



Square Peg

Communications Inc.

L-Band Radio Frequency Unit (RFU)



OVERVIEW

Square Peg Communications Inc.'s Radio Frequency Unit (RFU) is a frequency converter that translates frequencies in the 70 MHz IF band to/from the MSS L-band utilized by Inmarsat, LightSquared, Thuraya and other mobile satellite operators. Some RFU variants also cover the extended L-band (XL) supported by Inmarsat's new Alphasat satellite.

The RFU is normally used for mobile terminal (MT) testing in conjunction with an SPCI Physical Layer Tester (PLT). In this configuration, the RFU allows the PLT to emulate the air interface as seen by the mobile terminal. Other variants of the RFU are also available which permit the IF equipment to emulate a mobile terminal or to perform off-air monitoring.

For mobile terminal testing, the RFU interfaces to the terminal at its L-band antenna port. A high-power attenuator mounted outside the RFU chassis brings the signal level to a convenient range, and a diplexer separates the received and transmitted signals. The separate transmit and receive RF signals pass through external loops, allowing the diplexer to be bypassed if desired.

The received L-band signal is converted to IF by a fixed-tuned downconverter. The IF signal is split into five outputs to drive a maximum of five demodulators. The level of the received signal can be adjusted with a manual step attenuator to match the input range of the demodulators.

The IF transmit signals from up to five modulators are combined and converted to L-band by a fixed-tuned upconverter. The level of the L-band signal is set with a manual step attenuator.

Noise or other interference can be added to the transmitted L-band signal via an auxiliary L-band input.



SPECIFICATIONS

PHYSICAL

RF Unit (RFU) 19" / 3U rack mount enclosure

RF INTERFACE

Connector	N female
Impedance	50 ohm nominal
Receive frequency	-01, -03: 1626.5 to 1660.5 MHz -02, -04: 1525.0 to 1559.0 MHz -05: 1626.5 to 1675.0 MHz
Receive level (into high-power attenuator)	0 to +48 dBm (+45 dBm max per channel)
Receive level (into RFU)	-30 to +18 dBm
Receive gain (Rx attenuator set to 0 dB)	18.5 ± 3.5 dB
Receive attenuator	0 to 60 dB in 10 dB steps
Receive flatness	± 3.0 dB
Receive spurious signals	≤ -90 dBm
Receiver 3 rd order intermodulation	≤ -55 dBc (two carriers at -23 dBm each, receive path attenuation adjusted optimally)



RF INTERFACE (continued)

Transmit frequency	-01, -03: 1525.0 to 1559.0 MHz -02, -04: 1626.5 to 1660.5 MHz -05: 1518.0 to 1559.0 MHz
Transmit level (from high-power attenuator)	-60 dBm max per-carrier (IF input signals) -15 dBm max (externally applied noise)
Transmit level (from RFU)	-30 dBm max per-carrier (IF input signals) +15 dBm max (externally applied noise) -10 dB
Transmit gain (Tx attenuator set to 0 dB)	
Transmit attenuator	0 to 60 dB in 10 dB steps
Transmit level flatness	± 3.0 dB
Transmit spurious	< -95 dBm
Transmit 3 rd order intermodulation	≤ -55 dBc with two carriers input at IF of -20 dBm each
Phase noise density (Tx or Rx)	-01, -02, -05 : @ 10 Hz: ≤ -67 dBc/Hz @ 100 Hz: ≤ -80 dBc/Hz @ 1 kHz: ≤ -86 dBc/Hz @ 10 kHz: ≤ -94 dBc/Hz @ 100 kHz: ≤ -110 dBc/Hz -03, -04 : @ 10 Hz: ≤ -67 dBc/Hz @ 100 Hz: ≤ -79 dBc/Hz @ 1 kHz: ≤ -79 dBc/Hz @ 2 kHz: ≤ -70 dBc/Hz @ 10 kHz: ≤ -92 dBc/Hz @ 100 kHz: ≤ -110 dBc/Hz
Frequency accuracy	Per input reference

TX IF INTERFACE

Number of ports	5
Connector	BNC female
Impedance	50 ohm nominal
Frequency	-01, -02 : 50.0 – 84.0 MHz -03, -04 : 53.0 – 87.0 MHz -05 : 43.0 – 84.0 MHz
Input level	-20 dBm to -40 dBm per channel

RX IF INTERFACE

Number of ports	5
Connector	BNC female
Impedance	50 ohm nominal
Frequency	-01, -02 variants: 51.5 – 85.5 MHz -03, -04 variants: 53.0 – 87.0 MHz -05 variant: 41.5 – 90.0 MHz
Output level	-20 dBm to -40 dBm per channel

REFERENCE INTERFACE

Connector	BNC female
Impedance	50 ohm nominal
Frequency	10 MHz
Input level	-01, -02, -05 variants: 0 dBm ± 3 dB -03, -04 variants: + 3 dBm ± 2 dB

POWER

Connector	IEC 320 male
Voltage	105-130 VAC or 205-250 VAC, 47-63 Hz
Current	≈0.12 A rms at 115 VAC

ORDERING

Model Number	Function
EM-907516C-01	LES emulator with PLT IF
EM-907516C-02	MT emulator with PLT IF
EM-907516C-03	LES emulator with 70 MHz IF
EM-907516C-04	MT emulator with 70 MHz IF
EM-907516C-05	LES emulator (XL) with PLT IF

CONTACT Us

For more information contact:

Square Peg Communications Inc.
4017 Carling Avenue, Suite 200
Ottawa, Ontario K2K 2A3 CANADA
Tel: +1 613 271 0044 Fax: +1 613 271 3007
Web: www.squarepeg.ca
Email: sales@squarepeg.ca