



User's Guide

InRow RD 100-Series InRow RD 200-Series

ACRD100, ACRD101
ACRD200, ACRD201

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Introduction

Product Description

Features

The APC by Schneider Electric InRow RD 100-series and InRow RD 200-series cooling units are modular cooling units that require only one-half the width of a standard enclosure and can be placed in a data center row. The InRow RD provides full management capabilities over a network using Telnet, Secure SHell (SSH), HyperText Transfer Protocol (HTTP), HTTP over Secure Sockets Layer (HTTPS), File Transfer Protocol (FTP), Secure CoPy (SCP), Modbus, and Simple Network Management Protocol (SNMP) versions 1 and 3. The InRow RD also provides the following features:

- Provides temperature monitoring and adapts its cooling output to rectify fluctuations in temperature
- Supports group control, which prevents demand-fighting and provides redundancy
- Enables you to shut down the cooling unit remotely over the network
- Provides output contact monitoring
- Provides the ability to export a user configuration (.ini) file from a configured card to one or more unconfigured cards
- Supports using a Dynamic Host Configuration Protocol (DHCP) or server to provide the network (TCP/IP) values for the InRow RD
- Supports using the APC Remote Monitoring Service (RMS)
- Provides data and event logs
- Enables you to configure notification through event logging (by the InRow RD and Syslog), e-mail, and SNMP traps. You can configure notification for single events or groups of events, based on the severity level or category of events
- Provides a selection of security protocols for authentication and encryption

Initial setup

You must define three TCP/IP settings for the InRow RD before it can operate on the network:

- IP address of the InRow RD
- Subnet mask
- IP address of the default gateway



Caution: Do not use the loopback address (127.0.0.1) as the default gateway. Doing so disables the card. You must then log on using a serial connection and reset TCP/IP settings to their defaults.



To configure the TCP/IP settings, see the InRow RD *Installation Manual*, available on the APC InRow RD *Utility* CD and in printed form.

For detailed information on how to use a DHCP server to configure the TCP/IP settings at the InRow RD, see “TCP/IP and Communication Settings” on page 29.

Network management features

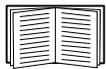
These applications and utilities work with the InRow RD.

- APC InfraStruXure[®] Central for enterprise-level power management and management of APC agents, UPSs, information controllers, and environmental monitors
- APC PowerNet[®] Management Information Base (MIB) with a standard MIB browser to perform SNMP SETs and GETs and to use SNMP traps
- The APC Device IP Configuration Wizard to configure the basic settings of one or more InRow RDs over the network
- The APC Security Wizard to create components needed for high security for the InRow RD when you are using Secure Sockets Layer (SSL) and related protocols and encryption routines

Internal Management Features

Overview

Use the Web interface or the control console interface to manage the InRow RD.

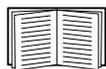


For more information about the internal user interfaces, see “Web Interface” on page 11 and “Control Console” on page 6.

Access priority for logging on

Only one user at a time can log on to the InRow RD. The priority for access, beginning with the highest priority, is as follows:

- Local access to the control console from a computer with a direct serial connection to the InRow RD.
- Telnet or Secure SHell (SSH) access to the control console from a remote computer.
- Web access, either directly or through the InfraStruXure Central.



See “SNMP” on page 37 for information about how SNMP access to the InRow RD is controlled.

Types of user accounts

The InRow RD has three levels of access (Administrator, Device User, and Read-Only User), which are protected by user name and password requirements.

- An Administrator can use all the menus in the Web interface and control console. The default user name and password are both **apc**.
- A Device User can access only the following:
 - In the Web interface, the menus on the **Group** and **Unit** tabs and the event and data logs, accessible under the **Events** and **Data** headings on the left navigation menu of the **Logs** tab.
 - In the control console, the equivalent features and options.

The default user name is **device**, and the default password is **apc**.

- A Read-Only User has the following restricted access:
 - Access through the Web interface only. You must use the Web interface to configure values for the Read-Only User.
 - Access to the same tabs and menus as a Device User, but without the capability to change configurations, control devices, delete data, or use file transfer options. Links to configuration options are visible but disabled, and the event and data logs display no button to clear the log.

The default user name is **readonly**, and the default password is **apc**.



To set **User Name** and **Password** values for the three account types, see “Setting user access” on page 25.

How to Recover from a Lost Password

You can use a local computer, a computer that connects to the InRow RD or other device through the serial port, to access the control console.

1. At the local computer, select a serial port, and disable any service that uses it.
2. Connect the provided serial cable from the selected port on the computer to the configuration port at the InRow RD.
3. Run a terminal program (such as HyperTerminal[®]) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:
 - The serial port is not in use by another application.
 - The terminal settings are correct as specified in step 3.
 - The correct cable is being used as specified in step 2.
5. Press the **Reset** button. The Status LED will flash alternately orange and green. Press the **Reset** button a second time immediately while the LED is flashing to reset the user name and password to their defaults temporarily.
6. Press ENTER as many times as necessary to redisplay the **User Name** prompt, then use the default, **apc**, for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is redisplayed, you must repeat step 5 and log on again.)
7. From the **Control Console** menu, select **System**, then **User Manager**.
8. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**.
9. Press CTRL+C, log off, reconnect any serial cable you disconnected, and restart any service you disabled.

Status and Link RX/TX LEDs

Status LED

This LED indicates the status of the InRow RD.

Condition	Description
Off	One of the following situations exists: <ul style="list-style-type: none">• The InRow RD is not receiving input power.• The InRow RD is not operating properly. It may need to be repaired. Contact APC Customer Support. See “APC Worldwide Customer Support” on page 69.
Solid green	The InRow RD has valid TCP/IP settings.
Solid orange	A hardware failure has been detected in the InRow RD. Contact APC Customer Support. See “APC Worldwide Customer Support” on page 69.
Flashing green	The InRow RD does not have valid TCP/IP settings. ¹
Flashing orange	The InRow RD is making BOOTP requests. ¹
Alternately flashing green and orange	If the LED is alternately flashing slowly, the InRow RD is making DHCP ² requests. ¹ If the LED is alternately flashing rapidly, the Management Card is starting up.
¹ If you do not use a BOOTP or DHCP server, see the InRow RD <i>Installation Manual</i> provided in printed format and on the APC InRow RD <i>Utility</i> CD in PDF to configure the TCP/IP settings of the InRow RD. ² To use a DHCP server, see “TCP/IP and Communication Settings” on page 29.	

Link-RX/TX (10/100) LED

This LED indicates the network status of the InRow RD.

Condition	Description
Off	One or more of the following situations exist: <ul style="list-style-type: none">• The InRow RD is not receiving input power.• The cable that connects the InRow RD to the network is disconnected or defective.• The device that connects the InRow RD to the network is turned off or not operating correctly.• The InRow RD itself is not operating properly. It may need to be repaired or replaced. Contact APC Customer Support. See “APC Worldwide Customer Support” on page 69.
Solid green	The InRow RD is connected to a network operating at 10 Megabits per second (Mbps).
Solid orange	The InRow RD is connected to a network operating at 100 Mbps.
Flashing green	The InRow RD is receiving or transmitting data packets at 10 Mbps.
Flashing orange	The InRow RD is receiving or transmitting data packets at 100 Mbps.

Watchdog Features

Overview

To detect internal problems and recover from unanticipated inputs, the InRow RD uses internal, system-wide watchdog mechanisms. When it restarts to recover from an internal problem, a **System: Warmstart** event is recorded in the event log.

Network interface watchdog mechanism

The InRow RD implements internal watchdog mechanisms to protect itself from becoming inaccessible over the network. For example, if the InRow RD does not receive any network traffic for 9.5 minutes (either direct traffic, such as SNMP, or broadcast traffic, such as an Address Resolution Protocol [ARP] request), it assumes that there is a problem with its network interface and restarts.

Resetting the network timer

To ensure that the InRow RD does not restart if the network is quiet for 9.5 minutes, the InRow RD attempts to contact the default gateway every 4.5 minutes. If the gateway is present, it responds to the InRow RD, and that response restarts the 9.5-minute timer. If your application does not require or have a gateway, specify the IP address of a computer that is running on the network most of the time and is on the same subnet. The network traffic of that computer will restart the 9.5-minute timer frequently enough to prevent the InRow RD from restarting.

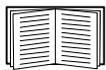
Control Console

How To Log On

Overview

You can use either a local (serial) connection, or a remote (Telnet or SSH) connection with a computer on the same network (LAN) as the InRow RD to access the control console.

Use case-sensitive user name and password entries to log on (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device User). A Read-Only User has no access to the control console.



If you cannot remember your user name or password, see “How to Recover from a Lost Password” on page 3.

Remote access to the control console

You can access the control console through Telnet or Secure SHell (SSH). Telnet is enabled by default. Enabling SSH disables Telnet.

To enable or disable these access methods:

- In the Web interface, on the **Administration** tab, select **Network** on the top menu bar, and then the **access** option under **Console** on the left navigation menu.
- In the control console, use the **Telnet/SSH** option of the **Network** menu.

Telnet for basic access. Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption.

To use Telnet to access the control console:

1. From a computer on the same network as the InRow RD, at a command prompt, type `telnet` and the System IP address for the InRow RD (for example, `telnet 139.225.6.133`, when the InRow RD uses the default Telnet port of 23), and press ENTER.

If the InRow RD uses a non-default port number (from 5000 to 32768), you must include a colon or a space, depending on your Telnet client, between the IP address (or DNS name) and the port number.

2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device User).

SSH for high-security access. If you use the high security of SSL for the Web interface, use Secure SHell (SSH) for access to the control console. SSH encrypts user names, passwords and transmitted data. The interface, user accounts, and user access rights are the same whether you access the control console through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer.

Local access to the control console

For local access, use a computer that connects to the InRow RD or other device through the serial port, to access the control console:

1. Select a serial port at the computer and disable any service that uses the port.
2. Connect the provided serial cable from the selected port on the computer to the configuration port at the InRow RD.
3. Run a terminal program (e.g., HyperTerminal), and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press ENTER, and at the prompts, enter your user name and password.

Main Screen

Sample main screen

Following is an example of the screen displayed when you log on to the control console at the InRow RD.

```
American Power Conversion          Network Management Card AOS  vx.x.x
(c)Copyright 2009 All Rights Reserved  InRow RD APP  vx.x.x
-----
Name      : Test Lab                Date : 11/30/2009
Contact   : Don Adams              Time : 5:58:30
Location  : Building 3             User : Administrator
Up Time   : 0 Days, 21 Hours, 21 Minutes  Stat : P+ N+ A+

----- Control Console -----

1- Device Manager
2- Network
3- System
4- Logout
<ESC>- Main Menu, <ENTER>- Refresh, <CTRL-L>- Event Log
```

Information and status fields

Main screen information fields.

- Two fields identify the APC operating system (AOS) and application (APP) firmware versions.

```
Network Management Card AOS  vx.x.x
InRow RD APP                vx.x.x
```

- Three fields identify the system name, contact person, and location of the InRow RD. (In the control console, use the **System** menu to set these values.)

```
Name: Test Lab
Contact: Don Adams
Location: Building 3
```

- The **Up Time** field reports how long the InRow RD has been running since it was last turned on or reset.

Up Time: 0 Days 21 Hours 21 Minutes

- Two fields report when you logged in, by date and time.

Date : 11/30/2009

Time : 5:58:30

- The **User** field reports whether you logged in through the **Administrator** or **Device User** account. (The **Read Only User** account cannot access the Control Console.)

User : Administrator

Main screen status fields.

- The **Stat** field reports the InRow RD status.

Stat : P+ N+ A+

P+	The APC operating system (AOS) is functioning properly.
N+	The network is functioning properly.
N?	A BOOTP request cycle is in progress.
N-	The InRow RD failed to connect to the network.
N!	Another device is using the IP address of this InRow RD.
A+	The application is functioning properly.
A-	The application has a bad checksum.
A?	The application is initializing.
A!	The application is not compatible with the AOS.



If P+ is not displayed, contact APC support staff. See “APC Worldwide Customer Support” on page 69.

Control Console Menus

Overview

The control console provides options to monitor and configure the InRow RD.

How to use control console menus

The menus in the control console list options by number and name. To use an option, type the option's number, press ENTER, and follow any on-screen instructions. If you use an option that changes a setting or value, select **Accept Changes** to save your change before you exit the menu.

While using a menu, you can also do the following:

- Type ? and press ENTER for menu option descriptions if help exists for the menu
- Press ENTER to refresh the menu
- Press ESC to go back to the menu from which you accessed the current menu
- Press CTRL+C to return to the main (**Control Console**) menu
- Press CTRL+D to toggle between menus
- Press CTRL+L to access the event log

Control console structure

For menus not specific to the InRow RD but shared among APC network-enabled devices, names and locations of options differ from those of the Web interface. The menu structure in the control console is retained from earlier firmware versions for compatibility with scripts and programs that rely on that structure.

Main menu

Use the main **Control Console** menu to access the control console's management features:

- 1- Device Manager
- 2- Network
- 3- System
- 4- Logout



Note: When you log on as Device Manager (equivalent to Device User in the Web interface), you can access only the **Device Manager** menus and the **Logout** menu.

Device Manager menu

An Administrator or Device User can use the options of the **Device Manager** menu to configure InRow RD parameters and display detailed status.

Network menu

To perform these tasks, use the options of the **Network** menu:

- Configure the TCP/IP settings of the InRow RD or, if the InRow RD obtains its TCP/IP settings from a server, configure the settings for the type of server (DHCP or BOOTP).
- Use the Ping utility.
- Define settings that affect FTP, Telnet and SSH, the Web interface and SSL, SNMP, e-mail, DNS, and Syslog.

System menu

To perform these tasks, use the options of the **System** menu:

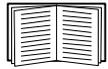
- Control **Administrator** and **Device Manager** access. (You can control **Read Only User** access by using the Web interface only.)
- Define the **Name**, **Contact**, and **Location** values for the system.
- Set the date and time used by the InRow RD.
- Through the **Tools** option:
 - Restart the InRow RD interface.
 - Reset parameters to their default values.
 - Delete SSH host keys and SSL certificates.
 - Upload an initialization file (.ini file) that has been downloaded from another InRow RD. The current InRow RD then uses the values in that .ini file to configure its own settings.
- Access system information about the InRow RD.

Web Interface

Introduction

Overview

The Web interface provides options to manage the InRow RD.



See “Web” on page 34 for information on how to select, enable, and disable the protocols that control access to the Web interface and to define the Web-server ports for the protocols.

Supported Web browsers

You can use Microsoft® Internet Explorer (IE) 5.5 and higher (on Windows operating systems only) or Mozilla Firefox 1.x or higher (on all operating systems) to access the InRow RD through its Web interface. Other commonly available browsers may work but have not been fully tested by APC.

The InRow RD cannot work with a proxy server. Therefore, before you can use a Web browser to access its Web interface, you must do one of the following:

- Configure the Web browser to disable the use of a proxy server for the InRow RD.
- Configure the proxy server so that it does not proxy the specific IP address of the InRow RD.

How to Log On

Overview

You can use the DNS name or System IP address of the InRow RD for the URL address of the Web interface. Use your case-sensitive user name and password to log on. The default user name differs by account type:

- **apc** for an Administrator
- **device** for a Device User
- **readonly** for a Read-Only User

The default password is **apc** for all three account types.



Note: If you are using HTTPS (SSL/TSL) as your access protocol, your logon credentials are compared with information in a server certificate. If the certificate was created with the APC Security Wizard, and an IP address was specified as the common name in the certificate, you must use an IP address to log on to the InRow RD. If a DNS name was specified as the common name on the certificate, you must use a DNS name to log on.



For information about the Web page that displays when you log on, see “Home Page” on page 13.

URL address formats

Type the DNS name or IP address of the InRow RD in the URL address field of the Web browser and press ENTER. When you specify a non-default Web server port in Internet Explorer, you must include `http://` or `https://` in the URL.

Common browser error messages at log-on.

Error Message	Browser	Cause of the Error
“You are not authorized to view this page” or “Someone is currently logged in...”	Internet Explorer, Firefox	Someone else is logged on
“This page cannot be displayed.”	Internet Explorer	Web access is disabled, or the URL was not correct
“Unable to connect.”	Firefox	

URL format examples.

- For a DNS name of Web1:
 - `http://Web1` if HTTP is your access mode
 - `https://Web1` if HTTPS (HTTP with SSL) is your access mode
- For a System IP address of 139.225.6.133 and the default Web server port (80):
 - `http://139.225.6.133` if HTTP is your access mode
 - `https://139.225.6.133` if HTTPS (HTTP with SSL) is your access mode
- For a System IP address of 139.225.6.133 and a non-default Web server port (5000):
 - `http://139.225.6.133:5000` if HTTP is your access mode
 - `https://139.225.6.133:5000` if HTTPS (HTTP with SSL) is your access mode.

Home Page

Overview

On the **Overview** page of the **Home** tab, displayed when you log on to the Web interface, you can view active alarm conditions and the most recent events recorded in the event log.

Quick status icons. At the upper right corner of every page, one or more icons and accompanying text indicate the current operating status of the InRow RD and the number of active alarms of that severity:

Icon	Description
	Critical: A critical alarm exists, which requires immediate action.
	Warning: An alarm condition requires attention and could jeopardize your data or equipment if its cause is not addressed.
	Online: No alarms are present, and the InRow RD is operating normally.

Active Alarms. The **Active Alarms** section of the **Overview** page summarizes the status of the InRow RD:

- The **Online** icon displays if no alarms exist.
- One or both of the other icons (**Critical** and **Warning**) display if any alarms exist, and after each icon, the number of active alarms of that severity.

To return to the **Home** page to view its summary of InRow RD status, including the active alarms, click a quick status icon on any page of the interface.

Group. The **Group** section lists the cooling output provided by the group, the target temperatures for air entering and leaving the InRow RD, and the highest and lowest recorded temperatures of air entering and leaving the InRow RDs in the group. Click **More Status** to view additional overview information about the group.

Unit. The **Unit** section displays the name and location of the cooling unit, and lists its operating mode, the cooling output it is providing, and the temperature of air entering the unit enclosure. Click **More Status** to view additional overview information about the unit.

Recent Device Events. The **Recent Device Events** section displays, in reverse chronological order, the events that occurred most recently and the dates and times they occurred. Click **More Events** to view the entire event log.

Alarm Status

From the **Home** tab, click **Alarm Status** on the top menu bar to view the severity and description of each active alarm or to clear all of the active group and unit alarms.

How to Use the Tabs, Menus, and Links

Tabs

In addition to the tab for the **Home** page, the following tabs are displayed. Click a tab to display a set of menu options:

- **Group:** View the status of all InRow RDs in the group. View active alarms and recent events. Configure thresholds and other parameters related to the group.
- **Unit:** Display InRow RD status, configure InRow RD parameters, configure and schedule maintenance, and view information about the InRow RD.
- **Logs:** View and configure event and data logs.
- **Administration:** Configure security, network connection, notification, and general settings.

Menus

Left navigation menu. Each tab (except the tab for the home page) has a left navigation menu, consisting of headings and options:

- If a heading has indented option names below it, the heading itself is not a navigational link. Click an option to display or configure parameters.
- If a heading has no indented option names, the heading itself is the navigational link. Click the heading to display or configure parameters.

Top menu bar. The **Administration** tab has a selection of menu options on the top menu bar. Select one of the menu options to display its left navigation menu.

Quick Links

At the lower left on each page of the interface, there are three configurable links. By default, the links access the URLs for these Web pages:

- **Link 1:** The home page of the APC Web site.
- **Link 2:** Demonstrations of APC Web-enabled products.
- **Link 3:** Information on APC Remote Monitoring Services.



To reconfigure the links, see “Configuring Links” on page 50.

Group and Unit Configuration

Viewing and Configuring Group Settings

Overview page

The **Overview** page, which displays by default the first time you select the **Group** tab, provides basic group status information.

- **Cool Setpoint**—The target value for the air temperature. A Cool setpoint equal or above the Supply Air Setpoint indicates that the group is operating normally. The Cool Setpoint should be set a few degrees above the Supply Air Setpoint when operating in the InRow mode.
- **Supply Air Setpoint**—The target value for air leaving the cooling units in the group. The Supply Air Setpoint should be set a few degrees below the Cool Setpoint to ensure that the group is operating normally.
- **Air Flow**—The amount of air flow provided by the group.
- **Maximum Return Air Temperature**—The highest return temperature recorded in the group.
- **Minimum Return Air Temperature**—The lowest return temperature recorded in the group.
- **Cool Output**—The actual cooling output of the group.
- **Cool Demand**—The amount of cooling the group requires from the units to maintain the Cool Setpoint.

Setpoints page

Use the **Setpoints** page to configure the temperature setpoints, capacity control mode, and fan speed mode for the cooling group.

- **Cool Setpoint**—The target value for the air temperature. The Cool Setpoint value must be equal to or greater than the Supply Air Setpoint value.
- **Cool Deadband**—The hysteresis value that prevents the unit from turning on and turning off too rapidly. For a cooling unit to activate its compressor, the air temperature must exceed the Cool Setpoint plus the Cool Deadband.
- **Supply Air Setpoint**—The target value for air leaving the cooling units in the group. The Supply Air Setpoint value must be equal to or below the Cool Setpoint value.
- **Capacity Control**—The method the units will use to regulate the cooling demand. **Discrete** is used for the Spot Cooling configuration mode only. Use **Proportional** for all other configuration modes.
 - **Proportional Mode**—The unit modulates the fan speeds and Hot Gas Bypass Valve (HGBV) to match the cooling output to the load demand, so the compressor turns off less frequently.
 - **Discrete Mode**—The unit runs the fans at a set speed with the HGBV fully closed. The unit activates the compressor when the Return Air Temperature reaches the Cool Setpoint plus the Cool Deadband. The unit deactivates the compressor when the Return Air Temperature reaches the Cool Setpoint.

- **Fan Speed Preference** — The preferred fan speed for normal operation of the cooling unit. Selecting the RACS or HACS mode sets the desired temperature difference between the rack inlet air temperature and the rack outlet air temperature.
- **Fan Speed Control** (Spot Proportional, In-Row, RACS or HACS cooling modes)—The method the units will use to control fan speed, **Automatic** or **Manual**.
 - **Automatic**—The unit controls the evaporator fan speed based on cooling demand.
 - **Manual**—The evaporator fan speed is fixed at a constant speed. Use the **Fan Speed Preference** setting to define the default speed.

Configuration page

Use the settings on the Configuration page to define how the units will divide the cooling load:

- **Number of Units in Group**—Specify the number of units in the group. Valid values are 1–12.
 -  **Note:** If you only have one air conditioner, select **1** from the **Number of Units in Group** drop-down list and define the group settings.
- **Number of Backup Units**—Specify the number of backup units in the group. Valid values are 0–11.
- **Run-Time Balancing Enable**—Enable this option (the default setting) to balance the unit run time across the units in the group and to ensure that all units have consistent operating time. Disable this option if the unit is using the Spot Cooling mode.
- **Load Assist Enable**—Define whether the backup units will assist the primary units when the cooling demand exceeds the cooling output capacity of the primary units.
- **Configuration Type**—The air flow control strategy the Group uses. You can change this setting only when all of the units in the group are in Standby mode.
 - **Spot**—The unit regulates the Return Air Temperature. The Rack Inlet Air Temperature sensor is ignored for control purposes. Use this option for standalone units only.
 - **Rack Air Containment System (RACS)**—Air flow in the enclosure is controlled by a ducting system fitted to the enclosure.
 - **Hot Aisle Containment System (HACS)**—Air flow in the room is controlled by enclosing the hot air aisle.
 - **In-Row**—Air flow is horizontal to allow in-row operation of cooling solutions. (Backup and Load Assist functions are disabled in InRow mode.)

Only an APC Field Service Engineer may change these values:

- **Cool Gain “P”**—Set the proportional multiplier to correct for differences between the selected control sensor's actual temperature and the setpoint.
- **Cool Reset Rate “I”**—Set the integral multiplier to correct for the proportional offset.
- **Cool Derivative “D”**—Set the derivative multiplier to counteract overshoot and droop during changes in the room load.

Units page

View a list of units in the group. For each unit, view its location, unit-type, application firmware version, and IP address.

To ensure optimal group performance, confirm that the units use the same application firmware version.

The value InRow RD should always display in the unit-type field. You can group InRow RD 100-series and InRow RD 200-series units, but do not attempt to connect other cooling-unit models to the group. Doing so may cause communication problems and prevent the group from operating correctly.



To configure the name and location of a unit, see “Identification” on page 18.

Viewing and Configuring Unit Settings

Status > Overview page

The **Overview** page, which displays by default the first time you select the **Unit** tab, provides basic unit status information.

- **Operating Mode**—The current operating mode of the unit:
 - **On**—The unit is providing cooling.
 - **Standby**—The user turned off the cooling functions of the unit, or the input contact is in an abnormal state.
 - **Idle**—The unit is not providing cooling because it has active alarms.
 - **Refrig**—The unit is in Refrigerant Fill mode.
- **Compressor State**—The present operating status (on or off) of the compressor for this unit.
- **Cool Output**—The amount of cooling provided by the unit.
- **Cool Demand**—The amount of cooling that is currently required.
- **Rack Inlet Temperature**—The temperature of air entering the enclosure.
- **Supply Air Temperature**—The temperature of air leaving the unit.
- **Return Air Temperature**—The temperature of air entering the unit.
- **Suction Temperature**—The temperature of the low pressure (suction) refrigerant line.
- **Air Flow**—The amount of air that must flow through the evaporator to maintain the setpoint temperature.
- **Fan Speed**—The speed of the fans that regulate air flow through the evaporator.
- **Fluid Valve Position (ACRD100)**—The position of the valve that regulates fluid flow through the unit (0% indicates that the valve is fully closed and 100% indicates that it is fully opened).
- **Hot Gas Bypass Valve Position (ACRD200)**—The position of the valve that regulates hot gas bypass (0% indicates that the valve is fully closed and 100% indicates that it is fully opened).

Status > Detailed Status page

- **Input State**—The current state of the input contact. If the input contact is in an abnormal state, an alarm occurs and the unit changes its operating mode to Standby.
- **Output State**—The current state of the output relay. An alarm will cause the output relay to change from its normal state.
- **OHE Input State**—The current state of the Outside Heat Exchanger (OHE) input. An alarm is generated if the current state differs from the configured normal state.
- **OHE Output State**—The current state of the OHE output.
- **Filter Differential Pressure**—The difference in pressure on either side of the air filters. A high differential pressure could indicate a clogged filter.
- **Suction Pressure**—The pressure of the low pressure (suction) refrigerant line.
- **Discharge Pressure**—The pressure of the high pressure (discharge) refrigerant line.
- **Superheat Temperature**—The difference between the suction temperature and the evaporator dew point temperature.

Identification page

Factory Information. This information is useful to APC Customer Support in helping to troubleshoot any problems you may be having with this unit.

- **Model Number**—The model number of the unit.
- **Serial Number**—The serial number of the unit.
- **Controller Firmware**—The version of the controller firmware.
- **Hardware Revision**—The version of the hardware.
- **Date of Manufacture**—The date on which the manufacture of this device was completed.

Identification. This information identifies the unit on the Overview page of the Home tab.

- **Name**—The name to assign to the unit.
- **Location**—The physical location of the unit.

Run Hours page

View the number of hours the unit and its components have been in operation. The air filter, fans, condensate pump, compressor, and upper and lower fan power supplies require routine maintenance. After you perform maintenance on a component, select its **Reset** check box and click **Apply** to reset the run-hours to zero (0).



For information about routine maintenance, see the *Operation Manual* for your unit, provided on the *Utility* CD or the APC Web site, www.apc.com.

Service Intervals page

Define the number of weeks after which an air filter must be cleaned or replaced (18 weeks, by default). By default, the unit generates an alarm when the interval expires. To disable the alarm, clear the **Alarm** check box and click **Apply**.

Thresholds page

Sensor Values. View the temperature values reported by these sensors:

- **Rack Inlet Temperature**—The temperature of air entering the enclosure on which the Rack Inlet Temperature Sensor is installed.
- **Supply Air Temperature**—The temperature of air leaving the unit.
- **Return Air Temperature**—The temperature of air entering the unit.

Thresholds. Configure the temperature thresholds:

- **Rack Inlet High Temperature**—Specify the high-temperature threshold. If air entering the enclosure is above this temperature, the unit generates an alarm.
- **Supply Air High Temperature**—Specify the high temperature threshold for air leaving the unit. If the temperature exceeds this threshold, the unit generates an alarm.
- **Return Air High Temperature**—Specify the high temperature threshold for air entering the unit. If the temperature exceeds this threshold, the unit generates an alarm.

Configuration page

Configure the startup delay, define the normal state of input contacts and output relays that affect the behavior of the unit, define how the unit will respond when an alarm condition is detected, and specify the units of measure the unit will use.

- **Startup Delay**—Set the delay that begins when power is applied and ends when the unit starts. Valid values are 0 to 999 seconds.
- **Idle on Leak Detect**—Idle the unit when a leak is detected. By default, this feature is not activated.
- **Input Normal State**—Define the normal state of the input, open or closed. The unit changes its operating mode to Standby when the input is not in its normal state.
- **Output Normal State**—Define the normal state of the output, open or closed. When one or more alarms are present on the output source, the output will be set to its abnormal state.
- **Output Source**—Define the type of alarm that will change the state of the output.
- **OHE Input Normal State**—Define the normal state of the Outside Heat Exchanger (OHE), open or closed. An alarm is generated if the current state differs from the configured normal state.
- **Unit Role Override**—When set to Automatic (the default setting), the system defines whether this unit is used as a primary or redundant unit. When set to Forced On, the unit is always a primary unit.
- **Idle on Cool Fail**—Idle the unit when the supply temperature exceeds 90°F (32.2°C) for a maximum of five minutes. The time limit decreases as the temperature rises. By default, this feature is enabled.
- **Display Units**—Define whether this interface will display Metric or US units of measure

Logs

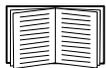
Use the Event and Data Logs

Event log

Path: Logs > Events > *options*

You can view, filter, or delete the event log. By default, the log displays all events recorded during the last two days, in reverse chronological order.

For lists of all configurable events and their current configuration, select the **Administration** tab, **Notification** on the top menu bar, and **by event** under **Event Actions** on the left navigation menu.



See “Configuring by event” on page 42.

To display the event log (Logs > Events > log):

- By default, view the event log as a page of the Web interface. The most recent event is recorded on page 1. In the navigation bar below the log:
 - Click a page number to open a specific page of the log.
 - Click **Previous** or **Next** to view the events recorded immediately before or after the events listed on the open page.
 - Click << to return to the first page or click >> to view the last page of the log.
- To see the listed events on one page, click **Launch Log in New Window** from the event log page to display a full-screen view of the log.



Note: In your browser's options, JavaScript[®] must be enabled for you to use the **Launch Log in New Window** button.

You can also use FTP or SCP to view the event log. See “How to use FTP or SCP to retrieve log files” on page 23.

To filter the log (Logs > Events > log):

- **Filtering the log by date or time:** To display the entire event log, or to change the number of days or weeks for which the log displays the most recent events, select **Last**. Select a time range from the drop-down menu, then click **Apply**. The filter configuration is saved until the InRow RD restarts.

To display events logged during a specific time range, select **From**. Specify the beginning and ending times (using the 24-hour clock format) and dates for which to display events, then click **Apply**. The filter configuration is saved until the InRow RD restarts.
- **Filtering the log by event:** To specify the events that display in the log, click **Filter Log**. Clear the checkbox of an event category or alarm severity level to remove it from view. Text at the upper right corner of the event log page indicates that a filter is active. As Administrator, click **Save As Default** to save this filter as the default log view for all users. If you do not click **Save As Default**, the filter is active until you clear it or until the InRow RD restarts.

To remove an active filter, click **Filter Log**, then **Clear Filter (Show All)**.

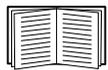


Note: Events are processed through the filter using **OR** logic.

- Events that you do not select from the **Filter By Severity** list never display in the filtered event log, even if the event occurs in a category you selected from the **Filter by Category** list.
- Events that you do not select from the **Filter by Category** list never display in the filtered event log, even if devices in the category enter an alarm state you selected from the **Filter by Severity** list.

To delete the log (Logs > Events > log):

To delete all events recorded in the log, click **Clear Log** on the Web page that displays the log. Deleted events cannot be retrieved.



To disable the logging of events based on their assigned severity level or their event category, see “Configuring by group” on page 42.

To configure reverse lookup (Logs > Events > reverse lookup):

Reverse lookup is disabled by default. Enable this feature unless you have no DNS server configured or have poor network performance because of heavy network traffic.

With reverse lookup enabled, when a network-related event occurs, both the IP address and the domain name for the networked device associated with the event are logged in the event log. If no domain name entry exists for the device, only its IP address is logged with the event. Since domain names generally change less frequently than IP addresses, enabling reverse lookup can improve the ability to identify addresses of networked devices that are causing events.

Data log

Path: Logs > Data > *options*

View a log of measurements about the InRow RD. Each entry is listed by the date and time the data was recorded.

To display the data log (Logs > Data > log):

- By default, view the data log as a page of the Web interface.
- To see the listed data on one page, click **Launch Log in New Window** from the data log page to display a full-screen view of the log.



Note: In your browser's options, JavaScript[®] must be enabled for you to use the **Launch Log in New Window** button. You can also use FTP or SCP to view the event log. See “How to use FTP or SCP to retrieve log files” on page 23.

To filter the log by date or time (Logs > Data > log):

To display the entire data log, or to change the number of days or weeks for which the log displays the most recent events, select **Last**. Select a time range from the drop-down menu, then click **Apply**. The filter configuration is saved until the device restarts.

To display data logged during a specific time range, select **From**. Specify the beginning and ending times (using the 24-hour clock format) and dates for which to display data, then click **Apply**. The filter configuration is saved until the device restarts.

To delete the data log:

To delete all data recorded in the log, click **Clear Data Log** on the Web page that displays the log. Deleted data cannot be retrieved.

To set the data collection to graphing (Logs > Data > graphing):

Use this option to create an interactive data graph. Select a maximum of four data parameters from the **Graph Data** pull down menu. Choose a time frame from the **Graph Time** pull down menu or enter a date range in the **From** and **To** fields. Click **Apply** to generate the graph.

Click **Launch Graph in New Window** to launch the graph in a new browser window that provides a full-screen view.

Use the zoom tool above the graph to magnify the data shown on the screen. You can also click on any point in the graph to center and magnify that point on the screen. Use the left or right arrows above the graph to navigate through the data displayed in the magnified graph. Hover over any horizontal line in the graph to view the date, time and Y-axis value for that data record.

To set the data collection interval (Logs > Data > interval):

Define, in the **Log Interval** setting, how frequently data is sampled and stored in the data log, and view the calculation of how many days of data the log can store, based on the interval you selected. When the log is full, the older entries are deleted. To avoid automatic deletion of older data, enable and configure data log rotation, described in the next section.

To configure data log rotation (Logs > Data > rotation):

Set up a password-protected data log repository on a specified FTP server. Enabling rotation causes the contents of the data log to be appended to the file you specify by name and location. Updates to this file occur at the upload interval you specify.

Parameter	Description
Data Log Rotation	Enable or disable (the default) data log rotation.
FTP Server Address	The location of the FTP server where the data repository file is stored.
User Name	The user name required to send data to the repository file. This User Name must also be configured to have read and write access to the data repository file and the directory (folder) in which it is stored.
Password	The password required to send data to the repository file.
File Path	The path to the repository file.

Parameter	Description
Filename	The name of the repository file (an ASCII text file).
Delay <i>X</i> hours between uploads.	The number of hours between uploads of data to the file.
Upload every <i>X</i> minutes	The number of minutes between attempts to upload data to the file after an upload failure.
Up to <i>X</i> times	The maximum number of times the upload will be attempted after an initial failure.
Until Upload Succeeds	Attempt to upload the file until the transfer is completed.

How to use FTP or SCP to retrieve log files

An Administrator or Device User can use FTP or SCP to retrieve a tab-delineated event log file (*event.txt*) or data log file (*data.txt*) and import it into a spreadsheet.

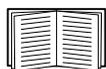
- The file reports all events or data recorded since the log was last deleted or (for the data log) truncated because it reached maximum size.
- The file includes information that the event log or data log does not display.
 - The version of the file format (first field)
 - The date and time the file was retrieved
 - The **Name**, **Contact**, and **Location** values and IP address of the InRow RD
 - The unique **Event Code** for each recorded event (*event.txt* file only)



Note: The InRow RD uses a four-digit year for log entries. You may need to select a four-digit date format in your spreadsheet application to display all four digits.

If you are using the encryption-based security protocols for your system, use Secure CoPy (SCP) to retrieve the log file.

If you are using unencrypted authentication methods for the security of your system, use FTP to retrieve the log file.



See the *Security Handbook*, available on the *Utility* CD provided with your InRow RD or on the APC Web site (www.apc.com), for information on available protocols and methods for setting up the type of security you need.

To use SCP to retrieve the files. To use SCP to retrieve the *event.txt* file, use the following command:

```
scp username@hostname_or_ip_address:event.txt ./event.txt
```

To use SCP to retrieve the *data.txt* file, use the following command:

```
scp username@hostname_or_ip_address:data.txt ./data.txt
```

To use FTP to retrieve the files. To use FTP to retrieve the *event.txt* or *data.txt* file:

1. At a command prompt, type `ftp` and the IP address of the InRow RD, and press ENTER.

If the **Port** setting for the **FTP Server** option (set through the **Network** menu of the **Administration** tab) has been changed from its default (**21**), you must use the non-default value in the FTP command. For Windows FTP clients, use the following command, including spaces. (For some FTP clients, you must use a colon instead of a space between the IP address and the port number.)

```
ftp>open ip_address port_number
```



To set a non-default port value to enhance security for the FTP Server, see “FTP Server” on page 40. You can specify any port from 5001 to 32768.

2. Use the case-sensitive **User Name** and **Password** for Administrator or Device User to log on. For Administrator, **apc** is the default for **User Name** and **Password**. For the Device User, the defaults are **device** for **User Name** and **apc** for **Password**.
3. Use the **get** command to transmit the text of a log to your local drive.

```
ftp>get event.txt
```

or

```
ftp>get data.txt
```

4. You can use the **del** command to clear the contents of either log.

```
ftp>del event.txt
```

or

```
ftp>del data.txt
```

You will not be asked to confirm the deletion.

- If you clear the data log, the event log records a deleted-log event.
- If you clear the event log, a new *event.txt* file records the event.

5. Type `quit` at the `ftp>` prompt to exit from FTP.

Administration: Security

Local Users

Setting user access

Path: Administration > Security > Local Users > options

You set the case-sensitive user name and password for each account type in the same manner. Maximum length is 10 characters for a user name and 32 characters for a password. Blank passwords (passwords with no characters) are not allowed.



Note: For information on the permissions granted to each account type (Administrator, Device User, and Read-Only User, see “Types of user accounts” on page 2.

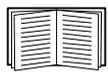
Account Type	Default User Name	Default Password	Permitted Access
Administrator	apc	apc	Web interface and control console
Device User	device	apc	
Read-Only User	readonly	apc	Web Interface only

Remote Users

Authentication

Path: Administration > Security > Remote Users > Authentication Method

Use this option to select how to administer remote access to the InRow RD.



For information about local authentication (not using the centralized authentication of a RADIUS server), see the *Security Handbook*, available on the *Utility CD* and on the APC Web site, www.apc.com.

APC supports the authentication and authorization functions of RADIUS (Remote Authentication Dial-In User Service).

- When a user accesses the InRow RD that has RADIUS enabled, an authentication request is sent to the RADIUS server to determine the user’s permission level.
- RADIUS user names used with the InRow RD are limited to 32 characters.

Select one of the following:

- **Local Authentication Only:** RADIUS is disabled. Local authentication is enabled.
- **RADIUS, then Local Authentication:** RADIUS and local authentication are enabled. Authentication is requested from the RADIUS server first. If the RADIUS server fails to respond, local authentication is used.
- **RADIUS Only:** RADIUS is enabled. Local authentication is disabled.



Note: If **RADIUS Only** is selected, and the RADIUS server is unavailable, improperly identified, or improperly configured, you must use a serial connection to the control console and change the **Access** setting to **Local Authentication Only** or **RADIUS, then Local Authentication** to regain access.

RADIUS

Path: Administration > Security > Remote Users > RADIUS

Use this option to do the following:

- List the RADIUS servers (a maximum of two) available to the InRow RD and the time-out period for each.
- Click **Add Server**, and configure the parameters for authentication by a new RADIUS server:
- Click a listed RADIUS server to display and modify its parameters.

RADIUS Setting	Definition
RADIUS Server	The server name or IP address of the RADIUS server. Note: RADIUS servers use port 1812 by default to authenticate users. To use a different port, add a colon followed by the new port number to the end of the RADIUS server name or IP address.
Secret	The shared secret between the RADIUS server and the InRow RD.
Timeout	The time in seconds that the InRow RD waits for a response from the RADIUS server.
Test Settings	Enter the Administrator user name and password to test the RADIUS server path that you have configured.
Skip Test and Apply	Do not test the RADIUS server path.
Switch Server Priority	Change which RADIUS server will authenticate users if two configured servers are listed and RADIUS, then Local Authentication or RADIUS Only is the enabled authentication method.

Configuring the RADIUS Server

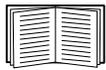
Summary of the configuration procedure

You must configure your RADIUS server to work with the InRow RD.



For examples of the RADIUS users file with Vendor Specific Attributes (VSAs) and an example of an entry in the dictionary file on the RADIUS server, see the *APC Security Handbook*.

1. Add the IP address of the InRow RD to the RADIUS server client list (file).
2. Users must be configured with Service-Type attributes unless Vendor Specific Attributes (VSAs) are defined. If no Service-Type attributes are configured, users will have read-only access (on the Web interface only).



See your RADIUS server documentation for information about the RADIUS users file, and see the *APC Security Handbook* for an example.

3. Vendor Specific Attributes (VSAs) can be used instead of the Service-Type attributes provided by the RADIUS server. VSAs requires a dictionary entry and a RADIUS users file. In the dictionary file, define the names for the ATTRIBUTE and VALUE keywords, but not for the numeric values. If you change numeric values, RADIUS authentication and authorization will fail. VSAs take precedence over standard RADIUS attributes.

Configuring a RADIUS server on UNIX[®] with shadow passwords

If UNIX shadow password files are used (*/etc/passwd*) with the RADIUS dictionary files, the following two methods can be used to authenticate users:

- If all UNIX users have administrative privileges, add the following to the RADIUS “user” file. To allow only Device Users, change the APC-Service-Type to Device.

```
DEFAULT      Auth-Type = System
              APC-Service-Type = Admin
```

- Add user names and attributes to the RADIUS “user” file, and verify password against */etc/passwd*. The following example is for users *bconners* and *thawk*:

```
bconners     Auth-Type = System
              APC-Service-Type = Admin
thawk        Auth-Type = System
              APC-Service-Type = Device
```

Supported RADIUS servers

APC supports FreeRADIUS and Microsoft IAS 2003. Other commonly available RADIUS applications may work but have not been fully tested by APC.

Inactivity Timeout

Path: Administration > Security > Auto Log Off

Use this option to configure the time (3 minutes by default) that the system waits before logging off an inactive user. If you change this value, you must log off for the change to take effect.



Note: This timer continues to run if a user closes the browser window without first logging off by clicking **Log Off** at the upper right. Because that user is still considered to be logged on, no user of that account type can log on until the time specified as **Minutes of Inactivity** expires. For example, with the default value for **Minutes of Inactivity**, if a Device User closes the browser window without logging off, no Device User can log on for 3 minutes.

Administration: Network Features

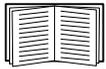
TCP/IP and Communication Settings

TCP/IP settings

Path: Administration > Network > TCP/IP

The **TCP/IP** option on the side menu bar, selected by default when you choose **Network** on the top menu bar, displays the current IP address, subnet mask, default gateway, and MAC address of the InRow RD.

On the same page, **TCP/IP Configuration** provides the following options for how the TCP/IP settings will be configured when the InRow RD turns on, resets, or restarts: **Manual**, **BOOTP**, **DHCP**, and **DHCP & BOOTP**.



For information on DHCP and BOOTP options, see **RFC2131** and **RFC2132**.

Setting	Description
Manual	The IP address, subnet mask, and default gateway must be configured manually. Click Next>> , and enter the new values.
BOOTP	<p>A BOOTP server provides the TCP/IP settings. At 32-second intervals, the InRow RD requests network assignment from any BOOTP server:</p> <ul style="list-style-type: none"> • If it receives a valid response, it starts the network services. • If it finds a BOOTP server, but a request to that server fails or times out, the InRow RD stops requesting network settings until it is restarted. • By default, if previously configured network settings exist, and it receives no valid response to five requests (the original and four retries), it uses the previously configured settings so that it remains accessible. <p>Click Next>> to access the BOOTP Configuration page to change the number of retries or the action to take if all retries fail ¹:</p> <ul style="list-style-type: none"> • Maximum retries: Enter the number of retries that will occur when no valid response is received, or zero (0) for an unlimited number of retries. • If retries fail: Select Use prior settings (the default) or Stop BOOTP request.
DHCP	<p>At 32-second intervals, the InRow RD requests network assignment from any DHCP server. By default, the number of retries is unlimited.</p> <ul style="list-style-type: none"> • If it receives a valid response, by default it requires the APC cookie from the DHCP server in order to accept the lease and start the network services. • If it finds a DHCP server, but the request to that server fails or times out, it stops requesting network settings until it is restarted. <p>To change these values, click Next>> for the DHCP Configuration page¹:</p> <ul style="list-style-type: none"> • Require vendor specific cookie to accept DHCP Address: Disable or enable the requirement that the DHCP server provide the APC cookie. • Maximum retries: Enter the number of retries that will occur when no valid response is received, or zero (0) for an unlimited number of retries.
DHCP & BOOTP	<p>The default setting. The InRow RD tries to obtain its TCP/IP settings from a BOOTP server first, and then, if it cannot discover a BOOTP server, from a DHCP server. If it obtains its TCP/IP settings from either server, it switches this setting to BOOTP or DHCP, depending on the type of server that supplied the TCP/IP settings to the InRow RD.</p> <p>Click Next>> to configure the same settings that are on the BOOTP Configuration and DHCP Configuration pages¹ and to specify that the DHCP and BOOTP setting be retained after either type of server provides the TCP/IP values.</p>
<p>1. The default values for these three settings on the configuration pages generally do not need to be changed:</p> <ul style="list-style-type: none"> • Vendor Class: APC • Client ID: The MAC address of the InRow RD, which uniquely identifies it on the local area network (LAN) • User Class: The name of the application firmware module 	

DHCP response options

Each valid DHCP response contains options that provide the TCP/IP settings that the InRow RD needs to operate on a network, and other information that affects the operation of the InRow RD.

Vendor Specific Information (option 43). The InRow RD uses this option in a DHCP response to determine whether the DHCP response is valid. This option contains up to two APC-specific options in a TAG/LEN/DATA format: the APC Cookie and the Boot Mode Transition.

- **APC Cookie. Tag 1, Len 4, Data “1APC”**

Option 43 communicates to the InRow RD that a DHCP server is configured to service APC devices. By default, this DHCP response option must contain the APC cookie for the InRow RD to accept the lease.



To disable the requirement of an APC cookie, see “DHCP” on page 30.

Following, in hexadecimal format, is an example of a Vendor Specific Information option that contains the APC cookie:

Option 43 = 0x01 0x04 0x31 0x41 0x50 0x43

- **Boot Mode Transition. Tag 2, Len 1, Data 1/2**

This option 43 setting enables or disables **Remain in DHCP & BOOTP mode after accepting TCP/IP settings**, which, by default, is disabled.

- A data value of 1 enables **Remain in DHCP & BOOTP mode after accepting TCP/IP settings**. Whenever the InRow RD reboots, it will request its network assignment first from a BOOTP server, and then, if necessary, from a DHCP server.
- A data value of 2 disables the option **Remain in DHCP & BOOTP mode after accepting TCP/IP settings** option. The **TCP/IP Configuration** setting option switches to **DHCP** when the InRow RD accepts the DHCP response. Whenever the InRow RD reboots, it will request its network assignment from a DHCP server only.

Following, in hexadecimal format, is an example of a Vendor Specific Information option that contains the APC cookie and the **disable** setting for **Boot Mode Transition**:

Option 43 = 0x01 0x04 0x31 0x41 0x50 0x43 0x02 0x01 0x01

TCP/IP options. The InRow RD uses the following options within a valid DHCP response to define its TCP/IP settings. All of these options except the first are described in **RFC2132**.

- **IP Address** (from the **yiaddr** field of the DHCP response, described in **RFC2131**): The IP address that the DHCP server is leasing to the InRow RD.
- **Subnet Mask** (option 1): The Subnet Mask value that the InRow RD needs to operate on the network.
- **Router**, i.e., Default Gateway (option 3): The default gateway address that the InRow RD needs to operate on the network.
- **IP Address Lease Time** (option 51): The time duration for the lease of the IP Address to the InRow RD.
- **Renewal Time, T1** (option 58): The time that the InRow RD must wait after an IP address lease is assigned before it can request a renewal of that lease.
- **Rebinding Time, T2** (option 59): The time that the InRow RD must wait after an IP address lease is assigned before it can seek to rebind that lease.

Other options. The InRow RD also uses these options within a valid DHCP response. All of these options except the last are described in **RFC2132**.

- **Network Time Protocol Servers** (option 42): Up to two NTP servers (primary and secondary) that the InRow RD can use.
- **Time Offset** (option 2): The offset of the InRow RD's subnet, in seconds, from Coordinated Universal Time (UTC).
- **Domain Name Server** (option 6): Up to two Domain Name System (DNS) servers (primary and secondary) that the InRow RD can use.
- **Host Name** (option 12): The host name that the InRow RD will use (32-character maximum length).
- **Domain Name** (option 15): The domain name that the InRow RD will use (64-character maximum length).
- **Boot File Name** (from the **file** field of the DHCP response, described in **RFC2131**): The fully qualified directory-path to an user configuration file (.ini file) to download. The **siaddr** field of the DHCP response specifies the IP address of the server from which the InRow RD will download the .ini file. After the download, the InRow RD uses the .ini file as a boot file to reconfigure its settings.

Port Speed

Path: Administration > Network > Port Speed

The **Port Speed** setting defines the communication speed of the TCP/IP port.

- For **Auto-negotiation** (the default), Ethernet devices negotiate to transmit at the highest possible speed, but if the supported speeds of two devices are unmatched, the slower speed is used.
- Alternatively, you can choose 10 Mbps or 100 Mbps, each with the option of half-duplex (communication in only one direction at a time) or full-duplex (communication in both directions on the same channel simultaneously).

DNS

Path: Administration > Network > DNS > options

Use the options under **DNS** on the left navigation menu to configure and test the Domain Name System (DNS):

- Select **servers** to specify the IP addresses of the primary and optional secondary DNS server. For the InRow RD to send e-mail, at least the IP address of the primary DNS server must be defined.
 - The InRow RD waits up to 15 seconds for a response from the primary DNS server or the secondary DNS server (if a secondary DNS server is specified). If the InRow RD does not receive a response within that time, e-mail cannot be sent. Therefore, use DNS servers on the same segment as the InRow RD or on a nearby segment (but not across a wide-area network [WAN]).
 - After you define the IP addresses of the DNS servers, verify that DNS is working correctly by entering the DNS name of a computer on your network to look up the IP address for that computer.

- Select **naming** to define the host name and domain name of the InRow RD:
 - **Host Name:** After you configure a host name here and a domain name in the **Domain Name** field, users can enter a host name in any field in the InRow RD interface (except e-mail addresses) that accepts a domain name.
 - **Domain Name:** You need to configure the domain name here only. In all other fields in the InRow RD interface (except e-mail addresses) that accept domain names, the InRow RD adds this domain name when only a host name is entered.
 - To override all instances of the expansion of a specified host name by the addition of the domain name, set the domain name field to its default, `somedomain.com`, or to `0.0.0.0`.
 - To override the expansion of a specific host name entry (or example, when defining a trap receiver) include a trailing period. The InRow RD recognizes a host name with a trailing period (such as `mySnmpServer.`) as if it were a fully qualified domain name and does not append the domain name.
- Select **test** to send a DNS query that tests the setup of your DNS servers:
 - As **Query Type**, select the method to use for the DNS query:
 - **by Host:** the URL name of the server
 - **by FQDN:** the fully qualified domain name
 - **by IP:** the IP address of the server
 - **by MX:** the Mail Exchange used by the server
 - As **Query Question**, identify the value to be used for the selected query type:

Query Type Selected	Query Question to Use
by Host	The URL
by FQDN	The fully qualified domain name, <i>my_server.my_domain.</i>
by IP	The IP address
by MX	The Mail Exchange address

- View the result of the test DNS request in the **Last Query Response** field.

Web

Path: Administration > Network > Web > *options*

Option	Description
access	<p>To activate changes to any of these selections, log off from the InRow RD:</p> <ul style="list-style-type: none"> • Disable: Disables access to the Web interface. (You must use the control console to re-enable access. Select Network and Web/SSL/TLS. Then for HTTP, select Access and Enabled. For HTTPS access, also select Web/SSL and Enabled.) • Enable HTTP (the default): Enables Hypertext Transfer Protocol (HTTP), which provides Web access by user name and password, but does not encrypt user names, passwords, and data during transmission. • Enable HTTPS: Enables Hypertext Transfer Protocol (HTTPS) over Secure Sockets Layer (SSL). SSL encrypts user names, passwords, and data during transmission, and authenticates the InRow RD by digital certificate. When HTTPS is enabled, your browser displays a small lock icon. <p>See “Creating and Installing Digital Certificates” in the <i>Security Handbook</i> on the APC InRow RD <i>Utility</i> CD to choose among the several methods for using digital certificates.</p> <p>HTTP Port: The TCP/IP port (80 by default) used to communicate by HTTP with the InRow RD.</p> <p>HTTPS Port: The TCP/IP port (443 by default) used to communicate by HTTPS with the InRow RD.</p> <p>For either of these ports, you can change the port setting to any unused port from 5000 to 32768 for additional security. Users must then use a colon (:) in the address field of the browser to specify the port number. For example, for a port number of 5000 and an IP address of 152.214.12.114:</p> <pre style="text-align: center;">http://152.214.12.114:5000 https://152.214.12.114:5000</pre>
ssl cipher suites	<p>Enable or disable any of the SSL encryption ciphers and hash algorithms:</p> <ul style="list-style-type: none"> • DES: A block cipher that provides authentication by Secure Hash Algorithm. • RC4_MD5 (enabled by default): A stream cipher that provides authentication by MD5 hash algorithm. • RC4_SHA (enabled by default): A stream cipher that provides authentication by Secure Hash Algorithm. • 3DES: A block cipher that provides authentication by Secure Hash Algorithm.

Option	Description
ssl certificate	<p>Add, replace, or remove a security certificate.</p> <p>Status:</p> <ul style="list-style-type: none"> • Not installed: A certificate is not installed, or was installed by FTP or SCP to an incorrect location. Using Add or Replace Certificate File installs the certificate to the correct location, /sec on the InRow RD. • Generating: The InRow RD is generating a certificate because no valid certificate was found. • Loading: A certificate is being activated on the InRow RD. • Valid certificate: A valid certificate was installed or was generated by the InRow RD. Click on this link to view the certificate's contents. <p>If you install an invalid certificate, or if no certificate is loaded when you enable SSL, the InRow RD generates a default certificate, a process which delays access to the interface for up to five minutes. You can use the default certificate for basic encryption-based security, but a security alert message displays whenever you log on.</p> <p>Add or Replace Certificate File: Enter or browse to the certificate file created with the Security Wizard.</p> <p>See “Creating and Installing Digital Certificates” in the <i>Security Handbook</i> on the APC InRow RD <i>Utility</i> CD to choose a method for using digital certificates created by the Security Wizard or generated by the InRow RD.</p> <p>Remove: Delete the current certificate.</p>

Console

Path: Administration > Network > Console > *options*

Option	Description
access	<p>Choose one of the following for access by Telnet or Secure SHell (SSH):</p> <ul style="list-style-type: none"> • Disable: Disables all access to the control console. • Enable Telnet (the default): Telnet transmits user names, passwords, and data without encryption. • Enable SSH v1 and v2: Do not enable both versions 1 and 2 of SSH unless you require both. They use extensive processing power.) • Enable SSH v1 only: SSH version 1 encrypts user names, passwords, and data for transmission. There is little or no delay as you log on. • Enable SSH v2 only: SSH version 2 transmits user names, passwords, and data in encrypted form with more protection than version 1 from attempts to intercept, forge, or alter data during transmission. There is a noticeable delay as you log on. <p>Configure the ports to be used by these protocols:</p> <ul style="list-style-type: none"> • Telnet Port: The Telnet port used to communicate with the InRow RD (23 by default). You can change the port setting to any unused port from 5000 to 32768 for additional security. Users must then use a colon (:) or a space, as required by your Telnet client program, to specify the non-default port. For example, for port 5000 and an IP address of 152.214.12.114, your Telnet client requires one of the these commands: <pre style="margin-left: 40px;">telnet 152.214.12.114:5000 telnet 152.214.12.114 5000</pre> • SSH Port: The SSH port used to communicate with the InRow RD (22 by default). You can change the port setting to any unused port from 5000 to 32768 for additional security. See the documentation for your SSH client for the command line format required to specify a non-default port.
ssh encryption	<p>Enable or disable encryption algorithms (block ciphers) compatible with SSH version 1 or version 2 clients:</p> <p>If your SSH v1 client cannot use Blowfish, you must also enable DES.</p> <p>Your SSH v2 client selects the enabled algorithm that provides the highest security. If the client cannot use the default algorithms (3DES or Blowfish), enable an AES algorithm that it can use (AES 128 or AES 256).</p>

Option	Description
ssh host key	<p>Status indicates the status of the host key (private key):</p> <ul style="list-style-type: none"> • SSH Disabled: No host key in use: When disabled, SSH cannot use a host key. • Generating: The InRow RD is creating a host key because no valid host key was found. • Loading: A host key is being activated on the InRow RD. • Valid: One of the following valid host keys is in the /sec directory (the required location on the InRow RD): <ul style="list-style-type: none"> • A 1024-bit host key created by the APC Security Wizard • A 768-bit RSA host key generated by the InRow RD <p>Add or Replace: Browse to and upload a host key file created by the Security Wizard:</p> <p>If you use FTP or Secure CoPy (SCP) instead to transfer the host key file, you must specify the /sec directory as the target location in the command.</p> <p>To use the APC Security Wizard, see the <i>Security Handbook</i> on the APC InRow RD <i>Utility CD</i>.</p> <p>NOTE: To reduce the time required to enable SSH, create and upload a host key in advance. If you enable SSH with no host key loaded, the InRow RD takes up to 5 minutes to create a host key, and the SSH server is not accessible during that time.</p> <p>Remove: Remove the current host key.</p>



Note: To use SSH, you must have an SSH client installed. Most Linux and other UNIX[®] platforms include an SSH client, but Microsoft Windows operating systems do not. Clients are available from various vendors.

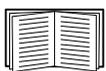
SNMP

SNMPv1

Path: Administration > Network > SNMPv1 > options

All user names, passwords, and community names for SNMP are transferred over the network as plain text. If your network requires the high security of encryption, disable SNMP access or set the access for each community to Read. (A community with Read access can receive status information and use SNMP traps.)

When using InfraStruXure Central to manage the InRow RD on the public network of an InfraStruXure system, you must have SNMP enabled in the InRow RD interface. Read access will allow InfraStruXure Central to receive traps from the InRow RD, but Write access is required while you use the interface of the InRow RD to set InfraStruXure Central as a trap receiver.



For detailed information on enhancing and managing the security of your system, see the *Security Handbook*, available on the APC InRow RD *Utility CD* or from the APC Web site, www.apc.com.

Option	Description
access	Enable SNMPv1 Access: Enables SNMP version 1 as a method of communication with this device.
access control	<p>You can configure up to four access control entries to specify which NMSs have access to this device. The opening page for access control, by default, assigns one entry to each of the four available SNMPv1 communities, but you can edit these settings to apply more than one entry to any community to grant access by several specific IP addresses, host names, or IP address masks. To edit the access control settings for a community, click its community name.</p> <ul style="list-style-type: none"> • If you leave the default access control entry unchanged for a community, that community has access to this device from any location on the network. • If you configure multiple access control entries for one community name, the limit of four entries requires that one or more of the other communities must have no access control entry. If no access control entry is listed for a community, that community has no access to this device. <p>Community Name: The name that a Network Management System (NMS) must use to access the community. The maximum length is 15 ASCII characters, and the default community names for the four communities are <code>public</code>, <code>private</code>, <code>public2</code>, and <code>private2</code>.</p> <p>NMS IP/Host Name: The IP address, IP address mask, or host name that controls access by NMSs. A host name or a specific IP address (such as 149.225.12.1) allows access only by the NMS at that location. IP addresses that contain 255 restrict access as follows:</p> <ul style="list-style-type: none"> • 149.225.12.255: Access only by an NMS on the 149.225.12 segment. • 149.225.255.255: Access only by an NMS on the 149.225 segment. • 149.255.255.255: Access only by an NMS on the 149 segment. • 0.0.0.0 (the default setting) which can also be expressed as 255.255.255.255: Access by any NMS on any segment. <p>Access Type: The actions an NMS can perform through the community.</p> <ul style="list-style-type: none"> • Read: GETS only, at any time • Write: GETS at any time, and SETS when no user is logged onto the Web interface or control console. • Write+: GETS and SETS at any time. • Disabled: No GETS or SETS at any time.

SNMPv3

Path: Administration > Network > SNMPv3 > options

For SNMP GETs, SETs, and trap receivers, SNMPv3 uses a system of user profiles to identify users. An SNMPv3 user must have a user profile assigned in the MIB software program to perform GETs and SETs, browse the MIB, and receive traps.



Note: To use SNMPv3, you must have a MIB program that supports SNMPv3.

The InRow RD supports only MD5 authentication and DES encryption.

Option	Description
access	SNMPv3 Access: Enables SNMPv3 as a method of communication with this device.

Option	Description
user profiles	<p>By default, lists the settings of four user profiles, configured with the user names apc snmp profile1 through apc snmp profile4, and no authentication and no privacy (no encryption). To edit the following settings for a user profile, click a user name in the list.</p> <p>User Name: The identifier of the user profile. SNMP version 3 maps GETs, SETs, and traps to a user profile by matching the user name of the profile to the user name in the data packet being transmitted. A user name can have up to 32 ASCII characters.</p> <p>Authentication Passphrase: A phrase of 15 to 32 ASCII characters (<code>apc auth passphrase</code>, by default) that verifies that the NMS communicating with this device through SNMPv3 is the NMS it claims to be, that the message has not been changed during transmission, and that the message was communicated in a timely manner, indicating that it was not delayed and that it was not copied and sent again later at an inappropriate time.</p> <p>Privacy Passphrase: A phrase of 15 to 32 ASCII characters (<code>apc crypt passphrase</code>, by default) that ensures the privacy of the data (by means of encryption) that an NMS is sending to this device or receiving from this device through SNMPv3.</p> <p>Authentication Protocol: The APC implementation of SNMPv3 supports MD5 authentication. Authentication will not occur unless MD5 is selected as the authentication protocol.</p> <p>Privacy Protocol: The APC implementation of SNMPv3 supports DES as the protocol for encrypting and decrypting data. Privacy of transmitted data requires that DES is selected as the privacy protocol.</p> <p>Note: You cannot select the privacy protocol if no authentication protocol is selected.</p>
access control	<p>You can configure up to four access control entries to specify which NMSs have access to this device. The opening page for access control, by default, assigns one entry to each of the four user profiles, but you can edit these settings to apply more than one entry to any user profile to grant access by several specific IP addresses, host names, or IP address masks.</p> <ul style="list-style-type: none"> • If you leave the default access control entry unchanged for a user profile, all NMSs that use that profile have access to this device. • If you configure multiple access entries for one user profile, the limit of four entries requires that one or more of the other user profiles must have no access control entry. If no access control entry is listed for a user profile, no NMS that uses that profile has any access to this device. <p>To edit the access control settings for a user profile, click its user name.</p> <p>Access: Mark the Enable checkbox to activate the access control specified by the parameters in this access control entry.</p> <p>User Name: Select from the drop-down list the user profile to which this access control entry will apply. The choices available are the four user names that you configure through the user profiles option on the left navigation menu.</p> <p>NMS IP/Host Name: The IP address, IP address mask, or host name that controls access by the NMS. A host name or a specific IP address (such as 149.225.12.1) allows access only by the NMS at that location. An IP address mask that contain 255 restricts access as follows:</p> <ul style="list-style-type: none"> • 149.225.12.255: Access only by an NMS on the 149.225.12 segment. • 149.225.255.255: Access only by an NMS on the 149.225 segment. • 149.255.255.255: Access only by an NMS on the 149 segment. • 0.0.0.0 (the default setting) which can also be expressed as 255.255.255.255: Access by any NMS on any segment.

FTP Server

Path: Administration > Network > FTP Server

The **FTP server** settings enable (by default) or disable access to the FTP server and specify the TCP/IP port (21 by default) that the FTP server uses to communicate with the InRow RD. The FTP server uses both the specified port and the port one number lower than the specified port.

You can change the **Port** setting to the number of any unused port from 5001 to 32768 for added security. Users must then use a colon (:) to specify the non-default port number. For example, for port 5001 and IP address 152.214.12.114, the command would be `ftp 152.214.12.114:5001`.



Note: FTP transfers files without encryption. For higher security, disable the FTP server, and transfer files with Secure CoPy (SCP). Selecting and configuring Secure SHell (SSH) enables SCP automatically.

At any time that you want a UPS to be accessible for management by InfraStruXure Central, FTP Server must be enabled in the InRow RD interface.



For detailed information on enhancing and managing the security of your system, see the *Security Handbook*, available on the APC InRow RD *Utility* CD or from the APC Web site.

Administration: Notification and Logging

Event Actions

Path: Administration > Notification > Event Actions > *options*

Types of notification

You can configure event actions to occur in response to an event or group of events. These actions notify users of the event in any of several ways:

- Active, automatic notification. The specified users or monitoring devices are contacted directly.
 - E-mail notification
 - SNMP traps
 - Syslog notification
- Indirect notification in the event log. If no direct notification is configured, users must check the log to determine which events have occurred.



For another method of indirect notification, see “SNMP” on page 37. SNMP enables an NMS to perform informational queries. For SNMPv1, configuring the most restrictive SNMP access type, READ, enables informational queries without the risk of allowing remote configuration changes.

You can also log system performance data to use for device monitoring. See “Data log” on page 21 for information on how to configure and use this data logging option.

Configuring event actions

Notification Parameters. For events that have an associated clearing event, you can also set the following parameters as you configure events individually or by group, as described in the next two sections. To access the parameters, click the receiver or recipient name.

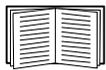
Parameter	Description
Delay x time before sending	If the event persists for the specified time, notification is sent. If the condition clears before the time expires, no notification is sent.
Repeat at an interval of x time	The notification is sent at the specified interval (e.g., every 2 minutes).
Up to x times	During an active event, the notification repeats for this number of times.
Until condition clears	The notification is sent repeatedly until the condition clears or is resolved.

Configuring by event. To define event actions for an individual event:

1. Select the **Administration** tab, **Notification** on the top menu bar, and **by event** under **Event Actions** on the left navigation menu.
2. In the list of events, review the marked columns to see whether the action you want is already configured. (By default, logging is configured for all events.)
3. To view or change the current configuration, such as recipients to be notified by e-mail, or Network Management Systems (NMSs) to be notified by SNMP traps, click on the event name.



Note: If no Syslog server is configured, items related to Syslog configuration are not displayed.



When viewing details of an event's configuration, you can change the configuration, enable or disable event logging or Syslog, or disable notification for specific e-mail recipients or trap receivers, but you cannot add or remove recipients or receivers. To add or remove recipients or receivers, see the following:

- “Identifying Syslog Servers” on page 46
- “E-mail recipients” on page 44
- “Trap Receivers” on page 45

Configuring by group. To configure a group of events simultaneously:

1. Select the **Administration** tab, **Notification** on the top menu bar, and **by group** under **Event Actions** on the left navigation menu.
2. Choose how to group events for configuration:
 - Choose **Grouped by severity**, and then select all events of one or more severity levels. You cannot change the severity of an event.
 - Choose **Grouped by category**, and then select all events in one or more pre-defined categories.
3. Click **Next>>** to move from page to page to do the following:
 - a. Select event actions for the group of events.
 - To choose any action except **Logging** (the default), you must first have at least one relevant recipient or receiver configured.
 - If you choose **Logging** and have configured a Syslog server, select **Event Log** or **Syslog** (or both) on the next page.
 - b. Select whether to leave the newly configured event action enabled for this group of events or to disable the action.

Active, Automatic, Direct Notification

E-mail notification

Overview of setup. Use the Simple Mail Transfer Protocol (SMTP) to send e-mail to up to four recipients when an event occurs.

To use the e-mail feature, you must define the following settings:

- The IP addresses of the primary and, optionally, the secondary Domain Name System (DNS) servers. (See “DNS” on page 32.)
- The IP address or DNS name for **SMTP Server** and **From Address**. (See “SMTP” on page 43.)
- The e-mail addresses for a maximum of four recipients. (See “E-mail recipients” on page 44.)



Note: You can use the **To Address** setting of the **recipients** option to send e-mail to a text-based pager.

SMTP.

Path: Administration > Notification > E-mail > server

Setting	Description
Local SMTP Server	The IP address or DNS name of the local SMTP server. Note: This definition is required only when SMTP Server is set to Local . See “E-mail recipients” on page 44.
From Address	The contents of the From field in e-mail messages sent by the InRow RD: <ul style="list-style-type: none">• In the format <i>user@ [IP_address]</i> (if an IP address is specified as Local SMTP Server)• In the format <i>user@domain</i> (if DNS is configured and the DNS name is specified as Local SMTP Server) in the e-mail messages. Note: The local SMTP server may require that you use a valid user account on the server for this setting. See the server’s documentation.

E-mail recipients.

Path: Administration > Notification > E-mail > recipients

Identify up to four e-mail recipients.

Setting	Description
To Address	<p>The user and domain names of the recipient. To use e-mail for paging, use the e-mail address for the recipient's pager gateway account (for example, myacct100@skytel.com). The pager gateway will generate the page.</p> <p>To bypass the DNS lookup of the mail server's IP address, use the IP address in brackets instead of the e-mail domain name, e.g., use jsmith@[xxx.xxx.x.xxx] instead of jsmith@company.com. This is useful when DNS lookups are not working correctly.</p> <p>Note: The recipient's pager must be able to use text-based messaging.</p>
SMTP Server	<p>Select one of the following methods for routing e-mail:</p> <ul style="list-style-type: none">• Local: Through the InRow RD's SMTP server. This setting (recommended) ensures that the e-mail is sent before the InRow RD's 20-second time-out, and, if necessary, is retried several times. Also do one of the following:<ul style="list-style-type: none">• Enable forwarding at the InRow RD's SMTP server so that it can route e-mail to external SMTP servers. Typically, SMTP servers are not configured to forward e-mail. Check with the administrator of your SMTP server before changing its configuration to allow forwarding.• Set up a special e-mail account for the InRow RD to forward e-mail to an external mail account.• Recipient: Directly to the recipient's SMTP server. With this setting, the InRow RD tries to send the e-mail only once. On a busy remote SMTP server, the time-out may prevent some e-mail from being sent. <p>When the recipient uses the InRow RD's SMTP server, this setting has no effect.</p>
E-mail Generation	<p>Enables (by default) or disables sending e-mail to the recipient.</p>
Format	<p>The long format contains Name, Location, Contact, IP address, serial number of the device, date and time, event code, and event description. The short format provides only the event description.</p>

E-mail test (Administration > Notification > E-mail > test). Send a test message to a configured recipient.

SNMP traps

Trap Receivers.

Path: Administration > Notification > SNMP Traps > trap receivers

View trap receivers by NMS IP/Host Name. You can configure up to six trap receivers.

- To open the page for configuring a new trap receiver, click **Add Trap Receiver**.
- To modify or delete a trap receiver, first click its IP address or host name to access its settings. (If you delete a trap receiver, all notification settings configured under Event Actions for the deleted trap receiver are set to their default values.)
- To specify the trap type for a trap receiver, select either the SNMPv1 or SNMPv3 radio button. For an NMS to receive both types of traps, you must configure two trap receivers for that NMS, one for each trap type.

Item	Definition
Trap Generation	Enable (the default) or disable trap generation for this trap receiver.
NMS IP/Host Name	The IP address or host name of this trap receiver. The default, 0.0.0.0, leaves the trap receiver undefined.

SNMPv1 option.

Community Name	The name (<code>public</code> by default) used as an identifier when SNMPv1 traps are sent to this trap receiver.
Authenticate Traps	When this option is enabled (the default), the NMS identified by the NMS IP/Host Name setting will receive authentication traps (traps generated by invalid attempts to log on to this device). To disable that ability, unmark the checkbox.

SNMPv3 option. Select the identifier of the user profile for this trap receiver. (To view the settings of the user profiles identified by the user names selectable here, choose **Network** on the top menu bar and **user profiles** under **SNMPv3** on the left navigation menu.)



See “SNMPv3” on page 38 for information on creating user profiles and selecting authentication and encryption methods.

SNMP Trap Test

Path: Administration > Notification > SNMP Traps > test

Last Test Result. The result of the most recent SNMP trap test. A successful SNMP trap test verifies only that a trap was sent; it does not verify that the trap was received by the selected trap receiver. A trap test succeeds if all of the following are true:

- The SNMP version (SNMPv1 or SNMPv3) configured for the selected trap receiver is enabled on this device.
- The trap receiver is enabled.
- If a host name is selected for the **To** address, that host name can be mapped to a valid IP address.

To. Select the IP address or host name to which a test SNMP trap will be sent. If no trap receiver was ever configured, a link to the **Trap Receiver** configuration page is displayed.

Syslog

Path: Logs > Syslog > options

The InRow RD can send messages to up to four Syslog servers when an event occurs. The Syslog servers record events that occur at network devices in a log that provides a centralized record of events.



This user's guide does not describe Syslog or its configuration values in detail. See [RFC3164](#) for more information about Syslog.

Identifying Syslog Servers.

Path: Logs > Syslog > servers

Setting	Definition
Syslog Server	Uses IP addresses or host names to identify from one to four servers to receive Syslog messages sent by the InRow RD.
Port	The user datagram protocol (UDP) port that the InRow RD will use to send Syslog messages. The default is 514 , the UDP port assigned to Syslog.

Syslog Settings.

Path: Logs > Syslog > settings

Setting	Definition
Message Generation	Enables (by default) or disables the Syslog feature.
Facility Code	Selects the facility code assigned to the InRow RD's Syslog messages (User , by default). Note: User best defines the Syslog messages sent by the InRow RD. Do not change this selection unless advised to do so by the Syslog network or system administrator.
Severity Mapping	Maps each severity level of InRow RD or Environment events to available Syslog priorities. You should not need to change the mappings. The following definitions are from RFC3164: <ul style="list-style-type: none">• Emergency: The system is unusable• Alert: Action must be taken immediately• Critical: Critical conditions• Error: Error conditions• Warning: Warning conditions• Notice: Normal but significant conditions• Informational: Informational messages• Debug: Debug-level messages Following are the default settings for the four Local Priority settings: <ul style="list-style-type: none">• Severe is mapped to Critical• Warning is mapped to Warning• Informational is mapped to Info Note: To disable Syslog messages, see "Configuring event actions" on page 41.

Syslog Test and Format example.

Path: Logs > Syslog > test

Send a test message to the Syslog servers configured through the **servers** option.

1. Select a severity to assign to the test message.
2. Define the test message, according to the required message fields
 - The priority (PRI): the Syslog priority assigned to the message's event, and the facility code of messages sent by the InRow RD.
 - The Header: a time stamp and the IP address of the InRow RD.
 - The message (MSG) part:
 - The TAG field, followed by a colon and space, identifies the event type.
 - The CONTENT field is the event text, followed (optionally) by a space and the event code.

For example, `APC: Test Syslog` is valid.

Queries (SNMP GETs)

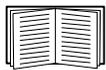
See “SNMP” on page 37 for a description of SNMPv1 and SNMPv3 settings that enable an NMS to perform informational queries. With SNMPv1, which does not encrypt data before transmission, configuring the most restrictive SNMP access type (READ) enables informational queries without allowing remote configuration changes.

Administration: General Options

Identification

Path: Administration > General > Identification

Define values for **Name** (the device name), **Location** (the physical location), and **Contact** (the person responsible for the device) used by the InRow RD's SNMP agent. These settings are the values used for the MIB-II **sysName**, **sysContact**, and **sysLocation** Object Identifiers (OIDs).



For more information about MIB-II OIDs, see the *PowerNet® SNMP Management Information Base (MIB) Reference Guide*, available on the *Utility* CD and the APC Web site, www.apc.com.

Set the Date and Time

Method

Path: Administration > General > Date & Time > mode

Set the time and date used by the InRow RD. You can change the current settings manually or through a Network Time Protocol (NTP) Server:

- **Manual Mode:** Do one of the following:
 - Enter the date and time for the InRow RD.
 - Mark the check box **Apply Local Computer Time** to match the date and time settings of the computer you are using.
- **Synchronize with NTP Server:** Have an NTP Server define the date and time for the InRow RD.

Setting	Definition
Primary NTP Server	Enter the IP address or domain name of the primary NTP server.
Secondary NTP Server	Enter the IP address or domain name of the secondary NTP server, when a secondary server is available.
Time Zone	Select a time zone. The number of hours preceding each time zone in the list is the offset from Coordinated Universal Time (UTC), formerly Greenwich Mean Time).
Update Interval	Define how often, in hours, the InRow RD accesses the NTP Server for an update. <i>Minimum:</i> 1; <i>Maximum:</i> 8760 (1 year).
Update Using NTP Now	Initiate an immediate update of date and time by the NTP Server.

Daylight saving

Path: Administration > General > Date & Time > daylight saving

Enable either traditional United States Daylight Saving Time (DST) or enable and configure a customized daylight saving time to match how Daylight Saving Time is implemented in your local area. DST is disabled by default.

When customizing Daylight Saving Time (DST):

- If the local DST always starts or ends on the fourth occurrence of a specific weekday of a month (e.g, the fourth Sunday), choose **Fourth/Last**. If a fifth Sunday occurs in that month in a subsequent year, the time setting still changes on the fourth Sunday.
- If the local DST always starts or ends on the last occurrence of a specific weekday of a month, whether it is the fourth or the fifth occurrence, choose **Fifth/Last**.

Format

Path: Administration > General > Date & Time > date format

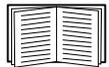
Select the numerical format in which to display all dates in this user interface. In the selections, each letter m (for month), d (for day), and y (for year) represents one digit. Single-digit days and months are displayed with a leading zero.

Use an .ini File

Path: Administration > General > User Config File

Use the settings from one InRow RD to configure another. Retrieve the config.ini file from the configured InRow RD, customize that file (e.g., to change the IP address), and upload the customized file to the new InRow RD. The file name can be up to 64 characters, and must have the.ini suffix.

Status	Reports the progress of the upload. The upload succeeds even if the file contains errors, but a system event r reports the errors in the event log.
Upload	Browse to the customized file and upload it so that the current InRow RD can use it to set its own configuration.



To retrieve and customize the file of a configured InRow RD, see “How to Export Configuration Settings” on page 55.

Instead of uploading the file to one InRow RD, you can export the file to multiple InRow RDs by using an FTP or SCP script or a batch file and the APC .ini file utility, available from www.apc.com/tools/download.

Temperature Units

Path: Administration > General > Preferences

Event Log Color Coding. Click in the box to select **Enable** or **Disable**.

Temperature Scale. Select the temperature scale (**Fahrenheit** or **Celsius**) in which to display all temperature measurements in this user interface.

Reset the Interface

Path: Administration > General > Reset/Reboot

Action	Definition
Reboot Management Interface	Restarts the interface of the InRow RD.
Reset All ¹	Select Exclude TCP/IP to reset all values except TCP/IP; clear Exclude TCP/IP to reset all configuration values.
Reset Only ¹	TCP/IP settings: Set TCP/IP Configuration to DHCP & BOOTP , its default setting, requiring that the InRow RD receive its TCP/IP settings from a DHCP or BOOTP server. See “TCP/IP and Communication Settings” on page 29.
	Event configuration: Reset all changes to event configuration, by event and by group, to their default settings.
1. Resetting may take up to a minute.	

Serial Modbus

Path: Administration > General > Serial Modbus

Check the **Access** box to Enable or Disable Modbus. Select the **Baud Rate** by clicking on one of the radio buttons by the baud rate options (9600 or 19200 bps). Specify a **Target Unique ID** by entering a number from 1 to 247 in the box. Then select **Apply**.

Modbus defines a request/response message structure for a client/server environment. The APC implementation of Modbus uses Remote Terminal Unit (RTU) mode. You can use Modbus to view the InRow RD through your building management system interface. It is read-only.

- The Modbus interface supports 2-wire RS-485.
- Modbus runs at 9600 or 19200 bps.

The Modbus register map for the InRow RD defines the data (type, location, and valid responses) available through Modbus. To download the latest Modbus register map, go to the APC web site, search by part number, and click the link to the register map in the list of documentation. Check the publication date at the start of the file.

Configuring Links

Path: Administration > General > Quick Links

Select the **Administration** tab, **General** on the top menu bar, and **Quick Links** on the left navigation menu to view and change the URL links displayed at the bottom left of each page of the interface.

By default, these links access the following Web pages:

- **Link 1:** The home page of the APC Web site.
- **Link 2:** A page where you can use samples of APC Web-enabled products.
- **Link 3:** The home page of the APC Remote Monitoring Service.

To reconfigure any of the following, click the link name in the **Display** column:

- **Display:** The short link name displayed on each interface page
- **Name:** A name that fully identifies the target or purpose of the link
- **Address:** Any URL — for example, the URL of another device or server

About the InRow RD

Path: Administration > General > About

The hardware information is especially useful to APC Customer Support to troubleshoot problems with the InRow RD. The serial number and MAC address are also available on the InRow RD itself.

Firmware information for the Application Module and APC OS (AOS) indicates the name, the firmware version, and the date and time each firmware module was created. This information is also useful in troubleshooting and enables you to determine if updated firmware is available at the APC Web site.

Management Uptime is the length of time the interface has been running continuously.

APC Device IP Configuration Wizard

Capabilities, Requirements, and Installation

How to use the Wizard to configure TCP/IP settings

The APC Device IP Configuration Wizard configures the IP address, subnet mask, and default gateway of one or more InRow RDs. You can use the Wizard in either of the following ways:

- Remotely over your TCP/IP network to discover and configure unconfigured InRow RDs on the same network segment as the computer running the Wizard.
- Through a direct connection from a serial port of your computer to the InRow RD to configure or reconfigure it.

System requirements

The Wizard runs on Microsoft Windows 2000, Windows 2003, and Windows XP operating systems.

Installation

To install the Wizard from the *Utility* CD:

1. If autorun is enabled, the user interface of the CD starts when you insert the CD. Otherwise, open the file **contents.htm** on the CD.
2. Click **Device IP Configuration Wizard** and follow the instructions.

To install the Wizard from a downloaded executable file:

1. Go to **www.apc/tools/download**.
2. Download the Device IP Configuration Wizard.
3. Run the executable file in the folder to which you downloaded it.

Use the Wizard



Note: Most software firewalls must be temporarily disabled for the Wizard to discover unconfigured InRow RDs.

Launch the Wizard

The installation creates a shortcut link in the **Start** menu to launch the Wizard.

Configure the basic TCP/IP settings remotely

Prepare to configure the settings. Before you run the Wizard:

1. Contact your network administrator to obtain valid TCP/IP settings.
2. If you are configuring multiple unconfigured InRow RDs, obtain the MAC address of each one to identify it when the Wizard discovers it. (The Wizard displays the MAC address on the screen on which you then enter the TCP/IP settings.)
 - The MAC address is on a label on the InRow RD.
 - You can also obtain the MAC address from the Quality Assurance slip that came with the InRow RD.

Run the Wizard to perform the configuration. To discover and configure unconfigured InRow RDs over the network:

1. From the **Start** menu, launch the Wizard. The Wizard detects the first InRow RD that is not configured.
2. Select **Remotely (over the network)**, and click **Next >**.
3. Enter the system IP, subnet mask, and default gateway for the InRow RD identified by the MAC address. Click **Next >**.

On the **Transmit Current Settings Remotely** screen, if you select the **Start a Web browser when finished** check box, the default Web browser connects to the InRow RD after the Wizard transmits the settings.

4. Click **Finish** to transmit the settings. If the IP address you entered is in use on the network, the Wizard prompts you to enter an IP address that is not in use. Enter a correct IP address, and click **Finish**.
5. If the Wizard finds another unconfigured InRow RD, it displays the screen to enter TCP/IP settings. Repeat this procedure beginning at step 3, or to skip the InRow RD whose MAC address is currently displayed, click **Cancel**.

Configure or reconfigure the TCP/IP settings locally

1. Contact your network administrator to obtain valid TCP/IP settings.
2. Connect the serial configuration cable (which came with the InRow RD) from an available communications port on your computer to the serial port of the card or device. Make sure no other application is using the computer port.
3. From the **Start** menu, launch the Wizard application.
4. If the InRow RD is not configured, wait for the Wizard to detect it. Otherwise, click **Next>**.
5. Select **Locally (through the serial port)**, and click **Next >**.
6. Enter the system IP, subnet mask, and default gateway for the InRow RD, and click **Next >**.
7. On the **Transmit Current Settings Remotely** screen, if you select the **Start a Web browser when finished** check box, the default Web browser connects to the InRow RD after the Wizard transmits the settings.
8. Click **Finish** to transmit the TCP/IP settings. If the IP address you entered is in use on the network, the Wizard prompts you to enter an IP address that is not in use. Enter a correct IP address, and click **Finish**.
9. If you selected **Start a Web browser when finished** in step 6, you can now configure other parameters through the Web interface of the device.

How to Export Configuration Settings

Retrieving and Exporting the .ini File

Summary of the procedure

An Administrator can retrieve the .ini file of a cooling unit and export it to another cooling unit or to multiple cooling units.

1. Configure one cooling unit to have the settings you want to export.
2. Retrieve the .ini file from that cooling unit.
3. Customize the file to change at least the TCP/IP settings.
4. Use a file transfer protocol supported by the cooling unit to transfer a copy to one or more other cooling units. For a transfer to multiple cooling units, use an FTP or SCP script or the APC .ini file utility.

Each receiving cooling unit uses the file to reconfigure its own settings and then deletes it.

Contents of the .ini file

The config.ini file you retrieve from the cooling unit contains the following:

- *section headings* and *keywords* (only those supported for the device from which you retrieve the file): Section headings are category names enclosed in brackets ([]). Keywords, under each section heading, are labels describing specific cooling unit settings. Each keyword is followed by an equals sign and a value (either the default or a configured value).
- The `Override` keyword: With its default value, this keyword prevents the exporting of one or more keywords and their device-specific values, e.g., in the `[NetworkTCP/IP]` section, the default value for `Override` (the MAC address of the cooling unit) blocks the exporting of values for the `SystemIP`, `SubnetMask`, `DefaultGateway`, and `BootMode`.

Detailed procedures

Retrieving. To set up and retrieve an .ini file to export:

1. If possible, use the interface of a cooling unit to configure it with the settings to export. Directly editing the .ini file risks introducing errors.
2. To use FTP to retrieve config.ini from the configured cooling unit:
 - a. Open a connection to the cooling unit, using its IP address:

```
ftp> open ip_address
```

- b. Log on using the Administrator user name and password.

- c. Retrieve the config.ini file containing the cooling unit's settings:

```
ftp> get config.ini
```

The file is written to the folder from which you launched FTP.



To retrieve configuration settings from multiple cooling units and export them to other cooling units, see *Release Notes: ini File Utility, version 1.0*, available on the *Utility CD* and at www.apc.com.

Customizing. You must customize the file before you export it.

1. Use a text editor to customize the file.
 - Section headings, keywords, and pre-defined values are not case-sensitive, but string values that you define are case-sensitive.
 - Use adjacent quotation marks to indicate no value. For example, `LinkURL1=""` indicates that the URL is intentionally undefined.
 - Enclose in quotation marks any values that contain leading or trailing spaces or are already enclosed in quotation marks.
 - To export scheduled events, configure the values directly in the `.ini` file.
 - To export a system time with the greatest accuracy, if the receiving cooling units can access a Network Time Protocol server, configure `enabled` for `NTPEnable`:

`NTPEnable=enabled`

Alternatively, reduce transmission time by exporting the `[SystemDate/Time]` section as a separate `.ini` file.
 - To add comments, start each comment line with a semicolon (`;`).
2. Copy the customized file to another file name in the same folder:
 - The file name can have up to 64 characters and must have the `.ini` suffix.
 - Retain the original customized file for future use. **The file that you retain is the only record of your comments.**

Transferring the file to a single cooling unit. To transfer the `.ini` file to another cooling unit, do either of the following:

- From the Web interface of the receiving cooling unit, select the **Administration** tab, **General** on the top menu bar, and **User Config File** on the left navigation menu. Enter the full path of the file, or use **Browse**.
- Use any file transfer protocol supported by cooling units, i.e., FTP, FTP Client, SCP, or TFTP). The following example uses FTP:
 - a. From the folder containing the copy of the customized `.ini` file, use FTP to log in to the cooling unit to which you are exporting the `.ini` file:

```
ftp> open ip_address
```

- b. Export the copy of the customized `.ini` file to the root directory of the receiving cooling unit:

```
ftp> put filename.ini
```

Exporting the file to multiple cooling units. To export the `.ini` file to multiple cooling units:

- Use FTP or SCP, but write a script that incorporates and repeats the steps used for exporting the file to a single cooling unit.
- Use a batch processing file and the APC `.ini` file utility.



To create the batch file and use the utility, see *Release Notes: ini File Utility, version 1.0* on the *Utility* CD.

The Upload Event and Error Messages

The event and its error messages

The following event occurs when the receiving cooling unit completes using the .ini file to update its settings.

Configuration file upload complete, with *number* valid values

If a keyword, section name, or value is invalid, the upload by the receiving cooling unit succeeds, and additional event text states the error.

Event text	Description
Configuration file warning: Invalid keyword on line <i>number</i> . Configuration file warning: Invalid value on line <i>number</i> .	A line with an invalid keyword or value is ignored.
Configuration file warning: Invalid section on line <i>number</i> .	If a section name is invalid, all keyword/value pairs in that section are ignored.
Configuration file warning: Keyword found outside of a section on line <i>number</i> .	A keyword entered at the beginning of the file (i.e., before any section headings) is ignored.
Configuration file warning: Configuration file exceeds maximum size.	If the file is too large, an incomplete upload occurs. Reduce the size of the file, or divide it into two files, and try uploading again.

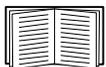
Messages in config.ini

A device associated with the cooling unit from which you download the config.ini file must be discovered successfully in order for its configuration to be included. If the device is not present or, for another reason, is not discovered, the config.ini file contains a message under the appropriate section name, instead of keywords and values.

If you did not intend to export the configuration of the device as part of the .ini file import, ignore these messages.

Errors generated by overridden values

The `Override` keyword and its value will generate error messages in the event log when it blocks the exporting of values.



See “Contents of the .ini file” on page 55 for information about which values are overridden.

Because the overridden values are device-specific and not appropriate to export to other cooling units, ignore these error messages. To prevent these error messages, you can delete the lines that contain the `Override` keyword and the lines that contain the values that they override. Do not delete or change the line containing the section heading.

Related Topics

On Windows operating systems, instead of transferring .ini files, you can use the APC Device IP Configuration Wizard to update the basic TCP/IP settings of cooling units and configure other settings through their user interface.



See “APC Device IP Configuration Wizard” on page 51.

File Transfers

Upgrading Firmware

Benefits of upgrading firmware

When you upgrade the firmware on the InRow RD:

- You obtain the latest bug fixes and performance improvements.
- New features become available for immediate use.

Keeping the firmware versions consistent across your network ensures that all InRow RDs support the same features in the same manner.

Firmware files (InRow RD)

A firmware version consists of two modules: An APC Operating System (AOS) module and an application module. Each module contains one or more Cyclical Redundancy Checks (CRCs) to protect its data from corruption during transfer.

The APC Operating System (AOS) and application module files used with the InRow RD share the same basic format:

`apc_hardware-version_type_firmware-version.bin`

- `apc`: Indicates that this is an APC file.
- ***hardware-version***: `hw0x` identifies the version of the hardware on which you can use this binary file.
- ***type***: Identifies whether the file is for the APC Operating System (AOS) or the application module for the InRow RD.
- ***version***: The version number of the file.
- `bin`: Indicates that this is a binary file.

Obtain the latest firmware version

Automated upgrade tool for Microsoft Windows systems. An upgrade tool automates the transferring of the firmware modules on any supported Windows operating system. Obtain the latest version of the tool at no cost from www.apc.com/tools/download. At this Web page, find the latest firmware release for your APC product and download the automated tool. **Never** use the tool for one APC product to upgrade firmware of another.

Manual upgrades, primarily for Linux systems. If no computer on your network is running a Microsoft Windows operating system, you must upgrade the firmware of your InRow RDs by using the separate AOS and application firmware modules.

Obtain the individual firmware modules by downloading the automated tool from www.apcc.com/tools/download, then extracting the firmware files from the tool.

To extract the firmware files:

1. Run the tool.
2. At the prompts, click **Next>**, and then specify the directory location to which the files will be extracted.
3. When the **Extraction Complete** message displays, close the dialog box.

Firmware File Transfer Methods

To upgrade the firmware of a InRow RD, use one of these methods:

- From a networked computer running a Microsoft Windows operating system, use the firmware upgrade tool downloaded from the APC Web site.
- From a networked computer on any supported operating system, use FTP or SCP to transfer the individual AOS and application firmware modules.
- For a InRow RD that is not on your network, use XMODEM through a serial connection to transfer the individual firmware modules from your computer to the InRow RD.



Caution: When you transfer individual firmware modules, **you must** transfer the APC Operating System (AOS) module to the InRow RD before you transfer the application module.

Use FTP or SCP to upgrade one InRow RD

FTP. For you to use FTP to upgrade one InRow RD over the network:

- The InRow RD must be connected to the network, and its system IP, subnet mask, and default gateway must be configured
- The FTP server must be enabled at the InRow RD
- The firmware files must be extracted from the firmware upgrade tool (see “To extract the firmware files:” on page 60)

To transfer the files:

1. Open a command prompt window of a computer on the network. Go to the directory that contains the firmware files, and list the files:

```
C:\>cd\apc  
C:\apc>dir
```

For the listed files, xxx represents the firmware version number:

- apc_hw03_aos_xxx.bin
- apc_hw03_application_xxx.bin

2. Open an FTP client session:

```
C:\apc>ftp
```

3. Type `open` and the InRow RD's IP address, and press `ENTER`. If the **port** setting for the FTP Server has changed from its default of **21**, you must use the non-default value in the FTP command.
 - For Windows FTP clients, separate a non-default port number from the IP address by a space. For example:

```
ftp> open 150.250.6.10 21000
```
 - Some FTP clients require a colon instead before the port number.
4. Log on as Administrator; **apc** is the default user name and password.
5. Upgrade the AOS. In the example, `xxx` is the firmware version number:


```
ftp> bin
ftp> put apc_hw03_aos_xxx.bin
```
6. When FTP confirms the transfer, type **quit** to close the session.
7. After 20 seconds, repeat step 2 through step 6. In step 5, use the application module file name.

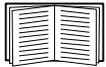
SCP. To use Secure CoPy (SCP) to upgrade firmware for a InRow RD:

1. Identify and locate the firmware modules described in the preceding instructions for FTP.
2. Use an SCP command line to transfer the AOS firmware module to the InRow RD. The following example uses `xxx` to represent the version number of the AOS module:


```
scp apc_hw03_aos_xxx.bin apc@158.205.6.185:apc_hw03_aos_xxx.bin
```
3. Use a similar SCP command line, with the name of the application module, to transfer the second firmware module to the InRow RD.

How to upgrade multiple InRow RDs

Export configuration settings. You can create batch files and use an APC utility to retrieve configuration settings from multiple InRow RDs and export them to other InRow RDs.



See *Release Notes: ini File Utility, version 1.0*, available on the *Utility CD*.

Use FTP or SCP to upgrade multiple InRow RDs. To upgrade multiple InRow RDs using an FTP client or using SCP, write a script which automatically performs the procedure.

Use XMODEM to upgrade one InRow RD

To upgrade the firmware for one InRow RD that is not on the network, you must extract the firmware files from the firmware upgrade tool (see “To extract the firmware files:” on page 60).

To transfer the files:

1. Obtain the individual firmware modules (the AOS module and the application module) from www.apc.com/tools/download.
2. Select a serial port at the local computer and disable any service that uses the port.
3. Connect the provided configuration cable to the selected port and to the serial port at the InRow RD.
4. Run a terminal program such as HyperTerminal, and configure the selected port for 2400 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
5. Press ENTER to display the **User Name** prompt.
6. Enter the Administrator user name and password (**apc** by default for both).
7. From the **Control Console** menu, select **System**, then **Tools**, then **File Transfer**, then **XMODEM**; and type **Yes** at the prompt to continue.
8. Select a baud rate, change the terminal program’s baud rate to match your selection, and press ENTER. A higher baud rate causes faster upgrades.
9. From the terminal program’s menu, select the binary AOS file to transfer using XMODEM-CRC. After the XMODEM transfer is complete, set the baud rate to 2400. The InRow RD automatically restarts.
10. Repeat step 4 through step 9 to install the application module. In step 9, use the application module file name, not the AOS module file name.
11. For information about the format used for firmware modules, see “Firmware files (InRow RD)” on page 59.

Verifying Upgrades and Updates

Verify the success or failure of the transfer

To verify whether a firmware upgrade succeeded, use the **Network** menu in the control console and select the **FTP Server** option to view **Last Transfer Result**, or use an SNMP GET to the **mfiletransferStatusLastTransferResult** OID.

Last Transfer Result codes

Code	Description
Successful	The file transfer was successful.
Result not available	There are no recorded file transfers.
Failure unknown	The last file transfer failed for an unknown reason.
Server inaccessible	The TFTP or FTP server could not be found on the network.
Server access denied	The TFTP or FTP server denied access.
File not found	The TFTP or FTP server could not locate the requested file.
File type unknown	The file was downloaded but the contents were not recognized.
File corrupt	The file was downloaded but at least one Cyclical Redundancy Check (CRC) failed.

Verify the version numbers of installed firmware.

Use the Web interface to verify the versions of the upgraded firmware modules by selecting the **Administration** tab, **General** on the top menu bar, and **About** on the left navigation menu, or use an SNMP GET to the MIB II **sysDescr** OID.

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