Fiberoptics

DATA SHEET

GPS Over Fiber System

GPS-FOS-T2R16-SA3A

- High Dynamic Range GPS to Fiberoptic Transmitter and Fiberoptic to GPS Receiver
- Provides +5VDC Bias for GPS Antenna LNA
- Integrated Monitoring and Alarm, with optional Ethernet/SNMP
- GPS Receiver available 16 port GPS ouput ports
- The receiver supports expansion recievers via an optical expansion port or passive expansion modules with an RF expansion port
- Ideal cost effective solution for distribution of GPS signal over long distances
- NEMA rated outdoor Transmitter designed for harsh environments
- Supports Hybrid Fiber/DC, 48VDC or AC Power Input

Overview

Communication Components, Inc. GPS Over Fiber (GPSoF) Systems provides an innovative and cost effective means of routing the GPS signal over a fiberoptic network to a remote Base Station location. This system is ideal for CRAN (Centralized Radio Access Network) deployments and In-building DAS installations when the Base Radio is in a remote location with no direct availability of GPS signal.

This CCI GPSoF System consists of two small footprint outdoor rated GPS to Fiberoptic Transmitters and an indoor Fiberoptic to GPS Receiver with 16 GPS RF output ports, that are connected using single mode fiberoptic cables or hybrid fiberoptic cables that can provide DC power for the GPS Transmitters and Annetnnas. The 16 port indoor receiver provides both optical and RF expansion ports as well alarming via dry contact or optional ethernet/SMNP.

Technical Description:

The Generation Two (Current Gen) GPS-FO-Tx-1A GPS to Fiberoptic Transmitters upconvert the GPS RF signal from any active GPS antenna to the optical band to enable transmission up to 8 km over single fiberoptic lines (max distance for hybrid cable is 4 km, limited by power line). GPS Antenna bias current is provided and comprehensive alarm detection and reporting of the GPS antenna and the fiberoptic transmitter are delivered over the single fiber to the companion Fiberoptic to GPS Receiver for local monitoring. The Transmitter can be powered via a hybrid fiberoptic cable or from any -48VDC source. An optional outdoor AC to -48VDC power supply is also available. The transmitter utilizes ultra-linear, high dynamic range DFB laser technology. Automatic Power Control is also used to stabilize the optical power.

The Generation Two (Current Gen) GPS-FO-Rx-16A Fiberoptic to GPS Receiver downconverts the optical signal from Transmitter back to its original RF signal level. 16 GPS RF outputs are available on the front panel. A -48VDC output power supply is also available to power the outdoor GPS Transmitter over a hybrid fiber cable. A 1 AMP resettable fuse is provided on the -48VDC output in order to insure the output power does not exceed the 100VA maximum mandated by many building electrical codes. Summary LED status indicators with corresponding dry-contact relay closure outputs are provided to monitor the status of the receiver as well as the companion Outdoor GPS Transmitter and active GPS antenna/LNA. Detailed status and control for the Receiver, Transmitter and Antenna are also available via a USB port. Optional ethernet port with SNMP for integration in the carriers backend system.The optical receiver uses ultra-linear PIN photodiodes in unison with high linearity RF Amplifiers.

SPECIFICATIONS

GPS Over Fiber System

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Electrical

Description	Fiber Converter Unit x16	Outdoor Remote Unit
# of RF Channels	16 RX (GPS-FO-Rx-16P)	1 TX (2 TX W/Redundancy)
Band Supported	L1 (GPS, Galileo, BeiDou, and QZSS)	
RX Noise Figure	N/A	5 dB max.
RX Input IP3 (IIP3)	N/A	30 dBm max.
RX RF Return Loss	N/A	14 dB min.
Antenna Power Supply	N/A	+5VDC, 70 mA max.
TX RF Output Power	-70 dBm max.	N/A
TX Output IP3 (OIP3)	+10 dBm max.	N/A
TX Other Spurious Outputs	-75 dBm max.	N/A
RF Link Budget to Antenna	N/A	+13 dB
Optical Ports	SMF, SC/APC	SMF, SC/APC
Fiber Category	Single Mode (OS2)	
Fiber Data Rate	100 GB max.	
Fiber Core/Cladding Dimension	9/125um	
Delay Efficiency	100 nS max.	
Optical Budget	Up to 4 Km @ 1310 nm	
Alarms	LEDs, Dry Contact Closures, USB readout	LED
	Laser warning:Invisible Laser Radiation emitting from Optical connector. Avoid direct exposure to beam. 20 mW max. A 1310 and 1550 nm CDRH Class IIIB.	

General Characteristics	Fiber Converter Unit	Outdoor Remote Unit
Power Consumption (@ 48 VDC)	350 mA Max. (Standalone)	250 mA Max., 200 mA Typ. (includes 70 mA @ 5 VDC provided to the GPS Antenna LNA)
Power Consumption	600 mA Max. (includes power supplied to outdoor unit)	
Input Fuse	2A Resettable	N/A
Output Fuse	1A Resettable (on 48 VDC Output Line)	N/A

Description	GPS-ANT-28-3 (GPS Antenna)
Frequency Range	1575.42 ± 10 MHz
LNA Gain	26.5 dB ± 3 dB
Element Gain	3.5 dBic
Out of Band Rejection	≥ 65 dB @ 1559 MHz, ≥ 65 dB @ 1625 MHz
VSWR (Return Loss)	≤ 1.5:1 (≥ 14.0 dB)
Noise Figure	≤ 4.0 dB @ 25°C (typ.), ≤ 4.5 dB @ 25°C (max.)
Current Draw	≤ 40 mA @ 5V
ESD Proterction	15 kV
DC Voltage	Operating: 3.3-12.0 VDC (regulated), Survival: 24 VDC
Nominal Impedance	50 ohms
Polarization	Right hand circular
Dimensions	5.0" (H) x 3.2" (D) (126 mm (H) x 81 mm (D))
Weight	0.6 lbs. (0.3 kg)
Temperature Range	-40°C to +85°C
Humidity	95%

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Description	GPS-ACC-48V (Optional Outdoor AC to DC Power Supply Specifications)
DC Output Voltage (Nominal)	48 VDC
Rated Current	1.3 A
Rated Power	62.4W
Output Voltage Stability	±1.0%
Input Voltage Range	90 - 264 VAC
Input Frequency Range	47 - 63 Hz
Power Factor (at full load)	98% typ. (115 VAC), 95% typ. (230 VAC)
Efficiency	90.5% typ. (115 VAC), 92% (230 VAC)
AC Current	0.64A typ.(115 VAC), 0.32A (230 VAC)
Inrush Current	Cold Start 55A typ. (twidth = 265uS measured at 50% Ipeak) at 230 VAC
Overcurrent Protection	95-108% (Constant current limiting), recovers automatically after fault condition is removed)
Short Circuit Protection	Hiccup mode (recovers automatically after fault condition is removed)
Over Voltage Protection	54-65 V (Shut down output voltage, re-power on to recover)
Over Temperature	Shut down output voltage, re-power on to recover
IEC Standard 60529 (Ingress Protection)	IP67
UL Certification	UL, ULC
Working Temperature	Tcase = -40°C - +80°C
Working Humidity	20 - 95 % RH (non-condensing)
Storage Temperature, Humidity	-40°C - +80°C, 10 - 95 % RH
Temp. Coefficient	±0.03%/°C (0°C - 60°C)
Withstanding Voltage	I/P-O/P:3.75 KVAC, I/P-FG:2 KVAC, O/P-FG:1.5 KVAC
Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG:100M Ohms (@500 VDC, 25°C, 70% RH)
EMC Emission	Compliance to BS EN/EN61000-4-2,3,4,5,6,8,11; BS EN/EN61547, light industry level (surge immunity Line-Earth 4KV, Line-Line 2KV),EAC TP TC 020
MTBF	338K hrs. minimum
Dimensions	171 x 61.5 x 36.8 mm (6.73 x 2.42 x 1.45")
Weight	0.73 kg (1.6 Lbs.)

Environmental

Operating Temperature	0˚C to +50˚C (Indoor FO/GPS Receiver) / -20˚C to +50˚C (Outdoor GPS/FO Transmitter)
Enclosure	Indoor FO/GPS Receiver (IP11) / Outdoor GPS/FO Transmitter (IP67)
Relative Humidity	0 - 45 % (Indoor) / 0 - 99% (Outdoor)
MTBF	>500,000 hours
Lightning Protection	8/20uS, ±20KA max., 10 strikes each, IEC61000-4-5

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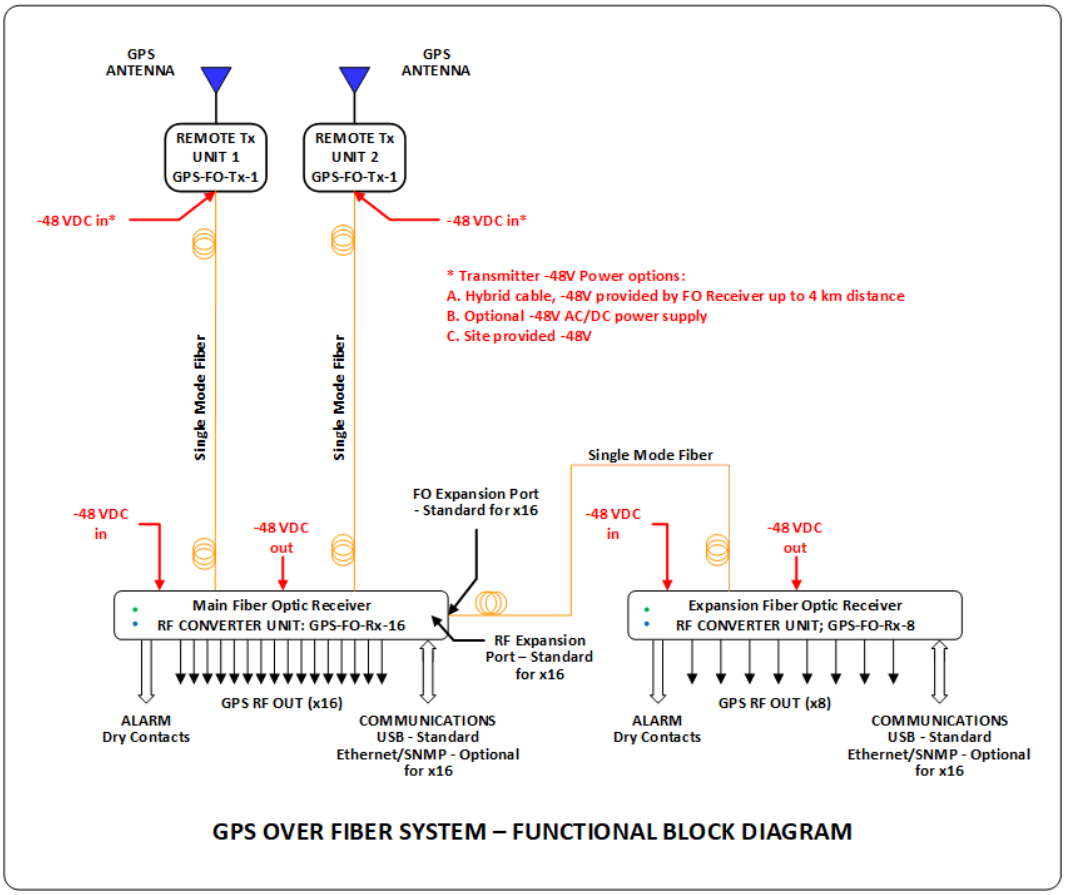
Mechanical

Outdoor GPS to Fiberoptic Transmitter	
GPS Antenna Input Connector	1 x N-Type male long neck
Fiberoptic Connector	SC/APC
DC Input Connector	2 Postion Terminal Block
Dimensions (with connectors & panel) - (HxWxD)	9.13 x 4.80 x 2.95 in (232 x 122 x 75 mm)
Weight (w/o Bracket)	< 2.75 lb
Mounting	Pole/Wall Mount

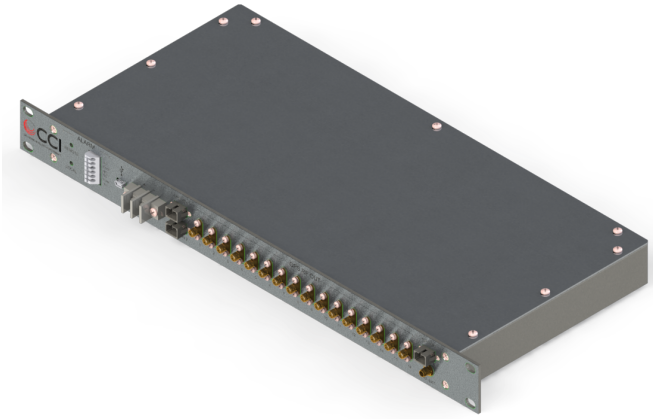
Indoor Fiberoptic to GPS Receiver	Fiber Converter Unit x16
GPS RF Output RF Connectors	16 x SMA female
Fiberoptic Input Connector	SC/APC x 2
Fiberoptic Expansion Output Connector	SC/APC x 1
RF GPS Expansion Output Connector	SMA female x 1
DC Input Connector	2 Postion Terminal Block
DC Output Connector	2 Postion Terminal Block
Communications & Control Connector	USB (standard) or RJ45 Ethernet/SNMP (optional)
Dimensions - (H x W x D) - with Faceplate	1.72 x 19 x 14 in (43.69 x 482.6 x 355.61 mm)
Dimensions - (H x W x D) - Body Only	1.72 x 17 x 14 in (43.69 x 431.8 x 355.61 mm)
Weight	6 lbs
Mounting	19 in. rack mountable 1U

Block Diagram



GPS Over Fiber System (GPS-FOS-T2R16-SA3P) Functional Block Diagram

GPS-FO-Tx-1A (GPS to Fiberoptic Transmitter)



GPS-FO-Rx-16P (Fiberoptic to GPS Receiver)

Parts & Accessories

GPS-FOS-T2R16-SA3A	This Generation Two (current Gen) GPS Over Fiber System includes two outdoor Generation Two (current Gen) GPS to Fiberoptic Transmitters (GPS-FO-Tx-1A) and one Generation Two (current Gen) 16 Channel Indoor Fiberoptic to GPS Receiver (GPS-FO-Rx-16A) with -48V positive ground.
GPS-FOS-T2R16-SA3AS	This Generation Two (current Gen) GPS Over Fiber System includes two outdoor Generation Two (current Gen) GPS to Fiberoptic Transmitters (GPS-FO-Tx-1A) and one Generation Two (current Gen) 16 Channel Indoor Fiberoptic to GPS Receiver (GPS-FO-Rx-16A) with -48V positive ground and SNMP option.
GPS-FOS-T2R16-SA3A-K	This Generation Two (current Gen) GPS Over Fiber System includes two outdoor Generation Two (current Gen) GPS to Fiberoptic Transmitters (GPS-FO-Tx-1A) and one Generation Two (current Gen) 16 Channel Indoor Fiberoptic to GPS Receiver (GPS-FO-Rx-16A) with -48V positive ground and two outdoor 48 VDC AC to DC Power Supplies (GPS-ACC-48).
GPS-FOS-T2R16-SA3AS-K	This Generation Two (current Gen) GPS Over Fiber System includes two outdoor Generation Two (current Gen) GPS to Fiberoptic Transmitters (GPS-FO-Tx-1A) and one Generation Two (current Gen) 16 Channel Indoor Fiberoptic to GPS Receiver (GPS-FO-Rx-16A) with -48V positive ground and SNMP option and two outdoor 48 VDC AC to DC Power Supplies (GPS-ACC-48).
GPS-FO-Tx-1A	Generation Two (current Gen) Outdoor GPS to Fiberoptic Transmitter
GPS-ANT-28-3	GPS Antenna
GPS-FO-Rx-16A	Generation Two (current Gen) 16 Channel Indoor Fiberoptic to GPS Receiver with RF and Fiber Expansion ports with -48V positive ground
GPS-FO-Rx-16AS	Generation Two (current Gen) 16 Channel Indoor Fiberoptic to GPS Receiver with RF and Fiber Expansion portswith -48V positive ground and SNMP Ethernet option
GPS-ACC-48	Outdoor 48V AC to DCPower Supply with US and Canadian UL Certification

Standards & Compliance

Safety	UL 60950-1
Environmental	EN 60529 IP11 (Indoor FO/GPS Receiver), IP 67 (Outdoor GPS/FO Transmitter)

STANDARDS & CERTIFICATIONS

GPS Over Fiber System

GPS-FOS-T2R16-SA3A

Certifications

CE, CSA US, ISO 9001