

OUTDOOR BLOCK CONVERTERS WITH HIGH PERFORMANCE OPTIONS

This series of 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.



STANDARD FEATURES

- Small-sized weather resistant enclosure
- Amplitude slope adjust
- RS422, RS485 and 10/100Base-T Ethernet
- Serial output for Redundancy Switchover units
- RF and L-band monitor ports
- Automatic 5/10 MHz internal/external
- Electronic adjust of internal reference frequency
- Low intermodulation distortion
- Low phase noise
- 64 programmable memory locations
- 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

BLOCK UPCONVERTERS

Input (GHz)	Output (GHz)	LO (GHz)	Model Number
0.95 - 1.525	5.85 - 6.425	7.375	UBE-6.1-INV
0.95 - 1.75	5.85 - 6.65	4.9	UBE-6.25
0.95 - 1.825	5.85 - 6.725	4.9	UBE-6.28
0.95 - 1.35	6.7 - 7.1	5.75	UBE-6.9
0.95 - 1.45	7.9 - 8.4	6.95	UBE-8.15
0.95 - 2.05	11.7 - 12.75	10.75	UBE-12.25
0.95 - 1.45	12.75 - 13.25	11.8	UBE-13
0.95 - 1.7	13.75 - 14.5	12.8	UBE-14.125
0.95 - 1.45	14 - 14.5	13.05	UBE-14.25
0.95 - 1.75	17.3 - 18.1	16.35	UBE-17.7
0.95 - 2.05	17.3 - 18.4	16.35	UBE-17.85
0.95 - 1.25	18.1 - 18.4	17.15	UBE-18.25

OPTIONS

- High performance package
- Lower gain
- Reference clean-up loop and improved frequency stability
- Lower phase noise (high performance package)

BLOCK DOWNCONVERTERS

Input (GHz)	Output (GHz)	LO (GHz)	Model Number
3.4 - 4.2	0.95 - 1.75	5.15	DBE-3.8-INV
3.4 - 4.2	0.95 - 1.75	9/6.55	DBE-3.8
3.7 - 4.2	0.95 - 1.45	9/6.25	DBE-3.95
4.5 - 4.8	0.95 - 1.7	3.55	DBE-4.65
7.25 - 7.75	0.95 - 1.45	6.3	DBE-7.5 ^{*(Note 1)}
7.9 - 8.4	0.95 - 1.45	6.95	DBE-8.15
10.7 - 11.7	0.95 - 1.95	9.75	DBE-11.2
10.95 - 11.7	0.95 - 1.7	10	DBE-11.35
11.2 - 12	0.95 - 1.75	10.25	DBE-11.6
11.4 - 12.2	0.95 - 1.75	10.45	DBE-11.8
11.45 - 12.25	0.95 - 1.75	10.5	DBE-11.85
11.7 - 12.5	0.95 - 1.75	10.75	DBE-12.1
11.7 - 12.75	0.95 - 2	10.75	DBE-12.225
12.2 - 12.75	0.95 - 1.5	11.25	DBE-12.475
12.2 - 13.25	0.95 - 2	11.25	DBE-12.725
13.75 - 14.5	0.95 - 1.7	12.8	DBE-14.125

NOTE: The DBE-7.5 Block Downconverter incorporates an inter-stage filter to attenuate the transmit frequency. Published performance will be maintained with the presence of a 7.9 GHz signal at a level of -5 dBm.



OUTDOOR BLOCK CONVERTERS WITH HIGH PERFORMANCE OPTIONS

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	15 dB maximum	15 dB maximum at maximum gain
	18 dB maximum >1 GHz IF bandwidth	
Image Rejection		60 dB minimum
Third Order Intermodulation Distortion	50 dBc minimum	60 dBc minimum
With two inband signals each at 0 dBm, measured at the output	(+25 dBm IP3)	(+30 dBm IP3)
Spurious Outputs (Inband)		
Signal Related up to 0 dBm output		65 dBc minimum
Signal Independent		-75 dBm maximum
Signal Harmonic Related up to 0 dBm output	65 dBc minimum (including 2 x 1 spurious on IF bandwidths >1 GHz)	60 dBc minimum (Including 2nd harmonic)
Maximum Phase Noise (dBc/Hz) – With Maximum Reference Phase Noise:		
10 Hz: -120 dBc/Hz	< 6.7 GHz	-52
100 Hz: -145 dBc/Hz	< 12 GHz	-46
1 kHz: -160 dBc/Hz	< 17.15 GHz (dual conv)	-45
Frequency Stability	$\pm 5 \times 10^{-8}$, -40° to 60°	
Frequency Aging	5 x 10 ⁻⁹ /Day after 24 hours on time	
Automatic Reference Configuration	External 5 or 10 MHz at +4 ± 3 dBm.	

REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100 Base-T Ethernet
	- HTTP-based web
	- SNMP1.0
	- Alarm reporting via SNMP
	- Telnet Access
	- Password protection

INDICATOR and ALARMS

Status Indicator	Red LED; Alarm, Yellow LED
Power ON Indicator	Green LED
Summary Alarm	Contact closure/open for DC voltage and local oscillator



OUTDOOR BLOCK CONVERTERS WITH HIGH PERFORMANCE OPTIONS

OPTIONS (1/2)

3-1. High Performance Package -

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
Group Delay	1 ns peak-to-peak maximum
Spurious Outputs (Inband)	
Signal Related	-65 dBc minimum at 0 dBm output
Signal Independent	-80 dBm maximum
Local Oscillator Leakage	-65 dBm maximum (upconverters only)
Image Rejection	80 dB minimum
Intermodulation Distortion (Third Order)	With two inband signals at 0 dBm output, third order intermodulation products are less than 60 dBc minimum.

High Performance Phase Noise (dBc/Hz) (Maximum) -

	Offset (Hz)					
LO Frequency	10	100	1K	10K	100K	1M
<6.7 GHz	-54	-78	-108	-116	-119	-136
<12 GHz	-48	-73	-103	-112	-115	-132
<17.15 GHz	-47	-70	-100	-108	-111	-128

AM/PM Conversion (at 0 dBm Output)	0.1°/dB maximum
Upconverter Mute	80 dB minimum on summary alarm, external mute input control or remote command

3-1A High Performance Phase Noise only. Standard IF/RF performance.

Note: Consult factory for lower phase noise options.

3- 1B High Dynamic Range -

Power output (1 dB compression)	20 dBm minimum
Group delay	1 ns peak-to-peak maximum

3-2. 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)

3-3. 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)

3-4. 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 x 10⁻⁹, -40 to 60°C
Frequency Aging: 1 x 10⁻⁹ per day after 24 hours operation



OUTDOOR BLOCK CONVERTERS WITH HIGH PERFORMANCE OPTIONS

OPTIONS (2/2)

3-5. DC Power Input

+24 to +32 VDC input

3-6. RF Output Detector (upconverters only)

RF Output Detector (upconverters only)

PRIMARY POWER REQUIREMENTS

Voltage

90-250 VAC

Frequency

47-63 Hz

Consumption

40W typical

Fuse

T1.25A

PHYSICAL

Weight

6 pounds (2.7 kg) nominal

Connectors

RF

SMA female

L-band

N female

RF Monitor

SMA female

L-band Monitor

SMA female

External Reference

SMA female

Status/Control Interface

Status/Control Interface 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

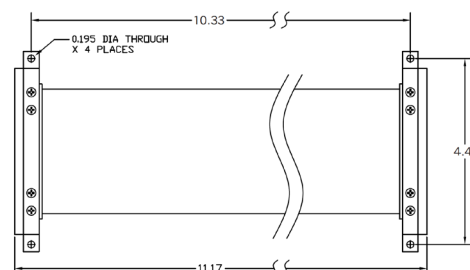
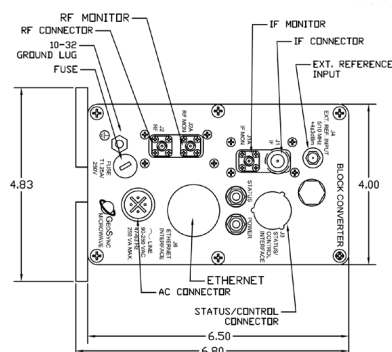
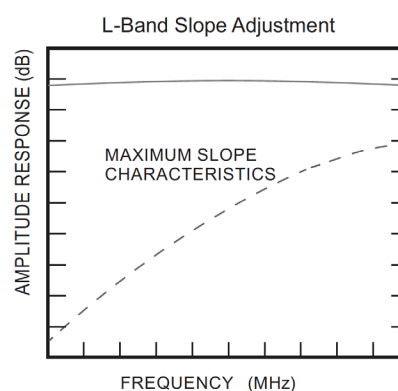
-50 to +70°C

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.

GS3-SPC, Rev D 3/16