

1:1, 1:2 and 1:N Redundant Switchover Systems



NSU Series

The MITEQ Redundant Switchover Unit (NSU) Series is designed to improve reliability and increase the availability of satellite links.

The NSU Series is available in three configurations:

NSU1

- The NSU1 emulates the operation of the older RSU-series, but also has the ability to communicate settings between the online unit and backup unit. This allows the backup path to be used for low-priority traffic. This is an optional feature, and can be accessed via a front panel key command.

NSU2

- The NSU2 is a fully integrated 1:2 system, with a four-port transfer switch matrix located on the rear panel.

NSUN

- The NSUN consists of up to 12 Redundant Switch Modules (RSM) with one controller. Each switch module is mountable in the rear panel of each converter.

When a fault is detected on a primary frequency converter, that converter is automatically switched to standby and the backup converter is put online in its place.

Options

- RS232 remote in lieu of RS485/RS422

NSU1 Features

- Redundant protection in a 1:1 configuration
- Rear panel mounted four-port transfer switches
- Communication of settings to backup converter for automatic switchover
- Simple manual mode operation

NSU2 Features

- Redundant protection for up to 2 converters
- Rear panel mounted four-port transfer switches

NSUN Features

- Redundant protection for up to 12 converters
- Distributed switch modules mountable at the rear of each converter for best RF performance
- Polarization switching supported
- Field expandable redundant protection

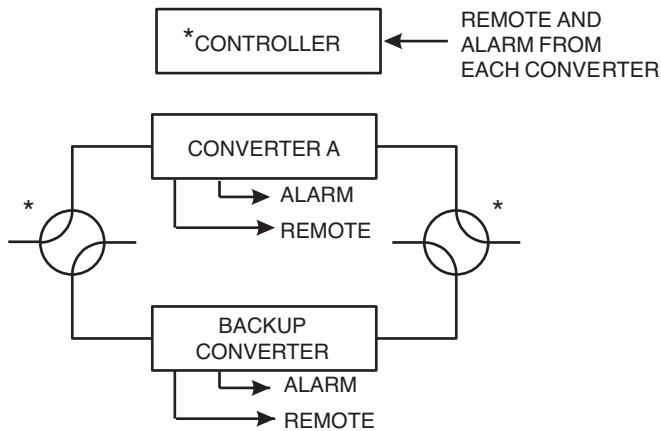
Common Features

- RS485/RS422 and Ethernet remote control (Telnet, SNMP, and embedded web server)
- Redundant rear panel removable hot-swappable power supplies
- Prioritized redundancy switching
- Self configuring redundancy settings
- Firmware updates through Ethernet port
- Time and date stamped activity log
- Gain equalization to compensate for cable losses
- CE Mark

1:1 Redundant Switchover System



NSU1 Series - Rear Panel View



NSU1 is an update of the older RSU Series 1:1 Redundant Switchover Unit. In its "simple mode" of operation it monitors the status alarm contacts on the online converter and switches to the standby unit in the event of an alarm. The user may select to enable the serial link through a front panel command. When the serial link is enabled, the NSU1 will monitor the frequency and attenuation settings of the online unit and set the backup unit to those settings in the event of a failure.

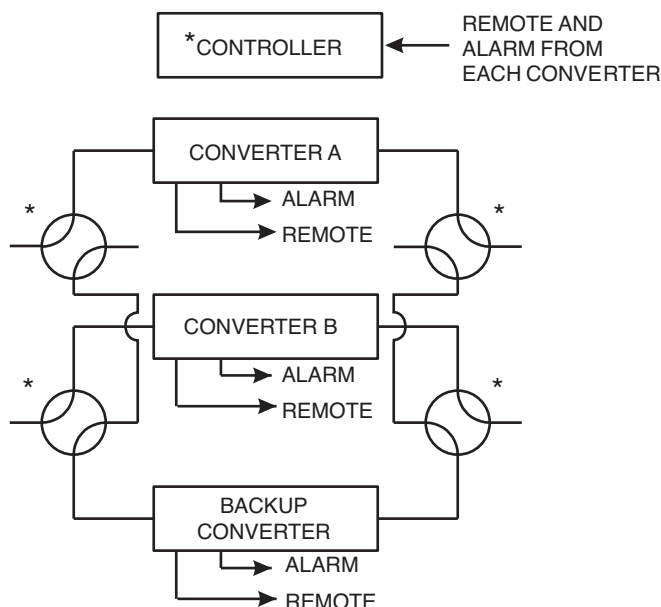
A strong feature set of monitor and control functions supports powerful local and remote control. An embedded web server provides for a user friendly computer interface.

* Inside NSU1 box.

1:2 Redundant Switchover System



NSU2 - Series Rear Panel View



NSU2 is a fully integrated 1:2 Redundant Switchover System. It consists of a controller and a matrix of four-port transfer switches.

The NSU2 controller monitors the status of two primary frequency converters and one backup converter, automatically detecting changes in settings and fault status.

The frequency converters can be prioritized so that critical communication channels have access to the backup converter.

A strong feature set of monitor and control functions supports powerful local and remote control. An embedded web server provides for a user friendly computer interface.

* Inside NSU2 box.

Internal Switches (Dedicated)

Model Numbers	Description
NSU1-B75/S50	One 75 ohm IF switch and one 50 ohm RF switch
NSU1-B50/S50	One 50 ohm IF switch and one 50 ohm RF switch
NSU1-S50/S50	One 50 ohm switches on input and output (for Block Converters)
NSU1-B75	One 75 ohm IF switch only
NSU1-B50	One 50 ohm IF switch only
NSU1-S50	One 50 ohm RF switch only
NSU2-B75/S50	Two 75 ohm IF switches and two 50 ohm RF switch
NSU2-B50/S50	Two 50 ohm IF switches and two 50 ohm RF switch
NSU2-S50/S50	Two 50 ohm switches on input and two on output (for Block Converters)
NSU2-B75	Two 75 ohm IF switches only
NSU2-B50	Two 50 ohm IF switches only
NSU2-S50	Two 50 ohm RF switches only

External Switches (Expandable)*

Model Numbers	Description
1:1 NSUN-B75/S50	One RSM, with one 75 ohm IF switch and one 50 ohm RF switch
1:1 NSUN-B50/S50	One RSM, with one 50 ohm IF switch and one 50 ohm RF switch
1:1 NSUN-S50/S50	One RSM, with one 150 ohm switch on input and one on output (for Block Converters)
1:1 NSUN-B75	One RSM, with one 75 ohm IF switch only
1:1 NSUN-B50	One RSM, with one 50 ohm IF switch only
1:1 NSUN-S50	One RSM, with one 50 ohm RF switch only
1:2 NSUN-B75/S50	Two RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:2 NSUN-B50/S50	Two RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:2 NSUN-S50/S50	Two RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:2 NSUN-B75	Two RSMs, each with one 75 ohm IF switch only
1:2 NSUN-B50	Two RSMs, each with one 50 ohm IF switch only
1:2 NSUN-S50	Two RSMs, each with one 50 ohm RF switch only
1:3 NSUN-B75/S50	Three RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:3 NSUN-B50/S50	Three RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:3 NSUN-S50/S50	Three RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:3 NSUN-B75	Three RSMs, each with one 75 ohm IF switch only
1:3 NSUN-B50	Three RSMs, each with one 50 ohm IF switch only
1:3 NSUN-S50	Three RSMs, each with one 50 ohm RF switch only
1:4 NSUN-B75/S50	Four RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:4 NSUN-B50/S50	Four RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:4 NSUN-S50/S50	Four RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:4 NSUN-B75	Four RSMs, each with one 75 ohm IF switch only
1:4 NSUN-B50	Four RSMs, each with one 50 ohm IF switch only
1:4 NSUN-S50	Four RSMs, each with one 50 ohm RF switch only
1:5 NSUN-B75/S50	Five RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:5 NSUN-B50/S50	Five RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:5 NSUN-S50/S50	Five RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:5 NSUN-B75	Five RSMs, each with one 75 ohm IF switch only
1:5 NSUN-B50	Five RSMs, each with one 50 ohm IF switch only
1:5 NSUN-S50	Five RSMs, each with one 50 ohm RF switch only

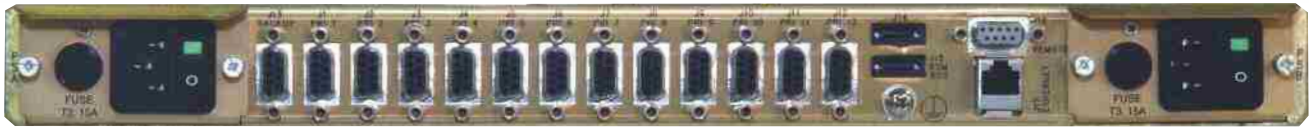
* Expansion from existing 1:N system requires customer provided detail of existing 1:N system for appropriate cable sets to be provided.

External Switches (Expandable) Continued*

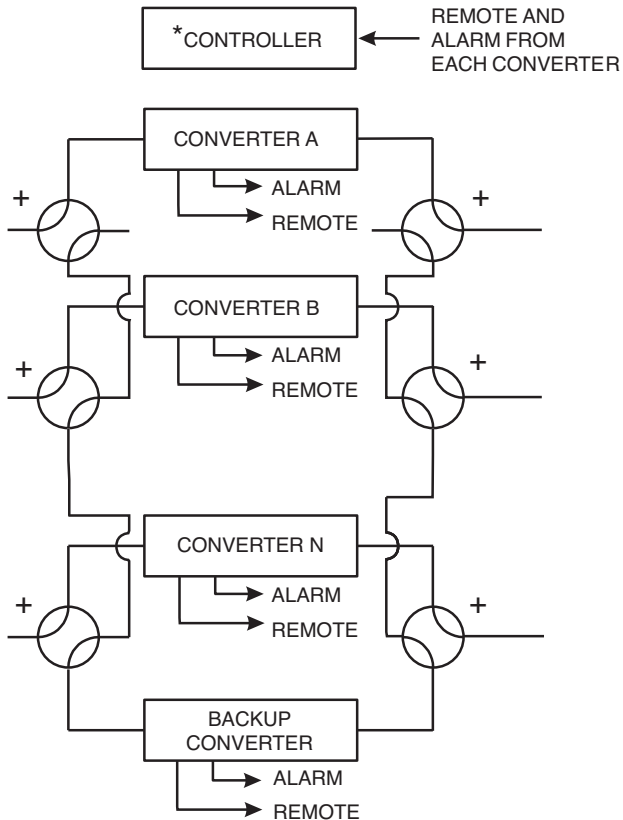
Model Numbers	Description
1:6 NSUN-B75/S50	Six RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:6 NSUN-B50/S50	Six RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:6 NSUN-S50/S50	Six RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:6 NSUN-B75	Six RSMs, each with one 75 ohm IF switch only
1:6 NSUN-B50	Six RSMs, each with one 50 ohm IF switch only
1:6 NSUN-S50	Six RSMs, each with one 50 ohm RF switch only
1:7 NSUN-B75/S50	Seven RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:7 NSUN-B50/S50	Seven RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:7 NSUN-S50/S50	Seven RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:7 NSUN-B75	Seven RSMs, each with one 75 ohm IF switch only
1:7 NSUN-B50	Seven RSMs, each with one 50 ohm IF switch only
1:7 NSUN-S50	Seven RSMs, each with one 50 ohm RF switch only
1:8 NSUN-B75/S50	Eight RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:8 NSUN-B50/S50	Eight RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:8 NSUN-S50/S50	Eight RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:8 NSUN-B75	Eight RSMs, each with one 75 ohm IF switch only
1:8 NSUN-B50	Eight RSMs, each with one 50 ohm IF switch only
1:8 NSUN-S50	Eight RSMs, each with one 50 ohm RF switch only
1:9 NSUN-B75/S50	Nine RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:9 NSUN-B50/S50	Nine RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:9 NSUN-S50/S50	Nine RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:9 NSUN-B75	Nine RSMs, each with one 75 ohm IF switch only
1:9 NSUN-B50	Nine RSMs, each with one 50 ohm IF switch only
1:9 NSUN-S50	Nine RSMs, each with one 50 ohm RF switch only
1:10 NSUN-B75/S50	Ten RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:10 NSUN-B50/S50	Ten RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:10 NSUN-S50/S50	Ten RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:10 NSUN-B75	Ten RSMs, each with one 75 ohm IF switch only
1:10 NSUN-B50	Ten RSMs, each with one 50 ohm IF switch only
1:10 NSUN-S50	Ten RSMs, each with one 50 ohm RF switch only
1:11 NSUN-B75/S50	Eleven RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:11 NSUN-B50/S50	Eleven RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:11 NSUN-S50/S50	Eleven RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:11 NSUN-B75	Eleven RSMs, each with one 75 ohm IF switch only
1:11 NSUN-B50	Eleven RSMs, each with one 50 ohm IF switch only
1:11 NSUN-S50	Eleven RSMs, each with one 50 ohm RF switch only
1:12 NSUN-B75/S50	Twelve RSMs, each with one 75 ohm IF switch and one 50 ohm RF switch
1:12 NSUN-B50/S50	Twelve RSMs, each with one 50 ohm IF switch and one 50 ohm RF switch
1:12 NSUN-S50/S50	Twelve RSMs, each with one 50 ohm switch on input and one on output (for Block Converters)
1:12 NSUN-B75	Twelve RSMs, each with one 75 ohm IF switch only
1:12 NSUN-B50	Twelve RSMs, each with one 50 ohm IF switch only
1:12 NSUN-S50	Twelve RSMs, each with one 50 ohm RF switch only

* Expansion from existing 1:N system requires customer provided detail of existing 1:N system for appropriate cable sets to be provided.

1:N Redundant Switchover System



NSUN Series - Rear Panel View



* Inside NSUN box.

+ Switch modules mountable in converters.

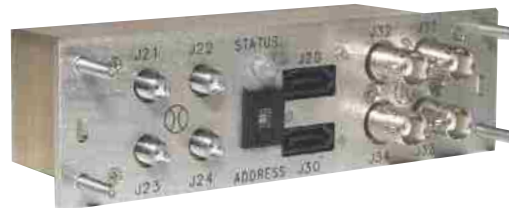
The 1:N Redundant Switchover System consists of:

- One NSUN controller for one to twelve primary frequency converters and one backup converter.
- One to twelve Redundant Switch Modules (RSM).

The NSUN controller monitors the status of up to twelve primary frequency converters and one backup converter, automatically detecting changes in settings and fault status.

The frequency converters can be prioritized so that critical communication channels have access to the backup converter on a prioritized basis.

A strong feature set of monitor and control functions supports powerful local and remote control. An embedded web server provides for a user friendly computer interface.



RSM - Redundant Switch Module

RF Specifications

Frequency	Insertion Loss (Maximum)	Amplitude Flatness/40 MHz (Maximum)	Return Loss (Minimum)	Isolation (Minimum)
50–180 MHz	0.3 dB	0.2 dB	20 dB	60 dB
0.95–3 GHz	0.2 dB	0.2 dB	20 dB	80 dB
3–8 GHz	0.3 dB	0.3 dB	17 dB	70 dB
8–12.4 GHz	0.4 dB	0.3 dB	15 dB	60 dB
12.4–18.4 GHz	0.5 dB	0.4 dB	13 dB	60 dB

Note: RF specifications apply to a single switch. IF switches (BNC female) are 50–180 MHz, RF switches (SMA female) are 0.95–18.4 GHz.

Options

- 17.** Remote control.
- C.** RS232 remote interface.
- TR.** Third rack interface cables.
- BN.** Interface cables for 1RU block converters with N female IF connectors.

Notes: Missing option numbers are not applicable for this product.

1:1, 1:2 and 1:N Redundant Switchover Systems

General Specifications

PHYSICAL

Controller unit:

Weight (NSU1/NSU2/1:N NSUN)	12 pounds (5.2 kg) nominal
Chassis dimensions.....	19" x 20" x 1.75" panel height
Converter control and status connectors.....	DE-9S
Remote interface and status connector.....	DE-9S
Ethernet interface connector	RJ45 receptacle
RSM switch module bus connectors	Serial ATA receptacle
AC inputs.....	IEC-320

Redundant Switch Modules (RSM) for use with 1:N NSUN:

Weight	1 pound nominal
Housing dimensions	5.60" wide x 1.61" high x 1.9" deep
RF connectors	SMA female
IF connectors.....	BNC female
Switch module bus connectors.....	Serial ATA receptacle

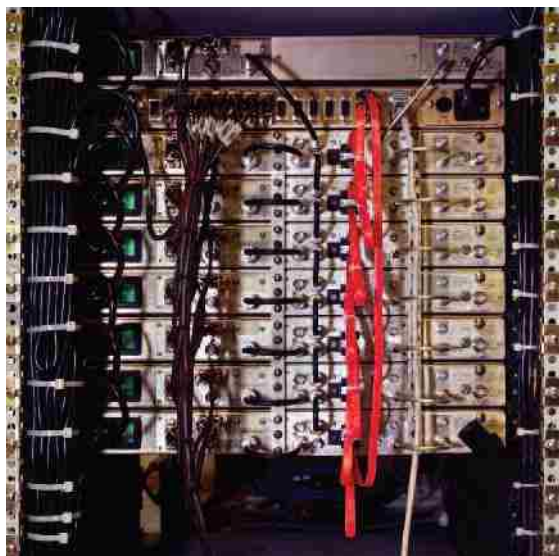
Interconnecting cables supplied with NSUN:

The U-links (for back-up converter) and converter interface cables supplied with NSUN are for use with 9800/9900 series converters. Other converter product lines require optional cable sets (see available Options TR and BN).

Included with the RSM Modules:

IF/RF U-links for use with 9800/9900 series converters. Other converter product lines require optional cable sets (see available Options TR and BN).

Note: IF/RF cables are not included with the NSU1 and NSU2. Cable kits can be ordered separately.



Typical 1:7 redundant system with interconnecting DC cables (NSUN and 9800/9900 series converters shown).

PRIMARY POWER

Voltage.....	100–240 VAC (-10%, +6%)
Frequency	47–63 Hz
Power consumption	
NSU1/NSU2.....	13 watts typical
NSUN in a	
1:12 configuration	18 watts typical

ENVIRONMENTAL

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

For additional details on local and remote controls, please reference MITEQ Technical Note 25T065.