

# AFL3430 *Antenna Fiber Optic Link*

## *High-Performance Broadband Optical Link*

**The AFL3430 is a broadband optical link with wide dynamic range for RF applications.** It uses a high-performance fiber optic transmitter and receiver to deliver high dynamic-range RF signals over low-loss optical fiber with low-noise characteristics. The AFL3430 system consists of an optical transmitter, with front-end low noise amplifier, installed in a stainless steel, NEMA enclosure and a rack-mountable 1U-high optical receiver unit. Both the transmitter and the receiver can be powered by 85-264 VAC. A typical application for the AFL3430 is as a fiber optic link in GPS receiver installations that require either extended antenna cable runs, enhanced lightning protection, or Tempest (red/black) isolation environments. The system meets full specifications over a 300 to 2500 MHz bandwidth, but will operate down to 50 MHz with degraded input impedance match.

### FEATURES

- 300 to 2500 MHz Bandwidth
- +30 to +15 dB Link Gain
- +25 dB Noise Figure
- 1310 nm Optically Stabilized, Low-Noise Laser
- Singlemode Fiber Cable, up to 5 km in Length
- Monitoring and Alarm Capability
- Integrated Bias-T for +5VDC Antenna/LNA Powering
- Simulates Active GPS Antenna DC Load for Fault Communication to GPS Receiver
- One-Year Warranty



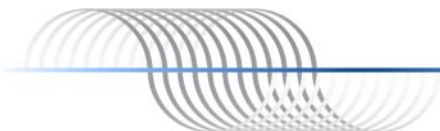
### Optical Transmitter

A broadband, low noise amplifier ahead of the optical transmitter increases the link gain and lowers the link noise figure. The transmitter uses a high-performance, linear laser operating at 1310 nm over 8/125  $\mu\text{m}$  singlemode fiber. Designed for superior stability, the laser incorporates optical power feedback to actively adjust the laser for optimal linearity and constant power output over temperature and lifetime. An integrated bias-T provides current-limited +5V DC power via the center conductor of the RF input connector to power an upstream active antenna or inline preamplifier. The transmitter is available in two different enclosures: a NEMA4 weatherproof, stainless steel, enclosure or a 1U rackmount enclosure for indoor use.

### Optical Receiver

The receiver uses a high-bandwidth, low-distortion diode photodetector. A laser and optical power monitor is provided that indicates an alarm condition when the optical signal is absent. Many GPS timing receivers sense the DC current draw on the antenna feed to determine its status. The AFL3430 seamlessly simulates this by presenting a 274 $\Omega$  DC resistance to ground when the optical link status is good, and a DC open circuit on optical link failure or disconnect.

The AFL3430 can be configured to operate with one transmitter powering two receivers. This is accomplished with the use of a fiber optic splitter and reduces system cost in many applications.

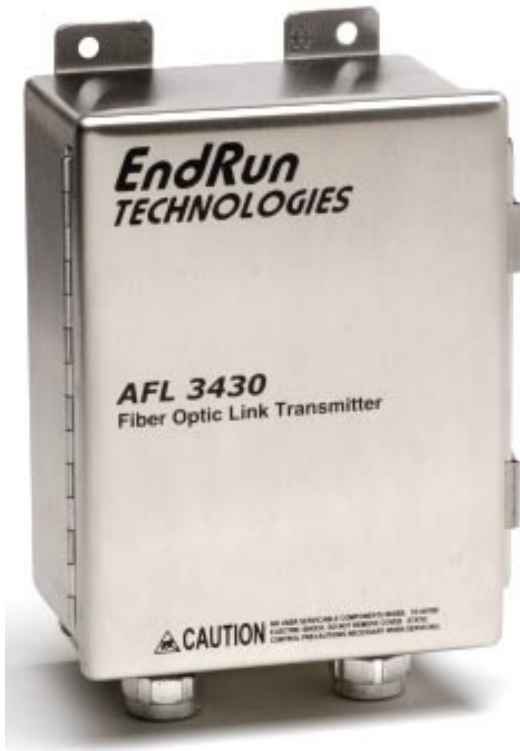


# AFL3430 Antenna Fiber Optic Link Specifications



## LINK:

- Gain: 15 dB, minimum, 300 MHz - 2500 MHz.  
Typical Gain Characteristic:  
30 dB @ 300 MHz  
22 dB @ 1500 MHz  
17 dB @ 2500 MHz
- Noise Figure: 25 dB, nominal.
- Input 1dB Compression (IP1dB): -23 dBm, minimum.  
Typical IP1 dB Characteristic:  
-23 dBm @ 300 MHz  
-20 dBm @ 1500 MHz  
-18 dBm @ 2500 MHz
- Length: 5 km (3 miles), maximum.
- Cable Type: Simplex 8/125 $\mu$ m single-mode fiber.
- Connector: FC/APC.



All Stainless Steel Enclosure for Outdoor Use.  
A 1U Rackmount Enclosure is Also Available for Indoor Use.

## TRANSMITTER:

- RF Input (Antenna):  
Female TNC Jack,  $Z_{in} = 50\Omega$ , >10 dB return loss, 300 MHz - 2500 MHz.  
Maximum RF Input Level: -24 dBm at 300 MHz.  
-18 dBm at 1500 MHz.  
-12 dBm at 2500 MHz.  
DC Power for GPS Antenna: 5V @ 50 mA, short-circuit protected.
- Optical Output Signal Characteristics:  
Optical Wavelength: 1310 nm.  
Optical Power Output: 2-4 mW, typical.
- Power (Outdoor Enclosure):  
90-264 VAC, 50/60Hz.  
4W typical, 6W maximum
- Environmental (Outdoor Enclosure):  
Operating Temperature: -30° to +60° C.  
Storage Temperature: -40° to +85° C.  
Humidity, using strain reliefs: 0 to 95%, non-condensing.  
Humidity, using LIQUID-TIGHT fittings: 0 to 100%.
- Size and Weight (Outdoor Enclosure):  
NEMA4 Stainless Steel, 8.0"H x 6.0"W x 4.0"D.  
7 lb. (3.2 kg.)
- Power (Indoor Enclosure):  
90-264 VAC, 50/60 Hz.  
4W typical, 6W maximum.  
3-pin IEC 60320 connector on rear-panel.
- Environmental (Indoor Enclosure):  
Operating Temperature: 0° to +50° C.  
Storage Temperature: -40° to +85° C.  
Humidity: 0 to 95%, non-condensing.
- Size and Weight (Indoor Enclosure):  
1U rackmount, 1.75"H x 17.0"W x 10.75"D.  
< 5 lb. (2.70 kg.)

## RECEIVER:

- RF Output:  
Female TNC Jack,  $Z_{out} = 50\Omega$ , >10 dB return loss, 50 MHz - 2500 MHz.  
Simulates active GPS antenna DC load, 18 mA @ 5-12V.
- Optical Input Signal Characteristics:  
Optical Wavelength: 1310 nm.
- Power:  
90-264 VAC, 50/60 Hz.  
5W typical, 8W maximum.  
3-pin IEC 60320 connector on rear-panel.
- Environmental:  
Operating Temperature: 0° to +50° C.  
Storage Temperature: -40° to +85° C.  
Humidity: 0 to 95%, non-condensing.
- Size and Weight:  
1U rackmount, 1.75"H x 17.0"W x 10.75"D.  
< 5 lb. (2.70 kg.)

## COMPLIANCE:

- CE, FCC.

