Operation and Maintenance Manual
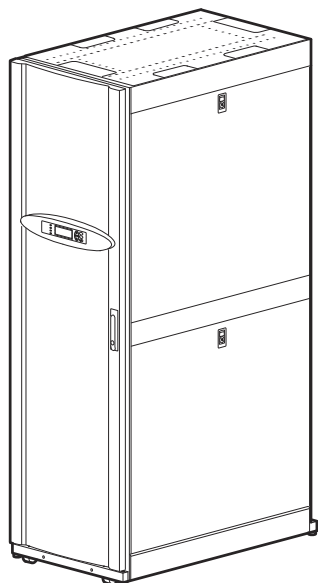
InRow® Direct Expansion Cooling Units

InRow® RD

ACRD500, ACRD501, ACRD502

Schneider Electric

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Table of Contents

Network Management Card 37

Maintenance 44

Troubleshooting 48

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. Follow all local and national regulations when handling refrigerants.

⚠ ⚠ 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.

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
• The cooling unit operates under pressure. Take proper safety precautions when connecting gauges or servicing piping.   • Do not operate the cooling unit with any cover, guard, door, or panel removed unless the instructions indicate otherwise. Then, proceed with extreme caution.   • Do not run service utilities in front of the fan outlets.
Failure to follow these instructions can result in death, 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

<table>
<tr><td colspan="2" align="center">⚠ ⚠ WARNING</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

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.
❏	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

NOTICE
HAZARD TO EQUIPMENT
• 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 equipment damage.

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 the:

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

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

❏ Piping has been leak tested and held a vacuum prior to introduction to refrigerant into the system.

❏ Mechanical connections are tight, including compressor and receiver rotolock connections.

❏ Refrigerant piping size is correct according to the line size table in the installation manual.

❏ The vertical, horizontal, and total run lengths of the liquid and discharge lines are recorded.

❏ The number of 45- and 90-degree bends in the refrigerant piping are recorded.

❏ Field-installed traps and piping are in accordance with the installation manual and follow proper piping practices.

❏ Piping is adequately supported and isolated when necessary.

❏ Field-installed service valves are open.

❏ Pressure relief valve is installed in accordance with the installation manual as well as local and national codes and regulations.

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

❏ Covers and guards are in place.

User interface inspection checklist

The user 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 RD between Modbus D0 and Modbus D1.
❏	The temperature and humidity sensors located on the front of the cooling unit are connected correctly.
❏	The rack temperature sensors are installed correctly.
❏	The network port is connected correctly and an IP address has been assigned to the equipment.
❏	The optional rope water detection device is installed properly.

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 sight glass moisture sensor is green.

❑ The current draw of fan motors, compressor, and transformers for the cooling operation is within the ratings of the respective circuit breakers.
   1. Record the current at the main power connection of the main circuit breaker.
   2. Record all current draws on the load side of any circuit breakers used for each device.
   3. 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.

❑ Compressor suction and discharge pressures are recorded.

❑ The cooling unit has the proper refrigerant charge for year-round operation

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

❑ The high-pressure switch is operating correctly.
   1. Shut down the condenser.
   2. The head-pressure will rise until the high-pressure switch shuts down the compressor.
   3. Record the shut-off point.

❑ The cool cycle engages.

❑ Air filters are clean and free of debris. Replace air filters with Schneider Electric air filters only.

❑ 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 system is clean and free of debris.

❑ Packaging materials are disposed of properly.

❑ The start-up form was completed and sent to Schneider Electric.

Charging With Refrigerant

Calculating R407C charge

Use the following table and formula when calculating the total R407C charge.

Condenser Model	Schneider Electric SKU	Selected Ambient Temperature °C (°F)	Condenser Summer Charge kg (lb)	Condenser Flooded Charge for Different Minimum Outdoor Ambient Temperatures kg (lb)				
				4°C (40°F)	-7°C (20°F)	-18°C (0°F)	-29°C (-20°F)	-40°C (-40°F)
LNE-S01-A009	ACCD75201 ACCD75204	35 (95)	4.5 (10)	9.7 (21.3)	10.7 (23.5)	11.2 (24.7)	11.6 (25.6)	12.7 (28.0)
LNE-S02-A015	ACCD75202 ACCD75205	40 (105)	6.8 (15)	14.2 (31.2)	15.6 (34.3)	16.4 (36.1)	17.0 (37.4)	18.6 (41.0)
LNE-S03-A027	ACCD75203 ACCD75206	46 (115)	13.6 (30)	28.0 (61.8)	30.8 (68.0)	32.4 (71.5)	33.6 (74.1)	36.8 (81.2)
KH1180.BDVES	ACCD75207	35 (95)	5.0 (11)	10.8 (23.7)	11.8 (26.1)	12.5 (27.5)	12.9 (28.5)	14.1 (31.2)
KH1280.ADVES	ACCD75208	40 (105)	6.8 (15)	14.4 (31.7)	15.8 (34.8)	16.6 (36.6)	17.2 (38.0)	18.9 (41.6)
KH1280.CDVES	ACCD75209	46 (115)	13.6 (30)	28.7 (63.3)	31.6 (69.6)	33.2 (73.3)	34.5 (76.0)	37.7 (83.2)

Total charge = Equipment charge + condenser summer charge + condenser flooded charge (for minimum possible ambient temperature) + liquid R407C in liquid pipe

Equipment charge: 4.5 kg (10 lb)

Quantity of R407C in. 7/8 in. OD liquid line: (area) x (length in. ft) x (density): 0.00306 (ft^2) x L (ft) x 66.0 (lbm/ft^3)

Density of liquid R407C at 40.6°C (105°F) and 17.9 bar (260 psig): 1.057 g/cm^3 (66.0 lbm/ft^3)

Inside diameter of ACR copper tube (7/8 in. OD): 19 mm (0.75 in.)

Cross sectional area for 0.75 in. inside diameter pipe is 0.000284 m^2 (0.00306 ft^2)

Liquid line charge for 7/8 in. ACR copper tube: 0.32 kg/m (0.22 lb/ft)

Quantity of R407C in 3/4 in. OD liquid line: (area) x (length in ft) x (density): 0.00245 (ft^2) x L (ft) x 66.0 (lbm/ft^3)

Density of liquid R407C at 40.6°C (105°F) and 17.9 bar (260 psig): 1.057 g/cm^3 (66.0 lbm/ft^3)

Inside diameter of ACR copper tube (3/4 in. OD): 17 mm (0.67 in.)

Cross sectional area for 17 mm (0.67 in.) inside diameter pipe is 0.000227 m^2 (0.00245 ft^2)

Liquid line charge for 3/4 in. ACR copper tube: 0.23 kg/m (0.16 lb/ft)

Example: Calculate the total R407C charge for an LNE-S01-A009 condenser with 25 ft of 7/8-in. liquid piping. Minimum outdoor design temperature is -28.9°C (-20°F).

NOTE: Imperial units are used in this example.

Total R407C charge: 20 + 10 + 25.6 + (25*0.20) = 60.6 lb.

Charging the equipment

⚠ 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.

⚠ CAUTION

HAZARD OF HIGH PRESSURE REFRIGERANT OR EQUIPMENT DAMAGE

• Use R410a refrigerant only.
• Use hose and manifold set suitable for R410a with a minimum pressure rating of 50 bar (725 PSIG).
• The unit display should be used to obtain pressure readings.

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

NOTICE

HAZARD TO EQUIPMENT

Introducing a fast charge of liquid refrigerant through the suction port may damage the compressor.

Failure to follow these instructions can result in equipment damage.

R407C is a blend refrigerant. When charging equipment with blend refrigerants, only liquid refrigerant must be charged.

1. Ensure the ball valves are open.

2. Confirm the calculated system charge.

3. Connect the refrigerant cylinder to the charging or gauge port on the receiver outlet valve. Open the receiver valve approximately half way.

4. Charge liquid refrigerant into the high side of the system until the system pressures equalize. While the unit is NOT operational, charge liquid to the suction (low side) line to simply equalize pressures throughout the system DO NOT start the system until the pressure equalizes. Please note charging liquid to the suction port during operation may damage or reduce the life of the compressor.

SERVICE PORT

SERVICE PORT

LIQUID LINE

---
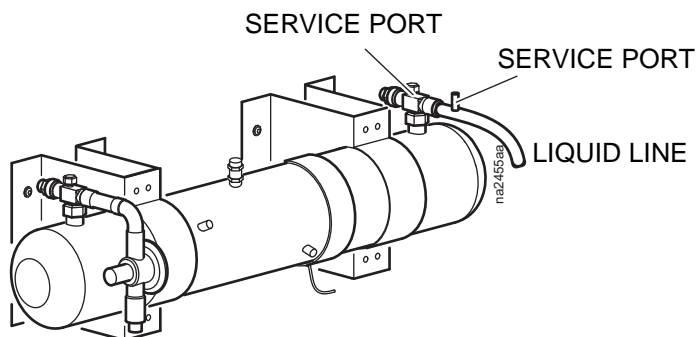
5. Prior to starting the system, make sure all system valves are open and the system high side pressure remains above 15.9 bar (230 psi). This may require blocking the condenser inlet slightly. Remove any blocking panels after charging is complete.

6. Start the cooling unit. See "Start the cooling unit" on page 19.

7. Once the system is operational, front seat the receiver service valve and continue charging liquid at the service port down stream of the receiver shutoff valve, until the calculated charge is complete. When this procedure is complete, fully back seat the receiver shutoff valve. Leave charging hoses in place in the event additional charging is required.

8. Charge the rest of the calculated liquid refrigerant very slowly through the suction port.

9. Verify that the sight glass is clear. If there is excessive bubbling in the sight glass, make sure the system high side pressure is above 15.9 bar (230 psi) and Superheat and Subcooling are within parameters (10-12 for Superheat and 8-10 for Subcooling). If additional charging is required, front seat the receiver outlet shutoff valve and weigh in the additional charge at the service port.

NOTE: Since good performance during low ambient temperatures depends on proper refrigerant charge, it is very important that this phase of the installation procedure be done carefully. Poor system performance can be due to too little or too much charge.
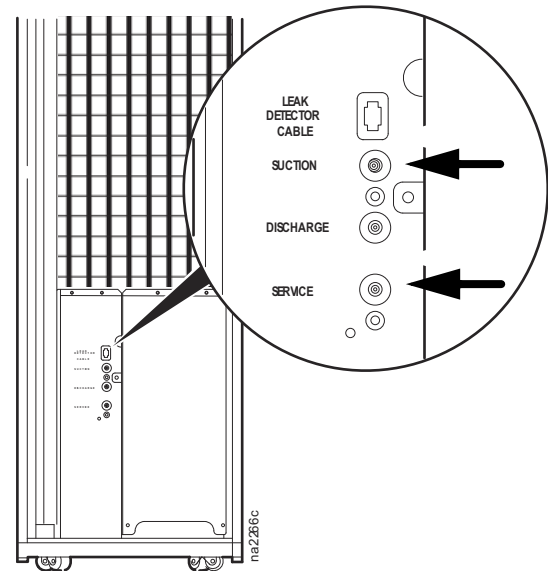
Compressor Oil Charge

⚠ 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.

You may need to add oil to air-cooled equipment, depending on the condenser size and the lengths of tube running between the equipment and the condenser.

Let the compressor run at full capacity for at least one hour and check the oil level in the oil sight glass. The level should be between 1/4 and 3/4 full, or within the limit shown on the oil level sticker. If the oil is not within the acceptable limit, perform the oil-charging procedure below.

SIGHT GLASS

na2265a
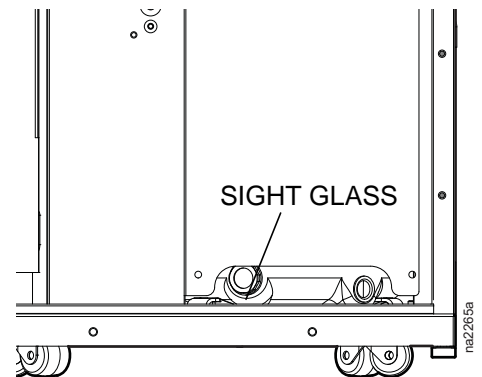
Oil charging procedure

NOTICE

HAZARD TO EQUIPMENT

Do not charge the compressor with too much oil, or compressor damage could result. The only way to drain oil from the compressor is to remove the compressor from the equipment, which cannot be done when the equipment is in the row.

Failure to follow these instructions can result in equipment damage.

NOTICE

DAMAGE TO EQUIPMENT

Be careful not to charge more oil than is necessary. Excessive oil in the system may cause system damage, including the following:

• Failure of valves and pistons due to oil slugging.

• Excessive oil carryover.

• Loss of evaporator performance due to oil level build-up in the low-pressure side of the system.

Failure to follow these instructions can result in equipment damage.

---

1. Calculate the approximate amount of additional oil needed using the following formula:

   (R x 0.022 x 16)–(C x 0.10) = A

   - **R** — Refrigerant in the system (this amount should have been recorded during installation)

   - **C** — Compressor oil charge (in fluid ounces)

   - **A** — Amount of additional oil (in fluid ounces).
     NOTE: The compressor used in this equipment comes with an internal oil charge of 1686 ml (57 fl oz).

     In the following example, there are 50 pounds of refrigerant in the system.

     (50 x 0.022 x 16) – (57 x 0.10)
     (17.6) – (5.7) = 11.9 fluid ounces of additional oil

2. Prepare to add oil:

   a. Use a new sealed oil can and a manual oil pump. The pump hose must be sized for 1/4 in flare fittings and must include a valve depressor at its end, which will open the valve on the service port of the compressor.

   b. At a minimum, use a quality POE oil with a viscosity of 32 cst, 160 sus at 40°C (104°F). Suggested oils: Danfoss Maneurop 160 PZ Polyolesteroil, the approved type of oil for this equipment. Approved alternative oil types:

      - CPI (Lubrizol) reference: CP-2931AH or CP-2931A or equivalent

      - ICI_UNIQUEMA reference: Emkarate RL32H or equivalent

3. Purge the pump and hose:

   a. Ensure that the oil pump is clean. Insert the pump in the oil container and make sure that the container is open to the atmosphere for as short a period of time as possible. When available, use a plug adapter kit to further reduce the exposure of the oil to the atmosphere.

   b. Bleed all air from the pump and hose with a few strokes of the pump. Purging the pump removes the moisture-saturated oil left inside the hose from previous usage.

   c. Connect the hose to the service port of the compressor immediately after purging to avoid

moisture contamination.

4. While the equipment is running, charge the oil through the suction service port. Pump the oil very slowly.

Allow the compressor to run at full capacity for at least one hour after charging the oil, then re-check the oil level in the sight glass. The level should be between 1/4 and 3/4 full, or within the limit shown on the oil level sticker. **NOTE:** Dispose of the oil waste appropriately.

Operation

Display Interface
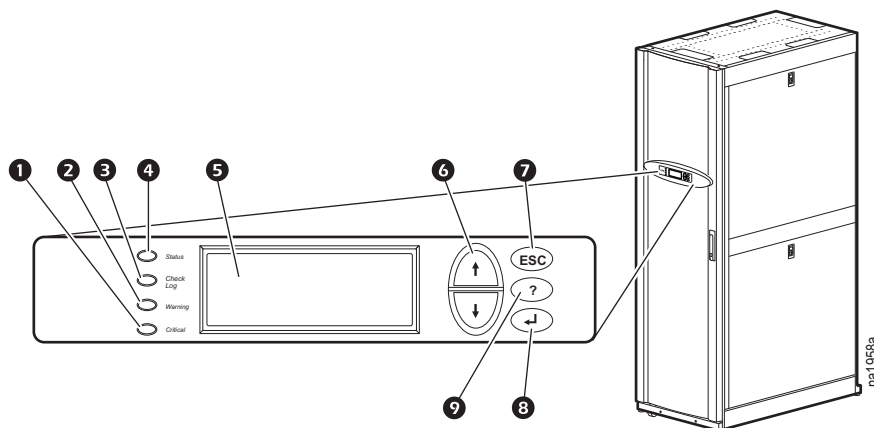
Item	Description	Function
❶	Critical Alarm LED (red)	When lit, a critical alarm condition exists and requires your immediate attention.
❷	Warning Alarm LED (yellow)	When lit, a warning alarm condition exists. Failure to correct this condition could cause a critical alarm.
❸	Check Log LED (yellow)	When lit, at least one new event has been logged since the last time the log was checked. Only events that pertain to the operation of the cooling unit will activate the LED.
❹	Status LED (green)	When lit, the cooling unit is receiving electrical power. When flashing green, the Cooling Unit is downloading firmware for the controller. This takes about one minute.
❺	Liquid Crystal Display (LCD)	View alarms, status data, and context-sensitive help, and modify configurable items.
❻	Up and Down arrow keys	Select menu items and access information.
❼	ESC key	Return to previous screen or cancel current operation.
❽	Enter key	Open menu items and input changes to cooling group level and cooling unit level settings.
❾	Help key	Display context-sensitive help. Press the help key for information about each option on the screen and for instructions on performing tasks.

Using the Display

Every time you apply power to the cooling unit, the display interface initializes, causing the LEDs to cycle and the alarm-tone to activate.

Scrolling status screens

After start-up, the interface displays the firmware revision number of the display interface. The display interface then scrolls automatically and continuously through screens of status information.

Status Screen Name	Status Information Displayed
InRow RD	• On/Standby • Unit identifier • Cooling Unit name • Cooling Unit location
Group	• Alarms/No Alarms • Cool Outpt (Cool Output) kW • Cool Setpt (Cool Setpoint) °C (or °F) • Max Rack *(Maximum Rack Temperature) °C (or °F)
Unit	• Alarms/No Alarms • Cool Output kW • Max Rack In (Max Rack Inlet) °C (or °F) • Air Flow l/s (liters per second) or CFM (cubic feet per minute)

Press the up or down arrow key to interrupt the automatic scrolling and view a specific status screen. To return to the scrolling status screens, press ESC from one of the main menu screens.

Main menu screens

On any top-level status screen, press the ENTER or ESC key to open the first main menu screen.

NOTE: Once a period of inactivity (at the keys of the display interface) exceeds the **Password Timeout** setting, the display interface returns to the scrolling status screens.

For information on setting the time-out duration, see "Timeout" on page 30.

All main menu choices are displayed on a series of six main menu screens, as shown.

```
On/Standby        ↑
View Alarms
Clear Alarms
View Event Log    ↓
```

```
Clear Event Log   ↑
Configure Modbus
→ Set Date & Time
Set Password      ↓
```

```
Set Display Units ↑
Configure Display
Configure Network ↓
```

```
About InRow RD     ↑
Set Identification
Service Intervals  ↓
```

```
View Run Hours    ↑
Configure Unit
Configure Group
Set Group PIDs    ↓
```

```
View Group Status  ↑
View Unit Status
Set Group Setpoints
Set Unit Threshlds ↓
```

na5325a

Navigating the main menu

Selector arrow: Press the up or down arrow key to move the selector arrow ❶ to a main menu option. Press the ENTER key to view the selected sub-menu screen. In the example shown below, the selector arrow points to the **Set Date and Time** setting. To select that item, press the ENTER key.

```
❶          ┌─────────────────────────┐
           │  Clear Event Log      ↑ │
           │  Configure Modbus       │
           │→ Set Date & Time        │
           │  Set Password         ↓ │
           └─────────────────────────┘
                                  na1623h
```
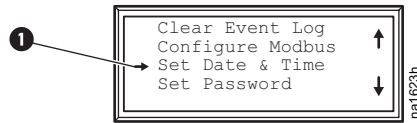
NOTE: If the selector arrow is on the top line of a main menu screen, press the up arrow key to move the selector arrow to the top line of the previous screen.

Continue arrows: Continue arrows ❷ indicate that additional options or settings are available on a menu or status screen. Press the up or down arrow key to view the additional items.

```
           ┌─────────────────────────┐      ❷
           │  Clear Event Log      ↑ │
           │  Configure Modbus       │
           │→ Set Date & Time        │
           │  Set Password         ↓ │
           └─────────────────────────┘
                                  na1623f
```
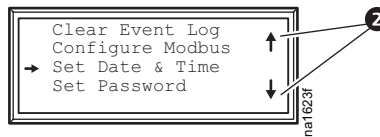
Sub-menus

Selecting a main menu option displays the sub-menu screen for that option. In this example, the selector arrow is on the top line of the **Set Date and Time** sub-menu screen.

```
           ┌─────────────────────────┐
           │→Time: 13:15:23          │
           │ Date: 18-Nov-2010       │
           │ Format: dd/mm/yyyy      │
           └─────────────────────────┘
                                  na1623g
```
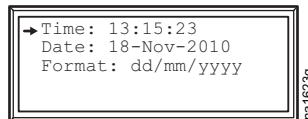
Use the up or down arrow key to move the selector arrow to an option, and press the ENTER key.

- **List of choices**: If the setting is a list of choices, an input arrow ❸ displays next to the setting. Press the up or down arrow key to select the menu option to change. Then press the ENTER key to exit the input mode and save the setting. Press the ESC key to exit without saving.

- **Numbers or text fields**: If the setting is a number or text field, use the arrow keys to select the value of the first character, and press the ENTER key to move to the next character. Press the ENTER key after the last character is set to exit the input mode and save the setting. Press the ESC key to exit without saving. If an invalid value is entered, the display interface beeps and restores the previous valid value to the field.

Input arrows: Input arrows ❸ next to a selected setting indicate that the setting can be modified by pressing the up or down arrow key. Press the ENTER key to save the change or the ESC key to cancel the change.

```
           ┌─────────────────────────┐
           │ Time: 13:15:23          │
           │ Date: ↕18-Nov-2010      │
           │ Format: dd/mm/yyyy      │
           └─────────────────────────┘
❸                                 na1622aa
```
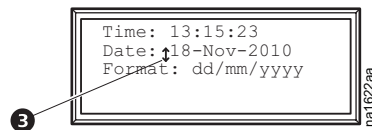
Using the Path statement

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 items you select to navigate to the item to view or modify. The parts of the path statement are defined below:

Path: Main > Set Password > Change Passwords

- **Main:** Your starting point is the main menu.
- **Set Password:** Scroll to and select this option from the main menu.
- **Change Passwords:** Scroll to and select this option from the sub-menu.

Subsequent options are listed and defined under the path statement.

Password entry

The cooling unit has two levels of password protection:

- **Device password** allows Device Users to change basic and environmental settings.
- **Admin password** allows all privileges granted for Device Users, and also allows the Administrator to modify settings that control the components in the cooling unit or change advanced options.

When you try to change a setting, the display interface prompts you to enter your Admin password. The default value for both the Device and Admin password is **apc** (lowercase). To enter your password, use the up or down arrow key to scroll through the available character set. Press the ENTER key to select the current character and move the cursor to the next character position. After selecting the last character of your password, press the ENTER key once more to submit your password.

Once the password is entered, it remains in effect until the period of inactivity exceeds the **Password Timeout** setting.

See "Password and timeout" on page 30.

NOTE: Passwords are case sensitive.

Start the cooling unit

Path: Main > Operation > On/Standby

1. To start the cooling unit, press the ENTER key until the cursor is on the **Operation > On/Standby** menu item.
2. Press the ENTER key again to show the toggle state arrow to the right of **Operation**.
3. Use the up and down arrow keys to change from **Standby** to **On**.

See "Path: Main > Operation > Limit Access" below if you are prompted to enter a password before changing the **On/Standby** setting.

4. Press the ENTER key again to set the **On** position.
   a. The fans will start.
   b. 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.

Path: Main > Operation > Limit Access

The default setting for the Limit Access password protection option is **No**. If the Limit Access option has been set to **Yes**, you will be prompted to enter the Device password before a change can be made to the **On/Standby** setting.

Stop the cooling unit

> ### ⚠ ⚠ WARNING
>
> **ELECTRICAL HAZARD**
>
> 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 can result in death, serious injury, or equipment damage.**

Path: Main > On/Standby

Press the ENTER key to change the setting to **Standby**. The cooling unit will enter the standby mode. General Configuration

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

Cooling unit configuration

Path: Main > Configure Unit > General

Capacity: Set the cooling capacity of the cooling unit:

- – **Auto**: The cooling unit automatically controls its output under normal (default) conditions.
- – **Max**: The cooling unit runs at full capacity.

    NOTE: Normal checks for cooling failures are disabled in the **Max** mode.

Start-up Dly: Enter a value for the delay. 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.

Idle On Leak: When set to **Yes**, the cooling unit will enter idle mode if a Water Detection Fault activates. Set to **No** to disable the cooling unit from entering idle mode if a leak is detected.

NOTE: The leak sensor (AP9325) is optional.

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

- Water Detection Fault (when **Idle On Leak** is set to **Yes**)
- Condensate Pan Fault
- Cooling Failure
- Persistent High Head Pressure
- VFD Inverter Over Heated

Idle On 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.

Role Over(ride): When selected this forces the cooling unit to be the primary cooling unit in the group.

- Set to Disable, allows the system to choose the role of the cooling unit.
- Select Enable if you have Runtime Balancing enabled and you DO NOT want a particular unit in the group to become a backup unit.

See "Alarm messages and suggested actions" on page 34 for more information on alarms.

Contacts

View the state of Input and output contacts

Path: Main > Configure Unit > Discrete I/O

Each cooling unit supports a user-defined input contact and a user-defined output contact. Each contact monitors a sensor and responds to changes in the state of the sensor (open or closed).

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 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.

Edit the normal state of input and output contacts

Path: Main > Configure Unit > Discrete I/O > Normal State

You can set input contacts to cause alarm conditions based on a user-defined normal state. Output contacts can map internal alarms and events to outside devices.

Input Norm: 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.

Output Norm: 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.

Outpt Src: Define the type of output source (alarm), either **Any Alrm** or **Critical**, that causes the output to change from its normal state.

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 > Configure Group

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

Num Units: Enter 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.

Type: Set the rack deployment strategy for the cooling units of this cooling group.

- **In-Row:** Air flow is not ducted. Hot aisle air is cooled, then shared by all loads in the row.
- **RACS (Rack Air Containment System):** Air flow in the enclosure is controlled by a ducting system fitted to the enclosure.
- **HACS (Hot Aisle Containment System):** Air flow in the room is controlled by enclosing the hot air aisle. The loads share an enclosed common hot aisle.
- **CACS (Cold Aisle Containment System):** Air flow in the room is controlled by enclosing the cold air aisle. The loads share an enclosed common cold aisle.

Max Fan Spd: The maximum fan speed of the Group. The default is 100%, and is adjustable to 60%.

Num Backups: The total number of desired backup cooling units. This value can range from zero to one less than Num Units.

Full RP Backups: The total number of desired backup cooling units that have advanced features (Humidification, dehumidification, reheat, heat assist) enabled. If you have a group of cooling units where some do not have advanced features you can use this control to reserve a number of cooling units with advanced features as backups. This value must not exceed **Num Backups**.

RT Bal (Runtime Balancing): When set to enabled, the system maintains similar runtimes between units in the group. When the difference between the runtime hours of the cooling units in the system exceeds 72 hours, the system will automatically exchange modes between the longest running primary unit and the backup unit with equal or greater capability if available with the least runtime hours.

NOTE: The runtime balancing cap is not adjustable. Runtime hours are hours that the cooling unit is actually operating and NOT 72 consecutive hours (3 days) of time.

Load Asst (Load Assist): When set to Enabled, provides extra capacity via a backup cooling unit in the event that a primary unit is unable to service the demand. When the assistance is no longer needed, the unit will return to the backup state.

NOTE: Redundancy (backup units), runtime balancing and load assist modes are only supported in HACS, RACS, and CACS configuration.

Active Flow Control Lamp Test: When enabled, the Active Flow Controller(s) LEDs will cycle through a red, green, and blue illumination pattern.(Not on unit.)

Number of Active Flow Controllers: Set the number of AFC units in the group (0 to 5).

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.

Identify the cooling unit

Path: Main > Set Identification

The **Set Identification** menu contains settings that identify the name and location of the cooling unit.

Unit Id: Assign a unique identification number to this cooling unit. Range: 1 through 12.

Name: Assign a **Name,** up to 40 alphanumeric characters, of the cooling unit.

Location: Enter the **Location**, up to 40 alphanumeric characters, of the cooling unit.

NOTE: Only the first 19 characters (of the 40 that are possible to enter) will display on the display interface. You must use Telnet, the Control console or the Web to access all 40 characters.

 See "Telnet for basic access" on page 41 and "Control console" on page 40 for more information.

Configure Modbus

Path: Main > Configure Modbus

Use the **Configure Modbus** menu to set up communications between the cooling unit and the building management system.

Modbus: Enable or disable Modbus communication protocol.

Target Id: Each Modbus device must have a unique target identification number. Enter a unique number for this cooling unit.

Baud Rate: Set either 9600 bps or 19200 bps.

Fixed settings: 8 data bits, no parity, 1 stop bit. These settings cannot be modified.

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 Cool mode works

Cool: The cooling unit uses a direct expansion coil, a variable speed compressor to modulate refrigerant flow through the coil, and a set of fans to control airflow through the coil. The cooling output is determined by the difference between the supply setpoint and the supply air temperature of the cooling unit.

The airflow control is varied based on configuration.

- InRow: The 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 inlet temperature decreases compared to the cooling set point the fans decrease output to maintain the set point.

- RACS/HACS: 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 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. By maintaining the desired temperature differential, the system matches the airflow requirements of the load.

- CACS: 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 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 set point the fans decrease output to maintain the setpoint.

The cooling unit is equipped with compressor cycling control that tries to minimize the number of times the compressor cycles on and off. The compressor will cycle off when the supply air temperature drops below 15°C (59° F) whether or not the minimum compressor on time of 3 minutes has elapsed. Once off, the compressor will not normally cycle on until the supply temperature reaches its setpoint and the minimum off time of 2 minutes has elapsed. However, if the rack inlet temperature reaches 25°C (78°F), the compressor will cycle on regardless of whether the minimum off time has elapsed (InRow and CACS only).

Compressor cycles are monitored over a 7-day period. If the number of cycles average more than 12 per hour over that period, the Excessive Compressor Cycling alarm is set.

See **Supply Air** and **Return Air** on page 32 for more information.

Setpoints

Path: Main > Set Group 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.

The setpoints for each mode must be within the following ranges:

- **Cool:** 18.0–32.2°C (64.4–90.0°F)
- **Supply Air:** 15.0–30.2°C (59.0–86.4°F)
  NOTE: The Supply Air setting is defined by Schneider Electric authorized personnel only when the cooling group is commissioned.
- **Fan Spd:** Set the fan speed preference that will give you 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)	Percentage of Speed (Manual Mode)
Low	16.7°C (30°F)	60
Med-Low	13.9°C (25°F)	-
Med	11.1°C (20°F)	70
Med-High	6.3°C (15°F)	-
High	5.6°C (10°F)	100

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.

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 Status: The status of the Active Flow Control indicates whether the correct amount of airflow is being provided to the load. This status is not configurable.
NOTE: AFC compatibility may require upgrading the cooling unit controller.

Fan Ctrl: When Automatic is selected, the unit operates based on measured demand. When Manual is selected uses fixed fan speeds 60%, 70%, 80%, 90%, or 100% that correspond to the Fan Spd setting.

PID settings

Path: Main > Set Group PIDs

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

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

Gain (P): The proportional multiplier (gain) for this mode or actuator. The proportional multiplier adjusts for the difference (error) between the measured value and the setpoint.

Rate (I): The integral multiplier (reset rate) for this mode or actuator. 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.

Deriv (D): The derivative multiplier (derivative) for this mode or actuator. The derivative multiplier adjusts the output for rapid changes in the error, correcting for the rate of change of the error over time.

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 authorized 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.

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	$0.6*G_U$	$1.2*G_U/P_U$	$0.075*G_U*P_U$

8. Set each constant according to these calculations.

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.

Loop Behavior	PID Tuning Correction
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.

Run hours

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

Path: Main > View Run Hours

Components:

- **Air Filter**
  - Reset Run Hours
    NOTE: Replace air filters with Schneider Electric air filters only.
- **Fans**
  - Fan Number
    - Reset Run Hours
- **Condensate Pump**
  - Reset Run Hours
- **Compressor**
  - Reset Run Hours
- **System Run Hours**
  - Reset Run Hours

Thresholds

Set alarms to alert you to threshold violations.

Path: Main > Set Unit ThreshIds

When the monitored input violates the unit threshold, an alarm will occur. Set thresholds for the following sensors:

- **Rack Inlet:** The temperature of the air entering the rack at the rack inlet sensor.
- **Supply Air:** The average temperature of the air output from the cooling unit, measured by the upper and lower supply air temperature sensors.
- **Return Air:** The temperature of the air entering the cooling unit at the temperature sensor.

Service intervals

Path: Main > Service Intervals

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 **Clear Alarms** in the main menu. Set the number of weeks to service the following:

- **Air Filter Interval:** The default is 18 weeks.
- **Compressor Interval:** The default is 52 weeks.
- **Condensate Pump Interval**: The default is 52 weeks.
- **Fan 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

Set display interface settings, including time and date, units, passwords, and time-out. You can also adjust the contrast, key click, beeper volume, and beep-on-alarm settings.

Password and timeout

Path: Main > Set Password

NOTE: The default user password is **apc** (lowercase). See "Password entry" on page 19 for more information on how to enter the password.

Change passwords: Set the Admin and Device passwords.

1. Move the selector arrow next to the **Change Passwords** option and press the ENTER key.
2. Select the password to change (either **Admin** or **Device**).
3. Enter a new password (up to 32 characters).
4. Press the ENTER key to confirm.

Timeout: Set the length of time which can elapse when no keys are pressed before the display interface returns to the scrolling screen status. The password must then be entered to regain access.

Invalidate: Override the password timeout and require password entry immediately.

Date and time

Path: Main > Set Date & Time

Set the time: Enter the correct time, and press the ENTER key. The **Time** is displayed on some status screens and is also used in the alarm and event logs to time-stamp events.

Set the date: Enter the day, month, and year, and press the ENTER key. The **Date** is displayed on some status screens and is also used in the alarm and event logs to date-stamp events.

Set the format: Use the up or down arrow key to select the date **Format** setting.

- mm/dd/yyyy (11/16/2007) (Default)
- yyyy-mm-dd (2007-11-16)
- dd-mmm-yy (16-Nov-07)
- mmm-dd-yy (Nov-16-07)
- dd.mm.yyyy (16.11.2007)

Adjust display

Path: Main > Configure Display

Contrast: Adjust the visibility of the screen text. Lower numbered settings provide darker text; higher numbers provide lighter text. Settings range from 0–7.

Key Click: Enable or disable an audible tone every time a key is pressed on the display interface.

Beeper Volume: Set the volume of the display interface alarm tone, and for the audible tone that sounds every time a key is pressed on the display interface.

Beep On Alarm: Set the cooling unit to sound an audible tone every 30 seconds when a new alarm occurs. Silence the audible tone by pressing any key on the display interface. When the alarm clears itself, the tone will stop on its own.

Display units

Path: Main > Set Display Units

Set the units of measure for the cooling unit to either **US** or **Metric**.

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 > Configure Network

MAC Address: Displays the unique network identifier assigned to the Network Management Card of the cooling unit installed in the cooling unit at the factory.

Boot Mode: Set the method by which the Network Management Card of the cooling unit will acquire its network settings.

- **Manual:** Enter the IP Address, subnet mask, and default gateway using the **IP Address** menu.
- **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.
- **BootPDHCP:** Set the Network Management Card of the cooling unit to search for its network settings from either a BootP or a DHCP server.

> By default, DHCP requires a cookie before it will accept an IP address. See "BootP & DHCP configuration" on page 38 for more information.

IP Address: You will be prompted to enter an Admin password. Enter the password and press ENTER to return to the **IP** screen. Press ENTER again to change the following settings for **Manual** boot mode only.

- **IP:** Enter the IP address assigned to the Network Management Card of the cooling unit.
- **SM:** Enter the subnet mask for the Network Management Card of the cooling unit.
- **GW:** Enter the default gateway for the Network Management Card of the cooling unit.

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 **View Unit Status** option in the main menu, and status readings for the cooling group are available under the **View Group Status** option on the main menu or on the scrolling status screens.

Scrolling status screens

When the display interface is idle, it scrolls through screens of status information. Press the up or down arrow key to interrupt the automatic scrolling and view a specific status screen.

Cooling unit status

Path: Main > View Unit Status

View information specific to this cooling unit.

Op 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.
- **Assist**: A Backup unit is operating due to a request for cooling assistance.
- **Backup**: The unit has been designated as a backup unit and is in the standby state.

 For more information, see "Idle On Leak" on page 20.

Cool Outpt: The actual cooling output of the cooling unit.

Cool Demnd: The amount of cooling that the heat load currently requires.

Supply Air: The average temperature of the air leaving the cooling unit, as measured by the upper and lower supply air temperature sensors.

Return Air: The temperature of the air entering the cooling unit.

Max Rack In: The highest reading of the three rack inlet temperature sensors determines the rack temperature.

Rack In #n: The temperature of the air entering the rack at the remote temperature sensor.

Air Flow: 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.

Filter DP: The filter differential pressure.

Suct Pres (Suction Pressure): The pressure at the compressor inlet.

Disc Pres (Discharge Pressure): The pressure at the compressor outlet.

Compressor Drive: Speed: The compressor speed.

Compressor Drive: Power: The compressor power consumption.

Compressor Drive: Voltage: The compressor voltage.

Compressor Drive: Current: The compressor current draw.

Compressor Drive: DC Link: The compressor internal direct current (DC) link voltage.

Compressor Drive: Heat Sink: The compressor heat sink temperature.

Compressor Drive: Ctrl Card (Control Card): The compressor control card temperature.

Compressor Drive: Warn Stat: The compressor warning word used for diagnostics.

Compressor Drive: Alrm Stat: The compressor alarm word used for diagnostics.

Cooling group status

Path: Main > View Group Status

View information about the cooling group.

Cool Output: The combined output of the cooling group.

Cool Demand: The cooling output required to meet the current heat load of the conditioned space.

Cool Setpt: The temperature you set to maintain the room environment.

Max Rack: The highest rack temperature reported by any cooling unit in the cooling group.

Min Rack: The lowest rack temperature reported by any cooling unit in the cooling group.

Air Flow: The combined airflow output of the cooling units in the cooling group.

About the cooling unit

Path: Main > About InRow RD

View identifying information that is helpful when obtaining service:

- **Model**: Model number
- **S/N**: Serial number
- **F/W**: Display interface firmware revision
- **H/W**: Hardware revision
- **Made**: Date of manufacture
- **RP APP**: Application version
- **AOS Ver**: OS version

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 > View 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 > Clear Event Log

A confirmation screen is displayed when you select this option. Enter the Admin password to erase the log. Select **YES** to erase all of the events in the log. Select **NO** to return to the main 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 > View Alarms

The **View Alarms** screen provides the number of alarms, the severity, and a brief description of the alarm. Press the arrow keys to view the rest of the list.

Clear active alarms

Path: Main > Clear Alarms

A confirmation screen is displayed when you select this option. Enter the Admin password to clear the alarm list. Select **YES** to clear all of the alarms in the list. Select **NO** to return to the main screen. If the conditions that caused the alarm still exist, those conditions cause the alarm to be regenerated.

Alarm messages and suggested actions

Alarm Message	Severity	Action Required
Active Flow Controller Sensor Fault	Warning	• Check the AFC hardware and wiring. Replace the AFC. 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	Critical	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Compressor Drive Communication Fault	Critical	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.

Alarm Message	Severity	Action Required
Compressor Drive Fault	Critical	• A hardware problem may exist. • For assistance, contact Schneider Electric technical support.
Compressor Drive Locked	Critical	• Resolve the VFD fault. Power cycle the unit to reset. If the problem persists, contact Schneider Electric technical support.
Compressor Drive Warning	Warning	• For assistance, 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.
Compressor High Pressure Alarm	Critical	• For assistance, contact Schneider Electric technical support.
Compressor Run Hours Violation	Warning	• At the display interface, make sure the **Compressor** run hours setting is correct in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
Condensate Pan Full	Critical	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Condensate Pump Run Hours Violation	Warning	• At the display interface, reset the **Condensate Pump** run hours in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
Cooling Failure	Critical	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Discharge Pressure Sensor Fault	Warning	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
EcoAisle Door Open	Warning	• Verify the EcoAisle door is shut properly. • If the problem persists, contact Schneider Electric technical support.
Excessive Compressor Cycling	Warning	• For assistance, contact Schneider Electric technical support.
External Communication Fault	Critical	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Fan #n Fault	Warning	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Fan #n Run Hours Violation	Warning	• At the display interface, reset the **Fans** run hours in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
Filter Sensor Fault	Warning	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Group Communication Lost	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.
High Discharge Pressure Alarm	Warning	• Check condenser for obstructions. • If the problem persists, contact Schneider Electric technical support.
Persistent High Head Pressure Fault	Critical	• Indicates there were four **Compressor High Pressure** shutdowns in 30 minutes. Alarms must be cleared manually. • If the problem persists, contact Schneider Electric technical support.
High Suction Pressure Fault	Warning	• Check that load is not greater than the cooling capacity rating on the unit. • A hardware problem may exist. • If the problem persists, contact Schneider Electric technical support.

Alarm Message	Severity	Action Required
Insufficient Airflow	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 Fault	Critical	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Low Suction Pressure Fault	Warning	• Check the air filter and evaporator for obstructions. • For assistance, contact Schneider Electric technical support.
No Backup Units Available	Warning	• Check to make sure cooling units in the group are set to **Configure Unit > General > Roll Over > Disable** and that cooling units are available (not in a failed state). • For assistance, contact Schneider Electric technical support.
On Standby: Input Contact Fault	Warning	• At the display interface, make sure the **Input Normal State** is defined correctly in the **Set Unit Threshlds** screen. • Clear the problem that caused the input contact switch to change from its normal state. • If the problem persists, contact Schneider Electric technical support.
Rack Inlet #n High Temperature Violation	Critical	• Make sure the temperature sensor is connected and placed properly. • Make sure the **Rack Inlet** threshold is set correctly in the **Set Unit Threshlds** screen. • For assistance, contact Schneider Electric technical support.
Rack Inlet #n Temperature Sensor Fault	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 Violation	Warning	• Make sure the **Return Air** threshold is set correctly in the **Set Unit Threshlds** screen. • If the problem persists, contact Schneider Electric technical support.
Return Air Sensor Fault	Critical	• Make sure the sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Suction Pressure Sensor Failure	Warning	• A hardware problem may exist. For assistance, contact Schneider Electric technical support.
Supply Air High Temperature Violation	Warning	• Make sure the temperature sensor is connected properly. • Make sure the **Supply Air** threshold is set correctly in the **Set Unit Threshlds** screen. • If the problem persists, contact Schneider Electric technical support.
Supply Air Sensor Fault (upper or lower)	Critical	• Make sure the faulty sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric technical support.
Supply Humidity Sensor Fault	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 problem persists, contact Schneider Electric technical support.
VFD Inverter Over Heated	Critical	• The VFD will restart once the inverter cools. • If the problem persists, contact Schneider Electric technical support.
Water Detection Fault	Warning	• Identify the source of the leak. • For assistance, contact Schneider Electric technical support.
Water Detection Shutdown	Critical	• System configured to shut down when leak has been detected. Identify the source of the leak. • For assistance, 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 control console" on page 39.)
- Networked computer (See "Remote access to the control console" on page 39.)

Device IP Configuration Wizard

You can use the Device IP Configuration Wizard at a computer running Microsoft® Windows® 2000, Windows® Server 2003, or Windows® XP to configure a Network Management Card.

NOTE: Most software firewalls must be temporarily disabled for the Wizard to discover unconfigured Network Management Cards.

To configure one or more Network Management Cards from a user configuration file, see the *User Guide* available on the Schneider Electric Web site, **www.schneider-electric.com**.

1. Download the Device IP Configuration Wizard from the Schneider Electric Web site: **www.schneider-electric.com**.

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 setting, **BootP & DHCP**, assumes that a properly configured BootP or DHCP server is available to provide TCP/IP settings to Network Management Cards. The Network Management Card first attempts to discover a properly configured BootP server, and then a DHCP server. It repeats this pattern until it discovers a BootP or DHCP server.

If neither of these servers is available, see "Local access to the control console" on page 39, or "Remote access to the control console" on page 39 to configure the needed TCP/IP settings.

A user configuration (.ini) file can function as a BootP or DHCP boot file. For more information, see the TCP/IP configuration section of the *User Guide*, available from the Schneider Electric Web site, **www.schneider-electric.com**.

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 boot-up file name. Look for the MAC address on the display interface (**Path: Main > Configure Network**) or on the label on the back of the Network Management Card.

2. When the Network Management Card reboots, the BootP server provides it with the TCP/IP settings.

   – If you specified a boot-up file name, the Network Management Card attempts to transfer that file from the BootP server using TFTP or FTP. The Network Management Card assumes all settings specified in the boot-up file.

   – If you did not specify a boot-up file name, you can configure the other settings of the Network Management Card remotely through its Web interface or control console; user name and password are both **apc**, by default.

See your BootP server documentation to create a boot-up file.

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

This section summarizes communication between the Network Management Card and a DHCP server. For more details about how a DHCP server can configure the network settings for a Network Management Card, see "DHCP Configuration" in the *User Guide*.

1. A Network Management Card sends out a DHCP request that uses the following to identify itself:
   – A Vendor Class Identifier (APC by default)
   – A Client Identifier (by default, the MAC address value of the Network Management Card)
   – A User Class Identifier (by default, the identification of the application firmware of 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). By default, the Network Management Card will ignore DHCP offers that do not encapsulate the cookie in the Vendor Specific Information option 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 cookie

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

To change the control console **DHCP Cookie Is** setting, use the **Advanced** option in the TCP/IP menu. See "Remote access to the control console" on page 39.

To disable the requirement that a DHCP offer include the cookie, use the **DHCP Cookie Is** setting in the control console:
Network > **TCP/IP** > **Boot Mode** > **DHCP only** > **Advanced** > **DHCP Cookie Is**.

Local access to the control console

You can use a computer connected to the serial port on the main board holding the Network Management Card to access the control console.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the configuration cable to connect the selected port to the serial port on the main board holding the Network Management Card. Use either the 6-ft (1.8-m) cable that came with your InRow RD (940-0103), or AP9804 (BroadBand Current Sensor Harness Assembly), the 15-ft (4.6-m) cable available from Schneider Electric.
3. Run a terminal program (such as HyperTerminal) and configure the selected port for 9600 or 19200 bps, 8 data bits, no parity, 1 stop bit, and no flow control. Save the changes.
4. Press ENTER to display the **User Name** prompt.
5. Use **apc** for the user name and password.

See "Control console" on page 40 to finish the configuration.

Remote access to the control console

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

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

1. Use the MAC address for the Network Management Card in the ARP command to define the IP address. 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:

   – 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
   ```

   NOTE: The MAC address is available on the display interface at:
   Path: Main > Configure Network or look at the label on the back of the Network Management Card for the MAC address.

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 user name and password.

   See "Control console" on page 40 to finish the configuration.

Control console

After you log on at the control console, as described in "Local access to the control console" on page 39 or "Remote access to the control console" on page 39:

1. Choose **Network** from the **Control Console** menu.
2. Choose **TCP/IP** from the **Network** menu.
3. If you are not using a BootP or DHCP server to configure the TCP/IP settings, select the **Boot Mode** menu and then select **Manual boot mode**.
4. Set the **System IP**, **Subnet Mask,** and **Default Gateway** address values. (Changes will take effect when you log out.)
5. Press ENTER to return to the **TCP/IP** menu.
6. Press CTRL+C to exit to the **Control Console** menu.
7. Log out (option 4 in the **Control Console** menu).
   NOTE: If you disconnected a cable from the local computer during the procedure described in "Local access to the control console" on page 39, reconnect that cable and restart the associated service.

Access a Configured Network Management Card

Overview

After the Network Management Card is running on your network, you can access the configured Network Management Card through the following interfaces:

- Web interface (HTTP or HTTPS protocol)
- Telnet or Secure SHell (SSH)
- SNMP
- FTP or Secure CoPy (SCP) to upgrade firmware
- Modbus

For more information on the interfaces, see the *User Guide*.

Web interface

Use Microsoft® Internet Explorer® (IE) 5.5 and higher (on Windows® operating systems only), browsers that support Mozilla® Firefox® 1.*x* (on all operating systems), or Netscape® 7.*x* and higher (on all operating systems) to access the Web interface of the cooling unit. 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 interface:

- 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 device on the network:

1. Address the Network Management Card by its IP address or DNS name (if configured).
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator).
3. To enable or disable the HTTP or HTTPS protocols, use the **Network** menu on the **Administration** tab, and select the **access** option under the **Web** heading on the left navigation menu.

   For more information on selecting and configuring network security, see the *Security Handbook*, available from the Schneider Electric Web site, **www.schneider-electric.com**.

Telnet and SSH

You can access the control console through Telnet or Secure SHell (SSH), depending on which is enabled. Select the **Administration** tab, the **Network** option on the top menu bar, and then the **access** option under **Console** on the left navigation menu. By default, Telnet is enabled. Enabling SSH automatically disables Telnet.

Telnet for basic access: Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. To use Telnet to access the control console of the Network Management Card:

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

   `telnet address`

As *address*, use the IP address of the Network Management Card 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 control console. SSH encrypts user names, passwords, and transmitted data.

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

See the *User Guide* for more information on configuring and using SSH.

Simple Network Management Protocol (SNMP)

SNMPv1 only: After you add the PowerNet® MIB to a standard SNMP MIB browser, you can use that browser to access the Network Management Card. 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 a MIB program that supports SNMPv3.

NOTE: The Network Management Card supports only MD5 authentication and DES encryption.

SNMPv1 and SNMPv3: To use StruxureWare Data Center Expert to manage the Network Management Card, you must have SNMPv1 enabled in the unit interface. Read access allows devices to receive traps. 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 the **Administration** tab, select the **Network** menu on the top menu bar, and use the **access** option under **SNMPv1** or **SNMPv3** on the left navigation menu.

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 event or data logs of the cooling unit. SCP provides the higher security of encrypted data transmission and is enabled automatically when you enable SSH.

To use StruxureWare Data Center Expert to manage the Network Management Card, you must have the **FTP Server** enabled in the Network Management Card. To enable or disable **FTP Server** access, you must be an Administrator. On the **Administration** tab, select the **Network** menu on the top menu bar, and use the **FTP server** option on the left navigation menu.

In the *User Guide*, 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 interface supports 2-wire RS-485, plus ground.

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, which are not changeable.

To access the Modbus register map, go to the Schneider Electric Web site, **www.schneider-electric.com**.

Recover a Lost Password

You can use a local computer (a computer that connects to the Network Management Card through the serial port) to access the control console.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the provided RS-232 configuration cable to the selected port on the computer and to the RS-232 console port at the Network Management Card.
3. Run a terminal program (such as HyperTerminal) on your computer and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.

1. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:
   – The serial port is not in use by another application.
   – The terminal settings are correct as specified in step 3.
   – The correct cable is being used as specified in step 2.
2. Press the **Reset** switch. The Status LED will flash alternately orange and green. Press the **Reset** button a second time immediately while the LED is flashing to reset the user name and password to their defaults temporarily.
3. Press ENTER as many times as necessary to redisplay the **User Name** prompt, then use the default, **apc,** for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is redisplayed, you must repeat step 5 and log on again.)
4. From the **Control Console** menu, select **System**, then **User Manager**.
5. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**.
6. Press CTRL+C, log off, reconnect any serial cable you disconnected, and restart any service you disabled.

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 is the cooling unit located?
_____

❑   Is the cooling unit maintaining the temperature setpoint?
_____

Temperature setpoint _____

❑   Is there visible damage to the cooling unit (dents, scratches)?
_____
_____
_____

❑   Check for environmental damage (dirt, dust, debris, liquid stains) around the cooling unit installation area.
_____
_____
_____

❑   Record the room temperature near the air return of the cooling unit.

Temperature _____

❑   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 for tight connections and for overheated connections from loose contact terminals.

❑ Confirm that the incoming main power matches the rating listed on the nameplate of the cooling unit. The measurement should be within 10% of the nameplate listing.

Quarterly Preventive Maintenance

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

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

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.

❑   Verify that the fan hardware is tight.

❑   Clean or replace the air filters.

❑   Clean the condensate drain line.

❑   Clean the dust from door perforations.

❑   Clean the dust from fan bezels.

Functional tests

❑   Verify the cooling operation mode is functioning properly.

Semi-Annual Preventive Maintenance

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

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Cleanliness

❑ Check the cleanliness of the evaporator coil. Clean if required.

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 at a number located on the rear of this manual.
	• 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/low	• 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.
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.

Problem	Possible Cause	Corrective Action
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 ≤50 mA. • Test the external equipment by bypassing the customer output contact. • Verify Customer Output Contact settings. See "Contacts" on page 22.
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 22.
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.