Port Interface Card
Quick Install Guide

AT-AR020 PRI E1/T1
AT-AR021 (S) BRI- S/T
AT-AR021 (U) BRI-U
AT-AR022 ETH
AT-AR023 SYN
AT-AR024 ASYN4
AT-AR026 4ETH
AT-AR027 VoIP-FXS

Allied Telesis

Port Interface Card Quick Install Guide
Document Number C613-04020-01 REV K.

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Models Covered By This Guide

This Quick Install Guide includes information on the following models:

- AT-AR020 PRI E1/T1
- AT-AR021 (S) BRI- S/T
- AT-AR021 (U) BRI-U
- AT-AR022 ETH
- AT-AR023 SYN
- AT-AR024 ASYN4
- AT-AR026 4ETH
- AT-AR027 VoIP-FXS

Quick Install Guide updates can be found at *www.alliedtelesis.com/support/software/* default.aspx

Package Contents

The following items are included with each Port Interface Card (PIC). Contact your sales representative if any items are damaged or missing.

- Two retaining thumbscrews
- One warranty card

Two jumpers are also included with the AT-AR020 PRI E1/T1 and AT-AR021(S) BRI-S/T PICs.

Hot Swapping

The following PICs can be hot swapped if they are to be installed or removed from an AR040 NSM, and the AR040 is installed in a switch or router running Software Version 2.3.1 or later.

- AT-AR021 (S) BRI- S/T
- AT-AR021 (U) BRI-U
- AT-AR023 SYN

The procedure for hot swapping PICs is described on page -7.

The following PICs cannot be hot swapped at this time.

- AT-AR020 PRI E1/T1
- AT-AR024 ASYN4
- AT-AR027 VoIP-FXS

These PICs, PICs installed directly into routers (i.e., PICs not installed in an AR040 NSM), or PICs installed in any device running Software Version 2.2.3 or

earlier must be installed or removed using the Standard Method (as outlined below).

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

```
show release
```

Installing A PIC

Standard Installation Method:

1. **Read the safety information**

   For 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/software/*.

2. **Gather the tools and equipment you will need**

   A medium-sized flat-bladed screwdriver may be useful when loosening the PIC thumbscrews.

   You should also have any cables required for connecting the PIC to a wide area network or other network devices.

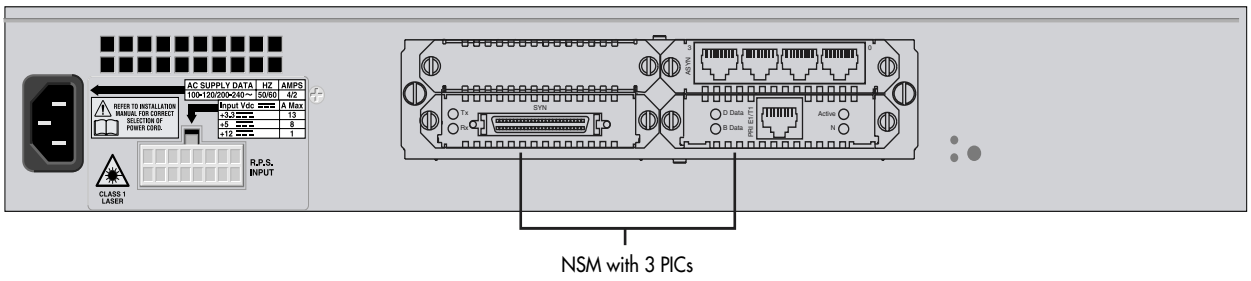
3. **For switches and routers with NSM bays, check that an NSM is installed**

   AR800 Series Switching Routers and Rapier Switches require an AT-AR040 NSM to be installed before PICs can be installed. AR740 and AR745 Routers have two base-unit PIC bays; installing an AT-AR040 NSM provides four additional PIC bays.

   NSMs are installed in the rear panel of AR800 Series Switching Routers, Rapier Switches, AR740 Routers, and AR745 Routers (see Figure 1 on page -4).

AT-AR022 ETH PICs and AT-AR026 4ETH PICs are not recommended for use in AT-AR040 NSM PIC bays.

Figure 1: An AT-AR40 NSM (with 3 PICs) installed in an AR824.



4. **If connected, disconnect the switch or router from its redundant power supply**

5. **Disconnect the switch or router from its AC or DC power supply**

When using the Standard Installation method, be sure to disconnect the main power supply and the redundant power supply before installing a PIC. Installing a PIC with the switch or router powered ON can damage the PIC.

6. Remove the PIC-bay faceplate, NSM PIC-bay faceplate, or existing PIC

Loosen the thumbscrews to remove the faceplate or PIC.

Keep the faceplate for future use. If you remove the PIC, replace the faceplate to prevent dust and debris from entering the switch or router and to maintain proper airflow.

7. Unpack the PIC

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

Do not attempt to install a PIC or any other expansion option without observing correct antistatic procedures. Failure to do so may damage the switch or router, PIC, or expansion option. If you are unsure what the correct procedures are, contact your authorised Allied Telesis distributor or reseller.

8. If the PIC has jumpers, check they are correctly set

AT-AR020 PRI E1/T1 and AT-AR021(S) BRI-S/T PICs have user-configurable jumpers. Check all jumpers and other hardware configurations are set correctly on the new PIC (see Table 1 and Table 2).

AT-AR026 4ETH PICs have user-configurable links that set features such as auto-negotiation, buffer size, and MAC address aging. Descriptions of the links can be found in the *PIC Hardware Reference*.

Table 1: Functions of jumpers on the AT-AR020 PRI E1/T1 PIC board.

Jumper	Function	Default
J1	Selects ISDN NT mode (installed, test only) or TE mode (not installed).	Not installed.
J2	Selects T1 mode (installed) or E1 mode (not installed).	Not installed.

Earlier versions of the AT-AR020 PIC also have a J3 interface jumper. If present, this jumper must be installed for E1 mode and removed for T1 mode.

Table 2: Functions of jumpers on the AT-AR021(S) BRI-S/T PIC board.

Jumper	Function
J1	100Ω termination for TX.
J2	100Ω termination for RX.

For more information on PIC jumpers and hardware configurations, see the *Port Interface Card Hardware Reference*. This Reference can be found on

the CD-ROM bundled with recently purchased switches or routers, or can be downloaded from www.alliedtelesis.com/support/software/.

Do not attempt to change any jumpers, DIP switches, or other hardware configurations while the switch or router is connected to a power supply, redundant power supply, or a 'live' network. Dangerous voltages may be present on some parts of the board, even if the switch or router is not turned on.

9. Slide the PIC into place

PIC bays should be filled in numerical order, starting with the lowest available bay (e.g., bay 0) followed by bays with progressively higher numbers.

When using AT-AR027 PICs with an AR740 and AR745 router and NSM, a maximum of four AT-AR027 PICs can be installed in the router and NSM.

10. Secure the PIC by tightening its thumbscrews

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

12. If you disconnected a redundant power supply, reconnect it

13. Test the PIC

There are several ways to check the PIC is installed and functioning correctly.

The **show system** command displays general system information about PICs and any other hardware installed, as well as memory, software version and patches loaded on the switch or router.

See the *Port Interface Card Hardware Reference* for detailed information on PIC testing.

Hot Swap Installation Method:

The following PICs can be hot swapped if they are to be installed or removed from an AR040 NSM, and the AR040 is installed in a switch or router running Software Version 2.3.1 or later:

- AT-AR021 (S) BRI- S/T
- AT-AR021 (U) BRI-U
- AT-AR023 SYN

WARNING: Failure to follow this procedure when hot swapping a PIC will cause the router to crash, and may damage files stored in FLASH.

1. Gather the tools and equipment you will need

A medium-sized flat-bladed screwdriver may be useful when loosening PIC thumbscrews.

You should also have any cables required for connecting the PIC to a wide area network or other network devices.

2. Prepare the PIC 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 version does not support hot swapping, and the Standard Installation Method must be used to install or remove the PIC.

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.

3. Remove the PIC-bay faceplate, NSM PIC-bay faceplate, or existing PIC

Loosen the thumbscrews to remove the faceplate or PIC.

Keep the faceplate for future use. If you remove the PIC, replace the faceplate to prevent dust and debris from entering the switch or router and to maintain proper airflow.

4. Unpack the PIC

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

Do not attempt to install a PIC or any other expansion option without observing correct antistatic procedures. Failure to do so may damage the switch or router, PIC, or expansion option. If you are unsure what the correct procedures are, contact your authorised Allied Telesis distributor or reseller.

5. **If the PIC has jumpers, check they are correctly set**

   See Step 8 of the Standard Installation Method for descriptions of jumpers and how to set them.

Do not attempt to change any jumpers, DIP switches or other hardware configurations while the switch or router is connected to a power supply, redundant power supply, or a 'live' network. Dangerous voltages may be present on some parts of the board, even if the switch or router is not turned on.

6. **Slide the PIC into place**

   PIC bays should be filled in numerical order, starting with the lowest available bay (e.g., bay 0) followed by bays with progressively higher numbers.

7. **Secure the PIC by tightening its thumbscrews**

8. **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 software version does not support hot swapping of this type of PIC.

9. **Test the PIC**

   There are several ways to check the PIC is installed and functioning correctly.

   The **show system** command displays general system information about PICs and any other hardware installed, as well as memory, software version and patches loaded on the switch or router.

See the Port Interface Card Hardware Reference for detailed information on PIC testing and the operational characteristics of hot swapped interfaces.

Downloading VoIP Firmware

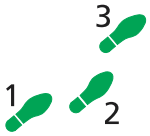
```
The following instructions are for downloading the Voice
   over IP (VoIP) PIC firmware onto your PIC. The
   instructions assume you have successfully installed the
   VoIP PIC into your router and made sure all the LEDs
   show as being on.
```

To download the VoIP PIC firmware, do the following:

Insert the VoIP PIC into the router according to your PIC Quick Install Guide.

Open the browser of your choice, enter the url *www.alliedtelesis.com* and navigate to *Products*, then to the *Accessories and Other Products* page. Click the *Show Products* button beside Port Interface Cards, and click the *AT-AR027/FXS* link. You can download all the files you require from here.

Download and save the firmware file to a location of your choice. Then load the boot code to the router's flash. If you have enough space in your flash, also load the application code to flash to allow downloading without an external tftp server.



1. **Set the boot file on the router, using the command:**

   `set voip bootcode=`*`filename`* `server={`*`ipaddr`*`|`*`flash`*`}`

where:

- *filename* is a file name of the form `filename.bin`. Valid characters are lowercase letters (a-z), digits (0-9) and the hyphen character (-).
- *ipaddr* is a tftp server IPv4 address in dotted decimal format. Use the PING command to make sure the IP address is reachable by the router.
- *flash* is the application code already stored in the router's flash.

This file should already be in the router's flash. Set the **server** parameter to "flash" if you wish to download the application code from flash.

2. **Set the protocol image filename in the TFTP server, using the command:**

   `set voip file=`*`filename`* `protocol={h323|sip} type={fxs|fxo}`

where:

- *filename* is a file name of the form `filename.bin`. Valid characters are lowercase letters (a-z), digits (0-9) and the hyphen character (-).

3. **Set the preferred router interface for the VoIP traffic, using the command:**

   `set voip public interface=`*`interface`*

where:

- *interface* is a port interface name formed by concatenating a layer 2 interface type, an interface instance, and optionally a hyphen followed by a logical interface number in the range 0-15 (for example, eth0). If a logical interface is not specified, 0 is assumed (that is, eth0 is equivalent to eth0-0).

4. **Initiate the download of the H.323 or SIP protocol image, using the command:**

   `enable voip protocol={h323|sip} [engine={`*`engine`*`}]`

where:

- *engine* is an engine name formed by concatenating a VoIP interface type and an engine instance (for example, fxs2). A fully qualified engine name may also be specified (for example, bay0.fxs0 or nsm0.bay1.fxs0).

If the TFTP download fails, possibly due to an incorrect filename or the unavailability of the TFTP server, then it can be restarted once the problem has been corrected by re-entering the **enable voip protocol** command.

Once the firmware is downloaded, all the LEDs should turn off. The figure below shows an example of the screen output of the firmware download process.

Figure 1-1: Example output of firmware download process

```
Manager> set voip boot=c-1-0-0.bin server=10.32.16.115
Info (1110003): Operation successful.
Manager> set voip fi=hs-1-0-0.bin protocol=h323
Info (1110003): Operation successful.
Manager> set voip public int=eth0
Info (1110003): Operation successful.
Manager> ena voip protocol=h323
Info (1110282): VoIP PIC BAY0:Firmware is loading...
Info (1110282): VoIP PIC BAY1:Firmware is loading...
Manager>
Info (1110293): VoIP PIC BAY0:Firmware successfully loaded.
Manager>
Info (1110293): VoIP PIC BAY0:Firmware is now running.
Manager>
Info (1110293): VoIP PIC BAY1:Firmware successfully loaded.
Manager>
Info (1110293): VoIP PIC BAY1:Firmware is now running.
```

Where To Find More Information

Sources of further information:

- The *Port Interface Card Hardware Reference*, which provides detailed information on PICs. This Reference can be found on the CD-ROM bundled with recently purchased switches or routers, or at *www.alliedtelesis.com/support/software*.
- The installation guide or reference manual for your switch or router, which provides detailed information on the operational requirements of each switch, router, or network configuration.
- Or go to *www.alliedtelesis.com*