

Multiple Input Outdoor Wideband Ku and Ka Upconverters



RF Frequency (GHz)	IF Frequency (GHz)	LO Frequency (GHz)	Model Number
Multi-Input Simultaneous Upconverters			
12.75–13.25 (RF ₁)	0.95–1.45 (IF ₁)	11.8 (LO ₁)	UPB2-W-13.625
13.75–14.5 (RF ₂)	0.95–1.7 (IF ₂)	12.8 (LO ₂)	
29.5–30.0 (RF ₁)	1.50–2.0 (IF ₁)	28.0 (LO ₁)	UPB2-W-30.25
30.0–31.0 (RF ₂)	1.00–2.0 (IF ₂)	29.0 (LO ₂)	
27.5–28.7 (RF ₁)	0.95–2.15 (IF ₁)	26.55 (LO ₁)	UPB3-W-29.75-1.2
28.65–29.85 (RF ₂)	0.95–2.15 (IF ₂)	27.7 (LO ₂)	
29.8–31.0 (RF ₃)	0.95–2.15 (IF ₃)	28.85 (LO ₃)	
27.0–28.0 (RF ₁)	0.95–1.95 (IF ₁)	26.05 (LO ₁)	UPB3-W-28.5-1
28.0–29.0 (RF ₂)	0.95–1.95 (IF ₂)	27.05 (LO ₂)	
29.0–30.0 (RF ₃)	0.95–1.95 (IF ₃)	28.05 (LO ₃)	
28.0–28.8 (RF ₁)	0.95–1.75 (IF ₁)	27.05 (LO ₁)	UPB3-W-29
28.7–29.5 (RF ₂)	0.95–1.75 (IF ₂)	27.75 (LO ₂)	
29.4–30.0 (RF ₃)	0.95–1.75 (IF ₃)	28.45 (LO ₃)	

This series of outdoor, antenna mount block upconverters are designed to cover simultaneously multiple wide bandwidth satellite transponders by accepting either two or three independent IF inputs which are up converted into one wideband RF output.

A strong set of monitor and control functions support powerful remote control. A contact closure summary alarm is provided for fault monitoring. A continuously updated log of time-stamped records of activity is also provided.

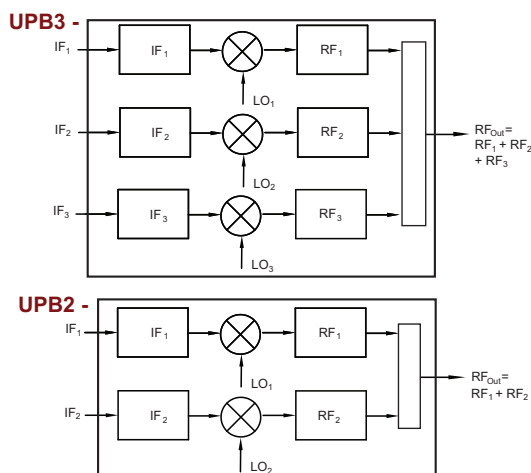
Features

- Small weather resistant enclosure
- Automatic 5/10 MHz internal/external reference selection
- 10/100Base-T Ethernet and RS485/RS422 remote control
- Superior phase noise below IESS308/309 and MIL-STD-188-164B specification
- 30 dB gain control
- 32 memory locations
- High frequency stability
- Summary alarm
- AC power supply with power factor correction
- CE Mark
- RoHS-5 Compliant

Options

- Custom frequency ranges
- Higher frequency stability
- Lower phase noise with high performance package Option 1
- Fiber optic L-band interface

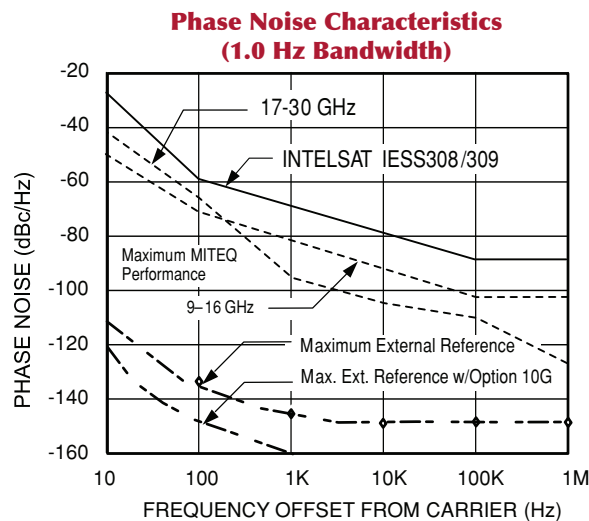
Block Diagrams



Specifications	Upconverter
Input characteristics	
Return loss (50 ohms)	18 dB minimum
Signal monitor	-20 dBc nominal (available as Option 6A)
Output characteristics	
Return loss	18 dB minimum
Power output (P1dB)	15 dBm minimum
Transfer characteristics	
Gain	27 dB, ± 3 dB at 23°C
Gain adjustment	30 dB in 0.2 dB steps independent for each input
Gain stability	± 0.25 dB/day maximum at constant temperature, ± 2 dB -40 to +50°C
Amplitude response	± 0.5 dB/40 MHz maximum, ± 1 dB/1 GHz, ± 2 dB over each output band above 1 GHz BW
Image rejection	80 dB minimum
Noise figure at min. atten.	15 dB maximum each band independently (only 1 band on), 18 dB maximum with all bands on
Group delay	1 ns peak-to-peak maximum per band
Intermodulation distortion (third order)	With two inband signals at 0 dBm output, third order intermodulation products are less than 50 dBc minimum at minimum attenuation
Spurious outputs	
Signal related (in band)	65 dBc minimum up to 0 dBm output
Signal independent	-70 dBm maximum including LO leakage
Phase noise	See graph
Frequency stability	$\pm 5 \times 10^{-8}$, -40 to +60°C (higher stability options available), 5×10^{-9} /day typical (fixed temperature after 24 hour on time)
Automatic reference configuration	External 5 or 10 MHz, +4 ± 3 dBm. If external reference is below +1 dBm nominal, the converter will lock to the internal reference.
Remote interface	10/100Base-T Ethernet interface providing Web-browser based configuration, SNMP 1.0 configuration, alarm reporting via SNMP trap, telnet access, password protection and selectable RS485/RS422. Refer to MITEQ's Multi-Channel Technical Note for details.
Indicator and Alarms	
LO out-of-lock	Red LED (front panel), Amber LED (for logged alarms), Summary alarm indicates: LO out-of-lock or DC voltage alarm
Power ON indicator	Green LED (front panel)
Summary alarm	Contact closure status for DC voltage and local oscillator, external mute input

Note: All specifications at maximum gain unless otherwise noted.

Phase Noise Specifications



Options

- 1.** High performance package.
- Gain slope 0.03 dB/MHz maximum
 - Gain stability ± 0.25 dB/day maximum at constant temperature,
 ± 1 dB peak-to-peak maximum/-40 to +60°C
 - Spurious outputs (inband)
 - Signal related 65 dBm minimum up to 0 dBm output
 - Signal independent -75 dBm maximum
 - Noise spectral density -90 dBm/4 kHz maximum
 - AM/PM conversion (at 0 dBm output) 0.1°/dB maximum

High performance phase noise (dBc/Hz) (maximum):

Models	OFFSET (Hz)					
	10	100	1K	10K	100K	1M
Ku-Band	- 48	-73	-103	-112	-115	-132
Ka-Band	- 42	-67	-97	- 106	- 109	-126

- 6A.** L-band IF monitor 20 dBc nominal from IF signal
- 6B.** RF monitor 20 dBc nominal from RF signal. SMA female below 15 GHz and 2.9 mm female with termination above 15 GHz.
- 10.** Higher frequency stability reference.
- D.** $\pm 5 \times 10^{-9}$, -40 to +60°C,
 2×10^{-10} /day typical (fixed temperature after 24 hour on time).
 - G.** Higher frequency stability reference with an analog phase lock with 0.2 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 and 100 dB at 100 Hz with the following frequency stability:
 $\pm 5 \times 10^{-9}$, -40 to +60°C,
 1×10^{-9} /day typical (fixed temperature after 24 hour on time).

Note: Converter may require 7-10 days to reach stability after long storage periods.

- 25.** Front panel connector option. (Above 22 GHz)
- 1.** WR-42 Grooved Flange, 2 psi 10 cm³/min. leakage rate.
 - 2.** WR-34 Grooved Flange, 2 psi 10 cm³/min. leakage rate.
 - 3.** 2.92 mm female.
- 28B.** L-band fiber optic interface (bandwidth 0.95-2.15 GHz).
Upconverter FO input receiver interface is;
Fiber: 9/125 (single mode fiber), Wavelength: 1540–1560 nm, Optical power in fiber: 4 mW typical
Connector: FC/APC

General Specifications

Primary Power Requirements

- Voltage 100–240 VAC, -10%, +6%
- Frequency 47–63 Hz
- Consumption 50 W typical below 15 GHz, 60 W typical above 15 GHz

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General Specifications (Cont.)

Physical

Weight	17 pounds [7.71kg] nominal, 20 pounds [9.07kg] maximum
Front Panel connectors	
RF Band	
Below 22 GHz	SMA female
L-Band	N female
RF band monitor	SMA female compatible (available as option below 22 GHz)
L-Band monitor	SMA female with termination (available as Option 6A)
External reference input.....	SMA female with termination
Status/control interface*	MS3116F14-18P for summary alarm, RS422/485 and redundancy
Remote interface*	RJ-45 female for Ethernet, RS422/485 available on status connector
Primary power input.....	FCI clipper series CL1M1102*
Rear Panel connectors (above 22 GHz)	
RF band	WR-28 standard
RF band monitor	SMA female compatible (available as option)

Note: * Unit supplied with mating connector.

Environmental

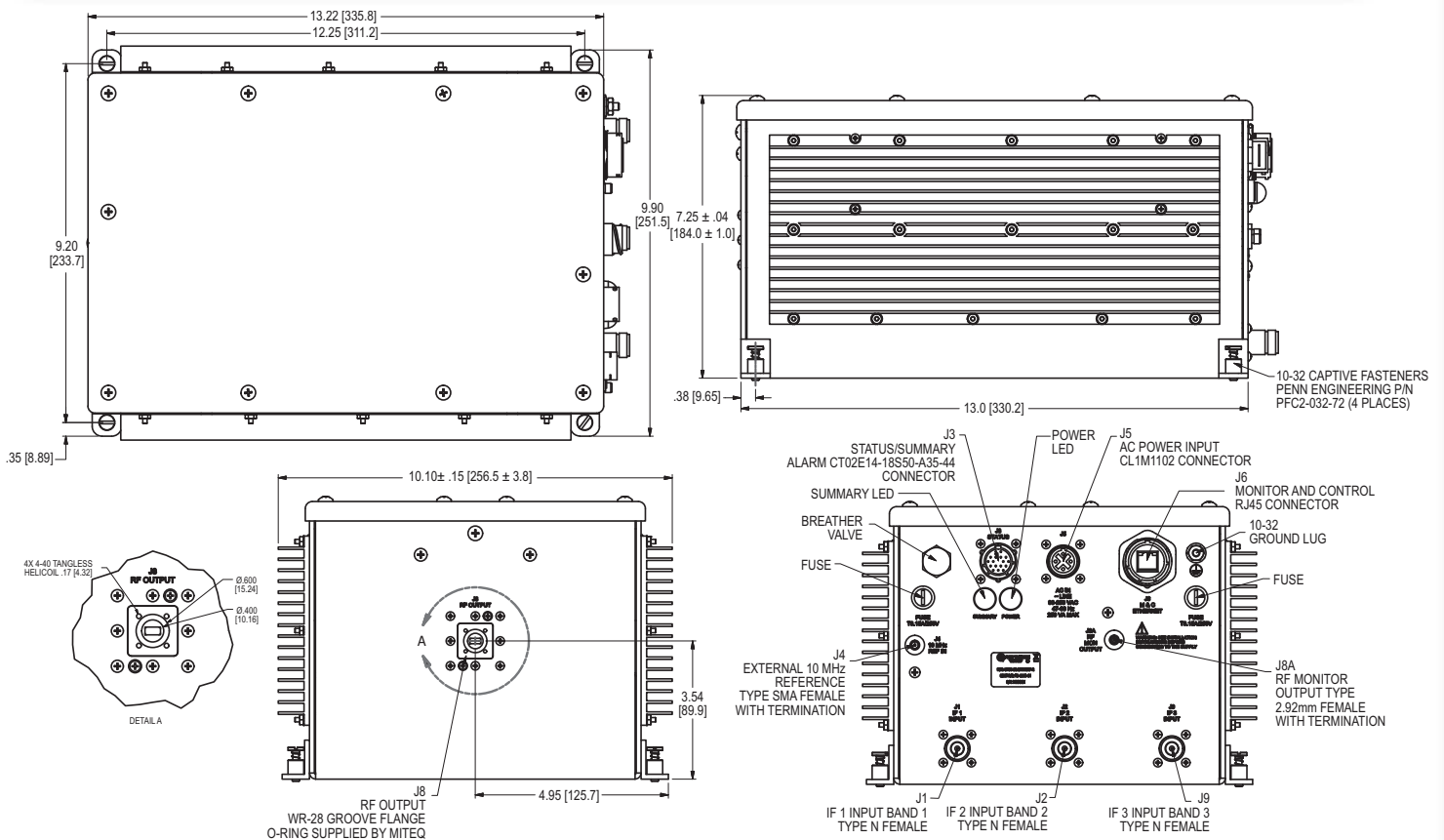
Operating

Ambient temperature	-40 to +50°C
Atmospheric pressure.....	Up to 10,000 feet

Nonoperating

Ambient temperature	-50 to +70°C
Atmospheric pressure.....	Up to 40,000 feet
Shock and vibration	Normal handling by commercial carriers

Outline Drawing



NOTE: Dimensions shown in brackets [] are in millimeters.



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