Ka-BAND OUTDOOR SELECTABLE BAND BLOCK CONVERTERS

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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	

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SPECIFICATIONS

	UPCONVERTER	DOWNCONVERTER
INPUT CHARACTERISTICS		
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	45 dBc minimum	50 dBc minimum
With two inband signals each at	(+17.5 dBm IP3)	(+20 dBm IP3)
0 dBm, measured at the output		
Spurious Outputs (Inband)		
Signal Related up to 0 dBm output	50 dBc minimum	
Signal Independent	-55 dBm maximum	-60 dBm maximum
Signal Harmonic	N/A	-45 dBc max.at 0 dBm output

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
16 to 20 GHz	-32	-65	-75	-84	-95	-105
Up to 30 GHz		-65	-75	-80	-95	-105

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 +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.

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REMOTE CONTROLS

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

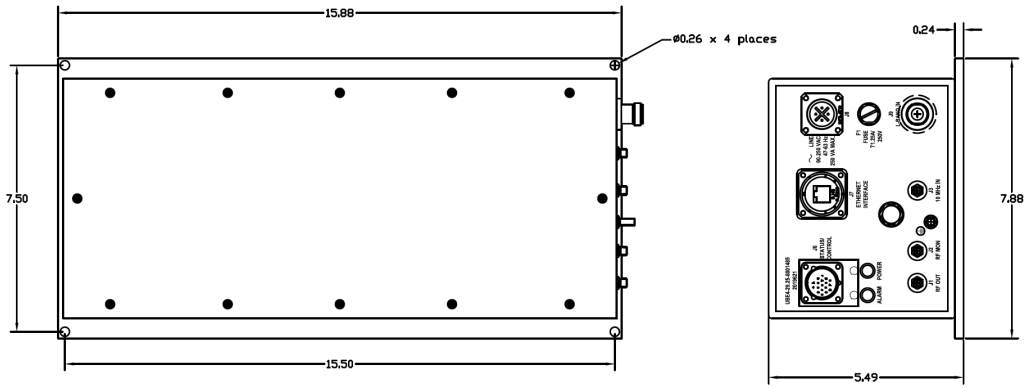
INDICATOR and ALARMS

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

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: ±5 x10^{-9}, -40 to 60°C
Frequency Aging: 1 x 10^{-9} per day after 24 hours operation preceded by 10 days operation.



Typical outline, shown with no options

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PRIMARY POWER REQUIREMENTS

Voltage	90-250 VAC
Frequency	47-63 Hz
Power Consumption	16W typical
Fuses	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

3 avenue du Canada, bât. Zeta, 91940 Les Ulis, France +33 1 69 18 19 30 www.eurosatcom.eu sales@eurosatcom.eu