

# Network Service Module Quick Install Guide



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

Network Service Module Quick Install Guide  
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## Models Covered By This Guide

This Quick Install Guide includes information on the following models:

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

Quick Install Guide updates can be found at [www.alliedtelesis.com/support/](http://www.alliedtelesis.com/support/).

## Package Contents

The following items are included with each NSM. Contact your sales representative if any items are damaged or missing.

- One NSM
- One NSM Quick Install Guide
- One warranty card

## Compatible Base Units

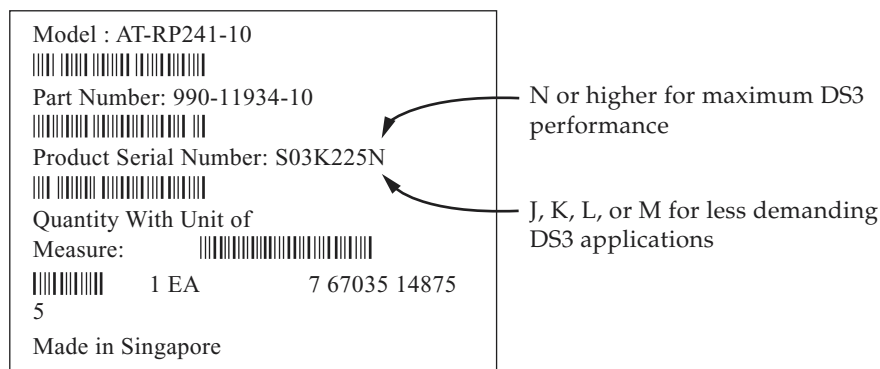
Table 1 lists NSMs and NSM-ready products. Ticks (✓) indicate which models are compatible.

**Table 1: Compatibility of NSM models.**

| Family                         | Model(s)                    | AR040 | AR041 & AR042 | AR048 <sup>1</sup> |
|--------------------------------|-----------------------------|-------|---------------|--------------------|
| 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                       | ✓     | ✓             |                    |

1. 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, the AT-AR048 can be installed in any Rapier 24*i* whose serial number ends in J, K, L, or M. The serial number can be found on the underside of the switch (see Figure 1 on page 4).

**Figure 1: Serial number label, as found on the underside of switches.**



## Installing a Network Service Module

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 release
```

### Standard Installation Method (for Software Version 2.2.3 or earlier):

Follow these steps to install or remove an NSM if the software release does not support hot swapping.

#### 1. Read the safety information

See the *Safety and Statutory Information* booklet for your switch or router. A copy of this booklet can be found on the CD-ROM that came with your switch or router, or at [www.alliedtelesis.com/support/](http://www.alliedtelesis.com/support/).

#### 2. If connected, disconnect the switch or router from its redundant power supply

#### 3. Disconnect the switch or router from the main power supply



*If using the Standard Installation Method, be sure to disconnect the main power supply and the redundant power supply before installing an NSM. Installing an NSM with this method when the switch or router is powered ON can damage the NSM.*

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

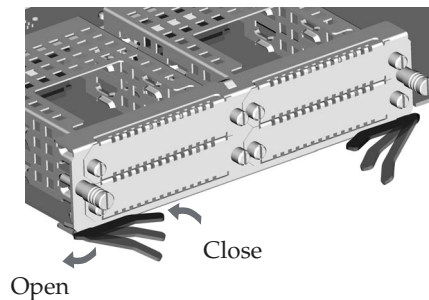
If the switch or router does not have an NSM installed, remove the blank NSM-bay face-plate by loosening the two M4 Phillips screws. See Figure 3 on page 5.

If an NSM is already installed, disconnect its network cables and TNV 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 (Figure 2 on page 5).

Figure 2: NSM extractor levers.



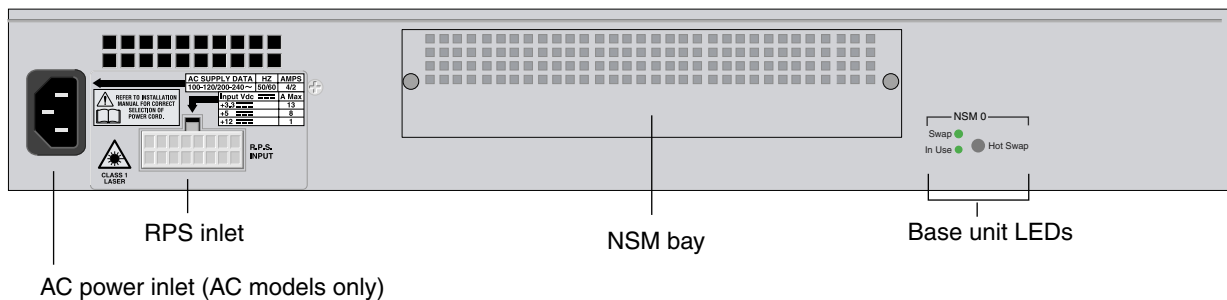
*When removing an NSM, take care to turn each thumbscrew by an equal amount to ensure the NSM does not become misaligned. Forcing a jammed thumbscrew may damage the NSM.*

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.*

Figure 3: The NSM bay on a Rapier Switch.



#### 5. Prepare the NSM

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



*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.*

## 6. 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 (Figure 2 on page 5).

## 7. 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.

## 8. Installing PICs in the AT-AR040 NSM

If you have PICs to install, install them now by following the *Port Interface Card Quick Install 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.

## 9. Apply power to the switch or router by re-attaching the power cord

Check that the switch or router power LED lights green.

## 10. If you disconnected a redundant power supply, reconnect it

## 11. Verify the installation

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.

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 6 and 7.

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

## Hot Swap Installation Method (for Software Version 2.3.1 or later):



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



The AT-AR040 NSM can be hot swapped with PICs installed in its PIC bays. There is no need to remove the PICs before hot swapping. See the NSM Hardware Reference for information on the operational characteristics of hot swapped interfaces.

Follow these steps to hot swap an NSM.

### 1. Prepare the NSM bay for hot swap

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 or Swap LED are lit, the software release does not support hot swapping, and the Standard Installation Method must be used.



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*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 licences and other files may be damaged.*

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### 2. Prepare the NSM

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



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*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.*

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### 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 Figure 3 on page 5.

If an NSM is already installed, disconnect its network cables and TNV 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 (Figure 2 on page 5).



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*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.*

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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.



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*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.*

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#### 4. 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 (Figure 2 on page 5).

#### 5. 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.

#### 6. Installing PICs in the AT-AR040 NSM

If you have PICs to install, install them now by following the *Port Interface Card Quick Install 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.

#### 7. 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 4 and 5.

If the reinstallation fails, use the Standard Installation Method or see the *Network Service Module Hardware Reference*, which has further troubleshooting information.

## LEDs and What They Mean

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### AT-AR040

The AT-AR040 NSM unit does not have independent LEDs. See Table 4 on page 10 for information about related LEDs found on the base-unit switch or router.

## AT-AR041 and AT-AR042.

**Table 2: 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.<br><br>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.<br><br>For permanent ISDN circuits, Off when no data exchange is occurring.                                                                                                           |

## AT-AR048

The AT-AR048 NSM has the following LEDs on its face-plate.

**Table 3: 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.                 |

## Switch and Router 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.

**Table 4: NSM LEDs (on switches or routers with NSM bays).**

| 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 <sup>1</sup> . |

1. 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.com/support/](http://www.alliedtelesis.com/support/).

## Where To Find More Information

Sources of further 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 Quick Install 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.com/support/](http://www.alliedtelesis.com/support/).