



## COMMUNICATION CONVERTERS SINGLE CONVERSION, FIXED FREQUENCY

**1.0-2.5 GHz RF FREQUENCY RANGE**  
**70 ±20 MHz or 140 ±40 MHz IF FREQUENCY**



*Panel for remote option*

### STANDARD FEATURES

- RF and IF monitor ports
- Low intermodulation distortion
- Low phase noise
- 30 dB level control
- Automatic switching to external 5/10 MHz reference
- Single conversion
- No spectral inversion
- Summary alarm
- Remote mute via contact closure (upconverters)

### OPTIONS

- Output amplifier for increased dynamic range (upconverters)
- Fully redundant operation
- Increased RF/IF gain (downconverters)
- RS422, RS485 and 10/100 Base-T Ethernet

	UPCONVERTERS	DOWNCONVERTERS
<b>Model Number</b>	UBR-(YY)-(XXXX)	DBR-(XXXX)-(YY)
<b>Input Center Frequency</b>	(YY) 70 ±20 MHz or 140 ±40 MHz (Other optional frequencies available)	(XXXX) 1000-2500 MHz band, 1.0 MHz minimum increments
<b>Output Center Frequency</b>	(XXXX) 1000-2500 MHz band, 1.0 MHz minimum increments	(YY) 70 ±20 MHz or 140 ±40 MHz (Other optional frequencies available)
<b>Examples:</b>	UBR-70-1425 Upconverter 70 ±20 MHz to 1425 ±20 MHz UBR-140-1425 Upconverter 140 ±40 MHz to 1425 ±40 MHz	DBR-1750-70 Downconverter 1750 ±20 MHz to 70 ±20 MHz DBR-1750-140 Downconverter 1750 ±40 MHz to 140 ±40 MHz

SPECIFICATIONS	UPCONVERTER	DOWNCONVERTER
Type	Single conversion	
Tunability	None	
Frequency Sense	No inversion	

### INPUT CHARACTERISTICS

Frequency	70 ±20 MHz (140 ±40 MHz, Option 8-1)	1000-2500 MHz band
Impedance	75 ohms (50 ohms, Option 8-3)	50 ohms
Return Loss	18 dB minimum	18 dBm minimum

### OUTPUT CHARACTERISTICS

Frequency	1000-2500 MHz band	70 ±20 MHz (140 ±40 MHz, Option 8-1)
Impedance	50 ohms	75 ohms (50 ohms, Option 8-3)
Return Loss	18 dBm minimum	18 dBm minimum
Power Output (1 dB Compression)-	-5 dBm nominal (up to +10 dBm with optional output amplifiers, refer to options)	+15 dBm typical, +10 dBm minimum

### TRANSFER CHARACTERISTICS

Gain	11 dB nominal at minimum attenuation	30 dB nominal at minimum attenuation (higher gain optional)	
Level Stability	±0.25 dB/day maximum at constant temperature		
Amplitude Response	0.5 dB peak-to-peak/40 MHz maximum, 70 MHz IF 0.75 dB peak-to-peak/80 MHz maximum 140 MHz IF (Option 8-1)		
Gain Slope	0.02 dB/MHz maximum		
Noise Figure	N/A	15 dB maximum (at minimum attenuation)	
Image Rejection	70 dB minimum		
Third Order Intermodulation Distortion	Two -20 dBm output signals, 50 dBc minimum (+5 dBm IP3)	Two -10 dBm output signals, 60 dBc minimum (+20 dBm IP3)	
LO Leakage at RF	-60 dBm maximum (output)	-60 dBm maximum (input)	
Gain Adjust	30 dB minimum		
Frequency Stability	±2 x 10 <sup>-8</sup> , 0 to 50° C		
Frequency Aging	5 x 10 <sup>-9</sup> /day typical (fixed temperature after 24 hours on time)		
External Reference	5 or 10 MHz, +4 ±3 dBm Automatic switch to the internal reference if the external reference level falls below +1 dBm nominal		
Phase Noise (dBc/Hz) – With Maximum Reference Phase Noise	Offset	Maximum	Typical
	10 Hz	-63	-70
	100 Hz	-76	-80
	1 kHz	-86	-90
	10 kHz	-90	-93
	100 kHz	-100	-102
	1 MHz	-127	-130
Upconverter Mute	60 dB minimum	N/A	

### INDICATOR and ALARMS

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

### CONTROLS

Level Control	Front panel knob, single turn
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## OPTIONS

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- 8-1. 140 MHz IF frequency
- 8-2. Increase Output Power and Gain-
- A. Upconverters Only ..... +5 dBm minimum power output,  
22 dB nominal gain (1 dB compression)
  - B. Upconverters Only ..... +10 dBm minimum power output,  
28 dB nominal gain (1 dB compression)
- 8-3. 50 ohm IF impedance
- 8-4. Higher Gain Option-
- A. Downconverters Only ..... 40 dB RF/IF gain
  - B. Downconverters Only ..... 50 dB RF/IF gain
- 8-5. 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:  
 $\pm 2 \times 10^{-9}$ , 0 to 50°C  
Frequency Aging:  
1 x 10<sup>-9</sup> per day after 24 hours operation preceded by 10 days operation
- 8.6 Remote Controls -
- Serial Interface ..... RS422/RS485
  - Ethernet Interface ..... 10/100 Base-T Ethernet interface providing:
    - HTTP-based web server
    - SNMP 1.0 configuration
    - Alarm reporting via SNMP Trap
    - Telnet access
    - Password protection

## PRIMARY POWER REQUIREMENTS

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

## SUMMARY ALARM

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Contact closure/open for DC voltage and/or LO alarm

## PHYSICAL

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Weight .....	9 pounds (4.08 kg) nominal without rack slides 13 pounds (5.9 kg) nominal with rack slides
Chassis Dimensions .....	19" x 1.75" panel height x 20" maximum (chassis depth 20")
Connectors -	
RF .....	N female
RF Monitor .....	SMA female
IF .....	BNC female
IF Monitor.....	BNC female
External Reference .....	BNC female
Summary Alarm .....	DE-9P
Redundancy Alarm .....	DE-9P
Remote Mute (Upconverters Only).....	DE-9S
For Option 8-6 Connectors-	
RS422, RS485.....	DE-9P
Ethernet .....	RJ-45 female

## ENVIRONMENTAL

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Operating -	
Ambient Temperature .....	0 to +50°C
Relative Humidity .....	Up to 95% at 30°C
Altitude .....	Up to 10,000 feet
Non-operating -	
Ambient Temperature .....	-50 to +70°C
Relative Humidity .....	Up to 95% at 40°C
Altitude .....	Up to 40,000 feet
Shock and Vibration .....	Normal handling by commercial carriers

**NOTE:** FOR DESCRIPTION OF OPERATION REFER TO TECHNICAL NOTE GS8-TCN.