

Network Service Module Installation and Safety Guide



AT-AR040
AT-AR041
AT-AR042
AT-AR048

Network Service Module Installation and Safety Guide
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Package Contents

The following items are included with each Network Service Module (NSM). Contact your authorised Allied Telesis distributor or reseller if any items are damaged or missing.

- One NSM
- One *Network Service Module Installation and Safety Guide*
- One warranty card

Compatible Base Units






The following table lists NSMs and NSM-ready products. Ticks (✓) indicate which models are compatible.

Table 1: Compatibility of NSM models

Family	Model(s)	AR040	AR041	AR042	AR048
Rapier	Rapier 8/8 (MT & SC)	✓	✓	✓	
	Rapier 16F-FX (MT-RJ & SC)	✓	✓	✓	
	Rapier 16Fi-FX (MT-RJ & SC)	✓	✓	✓	
	Rapier 24	✓	✓	✓	
Rapier <i>i</i>	Rapier 24 <i>i</i>	✓	✓	✓	✓
AR800 Modular Switching Router	AR816F-FX (MT-RJ & SC)	✓	✓	✓	
	AR824	✓	✓	✓	
AR Routers	AR740	✓	✓	✓	
	AR745	✓	✓	✓	

AT-AR048 Support

The maximum DS3 packet forwarding rates are achieved only when the AT-AR048 is installed in a Rapier 24*i* whose serial number ends with the letter N or higher. If maximum DS3 performance is not required, you can install the AT-AR048 in any Rapier 24*i* whose serial number ends in J, K, L, or M. You can find the serial number on the underside of the switch (see the following figure).

Model : AT-RP241-10

 Part Number: 990-11934-10

 Product Serial Number: S03K225N

 Quantity With Unit of
 Measure: 
 1 EA 7 67035 14875
 5
 Made in Singapore

N or higher for maximum DS3 performance

J, K, L, or M for less demanding DS3 applications

Hot Swapping

There are two methods for installing and removing NSMs: the standard installation method and the hot swap installation method. The software release running on your switch or router determines which of these two methods should be used.

If your switch or router is running Software Version 2.2.3 or earlier, follow the standard method. If your switch or router is running Software Version 2.3.1 or later, you can use the hot swap method.

To find out which software release your switch or router is running, use the command:

```
show install
```

The following installation procedure describes how to install an NSM using either installation method.

Hot swapping an AT-AR040



Caution You cannot install PICs into an AT-AR040 NSM that has power applied to it. This includes NSMs that have been deactivated using the hot swap button, but not physically removed from the switch or router. To ensure that all power is removed from the NSM bay, you must either physically remove it from the switch or router (using the hot swap method), or disconnect all power sources to the switch or router.

If you have PICs to install, follow the *Port Interface Card Installation and Safety Guide*. If there are more PIC bays than PICs, use the bays on the switch or router base unit first, then fill the NSM PIC bays starting with bay 0.

Please note that you can hot swap the AT-AR040 NSM with PICs already installed in its PIC bays. There is no need to remove the PICs before hot swapping. See the *Network Service Module Hardware Reference* for information on the operational characteristics of hot swapped interfaces.

Installing a Network Service Module



Warning Failure to follow this procedure when hot swapping an NSM will cause the switch or router to crash, and may damage it and any files stored in Flash.

1. Read the safety information.

See the Installation and Safety Guide for your switch or router. A copy of this guide can be found on the CD-ROM that came with your switch or router, or at www.alliedtelesis.co.uk/site/products/.

2. If you are not hot swapping, remove power to the switch or router.



Warning Be sure to disconnect the main power supply and the redundant power supply before installing the NSM. Installing an NSM with the switch or router powered ON can damage the NSM or base unit.

If you are hot swapping, prepare the NSM bay.



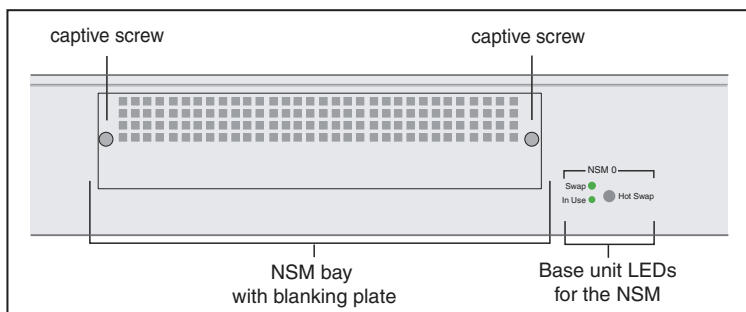
Warning Do not attempt to hot swap while the contents of Flash are being modified; for instance, during Flash compaction or when files are being loaded onto the switch or router. If the switch or router crashes while Flash is being modified, configuration files, software release files, feature licenses and other files may be damaged.

If the In Use LED (next to the NSM bay) is lit, use a pencil tip or similar object to press the recessed Hot Swap button. The In Use LED should go out and the Swap LED should light.

If the In Use LED remains lit or if neither the In Use nor Swap LED are lit, the software release does not support hot swapping, and you must install the NSM with the switch or router powered OFF.

3. Remove the switch or router NSM-bay face-plate or existing NSM.

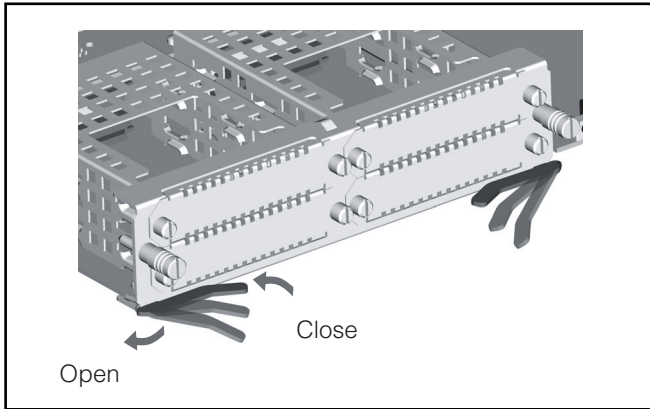
If the switch or router does not have an NSM installed, remove the blank NSM-bay face-plate by loosening the two M4 Phillips screws (see the following figure).



If an NSM is already installed, disconnect its network cables and TNY lines before removing it from the switch or router.

Remove the NSM by unscrewing both thumbscrews at the same time. As the thumbscrews are turned, they will push the NSM out of the bay.

If the NSM has extractor levers, moving them to the open position will assist the removal process (see the following figure).



When removing an NSM, take care to turn each thumbscrew by an equal amount to ensure the NSM does not become misaligned. Forcing a jammed thumbscrew may damage the NSM.

If a thumbscrew becomes tight, it must not be forced. Instead, screw it in or out slightly to loosen it and then try again, taking care to unscrew both thumbscrews at the same rate.

Keep the face-plate for future use. If you remove an NSM, replace the face-plate to prevent dust and debris from entering the switch or router and to maintain proper airflow.

4. Prepare the NSM.

In an antistatic environment, remove the NSM from its packing material. Be sure to observe ESD precautions.



Warning Do not attempt to install an NSM without observing correct antistatic procedures. Failure to do so may damage the switch, router, or NSM. If you are unsure what the correct procedures are, contact your authorised Allied Telesis distributor or reseller.

5. Slide the NSM into place.

Slide the NSM into the NSM bay, making sure the ends of the thumbscrews are aligned with the screw holes on the switch or router.

If the NSM has extractor levers, they should be in the closed position.

6. Secure the NSM.

When the NSM has been firmly pushed into place, turn the NSM's two thumbscrews to engage their threads. Tighten both thumbscrews at the same rate to pull the NSM into position.

The screws will tighten when the NSM panel is in its installed position. The thumbscrews should be firm but not over-tight.

If one thumbscrew becomes tight before the other, loosen it slightly before proceeding.

7. If you are not hot swapping, apply power to the switch or router.

Re-attach the power cord, and reconnect any redundant power supply. Check that the switch or router power LED lights green.

Check the In Use LED. The In Use LED (on the switch or router rear panel) lights to indicate the NSM is installed, is receiving power, and is operational.

If you are hot swapping, return the NSM bay to use.

Press the recessed Hot Swap button. The Swap LED will go out and the In Use LED will light.

If the In Use LED lights only briefly and the Swap LED then lights continuously, the NSM is of a type the software release does not support.

8. Verify the installation.

Use the **show system** command to verify the switch or router has recognised the NSM. If there is no NSM entry in the output, recognition has failed.

If the In Use LED fails to light or recognition fails, repeat the installation process, paying particular attention to steps 5 and 6.

If the reinstallation fails, see the *Network Service Module Hardware Reference*, which has further troubleshooting information.

LEDs and What They Mean

AT-AR040 LEDs

The AT-AR040 NSM unit does not have independent LEDs. See [“Base Unit LEDs related to NSMs” on page 10](#) for information about related LEDs found on the base-unit switch or router.

AT-AR041 and AT-AR042 LEDs

LED	State	Function
Active	Green	Lit when the BRI has successfully completed the exchange of INFO 1 and INFO 2 signals, and INFO 3 and INFO 4 signals are present on the link. This means the ISDN interface is correctly connected to a working NT device.
	Off	There is no connection to the ISDN, or the ISDN has deactivated the connection.
Data	Amber	For on-demand ISDN, lit when there is a call up over the respective B channel. For permanent circuits, lit when HDLC packets are being exchanged between the switch or router and another TE end system device (normally another switch or router) over the respective B (data) channel.
	Flashing Amber	For on-demand ISDN, flashing when data is being exchanged.
	Off	For on-demand ISDN, Off when there is no active connection or when continuous data exchange is occurring. For permanent ISDN circuits, Off when no data exchange is occurring.

AT-AR048 LEDs

LED	State	Function
Active	Green	Lit when the Line Interface Unit (LIU) is receiving a signal.
Loop	Green	Lit when any loopback is active.
LOS	Amber	Lit when the received signal is lost. This usually indicates a network disruption, such as a cable being disconnected or a device failure.
LOF	Amber	Lit when the DS3 framer cannot extract valid frames from the received signal.
AIS	Amber	Lit when an Alarm Indication Signal is detected.
FERF	Amber	Lit when a Far End Receive Failure signal is detected. This indicates the far end is receiving an AIS, LOS, or LOF signal.

Base Unit LEDs related to NSMs

The following table may be helpful when diagnosing possible NSM faults. Switches and routers with NSM bays have these LEDs built into their chassis.

LED	State	Function
In Use (rear panel)	Green	An NSM is installed, is receiving power, and is operational. The NSM and its PICs are not ready for hot swap.
	Off	No NSM is installed or the NSM is not installed correctly (the switch or router has not recognised the NSM).
Swap (rear panel)	Green	The NSM and its PICs are ready to be hot swapped.
	Off	The Hot Swap button must be pressed before the NSM or its PICs can be hot swapped or the software release does not support hot swapping. Hot swapping is supported by Software Version 2.3.1 or later.

PIC LEDs

PIC LED descriptions can be found in the *Port Interface Card Hardware Reference*, which is included on the CD-ROM bundled with your switch or router or at www.alliedtelesis.co.uk/site/products/.

Where To Find More Information

For further information on NSMs:

See the *Network Service Module Hardware Reference*, which provides detailed information on NSMs.

For information on base units (switches and routers):

See the Hardware Reference or Software Reference for your switch or router, which provides information on hardware and software features.

For information on PIC expansion options:

See the *Port Interface Card Installation and Safety Guide*, which outlines the procedure for installing PICs; and the *Port Interface Card Hardware Reference*, which provides detailed information on PICs.

These documents can be found on the CD-ROM bundled with your switch or router or at www.alliedtelesis.co.uk/site/products/.



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