

V-SERIES CONVERTERS

MOST INTEGRATED AND SPACE SAVING SYSTEM AVAILABLE

The L-3 Narda V2200 Dual C- and Ku-Band Satellite Converter System for data quality applications has built-in 1:1 capabilities and is housed in a single Rack Unit (1RU). The V2200 is designed to meet the stringent requirements for Intelsat, IDR, IBS, and TDMA services. SCPC, FM-FDM, and HDTV are also supported.

FEATURES

- 1:1 Redundant System
- Up and Down Converter
- C- and Ku-Band frequencies
- Local and Remote M&C via RS-485 or RS-232
- 125 kHz Step Size
- Dual Power Supplies

- Dual Reference Capabilities
- 70 or 140 MHz IF Frequency
- Field Replaceable Converter Trays
- Offline Tray Replacement While Online Unit is Operational
- Automatic Configuration Restoral for Replacement Tray
- External Fault Inputs



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 for 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
- Monitor ports are easily accessible (view removing front panel)

APPLICATIONS

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

V2200 SPECIFICATIONS

SPECIFICATIONS	C-BAND UP CONVERTER	C-BAND DOWN CONVERTER	KU BAND UP CONVERTER	KU-BAND DOWN CONVERTER
RF Output: Frequency Range	5.845 to 6.725 GHz in 125 kHz step size		13.75 to 14.5 GHz in 125 kHz step size	
Impedance	50Ω, unbalanced, SMA		50Ω, unbalanced, SMA	
Return Loss	23 dB, typical 20 dB, minimum		23 dB, typical 20 dB, minimum	
RF Input: Frequency Range		3.4 to 4.2 GHz in 125kHz step size		10.95 to 12.75 GHz in 125 kHz step size
Level: Operating		-80 to -40 dBm +13 dBm		-80 to -40 dBm +13 dBm
Without Damage		50Ω, unbalanced, SMA		50Ω, unbalanced, SMA
Impedance		23 dB, typical; 19 dB, minimum		23 dB, typical; 20 dB, minimum
Return Loss				
IF Output: Frequency Range		70 ±20 MHz or 140 ±40 MHz		70 ±20 MHz or 140 ±40 MHz
Impedance		75Ω, unbalanced, BNC		75Ω, unbalanced, BNC
Return Loss		23 dB minimum		23 dB, minimum
IF Input: Frequency Range	70 ±20 MHz or 140 ±40 MHz		70 ±20 MHz or 140 ±40 MHz	
Impedance	75Ω, unbalanced, BNC		75Ω, unbalanced, BNC	
Return Loss	23 dB, minimum		23 dB, minimum	
RFLO Monitor: Power Level	0 dBm ±5 dB	5 dBm ±3dB	0 dBm ±5 dB	0 dBm ±5 dB
IF Monitor: Coupling		-22 dBc ±4 dB		-22 dBc ±4 dB
RF Monitor: Coupling	-22 dBc ±2 dB		-22 dBc ±2 dB	
Phase Noise				
Offset Frequency: Level (dBc/Hz)				
100 Hz	-67	-67	-65	-65
1 kHz	-77	-77	-75	-75
10 kHz	-86	-86	-83	-83
100 kHz	-97	-97	-95	-95
1 MHz	-105	-105	-105	-105
RF/IF Performance: Gain	+30 dB minimum	+50 dB minimum	+30 dB minimum	+50 dB minimum
Attenuation	10 dB continuous & 0 to 41.5 dB in 0.25 dB steps via serial control	10 dB continuous & 0 to 41.5 dB in 0.25 dB steps via serial control	10dB continuous & 0 to 41.5 dB in 0.25 dB steps via serial control	10 dB continuous & 0 to 41.5 dB in 0.25 dB steps via serial control
Gain Flatness	3.0 dB p-p over RF output frequency range	3.0 dB p-p over RF output frequency range	3.0 dB p-p over RF output frequency range	3.0 dB p-p over RF output frequency range
Gain Stability +25° ±10°C	±0.30 dB	±0.40 dB	±0.40 dB	±0.40 dB
0° to +50°C	±0.75 dB	±1.0 dB	±1.0 dB	±1.0 dB
Output 1 dB Compression	+9 dBm minimum at 30 dB gain	+14 dBm minimum at 50 dB gain	+5 dBm minimum at 30 dB gain	+14 dBm minimum at 50 dB gain
Third Order Intercept Point	+19 dBm minimum	+24 dBm minimum	+15 dBm minimum	+24 dBm minimum
Noise Figure		13 dB maximum		13 dB maximum
Amplitude Response 70 ±20 MHz	±0.35 dB	±0.35 dB	±0.35 dB	±0.35 dB
140 ±40 MHz	±0.45 dB	±0.45 dB	±0.45 dB	±0.45 dB
Group Delay Response at 70 ±20MHz:				
Parabolic	0.008 ns/MHz ² maximum	0.008 ns/MHz ² maximum	0.008 ns/MHz ² maximum	0.008 ns/MHz ² maximum
Linear	±0.05 ns/MHz maximum	±0.05 ns/MHz maximum	±0.05 ns/MHz maximum	±0.05 ns/MHz maximum
Ripple	1 ns p-p maximum	1 ns p-p maximum	1 ns p-p maximum	1 ns p-p maximum
Group Delay Response at 140 ±40MHz:				
Parabolic	-0.003 ns/MHz ² maximum	-0.003 ns/MHz ² maximum	0.003 ns/MHz ² maximum	0.003 ns/MHz ² maximum
Linear	±0.03 ns/MHz maximum	±0.03 ns/MHz maximum	±0.03 ns/MHz maximum	±0.03 ns/MHz maximum
Ripple	1 ns p-p maximum	1 ns p-p maximum	1 ns p-p maximum	1 ns p-p maximum
AM/PM Conversion	0.1°/dB at -10 dBm output	0.1°/dB at 0 dBm output	0.1°/dB at -10 dBm output	0.1°/dB at 0 dBm output
Spurious				
Carrier Dependant				
Spurious	-80 dBc at 30 dB gain, 0 dBm output	-60 dBc, at -35 dBm In, 0 dBm Out	-80 dBc at 30 dB gain, 0 dBm output	-60 dBc, at 35 dBm In, 0 dBm Out
F ₀ ±150 kHz (Including 50/60 Hz harmonics)	-45 dBc	-45 dBc	-45 dBc	-45 dBc
Carrier Independent				
LO Leakage	-75 dBm at 30 dB gain	-70 dBm at +50 dB gain	-70 dBm, at 30 dB gain	-70 dBm at +50 dB gain
Image Rejection	-65 dBm, out of band @ 30 dB gain	-70 dBm, out of band @ 50 dB gain	-60 dBm, out of band @ 30 dB gain	-65 dBm, out of band @ 50 dB gain
	-85 dBc at 30 dB gain	-70 dBc at 50 dB gain	-85 dBc at 30 dB gain	-65 dBc at 50 dB gain
Frequency Stability: Over Temperature (0 to 50°C)	±1.0 x 10 ⁻⁸	±1.0 x 10 ⁻⁸	±1.0 x 10 ⁻⁸	±1.0 x 10 ⁻⁸
24 hrs., Constant Ambient	±1.0 x 10 ⁻⁹	±1.0 x 10 ⁻⁹	±1.0 x 10 ⁻⁹	±1.0 x 10 ⁻⁹

V-SERIES CONVERTERS

HIGHLY ADVANCED SPACE SAVING SYSTEM

The L-3 Narda V2245 1:N fully-integrated redundant converter system is designed for use in ground-based satellite communications systems, where backup protection of multiple on-line converter channels is required.

COST EFFECTIVE CONFIGURATION

The 1:N redundant converter protects up to four on-line converter trays, expandable to eight with optional rear panel expansion port and additional chassis mainframe.

FLEXIBILITY

Internal converter trays conveniently provide up or down conversion in the C- or Ku-Band frequency ranges. Rear panel mounted transfer switch modules provide protection switching for a failed converter channel. The system is entirely self-contained, requiring only primary AC power and an RF/IF carrier to provide an output.



CONFIGURATIONS

- Contained in an 8.75-inch high fixed-mount chassis designed to fit in a standard equipment rack or cabinet.
- Front panel opens to access internal modules. Two fans cool the internal components, allowing the converter to be mounted directly on top of or below other units without performance degradation.
- Easy to configure the operating parameters easily from the front panel. Push-button switches initiate commands, while the alphanumeric display prompts the operator for parameter selection such as RF frequency, serial port configuration, frequency storage and recall, mode, and monitor functions. Upon detection of an on-line converter fault, the backup converter tray is automatically tuned to the appropriate channel frequency (pre-stored in non-volatile memory) and initiates the necessary switching to replace the failed unit.

APPLICATIONS

- Narrowband or wideband digital
- Frequency Division Multiplexed/Frequency Modulation (FDM/FM)
- Time Division Multiple Access (TDMA)
- Single Channel Per Carrier (SCPC)
- Single Sideband (SSB)
- Intermediate Data Rate (IDR)
- INTELSAT Business Services (IBS)

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 ± 10% optional) 48W maximum (per tray), 25 W maximum chassis
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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.
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CONVERTER CONFIGURATIONS*

Table-1 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