Operation and Maintenance Manual
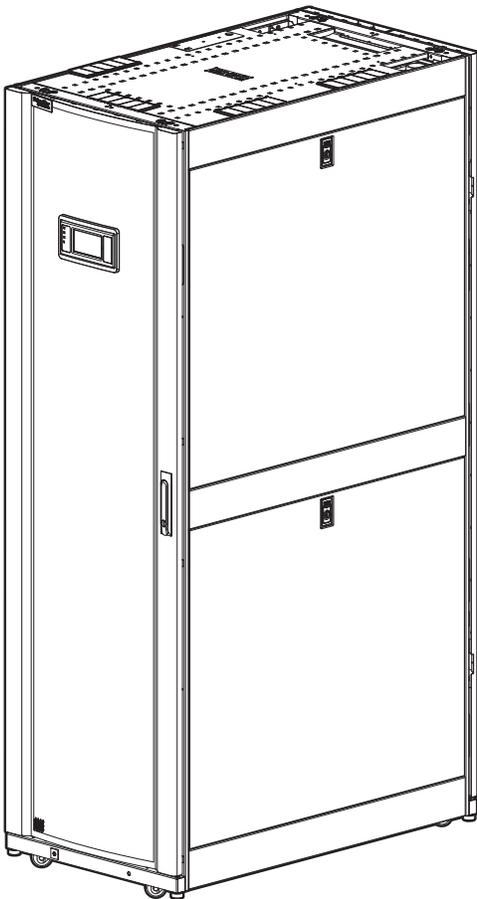
InRow® Chilled Water Air Conditioners

InRow® RC

ACRC600, ACRC601, ACRC602, ACRC600P, ACRC601P, ACRC602P

Schneider Electric

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Safety

Important Safety Information

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

Safety Notices During Operation

Read and adhere to the following important safety considerations when working with this equipment.

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

• Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.

• This equipment must be installed and serviced by qualified personnel only.

• Turn off all power supplying this equipment before working on or inside the equipment.

• Always use a properly rated voltage sensing device to confirm power is off.

• Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

HAZARD FROM MOVING PARTS

Keep hands, clothing, and jewelry away from moving parts. Check the equipment for foreign objects before closing the doors and starting the equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

HAZARD TO EQUIPMENT OR PERSONNEL

All work must be performed by Schneider Electric qualified personnel.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

HAZARD OF EQUIPMENT FALLING OVER

• Use two or more persons at all times to move or turn this equipment.

• Always push, pull, or turn while facing the front and rear of this equipment. Never push, pull, or turn while facing the sides of this equipment.

• Slowly move this equipment across uneven surfaces or door thresholds.

• Lower leveling feet to floor when this equipment is at rest.

• Lower leveling feet and attach joining brackets to adjacent racks when this equipment is in final position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION
HAZARD TO EQUIPMENT OR PERSONNEL
Ensure that all spare parts and tools are removed from the equipment before operating it.
Failure to follow these instructions can result in injury or equipment damage.

General Information

Overview

Save these instructions

This manual contains important instructions that must be followed during installation, operation, and maintenance of the cooling unit.

Cross-reference symbol used in this manual

See another section of this document or another document for more information on this subject.

Manual updates

Check for updates to this manual on the Schneider Electric Web site, **www.schneider-electric.com/support**. Select the **Download Documents and Software** link under the **Support** tab and enter the manual part number or SKU for your equipment in the search field. See the back cover of this manual for the part number.

Equipment Disposal

Waste Electrical and Electronic Equipment (WEEE) disposal

Schneider Electric products comply with international directives on the Restriction of Hazardous Substances (RoHS) in electronic and electrical equipment and the disposal of Waste Electrical and Electronic Equipment (WEEE). Dispose of any waste electronic or electrical equipment with the appropriate recycling center. Contact Schneider Electric for assistance.

Commissioning

After installation, verify that all components are working properly and that the equipment is ready to begin operation.

Inspection Checklists

Initial inspection checklist

⚠ WARNING
DAMAGE TO EQUIPMENT OR PERSONNEL
Do not run service utilities in front of the fan outlet.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The initial inspection ensures that the equipment has been properly installed. The location of the cooling unit has been properly prepared and the cooling unit is free of damage.

NOTE: The vapor barrier minimizes moisture infiltration. Without a vapor barrier, it will be difficult to maintain the humidity in the room. Do not introduce unconditioned outside air into the space.

Ensure that:

- ❏ The installation procedure is complete according to the installation manual.
- ❏ The walls, floor, and ceiling of the room where the cooling unit is located are sealed with a vapor barrier.
- ❏ There is no evidence of damage to the cooling unit.
- ❏ The cooling unit is level and joined to the adjacent racks.
- ❏ The cooling unit is not installed at the open end of a row.
- ❏ The clearance around the equipment is in accordance with local and national codes and regulations as well as the installation manual.

Electrical inspection checklist

> ## ⚡ ⚠ DANGER
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
>
> • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
> • This equipment must be installed and serviced by qualified personnel only.
> • Turn off all power supplying this equipment before working on or inside the equipment.
> • Always use a properly rated voltage sensing device to confirm power is off.
> • Replace all devices, doors, and covers before turning on power to this equipment.
>
> **Failure to follow these instructions will result in death or serious injury.**

> ## ⚠ ⚠ WARNING
>
> **ELECTRICAL HAZARD**
>
> • Electrical service must conform to local and national electrical codes and regulations.
> • The equipment must be grounded.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

The electrical inspection verifies that all electrical connections are secure and correct and that the equipment is properly grounded.

Ensure that the:

❏	Incoming voltages match the phase and voltage listing on the nameplate.
❏	Electrical wiring complies with local and national codes and regulations.
❏	Equipment is properly grounded.
❏	Front and rear doors are properly grounded.
❏	The rack temperature sensors are installed correctly for InRow and CACS modes.
❏	The optional rope water detection device is installed properly.
❏	The temperature and humidity sensors are connected correctly.
❏	Electrical connections are tight, including contactors, terminal blocks, controllers, switches, relays, auxiliary devices, and field connections.
❏	Circuit breakers are properly connected and securely attached to the DIN rail.

Mechanical inspection checklist

<table>
<tr><td colspan="2" align="center">⚠ CAUTION</td></tr>
<tr><td colspan="2">HAZARD TO EQUIPMENT OR PERSONNEL

• The equipment is shipped from the factory with a nitrogen holding charge. Remove the nitrogen holding charge using the service ports located on the internal refrigerant piping.
 Improperly installed piping may result in improper operation and possible damage to the cooling unit or surrounding equipment.

Failure to follow these instructions can result in injury or equipment damage.</td></tr>
</table>

The mechanical inspection verifies that all mechanical components and connections are secure and tight and ready for start-up. The inspection ensures that field piping is properly installed to promote oil return to the compressor.

Ensure that:

❏ Condensate drain line is at least the size of the drain connection.

❏ Mechanical connections are tight.

❏ Fans are turning freely and the blades are not distorted or bent.

❏ Pipe fittings are tight.

❏ Air is bled from the water system. If air remains in the system, bleed it out now.

❏ Supply chilled water temperature is recorded.

❏ Chilled water flow is correct based on the performance requirements of the cooling unit.

❏ Field-installed traps and piping are in accordance with the installation manual. Strainers are in place in the chilled water supply loop. Proper piping practices have been followed.

❏ Piping is adequately supported and isolated when necessary.

❏ Field-installed service valves are open.

❏ Water outlet temperature sensor is positioned correctly. For top-connected cooling units, the wire with only a green wire tie is positioned in connector J23. For bottom-connected cooling units, the wire with both green and white wire ties is positioned in connector J23.

❏ Piping in the building and on the roof is properly insulated.

❏ Covers and guards are in place.

Display interface inspection checklist

The display interface inspection verifies that the sensors and internal communication links are installed properly. Check that the cooling unit is connected to the other cooling units in the room if you are using cooling group controls.

Ensure that:

❏   An A-Link bus is connected to each cooling unit and a terminator is plugged into all unused A-Link connectors.

❏   The input contacts and output relays are connected correctly.

❏   The building management system is connected correctly and a terminator is wired into the final InRow RC unit between Modbus D0 and Modbus D1.

❏   The network port is connected correctly and an IP address has been assigned to the equipment.

Start-up inspection checklist

The start-up inspection ensures that the equipment is operating properly after the initial start-up. This inspection verifies that all modes of operation are working correctly and that the cooling unit is ready for normal operation..

While the equipment is operating, ensure that:

❏   The cooling unit is free from malfunctions, including chilled water leaks, unusual vibrations, or other irregularities, in each mode of operation.

❏   The current draw of fan motors and transformers for the cooling operation is within the ratings of the respective circuit breakers.
• Record the current at the main power connection of the main circuit breaker.
• Record all current draws on the load side of any circuit breakers used for each device.
• Compare the circuit breaker setting for each device to the actual current measured and the full load amps of the device to verify that the current draws are acceptable.

❏   Feed B can supply power to all functions in the equipment.

❏   The cool cycle engages.

❏   The cool, reheat, dehumidification, and humidification cycles engage. (ACRC60xP units only)

❏   The correct water outlet temperature sensor is positioned in connector J23.

❏   Air filters are clean and free of debris. Replace air filters as needed.

❏   The clogged filter alarm is operating properly.
Cover 1/3 of the filter area to initiate the alarm.

Final inspection checklist

The final inspection verifies that the system is clean, the installed options work properly, and the start-up form is sent to Schneider Electric.

Ensure that:

❏	The unit is clean and free of loose hardware and debris.
❏	Internal protective covers and hardware are installed.
❏	Hinged doors and hardware are installed and secure.
❏	There are no active alarms.
❏	Unit documentation has been given to the customer.
❏	Packaging materials are disposed of properly.
❏	The start-up form was completed and sent to Schneider Electric.

Operation

Display Interface
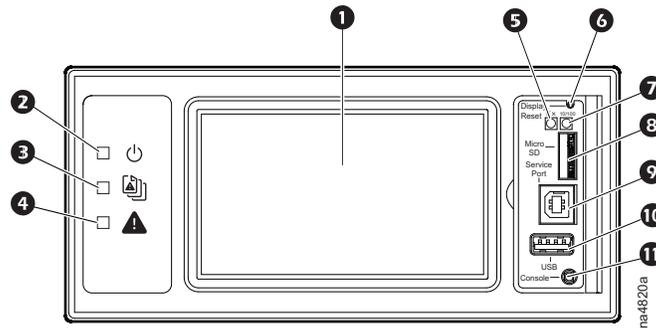
Item	Description	Function
❶	LCD display	4.3-in. touch-screen color display.
❷	Power LED	The cooling unit is powered when the LED is illuminated. Unit firmware is updating when LED is blinking.
❸	Check Log LED	When this LED is illuminated, a new entry has been made to the event log.
❹	Alarm LED	Displays current alarm condition of unit.
❺	Status LED	Displays current network management card status.
❻	Display Reset button	Resets the display microprocessor. This has no effect on the air conditioner controller.
❼	Link-RX/TX (10/100) LED	Displays current network link status.
❽	Micro SD card slot	Memory card expansion slot.
❾	Service port	USB-B port used only by service personnel.
❿	USB-A port	Supports firmware upgrades.
⓫	Serial Configuration port	Connects the display to a local computer to configure initial network settings or access the command line interface (CLI).

Alarm LED

This LED indicates active alarms on the display.

Condition	Description
Off	No Alarms
Solid yellow	Warning Alarm
Solid red	Critical Alarm

Status LED

This LED indicates the status of the display.

Condition	Description
Off	One of the following situations exist: • The display is not receiving input power. • The display is not operating properly. It may need to be repaired or replaced. Contact Schneider Electric Customer Support.
Solid green	The display has valid TCP/IP settings.
Solid orange	A hardware malfunction has been detected in the display. Contact Schneider Electric Customer Support.
Flashing green	The display does not have valid TCP/IP settings.
Flashing orange	The display is making BOOTP requests.
Alternately flashing green and orange	If the LED is flashing slowly, the display is making DHCP requests. If the LED is flashing rapidly, the display is starting up.

Link-RX/TX (10/100) LED

This LED indicates the network status of the display.

Condition	Description
Off	One or more of the following situations exist: • The display is not receiving input power. • The cable or device that connects the cooling unit to the network is disconnected or not functioning properly. • The display itself is not operating properly. It may need to be repaired or replaced. Contact Schneider Electric Customer Support.
Solid green	The display is connected to a network operating at 10 megabits per second (Mbps).
Solid orange	The display is connected to a network operating at 100 Mbps.
Flashing green	The display is receiving or transmitting at 10 Mbps.
Flashing orange	The display is receiving data packets at 100 Mbps.

Using the Display

Overview screen

After start-up, the display shows an overview screen containing basic status information. Press **Home** to toggle between the main menu and overview screen. After a period of inactivity, the display also reverts back to the overview screen.

HOME

ALARMS

InRow RC Precision
Operating Mode: On

Unit Maximum Rack Inlet
Temperature
21.1 °C

Group Maximum Rack Inlet
Temperature
21.2 °C

Supply Air Temperature
13.1 °C

Unit Output
3.1 kW 1170.4 L/s

Group Output
3.1 kW 1170.4 L/s

na5070a
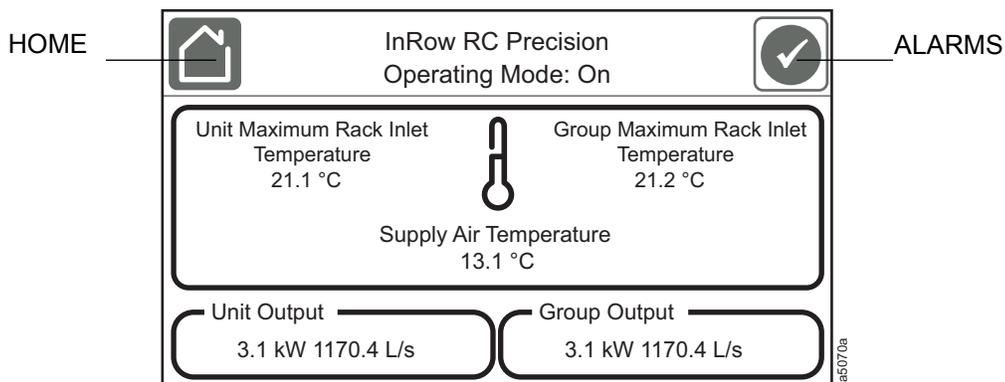
NOTE: To maintain cleanliness and optimal performance of the touch-screen surface, it is recommended to use a soft-tip stylus when using the display. Never use sharp or hard-pointed objects on the touch-screen surface.

Main menu screen

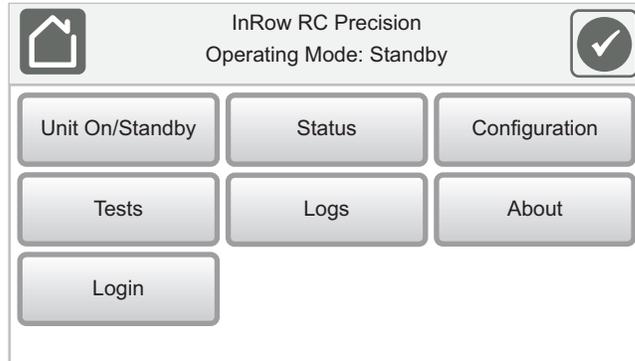At any time during operation, press **Home** to return to the main menu. To view active alarms, press **Alarms**. The **Alarms** image changes based on the current state of the display.

See "Alarm messages and suggested actions" on page 33 for more information on the **Alarms** state images.

Main menu options appear on the display as shown below.

Display controls

To view a sub-menu, select an option from the main menu. Continue this process until the appropriate menu is active.

During navigation, the current file path is displayed at the top of the screen. Up to three menu headers can be displayed at one time. Clicking on any of the headers reverts the display to the specified menu.

Menus with multiple pages use arrows to move between pages. **Forward** and **Back** advance one page at a time while **First** and **Last** move directly to the first or last page within the menu. Once changes have been made within a menu, press **OK** to confirm changes or **ESC** to cancel.
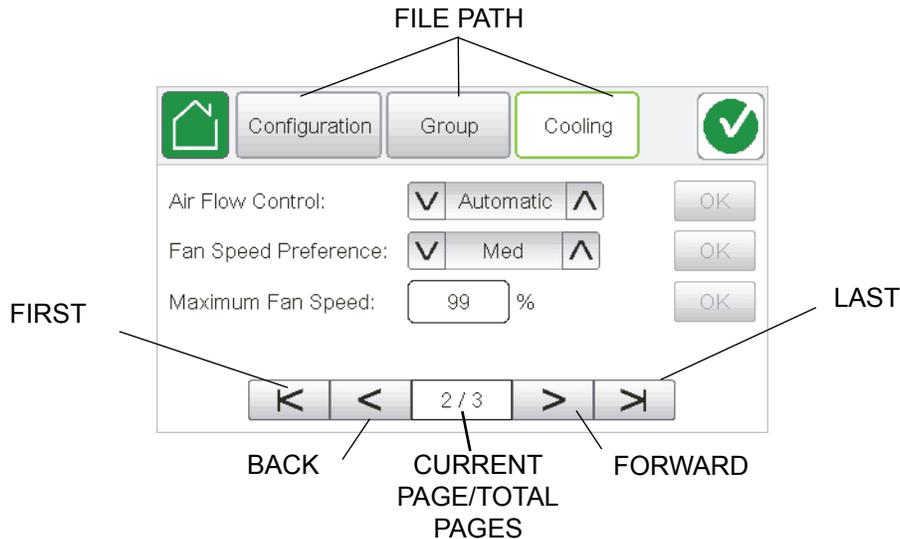
Using the path statement

Select the main- and sub-menu options specified in the path statement to view or configure a setting. The path statement lists the main- and sub-menu options you select to navigate to the setting you want to view or modify. The parts of the path statement are defined in the following example:

Path: Main > Status > Unit Overview

Main > Your starting point is the main menu.

Status > Select this option from the main menu.

Unit Overview > Select this option from the sub-menu.

Subsequent options are listed and defined under the path statement.

Calibrating the display

Path: Main > Tests > Display Calibration > Calibrate

Use this screen to calibrate the touch screen by touching the center of the box that appears on the screen. When you are satisfied with the calibration, let the timer run down to zero.

Password entry

The InRow RC cooling unit display requires password verification before settings can be altered on the unit. You can log in from the main menu by selecting **Login**. While it is not required to log in to view unit configurations, it is required to make any changes. If the password was not entered from the **Login** screen on the main menu, you will be prompted to enter the password when attempting to change a setting. The unit default password is `1234`.

See "Add a new user or edit an existing user" on page 26 for information on editing users and passwords.

The **Home** button visually changes to signify that a user is currently logged in.

Symbol	Description
	Home when the system is locked.
	Home when the system has been unlocked by a user.

Once the password is entered, user login remains active until the period of inactivity exceeds the **Auto Logoff** setting.

See "Screen visibility and audible tones" on page 26.

Start the cooling unit

Path: Main > Unit On/Standby

1. Select **On** for **On/Standby.**
   If not logged in and **Protect On/Standby** is activated, a prompt will appear to enter your password.
   NOTE: Protect On/Standby can be enabled under **Configuration > Unit > Security**. The default setting is **Disable**.

2. Enter your password if required.
   The **Operating Mode** will now display **On**.

The cooling unit will run according to the configured settings.

NOTE: On/Standby only affects the local cooling unit. You must set the **On/Standby** option for each cooling unit in the cooling group.

NOTE: The **Standby Input** must also be inactive in order to leave the **Standby** state.

If the **Protect On/Standby** option has been selected, you will be prompted to enter the device password before a change can be made to the **On/Standby** setting.

Stop the cooling unit

<div style="border:1px solid black">

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The Standby option does not remove power from the cooling unit. You must disconnect power at the mains to remove power from the cooling unit.

Failure to follow these instructions will result in death or serious injury.

</div>

Path: Main > On/Standby

1. Select **Standby** for **On/Standby**.
   If you are not logged in and **Protect On/Standby** is activated, a prompt will appear for you to enter your password.

2. The **Operating Mode** will now display **Standby**.
   NOTE: The unit can also be stopped via an external signal connected to the **Standby Input**.

General Configuration

Cooling Unit Configuration

The cooling group configuration options are set during the commissioning of the cooling units in the cooling group.

NOTE: Changing the settings incorrectly can cause malfunctions to your cooling unit. Only qualified service personnel should make changes to these settings.

NOTE: Displayed settings may vary based on model.

Thresholds

Thresholds can be set to activate alarms to alert you to violations when the threshold is exceeded. The following thresholds can be set on the **Main > Configuration > Unit > Cooling** and **Main > Configuration > Unit > Humidity** screens:

- Rack Inlet High Temperature Threshold
- Supply Air High Temperature Threshold
- Return Air High Temperature Threshold
- Inlet Fluid High Temperature Threshold
- Return Humidity High Threshold
- Return Humidity Low Threshold

Configure the unit

Path: Main > Configuration > Unit > Cooling

- **Rack Inlet High Temperature Threshold:** The high temperature threshold for air entering the racks. If the temperature exceeds the threshold, an alarm will occur. (0–100°C (32–212°F))
- **Supply Air High Temperature Threshold:** The high temperature threshold for the supply air as averaged by the upper and lower supply air temperature sensors. If the temperature exceeds this threshold, an alarm will occur. (0–100°C (32–212°F))
- **Return Air High Temperature Threshold:** The high temperature threshold for the air entering the cooling unit. If the temperature exceeds this threshold, an alarm will occur. (0–100°C (32–212°F))
- **Inlet Fluid High Temperature Threshold:** The high temperature threshold for chilled water entering the cooling unit. (0–40°C (32–104°F))
- **Bypass Valve Position:** Select the setting that matches the physical status of the bypass valve (**Open** or **Closed**).
- **Startup Delay:** Enter a value for the start-up delay in seconds. The start-up delay begins when the cooling unit is started and initialized. The cooling unit cannot begin operation until this delay expires. Use the start-up delay to restart equipment sequentially in your room after a scheduled downtime or a power outage. (0–999)
- **Cool Capacity:** Set the cooling capacity of the unit.
  - **Automatic:** The cooling unit automatically controls its output under normal (default) conditions.
  - **Maximum:** The cooling unit runs at full capacity.
    NOTE: Normal checks for cooling failures are disabled in **Maximum** mode.
- **Idle on Leak Detect**: When set to **Yes**, the cooling unit will enter idle mode if a **Leak Detected Critical** alarm activates. Set to **No** to disable the cooling unit from entering idle mode if a leak is detected.

    NOTE: The leak sensor (AP9326) is optional.

NOTE: There are seven alarms that will cause the cooling unit to enter idle mode:

- Leak Detected Critical (when **Idle On Leak Detect** is set to **Yes**)
- Condensate Pan Full Shutdown
- Cooling Failure
- Fan 1 Error Detected
- Fan 2 Error Detected
- Fan 3 Error Detected
- Entering Chilled Water Temperature Sensor Error

- **Idle on Cool Fail:** Set the cooling unit to enter idle mode if the cooling unit is unable to supply conditioned air. Select **Yes** to enable the cooling unit to enter idle mode when unable to supply conditioned air. Select **No** to disable the cooling unit from entering idle mode if a cooling failure is detected.

Path: Main > Configuration > Unit > Humidity

- **Return Humidity High Threshold:** The relative humidity at which the high threshold alarm occurs. (35–90%RH)
- **Return Humidity Low Threshold:** The relative humidity at which the low threshold alarm occurs. (20–50%RH)
- **Humidify Enable: Enable** or **Disable** humidification.
- **Humidifier Control:** Select **Auto** to run according to settings. Select **Drain** to manually drain the humidifier canister.
- **Dehumidify Enable: Enable** or **Disable** dehumidification.

Path: Main > Configuration > Unit > Reheat

- **Reheat Enable: Enable** or **Disable** the reheat function.
- **Heat Assist Enable:** When **Enable** is selected, this setting allows use of heat when load is less than approximately 10 kW.

Power supply

Path: Main > Configuration > Unit > Power

Each cooling unit is equipped with the ability to have dual power feeds.

- **Power Source:** Select **Single** for a single power and **Dual** for a dual power supply.
- **Secondary Power Feed Capacity:** Select whether the secondary power supply will provide **Full Power** or **Reduced Power**.

Contacts

Each cooling unit supports a user-defined input contact and a user-defined normal or output contact. Each contact monitors a sensor and responds to changes in the state of the sensor (open or closed). Output contacts can map internal alarms and events to outside devices.

Path: Main > Configuration > Unit > Input/Output

- **Standby Input Normal State:** Set the normal state of the contact (**Open** or **Closed**). The cooling unit changes its operating mode to **Standby** when the actual state differs from the normal state.
- **Standby Input State:** Indicates the actual state of the input contact (**Open** or **Closed**). A cooling unit is **On** when the state is normal and in **Standby** when the state is not normal.
- **Output Contact Normal State:** Set the normal state of the contact (**Open** or **Closed**). If the state of an alarm or event mapped to this contact changes from the normal state, the contact also changes state.
- **Output State:** Indicates the actual state of the output contact (**Open** or **Closed**). An alarm will cause the output contact to change from the normal state.
- **Output Source:** Define the type of output source (alarm) that causes the output to change from its normal state.
  - Any Alarm
  - Only Critical Alarms

Identify the cooling unit

Path: Main > Configuration > Unit > Identity

- **Unit ID**: Assign a unique identification number to this cooling unit. (1–12)

Cooling Group Configuration

The cooling group configuration settings determine which components are available and how the cooling group should operate.

NOTE: All changes to settings must be performed by qualified personnel

Configure the cooling group

Path: Main > Configuration > Group > Composition

The **Composition** menu contains settings that identify the number of cooling units installed in this cooling group and the physical arrangement of those cooling units.

- **Number of Units in Group:** The number of cooling units in this cooling group. Up to 12 cooling units can be joined together to work as a single cooling group.
- **Altitude:** Set the altitude (in feet or meters) of the unit above sea level. This number is used to estimate the density of air and is a factor in pressure measurement.

Configure Modbus

Use the **Modbus** menu to set up communications between the cooling unit and the building management system. Select to enable serial Modbus or TCP communication protocol.

Path: Main > Configuration > Modbus > Serial

- **Enable Serial Modbus:** Select to enable Modbus serial communication protocol.
- **Address:** Each Modbus device must have a unique target identification number. Enter a unique number for this cooling unit (1–247).
- **Baud Rate:** Set to either 9600 bps or 19200 bps.
- **Parity**: Select **Even**, **Odd**, or **None**.
  NOTE: If you select **Even** or **Odd** parity, then select 1 stop bit on the host computer. If you select **None,** then select two stop bits on the host computer.

Path: Main > Configuration > Modbus > TCP

- **Enable Modbus TCP:** Select to enable Modbus TCP.
- **Port:** Enter a port. The default port is 502. For additional security, enter a port between 5000 and 32768 (TCP connection only).
- **Restore Port to Default:** Press to restore the **Port** to default settings (502).

Control the Environment

The primary function of the cooling unit is to cool air from the hot aisle and deliver it to the cold aisle at the temperature setpoint. The control strategies employed by the cooling unit depend upon the deployment strategy of the cooling group.

In an InRow environment, the cooling unit supplies constant-temperature supply air to the common cold aisle. The fan speed is modulated to ensure that the desired volume of air reaches the IT equipment. The fan speed is determined by the difference between the cooling setpoint and the maximum rack air inlet temperature.

In a HACS or RACS environment, the cooling unit neutralizes the heat accumulated in the common hot aisle and expels it back into the surrounding environmental space while maintaining the desired temperature in the cold aisle.

In a CACS environment, the cooling unit supplies constant temperature supply air to the enclosed cold aisle. The fan speed is modulated to ensure that the required volume of air reaches the IT equipment.

How the modes of operation work

Path: Main > Configuration > Service > Configuration

Cool: Cooling control is varied based on configuration:

- **In-Row:** The equipment maintains the supply air temperature setpoint by regulating the flow of chilled water through the cooling coil. The evaporator fan speed is controlled by comparing the rack inlet temperature to the cooling setpoint. As the rack temperature increases compared to the cooling setpoint, the fans increase output to maintain the setpoint. As rack temperature decreases compared to the cooling setpoint, the fans decrease output to maintain the setpoint.

- **RACS/HACS:** The supply air setpoint is maintained the same way as with the InRow configuration. When Active Flow Controller (AFC) devices are present, the controller utilizes differential pressure data supplied by the AFC(s) to supply the correct amount of airflow to the IT load. When AFC devices are not present the fan speed is controlled by the fan speed preference setting. The fan speed can be selected based on the temperature differential across the cooling unit. As actual supply and return temperatures deviate from the fan speed preference setting, the fan speed increases to bring the temperature difference back down to the setpoint or decreases fan output to increase the unit temperature differential.

- **CACS:** The equipment maintains the supply air temperature set point by regulating the flow of chilled water through the cooling coil. When AFC devices are present, the controller utilizes differential pressure data supplied by the AFC(s) to supply the correct amount of airflow to the IT load. When AFC devices are not present the evaporator fan speed is controlled by comparing the rack inlet temperature to the cooling set point. As the rack temperature increases compared to the cooling set point the fans increase output to maintain the set point. As rack temperature decreases compared to the cooling set point the fans decrease output to maintain the setpoint.

Humidify (ACRC60xP units only): The equipment contains an electric humidifier that injects steam into the air if the humidity is below the humidify setpoint. The controls use dew point as the process variable and select different setpoints based on configuration.

- **In-Row/CACS:** The humidification setpoint and the cooling setpoint are used to calculate the dew point setpoint. A return air dew point is calculated from the return air temperature and humidity. The humidifier output is generated using a proportional controller using the return air dew point as the process variable. The proportionality constant is user programmable.

- **RACS/HACS:** These configurations use the humidification setpoint and the supply air setpoint to calculate the dew point setpoint. A return air dew point is calculated from the return air temperature and humidity. The humidifier output is generated using a proportional controller using the return air dew point as the process variable. The proportionality constant is user programmable.

Dehumidify (ACRC60xP units only): The equipment removes humidity from the air passing through the cooling unit. A dehumidification demand is created when the return dew point temperature is greater than the dehumidification dew point setpoint plus a dead band and the spare fan capacity is less than or equal to 80%. The dehumidification dew point setpoint is calculated using the user configurable dehumidifying setpoint %RH and either the cooling set point temperature for InRow/CACS strategy or the **Supply Air Setpoint** temperature for HACS/RACS strategy. The dehumidification mode of operation uses the heaters in stages to control the supply air temperature controller when the **Reheat** and **Heat Assist** are enabled. Otherwise, the dehumidification mode will use a 16.7°C (62.0°F) dew point temperature setpoint for the supply air temperature controller. The evaporator fans decrease to 40% output in InRow/CACS strategy when in the dehumidification mode.

Reheat (ACRC60xP units only): The electric heater heats the air passing through the cooling unit when the return air temperature is below the reheat setpoint. The return air temperature may be low while the unit is dehumidifying or if data center equipment is off and the environment is relatively cold. The reheat output is determined by the difference between the reheat setpoint and the cooling unit return air temperature (the reheat output increases as the return air temperature decreases).

The reheat output is managed by stages of 25%, 50%, 75%, and 100% output. The heaters will not engage at fan speeds below 50% output.

Heat Assist (ACRC60xP units only): Enabling heat assist improves low load temperature control as well as dehumidification. Heat assist allows the coils to stay colder without changing the temperature of the output air, assisting dehumidification and providing more stable cooling at a lower heat load.

Fluid Calibration: Runs the cooling unit with the valve fully open and at minimum fan speed. This special mode is typically used to balance the fluid flow in multiple units or in one unit. This mode generates a critical alarm. The cooling unit will take some time to return to normal operation once **Fluid Calibration Active** is turned off.

See **Supply Air Temperature** and **Return Air Temperature** on page 28 for more information.

Percent Glycol: Enter the percentage of glycol in the group. This is used to calculate the amount of energy (in KW) required by the unit.

Setpoints

A setpoint is the target value that a cooling group tries to maintain in the rack. The default setpoints are appropriate for most cooling applications.

Path: Main > Configuration > Group > Cooling

- **Cool Setpoint:** Set the temperature that the cooling group should maintain. The setpoint must be within 18.0–35°C (64.4–95.0°F).
- **Supply Air Setpoint:** The setpoint must be within 15.0–30.2°C (59.0–86.4°F). The **Supply Air Setpoint** will be the required temperature of the air expelled into the surrounding environment.
  NOTE: The **Supply Air** setting is defined by Schneider Electric qualified personnel when the cooling group is commissioned.
- **Air Flow Control:** When **Automatic** is selected, the unit operates based on measured demand.
  – Manual/Automatic
- **Fan Speed Preference:** Set the fan speed preference that will produce the desired temperature difference (DT). Each fan speed provides an approximate DT between the supply air from the cooling unit and the air returned from the rack.

HACS/RACS Mode Fan Speeds	
Speed Range	**Desired Temperature Difference (Automatic Mode)**
Low	16.7°C (30°F)
Med-Low	13.9°C (25°F)
Med	11.1°C (20°F)
Med-High	6.3°C (15°F)
High	5.6°C (10°F)

NOTE: The cooling group will automatically override this fan speed setting and adjust the fan speed to provide optimum cooling for the environment as needed.

- **Maximum Fan Speed:** The maximum fan speed of the group. The default is 100% and is adjustable to 60%.

Path: Main > Configuration > Group > Reheat

- **Reheat Setpoint:** The target value for air leaving the cooling unit. This setting must be at least 1.1°C (2°F) below the **Supply Air Setpoint**. (10.0–18.0°C (50.0–64.4°F))

Path: Main > Configuration > Group > Humidity

The setpoints are the target values that the cooling group tries to maintain in the rack. The default setpoints are appropriate for most cooling applications:

- **Humidify Setpoint:** The target value for the relative humidity of conditioned air, as a percentage. The **Humidify Setpoint** must be at least 5% RH below the **Dehumidify Setpoint**. (20.0–50.0% RH)
- **Humidify Sensitivity Band:** Set the percentage of relative humidity below the **Humidify Setpoint** that will make the humidifier operate at full capacity.
- **Dehumidify Setpoint:** The target value for the relative humidity of conditioned air, as a percentage. The **Humidify Setpoint** must be at least 5% RH below the **Dehumidify Setpoint**. (35.0–80.0% RH)
- **Dehumidify Deadband:** The allowable percentage of relative humidity below the **Dehumidify Setpoint** before dehumidification ceases. (2.0–10.0%)

PID settings

Path: Main > Configuration > Service > PID

The Proportional plus Integral plus Derivative (PID) loop controls the output of the fans.

NOTE: This procedure is to be performed by Schneider Electric qualified personnel only. Improperly set PID controls could result in equipment damage.

- **Cool Gain 'P':** The proportional multiplier (gain) for this mode. The proportional multiplier adjusts for the difference (error) between the measured value and the setpoint.
- **Cool Reset Rate 'I':** The integral multiplier (reset rate) for this mode. The integral multiplier adjusts for error measurement and the amount of time that the error has existed. The integral multiplier adds to or subtracts from the output in small increments to correct for the offset error caused by the proportional contribution.
- **Cool Derivative 'D':** The derivative multiplier (derivative) for this mode. The derivative multiplier adjusts the output for rapid changes in the error, correcting for the rate of change of the error over time.
- **Reheat Gain 'P':** The proportional multiplier (gain) for this mode. The proportional multiplier adjusts for the difference (error) between the measured value and the setpoint.
- **Reheat Reset Rate 'I':** The integral multiplier (reset rate) for this mode. The integral multiplier adjusts for error measurement and the amount of time that the error has existed. The integral multiplier adds to or subtracts from the output in small increments to correct for the offset error caused by the proportional contribution.

- **Reheat Derivative 'D':** The derivative multiplier (derivative) for this mode. The derivative multiplier adjusts the output for rapid changes in the error, correcting for the rate of change of the error over time.
- **Dehumidify Gain 'P':** The proportional multiplier (gain) for this mode. The proportional multiplier adjusts for the difference (error) between the measured value and the setpoint.
- **Dehumidify Reset Rate 'I':** The integral multiplier (reset rate) for this mode. The integral multiplier adjusts for error measurement and the amount of time that the error has existed. The integral multiplier adds to or subtracts from the output in small increments to correct for the offset error caused by the proportional contribution.
- **Dehumidify Derivative 'D':** The derivative multiplier (derivative) for this mode. The derivative multiplier adjusts the output for rapid changes in the error, correcting for the rate of change of the error over time.
- **Reset PID Coefficients to Factory Default:** Reset the coefficients to the default settings.
- **Reset Reheat PID Coefficients:** Select **Yes** or **No** to reset the reheat PID coefficients to default settings.

Tune the PID loop

Tune the PID loop to optimize the performance of the cooling group.

NOTE: This procedure is to be performed by Schneider Electric qualified personnel only. The PID loop must be tuned after the equipment in the room is installed and running. The loop should be tuned periodically to account for changes in the room load.

1. Adjust the integral and derivative constants to zero and the proportional constant to 1.0.
2. Set the temperature setpoint value and start the cooling group.
3. When the temperature reaches a stable value, increase the proportional constant by 0.5. If the temperature does not respond to this change, adjust the setpoint.
4. Repeat step 3 until the temperature value starts to oscillate and the peak amplitude of the oscillations is constant.
5. Note the time, in minutes, between the peaks of the oscillations. This is the Ultimate Period, P_U.
6. Note the value of the proportional constant. This is the Ultimate Gain, G_U.
7. Compute the PID constants using the table below. Use the equations for that control method in the row to compute the values for each constant.
8. Set each constant according to these calculations.

Control Method	Proportional	Integral	Derivative
P	$0.5 * G_U$	–	–
P + I	$0.45 * G_U$	$0.54 * G_U / P_U$	–
P + I + D	$0.6 * G_U$	$1.2 * G_U / P_U$	$0.075 * G_U * P_U$

You may need to further tune the PID loop in the following ways to account for changes in the room load:

Loop Behavior	PID Tuning Correction
Slow response to temperature changes	Increase the proportional multiplier or increase the derivative multiplier.
Overcooling/undercooling after changes in the room load or changes in setpoint	Increase the derivative or the proportional multiplier.
Environmental temperature never reaches the setpoint	Increase the integral multiplier.
Overcooling/undercooling on constant room load	Decrease the integral multiplier.

Active Flow Controller (AFC) settings

Path: Main > Configuration > Service > AFC

- **Number of Active Flow Controllers:** Set the number of AFC units in the group (0 to 5).
- **Active Flow Control Bias:** This setting is used to change the bias of the controller by adjusting the contained aisle pressure threshold. **Zero** is the default setting. Only qualified service personnel can make changes to these settings.
  - Hot Aisle Containment (HACS)
    - If the cooling units seem to be under-cooling, select **Negative** or **Slightly Negative** to adjust the aisle pressure for additional cooling.
    - If the cooling units seem to be over-cooling, select **Positive** or **Slightly Positive** to adjust the aisle pressure for less cooling.
  - Cold Aisle Containment (CACS)
    - If the cooling units seem to be under-cooling, select **Positive** or **Slightly Positive** to adjust the aisle pressure for additional cooling.
    - If the cooling units seem to be over-cooling, select **Negative** or **Slightly Negative** to adjust the aisle pressure for less cooling.

Setting	Blue LED – HACS Red LED – CACS	Setpoint Green LED	Red LED – HACS Blue LED – CACS
Positive	< –0.008 in. ±3%	0.004 ±0.0004 in.	> 0.016 in. ±3%
Slightly Positive	< –0.010 in. ±3%	0.002 ±0.0004 in.	> 0.014 in. ±3%
Zero	< –0.012 in. ±3%	0.000 ±0.0004 in.	> 0.012 in. ±3%
Slightly Negative	< –0.014 in. ±3%	–0.002 ±0.0004 in.	> 0.010 in. ±3%
Negative	< –0.016 in. ±3%	–0.004 ±0.0004 in.	> 0.008 in. ±3%

- **Active Flow Control Lamp Test:** When set to **On**, the Active Flow Controller(s) LEDs will cycle through a red, green, and blue illumination pattern (not on unit).

Run hours

The cooling unit records the number of hours each of its components has operated. When a component is replaced, use the **Reset** option to reset the run hours for the displayed component to zero.

Path: Main > Configuration > Service > Run Hours

- Evap Fan 1 Run Hrs Reset
- Evap Fan 2 Run Hrs Reset
- Evap Fan 3 Run Hrs Reset
- Air Filter Run Hours Reset
- Condensate Pump Run Hours Reset
- Humidifier Run Hours Reset
- Heater 1 Run Hrs Reset
- Heater 2 Run Hrs Reset
- Heater 3 Run Hrs Reset
- Unit Run Hours Reset

Service intervals

Path: Main > Configuration > Unit > Alarms

The service interval depends on environmental cleanliness. Each component interval setting has an alarm. If enabled, the alarm will sound when the component interval has elapsed. The alarm is cleared by selecting **Main > Status > Active Alarms > Clear Alarms**. Set the number of weeks to service the following:

- **Air Filter Service Interval:** The default is 18 weeks.

- **Heater Service Alarm Interval:** The default is 52 weeks.

- **Humidifier Service Alarm Interval:** The default is 26 weeks.

- **Fans Service Alarm Interval:** The default is 52 weeks.

- **Condensate Pump Service Alarm Interval:** The default is 52 weeks.
  NOTE: The Air Filter interval alarm is enabled by default. The condensate pump, fan, and compressor interval alarms are disabled by default.

Display

The **Display** menus set the display interface settings, including time and date, units, passwords, and time-out. You can also adjust the contrast and sound settings.

Add a new user or edit an existing user

Path: Main > Configuration > Display > Security

1. Select **Add User** to add a new user or select **Edit User** to edit an existing user of the system.
2. In the **Name** field, enter the name of the user.
3. In the **Pin** field, enter a pin code for the user.
4. In the **Confirm Pin** field, re-enter the pin code of the user.
5. Press **OK** to save your settings.

Delete a user

Path: Main > Configuration > Display > Security > Delete User

1. Browse to the user that you wish to delete using the up and down arrows and press **OK**.
2. Press **Yes** to confirm deletion of an existing user of the system.

Language, date, time, and temperature

Path: Main > Configuration > Display > Preferences

- **Language:** Select the correct language for the display.
- **Current Date:** Enter the day, month, and year. The date is displayed on some status screens and is also used in the alarm/event log to date-stamp events.
- **Current Time:** Enter the current time for the display.
- **Temperature:** Select **Metric** or **US Customary** for temperature format.

Screen visibility and audible tones

Path: Main > Configuration > Display > System Settings

- **Alarm Volume:** Select the level of audio at which alarms will sound.
- **Button Volume:** Select the audible tone that sounds every time a button is pressed on the display interface and select the volume at which the tone will be produced. The audible tone can also be set to **Off**.
- **Brightness:** Controls the visibility of the display.
- **Enable Backlight Timeout: Enable** or **Disable** backlight timeout settings.
- **Backlight Timeout:** Turns off unit backlight after a specified amount of time. Timeout range is 1–60 minutes.
- **Intensity:** Select the visibility of the display during backlight timeout.
  - **Off:** The display will remain at the normal intensity level.
  - **Very Low:** The display will be very dim.
  - **Low:** The display will be dim.
  - **Medium:** The display will dim to about half of the normal brightness.
- **Auto Logoff**: Automatically signs current user out of the system after specified amount of time. Options are 1, 5, 10, 30, or 60 minutes.

Network Configuration

The cooling unit is shipped with a Network Management Card (NMC) that enables you to manage the cooling unit over your network. Configure the network settings for the cooling unit Network Management Card from the display interface. The management card allows remote control and configuration of the equipment.

Configure the network

Path: Main > Configuration > Network

- **TCP/IPv4:** Enable IPv4 (if applicable), and select the **Address Mode** (**Manual**, **DCHP**, **BOOTP**).
    - **Manual:** Enter the IP Address, subnet mask, and default gateway.
    - **BootP:** Set the Network Management Card of the cooling unit to obtain its network settings from a BootP server.
    - **DHCP:** Set the Network Management Card of the cooling unit to obtain its network settings from a DHCP server. Select whether or not to require vendor-specific cookies to accept the DHCP address.
- **TCP/IPv6:** Enable IPv6 (if applicable), select **Auto Configuration** or **Manual Configuration**, and select the **DHCPv6 Mode** (**Router Controlled**, **Non-Address Information Only**, **Address and Other Information**, or **Never**). For **Manual Configuration**, enter the **System IP** and **Default Gateway**.
- **Web Access:** Enable Web (if applicable) and select the **Access Mode** (**HTTP** or **HTTPS**) and enter the **Port**.
- **FTP server:** Enable FTP (if applicable) and enter the **Port**.

View Status Readings

The display interface has several options for viewing the status of the cooling unit, the cooling group to which the cooling unit belongs, and the environment being controlled. The status readings for the cooling unit are available under the **Status > Unit Overview** screen, and status readings for the cooling group are available under the **Status > Group Status** screen or on the overview screen.

Overview screen

After start-up, the display shows an overview screen containing basic status information. Press **Home** to toggle between the main menu and overview screen. After a period of inactivity, the display also reverts back to the overview screen.

Cooling unit status

Path: Main > Status > Unit Overview

View information specific to this cooling unit.

- **Operating Mode:** The cooling unit is in one of the following modes:
    - **On:** The cooling unit is cooling.
    - **Standby:** The cooling unit is receiving power but not enabled for cooling.
    - **Idle:** The cooling unit is not operating in normal mode due to active alarms.

 For more information, see" Idle on leak Detect" on page 16.

- **Unit Maximum Rack Inlet Temperature:** The highest reading of the three rack inlet temperature sensors determines the rack temperature.
- **Airflow:** The amount of air required to maintain the setpoint temperature.
- **Fan Speed:** The speed of the fans that regulate the air flow through the cooling unit.
- **Supply Air Temperature:** The average temperature of the air leaving the cooling unit, as measured by the upper and lower supply air temperature sensors.
- **Return Air Temperature:** The temperature of the air entering the cooling unit.
- **Supply Humidity:** The humidity of the air leaving the cooling unit.
- **Return Humidity:** The humidity of the air entering the cooling unit.
- **Cool Output:** The actual cooling output of the cooling unit.
- **Cool Demand:** The amount of cooling that the heat load currently requires.
- **Reheat Output:** The actual percent of maximum reheating output of the cooling unit.
- **Reheat Demand:** The percent of maximum reheating that the rack currently requires.
- **Dehumidify Output:** The actual percent of maximum dehumidification output of the cooling unit.
- **Dehumidify Demand:** The percent of maximum dehumidification that the rack currently requires.
- **Humidify Output:** The actual percent of maximum humidification output of the cooling unit.
- **Humidify Demand:** The percent of maximum humidification that the rack currently requires.

Cooling group status

View information about the cooling group.

- **Cool Setpoint:** The temperature set to maintain the room environment.
- **Supply Air Setpoint:** The desired temperature of the air supplied by the cooling unit.
- **Group Maximum Rack Inlet Temperature:** The highest rack temperature reported by any cooling unit in the cooling group.
- **Group Minimum Rack Inlet Temperature:** The lowest rack temperature reported by any cooling unit in the cooling group.
- **Dew Point Temperature:** The average group dew point temperature.
- **Airflow:** The combined airflow output of the cooling units in the cooling group.
- **Active Flow Control Status:** The conditional state of the containment air pressure differential measurement device (AFC).
  - Under
  - Okay
  - Over
- **Group Cool Demand:** The cooling output required to meet the current heat load of the conditioned space.
- **Group Cool Output:** The combined output of the cooling group.
- **Group Humidify Output:** The actual percent of maximum humidification output of the cooling group.
- **Group Humidify Demand:** The percent of maximum humidification that is currently required.
- **Group Dehumidify Output:** The actual percent of maximum dehumidification output of the cooling group.
- **Group Dehumidify Demand:** The percent of maximum dehumidification that is currently required.
- **Group Reheat Output:** The actual percent of maximum reheating output of the cooling group.
- **Group Reheat Demand:** The percent of maximum reheating that is currently required.

Humidifier

View information about the humidifier.

- **Humidifier Software Release:** The version of humidifier software currently installed on the humidifier controller.

Detailed unit status

The following detailed unit information is available:

- **Entering Fluid Temperature:** The temperature of the chilled water entering the cooling unit.
- **Leaving Fluid Temperature:** The temperature of the chilled water leaving the cooling unit.
- **Active Power Source:** Displays whether the **Primary** or **Secondary** power source is currently active.
- **Fluid Valve Position:** The percent open position of the valve that controls how much chilled water enters the cooling unit.
- **Fluid Flow:** The flow rate of the chilled water through the cooling unit.
- **Standby Input State:** The state of the standby digital input.
- **Output State:** The state of the output contact.
- **Filter Differential Pressure:** The amount of pressure drop through the air filter media.
- **Humidifier Current:** The humidifier working current in amps.
- **Humidifier Water Conductivity:** The conductivity of the supply water of the humidifier.
- **Rack Inlet Temperature 1:** The first rack inlet temperature sensor reading.
- **Rack Inlet Temperature 2:** The second rack inlet temperature sensor reading.
- **Rack Inlet Temperature 3:** The third rack inlet temperature sensor reading.

View run hours

View the run hours for the cooling unit and components.

- Unit Run Hrs
- Humidifier Run Hs
- Condensate Pump Run Hs
- Evap Fan 1 Run Hrs
- Evap Fan 2 Run Hrs
- Evap Fan 3 Run Hrs
- Heater 1 Run Hrs
- Heater 2 Run Hrs
- Heater 3 Run Hrs
- Air Filter Run Hrs
- Air Filter Serviced
  This setting allows the customer to service the air filter and reset the run hours.

About the network

View identifying information about the cooling network parameters. Select IPv4 or IPv6.

Enabled: Identifies whether the specified network is **Enabled** or **Disabled**.

- **Mode:** Identifies how the IP address is obtained.
- **IP Address:** The IP address of the unit.
- **Subnet Mask:** The subnet mask for the sub-network.
- **Default Gateway:** The default gateway address used by the network.

Path: Main > About > Network > IPv6

Press **Addresses** to view all assigned IPv6 addresses.

- **Enabled:** Identifies whether the specified network is **Enabled** or **Disabled**.
- **Auto Configuration:** Displays **Yes** if the IP address is assigned automatically.
- **Manual Configuration:** Displays **Yes** if the IP address is assigned manually.
- **DHCPv6 Mode:** The DHCPv6 mode.
  - **Router Controlled:** When this is selected, DHCPv6 is controlled by the **M** (Managed Address Configuration Flag) and **O** (Other Stateful Configuration Flag) flags received in IPv6 Router Advertisements. When a router advertisement is received, the network management card (NMC) checks whether the **M** and **O** flags are set. The NMC interprets the state of the **M** and **O** "bits" for the following cases:
    - Neither is set: Indicates local network has no DHCPv6 infrastructure. The NMC uses Router Advertisements and/or manual configuration to get non-link-local addresses and other settings.
    - **M**, or **M** and **O** are set: In this situation, full DHCPv6 address configuration occurs. DHCPv6 is used to obtain addresses AND other configuration settings. This is known as DHCPv6 stateful. Once the **M** flag has been received, the DHCPv6 address configuration stays in effect until the interface in question has been closed, even if subsequent Router Advertisement packets are received in which the **M** flag is not set. If an **O** flag is received first, then an **M** flag is received subsequently, the NMC performs full address configuration upon receipt of the **M** flag
    - Only **O** is set: In this situation, the NMC sends a DHCPv6 Info-Request packet. DHCPv6 is used to configure "other" settings (such as location of DNS servers), but NOT to provide addresses. This is known as DHCPv6 stateless.
  - **Address and Other Information:** If this radio box is selected, DHCPv6 is used to obtain addresses AND other configuration settings. This is known as DHCPv6 stateful.
  - **Non-Address and Information Only:** If this radio box is selected, DHCPv6 is used to configure "other" settings (such as locations of DNS servers), but NOT to provide addresses. This is known as DHCPv6 stateless.
  - **Never:** If this radio box is selected, DHCPv6 is NOT to be used for any configuration settings.

About the cooling unit

Path: Main > About > Unit

View identifying information that is helpful when obtaining service:

- **Model Number:** The model number of the unit.
- **Serial Number:** The serial number of the unit.
- **Firmware Revision:** The firmware revision of the unit.
- **Hardware Revision:** The hardware revision of the unit.

Path: Main > About > Identification

- **Name:** The name assigned to the cooling unit.
- **Unique ID:** The unique ID assigned to the cooling unit.
- **Location:** The physical location of the cooling unit.

About the display

Path: Main > About > Display > Device

- **Model Number:** The model number of the user interface.
- **Serial Number:** The serial number of the user interface.
- **Hardware Revision:** The hardware revision of the user interface.
- **Manufacture Date:** The date the user interface was manufactured.
- **MAC Address:** The MAC address of the unit.

Path: Main > About > Display > Firmware

View identifying revision information about the display interface firmware:

- **Application**
- **APC OS (AOS)**
- **APC Boot Monitor**
- **Video Driver**
- **FPGA**

Event Log

The event log saves status information and a message each time a change in the cooling group is detected. Alarms and events are recorded in the log and displayed on the active alarms screen. Status events (informational) and system configuration changes are only displayed in the event log.

View event log

Path: Main > Event Log

The event log keeps a record of all alarms and events. The screen displays the following:

- The name of the event.
- The time and date the event occurred.

Use the arrow keys to scroll through the list of events and display the date and time for each event.

Clear event log

Path: Main > Event Log

1. Press the trash can icon in the bottom-left corner of the screen to clear the event log. A confirmation screen is displayed.
2. Enter the Admin password to erase the log.
3. Select **Yes** to erase all of the events in the log. Select **No** to return to the **Event Log** screen.

Respond to Alarms

When an alarm is triggered, the cooling unit alerts you through the display by the following methods:

- Active alarm screen entry on scrolling status screens
- LEDs on the front panel display
- An optional audible alarm every 30 seconds, if enabled

View active alarms

Path: Main > Status > Active Alarms

The **Active Alarms** screen provides the number of alarms, the severity, and a brief description of the alarm.

Clear active alarms

Path: Main > Status > Active Alarms

1. Press **Clear** to clear the active alarms. A confirmation screen is displayed.
2. Enter the Admin password to erase the alarms list.
3. Select **Yes** to erase all of the alarms. Select **No** to return to the **Active Alarms** screen.

Alarm messages and suggested actions

Alarm Message	Severity	Action Required
EcoAisle Door Open	Warning	• Verify the aisle containment system door is shut properly. • If the problem persists, contact Schneider Electric technical support.
Air Filter Clogged	Warning	• Clean or replace the air filter. • If the problem persists, contact Schneider Electric technical support.
Air Filter Run Hours Violation	Warning	• Reset the Air Filter Run Hours after the air filter is cleaned or replaced.
A-Link Isolation Relay Fault Exists	Critical	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.

Alarm Message	Severity	Action Required
Active Flow Controller Sensor Error Detected	Warning	• Check the Active Flow Controller (AFC) hardware and wiring. Replace the AFC. • If the problem persists, contact Schneider Electric technical support.
Check Condensate Management System	Warning	• Clear debris from condensate pump reservoir and the condensate removal lines. • Verify the condensate removal lines are free of obstructions and the float switch moves freely. • For assistance, contact Schneider Electric technical support.
Chilled Water Flow Meter Error Detected	Warning	• A hardware error may exist. • For assistance, contact Schneider Electric technical support.
Chilled Water Valve Actuator Error Detected	Critical	• A hardware error may exist. • For assistance, contact Schneider Electric technical support.
Condensate Pan Full	Critical	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Condensate Pump Runtime Condition	Warning	• At the display interface, make sure the condensate pump run hours setting is correct in the **Main > Status > Run Hours** screen after the appropriate maintenance for the device has been performed.
Cool Function Unavailable	Critical	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Entering Chilled Water High Temperature Condition	Warning	• Check operation of the chiller. Ensure the chilled water supply temperature is within range. • If the problem persists, contact Schneider Electric technical support.
Entering Chilled Water Temperature Sensor Error Detected	Warning	• A hardware error may exist. • For assistance, contact Schneider Electric technical support.
External Communication Fault	Critical	• A hardware error may exist. • For assistance, contact Schneider Electric technical support.
Fan #n Error Detected	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Fan #n Runtime Condition	Warning	• At the display interface, make sure the fan run hours setting is correct in the **Main > Status > Run Hours** screen after the appropriate maintenance for the device has been performed.
Filter Differential Pressure Sensor Error Detected	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Fluid Calibration Active	Critical	• The alarm will clear after fluid calibration mode is turned off.
Group Communication Error	Warning	• Make sure the number of cooling units in the group is configured properly, and the A-Link connections between cooling units are correct. • Make sure the system is receiving power and is connected properly. • If the problem persists, contact Schneider Electric technical support.
Heater #n Error	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Heater #n Runtime Condition	Warning	• At the display interface, make sure the heater hours setting is correct in the **Main > Status > Run Hours** screen after the appropriate maintenance for the device has been performed.
High Return Humidity Condition	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Humidifier Communication Error	Warning	• A hardware problem may exist. • See the humidifier manual. • If the problem persists, contact Schneider Electric technical support.
Humidifier Cylinder Full Unit Off Condition	Warning	• See the humidifier manual. • If the problem persists, contact Schneider Electric technical support.

Alarm Message	Severity	Action Required
Humidifier Drain Error	Warning	• A hardware problem may exist. • See the humidifier manual. • If the problem persists, contact Schneider Electric technical support.
Humidifier Error Tolerance Exceed Condition	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Humidifier Excessive Output Reduction Condition	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Humidifier High Water Conductivity	Warning	• See the humidifier manual. • If the problem persists, contact Schneider Electric technical support.
Humidifier Low Water Condition	Warning	• Make sure the water line to the humidifier is connected, and the water supply is turned on. • If the problem persists, contact Schneider Electric technical support.
Humidifier Replace Cylinder Condition	Warning	• Replace the humidifier cylinder. • Consult the humidifier manual. • For further assistance, contact Schneider Electric technical support.
Humidifier Runtime Condition	Warning	• At the display interface, make sure the humidifier run hours setting is correct in the **Main > Status > Run Hours** screen after the appropriate maintenance for the device has been performed.
Idle Due to Leak Detected	Critical	• Check the water leak sensor for presence of liquid. • For assistance, contact Schneider Electric technical support.
Insufficient Airflow Detected	Warning	• Verify the air ports are clear of obstructions and there is sufficient cooling capacity for the load. • If the problem persists, contact Schneider Electric technical support.
Internal Communication Error	Critical	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Leaving Chilled Water Temperature Sensor Error Detected	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Low Return Humidity Condition	Warning	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Lower Supply Air Sensor Error Detected	Critical	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Primary Power Source Unavailable	Warning	• Make sure the power source is connected properly and the power is on. • If the problem persists, contact Schneider Electric technical support.
Rack Inlet #n High Temperature Condition	Critical	• Make sure the temperature sensor is connected and placed properly. • Make sure the **Rack Inlet Threshold** is set correctly in the **Main > Configuration > Unit > Cooling** screen. • For assistance, contact Schneider Electric technical support.
Rack Temperature Sensor #n Error Detected	Critical	• Make sure the sensors are connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Return Air High Temperature Condition	Warning	• Make sure the **Return Air Threshold** is set correctly in the **Main > Configuration > Unit > Cooling** screen. • If the problem persists, contact Schneider Electric technical support.
Return Air Temperature Sensor Error Detected	Critical	• Make sure the faulty sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Return Humidity Sensor Error Detected	Warning	• Make sure the faulty sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.

Alarm Message	Severity	Action Required
Standby Due to Input Contact	Warning	• Check the device connected to the input contact and resolve the fault. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Supply Air High Temperature Condition	Warning	• Make sure the temperature sensor is connected properly. • Make sure the **Supply Air Threshold** is set correctly in the **Main > Configuration > Unit > Cooling** screen. • If the problem persists, contact Schneider Electric technical support.
Supply Humidity Sensor Error Detected	Warning	• Make sure the faulty sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Unexpected Number of Active Flow Controllers	Warning	• Verify physical number of AFC units matches the number shown in the **Number of Active Flow Controllers** setting. • If the problem persists, contact Schneider Electric technical support.
Unit Capability Not Configured	Warning	• A manufacturing problem may exist. • If the problem persists, contact Schneider Electric technical support.
Upper Supply Air Sensor Error Detected	Critical	• Make sure the faulty sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Water Detected Error	Warning	• Check the water leak sensor for presence of liquid. • If the problem persists, contact Schneider Electric technical support.

Network Management Card

Quick Configuration

The cooling unit is shipped with a Network Management Card that enables the cooling unit to be managed over a network. Configure the Network Management Card to control this cooling unit through a network.

Overview

You must configure the following TCP/IP settings before the Network Management Card can operate on a network:

- IP address of the Network Management Card
- Subnet mask
- Default gateway
  NOTE: Never use the loopback address (127.0.0.1) as the default gateway address for the Network Management Card. Doing so will disable the card and will require you to reset TCP/IP settings to their defaults using a local serial login.
  NOTE: If a default gateway is unavailable, use the IP address of a computer that is located on the same subnet as the Network Management Card and that is usually running. The Network Management Card uses the default gateway to test the network when traffic is very light.

> See "Watchdog Features" in the "Introduction" of the *User Guide* for more information about the watchdog role of the default gateway.

TCP/IP configuration methods

Use one of the following methods to define the TCP/IP settings needed by the Network Management Card:

- Device IP Configuration Wizard (See "Device IP Configuration Wizard" on page 38.)
- BootP or DHCP server (See "BootP & DHCP configuration" on page 38.)
- Local computer (See "Local access to the command line interface (CLI)" on page 40.)
- Networked computer (See "Remote access to the command line interface (CLI)" on page 39.)

Device IP Configuration Wizard

The Device IP Configuration Wizard is used to discover and configure Network Management Cards that do not have IP addresses assigned. The Device IP Configuration Wizard runs on Microsoft® Windows® 2000, Windows Server® 2003, Windows Server® 2012, and on 32- and 64-bit versions of Windows XP, Windows Vista, Windows 2008, Windows 7, and Windows 8 operating systems.

The Device IP Configuration Wizard supports cards that have firmware version 3.0.x or higher and is for IPv4 only.

NOTE: Most software firewalls must be temporarily disabled for the Wizard to discover Network Management Cards that are not configured.

To configure one or more network management cards from a user configuration file, see the *User Manual*.

1. Download the Device IP Configuration Wizard from http://www.apc.com/tools/download.
2. Install and run the Device IP Configuration Wizard.
3. Follow the on-screen instructions.

NOTE: If you leave the option **Start a Web browser when finished** enabled, you can use `apc` (the default) for both the user name and password.

.ini file utility

You can use the .ini file export utility to export .ini file settings from configured Network Management Cards to one or more unconfigured Network Management Cards.

BootP & DHCP configuration

The default **TCP/IP Configuration**, **DHCP**, assumes that a properly configured DHCP server is available to provide TCP/IP settings to Network Management Cards. The possible settings are **Manual**, **DHCP**, or **BOOTP**.

If neither a DHCP nor BOOTP server is available, see "Device IP Configuration Wizard" on page 38 or "Remote access to the command line interface (CLI)" on page 39 to configure the TCP/IP settings.

BOOTP: For the Network Management Card to use a BOOTP server to configure its TCP/IP settings, it must find a properly-configured RFC951-compliant BOOTP server.

1. In the BOOTPTAB file of the BOOTP server, enter the MAC address of the Network Management Card, and the IP addresses of the subnet mask and default gateway, and an optional bootup file name.
   NOTE: Look on the nameplate of the unit for the MAC address. The MAC address is also available on the display interface at **Main > About > Display > Device.**
2. When the Network Management Card reboots, the BOOTP server provides it with the TCP/IP settings.
   – If you specified a bootup file name, the Network Management Card attempts to transfer that file from the BOOTP server using TFTP or FTP. The Network Management Card takes on all settings specified in the bootup file.
   – If you did not specify a bootup file name, the Network Management Card can be configured remotely by using the CLI or the Web interface. User name and password are both `apc`, by default.

To create the bootup file, see your BOOTP server documentation.

DHCP: You can use a RFC2131/RFC2132-compliant DHCP server to configure the TCP/IP settings for the Network Management Card.

For more details on how a DHCP can configure the network settings for a Network Management Card, see "DHCP Configuration" in the *InRow RC Chilled Water Air Conditioners Installation Manual*.

1. The Network Management Card sends out a DHCP request that uses the following to identify itself:
   – Vendor Class Identifier (by default, APC)
   – Client Identifier (by default, the MAC address of the Network Management Card)
   – User Class Identifier (by default, the identification of the application firmware installed on the Network Management Card)

2. A properly configured DHCP server responds with a DHCP offer that includes all of the settings that the Network Management Card needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). If configured to do so, the Network Management Card will ignore DHCP offers that do not encapsulate the APC cookie in DHCP option 43 using the following hexadecimal format:

   ```
   Option 43 = 01 04 31 41 50 43
   ```

   where
   – The first byte (`01`) is the code
   – The second byte (`04`) is the length
   – The remaining bytes (`31 41 50 43`) are the APC cookie (not required by default)

See your DHCP server documentation to add code to the Vendor Specific Information option.

To change the command line interface (CLI) DHCP Cookie Is setting, use the Advanced option in the TCP/IP menu.

See "Local access to the command line interface (CLI)" on page 40.

Remote access to the command line interface (CLI)

From any computer on the same network as the Network Management Card, you can use ARP and Ping to assign an IP address to the Network Management Card and then use Telnet to access the CLI of that Network Management Card and configure the other TCP/IP settings.

NOTE: After a Network Management Card has its IP address configured, you can use Telnet, without first using ARP and Ping, to access that Network Management Card.

1. Use the MAC address of the Network Management Card in the ARP command to define an IP address for the Network Management Card. For example, to define an IP address of 156.205.14.141 for a Network Management Card that has a MAC address of 00 c0 b7 63 9f 67, use one of the following commands:

   NOTE: Look on the nameplate of the unit for the MAC address. The MAC address is also available on the display interface at **Main > About > Display > Device.**

   – Windows command format:

   ```
   arp -s 156.205.14.141 00-c0-b7-63-9f-67
   ```
   – LINUX command format:

   ```
   arp -s 156.205.14.141 00:c0:b7:63:9f:67
   ```

2. Use Ping with a size of 113 bytes to assign the IP address defined by the ARP command. For the IP address defined in step 1, use one of the following Ping commands:

– Windows command format:

```
ping 156.205.14.141 -l 113
```

– LINUX command format:

```
ping 156.205.14.141 -s 113
```

3. Use Telnet to access the Network Management Card at its newly assigned IP address. For example,

```
telnet 156.205.14.141
```

4. Use `apc` for both the user name and password.

5. Contact your network administrator to obtain the IP address, subnet mask, and default gateway for the Network Management Card.

6. Use these three commands to configure network settings (text in *italics* indicates a variable):

   a. `tcpip -i` *yourIPaddress*

   b. `tcpip -s` *yourSubnetMask*

   c. `tcpip -g` *yourDefaultGateway*

   For each variable, enter a numeric value with the format xxx.xxx.xxx.xxx.
   For example, to set a system IP address of 156.205.14.141, enter the following command and press ENTER:
   `tcpip -i 156.205.14.141`

7. Type `reboot`. The Network Management Card restarts to apply the changes.

Local access to the command line interface (CLI)

You can use a computer connected to the serial port on the front of the display to access the CLI.

1. Select a serial port on the local computer and disable any service that uses that port.

2. Use the provided serial cable to connect the selected serial port to the serial on the front of the display.

3. Run a terminal program (such as HyperTerminal®, TeraTerm, or PuTTY) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.

4. Save the changes.

5. Press ENTER, repeatedly if necessary, to display the **User Name** prompt.

6. Use `apc` for the user name and password.

7. Contact your network administrator to obtain the IP address, subnet mask, and default gateway for the Network Management Card.

8. Use these three commands to configure network settings (text in *italics* indicates a variable):

   a. `tcpip -i` *yourIPaddress*

   b. `tcpip -s` *yourSubnetMask*

   c. `tcpip -g` *yourDefaultGateway*

   For each variable, enter a numeric value with the format xxx.xxx.xxx.xxx.
   For example, to set a system IP address of 156.205.14.141, enter the following command and press ENTER:
   `tcpip -i 156.205.14.141`

9. Type `reboot`. The Network Management Card restarts to apply the changes.

Access a Configured Unit

Overview

After the unit is running on your network, you can access the configured cooling unit through the following interfaces:

- Web interface
- Telnet/SSH
- Simple Network Management Protocol (SNMP)
- FTP/SCP
- Modbus

For more information on the interfaces, see the *InRow RC User Manual*.

Web interface

Use Microsoft Internet Explorer® 7.x or higher (on Windows operating systems only), or Mozilla® Firefox® 3.0.6 or higher (on all operating systems) to access the cooling unit through its Web interface. Other commonly available browsers also may work but have not been fully tested by Schneider Electric.

You can use either of the following protocols when you use the Web browser to configure display interface options or to view the event log:

- The HTTP protocol (enabled by default), which provides authentication by user name and password but no encryption.
- The HTTPS protocol, which provides extra security through Secure Sockets Layer (SSL), encrypts user names, passwords, and data being transmitted, and authenticates the Network Management Card by means of digital certificates.

To access the Web interface and configure the security of your cooling unit on the network,

1. Enter the IP address or DNS name of the cooling unit into a web browser.
2. Enter the username and password (both are `apc` by default).
3. To enable or disable the HTTP or HTTPS protocols, use **Main > Configuration > Network**.

For more information on selecting and configuring network security, see the UPS Network Management Card Security Handbook, available on www.schneider-electric.com. Click on "User Manuals" on the right side and search for "UPS Network Management Cards."

Telnet and SSH

You can access the control console through Telnet and/or Secure SHell (SSH), depending on which is enabled. To enable these access methods from the Web UI, select **Configuration > Network > Console > Access.** By default, Telnet is enabled. Telnet and SSH can be enabled simultaneously.

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 Network Management Card control console from any computer on the same network,

1. At a command prompt, use the following command line, and press ENTER:

   ```
   telnet address
   ```

   As *address*, use the Network Management Card IP address or DNS name (if configured).

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 CLI. SSH encrypts user names, passwords, and transmitted data.

The interface, user accounts, and user access rights are the same whether you access the CLI through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer.

 See the *InRow RC User Manual* for more information on configuring and using SSH.

Simple Network Management Protocol (SNMP)

SNMPv1 only: After you add the latest version of PowerNet® MIB to a standard SNMP MIB browser, you can use that browser to access the InRow RC cooling unit. All user names, passwords, and community names for SNMP are transferred over the network as plain text. The default read community name is **public**; the default read/write community name is **private**.

SNMPv3 only: 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. The default settings are **no authentication** and **no privacy**.

NOTE: To use SNMPv3, you must have an MIB program that supports SNMPv3, and SNMPv3 must be configured correctly in the Network Management Card.

The cooling unit supports SHA or MD5 authentication and V or DES encryption.

SNMPv1 and SNMPv3: To use StruxureWare Data Center Expert to manage the InRow RC cooling unit on the public network of StruxureWare system, you must have SNMPv1 enabled in the unit interface. Read access allows devices to receive traps from the cooling unit. Write access is required while you set the device as a trap receiver.

To enable or disable SNMP access, you must be an Administrator. Select **Administration > Network** and select the access option under SNMPv1 or SNMPv3.

FTP/SCP

You can use FTP (enabled by default) or Secure CoPy (SCP) to transfer downloaded firmware to the Network Management Card or to access a copy of the InRow RC event or data logs. SCP provides the higher security of encrypted data transmission and is enabled automatically when you enable SSH. FTP and SCP can be enabled simultaneously.

To access the Network Management Card through FTP or SCP, the default user name and password are `apc` and `apc` for an Administrator, or `device` and `apc` for a Device User. In the command line, use the IP address of the unit.

NOTE: If you enable SSL and SSH for their high-security authentication and encryption, disable FTP. To disable FTP, you must be an Administrator. Go to **Main > Configuration > Network** to enable FTP.

 In the *InRow RC User Manual*, see the following sections:

—-To transfer firmware, see "File Transfers."

—-To retrieve a copy of the event or data log, see "Use FTP or SCP to retrieve log files."

Modbus

Modbus lets you view the Network Management Card through the interface of your building management system.

The Modbus RTU interface supports 2-wire RS-485, 4-wire RS-485, plus ground MODBUS TCP.

NOTE: Modbus can be configured to run at either 9600 or 19200 bps. It is already configured for 8 data bits, no parity, and 1 stop bit: parity is changeable but data bits and stop bits are not.

To access the Modbus register map, go to the Schneider Electric website, download.schneider-electric.com/library and search for the Modbus register map.

Recover a Lost Password

Use a local computer (a computer that connects to the Network Management Card through the serial port) to access the command line interface (CLI).

1. Select a serial port at the local computer, and disable any service that uses that port.

2. Connect the Schneider Electric serial cable (part number 990-0299) to the selected port on the computer and to the serial port on the front of the display.

3. Run a terminal program (such as HyperTerminal®) and configure the selected port:
   – 9600 bps
   – 8 data bits
   – no parity
   – 1 stop bit
   – no flow control

4. Press the RESET button on the front of the display, immediately press ENTER on the computer keyboard, repeatedly if necessary, to display the **User Name** prompt.

   NOTE: If you do not press the ENTER key before five seconds elapse, you must press the RESET button again.

   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 on the front of the display. The Status LED will alternately flash orange and green. Immediately press the RESET button on the front of the display a second time while the LED is flashing to temporarily reset the user name and password to their defaults.

6. Press ENTER on the computer keyboard as many times as necessary to re-display 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 re-displayed, you must repeat step 5 and log on again.)

7. At the command line interface, use the following commands to change the password setting, which has been reset to `apc`:
   ```
   user -n <user name> -pw <user password>
   ```

   For example, to change the Super User password to **XYZ**, type

   ```
   user -n apc -pw XYZ
   ```

8. Type `quit` or `exit` to log off, reconnect any serial cable you disconnected, and restart any service you disabled.

Upgrading Firmware

For a complete description on how to download a firmware upgrade for your Schneider Electric InRow RC cooling unit and transfer it to the unit, see the *InRow RC User Manual*.

Maintenance

Monthly Preventive Maintenance

Photocopy the following pages and use them during the maintenance procedures. After they have been completed, save them for future reference.

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Environment

❏	In what type of room in the cooling unit located?_____
❏	Is the cooling unit maintaining the temperature setpoint? _____ Temperature setpoint: _____
❏	Is there visible damage on the cooling unit (dents, scratches, etc.)? _____
❏	Check for dirt, dust, debris, and liquid stains in and around the cooling unit
❏	Room temperature near cooling unit: _____
❏	Supply air temperature sensor reading: _____
❏	Supply air humidity sensor reading: _____
❏	Return air temperature sensor reading: _____
❏	Return air humidity sensor reading: _____
❏	Record the alarm history for the last month. _____ _____ _____ _____

Cleanliness

❏	Check the condition of the air filters. Clean or change if necessary.
❏	Check for accumulation of debris in the drain pan. Clean as required.

Mechanical

> ### ⚠⚠ DANGER
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
>
> • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
>
> • This equipment must be installed and serviced by qualified personnel only.
>
> • Turn off all power supplying this equipment before working on or inside the equipment.
>
> • Always use a properly rated voltage sensing device to confirm power is off.
>
> • Replace all devices, doors, and covers before turning on power to this equipment.
>
> **Failure to follow these instructions will result in death or serious injury.**

❏ Check the fans. All components should be moving freely with no signs of binding or damages.

❏ Verify that the condensate line is flowing freely.

Electrical

> ### ⚠⚠ DANGER
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
>
> • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
>
> • This equipment must be installed and serviced by qualified personnel only.
>
> • Turn off all power supplying this equipment before working on or inside the equipment.
>
> • Always use a properly rated voltage sensing device to confirm power is off.
>
> • Replace all devices, doors, and covers before turning on power to this equipment.
>
> **Failure to follow these instructions will result in death or serious injury.**

❏ Inspect the electrical panel doors and covers for damage or loose hardware.

❏ Confirm the incoming main voltage matches the cooling unit nameplate. The measurement should be within 10% of the nameplate listing.

Functional tests

❏ Check the operation of the display interface.

Quarterly Preventive Maintenance

* Perform all the Monthly Preventive Maintenance items **and** the items below.

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Environment

❑   Record the **Supply Air Setpoint**: _____

❑   Record the **Cool Setpoint**: _____

Cleanliness

❑   Check for debris in the condensate pan. Clean as needed.

Mechanical

⚠ ⚠ **DANGER**
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
• Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
• This equipment must be installed and serviced by qualified personnel only.
• Turn off all power supplying this equipment before working on or inside the equipment.
• Always use a properly rated voltage sensing device to confirm power is off.
• Replace all devices, doors, and covers before turning on power to this equipment.
Failure to follow these instructions will result in death or serious injury.

❑   Verify that the fan hardware is tight.

❑   Clean the condensate drain line.

❑   Clean the dust from door perforations and fan bezels.

Electrical

```
⚠ ⚠ DANGER
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

• Apply appropriate personal protective equipment (PPE) and follow safe electrical work
practices. See NFPA 70E or CSA Z462.
• This equipment must be installed and serviced by qualified personnel only.
• Turn off all power supplying this equipment before working on or inside the equipment.
• Always use a properly rated voltage sensing device to confirm power is off.
• Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.
```

❏   Check wiring harnesses and molded connectors.

❏   Check customer interface wiring connections.

❏   Check temperature and humidity sensor connections.

Functional tests

❏   Check the operation of the water leak detection device.

❏   Verify the cooling operation mode is functioning properly.

❏   Check condensate pump operation.

Semi-Annual Preventive Maintenance

* Perform all the Monthly/Quarterly Preventive Maintenance items **and** the items below.

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Environment

❏	Check for visible damage to the cooling unit.
❏	Check for dirt, dust, debris, and liquid stains in and around the cooling unit

Cleanliness

❏	Replace air filters. Reset air filter run hours alarm counter.
❏	Replace humidifier cylinder. Reset humidifier run hours alarm counter.
❏	Check and clean the evaporator coil.

Electrical

> ⚠ ⚠ **DANGER**
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
>
> • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
> • This equipment must be installed and serviced by qualified personnel only.
> • Turn off all power supplying this equipment before working on or inside the equipment.
> • Always use a properly rated voltage sensing device to confirm power is off.
> • Replace all devices, doors, and covers before turning on power to this equipment.
>
> **Failure to follow these instructions will result in death or serious injury.**

❏	Check circuit breaker and fuse block electrical connections.
❏	Check low voltage transformers, measure and record output voltage.
❏	Measure and record mains input voltage: _____
❏	Check and record the current draw for the following components: • Fans: _____ • Heaters:_____ • Humidifier:_____

Troubleshooting

Problem	Possible Cause	Corrective Action
Controls erratic or inoperative	• Inlet temperature to cooling unit is higher than rated maximum temperature	• Reduce the load or add additional cooling equipment.
Fans fail to start	• Cooling unit shutdown due to an external command	• Temporarily remove the input contact cable, if it is connected.
	• Single fan fails to start	• Verify that the fan circuit breaker is ON.
Cooling unit cannot obtain setpoint	• Improper placement of remote temperature sensor	• Verify that the remote temperature sensor is properly located in the cold aisle.
	• Dirty filter	• Clean the filter.
	• Dirty coil	• Clean the coil.
	• Application error	• Contact Schneider Electric technical support
	• Heat load is too far away	• Place the cooling unit closer to the heat load.
Water carryover	• Improper fan speed selected	• RACS and HACS modes only: Select the next-highest fan speed setting. For example, change the fan speed setting from **Low** to **Med/Low**.
	• Room humidity is too high	• Improve room sealing.
Temperature control not tight enough	• Improper placement of remote temperature sensor	• Verify that the remote temperature sensor is properly located in the cold aisle.
Water on outside of cooling unit	• Condensate drain hose is not connected or not properly routed outside the cooling unit	• Verify that the condensate drain hose is properly connected to the pump and properly routed outside of the cooling unit. • Verify that the condensate drain line does not exceed 3.5 m (11.5 ft) lift and 18.0 m (60.0 ft) horizontal run.
	• Leak in drain system	• Locate and repair the leak.
	• Cooling unit not leveled properly	• Adjust the leveling feet of the cooling unit.
	• Damaged piping insulation	• Identify damaged area and repair the insulation.
Fluid valve not responsive	• Actuator not connected properly	• Verify that the actuator is connected properly.
	• Actuator and shaft not rotating together	• Tighten the linkage screw on the actuator shaft.
	• Rotary switch on the bottom of the actuator is set incorrectly	• Confirm that the rotary switch is pointing toward the front of the cooling unit.

Problem	Possible Cause	Corrective Action
Display interface not operational, but cooling unit operates	• Display interface not connected properly	• Verify that the display interface cable is connected properly.
Incorrect air pressure	• False filter clogs	• Verify that the ends of the clear plastic air tubes are not obstructed. • Verify that the clear plastic air tubes are connected to the controller. • Verify that the clear plastic air tubes are not pinched.
Alarms do not show up on monitoring equipment (Customer Output Contact)	• External monitoring equipment is not receiving power or is not functioning properly	• Confirm that power, if required, is being supplied to the external equipment. • If the cooling unit (+12 V or +24 V) is providing power to the external equipment, verify that the external equipment is $\leq$50 mA. • Test the external equipment by bypassing the customer output contact. • Verify Customer Output Contact settings. See "Contacts" on page 17.
Cooling unit does not shut down on command	• Drive voltage	• Verify that there is a drive voltage entering the input of the cooling unit. You may use the available +12 V or +24 V. You must also use the ground. • Verify Customer Input Contact settings. See "Contacts" on page 17.
No communication with building management system (BMS) port	• Improper connection	• Confirm that the cooling unit is connected to the BMS port and not to the Control port. • Make sure that the wire polarity is correct. Using a DC voltmeter, test the signal with no transmissions in progress. Expect the voltage at pin 2 to be greater than at pin 1 by at least 200 mV. Measure the cooling unit with the cable disconnected, and then measure it again with the cable connected. If the signal is less than 200 mV, the cooling unit may be reverse-wired. • Make sure that every cooling unit has either two sets of wires in its connector or one set of wires and a terminating resistor of 100 to 120 ohms.
Cooling units are not communicating with each other	• A-Link failure	• Verify that the first and last cooling units have one cable and a terminator. • Verify that every other cooling unit has two cables. • Confirm that the A-Link cables are connected to the A-Link ports and that a network cable is connected to the network port. • Verify that the number of cooling units in the cooling group matches the group number setting.
Output air is 17°C (62°F) and fans are running at a very high rate of speed.	• Upper or lower supply air sensor	• Either upper or lower supply air temperature sensor has a fault. Verify that both supply air temperature sensors are installed and working properly.

Worldwide Customer Support

Customer support for this or any other product is available at no charge in any of the following ways:

- Visit the Schneider Electric Web site to access documents in the Schneider Electric Knowledge Base and to submit customer support requests.
  - **www.schneider-electric.com** (Corporate Headquarters)
    Connect to localized Schneider Electric Web sites for specific countries, each of which provides customer support information.
  - **www.schneider-electric.com/support/**
    Global support searching Schneider Electric Knowledge Base and using e-support.
- Contact the Schneider Electric Customer Support Center by telephone or e-mail.
  - Local, country-specific centers: go to **www.schneider-electric.com > Support > Operations around the world** for contact information.

For information on how to obtain local customer support, contact the representative or other distributors from whom you purchased your product.