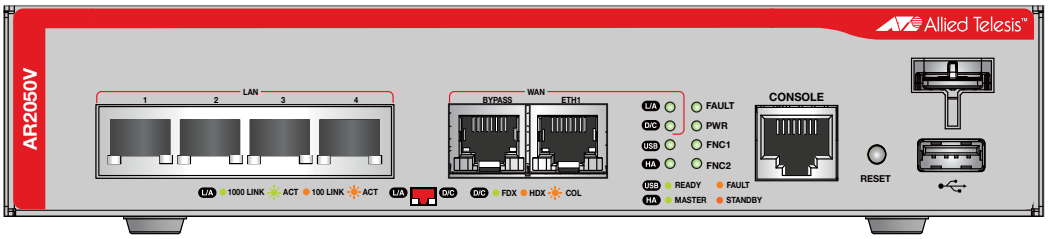
Allied Telesis™

❒ AT-AR2050V



Installation Guide

C613-04074-00 REV A

Electrical Safety and Emissions Standards

This product meets the following standards.

U.S. Federal Communications Commission
Radiated Energy Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Note: Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment.

Industry Canada
This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

> **Warning:** In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EMC: AS/NZS CISPR22 class A, EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 (CFR 47) Class A, ICES-003, VCCI-A

Electrical Safety: IEC 60950-1, CAN/CSA-C22.2 No.60950-1, EN60950-1, UL 60950-1

Environmental Compliance: 2011/65/EU RoHS Directive, China RoHS

Translated Safety Statements

Important: Safety statements that have the ⍾ symbol are translated into multiple languages in the *Translated Safety Statements* document at **www.alliedtelesis.com/support**.

Contents

Figures

Tables

Preface

This guide contains the installation instructions for the AT-AR2050V router. This preface contains the following sections:

Document Conventions

This document uses the following conventions:

Note
Notes provide additional information.

Caution
Cautions inform you that performing or omitting a specific action may result in equipment damage or loss of data.

Warning
Warnings inform you that performing or omitting a specific action may result in bodily injury.

Contacting Allied Telesis

If you need assistance with this product, you may contact Allied Telesis technical support by going to the Support & Services section of the Allied Telesis web site at **www.alliedtelesis.com/support**. You can find links for the following services on this page:

- 24/7 Online Support — Enter our interactive support center to search for answers to your product questions in our knowledge database, to check support tickets, to learn about RMAs, and to contact Allied Telesis technical experts.
- USA and EMEA phone support — Select the phone number that best fits your location and customer type.
- Hardware warranty information — Learn about Allied Telesis warranties and register your product online.
- Replacement Services — Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
- Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.
- Software Downloads — Download the latest software releases for your managed products.

For sales or corporate information, go to **www.alliedtelesis.com/purchase** and select your region.

Chapter 1
Overview

This chapter contains the following sections:

Features

Here are the features of the AR2050V router.

10/100/1000 Mbps Twisted Pair Ports

Here are the basic features of the 10/100/1000 Mbps twisted pair ports.

- ❒ 4 copper LAN ports per router
- ❒ 10Base-T (IEEE 802.3i), 100Base-TX (IEEE 802.3u), and 1000Base-T (IEEE 802.3ab) compliant
- ❒ IEEE 802.3u Auto-Negotiation compliant
- ❒ Auto-MDI/MDIX
- ❒ 100 meters (328 feet) maximum operating distance
- ❒ RJ-45 connectors

WAN Ports

Here are the basic features of the WAN ports.

- ❒ Supports one ETH port
- ❒ Supports one bypass port

USB Port

Here are the basic feature of the USB port.

- ❒ Used for maintenance

USB Retainer Slot

- ❒ Used in conjunction with the USB retainer kit
- ❒ Used for preventing the USB device from falling out of the router

Reset Button

Here are the basic features of the reset button.

- ❒ Returns to factory default settings
- ❒ Reboots the router

High Availability

- ❒ One bypass port per router

LEDs

Here are the LEDs.

- ❒ One Power LED
- ❒ One Fault LED
- ❒ One High Availability LED
- ❒ One USB LED
- ❒ One Duplex/collision LED and one link/activity LED for the ETH1 port
- ❒ Four Duplex/collision LEDs and four link/activity LEDs for the

twisted pair LAN ports

- ❒ One Function 1 LED
- ❒ One Function 2 LED

Kensington Lock Hole

Here are the basic features of the Kensington lock hole.

- ❒ Used for attaching a lock-and-cable apparatus
- ❒ One hole located on the center of the back panel

Installation Options

Here are the installation options for the routers.

- ❒ Desk or tabletop
- ❒ 19-inch equipment rack - horizontal mounting
- ❒ Wall mounted

Management Software and Interfaces

Here are the management software and interfaces.

- ❒ AlliedWare Plus™ Operating System
- ❒ Command line interface
- ❒ Web browser interface

Management Methods

Here are the methods for managing the routers.

- ❒ Local management through the Console port
- ❒ Remote Telnet and Secure Shell management
- ❒ Remote web browser management
- ❒ SNMPv1, v2c, and v3

Package Contents

- ❒ 1 main unit
- ❒ 1 AC power cord
- ❒ 1 AC power cord retainer
- ❒ 1 addendum document sheet
- ❒ 1 USB retainer
- ❒ 1 double-side adhesive tape
- ❒ 2 cable ties
- ❒ 4 stick-on rubber feet kit
- ❒ 1 RS-232 console cable

Front and Back Panels

The front panel of the AT-AR2050V router is shown in Figure 1.

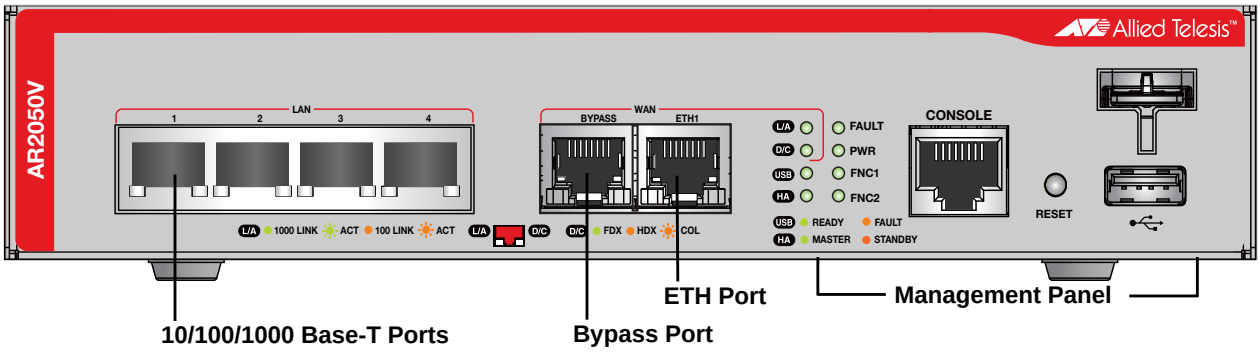


Figure 1. Front panel of the AT-A2050V router

The back panel of the AT-AR2050V router is shown in Figure 2.

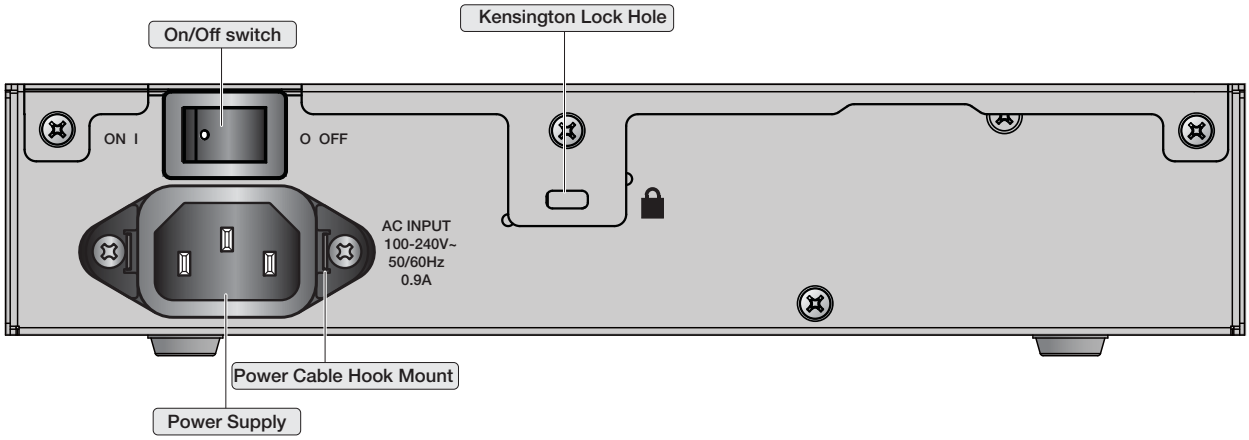


Figure 2. Back panel of the AT-AR2050V router

Management Panel

Figure 3 identifies the components in the management panel on the AT-AR2050V router.

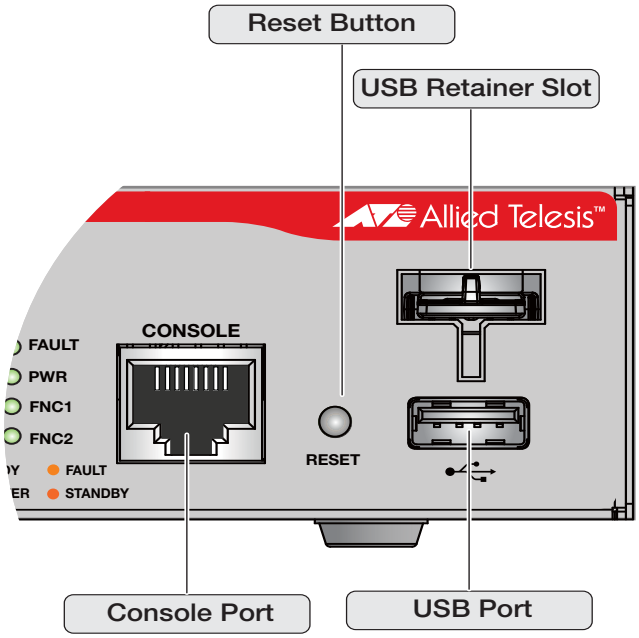


Figure 3. AT-AR2050V management panel

Management Software

The routers are shipped with the management software pre-installed. The software provides a Command Line Interface (CLI) and a Graphical User Interface (GUI) for in-band, over-the-network management.

In the unlikely event that the management software becomes corrupted or damaged on the router, you can download the software from the Allied Telesis corporate web site and reinstall it on the router. For instructions on how to install new management software, see the production documentation.

Twisted Pair Ports

The AT-AR2050V router features 4 twisted pair LAN ports and 1 twisted pair port for WAN connection. All ports are 10Base-T, 100Base-TX, and 1000Base-T compliant. You can set the port speeds and duplex modes either automatically with IEEE 802.3u Auto-Negotiation or manually with the management software.

The twisted pair ports feature 8-pin RJ-45 connectors. For the port pinouts, see “RJ-45 Twisted Pair Port Pinouts” on page 71.

The ports have a maximum operating distance of 100 m (328 feet). For 10 Mbps operation, the ports require Category 3 or better 100 ohm shielded or unshielded twisted pair cabling. For 100 or 1000 Mbps operation, the ports require Category 5 or Enhanced Category 5 (5e) 100 ohm shielded or unshielded twisted pair cabling.

Note

A router port connected to an end node that is not using Auto-Negotiation should not use Auto-Negotiation to set the speed and duplex mode, because a duplex mode mismatch may occur. In this case, disable Auto-Negotiation and set the port’s speed and duplex mode manually.

WAN Ports

ETH1 Port

The router has one ETH1 port that support 10/100/1000 Mbps twisted pair ports.

You can use the ETH1 port to connect the router to the WAN.

Bypass Port

The router has one bypass port. You can use the bypass port to connect the master router to a backup router to maintain the incoming WAN link.

You may connect the ETH1 port of the master router to the incoming WAN link to the building and connect the bypass port of the master router to the ETH1 port of an identical backup router. The bypass port of the master router is only active and in the bypass mode if:

- The master router has no power supply or suffers an internal fault, then the incoming WAN link is bypassed to the ETH1 port of the backup router.
- The master router is active but unable to boot because of some critical issues, then the incoming WAN link is bypassed to the backup router.
- The router is under software control because of some trigger events. For example, if the master router is active and a manual override command is given via the CLI, then the incoming WAN link is bypassed to the backup router.

Note that if the master router is active and is able to boot normally, then the master router connects to the WAN link, the bypass port is inactive and the backup router will not see a link to the WAN on its ETH1 port.

LEDs

Here are the descriptions of the LEDs.

Power LED

The Power LED reports the status of AC power. The LED is shown in Figure 4.

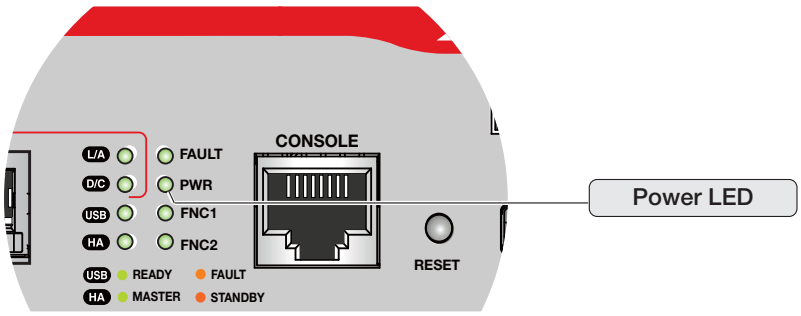


Figure 4. Power LED

The LED is described in Table 1.

Table 1. Power LED

LED	State	Description
Power	Off	The router is not receiving AC power or the internal PSU is not functioning. ETH1 will be in bypass mode.
	Steady Green	The router is receiving AC input power and is operating normally.

Fault LED

The Fault LED reports the status of the router. The LED is shown in Figure 5.

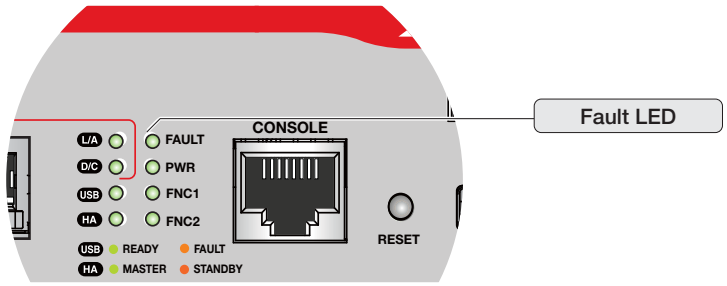


Figure 5. Fault LED

The LED is described in Table 2.

Table 2. Fault LED

LED	State	Description
Fault	Off	The router is operating normally.
	2 Red Flashes	Indicate a power (internal voltage) fault.
	6 Red Flashes	Indicates a temperature fault.

High Availability LED

The High Availability (HA) LED reports the connectivity status of the router.

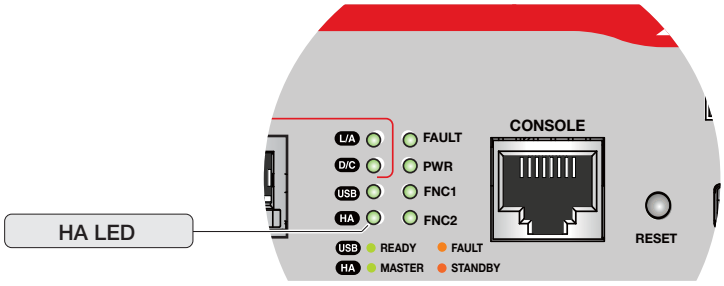


Figure 6. HA LED

The LED is described in Table 3.

Table 3. High Availability LED

LED	State	Description
High Availability	Off	No HA-Mode VRRP (Virtual Router Redundancy Protocol) instances are configured with associated WAN interfaces on the router.
	Steady Green	An HA-Mode VRRP instance on the router is in master state.
	Steady Yellow	An HA-Mode VRRP instance on the router is in backup state and no failover has occurred.
	Blinking Yellow	An HA-Mode VRRP instance is in backup state after having failed over from master state.
		An HA-Mode VRRP instance is in init state (administratively disabled or the VRRP link is down).

USB LED

The USB LED reports the status of the USB memory device. The LED is shown in Figure 7.

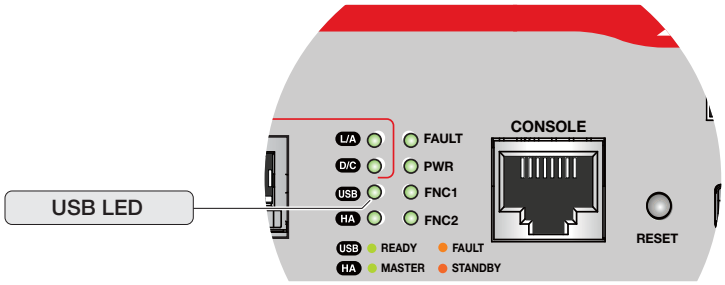


Figure 7. USB LED

The LED is described in Table 4.

Table 4. USB LED

LED	State	Description
USB	Off	No USB memory device is attached.
	Steady Yellow	USB memory device is experiencing failure.
	Steady Green	USB memory device is mounted correctly.

ETH1 Port LEDs

The ETH1 port has two LEDs that display link, activity, duplex and collision information. The LEDs are shown in Figure 8.

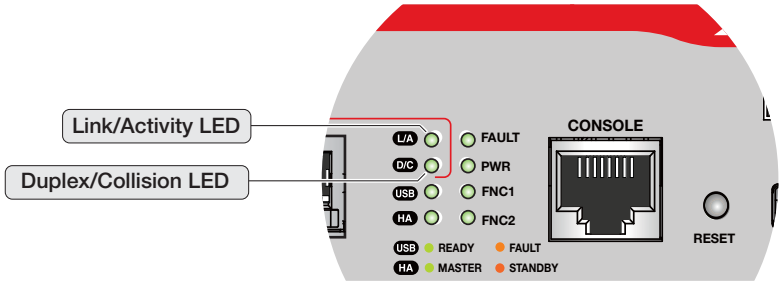


Figure 8. ETH1 Port LEDs

The LEDs are described in Table 5.

Table 5. LEDs for ETH1 Port

LED	State	Description
Link/ Activity LED	Solid Green	A port has established a 1000 Mbps link to a network device.
	Blinking Green	A port is transmitting or receiving data at 1000 Mbps.
	Solid Yellow	A port has established a 10 Mbps or 100 Mbps link to a network device.
	Blinking Yellow	A port is transmitting or receiving data at 10 or 100 Mbps.
	Off	A port has not established a link with another network device.
Duplex Mode LED	Solid Green	A port is operating in full duplex mode.
	Solid Yellow	A port is operating in half-duplex mode at 10 or 100 Mbps. (Half-duplex mode does not apply to 1000 Mbps operation.)
	Blinking Yellow	Collisions are occurring on a port operating at 10 or 100 Mbps.
	Off	A port has not established a link with another network device.

LEDs for the Twisted Pair LAN Ports

Each twisted pair port on the AT-AR2050V router has two LEDs that display link, activity, duplex and collision information. The LEDs are shown in Figure 9.

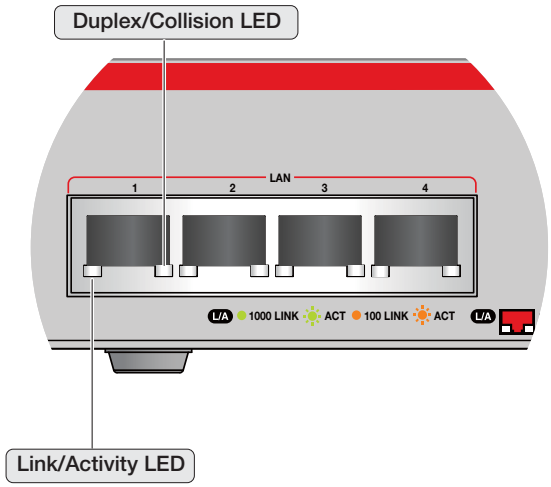


Figure 9. LEDs for the 10/100/1000Base-T Ports

The LEDs are described in Table 6.

Table 6. LEDs for the Twisted Pair LAN Ports

LED	State	Description
Link/ Activity LED	Solid Green	A port has established a 1000 Mbps link to a network device.
	Blinking Green	A port is transmitting or receiving data at 1000 Mbps.
	Solid Yellow	A port has established a 10 or 100 Mbps link to a network device.
	Blinking Yellow	A port is transmitting or receiving data at 10 or 100 Mbps.
	Off	A port has not established a link with another network device.
Duplex/ Collision Mode LED	Solid Green	A port is operating in full duplex mode.
	Solid Yellow	A port is operating in half-duplex mode at 10 or 100 Mbps. (Half-duplex mode does not apply to 1000 Mbps operation.)
	Blinking Yellow	Collisions are occurring on a port operating at 10 or 100 Mbps.
	Off	A port has not established a link with another network device.

Function 1 LED

The Function 1 LED is shown in Figure 10. The Function 1 LED is user configurable and controlled by trigger actions.

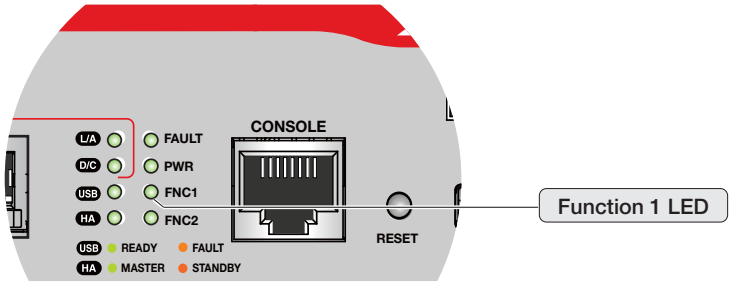


Figure 10. Function 1 LED

Function 2 LED

The Function 2 LED is shown in Figure 11. The Function 2 LED is user configurable and controlled by trigger actions.

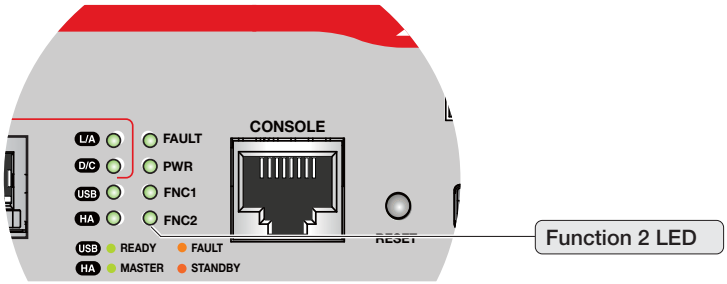


Figure 11. Function 2 LED

USB Port

The management panel has a USB port which is shown in Figure 12. You may also use the port for the following maintenance purposes.

- Store configuration files on a USB device and copy the files to routers whose settings have been lost or corrupted
- Update the management firmware on the routers

The USB port is USB2.0 type-A compatible.

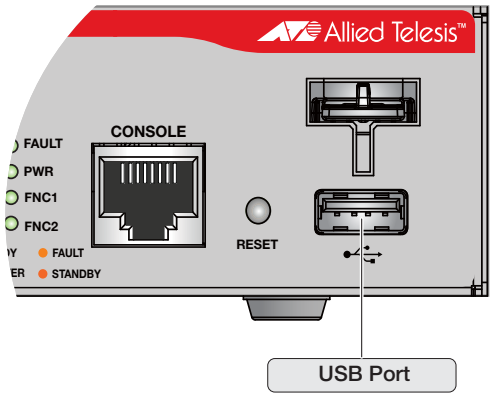


Figure 12. USB port

USB Retainer Slot

The management panel has a USB retainer slot which is shown in Figure 13. You can use the USB retainer kit and the USB retainer slot to prevent the USB device from falling out the USB port.

Note
Cable ties are designed to be used only once. Before you tighten them make sure they are positioned where you want them.

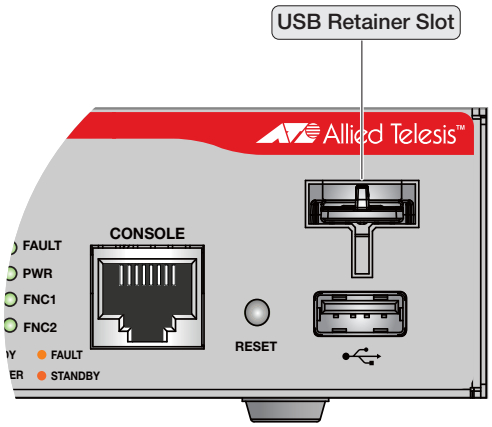


Figure 13. USB retainer slot

The following steps describe how to use the USB retainer kit and the USB retainer slot.

1. To fit the shape of the USB device, cut the USB retainer to an appropriate size and stick the double-side adhesive tape onto the back

of the USB retainer as shown in Figure 14.

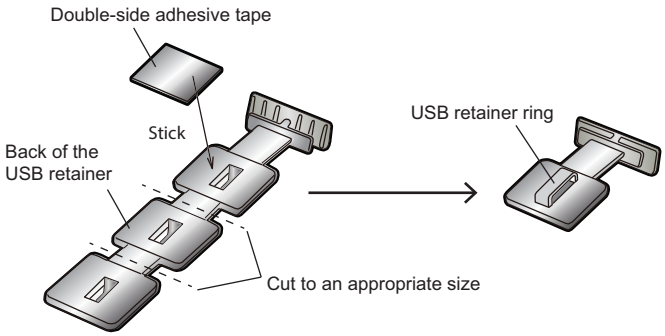


Figure 14. USB retainer

2. Mount the USB device into the USB port and then attach the H-shaped tip of the USB retainer to the USB retainer slot as shown in Figure 15.

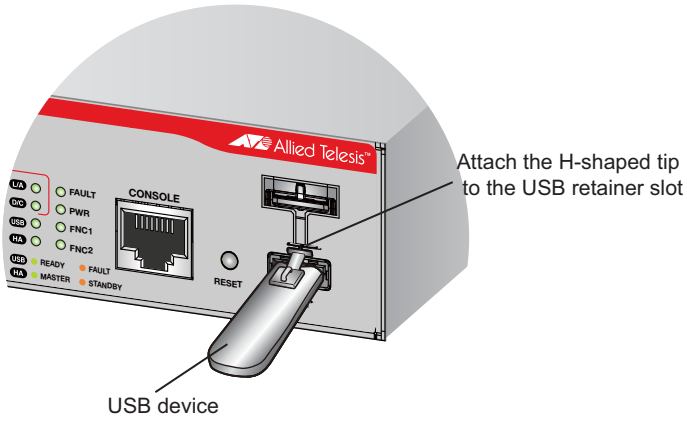


Figure 15. Attaching the USB retainer

3. Stick the double-side adhesive tape onto the back of the USB retainer. Wrap the cable tie around the USB device and pass the flat side through the USB retainer ring. Move the arm into position and the buckle of the cable tie under the device and tighten the tie.

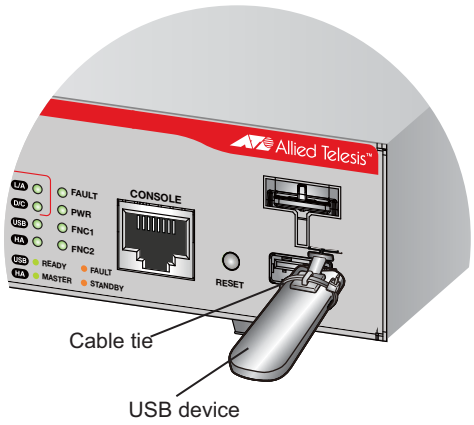


Figure 16. Attaching the cable tie

Console Port

The Console port is used to establish a management session with the router to configure its features and parameter settings. The Console port is shown in Figure 17. This type of management uses serial RS-232 and is commonly referred to as local or out-of-band management because it is not conducted over your network. To perform local management, you must be at the location of the router and must use the management cable included with the router.

To establish a local management session with the router, connect a terminal or a personal computer with a terminal emulation program to the Console port, which has an RJ-45 style (8P8C) connector, using the provided management cable. The cable has RJ-45 style (8P8C) and DB-9 (D-sub 9-pin female) connectors.

The Console port is set to the following specifications.

- Default baud rate: 9600 bps
- Supported baud rate: 9600 bps, 14400 bps, 19200 bps, 28800 bps, 38400 bps, 57600 bps, 115200 bps
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Note
These settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulation program.

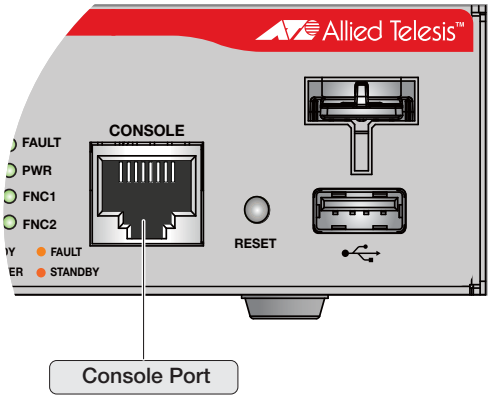


Figure 17. Console port

Reset Button

The reset button is located between the Console port and the USB port. You may use the reset button to restore the router to its factory default settings or reboot the router.

- To return to the factory default settings, press and hold the reset button for at least 5 seconds, and then release the button.
- To return to the normal configuration and reboot the router, press and hold the reset button for at least 1 second but less than 5 seconds, and then release the button.

Note
You won't lose files that contain user information by rebooting the router.

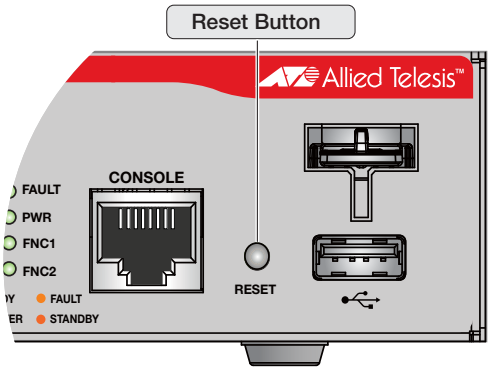


Figure 18. Reset button

Power Supply

Each router has an internal power supply with a single AC power supply socket on the back panel. A power cable is supplied with the router. You can use the On/Off switch on the back panel of the router to power the router on or off.

Refer to “Technical Specifications” on page 69 for the input voltage range.

Warning
Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. E3

Chapter 2

Beginning the Installation

The chapter contains the following sections:

Reviewing Safety Precautions

Review the following safety precautions before beginning the installation procedure.

Note
Safety statements that have the ☞ symbol are translated into multiple languages in the *Translated Safety Statements* document at **www.alliedtelesis.com/support**.

Warning
Class 1 Laser product. ☞ L1

Warning
Do not stare into the laser beam. ☞ L2

Warning
Do not look directly at the fiber optic cable ends or inspect the cable ends with an optical lens. ☞ L6

Warning
Class 1 LED product. ☞ L3

Warning
To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables. ☞ E1

Warning
Do not work on equipment or cables during periods of lightning activity. ☞ E2

Warning
Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. E3

Warning
Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. E4

Note
Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible. E5

Warning
Operating Temperatures. All the routers are designed for a maximum ambient temperature of 50° degrees C.

Note
All Countries: Install product in accordance with local and National Electrical Codes. E8

Warning
Only trained and qualified personnel are allowed to install or replace this equipment. E14

Caution
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. E21

Caution
Risk of explosion if battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Attention: Le remplacement de la batterie par une batterie de type incorrect peut provoquer un danger d'explosion. La remplacer uniquement par une batterie du même type ou de type équivalent recommandée par le constructeur. Les batteries doivent être éliminées conformément aux instructions du constructeur. E22

Warning
Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. E25

Note
Use dedicated power circuits or power conditioners to supply reliable electrical power to the device. E27

Note
If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra). E35

Caution
Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. E36

Warning
Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). E37

Caution

The unit does not contain serviceable components. Please return damaged units for servicing. E42

Choosing a Site for the Routers

Observe these requirements when planning the installation of the router.

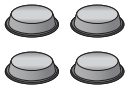
- If you plan to install the routers in an equipment rack, check to be sure that the rack is safely secured so that it will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.
- If you plan to install the routers on a table, check to be sure that the table is level and stable.
- The power outlet should be located near the routers and be easily accessible.
- The site should allow for easy access to the ports on the front of the routers, so that you can easily connect and disconnect cables, and view the port LEDs.
- The site should not expose the routers to moisture or water.
- The site should be a dust-free environment.
- The site should include dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- Do not install the routers in a wiring or utility box because it will overheat and fail from inadequate airflow.

Warning
Routers should not be stacked on top of one another on a table or desktop because that could present a personal safety hazard if you need to move or replace routers.

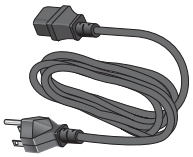
Unpacking the Router

Figure 19 lists the items that come with the AT-AR2050V router. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance. You should retain the original packaging material in the event you need to return the unit to Allied Telesis.

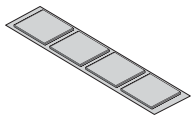
One 2 m (6.6 ft) local management cable with RJ-45 (8P8C) and DB-9 (D-sub 9-pin female) connectors.



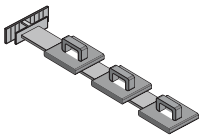
Four rubber feet



One regional AC power cords



One double-side adhesive tape



One USB retainer

Two cable ties

One AC power cord retainer

One addendum document sheet

Figure 19. Components of the AT-AR2050V router

Chapter 3

Installing the Router and Powering on the Router

The procedures in this chapter are:

Installing the Power Cord Retaining Clip

Perform the following procedures to install the power cord retaining clip on the power supply module.

Warning
Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. E3

1. Locate the power cord retaining clip, shown in Figure 20.

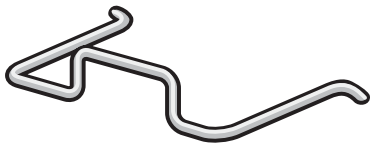


Figure 20. Power cord retaining clip

2. Install the clip on the AC power connector on the power supply module. With the ‘u’ of the clip facing down, press the sides of the clip forwards the center and insert the short ends into the holes in the retaining bracket, as shown in Figure 21.

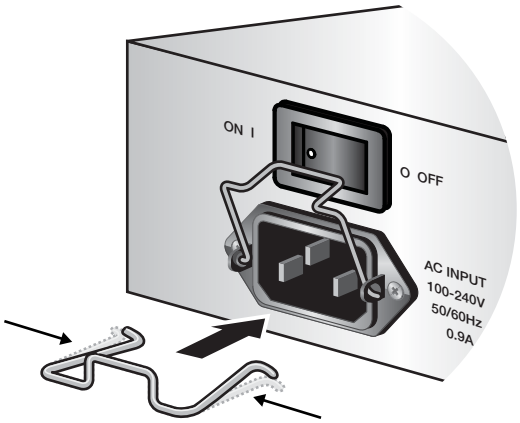


Figure 21. Inserting the retaining clip into the retaining bracket

Installing the Router on a Table or Desktop

You may install the routers on a table or desktop. Here are the guidelines to selecting a site.

- ❒ The table should be level and stable.
- ❒ The power outlet should be located near the routers and be easily accessible.
- ❒ The site should allow for easy access to the ports on the front of the routers, so that you can easily connect and disconnect cables, and view the port LEDs.
- ❒ The site should not expose the routers to moisture or water.
- ❒ The site should be a dust-free environment.
- ❒ The site should include dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- ❒ The rubber feet on the bottom of the routers should be fitted for table or desktop installation.

Warning
Do not stack routers on top of one another on a table or desktop because that could present a personal safety hazard if you need to move or replace routers.

After placing the router on the table or desktop, go to Chapter 4, “Cabling the Networking Ports” on page 63 to connect the network cables to the ports on the router.

Fitting Rubber Feet

If your routers do not already have rubber feet fitted, fit these as follows:

1. Remove all equipment from the package and store the packaging material in a safe place.
2. Turn the router over and place it on a table.
3. Remove the adhesive rubber feet from the packaging and press them firmly onto the base of the router, as shown in Figure 22.

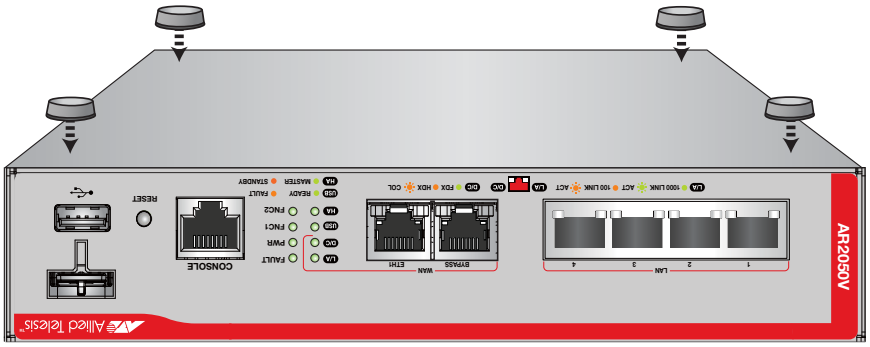


Figure 22. Attaching the rubber feet

4. Turn the router over again and place it on a flat, secure surface (such as a desk or table) leaving ample space around the unit for ventilation.

Installing the Router in an Equipment Rack

This procedure requires the following items:

- ❒ Eight bracket screws (not provided)
- ❒ Two equipment rack brackets (not provided)
- ❒ Two handles (not provided)
- ❒ Four handle screws (not provided)
- ❒ Flat-head screwdriver (not provided)
- ❒ Cross-head screwdriver (not provided)
- ❒ Four standard equipment rack screws (not provided)

Note
Rack mount kits can be purchased separately from your Allied Telesis dealer.

Note
You can mount two routers side-by-side in a rack mount tray drawer with the AT-RKMT-J15 kit. The AT-RKMT-J15 kit can be purchased separately from your Allied Telesis dealer.

Installation guidelines can be found in “Choosing a Site for the Routers” on page 44. Here is the procedure for installing the routers in a 19-inch equipment rack.

Caution
The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. E28

1. Place the unit upside down on a level, secure surface, as shown in Figure 23.

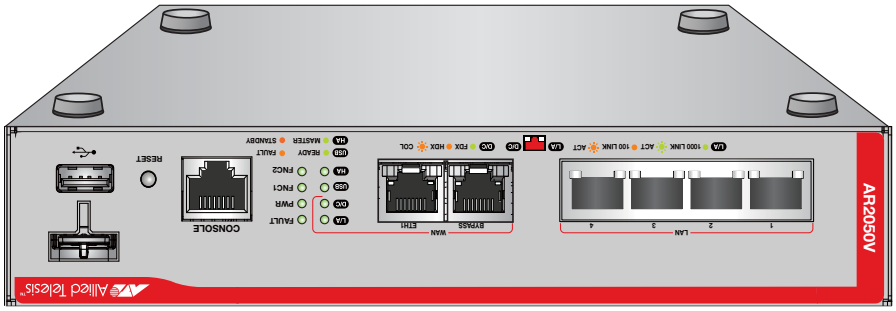


Figure 23. Turning the router upside down

2. If rubber feet are attached to the base of the router, remove them by prising off with a flat-head screwdriver, as shown in Figure 24, then turn the router back over.

Note
The rubber feet is an adhesive backed polyurethane product. Using a screwdriver to pry the rubber feet kit off the metalwork may destroy the adhesive in the removal process.

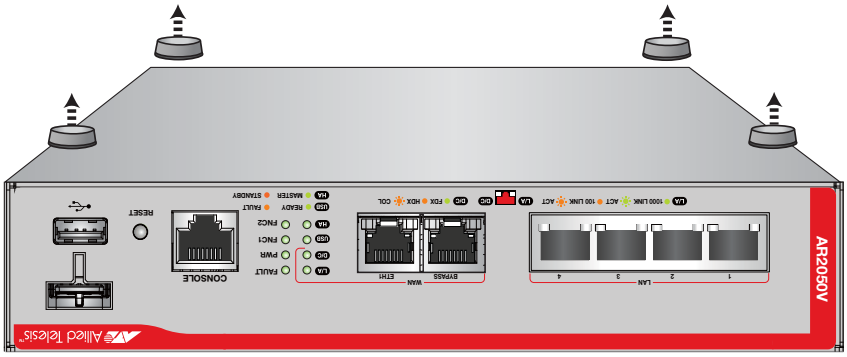


Figure 24. Removing the rubber feet

3. Turn the router over.

4. Use the four handle screws to screw the handles to the wider side of each bracket, as show in Figure 25.

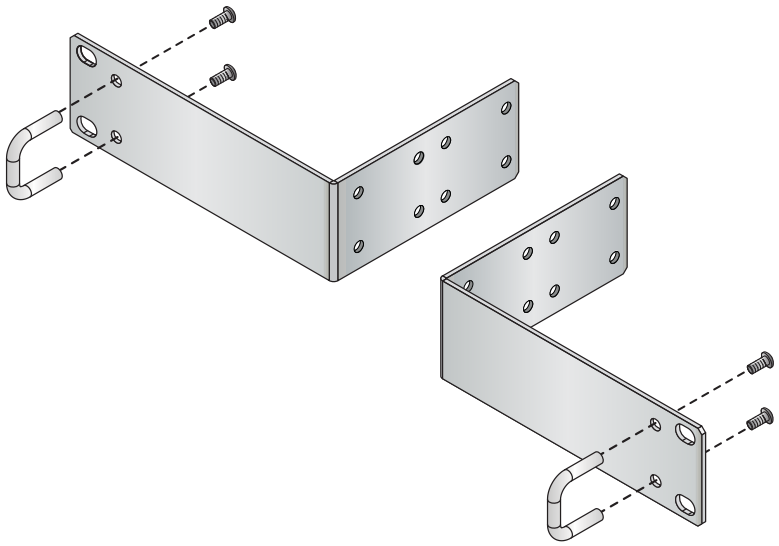


Figure 25. Attaching handles to the brackets

5. Use the eight bracket screws to screw the two rack mount brackets to the sides of the router, as shown in Figure 26.

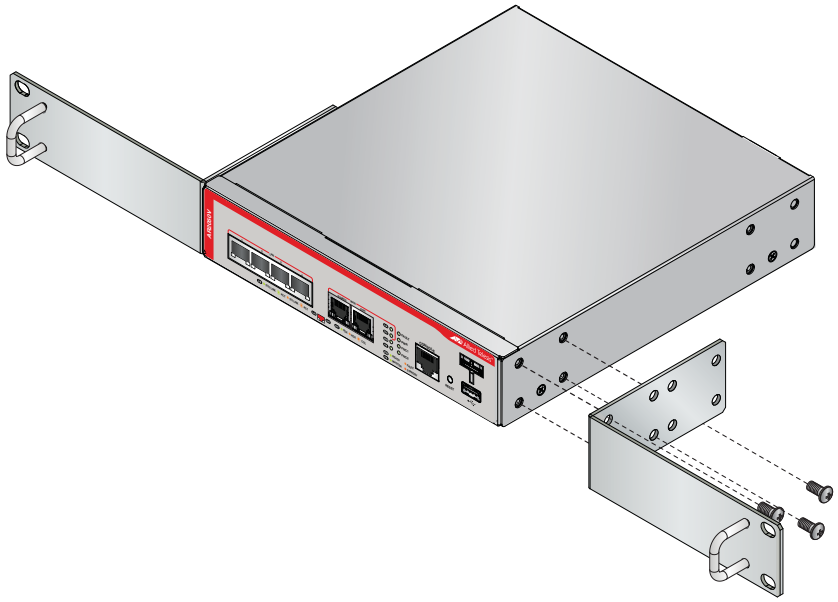


Figure 26. Attaching the equipment rack brackets

6. While another person holds the router in the equipment rack, secure it using standard equipment rack screws, as shown in Figure 27.

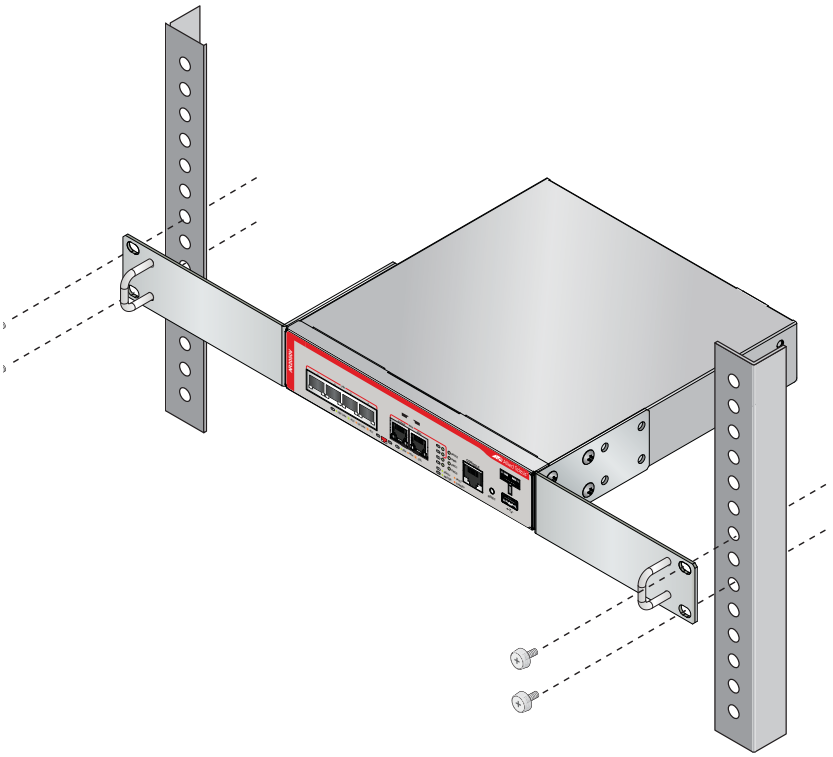


Figure 27. Mounting the router horizontally in an equipment rack

7. Go to Chapter 4, “Cabling the Networking Ports” on page 63, to connect the network cables to the ports on the router.

Installing the Router on a Wall

This procedure requires the following items:

- ❒ A wall mount kit (not provided)
- ❒ Cross-head screwdriver (not provided)
- ❒ If you are fixing the routers to a solid masonry or hollow wall, you need equipment to drill a 6 mm hole. The wall mount kit is supplied with screws and rawplugs to fasten the brackets to a masonry or plasterboard wall. If you are fixing the routers to a wooden wall, the screws are self-tapping.

Note
Wall mount kits can be purchased separately from your Allied Telesis dealer.

To install the routers on a wall, perform the following procedure:

1. Turn the router over and place it on a table.
2. If the rubber feet are attached to the bottom of the router, remove them by prising off with a flat-head screwdriver.
3. Orient the brackets against the sides of the router, and secure them to the unit with the 16 brackets screws included in the wall mount kit. See Figure 28.

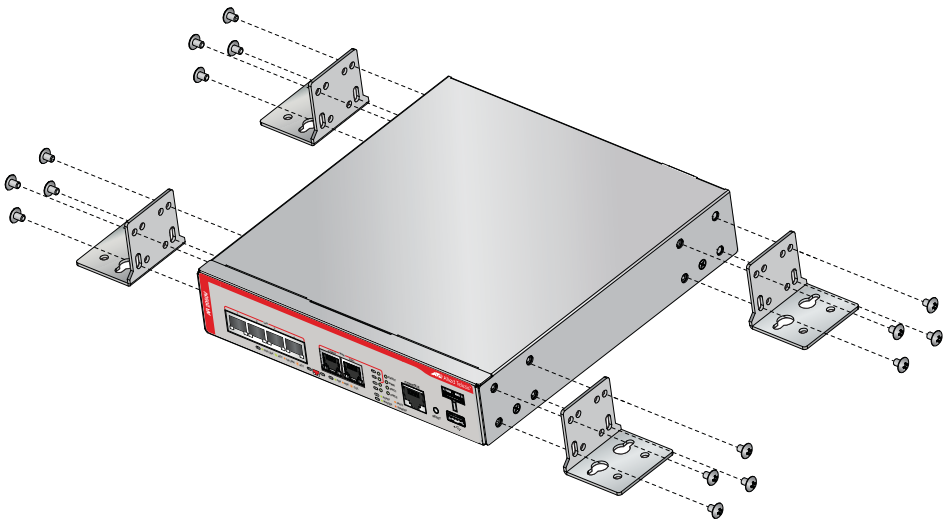


Figure 28. Attaching the wall mount brackets to the side of the router

4. Have another person hold the router at the wall location where the router is to be installed, while you use a pencil or pen to mark the wall with the locations of the holes in the brackets. The router should be oriented such that its front faceplate is facing to the left or right, and is exactly vertical. See Figure 29.

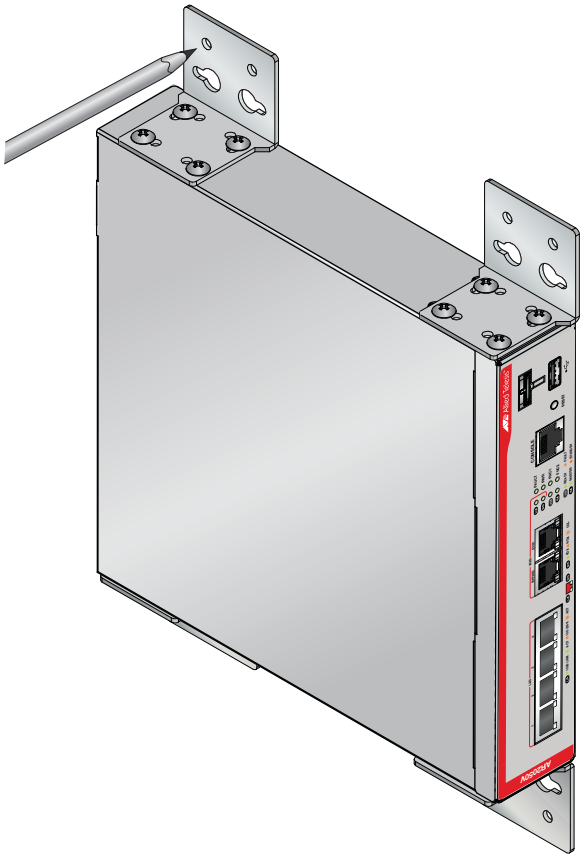


Figure 29. Marking the anchor hole location

5. While another person holds the router at the wall location, secure it to the wall using the 16 wall mounting screws. See Figure 30.

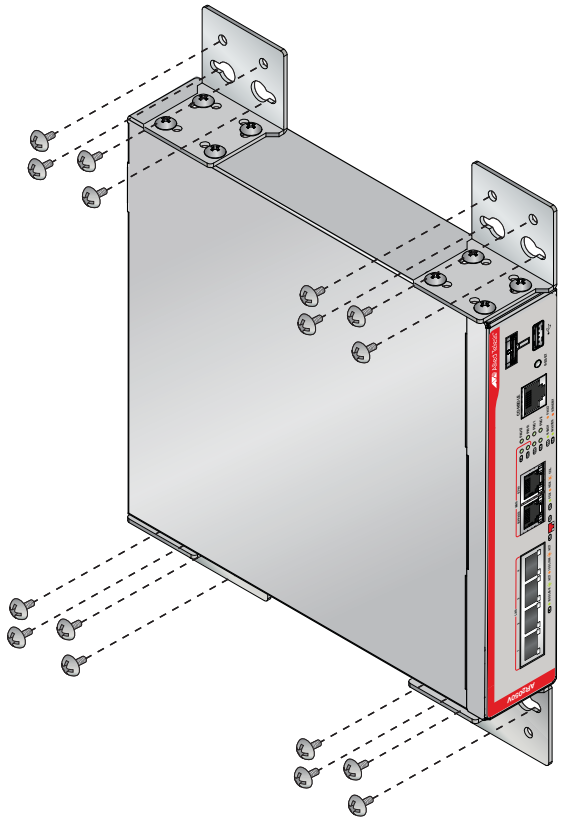


Figure 30. Securing the router to the wall

Connecting AC Power to a Power Supply Module

To power on the routers, perform the following procedure:

1. Position the power cord retaining clip in the up position, as shown in Figure 31.

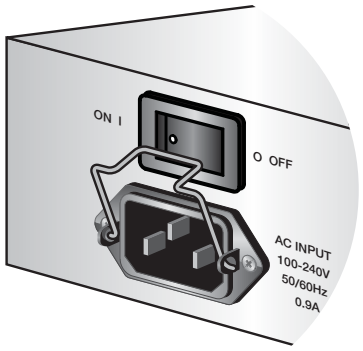


Figure 31. Power cord retaining clip in the up position

2. Plug the power cord into the AC power connector on the rear panel of the unit. Lower the power cord retaining clip to secure the power cord to the unit.

Warning
Power cord is used as a disconnected device. To de-energize equipment, disconnect the power cord. E3

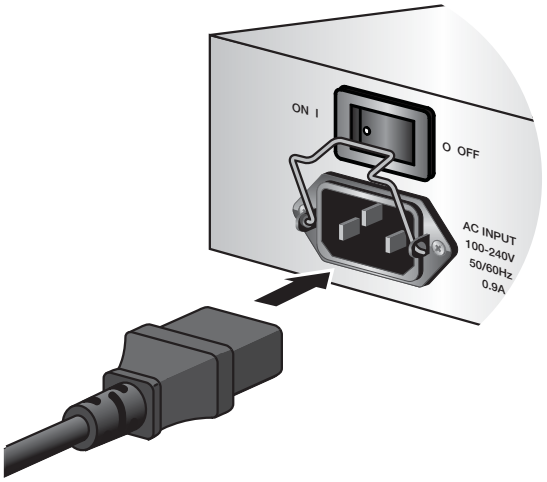


Figure 32. Connecting the AC power cord

3. Connect the other end of the power cord to an appropriate AC power outlet and switch the On/Off switch to On. For power specifications for the router, refer to Appendix A, “Technical Specifications” on page 69.

4. Verify that the POWER LED is green.

Starting a Local Management Session

This procedure requires a terminal or a terminal emulator program and the management cable that comes with the router. To start a local management session on the router, perform the following procedure:

1. Connect the RJ-45 connector on the management cable to the Console port on the front panel of the router, as shown in Figure 33.

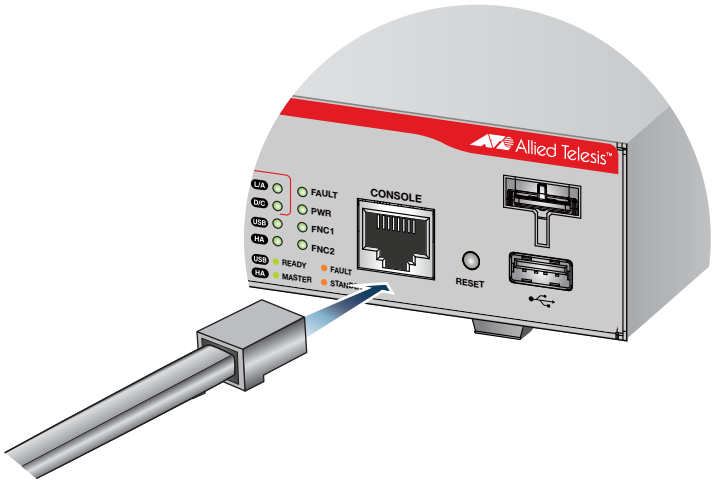


Figure 33. Connecting the Management Cable to the Console Port

2. Connect the other end of the cable to an RS-232 port on a terminal or PC with a terminal emulator program.

3. Configure the terminal or terminal emulator program as follows:

   - Baud rate: 9600 bps (9600 bps, 14400 bps, 19200 bps, 28800 bps, 38400 bps, 57600 bps, 115200 bps. The default is 9600 bps.)
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None

Note
The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.

Monitoring the Initialization Processes

It takes about thirty seconds for the router to initialize its management software programs and features, and load the default configuration.

You may also monitor the bootup sequence by connecting a terminal or computer that has a terminal emulator program, to the console port on the router. You will see the messages from Figure 34 below to Figure 35 on page 62.

```
Starting base/first...                                    [  OK  ]
Mounting virtual filesystems...                           [  OK  ]


          _______________   ____
        /\ \             / /______\
      /   \ \_       __/ /| _______ |
    /      \ |     |  /  | _______ |
  /         \ \   / /     \ ____ /
/_______/\____\ \/ /_____________/

Allied Telesis Inc.
AlliedWare Plus (TM) v0.0.0
Current release filename:AR2050V-5.4.5-0.1.rel
Built: Tue Aug 25 20:36:11 UTC 2015
Mounting static filesystems...                            [  OK  ]
Checking flash filesystem...
Formatting flash filesystem...
Mounting flash filesystem...
Checking NVS filesystem...                                [  OK  ]
Mounting NVS filesystem...                                [  OK  ]
Starting base/rename-eth...                               [  OK  ]
Starting base/dbus...                                     [  OK  ]
Starting base/syslog...                                   [  OK  ]
Starting base/loopback...                                 [  OK  ]
Starting base/sysctl...                                   [  OK  ]
Starting base/portmapper...                               [  OK  ]
Received event syslog.done
Starting base/reboot-stability...                         [  OK  ]
Checking system reboot stability...                       [  OK  ]
```

Figure 34. Router initialization messages

```
Checking system reboot stability...                    [  OK  ]
Starting base/cron...                                  [  OK  ]
Starting base/appmond...                               [  OK  ]
Starting hardware/openhpi...                           [  OK  ]
Starting hardware/timeout...                           [  OK  ]
Starting base/inet...                                  [  OK  ]
Starting base/modules...                               [  OK  ]
Received event modules.done
Received event board.inserted
Received event hardware.done
Starting network/startup...                            [  OK  ]
Starting base/external-media...                        [  OK  ]
Starting network/roboswitch...                         [  OK  ]
Received event network.enabled

Initializing HA processes:
auth, hostd, hsl, irdpd, lacp, loopprot, mstp
nsm, ospf6d, pimd, ripd, ripngd, rmon, tunneld
bgpd, cntrd, imi, ospfd

Received event network.initialized
Received event standalone

Assigning Active Workload to HA processes:
authd, hsl, imi, irdpd, lacpd, loopprotd, mstpd
nsm, ripd, rmond

Received event network.activated

Loading default configuration
Warning: flash:/default.cfg does not exist, loading factory defaults.
..

done!
Received event network.configured
```

Figure 35. Router initialization messages (Continued)

Chapter 4

Cabling the Networking Ports

This chapter contains the following procedures:

Cabling the Twisted Pair Ports

Here are the guidelines to cabling the 10/100/1000Base-T twisted pair ports.

- The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.
- The default setting for the wiring configurations of the ports is auto-MDI/MDI-X. The default setting is appropriate for router ports that are connected to 10/100Base-TX network devices that also support auto-MDI/MDI-X.
- The default auto-MDI/MDI-X setting is not appropriate for router ports that are connected to 10/100Base-TX network devices that do not support auto-MDI/MDI-X and have a fixed wiring configuration. For router ports connected to those types of network devices, you should disable auto-MDI/MDI-X and set the wiring configurations manually.
- The appropriate MDI/MDI-X setting for a router port connected to a 10/100Base-TX network device with a fixed wiring configuration depends on the setting of the network device and whether the router and network device are connected with straight-through or crossover cable. If you are using straight-through twisted pair cable, the wiring configurations of a port on the router and a port on a network device must be opposite each other, such that one port uses MDI and the other MDI-X. For example, if a network device has a fixed wiring configuration of MDI, you must disable auto-MDI/MDI-X on the corresponding router port and manually set it to MDI-X. If you are using crossover twisted pair cable, the wiring configurations of a port on the router and a port on a network device must be the same.
- The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- The default speed setting of Auto-Negotiation is not appropriate for ports connected to 10/100Base-TX network devices that do not support Auto-Negotiation and have fixed speeds. For those router ports, you should disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.
- The 10/100/1000Base-T ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not

support Auto-Negotiation and have a fixed duplex mode. You should disable Auto-Negotiation on those ports and set their duplex modes manually to avoid the possibility of duplex mode mismatches. A router port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation, which can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

Chapter 5
Troubleshooting

This chapter contains suggestions on how to troubleshoot the router if a problem occurs.

> **Note**
> For further assistance, please contact Allied Telesis Technical Support at **www.alliedtelesis.com/support**.

Problem 1: The POWER LED on the front of the router is off.

Solutions: The unit is not receiving power. Try the following:

- Verify that the power cord is securely connected to the power source and to the AC connector on the back panel of the router.
- Verify that the power outlet has power by connecting another device to it.
- Try connecting the unit to another power source.
- Try a different power cord.
- Verify that the voltage from the power source is within the required levels for your region.

Problem 2: A twisted pair port on the router is connected to a network device but the port's Link/Activity LED is off.

Solutions: The port is unable to establish a link to a network device. Try the following:

- Verify that the network device connected to the twisted pair port is powered on and is operating properly.
- Verify that the twisted pair cable is securely connected to the port on the media converter channel and to the port on the remote network device.Verify that the twisted pair cable is securely connected to the port on the media converter channel and to the port on the remote network device.
- Verify that the port is connected to the correct twisted pair cable. This is to eliminate the possibility that the port is connected to the wrong network device, such as a powered off device.
- Try connecting another network device to the twisted pair port with a different cable. If the twisted pair port is able to establish a link,

then the problem is with the cable or the other network device.

- ❒ Verify that the twisted pair cable does not exceed 100 meters (328 feet).
- ❒ Verify that you are using the appropriate category of twisted pair cable: Category 3 or better for 10 Mbps operation and Category 5 and Category 5e for 100 and 1000 Mbps operation.

Note
A 1000BASE connection may require five to ten seconds to establish a link.

Problem 3: Network performance between a twisted pair port on the router and a network device is slow.

Solutions: There might be a duplex mode mismatch between the port and the network device. This occurs when a twisted pair port using Auto-Negotiation is connected to a device with a fixed duplex mode of full duplex. If this is the cause of the problem, adjust the duplex mode of the port on the network device or on the router so that both ports are using the same duplex mode.

Problem 4: A port's Link/Activity LED is blinking.

Solutions: The link between the port and the network device is intermittent. Try the following:

- ❒ Connect another network device with a different cable to the port. If the Link LED remains steady on, then the problem is with the original cable or the network device.

Appendix A
Technical Specifications

Physical Specifications

Dimensions (Height x Width x Depth)

Table 7. Product Dimension

AT-AR2050V	42.5 mm x 210 mm x 220 mm (1.7 in. x 8.3 in. x 8.7 in.)

Weights

Table 8. Product Weight

AT-AR2050V	1.8 kg (4.0 lb.)

Environmental Specifications

Table 9. Environmental Specifications

Operating Temperature	0° C to 45° C (32° F to 113° F)
Storage Temperature	-20° C to 60° C (-4° F to 140° F)
Operating Humidity	5% to 80% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	2,000 m (6,562 ft) You need to de-rate the operating temperature as altitude increases. A de-rating of 1° C for every 305 m (1,000 ft) normally applies.
Maximum Nonoperating Altitude	3,000 m (9,843 ft)

Power Specifications

Maximum Power Consumptions

Table 10. Maximum Power Consumption

AT-AR2050V	14 watts

Input Voltages

Table 11. Input Voltages

AT-AR2050V	100-240 VAC, 0.9 A maximum, 50/60 Hz

Certifications

Table 12. Product Certifications

EMC	AS/NZS CISPR22 class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3 FCC Part 15 (CFR 47) Class A ICES-003 VCCI-A
Electrical Safety	IEC 60950-1 CAN/CSA-C22.2 No.60950-1 EN 60950-1 UL 60950-1
Environmental Compliance	2011/65/EU RoHS Directive China RoHS
CE Marking	2006/95/EC Low Voltage Directive 2004/108/EC EMC Directive

RJ-45 Twisted Pair Port Pinouts

Figure 36 illustrates the pin layout of the RJ-45 connectors and ports.

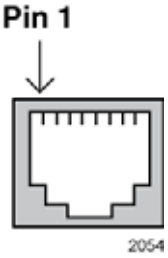


Figure 36. RJ-45 Socket Pin Layout (Front View)

Table 13 on page 71 lists the pin signals for 10 and 100 Mbps.

Table 13. Pin Signals for 10 and 100 Mbps

Pin	MDI Signal	MDI-X Signal
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
4	Not used	Not used
5	Not used	Not used
6	RX-	TX-
7	Not used	Not used
8	Not used	Not used

Table 14 lists the pin signals when a port operating at 1000 Mbps.

Table 14. Pin Signals for 1000 Mbps

Pinout	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +

Table 14. Pin Signals for 1000 Mbps (Continued)

5	Pair 3 -
6	Pair 2 -
7	Pair 4 +
8	Pair 4 -

RJ-45 Style Serial Console Port Pinouts

Table 15 lists the pin signals of the RJ-45 style serial Console port.

Table 15. RJ-45 Style Serial Console Port Pin Signals

Pin	Signal
1	Looped to pin 8.
2	Looped to pin 7.
3	Transmit Data
4	Ground
5	Ground
6	Receive Data
7	Looped to pin 2.
8	Looped to pin 1.