



TWO CHANNEL DUAL CONVERSION L-BAND SATCOM FREQUENCY CONVERTERS



STANDARD FEATURES

- 10/100Base-T Ethernet
- Redundant power supplies
- 10 MHz reference output
- Switchable 50/75 ohm IF impedance
- RF and IF monitor ports
- Automatic switching to external 5/10 MHz reference
- Electronic adjustment of internal reference frequency
- Low intermodulation distortion
- Phase noise IESS-308/309 compliant
- 30 dB level control
- Independent input level control (upconverters only)
- Elapsed time and event log
- CE mark

OPTIONS

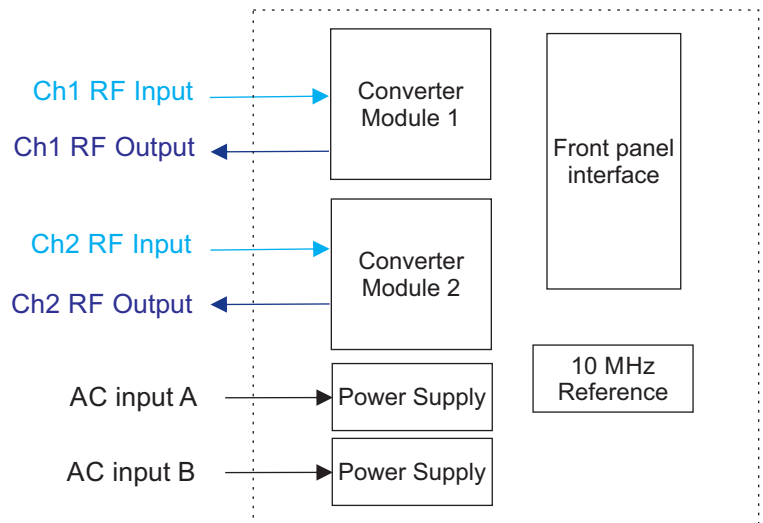
- 140 MHz IF frequency
- Switchable 70/140 MHz IF frequencies
- Reference clean-up loop and improved frequency stability

The GeoSync Microwave Converters are designed to simultaneously provide high performance, high reliability and high value, and are available for operation in the full L-band frequency range.

The low phase noise and excellent dynamic range of these converters enable them to carry almost any type of digital communications signals.

A robust protocol provides strong M&C support.

DUAL CHANNEL CONFIGURATION



DUAL CHANNEL – NO REDUNDANCY

DESCRIPTION	FREQUENCY (MHz)	MODEL NUMBER
2 Upconverter In Rack	950-1750	UTR2-095175
2 Upconverter In Rack	950-2150	UTR2-095215
2 Downconverter In Rack	950 2150	DTR2 095215
1 Downconverter and 1 Upconverter In Rack	(Upconverter) 950-2150 (Downconverter) 950-2150	UTR/DTR-950215
1 Downconverter and 1 Upconverter In Rack	(Upconverter) 950-1750 (Downconverter) 950-2150	UTR/DTR-950175/950215

SPECIFICATIONS	UPCONVERTER	DOWNCONVERTER
Type	Dual conversion	
Frequency Step Size	1 kHz	
Frequency Sense	No inversion	

INPUT CHARACTERISTICS

Frequency	70 ±20 MHz (140 ±40 MHz, Option 1-1)	950-2150 MHz
Impedance	50/75 ohm switchable	50 ohms
Return Loss	18 dB minimum	
Signal Monitor	-20 dBc nominal	
Input Level (Non-damage)	+10 dBm maximum	

OUTPUT CHARACTERISTICS

Frequency	Refer to model number table	70 ±20 MHz (140 ±40 MHz, Option 1-1)
Impedance	50 ohms	50/75 ohm switchable
Return Loss	18 dB minimum	
Signal Monitor	-20 dBc nominal	
Power Output (1 dB Compression)	+10 dBm minimum	+16 dBm minimum

TRANSFER CHARACTERISTICS

Gain	+31 to +34 dB	+44 to +48 dB
Level Control	30 dB in 0.1 dB steps	
Input Level Control	20 dB in 0.1 dB steps	N/A
Level Stability	±0.25 dB/day 0°C ±0.5 dB typical from 0 to 50°C	
Amplitude Response	±0.5 dB peak-to-peak/40 MHz maximum, 70 MHz IF ±0.75 dB peak-to-peak/80 MHz maximum, 140 MHz IF (Option 1-1) ±2 dB maximum/RF band	
Slope Adjust	±3 dB typical in 0.2 dB steps	
Noise Figure at Minimum Attenuation	20 dB nominal	14 dB maximum
Image Rejection	N/A	80 dB minimum
Group Delay (70±18 MHz)-		
Linear	0.03 ns/MHz maximum	
Parabolic	0.01 ns/MHz ² maximum	
Ripple	1 ns peak-to-peak maximum	

TRANSFER CHARACTERISTICS (Continued)-	UPCONVERTER	DOWNCONVERTER
Group Delay (140 ±36 MHz)-		
Linear	0.025 ns/MHz maximum	
Parabolic	0.0035 ns/MHz ² maximum	
Ripple	1 ns peak-to-peak maximum	
Third Order Intermodulation Distortion (Two tones each at 0 dBm output)	40 dBc minimum (+20 dBm IP3)	60 dBc minimum (+30 dBm IP3)
AM/PM Conversion	0.1°/dB maximum to 0 dBm output	
Spurious Outputs (Inband)-		
Signal Related up to 0 dBm output	50 dBc maximum	65 dBc maximum
Signal Independent	-50 dBm maximum	-70 dBm maximum
Harmonic Emission	-60 dBm maximum up to 0 dBm output	N/A
LO Leakage at RF	-65 dBm maximum	-80 dBm maximum
Frequency Stability	±2 x10 ⁻⁸ , 0 to 50°C	
Frequency Aging	5 x10 ⁻⁹ per day, after 24 hours on time	
Frequency Accuracy	Less than 1 Hz (external reference)	
External Reference	5 or 10 MHz, +4 ±3 dBm Automatic switch to the internal reference if the external reference level falls below +1 dBm nominal	
Phase Noise (dBc/Hz)-		
With Maximum Reference	Offset	Maximum
Phase Noise:	10 Hz	-72
10 Hz: -120 dBc/Hz,	100 Hz	-82
100 Hz: -145 dBc/Hz,	1 kHz	-90
1 kHz: -160 dBc/Hz	10 kHz	-95
	100 kHz	-99
	300 kHz	-99
	1 MHz	-115
Upconverter Mute	60 dBm minimum	N/A

REMOTE CONTROLS

Ethernet Interface	10/100 Base-T Ethernet interface providing: - HTTP-based web server, Telnet access
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INDICATOR and ALARMS

Remote Mode	Green LED (front panel)
Alarm	Red LED (front panel)

OPTIONS

19-1. 140 MHz IF frequency

19-2. Selectable 70 MHz and 140 MHz IF frequencies.

One IF connector provided (BNC female).

Selection of IF frequency is available over the remote bus.

19-3 Reference clean-up loop and improved frequency stability

Reference oscillator acts as an analog phase lock with a 0.1 Hz nominal loop bandwidth.

Typical loop suppression of the external reference is as follows:

28 dB at 1 Hz offset, 65 dB at 10 Hz offset and 100 dB at 100 Hz offset

Frequency stability: ±2 x 10⁻⁹, 0 to 50°C

Frequency aging: 1 x 10⁻⁹ per day after 24 hours operation preceded by 10 days of operation

PRIMARY POWER REQUIREMENTS PER CHANNEL

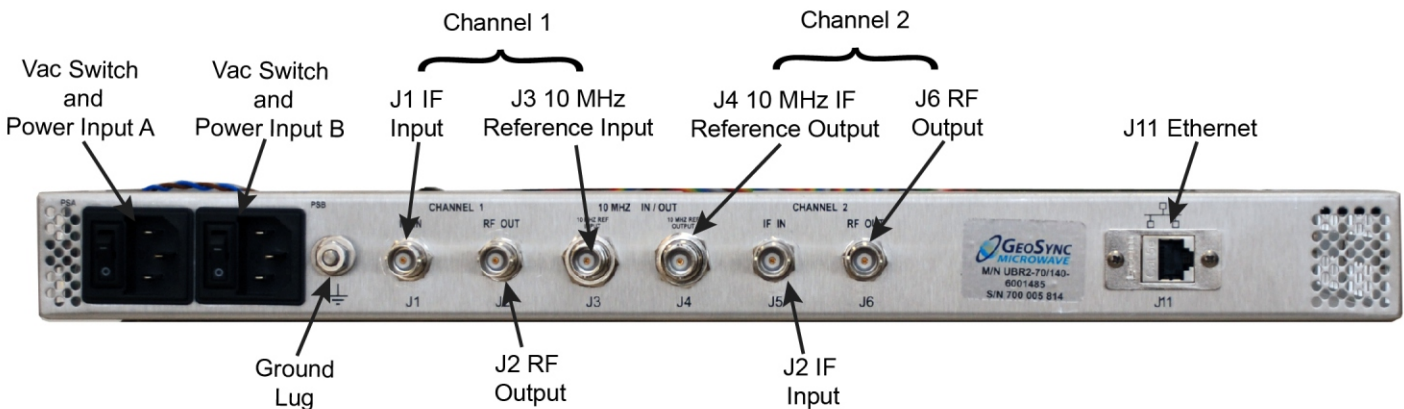
Voltage.....	90-250 VAC
Frequency.....	47-63 Hz
Power Consumption	40W typical
Fuse.....	T1.25A

PHYSICAL

Weight	16 pounds (7.3 kg) nominal without rack slides
	20 pounds (9.1 kg) nominal with rack slides
Chassis Dimensions	19" x 1.75" panel height x 20" maximum
Connectors -	
RF.....	BNC female
IF	BNC female
RF Monitor.....	BNC female
IF Monitor	BNC female
External Reference	BNC female
Remote Interface	RJ-45 female for Ethernet
Primary Power	IEC-320

ENVIRONMENTAL

Operating -	
Ambient Temperature	0 to +50°C
Relative Humidity	Up to 95% at 30°
Altitude	Up to 10,000 feet
Non-operating -	
Ambient Temperature	-50 to +70°C
Relative Humidity	Up to 95% at 40°C
Altitude	Up to 40,000 feet



Typical rear panel view - Shown with no options