9900 SERIES C- AND Ku-BAND COMMUNICATION UPCONVERTER

AUXILARY L-BAND OUTPUT IDEAL FOR ENG/ SNG AND VIDEO BROADCASTING APPLICATIONS

FEATURES

- L-Band monitor output
- Supports expandable NSU 1:N switchover series (D-323)
- Three monitor and control ports:
  1. RS-485/RS-422 remote interface (J6A) changes to RS-232 with Option 17C
  2. RS-485/RS-422 control interface (J7) is provided for use with NSU redundancy system (D-323) or as an alternative interface
  3. 10/100 Base-T Ethernet interface (J6B)
- RF, IF and LO monitor ports
- Automatic switching to external 5/10 MHz reference and electronic adjust of internal reference frequency
- Low intermodulation distortion
- Better than IESS-308/309-compliant phase noise
- 64 programmable memory locations
- 30 dB level control
- External alarm input via contact closure
- Time and date-stamped event log
- CE mark

OPTIONS

- High-frequency stability reference
- Remote RS-232
- 140 MHz IF frequency
- 50 ohm IF impedance
- Type N RF connector (C-Band connectors only)

RF FREQUENCY (GHz)	MODEL NUMBER
UPCONVERTERS	
5.725 to 6.725	U-9953-6-1K-L
13.75 to 14.8	U-9956-6-1K-L

The Narda-MITEQ Model U-9953-6-1K-L is a C-Band upconverter covering 5.725 GHz to 6.725 GHz band, while Model U-9956-6-1K-L is a Ku-Band upconverter covering 13.75 GHz to 14.8 GHz band. Both of these upconverters provide an L-Band monitor output to a rear panel SMA connector. This enables the operator to monitor the uplink signal using an L-Band receiver or spectrum analyzer. The L-Band monitor signal is 1.15 GHz (1.22 GHz for Option 4) at a level of -2 dBc relative to the input, less any input attenuation.

A strong feature set of monitor and control functions supports powerful local and remote control. Among the features are control of frequency, attenuation and 64 memory locations for each converter where various setups can be stored and recalled.

A continuously updated log of time-stamped records of activity is also provided.

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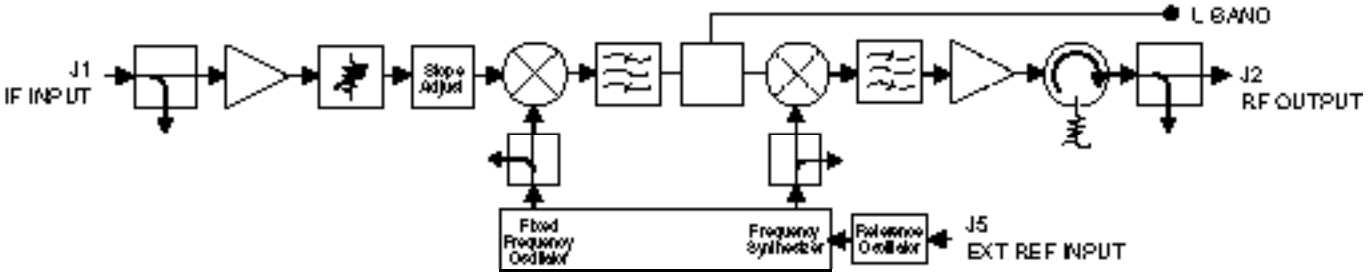
SPECIFICATIONS	UPCONVERTER
Type	Dual conversion
Frequency step size	1 kHz
Frequency sense	No inversion
Input characteristics	
Frequency	70 ±20 MHz (140 ±40 MHz Option 4)
Impedance	75 ohms (50 ohms Option 15)
Return loss	26 dB minimum (70 ±20 MHz), 20 dB minimum (140 ±40 MHz)
Signal monitor	-20 dBc nominal
Input level (non-damage)	+15 dBm maximum
Output characteristics	
Frequency	Refer to model number table on page one
Impedance	50 ohms
Return loss	20 dB minimum
Signal monitor	-20 dBc nominal
ower output (P1 dB)	
C-Band	+16 dBm minimum/17 dBm typical
Ku-Band	+10 dBm minimum/12 dBm typical
ansfer characteristics	
Gain	+31 dB to 34 dB at 23 °C
L-Band monitor output	-2 dBc nominal relative to the input signal at 0 dB attenuation at 1.15 GHz (1.22 GHz for Option 4)
Noise figure at minimum attenuation	14 dB maximum
Noise power density	-125 dBm/Hz maximum
Image rejection	80 dB minimum
Level stability	±0.25 dB/day maximum at constant temperature, ±0.5 dB typical from 0 °C to 50 °C
Amplitude response	±0.3 dB maximum
Slope adjust	±1 dB typical in 0.2 dB steps
Group delay (70 ±18 MHz)	
Linear	0.03 ns/MHz maximum (15 °C to 50 °C)
Parabolic	0.01 ns/MHz^2 maximum (15 °C to 50 °C)
Ripple	1 ns peak-to-peak maximum
roup delay (140 ±36 MHz)	
Linear	0.025 ns/MHz maximum (15 °C to 50 °C)
Parabolic	0.0035 ns/MHz^2 maximum (15 °C to 50 °C)
Ripple	1 ns peak-to-peak maximum
Intermodulation distortion	
ird order)	Two signals each at 0 dBm output
C-Band	55 dBc minimum (+27.5 dBm IP3 pt.)
Ku-Band	45 dBc minimum (+22.5 dBm IP3 pt.)
AM/PM conversion	0.1°/dB maximum to 0 dBm output
Gain slope	0.03 dB/MHz typical, 0.05 dB/MHz maximum (10 MHz minimum)
Frequency accuracy	C-Band: ±10 Hz, Ku-Band: ±22 Hz, maximum using external reference
purious outputs	
Signal-related	65 dBc up to 0 dBm output
Signal-independent	-80 dBm maximum
LO leakage at RF	-75 dBm maximum
Gain adjustment	30 dB in 0.2 dB steps
equency stability	±2 x 10^{-8}, 0 °C to 50 °C (higher stability options available) ±5 x 10^{-9}/day typical (fixed temperature after 24 hours on time)
Option 10B	±5 x 10^{-9}, 0 °C to 50 °C, 1 x 10^{-9}/day typical (fixed temperature after 24 hours on time)
Option 10C	±2 x 10^{-9}, 0 °C to 50 °C, 1 x 10^{-9}/day typical (fixed temperature after 24 hours on time)
Upconverter mute	80 dB minimum
External reference	5 MHz or 10 MHz, +4 ±3 dBm. Unit will automatically switch to internal reference if external reference level falls below +1 dBm nominal.
Phase noise	See table on next page
Remote interface	RS-485/RS-422: 2 ports user selectable each port (1 port with Option 17C) Ethernet interface: HTTP-based web server, SNMP 1.0 configuration, alarm reporting via SNMP trap, telnet access, password protection

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

REPRESENTATIVE BLOCK DIAGRAM



OPTIONS

Missing option numbers are not applicable for this product.

4. 140 MHz IF frequency

10. High-frequency stability reference

    C. ±2 x 10^{-9}, 0 °C to 50 °C,

    1 x 10^{-9}/day typical (fixed temperature after 24 hours on time).

15. 50 ohm IF impedance

17. Remote control

    C. RS-232 remote interface

NRF. Type N female RF connector (Note: monitor remains SMA female). RF return loss: 18 dB, 9 GHz to 13 GHz (not available above 13 GHz).

Notes: For literature describing Local control (front panel) and remote control (bus protocols), refer to Narda-MITEQ Technical Note 25T063.

Protocols are backwards compatible with Narda-MITEQ Technical Notes 25T010 and 25T009.

PHASE NOISE SPECIFICATIONS

Model	10	100	1K	3K	10K	100K	Offset (Hz)
U-9953-6-1K-L	-63	-80	-95	-	-97	-97	Maximum phase noise (dBc/Hz)
U-9956-6-1K-L	-55	-70	-78	-80	-90	-100	(1.0 Hz bandwidth)
							Straight line curve defined by
							the points in the table
Maximum External Reference							
All Systems	-120	-150	-160	-160	-160	-160	

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GENERAL SPECIFICATIONS

PRIMARY POWER REQUIREMENTS

Voltage ..... 90 VAC to 250 VAC

Frequency ..... 47 Hz to 63 Hz

Consumption

- C-Band (U-9953-6-1K-L) ..... 35 W typical
- Ku-Band (U-9956-6-1K-L) ..... 45 W typical

PHYSICAL

Weight ..... 12 lb. [5.4 kg], nominal

Chassis dimensions ..... 19” [482.6 mm] x 1.75” [44.45 mm] panel height x 20” [508 mm] maximum

Connectors

- RF ..... SMA female-N female, Option NRF
- RF monitor ..... SMA female
- IF ..... BNC female
- IF monitor ..... BNC female
- LO monitors ..... SMA female
- L-Band monitor output ..... SMA female
- Alarm DE-9P
- External reference ..... BNC female
- Remote interface ..... DE-9S for RS-485, RS-422 and RS-232, RJ-45 female for Ethernet
- Primary power input IEC-320
- Control interface DE-9S

ENVIRONMENTAL

Operating

- Ambient temperature ..... 0 °C to 50 °C
- Relative humidity ..... Up to 95% at 30 °C
- Atmospheric pressure ..... Up to 10,000 feet

Nonoperating

- Ambient temperature ..... -50 °C to +70 °C
- Relative humidity ..... Up to 95% at 40 °C
- Atmospheric pressure ..... Up to 40,000 feet
- Shock and vibration ..... Normal handling by commercial carriers

REAR-PANEL VIEW

RSM Switch Module Location
(see D-323 for more information)

D-338D/12.20.16

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