

V Series Frequency Converters

V Series 2200

When it comes to frequency converters, there are two key considerations: reliability and size. L-3 Satellite Networks has designed the frequency converters to meet exacting engineering and test standards as well as strict quality controls criteria, to be the most reliable on the market, and are combined and packaged to save you precious space.

Our state-of-the-art converter line includes single converters, redundant converters, and high-performance low phase noise converters. You can be assured we have the right configuration to meet your needs.

Applications

Intermediate Data Rate (IDR)
Intelsat Business Services (IBS)
Satellite Multi-service System (SMS)
Satellite News Gathering (SNG)
Disaster Recovery
Fly-Away Terminals

The V-series converters are designed to provide flexibility in system design. The V2200 converter is a premier space saving system, designed to deliver redundancy or up and down versatility in a single rack height unit. As a dual C- and Ku- band frequency converter, it offers superior performance using half the space of competitors' models.

Other features include 125 KHz step size frequency tuning, 1:1 redundancy, and either 70 or 140 MHz IF frequency capabilities.



FEATURE ENHANCEMENTS

The V2200 consists of a 1RU chassis and one or two converter trays. The chassis is comprised of redundant fans, a system M&C processor, IF and RF switches (optional), and front-panel controls and display. Each converter tray is equipped with a power supply and reference oscillator in addition to the converter module. The converter trays can be configured in any combination of the following: C- or Ku-Band, up or down converter, 70 or 140 MHz IF. This flexible architecture allows multiple and varied system configurations in one-half the space of the industry standard. Likely configurations include:

- 1:1 Redundant Up or Down Converter
- Up and Down Converter in a Single RU Chassis
- Dual Frequency Up or Down Converter
- Dual Up Converter
- Dual Down Converter



Specifications - V2200

Specifications

RF Output:
 Frequency Range
 Impedance
 Return Loss

RF Input:
 Frequency Range

Level:
 Operating Without Damage
 Impedance
 Return Loss

IF Output:
 Frequency Range
 Impedance
 Return Loss

IF Input:
 Frequency Range
 Impedance
 Return Loss

RFLO Monitor:
 Power Level

IF Monitor:
 Coupling

RF Monitor:
 Coupling

Phase Noise

Offset Frequency:
 100 Hz
 1 kHz
 10 kHz
 100 kHz
 1 MHz

RF/IF Performance:
 Gain
 Attenuation

Gain Flatness

Gain Stability
 +25° ±10°C
 0° to +50°C

Output 1 dB Compression
 Third Order Intercept Point
 Noise Figure

Amplitude Response
 70 ±20 MHz
 140 ±40 MHz

Linear Amplitude Slope Adjustment
 over 70 ±20 MHz, 140 ±40 MHz

Group Delay Response at
 70 ±20MHz:
 Parabolic
 Linear
 Ripple

Group Delay Response at
 140 ±40MHz:
 Parabolic
 Linear
 Ripple

AM/PM Conversion
 Spurious
 Carrier Dependant
 Spurious
 F₀ ±150 kHz (Including
 50/60 Hz harmonics)
 Carrier Independent
 LO Leakage
 Image Rejection

Frequency Stability:
 Over Temperature (0 to 50°C)
 24 hrs., Constant Ambient

C-Band Up Converter

5.845 to 6.725 GHz in 125 kHz step size
 50Ω, unbalanced, SMA
 23 dB, typical
 20 dB, minimum

70 ±20 MHz or 140 ±40 MHz
 75Ω, unbalanced, BNC
 23 dB, minimum

70 ±20 MHz or 140 ±40 MHz
 75Ω, unbalanced, BNC
 23 dB, minimum

0 dBm ±5 dB

-22 dBc ±4 dB

Level (dBc/Hz)
 -67
 -77
 -86
 -97
 -105

+30 dB minimum
 10 dB continuous & 0 to 31.5 dB in 0.5 dB steps via serial control

3.0 dB p-p over RF output frequency range

±0.30 dB
 ±0.75 dB

+9 dBm minimum at 30 dB gain
 +19 dBm minimum

±0.35 dB
 ±0.45 dB
 ±1.0 dB, typical

0.008 ns/MHz² maximum
 ±0.05 ns/MHz maximum
 1 ns p-p maximum

-0.003 ns/MHz² maximum
 ±0.03 ns/MHz maximum
 1 ns p-p maximum

0.1°/dB at -10 dBm output

-80 dBc at 30 dB gain, 0 dBm output
 -45 dBc

-75 dBm at 30 dB gain
 -65 dBm, out of band @ 30 dB gain
 -85 dBc at 30 dB gain

±1.0 x 10⁻⁸
 ±1.0 x 10⁻⁹

C-Band Down Converter

3.4 to 4.2 GHz in 125kHz step size

-80 to -35 dBm
 +13 dBm
 50Ω, unbalanced, SMA
 23 dB, typical; 20 dB, minimum

70 ±20 MHz or 140 ±40 MHz
 75Ω, unbalanced, BNC
 23 dB minimum

0 dBm ± 5dB

-20 dBc ±4 dB

Level (dBc/Hz)
 -67
 -77
 -86
 -97
 -105

+50 dB minimum
 10 dB continuous & 0 to 31.5 dB in 0.5 dB steps via serial control

3.0 dB p-p over RF output frequency range

±0.40 dB
 ±1.0 dB

+14 dBm minimum at 50 dB gain
 +24 dBm minimum
 13 dB maximum

±0.35 dB
 ±0.45 dB
 ±1.0 dB, typical

0.008 ns/MHz² maximum
 ±0.05 ns/MHz maximum
 1 ns p-p maximum

-0.003 ns/MHz² maximum
 ±0.03 ns/MHz maximum
 1 ns p-p maximum

0.1°/dB at 0 dBm output

-60 dBc, 0 dBm Out
 -45 dBc

-70 dBm at +50 dB gain
 -70 dBm, out of band @ 50 dB gain
 -70 dBc at 50 dB gain

±1.0 x 10⁻⁸
 ±1.0 x 10⁻⁹

KU Band Up Converter

13.75 to 14.5 GHz in 125 kHz step size
 50Ω, unbalanced, SMA
 23 dB, typical
 20 dB, minimum

70 ±20 MHz or 140 ±40 MHz
 75Ω, unbalanced, BNC
 23 dB, minimum

70 ±20 MHz or 140 ±40 MHz
 75Ω, unbalanced, BNC
 23 dB, minimum

0 dBm ±5 dB

-22 dBc ±4 dB

Level (dBc/Hz)
 -65
 -75
 -83
 -95
 -105

+30 dB minimum
 10dB continuous & 0 to 31.5 dB in 0.5 dB steps via serial control

3.0 dB p-p over RF output frequency range

±0.40 dB
 ±1.0 dB

+5 dBm minimum at 30 dB gain
 +15 dBm minimum

±0.35 dB
 ±0.45 dB
 ±1.0 dB, typical

0.008 ns/MHz² maximum
 ±0.05 ns/MHz maximum
 1 ns p-p maximum

0.003 ns/MHz² maximum
 ±0.03 ns/MHz maximum
 1 ns p-p maximum

0.1°/dB at -10 dBm output

-80 dBc at 30 dB gain, 0 dBm output
 -45 dBc

-70 dBm, at 30 dB gain
 -60 dBm, out of band @ 30 dB gain
 -85 dBc at 30 dB gain

±1.0 x 10⁻⁸
 ±1.0 x 10⁻⁹

KU Band Down Converter

10.95 to 12.75 GHz in 125 kHz step size

-80 to -35 dBm
 +13 dBm
 50Ω, unbalanced, SMA
 23 dB, typical; 20 dB, minimum

70 ±20 MHz or 140 ±40 MHz
 75Ω, unbalanced, BNC
 23 dB, minimum

0 dBm ±5 dB

-20 dBc ±4 dB

Level (dBc/Hz)
 -65
 -75
 -83
 -95
 -105

+50 dB minimum
 10 dB continuous & 0 to 31.5 dB in 0.5 dB steps via serial control

3.0 dB p-p over RF output frequency range

±0.40 dB
 ±1.0 dB

+14 dBm minimum at 50 dB gain
 +24 dBm minimum
 13 dB maximum

±0.35 dB
 ±0.45 dB
 ±1.0 dB, typical

0.008 ns/MHz² maximum
 ±0.05 ns/MHz maximum
 1 ns p-p maximum

0.003 ns/MHz² maximum
 ±0.03 ns/MHz maximum
 1 ns p-p maximum

0.1°/dB at 0 dBm output

-60 dBc, 0 dBm Out
 -45 dBc

-70 dBm at +50 dB gain
 -65 dBm, out of band @ 50 dB gain
 -65 dBc at 50 dB gain

±1.0 x 10⁻⁸
 ±1.0 x 10⁻⁹

V Series 2245

When you require backup protection of multiple online converter channels, consider the V2245 unit. A fully integrated redundant converter system, this unit can protect up to eight converters. Optional dual-polarization and standard dual internal power supplies make this an obvious choice for reliable backups.

The V2245 unit offers complete control of its 1:N (N = 8 maximum) system through a single, easy-to-use push-button interface and fits into any standard equipment rack or cabinet. Because it is scalable, this system is perfect for a startup system while also accommodating planned incremental growth. Our goal is to offer sufficient flexibility to meet a broad range of satellite telecommunications requirements. To achieve this, our converters are designed with features to support flexibility and scalability. They are also backed up by our 24/7 support service, as well as Satellite Networks' commitment to excellence.



Specifications - V2245

Physical

| | |
|--------|--|
| Size | 8.75 x 22 x 19 inch rack mountable (22.23 x 55.88 x 48.26 cm) |
| Weight | 60 lb. (27.22 kg) fully loaded |

Environmental

| | |
|-------------|---------------------------|
| Temperature | 0° to 50°C (32° to 122°F) |
| Humidity | 5 to 95% non-condensing |
| Altitude | 10,000 Feet MSL |

Prime Power

90 to 264 VAC, 47 to 63 Hz (48 VDC \pm 10% optional)
48W maximum (per tray), 25 W maximum chassis

Rear Panel Connections

| | |
|----------------------|------------------|
| Status | 37-pin D, Female |
| External Fault | 15-pin D, Female |
| Remote Control | 9-pin D, Female |
| Expansion Port | 9-pin D, Female |
| RF Connections | SMA, Female |
| IF Connections | BNC, Female |
| Ext Ref. Connections | BNC, Female |

RF Characteristics

RF Transfer Switch:

| | |
|----------------|--------------------------|
| Frequency | 3.4 to 14.5 GHz |
| Impedance | 50 Ω , unbalanced |
| Insertion Loss | 0.5 dB, maximum |

VSWR:

| | |
|----------------|-------|
| 3.4-4.2 GHz | 1:2:1 |
| 5.7-6.8 GHz | 1:3:1 |
| 10.8-12.75 GHz | 1:4:1 |
| 13.75-14.5 GHz | 1:5:1 |

IF Transfer Switch:

| | |
|----------------|--------------------------|
| Frequency | 50 to 200 MHz |
| Impedance | 75 Ω , unbalanced |
| Insertion Loss | 0.5 dB |
| VSWR | 1:2:1 |

Switching Time <300 msec.

Converter Configurations

| | |
|---------------------------|----------------------------|
| Uplink Converter, 70MHz | Ku-Band 13.75 to 14.50 GHz |
| Uplink Converter, 140 MHz | Ku-Band 13.75 to 14.50 GHz |
| Uplink Converter, 70 MHz | C-Band 5.845 to 6.725 GHz |
| Uplink Converter, 140 MHz | C-Band 5.845 to 6.725 GHz |
| Down Converter, 70 MHz | C-Band 3.40 to 4.20 GHz |
| Down Converter, 140 MHz | C-Band 3.40 to 4.20 GHz |
| Down Converter, 70 MHz | Ku-Band 10.95 to 12.75 GHz |
| Down Converter, 140 MHz | Ku-Band 10.95 to 12.75 GHz |

* See V2200 For Converter Performance Specifications



communications
Satellite Networks

125 Kennedy Drive • Hauppauge, NY 11788
Ph: +1-631/272.5600 • +1-800/666.7060
Fx: +1-631/272.5517
www.L-3com.com/satellitenetworks
Em: SN.mktg@L-3com.com