WIDE RF BAND MULTIPLE INPUT OUTDOOR BLOCK UP CONVERTERS WITH HIGH PERFORMANCE OPTIONS

EUROSATCOM
VSATECH ASSOCIÉ

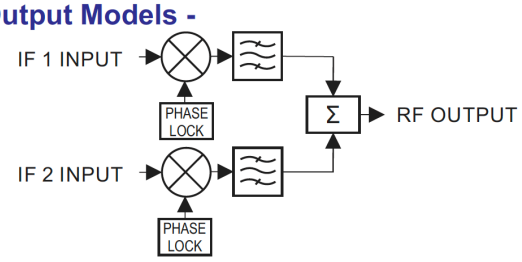
This series of Outdoor Block Upconverters provides one RF composite output covering 2 satellite transponder frequencies and accepts 2 separate & independent L-band IF inputs in an integral, self-contained weather proof package designed for outdoor antenna mounting.
Ka-band, Ku-band and C-band models are available covering the entire SatCom bands.
A companion series of Down Converters is also available, as are reverse band models.
A strong set of monitor and control functions provides powerful remote control capability via either RS422/485 or 10/100BaseT Ethernet.
A contact closure summary alarm is provided for fault monitoring.
The standard phase noise is superior to IESS-308/309 and options are available for lower phase noise surpassing the phase noise requirements of MIL-STD-188-164B.

BLOCK UPCONVERTERS

Output (GHz)	Input (GHz)	LO (GHz)	Model number
12.75-13.25	0.95-1.45	11.8	UBE2-13.625
13.75-14.5	0.95-1.7	12.8	
12.75-13.75	0.95-1.95	11.8	UBE2-13.6
13.75-14.5	0.95-1.7	12.8	
28.0-29.0	0.95-1.95	27.05	UBE2-29
29.0-30.0	0.95-1.95	28.05	

BLOCK DIAGRAM

Dual Output Models -



STANDARD FEATURES

- Single wideband RF output with 2 independent IF inputs
- Small-size weather resistant enclosure
- Amplitude slope adjust
- RS422, RS485 and 10/100 Base-T Ethernet
- Serial output for Redundancy Switchover units
- RF and L-band monitor ports
- Automatic 5/10 MHz internal/external reference selection
- Electronic adjust of internal reference frequency
- IESS-308/309 phase noise
- Low intermodulation distortion
- 64 programmable memory locations
- 45 dB of independent RF and L-band level control
- Mute function on alarm or external mute input command
- Elapsed time and event log after power turn on
- CE Mark and RoHS

OPTIONS

- High Performance Package
- Lower gain
- Reference clean-up loop and improved stability
- Lower phase noise
- RF waveguide inputs

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SPECIFICATIONS

INPUT CHARACTERISTICS

Return Loss (50 Ohms)	18 dB minimum
Signal Monitor	-20 dBc nominal

OUTPUT CHARACTERISTICS

Return Loss (50 ohms)	18 dB minimum
Signal Monitor	-20 dBc nominal
Power Output (1 dB Compression)	+15 dBm minimum (note our standardis13dBm)

TRANSFER CHARACTERISTICS

Gain	27 ±3 dB at center frequency
L-band Level Control	30 dB in 0.2 dB steps
RF-band Level Control	15 dB in 0.2 dB steps
Level Stability	±0.25 dB over any 20°C, ±1.5 dB over -40° to 60°C
Amplitude Response	±0.25 dB/40 MHz maximum, ±1 dB maximum over RF frequency band
Slope Adjust	0 to 6 dB minimum
Noise Figure at Minimum Attenuation	15 dB maximum at maximum gain
Image Rejection	60 dB minimum
Third Order Intermodulation Distortion	50 dBc minimum (+25 dBm IP3)
With two inband signals each at	
0 dBm, measured at the output	
Spurious Outputs (Inband)	
Signal Related up to 0 dBm output	65 dBc minimum
Signal Independent	-75 dBm maximum
Signal Harmonic Related	55 dBc minimum
up to -10 dBm output	(including 2nd harmonic)

Maximum Phase Noise (dBc/Hz) – With Maximum Reference Phase :

- 10 Hz: -120 dBc/Hz
- 100 Hz: -145 dBc/Hz
- 1 kHz: -160 dBc/Hz

LO Frequency	Offset (Hz)					
	10	100	1K	10K	100K	1M
6.7 to 12 GHz	65	-73	-85	-95	-104	-119
16 to 20 GHz	-60	-70	-85	-85	-92	-112
Up to 30 GHz	-47	-65	-78	-85	-87	-110

Frequency Stability	±5 x 10^{-8},-40° to +60°C (reference 25°C)
Frequency Aging	5 x 10^{-9}/day after 24 hours on time
Automatic Reference Configuration	External 5 or 10 MHz at +4 ±3 dBm. If external reference is below +1 dBm nominal, the converter will automatically lock to the internal reference.
Converter Mute	60 dB minimum on summary alarm or mute command.

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REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100 Base-T Ethernet - HTTP-based web server - Telnet Access - Password protection

INDICATOR and ALARMS

Remote Mode	Red LED: Alarm, Yellow LED: External Reference
Alarm	Green LED
Summary Alarm	Contact closure/open for DC voltage and local oscillator (programmable LNA current alarm on down-converters +12VDC at 250 mA)

OPTIONS (1/2)

41-1. High Performance Package -

Gain	27 ±1 dB
Power Output (1 dB Compression)	+20 dBm minimum
Gain Slope	0.03 dB/MHz maximum
Level Stability	±0.25 dB/day maximum at constant temperature, ±1.0 dB maximum/-40 to 60°C

Spurious Outputs (Inband)

Signal Related	-65 dBc minimum at 0 dBm output
Signal Independent	-80 dBm maximum
Local Oscillator Leakage	-70 dBm maximum (upconverters only)
Image Rejection	80 dB minimum

High Performance Phase Noise (dBc/Hz, maximum)

	Offset (Hz)					
LO Frequency	10	100	1K	10K	100K	1M
<12 GHz	-60	-78	-105	-112	-117	-136
<20 GHz	-42	-67	-98	-106	-109	-126
<30 GHz	-41	-64	-94	-102	-107	-124

Group delay	1 ns maximum peak to peak/RF band segment
Mute	80 dB minimum on summary alarm or mute command
Intermodulation Distortion (Third Order)	With two inband signals at 0 dBm output, third order intermodulation products are less than 60 dBc minimum.
AM/PM Conversion (at 0 dBm Output) .	0.1°/dB maximum

41-1A High Performance Phase Noise only. Standard IF/RF performance.

Note: Consult factory for lower phase noise options.

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OPTIONS (2/2)

41-2. Lower Gain	20 ±3 dB at 23°C, 18 dB noise figure (20 dB noise figure for upconverters with 1 GHz bandwidth) (2 x 1 signal related, 65 dBc at -10 dBm output)
41-3. Lower Gain	10 ±3 dB at 23°C, 20 dB noise figure (22 dB noise figure for upconverters with 1 GHz bandwidth) (2 x 1 signal related, 65 dBc at -10 dBm output)
41-4. 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: ±5 x10^{-9}, -40 to 60°C Frequency Aging: 1 x 10^{-9} per day after 24 hours operation preceded by 10 days operation.
41-6. MIL-STD-188-164B Compliant Phase Noise	

PRIMARY POWER REQUIREMENTS

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

PHYSICAL

Weight	22 pounds (10 kg) nominal
Connectors	
RF	SMA female below 22 GHz, 2.92 mm female
L-band	N female
RF Monitor	SMA female compatible
L-band Monitor	SMA female
External Reference	SMA female
Status/Control Interface	MS3116F14-18P type for summary alarm, RS422, RS485, and LNA power
Remote Interface	RJ-45 female for Ethernet RS485 available on Status connector
Primary Power	FCI clipper series CL1M1102

ENVIRONMENTAL

Operating	
Ambient Temperature	-40 to 60°C
Altitude	Up to 10,000 feet
Non-operating	
Ambient Temperature	-50 to +70°C
Altitude	Up to 40,000 feet
Shock and Vibration	Normal handling by commercial carriers

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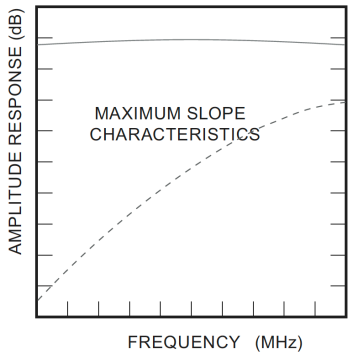
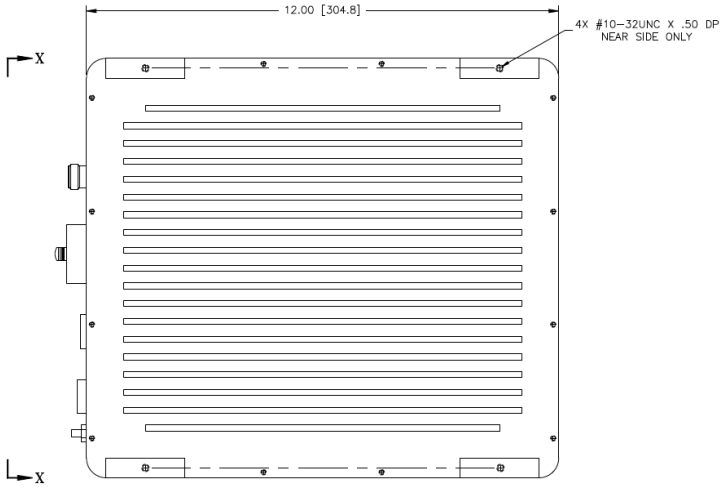
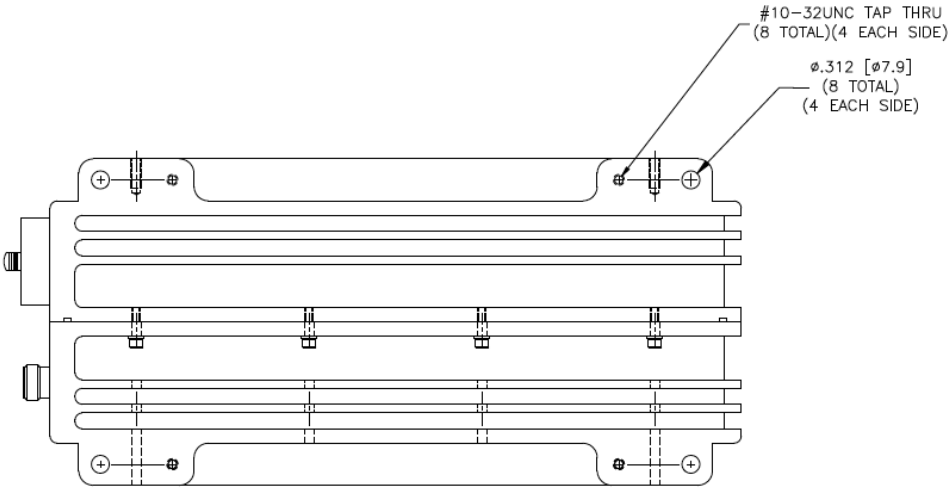
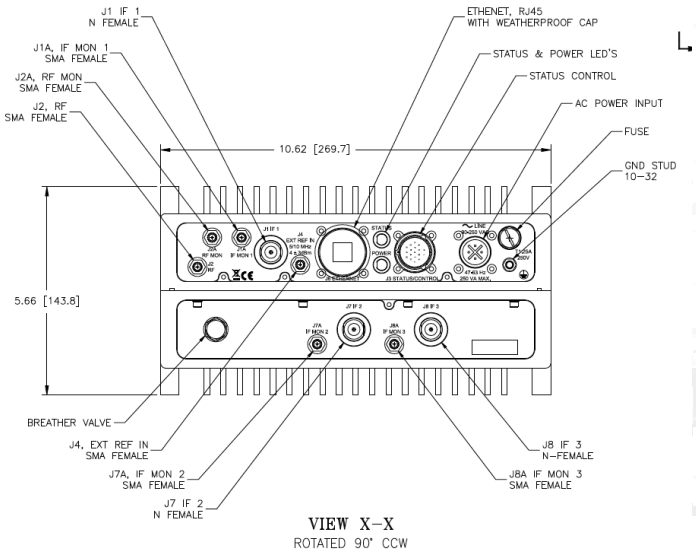
L-Band Slope Adjustment









VIEW X-X
ROTATED 90° CCW