

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 reference selection
- 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 |

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.



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*(Note1) |
| 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 |

SPECIFICATIONS

| INPUT CHARACTERISTICS- | UPCONVERTER | DOWNCONVERTER |
|------------------------|-----------------|----------------|
| 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 |

TRANSFER CHARACTERISTICS -

| | | |
|--|---|--|
| Gain | 30 dB, ± 3 dB at 23°C | 35 dB, ± 3 dB at 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 frequencyband | |
| Slope Adjust | 0 to 6 dB | |
| Noise Figure at Minimum Attenuation | 15 dB maximum 18 dB maximum ≥ 1 GHz IF bandwidth | 15 dB maximum at maximum gain |
| Image Rejection | 60 dB minimum | |
| Third Order Intermodulation Distortion With two inband signals each at 0 dBm, measured at the output | 50 dBc minimum (+25 dBm IP3) | 60 dBc minimum (+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: | LO Frequency | Offset (Hz) |
| 10 Hz: -120 dBc/Hz | 10 | 100 |
| 100 Hz: -145 dBc/Hz | 1K | 10K |
| 1 kHz: -160 dBc/Hz | 100K | 1M |
| | ≤ 6.7 GHz | -52 |
| | < 12 GHz | -80 |
| | < 17.15 GHz (dual conv) | -73 |
| | | -84 |
| | | -90 |
| | | -94 |
| | | -100 |
| | | -104 |
| | | -100 |
| | | -110 |
| | | -115 |
| Frequency Stability | $\pm 5 \times 10^{-8}$, -40° to 60°C | |
| Frequency Aging | 5×10^{-9} /Day after 24 hours on time | |
| Automatic Reference Configuration | External 5 or 10 MHz at +4 ± 3 dBm. If external reference is below +1 dBm nominal, the converter will automatically lock to the internal reference. | |

REMOTE CONTROLS

| | |
|--------------------|----------------------------|
| Serial Interface | RS485/RS422 |
| Ethernet Interface | 10/100Base-T Ethernet |
| | • HTTP-based web |
| | • SNMP 1.0 |
| | • Alarm reporting via SNMP |
| | • Telnet access |
| | • Password protection |

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 |

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

OPTIONS

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) -

| LO Frequency | Offset(Hz) | | | | | |
|--------------|------------|-----|------|------|------|------|
| | 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: $\pm 5 \times 10^{-9}$, -40 to 60°C
Frequency Aging: 1×10^{-9} per day after 24 hours operation preceded by 10 days operation

3-5. DC Power Input

+24 to +32 VDC input

3-6. RF Output Detector (upconverters only) Composite output RF detector

PRIMARY POWER REQUIREMENTS

Voltage..... 90-250 VAC
 Frequency..... 47-63Hz
 Consumption 40W typical
 Fuse..... T1.25A

PHYSICAL

Weight 6 pounds (2.7 kg) nominal

Connectors-

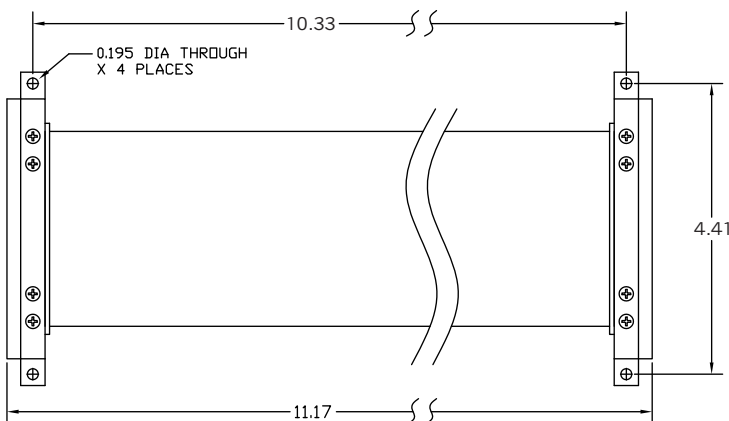
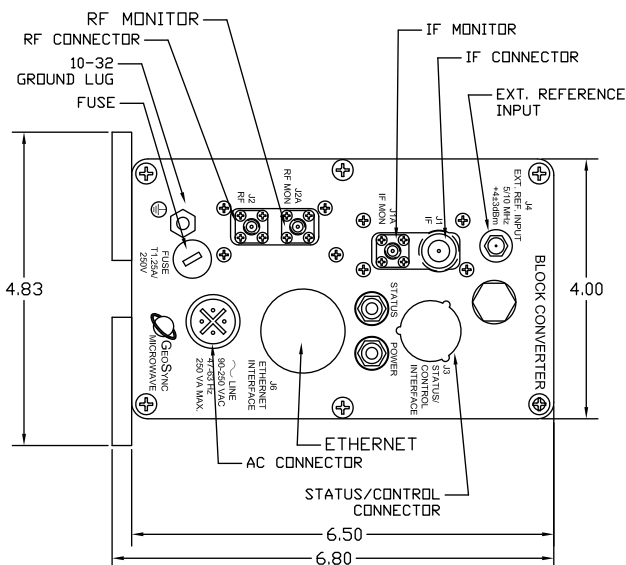
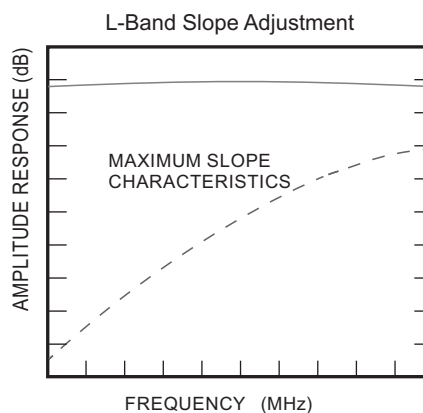
RF SMA female
 L-band N female
 RF Monitor SMA female
 L-band Monitor SMA female
 External Reference..... SMA female
 Status/Control Interface MS3116F14-18P type for summary alarm, RS422, RS485, and LNA power

 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.