



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
- 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

These Selectable Band 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.

OPTIONS

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

CONVERTER MODELS

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	DBR-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	DBR-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	DBR-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	DBR-2KuL
2	11.7 - 12.75	0.95 - 2	10.75	
1	10.7 - 11.9	0.95 - 2.15	9.75	DBR-2KuL-1
2	11.8 - 13	0.95 - 2.15	10.85	
1	17.0 - 18.25	0.95 - 2.2	16.05	DBR-4KaL
2	18.25 - 19.5	0.95 - 2.2	17.25	
3	19.5 - 20.75	0.95 - 2.2	18.55	
4	20.75 - 22	0.95 - 2.2	19.8	
1	17.0 - 18.2	0.95 - 2.15	16.05	DBR-5KaL
2	18.2 - 19.2	0.95 - 1.95	17.3	
3	19.2 - 20.2	0.95 - 1.95	18.25	
4	20.2 - 21.2	0.95 - 1.95	19.25	
5	21.2 - 22.2	0.95 - 1.95	20.25	
1	17.0 - 17.8	0.95 - 1.75	16.05	DBR-7KaL
2	17.7 - 18.5	0.95 - 1.75	16.75	
3	18.4 - 19.2	0.95 - 1.75	17.45	
4	19.1 - 19.9	0.95 - 1.75	18.15	
5	19.8 - 20.6	0.95 - 1.75	18.85	
6	20.5 - 21.3	0.95 - 1.75	19.55	
7	21.2 - 22.0	0.95 - 1.75	20.25	

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	UBR-2LKu
2	13.75 - 14.8	0.95 - 2	12.8	
1	10.7 - 11.7	0.95 - 1.95	9.75	UBR-2LKu-1
2	11.7 - 12.75	0.95 - 2	10.75	

CONVERTER 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 (1dB Compression) –	+13 dBm minimum	+18 dBm minimum

TRANSFER CHARACTERISTICS -

Gain	30 dB, ± 3 dB at 23°C	35 dB, ± 3 dB at 23°C					
RF 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/day maximum at 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 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	65 dBc minimum up to 0 dBm output (including 2x1 spurious on 1 GHz IF bandwidth units)						
Signal Independent	-75 dBm maximum						
Maximum Phase Noise (dBc/Hz) –	Offset (Hz)						
	10	100	1K	10K	300K	1M	
Ku band Multi-band units	-50	-70	-90	-95	-95	-115	
Ka band Multi-band units	-47	-67	-87	-92	-92	-112	
Maximum reference	-120	-145	-160				
Frequency Stability	$\pm 2 \times 10^{-8}$, 0° to 50°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.						
Upconverter Mute	60 dB minimum on summary alarm or mute command.						

OPTIONS

29-1. 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 peak-to-peak maximum, 0 to 50°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
Image Rejection	80dB minimum
Intermodulation Distortion (ThirdOrder)	With two inband signals at 0 dBm output, third order intermodulation products are less than 60 dBc minimum.
Noise Spectral Density.....	-85 dBm/4 kHz maximum
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

29-2. Lower Gain..... 20 \pm 3 dB at 23°C, 18 dB noise figure
(20 dB noise figure for upconverters with 1 GHz bandwidth)
(2x1 signal related, 65 dBc at -10 dBm output)

29-3. LowerGain 10 \pm 3 dB at 23°C, 20 dB noise figure
(22 dB noise figure for upconverters with 1 GHz bandwidth)
(2x1 signal related, 65 dBc at -10 dBm output)

29-4. Reference Clean-up Loop and Improved Frequency Stability Reference oscillator acts as an digital 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, and 100 dB at 100 Hz offset
Frequency Stability: $\pm 2 \times 10^{-9}$, 0 to 50°C
Frequency Aging: 1×10^{-9} per day after 24 hours operation preceded by 10 days operation.

29-4A. Reference Clean-up Loop. Reference oscillator acts as an digital phase lock with a 40 Hz nominal loop bandwidth. Typical loop suppression of the external reference is as follows: 24 dB at 100 Hz offset.
Frequency Stability: $\pm 2 \times 10^{-8}$, 0 to 50°C
Frequency Aging: 1×10^{-9} per day after 24 hours operation preceded by 10 days operation.

REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100Base-T Ethernet interface providing: <ul style="list-style-type: none"> • HTTP-based web server • SNMP 1.0 configuration • Alarm reporting via SNMP Trap • Telnet access • Password protection

INDICATOR and ALARMS

Remote Mode	Green LED (front panel)
Alarm	Red LED (front panel)
Summary Alarm	Contact closure status for DC voltage and local oscillator

PRIMARY POWER REQUIREMENTS

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

PHYSICAL

Weight 10 pounds (4.5 kg) nominal
 with rack slides,
 14 pounds (6.4 kg) nominal
 without rack slides

Chassis Dimensions 19" x 1.75" panel height
 x 20" maximum

Connectors -

RFSMA female
 L-band SMA female
 L-band Monitor SMA female
 External ReferenceBNC female
 Summary AlarmDE-9P
 Remote InterfaceDE-9S for RS422, RS485
 RJ-45 female for Ethernet
 Primary PowerIEC-320

ENVIRONMENTAL

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 45°C
 Altitude Up to 40,000 feet
 Shock and Vibration Normal handling by
 commercial carriers

