

This series of Ka-band Outdoor Block upconverters and Downconverters are designed for antenna mounting.

A strong set of monitor and control functions support powerful remote control. A contact closure summary alarm is provided for fault monitoring.

The standard phase noise is compliant with IESS-308/309.



## STANDARD FEATURES

- Small-sized weather resistant enclosure
- RS422, RS485 and 10/100 Base-T Ethernet
- RF and L-band monitor ports
- Automatic 5/10 MHz internal/external reference selection
- 10 MHz output monitor
- Electronic adjust of internal reference frequency
- IESS-308/309 phase noise
- Low intermodulation distortion
- Mute function on alarm or external mute input command
- Elapsed time and event log after power turn on

## OPTIONS

- Reference clean-up loop and improved stability

### BLOCK UPCONVERTERS

Band	RF Output (GHz)	L-Band (GHz)	LO (GHz)	Model Number
1	27.5-28.5	0.95-1.95	26.05	UBE-4KaL
2	28-29	0.95-1.95	27.05	
3	29-30	0.95-1.95	28.05	
4	30-31	0.95-1.95	29.05	

### BLOCK DOWNCONVERTERS

Band	RF Input (GHz)	L-Band (GHz)	LO (GHz)	Model Number
1	17.7-18.7	0.95-1.95	16.75	DBE-4LKa
2	18.3-19.3	0.95-1.95	17.35	
3	19.2-20.2	0.95-1.95	18.25	
4	20.2-21.2	0.95-1.95	19.25	

## SPECIFICATIONS

INPUT CHARACTERISTICS -	UPCONVERTER	DOWNCONVERTER
Return Loss (50 Ohms)	12 dB minimum	
LO Leakage	N/A	-80 dB maximum
Input Level range	-40 to -15 dBm	N/A
Input Monitor	N/A	0 ±4 dB above RF level
Input Level range (non-damage)	0 dBm	

## OUTPUT CHARACTERISTICS -

Return Loss (50 ohms)	12 dB minimum	
Output signal range	-15 to 0 dBm	
Power Output (1 dB Compression)	+8 dBm minimum at max gain	+15 dBm
Output monitor	20 dBc nominal	N/A

## TRANSFER CHARACTERISTICS -

Gain	27-34 dB at center frequency						
Level Control	30 dB in 0.5 dB ±1 dB steps			20 dB in 0.5 dB ±0.5 dB steps			
Level Stability	±0.25 dB over any 20°C, ±1.5 dB over -40° to 60°C						
Amplitude Response	±0.5 dB/40 MHz maximum, ±3 dB maximum over RF frequency band						
Noise Figure at Minimum Attenuation	20 dB maximum			20 dB maximum at maximum gain			
Image Rejection	60 dB minimum						
Third Order Intermodulation Distortion With two inband signals each at -5 dBm, measured at the output	45 dBc minimum (+17.5 dBm IP3)			50 dBc minimum (+20 dBm IP3)			
Spurious Outputs (Inband) –							
Signal Related up to 0 dBm output	50 dBc minimum						
Signal Independent	-55 dBm maximum			-60 dBm maximum			
Signal harmonics	N/A			-45 dBc maximum at 0 dBm output			
Maximum Phase Noise (dBc/Hz) –	Offset (Hz)						
With Maximum Reference Phase	LO Frequency	10	100	1K	10K	100K	1M
10 Hz: -120 dBc/Hz	16 to 20 GHz	-32	-65	-75	-84	-95	-105
100 Hz: -145 dBc/Hz	Up to 30 GHz		-65	-75	-80	-95	-105
1 kHz: -160 dBc/Hz							
Frequency Stability	±5 x 10 <sup>-8</sup> , -40° to +60°C (reference 25°C)						
Frequency Aging	5 x 10 <sup>-9</sup> /day after 24 hours on time						
Automatic Reference Configuration	External 5 or 10 MHz at +5 ±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.						

## REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100Base-T Ethernet <ul style="list-style-type: none"> <li>• HTTP-based web server</li> <li>• Telnet access</li> </ul>

## INDICATORS and ALARMS

Status Indicator	Red LED: Alarm, Yellow LED: External Reference
Power ON Indicator	Green LED
Summary Alarm	Contact closure/open for DC voltage and local oscillator (programmable LNA current alarm on downconverters +12VDC at 250 mA )

Note: All specifications are at maximum gain unless otherwise noted.

## OPTIONS

71-1. 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

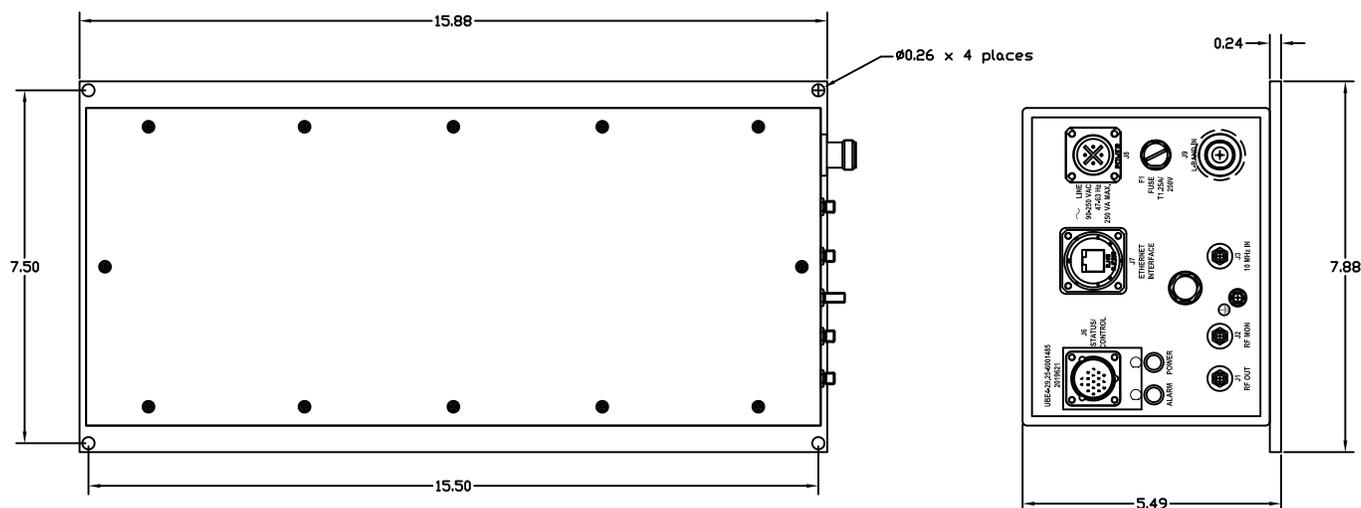
100 dB at 100 Hz offset

Frequency Stability:

$\pm 5 \times 10^{-9}$ , -40 to 60°C

Frequency Aging:

$1 \times 10^{-9}$  per day after 24 hours operation preceded by 10 days operation



Typical outline, shown with no options

## PRIMARY POWER REQUIREMENTS

Voltage..... 90-250 VAC  
Frequency..... 47-63Hz  
Consumption ..... 16W typical  
Fuse..... T1.25A

## PHYSICAL

Weight ..... 6 pounds (2.7 kg) nominal

### Connectors-

RF ..... Super SMA/2.92 mm female  
L-band ..... N female  
RF Monitor ..... 2.92 mm female  
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

Enclosure Rating ..... IP-65  
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