



## DATA SHEET

### GNSS signal extension solution over optical fibre



Optical transmitter



Optical receiver



1/2 U power rack :  
FCCM08536s-32GE1GF



5 slot power rack : FCCS152120

Non contractual photos

### FEATURES & BENEFITS

- **Optical transmitter: Bandwidth between 350 and 2500MHz**
- **Low noise figure for low level signal processing**
- **Adjustable gain preamplifier on the optical transmitter**
- **Remote feeding of the antenna via the coaxial cable**
- **Supports up to 10 dB of optical line balance, covering distances up to 20 km**
- **Supervision of operation and adjustment by the rack**
- **Optical receiver: Bandwidth between 1100 and 1800MHz**
- **Alarm signal on optical reception default**

### DESCRIPTION

These FEHS-350-2500MHz transmitters and FRHS-1100-1800MHz receivers enable GNSS (GPS, Galileo, Glonass, Beidou, IRNSS...) signal transmission over fibres.

The FEHS-350-2500MHz modules are to be integrated in the FCCS152120, FCCS55912A-1GE2GF and FCCM08536S-2GE-1GF racks and allow the GNSS signal transmission via single-mode optical fibre.

The optical transmitters based on DFB isolated laser ensure a quality transmission with a reduced noise and low distortions, even in an electronically disturbed environment.

The FEHS-350-2500MHz transmitters are equipped with a polarisation tee to feed an antenna preamplifier through the coaxial cable.

The operation of the FEHS-350-2500MHz modules can be supervised by the rack equipped with the appropriate firmware.

The supervision access of the rack allows, via the Ethernet network, to :

- ✓ Control the operating parameters of the modules.
- ✓ Adjust the gains of the input or output stages of the modules.
- ✓ Activate an automatic optical loss correction mode on the receiver.

The FRHS-1100-1800MHz optical receiver modules are offered in a miniature stand alone housing that can be easily integrated. They are powered by a DC voltage, 12 VDC with an AC adapter. The 12VDC AC adapter is supplied.

The transmitter and receiver optical modules are equipped with SMA 50Ω access connector.

Function indicators are associated with the main functions of the product and provide diagnostic support.

## TECHNICAL SPECIFICATIONS

FEHS-350-2500MHz OPTICAL TRANSMITTER	
<b>RF Characteristics</b>	
Bandwidth at -3dB	350 to 2500 MHz
Flatness	$\pm 1.5$ dB
Input compression @ 1 dB	0 dB (Note 1)
IM3 at -10dBm	$\leq -60$ dBc (Note 2)
Noise figure	$\leq 35$ dB (Note 3)
Transmission gain between 0 and 10dB loss	0 ( $\pm 2$ ) dB
Characteristic impedance	50 $\Omega$
Access ROS	< 1,5 : 1
Optical loss compensation	AGC circuit, (can be disabled by supervision)
Performance guaranteed for optical reflections below -45dB, gain setting on modules at 0dB, AGC activated on the receiver.	
<i>Note 1: measured with a 1500MHz carrier.</i>	
<i>Note 2: measured with 2 carriers 1500 MHz &amp; 1501MHz, P RF = -10dBm per carrier, 4.5 Km single mode fibre G652 link</i>	
<i>Note 3: measured at 1500MHz with 4.5km of fibre</i>	
<b>Optical specifications</b>	
Number of fibres used	1
Optical fiber	SMF
Wavelength	1310 $\pm$ 10 nm
Optical line budget (Note 5)	0 to 10 dB
Maximum distance (Note 6)	20 km
Optical power (Note 7)	5 ( $\pm 1.5$ ) dBm
Transmitter type	Isolated DFB laser (for RF transmissions)
Receiver type	PIN Photodiode
Input polarisation	Depending on the rack used
<i>Note 5: For a transmission gain of 0 dB</i>	
<i>Note 6: Considering only the optical losses</i>	
<i>Note 7: Laser power is stabilised by control photodiode and driver circuit</i>	
<b>Operating indicators</b>	
Laser transmission	Power supply Green LED
<b>Connectors</b>	
Optical connector	SC/APC (on the back of the rack)
RF connector	SMA (on the back of the rack)
<b>Power supply</b>	
Alimentation	Via the host rack
Maximum power consumption per module	3W
<b>Physical characteristics</b>	
Housing type	Aluminium housing that can be integrated into IFOTEC RF racks FCCS152120 , FCCS55912A-1GE2GF, FC-CM08536S-2GE1GF

Environmental conditions	
Operating temperature	-10 to +50°C
Storage temperature	-20 to +85°C
Relative humidity	0 to 85 % (not condensed)
Guarantee	
Country of origin	Voiron (France)
Guarantee	3 years
Guarantee information	<a href="https://www.ifotec.com/support/">https://www.ifotec.com/support/</a>

FRHS-1100-1800MHZ OPTICAL RECEIVER	
RF Characteristics	
Bandwidth at $\pm 3$ dB	1100 to 1800 MHz
Faltness in 20MHz channel (Note 1)	$\pm 0.2$ dB
Level variation over the entire band	$\pm 1.5$ dB
Link gain (Note 1)	5 ( $\pm 1.5$ ) dB - 2xLO (Note 2)
Access impedance	50 $\Omega$
Access ROS	< 1.5 :1 @ 1575 MHz
<i>Note 1: Measured at 1575.42 MHz with 1 m of fibre</i>	
<i>Note 2: LO = Optical losses of the fibre</i>	
Optical specifications	
Number of fibres used	1
Optical fiber	SMF
Wavelength	1310 $\pm$ 20 nm
Transmitter optical power (Note 3)	5.5 ( $\pm 1.5$ ) dBm
Minimum optical reception level (Note 4)	-3 dBm
Transmitter type	DFB laser with a built-in optical isolator
Receiver type	PIN Photodiode
<i>Note 3: The laser power is stabilized by a driver circuit and photodiode control</i>	
<i>Note 4: before alarm</i>	
Operating indicators and alarm	
Power supply presence indicator	Green Led
Alarm indicator	Red Led (lit on alarm)
Alarm type	Open collector (normally grounded, open on alarm)
Connectors	
Optical connector	SC/APC (back panel)
RF connector	SMA
Alarm connector	Screw terminal block
Power connector	Screw terminal block (common with alarm)
Power supply	
Power supply (delivered with EC + US plugs)	12 VDC nominal with an AC adapter
Power consumption	<5W@12VDC

Physical characteristics	
Housing type	Miniature aluminium housing
Dimensions (l x W x h) excluding connectors	96x85x21 mm
Mounting holes	4 holes Ø 3,5 mm, l.21 mm on each case
Center distance	91x65 mm
Environmental conditions	
Operating temperature	0 to +50°C (limited to 40°C for AC adapter)
Storage temperature	-20 to +85°C
Relative humidity	0 to 85 % (not condensed)
Guarantee	
Country of origin	Voiron (France)
Guarantee	3 years
Guarantee information	<a href="https://www.ifotec.com/support/">https://www.ifotec.com/support/</a>

## ORDERING INFORMATION

Reference	Equipment	Application	Optical Connector	Power supply
FEHS2Z900S-350-2500MHZ-TEE	Optical transmitter to be integrated in a power rack	GNSS signal	SC/APC	Rack 1/2U or 1U
FRHS31902S-1100-1800MHZ	Optical miniature stand alone housing	GNSS signal	SC/APC	12VDC with an AC adapter (supplied)

## RELATED PRODUCTS WITH FEHS-350-2500MHZ-TEE

For more information, see the rack data sheet

Reference	Type of rack	Application	Nbre of slot	Optical connector	Polarisation	Power supply
FCCS152120	19" 1U rack with Ethernet access for supervision	Support, power and supervisory access for FEHS-350-2500MHZ-TEE equipment	5		None	230 VAC
FCCS55912A-1GE2GF	19"1U rack with Ethernet access for supervision and optical access		4	SC/APC	20 VDC	230 VAC
FCCM08536S-2GE1GF	½ rack with Ethernet access for supervision and SFP port		2	According to SFP	12 to 20 VDC	9 to 36 VDC

In line with the company policy of continuous improvement, product specifications are subject to change without prior notice.

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