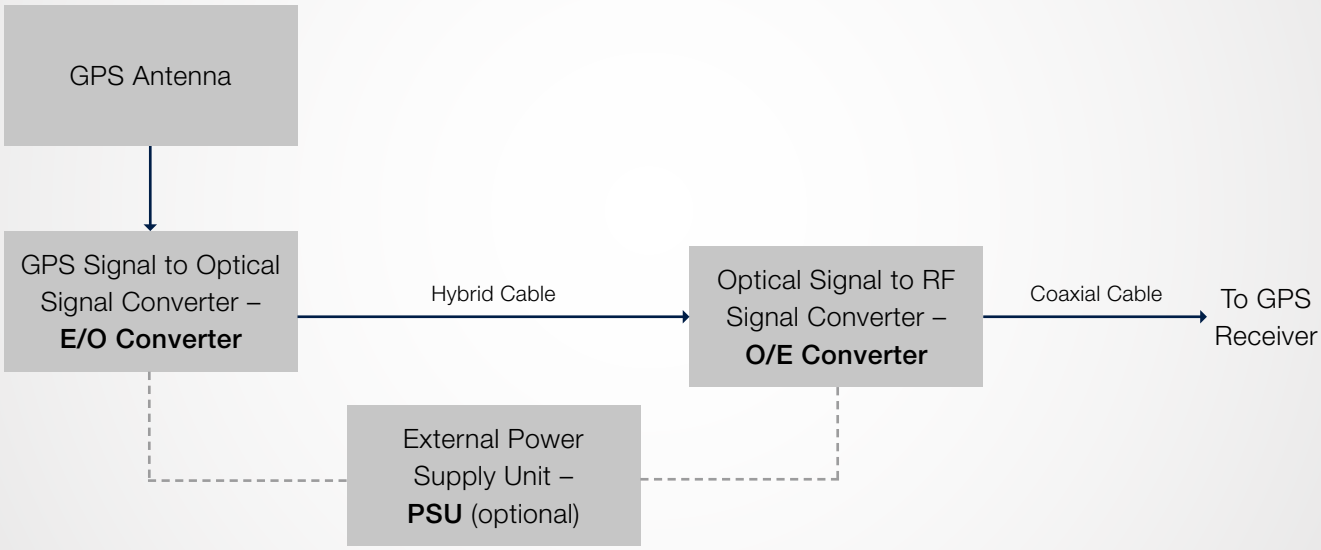
Rosenberger

Distribution of the GPS Signal Over Long Distances

Remote GPS Antenna System

COMMUNICATION



System Overview

Rosenberger presents a new and innovative remote GPS antenna system for those applications where coax cannot be used to route the GPS signal to base stations. With more centralized RAN and large-scale DAS applications, there are many cases where the GPS antennas are located too far from the base stations for coaxial losses to be acceptable. To overcome this issue, the remote GPS antenna system converts the RF signal to light, transmits it over the fiber and then restores the light to the original RF signal. Unlike many systems employing a bulky remote unit requiring power and separate mounting space as well as a large master unit encompassing an active GPS splitter, Rosenberger has rethought the process and designed a fiber optic replacement for the coaxial cable. Instead of a master unit and a remote unit, you use an electro-optical converter (E/O converter) at the antenna and an opto-electrical converter (O/E converter) near the base station.

By employing this method, the E/O converter becomes a small, compact unit that connects directly to the GPS antenna. The unit is so small it can even fit within a 1 ½ inch pipe often used to mount GPS antennas. The O/E converter is also compact, handles all alarming, can be used to power the E/O converter and can be connected to standard GPS splitters fully supporting their redundancy functionality. This means that the remote GPS antenna system fully emulates the behavior of a passive copper cable and GPS antenna, allowing any device normally connected to the GPS antenna to maintain proper operation when connected to a O/E converter.

Interconnecting the two is a thin hybrid cable comprised of fiber and power which means no power source is required at the GPS antenna.

The individual link support for each GPS antenna allows for the flexibility of using a normal coaxial configuration and simply replacing each coax cable from a GPS antenna with E/O converter, O/E converter, and hybrid cable. And with a maximum hybrid cable length of 1.9 miles (3 km), this system can meet the demands of almost any installation.

Remote GPS Antenna System

- Distribution of the GPS signal over long distances
- Converts the RF signal to an optical signal, then back again

GPS Antenna

O/E Converter

E/O Converter

External Power Supply Unit

Product Description

E/O Converter

The E/O converter directly connects to the GPS antenna and converts the GPS RF signal to an optical one. Powered through a hybrid cable, the E/O converter. Not only transfers the GPS signal to the O/E converter, furthermore it supplies power to the GPS antenna and detects any antenna faults, relaying the alarm information to the O/E converter. Small enough to fit inside 1 ½ inch conduit, the E/O converter is IP67 and rugged for the harsh conditions required.

O/E Converter

The O/E converter receives the optical signal from the E/O converter via the hybrid cable connection and converts it back to an RF signal. The O/E converter also sends power to the E/O converter via the same hybrid cable. Available in a standalone unit or in a 19” rack unit that can hold up to 4 O/E converters, the O/E converter can be powered through PoE or a direct -48 Volt connection. The O/E converter supports SNMP, reporting alarms on antenna failure and communication fault with the E/O converter. An RF connection to any industry standard active GPS splitter completes the system.

By not including the splitter in the O/E converter, more flexibility is allowed in configuring the system.

External Power Supply Unit (PSU)

For those cases where existing fiber deployment shall be used a small external power supply unit is available to be able to power the E/O converter directly and output a fiber cable to connect to the O/E converter. The PSU connects to the E/O converter via a short hybrid cable, using the Rosenberger RQC hybrid connector to insure a safe power and fiber connection as well as environmental protection. The PSU is available as Power over Ethernet as well as AC option.

Specifications

Electrical	**E/O Converter**	**O/E Converter**	**Power Supply Unit (optional)**
Frequency range	L1 band (GPS, Galileo, Glonass), Beidou		n.a.
Link gain (typical)	10 dB		n.a.
Input P1 dB (typical)	-55 dBm		n.a.
Impedance	50 Ω		n.a.
Input voltage	24 VDC	48 VDC or PoE	110 to 240 VAC @ 50/60 Hz or PoE
Output voltage	n.a.	n.a.	24 VDC
Power to GPS Antenna	5 VDC / 120 mA max.		n.a.
Alarms	Loss of antenna Link failure indicated by LED Readout by SNMP		n. a.
Remote access	n. a.	SNMP (v1, v2c, v3) via Ethernet	n. a.
Optical			
Fiber length	SMF > 3.8 miles / 6 km		
Hybrid cable length	1.9 miles / 3 km (1 mm² / AWG 18)		
Wavelength (typical)	1310 nm		
Optical power (typical)	8 dBm		
Mechanical			
Dimensions	Ø 40 mm x 145 mm	105 mm x 185 mm x 47 mm (standalone) 483 mm x 215 mm x 44 mm (19” rack)	170 mm x 102 mm x 55 mm
Connectors	N male 50 Ω (RF) Rosenberger RQC Hybrid (optical & power)	SMA female 50 Ω (RF) LC APC (optical) RJ45 (PoE) 2 pin (power in) 2 pin (power out)	Rosenberger RQC Hybrid (optical in) LC APC (optical out) RJ45 (power, PoE) 3 pin (power, AC)
Weight	295 g	250 g (RX Unit standalone) 1500 g (19” rack with 2 RX units included)	350 g
Environmental			
Operating temperature	-40 °C to +85 °C	0 °C to +40 °C	-40 °C to +85 °C
Compliance	FCC, CE		
Protection	IP67	IP11	IP67
Ordering Information			
Remote GPS Antenna System	98GOF002-TX	98GOF002-RX (standalone) 98GOF102-RX (2 RX units in 1 HU 19” rack)	98GOF001-PSU (PoE) 98GOF002-PSU (AC)
Hybrid cable	L98B-A0650-XXX (shielded hybrid cable, RQC connectors, XXX m) L98B-A0651-XXX (shielded hybrid cable, RQC - LC Duplex APX, XXX m)		
GPS antenna	GPS-36-N-SC (GPS only) GPSGlonass-36-N-SC (GPS, Galileo, Glonass, Beidou)		

Company Profile

About Rosenberger

Rosenberger is one of the worldwide leading suppliers of controlled impedance and optical connectivity solutions, system components for mobile communications networks, data centers and test & measurement as well as high voltage contact systems. The Rosenberger Group operates manufacturing and assembly locations in over 10 countries as well as a global sales network.

Rosenberger Communication

The Rosenberger Business Area Communication designs, manufactures and provides solutions for the communication market. In close cooperation with our customers our offering is the complete product development from the first idea to volume production. As part of the Rosenberger Group we use the synergies of research and development, purchasing, production and sales know-how and resources around the world.

The Rosenberger Group is used to handle small and large production volumes utilizing our global manufacturing infrastructure.

Quality and Environment

Rosenberger's quality philosophy is not just to optimize components and products, but to continuously improve and optimize all processes to ensure customer satisfaction: From product development, planning, procurement, production, sales, logistics and services to environmental policy. In summary, to offer maximum benefits to our customers all over the world.

Our quality responsibility includes being proactive in protecting our environment and natural resources. We endeavour to avoid any environmental pollution, even beyond the requirements of legal regulations whenever possible.

Website

For more information refer to our website:
www.rosenberger.com/communication

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