

# FIDra

FIBER OPTIC SWITCH

- Physical Layer Router and Repeater
- Eliminates Handling of Fibers
- Monitor, Alarm, and Cut Optic Signals
- Convert Fiber Types and Frequencies
- Multiple Preprogrammed Modes
- Designed for use with Protective Relaying



## INTRODUCTION

The Fidra is a fiber optic switch designed to monitor, reroute, repeat, boost and disable up to 3 fiber optic communication pairs. Utilizing industry standard SFP modules allows Fidra to support various optical communications including single/multimode, LED/Laser as well as multiple wavelengths. Common applications for Fidra include:

1. Communications disable
2. Fiber optic path routing
3. Wavelength and fiber type conversion
4. Level monitoring
5. Local and remote loopback testing

The Fidra was designed for applications such as protective relaying and other environments where substation hardened equipment is required. It resides in line with equipment utilizing fiber optic communications. It allows for testing and maintenance without the need to remove and reroute fiber cables, eliminating costly fiber damage and ruining components caused by improper handling.

The Fidra is programmable to route any receive signal to any of the three transmitters. All routing is performed at the physical layer (PHY layer), therefore Fidra is agnostic to the brand of communications equipment and no protocol support is required while adding only microseconds to the signal propagation time. Testing and monitoring are streamlined while providing safety to the technician and ease of implementation to the system.

System configuration is performed via the built in web server, which allows configuration of the 3 basic modes of operation Normal Mode and two Test Modes. These two modes eliminate the need to reprogram the unit for routine maintenance and testing of the connected devices. The mode is controlled by switches on the front panel. A Cutout switch input is also provided to disable all transmitters quickly and easily.

The SFP can be singlemode or multimode. A single Fidra can have singlemode, multimode, and/or different frequency heads simultaneously. Since the SFP module is not soldered to the board, they are easily added or changed in the field.

Monitoring of fiber optic signals is standard. The Fidra displays the level of three receivers on the front panel. Alarming for a drop in signal level, receive fail, transmitter failure, power supply failure, and test mode function are all included.

# PROGRAMMING

The Fidra is programmed using a web browser. A PC can be connected to the unit using a standard Ethernet cable. A web server is embedded in the Fidra and can be accessed one of three ways.

The Fidra supports Dynamic Host Configuration Protocol (DHCP). When enabled, the Fidra's DHCP Server assigns an IP address to the PC. This allows the PC to be connected directly to the Fidra, making field connections more straight forward. Using the DHCP server also allows the Fidra not to be permanently connected to the sub-station's Ethernet network.

The Fidra may be set-up as a DHCP client or it may be assigned a fixed IP address.

The fiber port settings map is easily set using radio buttons. The three transmitters can set to any of the three receivers. This allows straight, local loopback, remote loopback, and bypass logic to be programmed in Normal mode, Test mode 1 and Test mode 2. The mode being utilized is controlled by locking toggle switches on the front panel.

Alarms may be disabled or bypassed in Test mode using the programming menu.

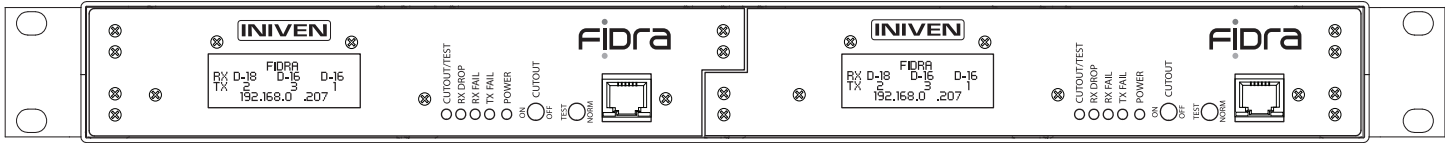
A unique feature is the RX Drop alarm. This alarm allows the user to program a receive level in dBm at which the Fidra will indicate an individual receiver has fallen to or below this setting. This is a pre-emptive warning of decreasing power and indicates a drop in level before the attached IED fails to receive the signal.

The screenshot displays the INIVEN Fidra web interface with the following sections:

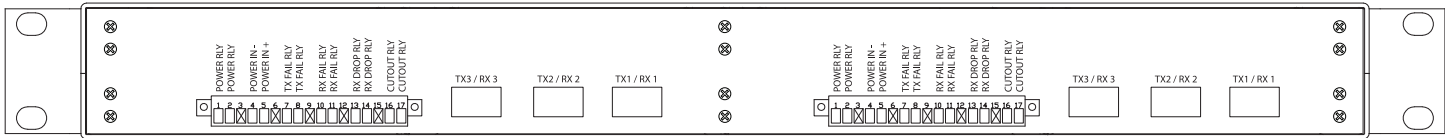
- TCP/IP Settings:** Includes DHCP SERVER (Enabled), CONFIGURE IP ADDRESS (Using DHCP), IPv4 Address (192.168.0.20), Subnet Mask (255.255.255.0), and Gateway (192.168.0.1).
- Signal Alarm Settings:** Contains Receiver Alarms (RX 1, 2, 3 DROP ALARM) and Transmitter Alarms (TX 1, 2, 3 FAIL ALARM) with signal level inputs in dBm.
- Com Port Settings:** Shows Normal Mode, Test Mode 1, and Test Mode 2, each with TX 1, 2, and 3 ROUTING options.
- Relay Settings:** Includes TX FAIL, RX FAULT, RX DROP, and CUTOFF, each with Invert and Disable in Test Mode checkboxes.

A "Save Settings" button is located at the bottom right of the interface.

# CHASSIS



## CHASSIS FRONT



## CHASSIS BACK

The Fidra resides in a 19 inch 1U panel mount rack. Each rack can accommodate two Fidra modules. Terminal blocks and fiber heads are accessed through cutouts on the back of the chassis. Wiring is completed using a removable euro-style terminal block.

# SPECIFICATIONS

Power Supply	24, 48, 125 or 250 VDC - Fused
Optical	SFP, LC Standard (other interfaces available upon request)
Optical In	0 to -35 dB (dependent on SFP module)
Data Rate	Up to 155 Mbps
Relays	Form C, Jumper selectable from Form A to Form B
Mac Contact Voltage	300 VDC
Max Contact Rating	10 A
Max Break Rating	.05 A @ 125 VDC
Alarms	Power Fail Receive Fail (Output can be inverted) Receive Level Drop (Output can be inverted) Transmitter Fail (Output can be inverted)
Ethernet	10Base-T 10/100 compatible Built-in DHCP Server for configuration or configurable IP address
Environmental	IEEE Std. 1613-2003
Chassis Dimensions	19 in. W x 11 in. D

