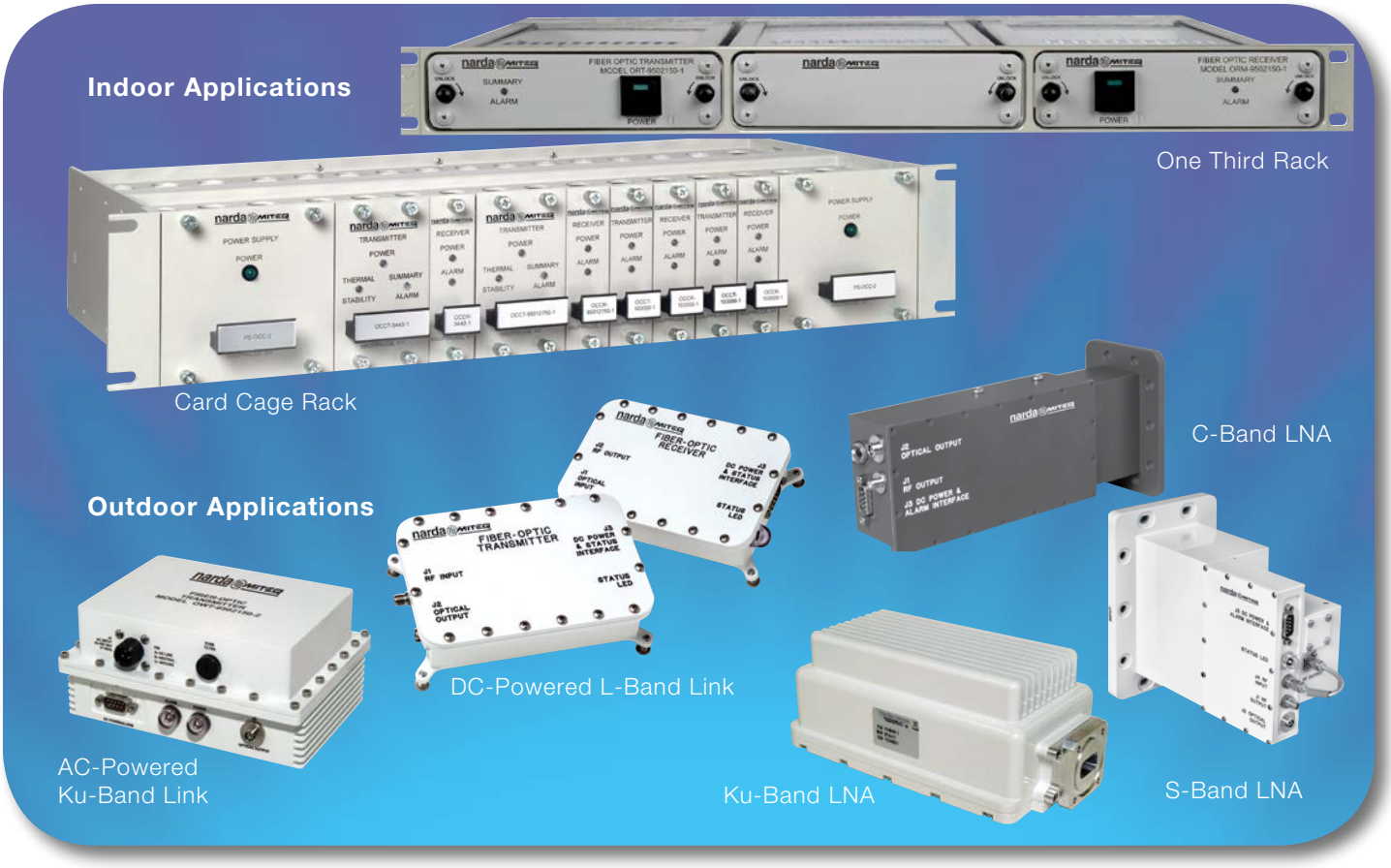


ADVANTAGES OF FIBER-OPTICS

- Longer transmission paths than coaxial cable
- Easy installation, lightweight and flexible
- Fiber is unsusceptible to lightning strikes
- Provides EMI/RFI insulation
- Larger bandwidths

TABLE OF CONTENTS

1/3 RACK FIBER-OPTIC LINKS

FEATURES

- High dynamic range
- Low-noise figure
- Compact size
- Summary alarm contacts
- Status LEDs
- Front panel removable
- Universal AC input (90 VAC to 250 VAC)
- Operational to distances over 10 km
- APC optical connectors
- Optional level adjust on Rx

U.S. Patent 7,510,090

Narda-MITEQ's one third rack fiber-optic systems are designed to provide state-of-the-art fiber-optic links, while reducing rack space requirements. By creating the framework with front panel access to the fiber-optic unit, the end-user has the flexibility to interchange transmitters and receivers as needed. One third rack systems can be provided in any combination of up to three individual transmitters or receivers spanning all covered satellite bands.

1/3 RACK MODELS (FRAME PART NUMBER: OL-TR3-12)

TRANSMITTER MODEL NUMBER	RECEIVER MODEL NUMBER	FREQUENCY
ORT-103000-1	ORM-103000-1	10 MHz to 3000 MHz
ORT-3442-1	ORM-3442-1	3.4 GHz to 4.2 GHz
ORT-95012750-1	ORM-95012750-1	0.95 GHz to 12.75 GHz
ORT-9502150-1	ORM-9502150-1	950 MHz to 2150 MHz
ORT-10701275-1	ORM-10701275-1	10.7 GHz to 12.75 GHz
ORT-13751450-1	ORM-13751450-1	13.75 GHz to 14.5 GHz

Note: Custom models available upon request.

SPECIFICATIONS

See pages six and seven for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage.....90 VAC to 250 VAC
Frequency.....47 Hz to 63 Hz
Power.....12 W typical

PHYSICAL

Weight
- Frame.....1.5 lb. [.68 kg] nominal
- Transmitter
  - ORT-9502150-1 & ORT-103000-1.....3 lb. [1.36 kg] nominal
  - ORT-10701275-1, ORT-3442-1.....5 lb. [2.27 kg] nominal
  - ORT-13751450-1 & ORT-95012750-1.....5 lb. [2.27 kg] nominal
- Receiver
  - ORM-9502150-1 & ORM-103000-1.....3 lb. [1.36 kg] nominal
  - ORM-10701275-1, ORM-3442-1.....5 lb. [2.27 kg] nominal
  - ORM-13751450-1 & ORM-95012750-1.....5 lb. [2.27 kg] nominal

Overall dimensions.....19" x 1.75" x 12" [482.6 mm x 44.5 mm x 304.8 mm] (excluding connectors)

PHYSICAL (CONTINUED)

Connectors
- RF ..... SMA female
- Summary alarm ..... DE-9P (mating connectors supplied)
- AC input..... IEC-320

PIN CONFIGURATION

PIN	DESCRIPTION
1	Summary alarm normally closed
2	Summary alarm normally common
3	Summary alarm normally open
4	Not connected
5	RSU power enable
6	Not connected
7	Not connected
8	+12 VDC output to RSU
9	+12 VDC return from RSU

OPTIONS AND NOTES

1:2 switchover available using NSU2 controller. See Narda-MITEQ data sheet D-323 for details.

See pages 18 and 19 for a list of additional options.

1/3 RACK FIBER REDUNDANT SWITCHOVER UNIT

FEATURES

- RF and optical switching
- Local and remote control (RS-485/RS-422 10/100 Base-T Ethernet)
- Automatic/manual control from both local and remote control
- Remote status
- Off-line input
- APC optical connectors
- CE mark

U.S. Patent 7,510,090

The 1:1 redundant switchover unit is used with two one third rack fiber-optic units, one on-line (Unit A) and the second in standby mode (Unit B). A fault condition in the on-line unit A, or an operator-generated command will switch the standby Unit B to the on-line position and remove Unit A from the transmission path. A full-feature set of commands is available for both remote and local control.

The 1:1 redundant switchover unit is designed to ensure continuous operation allowing a unit fault to be repaired and/or routine maintenance to be performed without disruption of signal transmission.

The 1:1 redundant switchover unit can be ordered as an RF, fiber or a combination of RF and fiber switching system.

1/3 RACK MODELS (FRAME PART NUMBER: OL-TR3-12)

MODEL*	RF SWITCHING	FIBER SWITCHING	FIBER CONNECTOR TYPE
OSU-S-TR	X		N/A
OSU-FC-TR		X	FC/APC
OSU-E-TR		X	E2000/APC
OSU-SC-TR		X	SC/APC
OSU-S/FC-TR	X	X	FC/APC
OSU-S/E-TR	X	X	E2000/APC
OSU-S/SC-TR	X	X	SC/APC

* See page two for available one third rack transmitters and receivers. All transmitter and receiver units ordered prior to June 2006 need to be retrofitted before accommodating switchover system.

ADDITIONAL INFORMATION

See pages eight and nine for a list of additional specifications.

For literature describing local control (front panel) and remote control (remote bus), refer to Narda-MITEQ Technical Note 25T067.

CARD CAGE FIBER-OPTIC LINKS

FEATURES

- High dynamic range
- Low-noise figure
- Hot-swappable modules
- Diode-summed power supplies
- Ten module capacity in a two rack unit high chassis
- Summary alarm contacts for each module
- Status LEDs
- Front panel removable
- Universal AC input (90 VAC to 250 VAC)
- Operational to distances over 10 km
- APC optical connectors

Narda-MITEQ's fiber-optic card cage system provides support for multiple transmitter and receiver modules spanning all covered satellite bands. The card cage design allows for the availability of multiple fiber-optic links in a two-rack unit high chassis, featuring hot-swappable connections, diode-summed redundant power supplies and summary alarm contacts. The card cage can be configured with up to ten receiver modules, five transmitter modules, or any combination of up to ten L-Band transmitter and/or receiver modules.

CARD CAGE COMPONENTS

MODEL NUMBER	DESCRIPTION
OCC-1	Card Cage Rack
PS-OCC-1*	Power Supply
PS-OCC-2*	Power Supply

* Card cage can operate from a single-power supply, however, two power supplies are needed for redundancy.

CARD CAGE MODELS

TRANSMITTER MODEL NUMBER	RECEIVER MODEL NUMBER	FREQUENCY
OCCT-103000-1	OCCR-103000-1	10 MHz to 3000 MHz
OCCT-9502150-1	OCCR-9502150-1	950 MHz to 2150 MHz
OCCT-3442-1*	OCCR-3442-1	3.4 GHz to 4.2 GHz
OCCT-95012750-1*	OCCR-95012750-1	0.95 GHz to 12.75 GHz
OCCT-10701275-1*	OCCR-10701275-1	10.7 GHz to 12.75 GHz
OCCT-13751450-1*	OCCR-13751450-1	13.75 GHz to 14.5 GHz

Note: Custom models available upon request.
* Denotes double width models.

CARD CAGE FIBER-OPTIC LINKS SPECIFICATIONS

See pages six and seven for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... 90 VAC to 250 VAC

Frequency ..... 47 Hz to 63 Hz

Power

- PS-OCC-1 ..... 45 W maximum
- PS-OCC-2 ..... 150 W maximum

PHYSICAL

Weight

- Transmitter ..... 3 lb. [1.36 kg] nominal
- Receiver ..... 2 lb. [.91 kg] nominal
- Card cage ..... 4 lb. [1.82 kg] nominal
- Power supply ..... 3 lb. [1.36 kg] nominal

Overall dimensions ..... 19” x 3.5” x 10” [482.6 mm x 88.9 mm x 254 mm] (excluding connectors)

Connectors

- RF ..... SMA female
- Summary alarm DB-25S
- AC input IEC-320
- Optical ..... See page seven

OPTIONS

See pages 18 and 19 for a list of additional options.

SPECIFICATIONS FOR INDOOR FIBER-OPTIC LINKS

The following specifications are based on link data, with 1 dB of optical loss and -30 dBm input level.

ELECTRICAL SPECIFICATIONS

BAND	L-BAND	L- AND S-BAND	C-BAND
Third rack model numbers	ORT-9502150-1, ORM-9502150-1	ORT-103000-1, ORM-103000-1	ORT-3442-1, ORM-3442-1
Card cage model numbers	OCCT-9502150-1, OCCR-9502150-1	OCCT-103000-1, OCCR-103000-1	OCCT-3442-1, OCCR-3442-1
Frequency range	950 MHz to 2150 MHz	10 MHz to 3000 MHz	3.4 GHz to 4.2 GHz
Gain	5 dB typical	10 dB minimum	10 dB typical
Amplitude response	1.5 dB peak-to-peak maximum	1.5 dB peak-to-peak maximum	±1 dB peak-to-peak maximum
Noise Figure	20 dB typical	10 dB typical, 15 dB maximum (above 10 MHz)	20 dB maximum
Group delay	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak
Input power (1 dB compression point)	-14 dBm minimum	-14 dBm minimum	-15 dBm minimum
Third-order intermodulation with two -25 dBm inputs	-42 dBc	-42 dBc	-40 dBc
Gain stability	±0.25 dB/24 hours at constant temperature	±0.25 dB/24 hours at constant temperature	±0.25 dB/24 hours at constant temperature
VSWR (RF only)	2.0:1 maximum	2.0:1 maximum	1.2:1 maximum
RF impedance	50 ohms	50 ohms	50 ohms
Phase noise*	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset
Spurious-free dynamic range	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth
Non-damage input	+10 dBm	+10 dBm	+5 dBm

* Phase noise is residual phase noise not single sideband. Specification is guaranteed not measured.

ELECTRICAL SPECIFICATIONS

BAND	BROADBAND	Ku-BAND (Rx-BAND)	Ku-BAND (Tx-BAND)
Third rack model numbers	ORT-95012750-1, ORM-95012750-1	ORT-10701275-1, ORM-10701275-1	ORT-13751450-1, ORM-13751450-1
Card cage model numbers	OCCT-95012750-1, OCCR-95012750-1	OCCT-10701275-1, OCCR-10701275-1	OCCT-13751450-1, OCCR-13751450-1
Frequency range	0.95 GHz to 12.750 GHz	10.70 GHz to 12.75 GHz	13.75 GHz to 14.5 GHz
Gain	13 dB typical	10 dB typical	10 dB typical
Amplitude response	±4 dB peak-to-peak maximum	±2 dB peak-to-peak maximum	±2 dB peak-to-peak maximum
Noise figure	20 dB typical, 25 dB maximum	20 dB typical, 25 dB maximum	20 dB typical, 25 dB maximum
Group delay	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak
Input power (1 dB compression point)	-15 dBm minimum	-15 dBm minimum	-15 dBm minimum
Third-order intermodulation with two -25 dBm inputs	-40 dBc	-40 dBc	-40 dBc
Gain stability	±0.25 dB/24 hours at constant temperature	±0.25 dB/24 hours at constant temperature	±0.25 dB/24 hours at constant temperature
VSWR (RF only)	2.0:1 maximum	1.3:1 maximum	1.3:1 maximum
RF impedance	50 ohms	50 ohms	50 ohms
Phase noise*	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset
Spurious-free dynamic range	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth
Non-damage input	+5 dBm	+5 dBm	+5 dBm

* Phase noise is residual phase noise not single sideband. Specification is guaranteed not measured.

SPECIFICATIONS FOR INDOOR FIBER-OPTIC LINKS (CONTINUED)

OPTICAL SPECIFICATIONS

Fiber	9/125 (single-mode fiber)
Optical connector*	
L- and S-Band units	FC/APC
C- and Ku-Band units	E2000/APC
Wavelength**	
Minimum	1300 nm (receivers), 1540 nm (transmitters)
Typical	1550 nm
Maximum	1560 nm
Spectral width	1.0 nm (transmitter only)
Optical power in fiber	4 mW typical
Single side-mode suppression ratio	30 dB minimum, 40 dB typical

* Optical connectors are standard connectors for listed bands. Other connectors are available as an option.

** Wavelengths listed are Narda-MITEQ's standard. For cases where a CWDM (Coarse Wavelength Division Multiplexing) system is needed, Narda-MITEQ can supply up to 10 different transmitter wavelengths with 20 nm channel spacing.

COMMON ENVIRONMENTAL SPECIFICATIONS

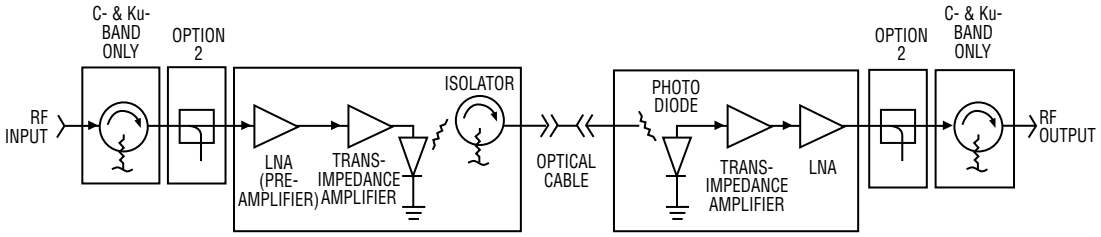
Operating

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 ..... -30 °C to +60 °C
Relative humidity ..... Up to 95% at 40 °C
Atmospheric pressure ..... Up to 40,000 feet
Shock and vibration ..... Normal handling by commercial carriers

FUNCTIONAL BLOCK DIAGRAM



SPECIFICATIONS FOR 1/3 RACK SWITCHOVER UNITS

MODES OF OPERATIONS

Local mode.....Commands are received from the keys on the front-panel.

Remote mode.....Commands are received from a remote system controller via the remote interface connector. All front-panel keys are disabled, with the exception of local/remote mode selection.

Automatic mode.....Switchover occurs if a fault is detected in an on-line unit.

Manual mode.....Switchover may be executed either via the front panel keys (local mode) or the remote interface (remote mode).

RF SPECIFICATIONS

FREQUENCY	VSWR (MAXIMUM)	ISOLATION (MINIMUM)	INSERTION LOSS (TYPICAL)
DC to 1 GHz	1.10:1	85 dB	0.40 dB
1 GHz to 4 GHz	1.20:1	80 dB	0.45 dB
4 GHz to 8 GHz	1.30:1	70 dB	0.55 dB
8 GHz to 14.5 GHz	1.40:1	65 dB	0.65 dB

OPTICAL SPECIFICATIONS

FREQUENCY	VSWR (MAXIMUM)	ISOLATION (MINIMUM)	INSERTION LOSS (TYPICAL)
DC to 14.5 GHz	1.01:1	60 dB	1.0 dB

MODES OF OPERATIONS

Switch type..... Coaxial, four-port transfer

Switch contacts..... Break-before-make, wiping

Switch drive..... Latching

Switching speed..... 150 ms maximum

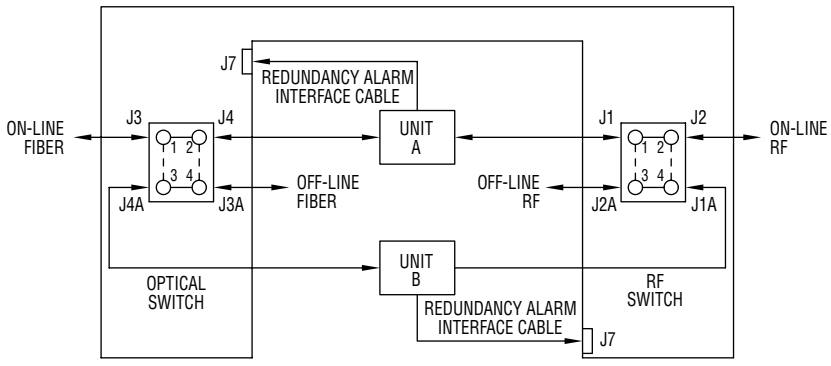
OPTICAL SWITCH SPECIFICATIONS

Switch type..... Optical, 2 x 2

Switch drive..... Latching

Switching speed..... 10 ms maximum

FUNCTIONAL BLOCK DIAGRAM



SPECIFICATIONS FOR 1:1 SWITCHOVER UNITS

1/3 RACK SPECIFICATIONS

PRIMARY POWER REQUIREMENT

Voltage.....DC power from Narda-MITEQ 1/3 rack fiber-optic Tx and Rx

PHYSICAL

Dimensions (excluding connectors)

Module.....5.70” x 1.48” x 12” [144.78 mm x 37.59 mm x 304.8 mm]

Frame.....19” x 1.75” panel height x 12” [482.60 mm x 44.45 mm x 304.8 mm]

Weight

Module.....4.5 lb. [2.04 kg] nominal

Frame.....1.5 lb. [0.68 kg] nominal

Connectors

RF.....SMA female

Fiber optic.....FC/APC, or E2000/APC or SC/APC

Redundancy alarm*.....DE-15P

Remote interface*.....DE-9S for RS-422/RS-485

Ethernet interface.....RJ-45

* Mating connectors supplied.

REDUNDANCY CONNECTOR J7

PIN	Description
1	Unit A summary alarm normally open
2	Unit A summary alarm common
3	Unit A summary alarm normally closed
5	Unit A +12 VDC
7	Unit A +12 VDC return
9	Unit B summary alarm normally open
10	Unit B summary alarm common
11	Unit B summary alarm normally closed
13	Unit B +12 VDC
15	Unit B +12 VDC return

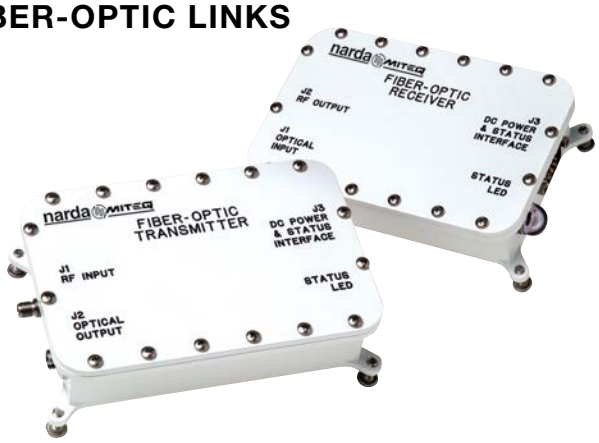
REDUNDANCY CONNECTOR J6

PIN	Description
1	Ground
2	OSU summary alarm common
3	Data out-
4	OSU summary alarm open
5	Data in-
6	OSU summary alarm closed
7	Data out+
8	Not connected
9	Data in+n

DC-POWERED OUTDOOR L-BAND FIBER-OPTIC LINKS

FEATURES

- High dynamic range
- Low-noise figure
- Operational to distances over 60 km
- Compact size
- Weather-tight enclosure
- Summary alarm contacts
- Status LEDs



Narda-MITEQ's outdoor L-Band fiber-optic links are designed for antenna mounting. With a high dynamic range and low-noise figure these units provide a low-cost alternative to coaxial cable. Their compact size provide an ideal solution for L-Band antenna-based fiber-optic applications.

TRANSMITTER AND RECEIVER MODELS

TRANSMITTER MODEL NUMBER	RECEIVER MODEL NUMBER	FREQUENCY
OWT-103000-1*	OWR-103000-1*	10 MHz to 3000 MHz
OWT-9502150-1	OWR-9502150-1	950 MHz to 2150 MHz

* Extended frequency range available, see Options.

SPECIFICATIONS

See pages twelve and thirteen for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... +15 ±0.5 VDC

Noise ripple ..... < 100mV peak-to-peak

Power

- Transmitter ..... 7.5 W typical
- Receiver ..... 4.5 W typical

Available colors

- Furniture white (standard) ..... FED-STD-595B color 27875
- Monarch black ..... FED-STD-595B color 27038
- Green PMS 383 ..... FED-STD-595B color 34094
- Desert tan ..... FED-STD-595B color 33303

PHYSICAL

Weight ..... 2 lb. [.91 kg] nominal

Overall dimensions ..... 5.0" x 3.25" x 1.3"
[127 mm x 82.55 mm x 33.02 mm]

Connectors

- RF ..... SMA female
- Optical ..... FC/APC (ST/APC optional)
- Alarm/power ..... DE-9P (mating connector supplied)

PIN CONFIGURATION

PIN	DESCRIPTION
1	Ground
2	+15 VDC input
3	Not connected
4	Summary alarm normally closed
5	Summary alarm common
6	Summary alarm normally open
7	Not connected
8	Not connected
9	Not connected

OPTIONS

See pages 18 and 19 for a list of additional options.

AC-POWERED OUTDOOR FIBER-OPTIC LINKS

FEATURES

- High dynamic range
- Low-noise figure
- Operational to distances over 10 km
- Compact size
- Weather-tight enclosure
- Summary alarm contacts
- Status LEDs
- Universal AC input (90 VAC to 250 VAC)
- Optional DC output to LNA
- CE mark

Narda-MITEQ's outdoor AC-powered fiber-optic links are designed for antenna mounting. With a high dynamic range and low-noise figure these units provide a low-cost alternative to coaxial cable. These units are an alternative to Narda-MITEQ's DC-powered units. These units are available in all covered satellite bands and are an ideal solution for all an-tenna-based fiber-optic applications.

TRANSMITTER AND RECEIVER MODELS

TRANSMITTER MODEL NUMBER	RECEIVER MODEL NUMBER	FREQUENCY
OWT-103000-2	OWR-103000-2	10 MHz to 3000 MHz
OWT-9502150-2	OWR-9502150-2	950 MHz to 2150 MHz
OWT-3442-2	OWR-3442-2	3.4 GHz to 4.2 GHz
OWT-95012750-2	OWR-95012750-2	0.95 GHz to 12.75 GHz
OWT-10701275-2	OWR-10701275-2	10.7 GHz to 12.75 GHz
OWT-13751450-2	OWR-13751450-2	13.75 GHz to 14.5 GHz

SPECIFICATIONS

See pages 12 and 13 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... 90 VAC to 250 VAC
Frequency ..... 47 Hz to 63 Hz
Power*
  Transmitter ..... 12 W typical
  Receiver ..... 8 W typical
* Without LNA option.
LNA Optional Power
Voltage ..... +12 VDC
Current ..... 500 mA maximum
Available colors
  Furniture white (standard) ..... FED-STD-595B color 27875
  Monarch black ..... FED-STD-595B color 27038
  Green PMS 383 ..... FED-STD-595B color 34094
  Desert tan ..... FED-STD-595B color 33303

PHYSICAL

Weight ..... 6 lb. [2.72 kg] nominal
Overall dimensions ..... 7.34" x 5.0" x 2.78"
[186.44 mm x 127 mm x 70.61 mm]

PHYSICAL (CONTINUED)

Connectors
  RF ..... SMA female
  Optical ..... FC/APC (ST/APC optional)
  AC input ..... MS3102R10SL-3P (mating connector supplied)
  Alarm/power ..... DE-9P (mating connector supplied)

PIN CONFIGURATION

PIN	DESCRIPTION
1	Ground
2	Not connected
3	Summary alarm normally closed
4	Summary alarm common
5	Not connected
6	LNA output voltage (optional)
7	Not connected
8	Summary alarm common
9	Not connected

OPTIONS

See pages 18 and 19 for a list of additional options.

SPECIFICATIONS FOR OUTDOOR FIBER-OPTIC LINKS

The following specifications are based on link data, with 1 dB of optical loss and -30 dBm input level.

ELECTRICAL SPECIFICATIONS

BAND	L-BAND	L- AND S-BAND	C-BAND
Model number	OWT-9502150-1, OWR-9502150-1 OWT-9502150-2, OWR-9502150-2	OWT-103000-1, OWR-103000-1 OWT-103000-2, OWR-103000-2	OWT-3442-2, OWR-3442-2
Frequency range	950 to 2150 MHz	10 to 3000 MHz	3.4 to 4.2 GHz
Gain	5 dB nominal	10 dB nominal	10 dB nominal
Amplitude response	1.5 dB peak-to-peak maximum	1.5 dB peak-to-peak maximum	±1 dB peak-to-peak maximum
Noise figure	20 dB typical	10 dB typical, 15 dB maximum (above 10 MHz)	20 dB maximum
Group delay	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak
Input power (1 dB compression point)	-14 dBm minimum	-14 dBm minimum	-15 dBm minimum
Third-order intermodulation with two -25 dBm inputs	-42 dBc	-42 dBc	-40 dBc
Gain stability	±0.25 dB/24 hours at constant temp. ±5 dB/temperature range	±0.25 dB/24 hours at constant temp. ±5 dB/temperature range	±0.25 dB/24 hours at constant temp. ±5 dB/temperature range
VSWR (RF only)	2.0:1 maximum	2.0:1 maximum	1.2:1 maximum
RF impedance	50 ohms	50 ohms	50 ohms
Phase noise*	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset
Spurious-free dynamic range	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth
Non-damage input	+10 dBm	+10 dBm	+5 dBm

* Phase noise is residual phase noise not single sideband. Specification is guaranteed not measured.

ELECTRICAL SPECIFICATIONS

BAND	BROADBAND	Ku-BAND (Rx-BAND)	Ku-BAND (Tx-BAND)
Model number	OWT-95012750-2, OWR-95012750-2	OWT-10701275-2, OWR-10701275-2	OWT-13751450-2, OWR-13751450-2
Frequency range	0.95 GHz to 12.750 GHz	10.70 GHz to 12.75 GHz	13.75 GHz to 14.5 GHz
Gain	13 dB typical	10 dB typical	10 dB typical
Amplitude response	±4 dB peak-to-peak maximum	±2 dB peak-to-peak maximum	±2 dB peak-to-peak maximum
Noise figure	25 dB maximum	25 dB maximum	25 dB maximum
Group delay	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak	±0.1 ns peak-to-peak
Input power (1 dB compression point)	-15 dBm minimum	-15 dBm minimum	-15 dBm minimum
Third-order intermodulation with two -25 dBm inputs	-40 dBc	-40 dBc	-40 dBc
Gain stability	±0.25 dB/24 hours at constant temp. ±5 dB/temperature range	±0.25 dB/24 hours at constant temp. ±5 dB/temperature range	±0.25 dB/24 hours at constant temp. ±5 dB/temperature range
VSWR (RF only)	2.0:1 maximum	1.3:1 maximum	1.3:1 maximum
RF impedance	50 ohms	50 ohms	50 ohms
Phase noise*	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset	-100 dBc/Hz typical at 100 Hz offset
Spurious-free dynamic range	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth	100 dB minimum at 1 Hz bandwidth
Non-damage input	+5 dBm	+5 dBm	+5 dBm

* Phase noise is residual phase noise not single sideband. Specification is guaranteed not measured.

SPECIFICATIONS FOR OUTDOOR FIBER-OPTIC LINKS (CONTINUED)

OPTIONS

Missing option numbers are not applicable for this product.

4. DC output to LNA for AC-powered units
   - A. DC output on J3 connector to power LNA
     +12 VDC available at 500 mA maximum
   - B. DC output on RF center pin to power LNA
     +12 VDC available at 300 mA maximum

See pages 18 and 19 for a list of available options.

OPTICAL SPECIFICATIONS

Fiber	9/125 (single-mode fiber)
Optical connector	
Standard	FC/APC
Optional	ST/APC
Wavelength	
Minimum	1300 nm (receivers), 1540 nm (transmitters)
Typical	1550 nm
Maximum	1560 nm
Spectral width	1.0 nm (transmitter only)
Optical power in fiber	4 mW typical
Single side-mode suppression ratio	30 dB minimum, 40 dB typical

COMMON ENVIRONMENTAL SPECIFICATIONS

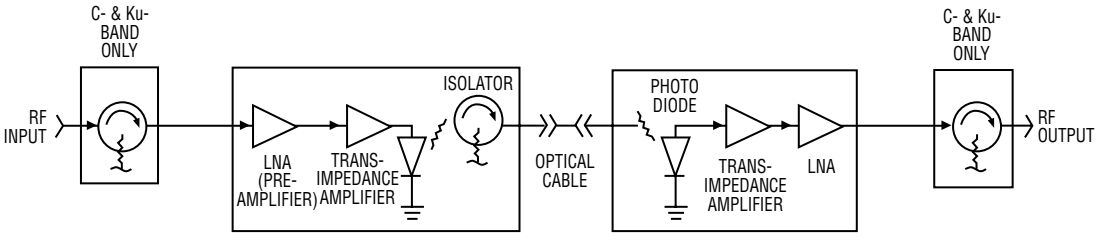
Operating

- **Ambient temperature** ..... **-30 °C to +60 °C**
- **Relative humidity** ..... **Up to 100% at 30 °C**
- **Atmospheric pressure** ..... **Up to 10,000 feet**

Nonoperating

- **Ambient temperature** ..... **-40 °C to +70 °C**
- **Relative humidity** ..... **Up to 100% at 40 °C**
- **Atmospheric pressure** ..... **Up to 40,000 feet**
- **Shock and vibration** ..... **Normal handling by commercial carriers**

FUNCTIONAL BLOCK DIAGRAM



INTEGRATED LNA WITH FIBER-OPTIC TRANSMITTER

FEATURES

- SATCOM LNA
- Fiber-optic transmitter
- High dynamic range
- Low-noise figure
- Operational to distances over 10 km
- Compact size
- Status LEDs

Narda-MITEQ's outdoor DC-powered low-noise amplifiers with integrated fiber-optic transmitters are designed for antenna mounting. These units combine two state-of-the-art technologies. The end-user gets all of the performance advantages of Narda-MITEQ's SATCOM LNAs plus a fiber-optic transmitter all in one package. The transmitter features a high dynamic range and low-noise figure while the LNA features a very low-noise temperature. These units eliminate the need for multiple housings and are an ideal solution for all antenna-based fiber-optic applications.

NOISE TEMPERATURE (°K)	LNA GAIN (dB)	MODEL NUMBER
C-Band (3.4 GHz to 4.2 GHz)		
30	50	OTA-C1
40	50	OTA-C2
30	60	OTA-C3
40	60	OTA-C4
S-Band (2.2 GHz to 2.3 GHz)		
30	50	OTA-S1
40	50	OTA-S2
30	60	OTA-S3
40	60	OTA-S4
Ku-Band (10.7 GHz to 12.75 GHz)		
70	60	OTA-K1
70	50	OTA-K2

SPECIFICATIONS

See page 15 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... +15 ±0.5 VDC
Noise ripple .... < 100 mV peak-to-peak
Power..... 12 W typical (C-, S-Band),
22.5 W typical (Ku-Band)

PHYSICAL

Weight ..... 5 lb. [2.27 kg] nominal
Connectors
RF output ..... SMA female
RF input ..... CPR229G, grooved flange (C-Band),
CPR430, flat flange (S-Band),
WR75, flat flange (Ku-Band)
Optical ..... FC/APC (ST/APC optional)
Alarm..... DE-9P (mating connector supplied: C-, S-Band),
MS3112E10-6P (mating connector supplied: Ku-Band)

PIN CONFIGURATION

PIN	DE-9P
1	Ground
2	+15 VDC input
3	Not connected
4	Summary alarm normally open
5	Summary alarm common
6	Summary alarm normally closed
7	Not connected
8	Not connected
9	Not connected
PIN	**MS3112E10-6P**
A	+15 VDC return
B	+15 VDC input
D	Summary alarm normally closed
E	Summary alarm common
F	Summary alarm normally open

SPECIFICATIONS FOR INTEGRATED LNA WITH FIBER-OPTIC TRANSMITTER

ELECTRICAL SPECIFICATIONS

Model number	OTA-C1 OTA-S1 OTA-K2	OTA-C2 OTA-S2	OTA-C3 OTA-S3 OTA-K1	OTA-C4 OTA-S4
Gain	50 dB minimum		60 dB minimum	
Gain/Flatness	±0.5 dB maximum			
P_{out}	10 dBm maximum			
IP3	20 dBm maximum			
VSWR				
Input	1.25:1 maximum			
Output	2.0:1 maximum			
Gain variation over temperature	5 dB			

ELECTRICAL SPECIFICATIONS FOR TRANSMITTER

Gain	LNA Gain -10 dB typical
Amplitude response	±1 dB peak-to-peak maximum (C-, S-Band), ±2 dB peak-to-peak maximum (Ku-Band)
Noise figure	20 dB maximum (C-, S-Band), 25 dB maximum (Ku-Band)
Group delay	±1 ns peak-to-peak maximum

* All specifications for RF performance of the transmitter imply mating to a receiver. Transmitter will work with any available Narda-MITEQ receiver covering the same band.

OPTICAL SPECIFICATIONS FOR TRANSMITTER

Fiber	9/125 (single mode)
Optical connector	FC/APC
Wavelength	
Minimum	1540 nm
Typical	1550 nm
Maximum	1560 nm
Spectral width	1.0 nm
Optical power in fiber	4 mW typical (C-, S-Band), 6 mW typical (Ku-Band)
Single side-mode suppression ratio	30 dB minimum, 40 dB typical

COMMON ENVIRONMENTAL SPECIFICATIONS

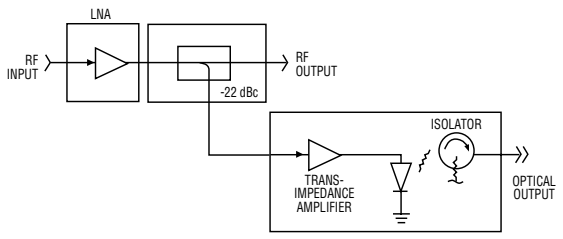
Operating

Ambient temperature ..... -30 °C to +60 °C
Relative humidity..... Up to 100% at 30 °C
Atmospheric pressure..... Up to 10,000 feet

Nonoperating

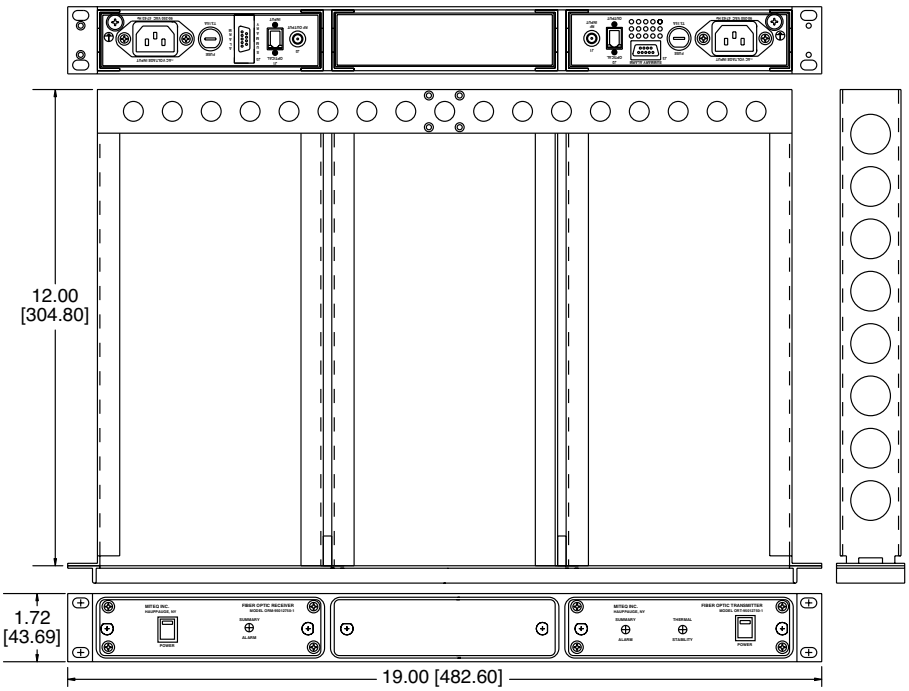
Ambient temperature ..... -50 °C to +70 °C
Relative humidity..... Up to 100% at 40 °C
Atmospheric pressure..... Up to 40,000 feet
Shock and vibration ..... Normal handling by commercial carriers

BLOCK DIAGRAM

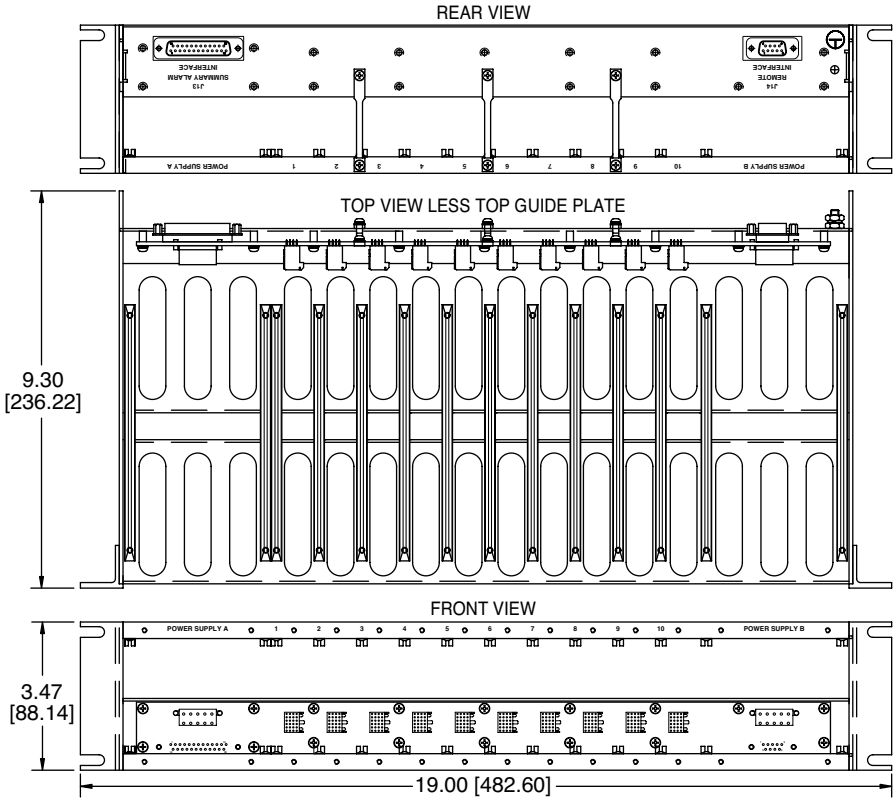


OUTLINE DRAWINGS

ONE THIRD RACK LINKS



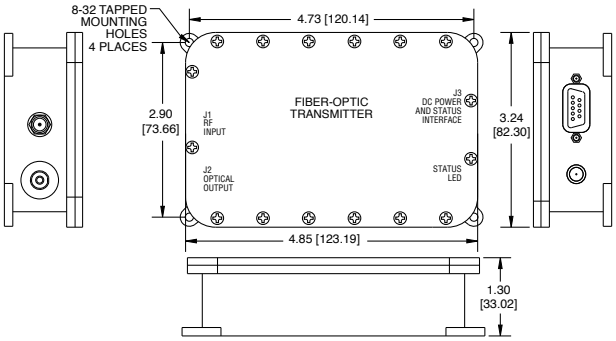
CARD CAGE LINKS



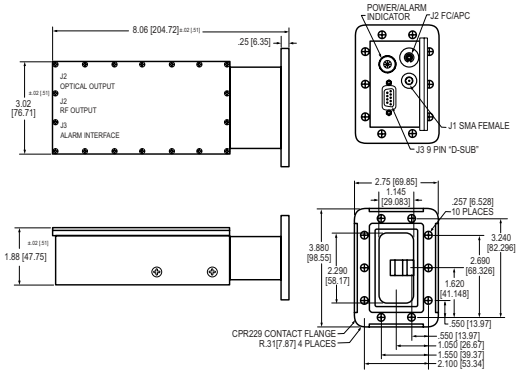
Note: Dimensions shown are in inches and those shown in brackets [ ] are in millimeters.

OUTLINE DRAWINGS (CONTINUED)

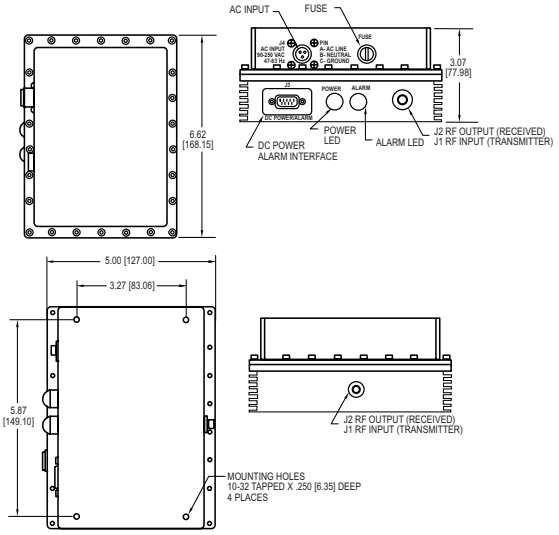
DC- POWERD L-BAND LINKS



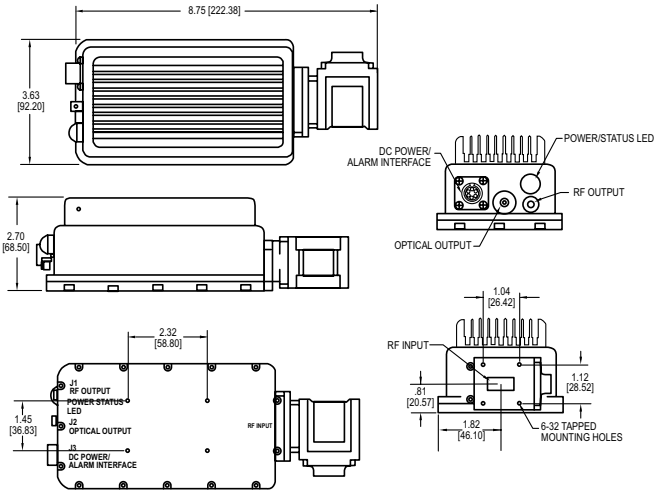
C-BAND LNA WITH FIBER



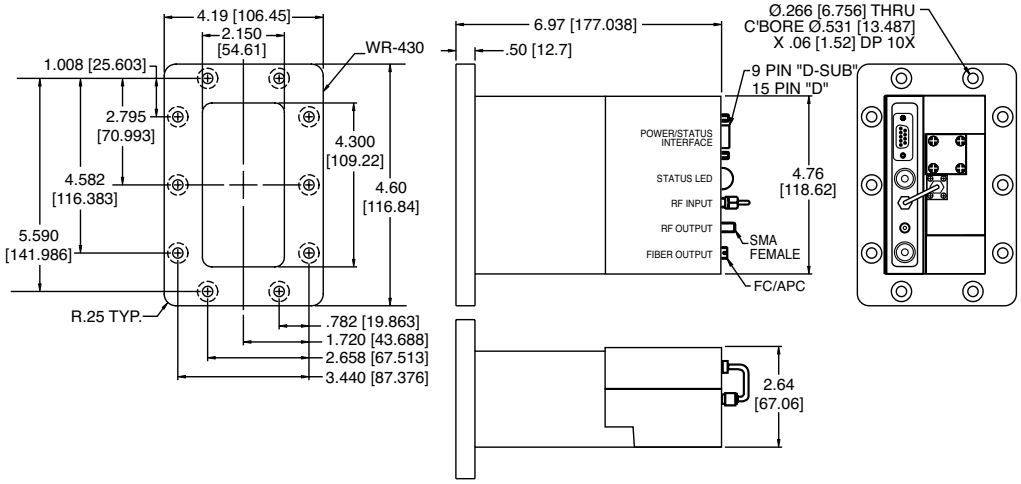
AC-POWERED LINKS



Ku-BAND LNA WITH FIBER



S-BAND LNA WITH FIBER



Note: Dimensions shown are in inches and those shown in brackets [ ] are in millimeters.

OPTIONS

Missing option numbers are not applicable for this product.

1. Extended frequency range (10 MHz to 4200 MHz)

2. RF signal monitor

   RF connector (SMA female) provided on front panel with -20 dBc nominal level

11. High input signal power

    The input intercept point can be increased for applications where a higher input power is needed.

    Input 1 dB compression: 0 dBm minimum

    Input IP3 : +10 dBm minimum

    Gain: 0 dB nominal

    Noise figure: 23 dB nominal

FC. FC/APC optical connector

SC. SC/APC optical connector

E2. E2000/APC optical connector

ST. ST/APC optical connector

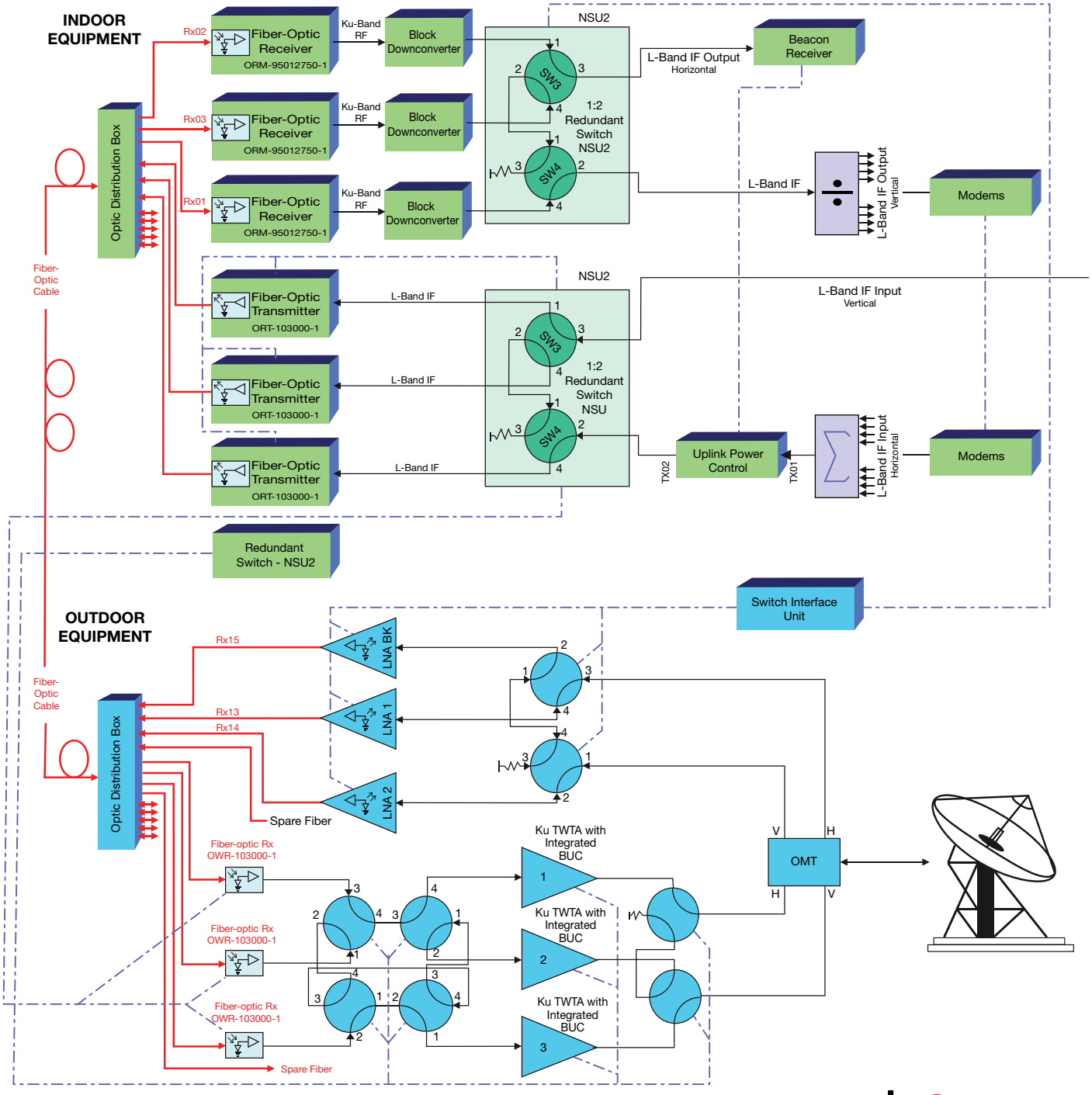
OPTIONS (CONTINUED)

AVAILABLE OPTIONS PER UNIT MODEL NUMBER

Model	Option Number							
Number	FC	E2	SC	ST	1	2	4	11
ORT-9502150-1		X	X					X
ORM-9502150-1		X	X					X
ORT-103000-1		X	X		X			X
ORM-103000-1		X	X		X			X
ORT-3442-1	X		X			X		
ORM-3442-1	X		X			X		
ORT-95012750-1	X		X			X		
ORM-95012750-1	X		X			X		
ORT-10701275-1	X		X			X		
ORM-10701275-1	X		X			X		
ORT-13751450-1	X		X			X		
ORM-13751450-1	X		X			X		
OCCT-9502150-1		X	X					X
OCCR-9502150-1		X	X					X
OCCT-103000-1		X	X		X			X
OCCR-103000-1		X	X		X			X
OCCT-3442-1	X		X			X		
OCCR-3442-1	X		X			X		
OCCT-95012750-1	X		X			X		
OCCR-95012750-1	X		X			X		
OCCT-10701275-1	X		X			X		
OCCR-10701275-1	X		X			X		
OCCT-13751450-1	X		X			X		
OCCR-13751450-1	X		X			X		
OWT-9502150-1				X				X
OWR-9502150-1				X				X
OWT-103000-1				X	X			X
OWR-103000-1				X	X			X
OWT-103000-2				X	X		X	X
OWR-103000-2				X	X		X	X
OWT-3442-2				X			X	
OWR-3442-2				X			X	
OWT-95012750-2				X			X	
OWR-95012750-2				X			X	
OWT-10701275-2				X			X	
OWR-10701275-2				X			X	
OWT-13751450-2				X			X	
OWR-13751450-2				X			X	
OWT-9502150-2				X			X	
OWR-9502150-2				X			X	

SATCOM FIBER-OPTIC PRODUCTS

TYPICAL FIBER-OPTIC DISTRIBUTION ARCHITECTURE



Narda-MITEQ provides complete custom fiber-optic network designs.
Our proven fiber-optic and RF SATCOM solutions are in use worldwide.

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