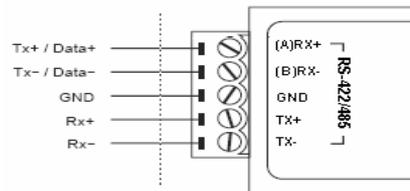


Warning Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.

Serial Connection

The 5-pin terminal block connector is provided at the front panel of the Converter. During shipping, the removable green terminal block may already be detached from the five pin terminal contact point. It may be easier to attach the serial cable wires to the green terminal block if it has first been unplugged from the terminal contact point on the Converter.

On the terminal block, use a flathead screwdriver to loosen the screws and then insert the related cable as shown in the figure below. Tighten screws until snug.



RS-422/485 cabling

LED Indicators

The Converter has following LEDs.

Power Indicator (PWR): This LED lights green when the Converter is receiving power from primary input.

Redundant Power Supply (RPS): This indicator lights green when the Converter is receiving power from redundant input.

Alarm (ALM)

This indicator will light red and will signal an alarm (when an external alarm is connected) during a down link condition on any port and/or during primary/redundant power failure to the Converter.

RCV LED

Illuminated (amber) to indicate when receiving data from

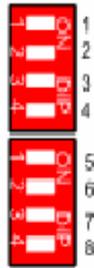
a compliant device.

LNK LED

LED indicates LNK status; illuminates to indicate receiving link pulses from a compliant device.

DIP Switch Settings

DIP Switches allow for the user to manually enable/disable external alarms, 2-wire / 4-wire cable mode, and TMR functions. The figure below shows the DIP switch control.



DIP 1 (PWR) Enable/Disable the primary power input external alarm. Default is OFF (Disable).

DIP 2 (RPS) Enable/Disable the redundant power input external alarm. Default is OFF (Disable).

DIP 3 (Fiber) Enable/Disable the fiber port external alarm. Default is OFF (Disable).

DIP 4-6 (N/A)

DIP 7 (2-wire / 4-wire) Enable the serial port wire function to either 2-wire or 4-wire (ON:485 2-wire, OFF: 422/485 4-wire). Default is OFF.

DIP 8 (TMR) Enable/Disable RS-422/485 terminator. Default is OFF (Disable).

TECHNICAL SPECIFICATIONS

General	
Standards	EIA/TIA-422, EIA/TIA-485
Connectors	1 (one) serial port (RS-422/485) ST/SC for multi-mode, SC for single mode
Wavelength	1310nm (multi-mode) 1310nm ~ 1550 (single mode)
Max Distances	RS-422/485 – 1,200 meters Fiber Optic – Up to 120,000 meters
Physical and Environmental	
Power Input	9-48V DC @ 1A
Temperature	Operating: 0° ~ 70° C, Storage: -20° ~ 80° C
Humidity	Operating: 10% ~ 80%
Dimensions	100 x 50 x 120 mm (D x W x H)
Compliance	FCC Class A, CE approved

DIP Switches	
Dip 1	Primary Power Alarm
Dip 2	Redundant Power Alarm
Dip 3	Fiber Port Alarm
Dip 4	N/A

Dip 5	N/A
Dip 6	N/A
Dip 7	2-wire (RS-485 OR 4-wire (RS-422/485)
Dip 8	RS-422/485 Terminator

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