

SELECTABLE FREQUENCY BAND OUTDOOR BLOCK CONVERTERS FOR SATELLITE COMMUNICATION

These Selectable Band Outdoor Block Converters are designed for applications where frequency translation is needed between the transponder and demodulator with a minimum of amplitude and group delay distortion.



STANDARD FEATURES

- 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
- Low 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

DOWNCONVERTERS

Band	Input Frequency Band (GHz)	Output Frequency Band (GHz)	LO Frequency (GHz)	Model Number
1	10.7 - 11.45	0.95 - 1.7	9.75	DBE-3KuL
2	11.45 - 12.2	0.95 - 1.7	10.5	
3	12.2 - 12.75	0.95 - 1.5	11.25	
1	10.95 - 11.7	0.95 - 1.7	10	DBE-3KuL-1
2	11.7 - 12.2	0.95 - 1.45	10.75	
3	12.2 - 12.75	0.95 - 1.5	11.25	
1	10.7 - 11.7	0.95 - 1.95	9.75	DBE-3KuL-2
2	11.45 - 12.45	0.95 - 1.95	10.5	
3	12.2 - 13.25	0.95 - 2	11.25	
1	10.7 - 11.75	0.95 - 2	9.75	DBE-2KuL
2	11.7 - 12.75	0.95 - 2	10.75	

OPTIONS

- High performance package
- Lower gain
- Reference clean-up loop and improved frequency stability

UPCONVERTERS

Band	Output Frequency Band (GHz)	Input Frequency Band (GHz)	LO Frequency (GHz)	Model Number
1	12.75 - 13.25	0.95 - 1.45	11.8	UBE-2LKu
2	13.75 - 14.8	0.95 - 2	12.8	
3	10.7 - 11.7	0.95 - 1.95	9.75	UBE-2LKu-1
1	11.7 - 12.75	0.95 - 2	10.75	



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CONVERTER SPECIFICATIONS

	UPCONVERTER	DOWNCONVERTER				
INPUT CHARACTERISTICS						
Return Loss (50 Ohms)	18 dB minimum	18 dB minimum				
Signal Monitor		-20 dBc nominal				
LO Leakage	N/A	-80 dB maximum				
OUTPUT CHARACTERISTICS						
Return Loss (50 ohms)	18 dB minimum	18 dB minimum				
Signal Monitor		-20 dBc nominal				
Power Output (1 dB Compression)	+13 dBm minimum	+18 dBm minimum				
TRANSFERT CHARACTERISTICS						
Gain	30 dB, ±3 dB at 23°C	35 dB, ±3 dB at 23°C				
RF-band Level Control		15 dB in 0.2 dB steps				
L-band Level Control		30 dB in 0.2 dB steps				
Level Stability		±0.25 dB maximum constant temperature				
Amplitude Response	±0.25 dB/40 MHz maximum, ±1 dB maximum over RF frequency band					
Slope Adjust		0 to 6 dB				
Noise Figure at Minimum Attenuation	N/A	15 dB maximum				
Noise Power Density	-125 dBm/Hz maximum	N/A				
Image Rejection		60 dB minimum				
Third Order Intermodulation Distortion	50 dBc minimum	60 dBc minimum				
With two inband signals each at	(+25 dBm IP3)	(+30 dBm IP3)				
0 dBm, measured at the output						
Spurious Outputs (Inband)						
Signal Related	60 dBc minimum up to 0 dBm output					
	(including 2 x1 spurious on 1 GHz IF bandwidth units)					
Signal Independent	-70 dBm maximum					
Maximum Phase Noise (dBc/Hz) –						
With Maximum Reference Phase Noise:						
	Offset (Hz)					
	10	100	1K	10K	100K	1M
Converter	-50	-70	-90	-95	-95	-115
Maximum Reference	-120	-145	-160			
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					
Upconverter Mute	60 dB minimum on summary alarm or mute command..					

REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100 Base-T Ethernet interface providing: - HTTP-based web server - SNMP 1.0 configuration - Alarm reporting via SNMP - Telnet Access - Password protection

INDICATOR and ALARMS

Status Indicator	Green LED (front panel)
Power ON Indicator	Red LED (front panel)
Summary Alarm	Contact closure/open for DC voltage and local oscillator



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OPTIONS

45-1. High Performance Package -

Power Output (1 dB Compression)

Gain Slope

Level Stability

Group Delay

Spurious Outputs (Inband)

Signal Related

Signal Independent

Image Rejection

Intermodulation Distortion (Third Order)

Noise Spectral Density

AM/PM Conversion (at 0 dBm Output)

Upconverter Mute

20 dBm minimum

0.03 dB/MHz maximum

± 0.25 dB/day maximum at constant temperature,

1.0 dB peak-to-peak maximum, 0 to 50°C

1 ns peak-to-peak maximum

65 dBc minimum at 0 dBm output

-80 dBm maximum

80 dB minimum

With two inband signals at 0 dBm output, third order intermodulation products are less than 60 dBc minimum.

-85 dBm/4 kHz maximum

0.1°/dB maximum

80 dB minimum on summary alarm, external mute input control or remote command

45-2. 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)

45-3. 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)

45-4. 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: $\pm 5 \times 10^{-9}$, -40 to 60°C

Frequency Aging: 1×10^{-9} per day after 24 hours operation



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PRIMARY POWER REQUIREMENTS

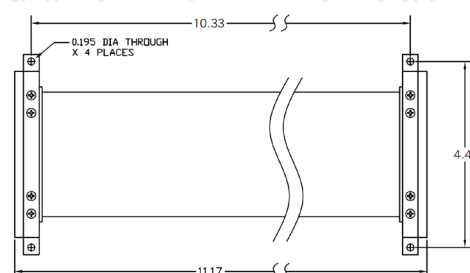
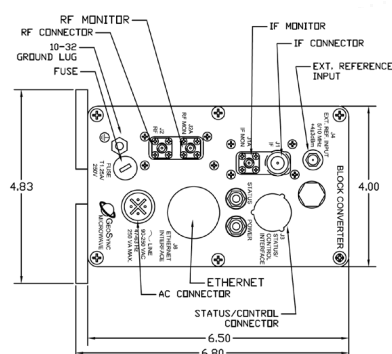
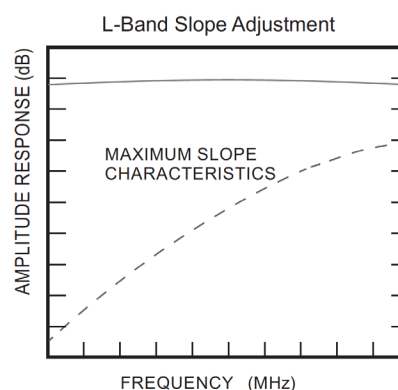
Voltage	90-250 VAC
Frequency	47-63 Hz
Consumption	20W typical
Fuse	T1.25A

PHYSICAL

Weight	6 pounds (2.7 kg) nominal
Connectors	
RF	SMA female
L-band	N female
RF Up Out 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

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



NOTE:
1. MOUNTING LEGS CAN BE DISASSEMBLED AND REINSTALLED ON WIDE SIDE OF ENCLOSURE (SHOWN INSTALLED ON NARROW SIDE).
2. TAPPED 10-32 HOLES AVAILABLE ON SUPPLIED MOUNTING LEGS. FOR DIMENSIONS OF THIS CONFIGURATION PLEASE CONSULT TECH-NOTE.



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