

RSC 1000 User Manual



Rev 2.2 10/25/16

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Lithium Battery Notice

Replace Battery with R/C (BBCV2), Lithium Battery, rated 3.3Vdc, with a maximum charge current rating of 2mA or greater. Use of another Battery May Present A risk Of Fire or Explosion.

CAUTION - battery may explode if mistreated. **Do Not** recharge, disassemble or dispose of in fire.

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1 Overview

THE RSC 1000 is a specific purpose controller designed to Monitor and Control remote network facilities that have up to two HVAC systems for maintaining the temperature in the facility. In addition to standard Lead/Lag control of the HVAC systems, the RSC 1000 has advanced patent pending control algorithms to optimize the control of the economizers, whether they are part of the HVAC systems or standalone economizers. The RSC 1000 also monitors the entire facility and provides alarm status and historical logging of critical infrastructure equipment to ensure proper network operation. The system has the ability to monitor multiple temperature sensors, digital inputs for commercial power and generator operation, smoke detection, gas alarms, intrusion etc. This manual is designed to assist the installer and users to get the system quickly installed and operational in order to control and monitor the facility.

1.1 Getting Started

With a quick and easy installation, the RSC 1000 allows you to start controlling and monitoring your facility right away. The basic steps are listed below along with a chapter reference for this manual:

1. Mount the RSC 1000 in the desired location. (section 2.1)
2. Connect the inputs to be monitored to the system. (section 2.3)
3. Connect the HVAC systems to be controlled. (section 2.6)
4. Power the system. (section 2.2)
5. Wire the alarm outputs. (section 2.3)
6. Connect the RSC 1000 to an Ethernet switch and configure the IP settings. (section 2.4)
7. Run the Wizard from the front panel User Interface. (section 3.1)
8. Adjust control and alarm setpoints. (section 3.5 for the touchscreen or 4.6 for the web server)
9. Configure the alarm distribution. (section 3.6.6.2 for the touchscreen and section 4.7.1.4, 4.7.2.1 for the web server)

2 Installation

The RSC 1000 is designed to be wall-mounted inside the controlled and monitored facility. This section will provide basic guidelines for installing the system. Refer to specific installation drawings for your particular application or contact Quest Controls, Inc. for assistance if your application is not covered in this section. All local and national electrical safety standards must be followed when installing the RSC 1000. If there is any contradiction in this manual and those standards, then the installer must follow the local and national standards. Use copper conductors only.

2.1 Mounting

Mount the RSC 1000 on an interior wall in a location that is accessible for wiring and attainable to the color touchscreen on the front of the system. It is recommended to mount the controller no higher than six feet above the finished floor so that the touchscreen is easily accessible. Use appropriate mounting hardware (screws, anchors etc.) based on the wall material to properly secure the RSC 1000 to the wall. The RSC 1000 has two keyhole mounts at the top of the enclosure and two mounting holes at the bottom of the enclosure. Attach the top two mounting screws to the wall and then slide the RSC 1000 onto the screws. Use a level to ensure the enclosure is straight and then tighten the top two screws. Add the additional two screws in lower section of the chassis to ensure the enclosure is securely mounted to the wall. Knockouts are provided on all sides for conduit and routing of wires into the enclosure.

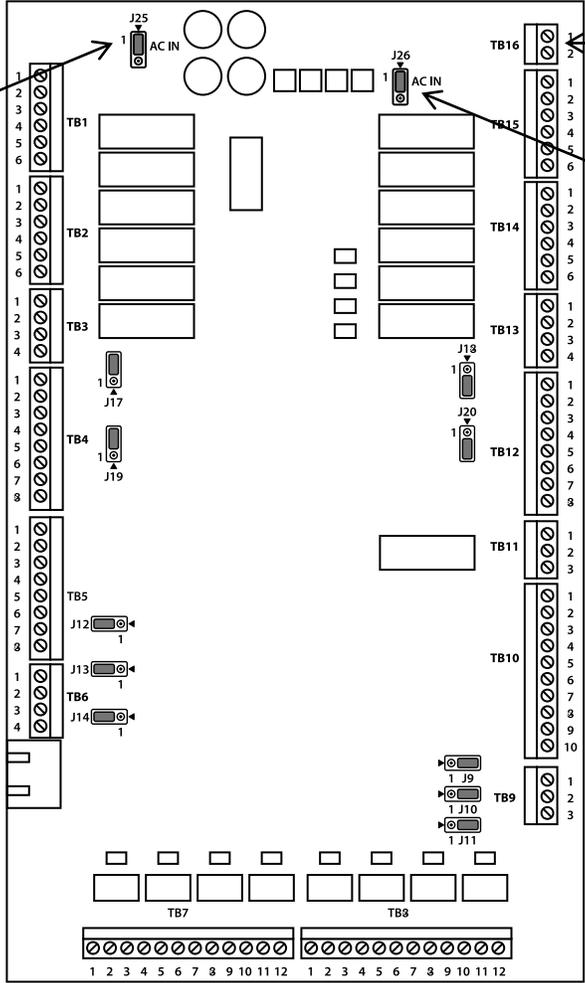
2.2 Powering the System

The RSC has three sources for being powered. All three can be used simultaneously to provide redundancy to the system. The RSC 1000 can get 24VAC power from each HVAC system being controlled when the R (24vac hot) and C (24VAC common) terminals are connected to the system. Additionally, there is a separate 18-65 VDC input on the upper left corner of the IO board for connection to the facilities DC plant. The DC plant takes precedence over the power from the HVAC systems, but if any source should fail, the system will switch seamlessly to the next available source and continue to operate. If the application requires the HVAC 24VAC to not power the RSC 1000, there are jumpers on the board to isolate the voltage for control only and not powering the RSC 1000. The system will still monitor the presence of the 24VAC voltage from the HVAC unit to determine if power is lost, requiring a switch of the lead HVAC system.

HVAC 1 - J25 default is up (pin 1 & 2) to power the RSC from the HVAC. Move to pin 2 & 3 to not power the RSC from the HVAC

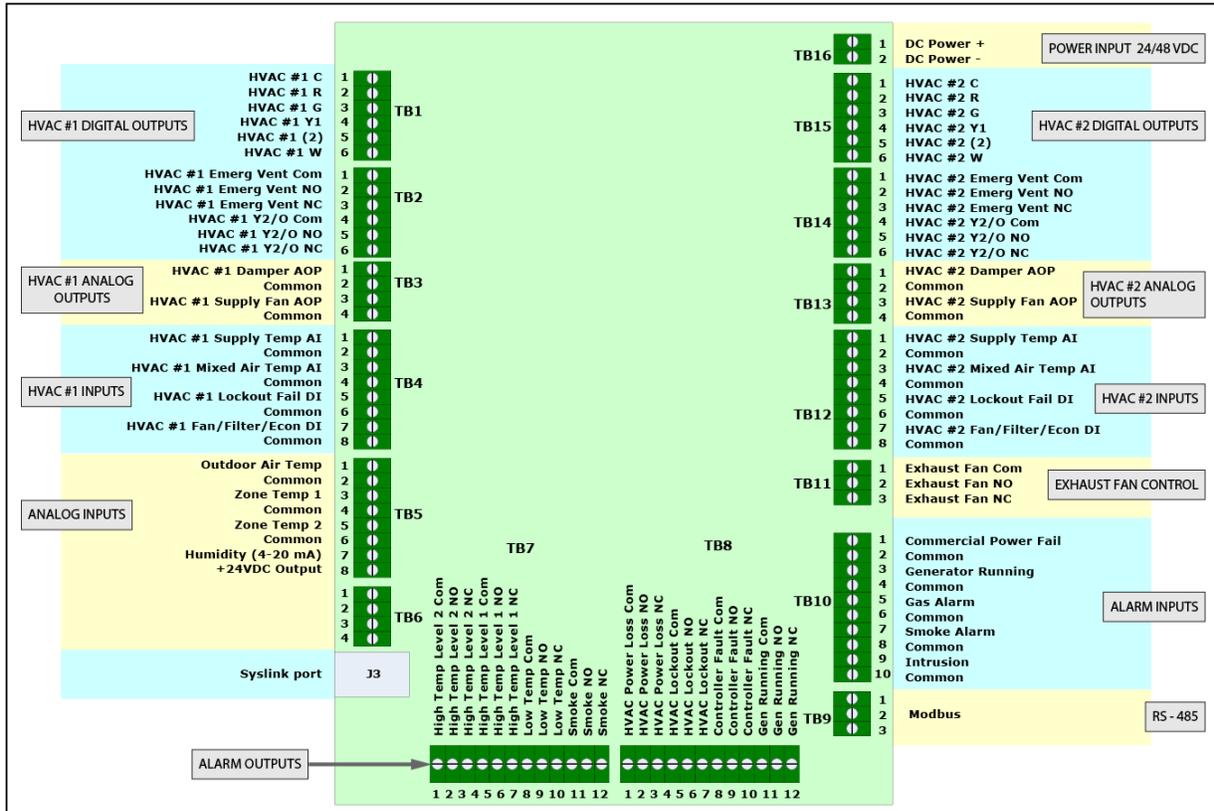
Optional 18-65 VDC power

HVAC 2 - J26 default is up (pin 1 & 2) to power the RSC from the HVAC. Move to pin 2 & 3 to not power the RSC from the HVAC



2.3 Wiring Inputs and Outputs

Use the following guide for wiring the monitoring and control points for your application. Temperature sensors are thermistor devices and are not polarity sensitive. For the Humidity sensor, make sure you wire the Power and Input terminals to the appropriate terminals. Follow the directions that come with the sensor. The alarm outputs are actually energized under normal condition and de-energize when an alarm occurs. The diagram shows the outputs in their “normal” or non-alarm condition.



2.4 Network Connection

Run a Cat5e cable from the assigned Ethernet port on the network switch to the RSC 1000. Route the cable into the enclosure and connect to the logic board on the door using an RJ45 connector. Secure the cable inside the RSC 1000 to the existing standoff and cable relief connectors in the enclosure.

2.5 Wiring Types

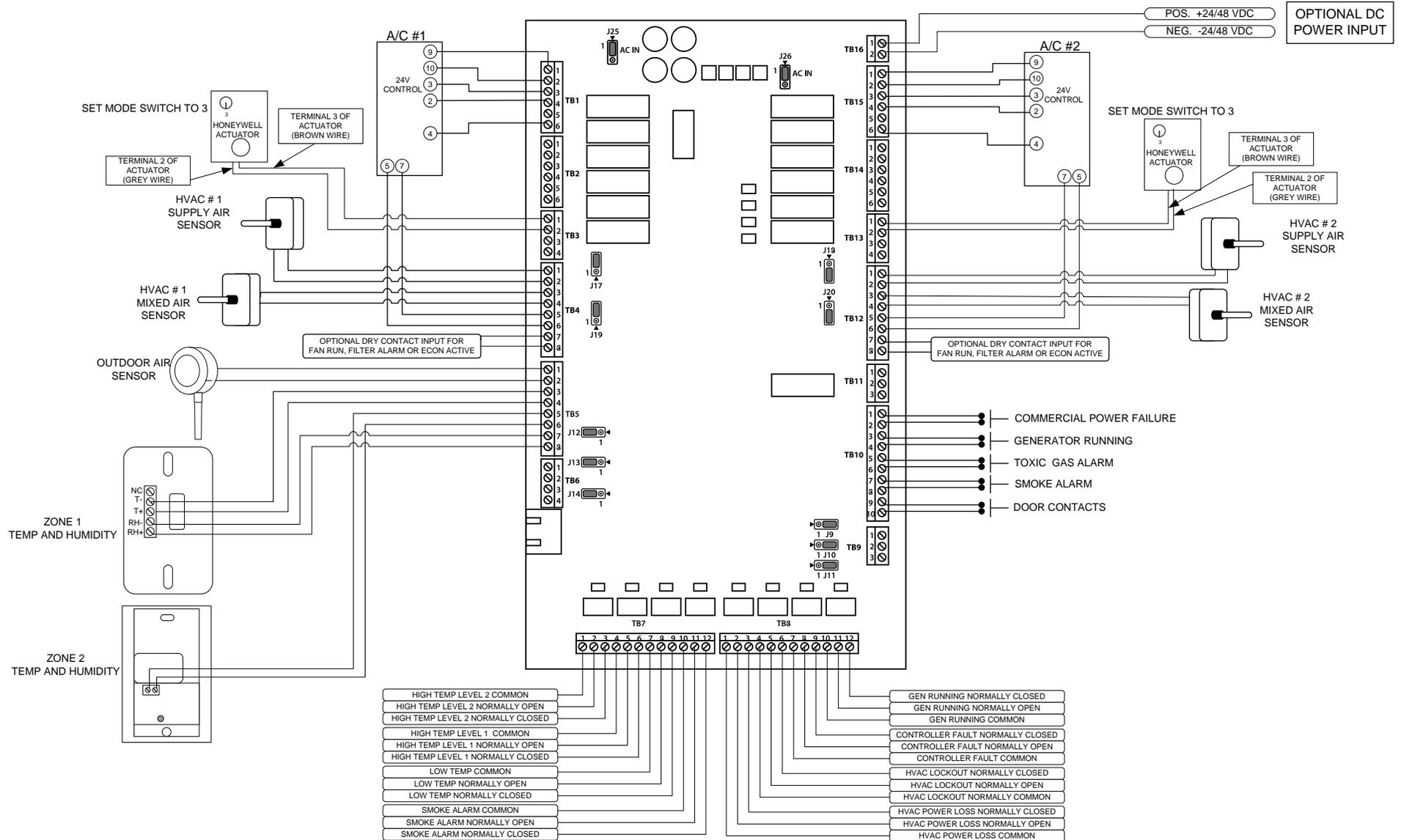
The following chart contains the recommended wire types for the inputs and outputs.

WIRE MATRIX		
Description	Cable Part Number	Usage
Cable, 2 Cond, 18 AWG, Unshld, Strnd (RED,BLACK)	Belden 6300UE	Power Supply to RSC 1000 and digital input monitor points
Cable, 2 Cond, 22 AWG, Shld, Solid (RED, BLACK)	Belden 6520FE	All temperature sensor inputs. Damper motor control from analog output.
Cable, 4 Cond, 20 AWG, Shld, Strnd 9 (RED, BLACK, WHITE, GREEN)	Belden 6402FE	Zone 1 combination temperature and humidity sensor. Can also be used for supply and mixed air sensors.
Cable, Cat5e, 4 Pair, 24 AWG, Unshld, Solid, (STD ETHERNET COLORSBlue	Belden 1700A	RSC 1000 to Router/Switch
Cable, 4 Pair, 24 AWG, Unshld, Solid	Belden 1245A2	Alarm outputs
Cable, 12 Pair, 24 AWG, Solid	CM-01224BAG-3	Alternate for alarm outputs
Cable, 8 Cond, 18 AWG, Unshld, Sld, T-Stat	Coleman 55308	HVAC control wiring
Cable, 2 Pair, 24 AWG, Shld, Strand (WHT/BLU, BLU/WHT, WHT/ORG, ORG/WHT)	Belden 88102	Modbus Cable

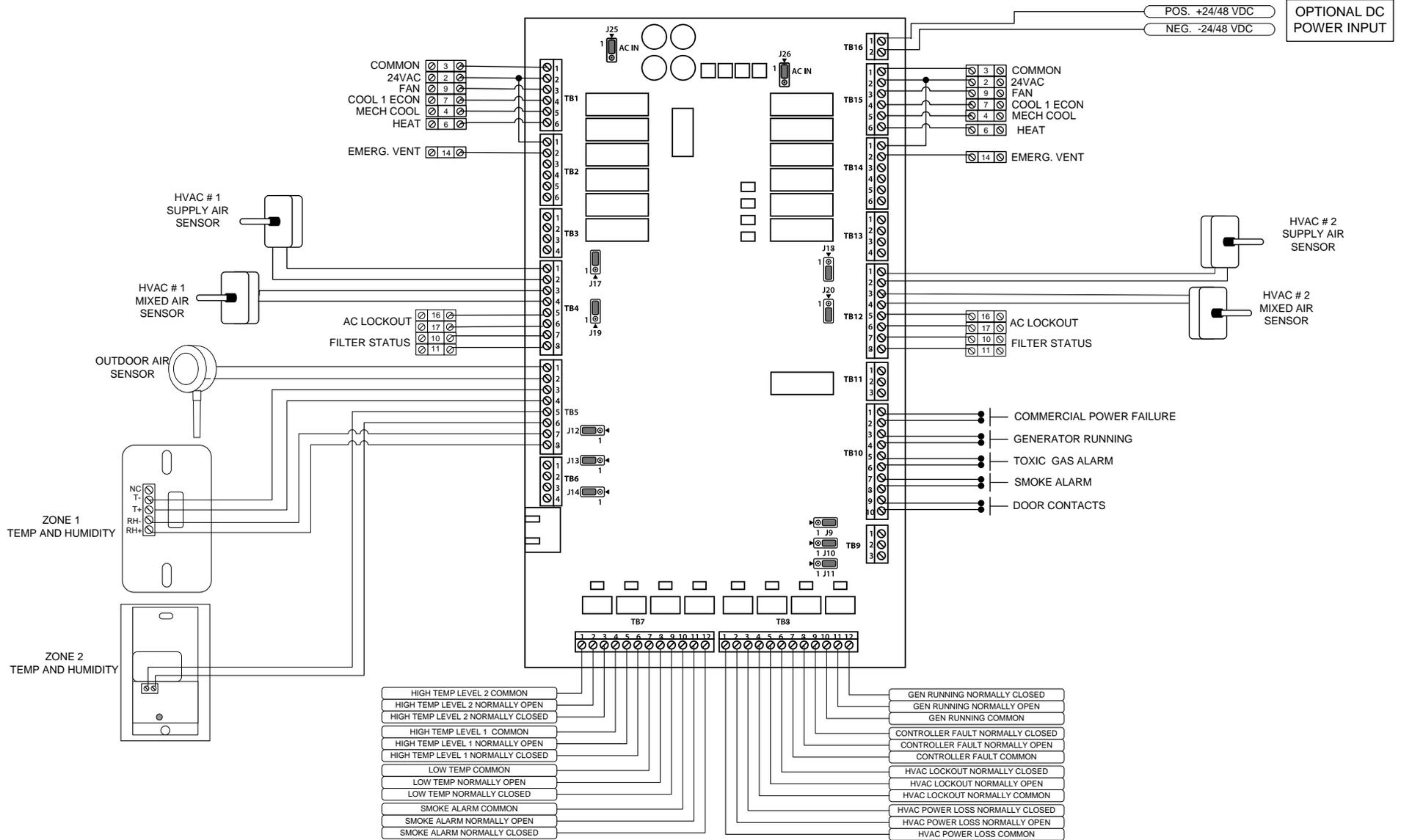
2.6 Typical installation drawings

Below are some typical installation drawings for HVAC systems with Integrated Economizer control and when the RSC 1000 is controlling the economizer damper directly. Please contact Quest Controls for assistance if your application differs from these examples.

2.6.1 Direct Control of Economizer Damper Motor



2.6.2 Economizer Control With Integrated Controller



3 Front Panel Operation

The RSC 1000 has a color touchscreen display for configuring, programming and reviewing operating conditions. When the system is powered up for the first time, the system will require the user to go through the Setup Wizard so the RSC 1000 knows what inputs are attached and how to control the HVAC systems.

3.1 Running the Setup Wizard

The Setup Wizard must initially be operated from the touchscreen as the first step in order for the system to operate properly. Later, users with the proper credentials can run the Setup Wizard from the Web Server. If the Wizard is cancelled before completion, you can get back to it by clicking on the menu hamburger in the lower left corner of the touchscreen. Select Settings and then Run Wizard Setup. Anytime the Wizard is ran and completed, the system will ask you to do a reboot at the end so the system can come up and run with the proper configuration.

3.1.1 Wizard Introduction

The first screen introduces the Setup Wizard function and asks that you continue. You must answer all the questions to the end in order for your changes to take place. On subsequent screens, you will see the current selection to the question with a darker background color. At each screen, you can select one of the choices or press the Next button to accept the current setting and move to the next question. Pressing the Back button will take you back to the previous question and allow you to modify your answer.



3.1.2 Temperature Units

Pressing the Next key on the welcome screen will bring up the Temperature unit question. Select Fahrenheit or Celsius for the readings desired.



The system must have at least one zone sensor connected to operate the HVAC system. The RSC 1000 supports two zones sensors that can be used in the control sequence. If only one sensor is used then it must be wired to the Zone 1 input terminals on the RSC 1000 IO board.



3.1.3 Controlling Sensor

This menu appears only if you selected two zone sensors on the previous question. Here you have the option of which sensor(s) to use when making control decisions. If you select Both Averaged or Highest of Both, then the RSC 1000 will use both sensors in determining the control sensor value. Note that if either sensor should fail the RSC 1000 will automatically use the one working sensor.



3.1.4 Supply Air Sensor

Answer Yes if supply air (discharge air) sensors are being used to monitor the performance of the HVAC systems. The RSC has alarm notices that the user can setup if the cooling or heating is not running properly. These alarms are not available if the user answers NO to this question.



3.1.5 Mixed Air Sensors

Mixed air sensors are necessary when the RSC 1000 takes direct control of the economizers. They are used to modulate the damper position to maintain a desired mixed air temperature between the outside air and the supply air. Economizer control is still possible when the mixed air sensor is not

present or in error. In those cases the RSC 1000 will look at the outside air sensor (OSA) and will economize provided that the OSA does not drop below the user defined Mixed Air Setpoint.



3.1.6 Humidity Sensor

The humidity sensor is used to monitor the humidity inside the facility and alarm if the %RH is above or below alarm thresholds. The humidity sensor, if present, is also used in the economizer control sequence to disable economizer mode if the humidity in the facility is greater than a user definable setpoint.



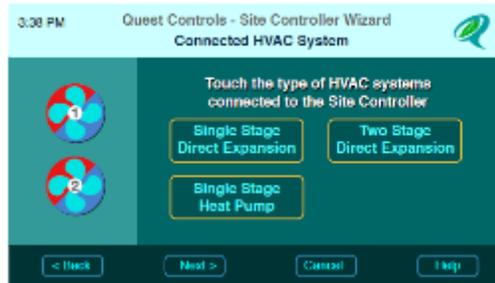
3.1.7 Outside Air Sensor

In order to use the advanced economizer control functions of the RSC 1000, you must have an outside air sensor. This sensor is used to make decisions on when to use economizers and whether it is acceptable. This is true when taking direct control of the economizer dampers through the analog outputs or if the RSC 1000 is supervising control of integrated economizers. Basic economization is still possible with integrated economizers within an HVAC unit, but the advanced features of floating the OSA setpoints will be omitted.



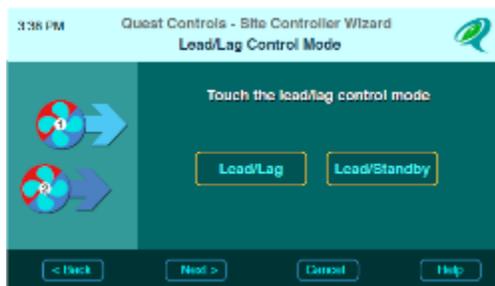
3.1.8 HVAC System Type

The RSC 1000 supports three HVAC system types: Single Stage Direct Expansion, Two Stage Direct Expansion and Single Sage Heat Pump. All HVAC systems being controlled must be the same type to operate properly because the RSC 1000 will turn on the appropriate outputs for control, depending on what HVAC system type is connected to the system.



3.1.9 Lead/Lag Control Mode

There are three control mode options supported by the RSC 1000. Lead/Lag is used when there are two HVAC systems and you want them to rotate operation based upon time. In this mode, the RSC 1000 can bring on the lag system if needed to augment the lead system. Additionally in economizer mode, the RSC can use the Lag unit as a second stage for economization, preventing the lead system from switching into mechanical mode if the facility temperature can be maintained with both units running. Lead/Standby means that only one unit can operate at a time. The system will only switch to the Standby unit if the lead system fails to operate or if the temperature in the facility gets above the second high temp limit setpoint. Choosing Single Unit means there is only one HVAC system and the system will not attempt to switch to a second HVAC unit. Single Unit configuration must have the HVAC system wired to the HVAC 1 terminals (left side of the RSC IO board).



3.1.10 Economizer Control Method

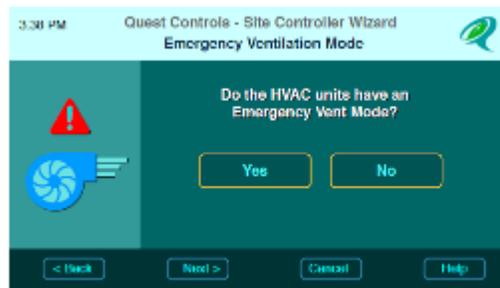
There are three options for economizer control. None Present tells the RSC 1000 to ignore economizer control operation and use mechanical cooling only for maintaining the facility temperature. Integrated with HVAC means that the HVAC unit has a built in economizer control module. In this case, the RSC 1000 will provide a "Call for Cooling" output to the HVAC unit and it is up to the HVAC unit to determine if economization can be used. If the RSC 1000 is monitoring the OSA temperature, it is recommended that the integrated economizer be set to the highest available external temperature. The RSC will then determine when to use the economizer and, if needed, will send a second output to the HVAC unit to force the system into mechanical cooling. Modulating using Analog Outputs is the preferred option for

economizer control. This allows the RSC 1000 to take direct control of the economizer damper and decide when to use economization. The Analog Output for controlling the damper can be configured for 0-10 VDC (default) or 4-20mA through jumper shunts on the IO board. When controlling the damper motor directly, make sure it is configured correctly for the analog output type being used on the RSC 1000.



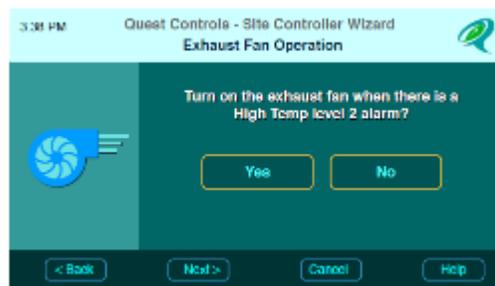
3.1.11 Emergency Vent Mode

Some HVAC systems have a separate control point to force the HVAC unit into emergency vent. The RSC 1000 can force the system into emergency vent in the event of a gas alarm, mechanical AC failure of both HVAC units or a high facility temperature condition.



3.1.12 Exhaust Fan Operation

The RSC 1000 has a form C output for controlling a separate DC fan. Answering Yes to this question will have the exhaust fan turn on if the temperature in the facility exceeds the high temp level 2 alarm threshold. Answering No to this question will cause the fan to only operate when there is a gas alarm condition or if both HVAC units fail.



3.1.13 Supply Fan Operation

The fans turn on automatically when a call for cooling or heating takes place. Lead supply Fan Always On means the lead fan will always run, with the exception of a shutdown event such as a smoke alarm input. The lag fan will cycle on as needed with a call for cooling. Both Fans Always On will turn on both fans and leave them running continuously unless there is a shutdown event.



3.1.14 Run Both Fan Temp Delta

If the fans are set to Automatic or Lead Fan Run Continuous, the system can cycle on the lag fan if the difference in temperature between the two zone sensors exceeds this setting. A value of 0 turns off this function.



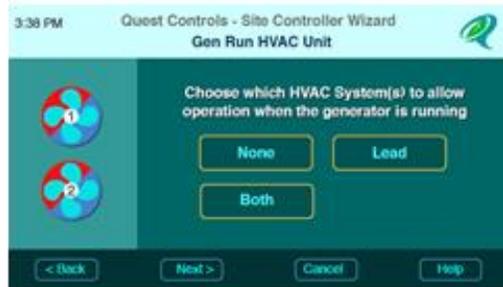
3.1.15 Fan Cycle Delay

A delay in minutes can be added to the fan control before the fan will cycle off. This is used for fans defined as Automatic and you want the fan to run for a period of time after the call for cooling or heating has ended.



3.1.16 Generator Run mode for HVAC

The RSC 1000 has an input for monitoring the emergency generator. The user can select if one, both or none of the HVAC units are allowed to operate when the generator is running. Note: this does not force on the HVAC, but can limit which units are allowed to operate if there is a call for cooling.



3.1.17 Smoke Alarm

Configure the alarm input for the smoke detector. The RSC 1000 supports normally open or normally closed alarm contacts. Select the option based upon how the input is wired to the RSC 1000. Note: to prevent false alarms you must choose normally open if a Smoke detector is not connected.



3.1.18 Commercial Power

Configure the alarm input for the Commercial Power Failure. The RSC 1000 supports normally open or normally closed alarm contacts. Select the option based upon how the input is wired to the RSC 1000. Note: to prevent false alarms you must choose normally open if a power failure monitor is not connected.



3.1.19 Generator Run Monitor

Configure the input for Generator running. The RSC 1000 supports normally open or normally closed contacts. Select the option based upon how the input is wired to the RSC 1000. Note: to prevent false alarms you must choose normally open if the generator run monitor is not connected.



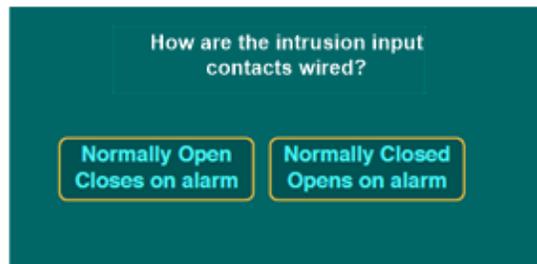
3.1.20 Gas Alarm

Configure the alarm input for the Gas detector. The RSC 1000 supports normally open or normally closed alarm contacts. Select the option based upon how the input is wired to the RSC 1000. Note: to prevent false alarms you must choose normally open if a Gas detector is not connected.



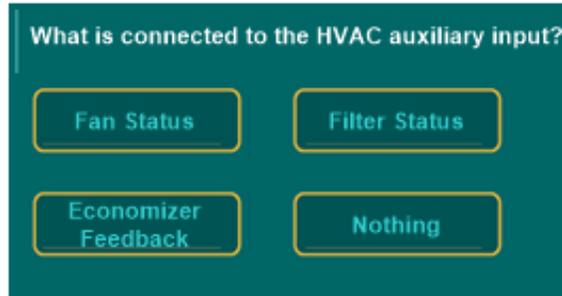
3.1.21 Intrusion Alarm

Configure the alarm input for the door contacts. The RSC 1000 supports normally open or normally closed alarm contacts. Select the option based upon how the input is wired to the RSC 1000. Note: to prevent false alarms you must choose normally open if door intrusion is not being monitored.



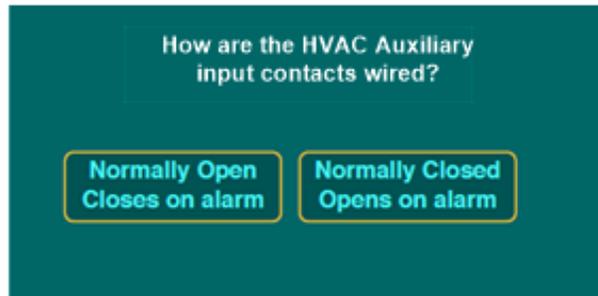
3.1.22 HVAC Auxiliary Input

There is an auxiliary input for each HVAC system that can be configured to monitor the Fan Status, Filter Status, Economizer Feedback or Nothing (for not being used). Select the option desired for monitoring. The RSC 1000 will create alarm options based upon how this point is configured. Fan status will create an alarm if the RSC 1000 calls for the fan to run and the input has an OFF status. For filter alarms, the RSC 1000 will create an alarm when the filter is in the ON condition.



3.1.23 Auxiliary Contact Wiring

Select the option of Normally Open or Normally Closed based on how the input is wired. For example, if you selected Fan Status in the previous menu and the input is wired normally open, then the RSC 1000 will show an ON when there is a contact closure present.



3.1.24 Wizard Finish

The changes made through the wizard will not be saved until the user presses the Finish button. Pressing the Finish button will cause the system to save the changes to the Setup Wizard and then the system will reboot so it can run with the new settings.



3.2 Status and Operation

The main screen shows the current readings of the sensors and HVAC operating status. There are a number of hotspot locations to navigate to other screens.



The Alarm icon will turn red when there are active alarms present. Touching the icon will navigate the screen to the Active Alarms screen to see a listing of all active alarms. Pressing the icon again will bring the operator back to the main status screen.



The Comfort Mode icon allows the user to enter the comfort mode for the defined time limit. Comfort mode is an alternate control temperature intended for when the facility is occupied. Pressing the button a second time will allow the operator to cancel Comfort Mode



The Lead Switch icon allows the user to switch which HVAC unit is currently the lead system if there are 2 HVAC units.



The Setpoint Adjust allows the operator to adjust the setpoint +/- 3 degrees as a temporary setting without having to go through the setpoint screens.



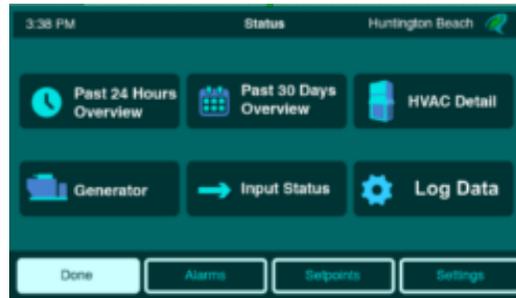
The HVAC icon will bring up the detail operation screen for each HVAC unit.



The menu icon will bring up the four main menu options which are Status, Alarms, Setpoints and Settings.

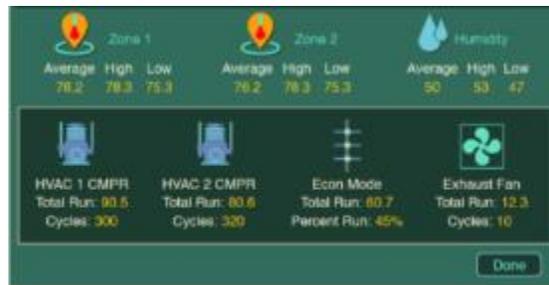
3.3 Detailed Status

Press the Menu button on the main screen and then select the Status button from the menu popup. The RSC 1000 will display the following screen:



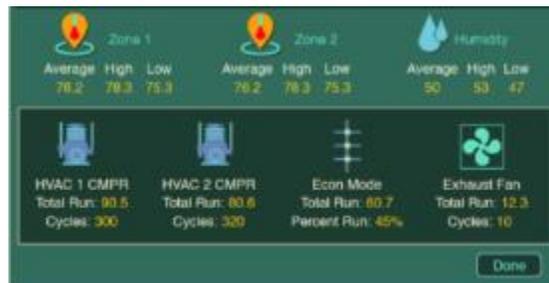
3.3.1 Past 24 Hours Overview

This screen provides an overview of the zone sensors, humidity and HVAC operation over the last 24 hour period.



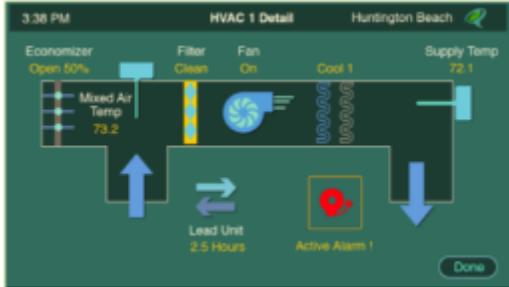
3.3.2 Past 30 Days Overview

This screen provides an overview of the zone sensors, humidity and HVAC operation over the last 30 days of operation.



3.3.3 HVAC Detail

This option provides the user with a choice to see the detailed operation status of either HVAC unit or the Runtime status of the HVAC unit.



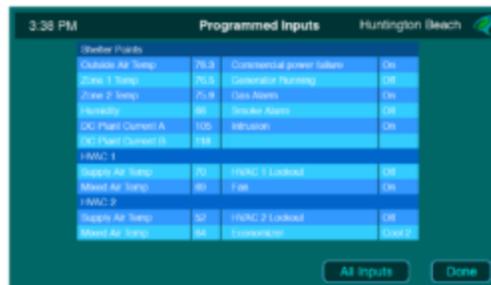
3.3.4 Generator Status

The generator status page provides details for the last time the generator ran, the duration, total run hours and number of cycles that have occurred.



3.3.5 Input Status

This screen provides a column list of all sensors and their current readings. Use this screen to see the name and value of all the sensors, defined for use through the Setup Wizard, in one location.



3.3.6 Log Data

The RSC 1000 does extensive logging of all the inputs, HVAC economizer, compressors, exhaust fans and control modes. This data can be displayed in a table or in a graph.

3.3.6.1 Analog Sensors

This section shows log data for the zone sensors, humidity sensor, outside air, supply and mixed air sensors for each HVAC unit. Select the option you want to view to see a table of data with the most recent entries first. The menu on the bottom of the screen has an option to graph the data, bringing up a line graph where you can zoom in/out and step through multiple pages of data. The zoom function allows the user to zoom in on a graph to show 60 minute intervals and zoom out to show seven days of data on a single graph.

3.3.6.2 Economizer data

This option will show the log data of the economizer damper position for each HVAC unit. Select the economizer you want to view to see a table of data with the most recent entries first. The menu on the bottom of the screen has an option to graph the data, bringing up a line graph where you can zoom in/out and step through multiple pages of data. The zoom function allows the user to zoom in on a graph to show 60 minute intervals and zoom out to show seven days of data on a single graph.

3.3.6.3 Digital Inputs

This section will allow the user to see the history data for the generator run monitor, commercial power fail, gas alarm, smoke alarm, intrusion HVAC lockout and Auxiliary input (depends on the definition from the Setup Wizard). Select the option you want to view to see a table of data with the most recent entries first. The menu on the bottom of the screen has an option to graph the data, bringing up a line graph where you can zoom in/out and step through multiple pages of data. The zoom function allows the user to zoom in on a graph to show 60 minute intervals and zoom out to show seven days of data on a single graph.

3.3.6.4 Mode Changes

This section logs the mode changes for Comfort Mode, Lead change, individual HVAC control mode, Overall control mode for the controller, overall economizer mode and the emergency vent mode. Think of modes as the trending of the mode of operation that the RSC 1000 is setting for the various options. Select the option you want to view to see at table of data with the most recent entries first. The menu on the bottom of the screen has an option to graph the data, bringing up a line graph where you can zoom in/out and step through multiple pages of data. The zoom function allows the user to zoom in on a graph to show 60 minute intervals and zoom out to show seven days of data on a single graph.

3.3.6.5 HVAC Detail

This option will show the log of the on/off cycles of each HVAC compressor and the Exhaust fan. Select the option you want to view to see at table of data with the most recent entries first. The menu on the bottom of the screen has an option to graph the data, bringing up a line graph where you can zoom in/out and step through multiple pages of data. The zoom function allows the user to zoom in on a graph to show 60 minute intervals and zoom out to show seven days of data on a single graph.

3.3.6.6 Visualize

The visualize option will allow the user to select up to four points at a time to see how they interact on a graph. Select the point using the drum wheels and then select Next from the bottom menu to see a trend graph of the points. The menu on the bottom of the screen has an option to graph the data, bringing up a line graph where you can zoom in/out and step through multiple pages of data. The zoom function allows the user to zoom in on a graph to show 60 minute intervals and zoom out to show seven days of data on a single graph.

3.4 Alarms

The RSC 1000 logs all of the alarm conditions and when the alarm clears. The alarms option from the menu allows the user to select which alarms to be viewed.

3.4.1 All Alarms

Choosing this option displays all alarms entries in the system. The bottom menu has the option for showing All alarms or just the Active alarms. The “All Alarms” button is for historical alarms and shows alarms and clears in chronological order with the most recent entries at the beginning of the log. Touching an alarm row changes the view to show all alarm and clear entries associated with that particular alarm.

3.4.2 HVAC Alarms

Select either HVAC 1 or 2 to see alarms that are specific to that system. The bottom menu allows the user to switch between Active only conditions and All alarm conditions, which shows the alarm and clear condition in chronological order with the most recent entries at the top of the log.

3.4.3 Environ. Alarms

This option shows environmental alarms that are not associated with a specific HVAC system. Such items as high temperature, humidity and smoke alarms would be displayed in this section. The bottom menu allows the user to switch between Active only conditions and All alarm conditions, which shows the alarm and clear condition in chronological order with the most recent entries at the top of the log.

3.4.4 Power Alarms

This section shows all power related alarms such as generator running and commercial power failure. The bottom menu allows the user to switch between Active only conditions and All alarm conditions, which shows the alarm and clear condition in chronological order with the most recent entries at the top of the log.

3.5 Setpoints

The setpoint option on the main menu provides access to the various setpoints in the system. To access press the menu icon on the main status screen and then select Setpoints.

3.5.1 Shelter Setpoints

This section allows the user to setup the settings for the facility when in normal operating mode and when in comfort mode. The first screen after pressing Shelter Setpoints shows the current value of each setting. To change a setting, click on the Configure option at the bottom of the page. The system will then display a screen to allow the user to change each setting. Touch and drag the balloon handle to the desired value. The H is for Heating, the S is the Shelter setpoint as well as the specific point for when the temperature falls below this value in which the cooling will turn off. The C handle is to select the value when the first stage of cooling should run. It is recommended that a 2-3 degree differential be maintained between the shelter (S) setpoint and the cooling (C) setpoint. Make your changes and/or press the Next button to move to the next screen which is the Comfort mode settings. Make any changes desired for comfort mode or press the done button to accept the changes. Changes will be lost if you do not press the Done button.

3.5.2 HVAC Stage Deltas

Stage deltas set the values for when to turn on the additional stages of cooling or heating. This allows the user to control how many degrees above the cooling setpoint (and below the heating setpoint) the facility temperature can get before calling on additional stages. Press the configure button to start the change process. Use the slider to set the value for each stage and press the Next button to move to the next setpoint. At the last delta setpoint the Next button will change to Done. You must select Done to save the changes made. Pressing the Cancel button instead will discard any changes made.

3.5.3 Time Intervals

This section allows the user to select the various time intervals associated with the HVAC control. Lead Change Time is the amount of time an HVAC unit will be the lead system. Comfort mode is the amount of time permitted when a user puts the system into Comfort Mode. Minimum On and Off times for the heating and cooling are to prevent short cycling. This is the minimum time that the unit has to be in the On or Off mode for heating or cooling before the system will allow a change in stage. Press the configure button to start the change process. Use the slider to set the value for each timer and press the Next button to move to the next timer. At the last timer, the Next button will change to Done. You must select Done to save the changes made. Pressing the Cancel button instead will discard any changes made.

3.5.4 Alarm Criteria

This section is used to set the various alarm thresholds, delay time and alarm severity for all the alarms available in the system.

3.5.4.1 Temperature

The Temperature option will show the current available alarm points for the facility zone sensors and humidity sensor. Press the configure button to change the alarm settings. Use the slider to set the alarm threshold (A) and the Clear (C) threshold. Pressing Next will move to the next option to set the delay time for the alarm and the severity. Under Severity the user can choose Disabled, which prevents the alarm from occurring. Step through each menu making the necessary changes and press Next until the last screen where the Next button changes to Done. You must press the Done button to save any changes made.

3.5.4.2 Shelter

Shelter alarms are digital input alarms that are not specific to HVAC systems. Press the Configure button to step through the program pages. For each alarm you can set the delay time and the severity of the alarm condition. Selecting Disable under Severity will prevent that particular alarm from occurring. Step through each menu making the necessary changes and press Next until the last screen where the Next button changes to Done. You must press the Done button to save any changes made.

3.5.4.3 Power

Power Alarms are specific for commercial power failure and generator monitoring. For each alarm you can set the delay time and the severity of the alarm condition. Selecting Disable under severity will prevent that particular alarm from occurring. Step through each menu making the necessary changes and press Next until the last screen where the Next button changes to Done. You must press the Done button to save any changes made. Note: the Generator Failed to Run alarm is a derived alarm where the RSC 1000 sees a commercial power failure and does not see the generator running input being on within the defined alarm delay time. This alarm clears when the RSC sees the generator run input go ON.

3.5.4.4 HVAC 1 & 2

These buttons allow the user to set alarms conditions that are specific to the HVAC operation. The table below provides a brief outline of how the alarm condition operates. Press the configure button to change the alarm settings. Use the slider to set the alarm threshold (A) and the Clear (C) threshold. Pressing Next moves to the next option to set the delay time for the alarm and the severity. Under Severity the user can choose Disabled which prevents the alarm from occurring. Step through each menu making the necessary changes and press Next until the last screen where the Next button changes to Done. You must press the Done button to save any changes made.

Cooling Failure	Alarm occurs when during a call for cooling if the supply air temperature is not below this threshold for the delay time.
Cooling Trouble	Alarm occurs when during a call for cooling if delta between the control temperature and the supply air is not greater than this value for the delay time.
Heating Failure	Alarm occurs when during a call for heating if the supply air temperature is not above this threshold for the delay time.
Lockout Alarm	Alarm occurs when the Lockout input for the HVAC unit is active.
Control Voltage Lost	Alarm occurs when the 24 VAC control voltage for the HVAC is not present.
Clogged Filter	The auxiliary input must be defined as filter for this alarm to function. An ON value for the delay time will cause the alarm to generate.
Fan Failed to Run	The auxiliary input must be defined as Fan Status for this alarm to function. If there is a call for the fan to run and the aux input is off for the delay time then the alarm will generate.

3.5.5 Economizer

The economizer settings are used to set the outside air setpoints and humidity conditions so the RSC 1000 can determine when it is acceptable to use the economizers. Press the Configure button to step through each setpoint. At the last setting menu, you must press Done for your changes to take effect. The available settings are:

OSA Setpoints	Set the Level 1 (L1) and Level 2 (L2) settings for when to use economizers. Note the RSC will adjust the settings based on the ability to maintain the facility temperature with these settings. Below L1, the system stages the economizers on, between L1 and L2, both economizers will come on together and above L2 economizers are disabled. The values shown are the currently used values. Changing these settings will clear the floated value and your setting will be the new starting point.
OSA max float change	This is the maximum allowable change for L1 and L2 to float up or down from the initial starting value.
OSA Time Delay	The amount of time the OSA has to be below L1, between L1 and L2 or above L2 before the system decides to use the new range in the control sequence.
Humidity setpoint	Above this setting the economizers are disabled.
Humidity time delay	The humidity has to be above the setpoint for this time delay before humidity will disable the economizer control.

3.5.6 Economizer Damper Control

These settings are used for controlling the economizer damper when the RSC 1000 is controlling directly through analog outputs. The control is based upon 0-100% where 0% = fully closed and 100% = fully open. Press the Configure button to step through each setpoint. At the last setting menu, you must press Done for your changes to take effect. The available settings are:

Mixed air setpoint	The dampers are modulated open & closed to maintain the mixed air temperature at this setpoint.
Mixed air dead band	Creates a dead band around the setpoint where no action is taken. This is to prevent constant changing to the output control of the damper.
Damper % min position	The user can set a minimum outside air position on the damper. The damper will close to this setting. The only time the control is overridden and goes to fully closed would be in the event of a smoke alarm.
Damper % change up	The increments for opening the damper every time the RSC 1000 calculates a new value. I.e. must open in increments of 5%.
Damper % change down	The increments for closing the damper every time the RSC 1000 calculates a new value. I.e. must close in increments of 5%.
Damper time delay (sec)	The number of seconds to wait until before calculating a new percentage output for the damper control.

3.6 Settings

The settings menu allows the user to set global functions on the controller. That is, settings which are used throughout the system for operation.

3.6.1 IP Config

Pressing the IP configuration button will show the current Ethernet settings for the system. The system supports DHCP for dynamic assignment of an IP address, or Static, where the user enters in the necessary IP settings to allow the system to communicate on the Ethernet network. Press the configure button to start the configuration process. Choose DHCP if the system is supposed to request an IP address from the network router, or press Static to enter the settings. Selecting Static will bring up a screen allowing the user to enter the IP address for the RSC 1000. Use the keypad to enter the IP address and click on the Next button. Enter the Netmask (subnet mask) information required for your network using the keypad. Pressing Next will bring up the gateway screen. Again, use the number keypad to enter the gateway address.

The system supports two DNS (Domain Name Server) servers. Use the keypad to enter the DNS server address available on your network. The RSC 1000 will allow you to change the network port for the web server. The default port number is 80. You can change the port number to another number if your network design requires it. Note: you may see a value of 443, which means that HTTPS has been enabled on your RSC 1000 (can only be done via a web browser). Changing this value to something other than 443 will disable HTTPS.

The last option is the Update Server. This is the IP address the RSC 1000 uses when a user (from the touchscreen or web interface) checks for software updates. Quest recommends leaving the default value in this field unless you are instructed to change it by your network team. Changes will not take effect until the user presses the Done button and then confirms the changes by pressing the Yes key.

3.6.2 Site Parameters

The site parameter option allows the user to create a Site Name which is used for alarm notification and site identification. Use the keyboard to enter in a name unique to the location. The keypad supports Alpha characters or numeric characters by clicking on the 123 icon. Enter the site name and press Next to get to the site information box. This is an area where you could enter the site address or key information that is important to this site. Use the keypad to type in the information and then press the Done key to save the changes.

3.6.3 Modbus Profiles

This menu option is for future functionality to monitor Modbus RTU devices and is currently not active.

3.6.4 Run Setup Wizard

The Setup Wizard that runs on the initial startup can be ran at any time by pressing this menu option. See section 3.1 for details on the Wizard operation.

3.6.5 Passwords

The password section allows the user to set a password on the bottom main menu. Enter in a 4 digit number for each menu option to secure that area. The display will show which menu section the password is for. To remove a password, use the delete key to erase the value. The default operation is that all sections are open. It might be desirable to password protect a section, say the Setpoints or Settings. Note: **if you forget the password for the Settings menu, there is no way to access this section without cold starting the system to bring it back to factory default.** This will cause a loss of all data and require the user to run the Setup Wizard again.

Choose which section(s) you want to protect by entering a 4 digit passcode, then click the Done button on the keypad. If you do not want to protect a certain section, click the Next button on the bottom, without inserting any digits. After going through all of the screens (4 total), press the Done key to save all changes.

3.6.6 Alarm/SNMP Config

This menu option allows the user to configure the general SNMP settings and also the SNMP trap destinations. The RSC 1000 supports SNMP v1 and v2c for Set, Gets, Traps and Informs.

3.6.6.1 SNMP Settings

SNMP settings allows the user to set the basic settings for SNMP access to query the system or make changes with an SNMP manager system. Press the configure button to step through the programmable options using the keypad/controls on each screen. Pressing the Done key at the last menu will save the changes made. The available options are:

Port Number	The IP port number used to listen for SNMP requests. The default is 161 and should not be changed unless your network security requires a different port number.
Read Community	This is the community string used for SNMP Get requests. Change this value to what is used for your network security.
Write Community	This is the community string used for SNMP Set commands. Change this value to what is used for your network security.
sysContact	This is a standard MIB II variable where you can program a contact person's information.
sysName	A standard MIB II variable that is a unique name for this system.
sysLocation	A standard MIB II variable where you can program the location of this system.

3.6.6.2 *SNMP Dispatch*

Use this menu option to program in the IP address of the Trap Server(s) that will receive the alarm messages or traps from the RSC 1000. The system supports sending traps to four locations. Each location can be configured for the IP address, the trap version, the type, and a community string for the trap. The RSC 1000 supports v1 and v2c trap formats as well as Informs. Informs are similar to a trap, but require the trap manager to send an acknowledgement back to the RSC 1000 to indicate the Inform was received. If the RSC 1000 does not get a confirmation, it will continue to resend the trap until it is successful. The RSC 1000 deploys a back off delay to extend the delay between attempts up to a maximum time of approximately 17 minutes if no response is provided from the trap server.

Press the configure button to walk through the menus to set the various options. You must step through all screens (press Next if there are no changes) until the last screen where pressing the Done key will accept the changes.

3.6.7 *Diags*

The Diags section is for diagnostics on the system and basic operation. The following options are available:

3.6.7.1 *About*

Pressing the About button will show the current firmware build information and provide an option to check for updates. Pressing the Check and Install Update button will cause the system to connect to the upgrade server IP address (see section 3.6.1) and check for a newer software version. The system will report whether an upgrade is needed, failed to connect or upgrade complete. If an upgrade is performed then the system will ask the user to press a Reboot button to complete the process.

3.6.7.2 *Comm Statistics*

Show communication information between the main logic board and the IO board. This section is only used under the direction of a Quest engineer for diagnostic purposes.

3.6.7.3 *Board Status*

Show information regarding the status of the IO Board. This section is only used under the direction of a Quest engineer for diagnostic purposes.

3.6.7.4 *Board Hardware*

This option will show the low level status of inputs and allow the user to turn on/off the outputs for testing purposes.

3.6.7.4.1 *Digital Inputs*

This menu shows the physical status of each digital input. A 0 indicates an open at the input and a 1 indicates a closure.

3.6.7.4.2 Analog inputs

This menu shows the current value of all sensors connected to the system in their specified engineering units.

3.6.7.4.3 Alarm/Digital Outputs

This screen will show all the alarm digital outputs and the exhaust fan. Each output can be turned on or off to verify operation. Note: if the point is green, this means pressing the button will turn the output ON. If the output is Red, then pressing the button will turn the point OFF. All overrides entered will be cleared when the user navigates away from this screen.

3.6.7.4.4 HVAC #1

This menu allows the user to override the operation of the outputs associated with the first HVAC. Each output can be turned on or off to verify operation. Note: if the point is green, this means pressing the button will turn the output ON. If the output is Red, then pressing the button will turn the point OFF. All overrides entered will be cleared when the user navigates away from this screen.

3.6.7.4.5 HVAC #2

This menu allows the user to override the operation of the outputs associated with the second HVAC. Each output can be turned on or off to verify operation. Note: if the point is green, this means pressing the button will turn the output ON. If the output is Red, then pressing the button will turn the point OFF. All overrides entered will be cleared when the user navigates away from this screen.

3.6.7.4.6 Analog Output

This screen allows the user to override the analog output control for the dampers to test the damper control. Note: the RSC 1000 has two additional analog outputs for future control of a supply fan. Use the wheel to select the percentage of output from 0 to 100% where 0% is fully closed and 100% is fully opened. All overrides entered will be cleared when the user navigates away from this screen.

3.6.8 Time Settings

Allows the user to set the system clock. The RSC 1000 can be manually set to a specific time or support NTP to do time synchronization over the network. Pressing the Time Settings option will show the current time and settings. Press the Configure button to walk through the option menus for setting the clock. The first choice is Automatic or Manual. The user will then be asked for the time zone followed by the ability to set daylight savings settings and/or turn off daylight savings. The last option is to either put in the IP address or URL of the NTP server if you chose Automatic, or use the dials to set the time and date for Manual operation. Press the Done button to accept your changes.

3.6.9 Bypass

The bypass option allows the user to bypass the exhaust fan or the control mode of each HVAC unit. Unlike the Diags override function, this section allows the user to put the bypass in place for a specific time duration.

3.6.9.1 System

The system bypass option will allow the user to turn on or off the exhaust fan for a defined time period or leave it in that condition indefinitely. This command overrides any control sequence, meaning that the exhaust fan will stay in the condition the user set it to until the time expires or once the user puts it back to automatic.

3.6.9.2 HVAC

The HVAC options allow the user to bypass HVAC 1 or HVAC 2 to a specific control mode. When bypassing one of the control modes, either on or off, the controller prevents the user from bypassing another control mode to prevent contradictory results. As an example, the system will not allow the user to bypass on the heating mode and also the cooling mode. Select the mode you want to bypass, then use the control wheels to select on or off and the delay time. The control mode will stay in that condition until the time has elapsed or the user goes back and sets the mode to automatic.

4 Web Server

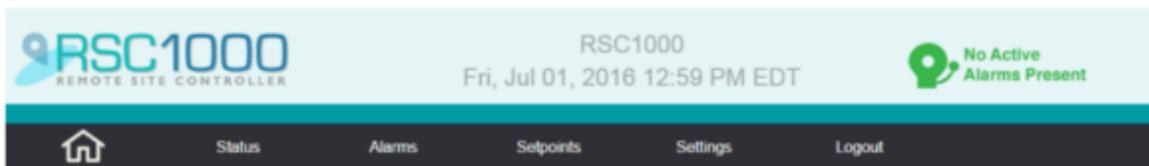
The RSC 1000 has a built in Web server that can be used for remote access for status, setpoint changes and system configuration. The RSC 1000 supports all modern web browsers. This section will provide an introduction to the various web pages and the capabilities presented.

4.1 Logging into the system

The system is password protected so when you first log in, you will be presented with a Username/Password screen. The default username/password is Admin/admin. Additional passwords can be added and the Admin password can be changed. Once you successfully log in, the system will display the home page.

4.2 Website Navigation

The RSC 1000 web server will show the system identification and current time from the RSC in the top banner. Additionally, there is an alarm bell icon that will be green when there are no alarms, or red if alarms are active. The user can click on this icon to navigate to the alarms page. Below the banner on every page is the site menu for navigation. Hovering on a menu choice displays any submenu option. Clicking on an option navigates the user to that screen.



4.3 Home Page

The home page displays the current status of the facilities temperature and humidity along with detail information on the operation of each HVAC unit. The HVAC detail graphically shows what items are operating and the current reading of the monitoring sensors. This page will automatically refresh as the sensors update. Note: the alarm icon for each HVAC unit indicates if there are alarms active that are specific to that unit. Clicking on the icon navigates you to the alarm page.

RSC1000
REMOTE SITE CONTROLLER

RSC1000
Fri, Jul 01, 2016 12:59 PM EDT

No Active Alarms Present

Home Status Alarms Setpoints Settings Logout

CURRENT ENVIRONMENTALS

65.1°F 72°F 75.2°F 30% 75°F 75.2°F

Outside Temperature Zone Temperature Zone 2 Temperature Humidity Current Setpoint Controlling Temperature

HVAC 1 Detail

Open 0% Economizer On Fan 49.0°F Supply Temp

48.1°F Mixed Air Temp

02.5hrs Lead Unit

No Active Alarms Present

HVAC 2 Detail

Open 0% Economizer Off Fan 50.1°F Supply Temp

50.1°F Mixed Air Temp

Lag Unit

No Active Alarms Present

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4.4 Status

4.4.1 Status Page

The status page contains detailed information regarding the operation of the facility and the HVAC system. All inputs being monitored are displayed, showing the current readings. This page will automatically update when the data changes.



Scroll down to see additional status data such as the 24 hour and 30 log data for sensors and compressor run data. Detail run times and cycle counters for the HVAC equipment and run time statistics for the generator monitoring function are also shown.

TEMPERATURES								
	Zone 1 Temperature		Zone 2 Temperature		Humidity		Outside Temperature	
	Last 24 Hours	Last 30 Days	Last 24 Hours	Last 30 Days	Last 24 Hours	Last 30 Days	Last 24 Hours	Last 30 Days
Average	72°F	72°F	75.2°F	75.2°F	29.9%	29.9%	65.1°F	65.1°F
High	72°F	72°F	75.2°F	75.2°F	30%	30%	65.1°F	65.1°F
Low	72°F	72°F	75.2°F	75.2°F	29.9%	29.9%	65.1°F	65.1°F

RUNTIMES						
	HVAC 1 Compressor		HVAC 2 Compressor		Exhaust Fan	
	Last 24 Hours	Last 30 Days	Last 24 Hours	Last 30 Days	Last 24 Hours	Last 30 Days
Total Runtime	0.00hrs	0.00hrs	0.00hrs	0.00hrs	0.00hrs	0.00hrs
Cycles	0	0	0	0	0	0

	Economizer Mode	
	Last 24 Hours	Last 30 Days
Total Runtime	0.00hrs	0.00hrs
Percent Runtime	0%	0%

HVAC 1 RUNTIME DETAIL					
	Fan	Cool 1	Cool 2	Heat	Economizer
	Total On Time	93.05hrs	0.00hrs	0.00hrs	0.00hrs
Interval On Time	93.05hrs	0.00hrs	0.00hrs	0.00hrs	0.00hrs
Cycles Per Hour	0.00	0.00	0.00	0.00	0.00

HVAC 2 RUNTIME DETAIL					
	Fan	Cool 1	Cool 2	Heat	Economizer
	Total On Time	0.00hrs	0.00hrs	0.00hrs	0.00hrs
Interval On Time	0.00hrs	0.00hrs	0.00hrs	0.00hrs	0.00hrs
Cycles Per Hour	0.00	0.00	0.00	0.00	0.00

GENERATOR STATUS					
Current State	OFF	Last Start Time	Never	Last End Time	Never
Last Duration	0.00 hrs	Total Runtime	0.00 hrs	Total Cycles	0

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4.4.2 Log Data

The log data option allows the user to select up to four points and trend the data on a graph or download the data to a CSV file. Select the points from the drop down list and click on the Regenerate Graph link. You can use the calendar tool to select a specific beginning and end date or leave it blank to see the entire log.



There are tools along the bottom of the graph for zooming in and out, as well as showing past data. Zooming in and out can display as small as a 60 minute interval to as large as a 30 day interval. There is also an option to download the data to a CSV file.

4.5 Alarms

The alarms page will show either the active alarms or all alarms in the alarm log. There are filter buttons that the user can click on to select what alarm types they want to view. The All Button shows all alarms and the Active button only shows the alarm that are currently in effect. Select/deselect the various severities by clicking on the severity name. Use the calendar icon to set a start and end date or leave them blank to see the entire log.

ALARMS

FILTER

All Critical Minor Notice Start Date []

Active Major Warning Clear End Date []

Regenerate Alarm Table

ALARMS

Timestamp	Severity	Description	Value
Mon Jun 13 2016 13:48:21 GMT-0700 (Pacific Daylight Time)	Major	HVAC #1 Control Voltage Lost	Alarm
Mon Jun 13 2016 13:48:21 GMT-0700 (Pacific Daylight Time)	Major	HVAC #2 Control Voltage Lost	Alarm

Download To CSV

4.6 Setpoints

4.6.1 Shelter

Click on the Setpoints menu and Shelter on the submenu to see a list of available setpoints. From here you can use the slider to set the values very similar to how the touchscreen operates. See section 3.5 for more details on the various settings. In addition to the setpoints, the user can also switch the lead system and enable comfort mode remotely. Click on the Save Settings button, after you made your changes, to send the updates to the RSC 1000.

SHELTER SETPOINTS

Normal Mode	51	77.5	79.5
Comfort Mode	54	72	75
Set Lead System	HVAC1 HVAC2		
Comfort Mode	ON OFF		
Cooling Stage 2 Delta	2		
Cooling Stage 3 Delta	3		
Cooling Stage 4 Delta	2		
Heating Stage 2 Delta	2		
Lead Change Time (days)	1		
Comfort Mode Time (hours)	2		
Minimum Off Cooling (minutes)	1		
Minimum On Cooling (minutes)	1		
Minimum Off Heating (minutes)	1		
Minimum On Heating (minutes)	1		

Save Settings

4.6.2 Alarm

The alarm page allows the user to make changes to the alarm settings. The page has the alarms grouped per function. Click on the arrow in the header to expand each section. The user can make all the changes needed in each section and then press the Save Settings button at the bottom of the page. No changes are saved unless this button is pressed. Refer to section 3.4 for more information on the various alarm options.

ENVIRONMENTAL

Alarm Setpoint (red) and Clear (blue)	Alarm Delay	Severity
High Shelter Temperature Level 2 82 85	5 min	Critical
High Shelter Temperature Level 1 80 82	5 min	Major
Low Shelter Temperature 45 47	5 min	Minor
High Shelter Humidity 75 80	15 min	Major
Low Shelter Humidity 5 10	15 min	Minor

SHELTER
POWER
HVAC 1
HVAC 2

Save Settings

Click here to expand

4.6.3 Economizer

This menu provides all of the settings for economizer control. Use the sliders to adjust the various settings and then press the Save Settings button to save your changes. Refer to section 0 and 3.5.6 for more detail on the available settings.

ECONOMIZER SETTINGS

OSA L1 and L2	<input type="text" value="65"/> <input type="text" value="68"/>
OSA Max Float Change	<input type="text" value="10"/>
OSA Dwell Time	<input type="text" value="15 min"/>
Humidity Setpoints	<input type="text" value="50"/> <input type="text" value="65"/>
Humidity Dwell Time	<input type="text" value="15 min"/>
Damper Mixed Air Setpoint	<input type="text" value="51"/>
Damper Mixed Air Deadband	<input type="text" value="3"/>
Damper Minimum Position	<input type="text" value="20"/>
Damper Percent Up Change	<input type="text" value="5"/>
Damper Percent Down Change	<input type="text" value="5"/>
Damper Dwell Time	<input type="text" value="60"/>

Save Settings

4.7 Settings

The Settings menu option will provide access to the functions under the Settings menu on the touchscreen. Here you can set the main functionality of the system and configure the global settings that are used throughout the system.

4.7.1 General Settings

This web page is organized to allow modifications to the Site Parameters, The IP configuration, Time Settings, Alarm Dispatch and Touchscreen Passwords. Click on the arrow in the header to expand each section. Press the Save Settings button after all changes are made to write your changes to the system.

GENERAL SETTINGS

- SITE PARAMETERS**
 - Site Name:
 - Site Information:
- IP CONFIGURATION
- TIME SETTINGS
- ALARM DISPATCH CONFIGURATION
- TOUCHSCREEN PASSWORDS

4.7.1.1 Site Parameters

Enter the Site name and Site information. Refer to section 3.6.2 for more details.

GENERAL SETTINGS

- SITE PARAMETERS**
 - Site Name:
 - Site Information:

4.7.1.2 IP Configuration

This section allows you to enter in the IP information to allow the RSC 1000 to communicate over an Ethernet network. Refer to section 3.6.1 for additional details. An additional function to enable HTTPS or secure communications is available through the web server. To enable this function, click on the SSL Enable button and then Copy/Paste the contents of a properly formatted PEM certificate file. When you press the Save Changes button, the RSC 1000 will process this data and store it if it is valid. Once you successfully turn on SSL, the system will only respond if HTTPS protocol is used. Make sure HTTPS:// is before your IP address in the address bar of the web browser. HTTPS is only available on port 443. Changing this port number to another number will disable the SSL function and the system will use HTTP protocol. Your network security group should be able to generate the certification file needed to use SSL. If further assistance is needed, please contact Quest Controls, Inc.

IP CONFIGURATION

Address Type	<input type="radio"/> DHCP <input checked="" type="radio"/> Static
IP Address	<input type="text" value="192.168.1.189"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.1"/>
DNS1	<input type="text" value="71.10.216.1"/>
DNS2	<input type="text" value="71.10.216.2"/>
Http Port	<input type="text" value="443"/>
SSL	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
	<div style="border: 1px solid #ccc; padding: 5px; min-height: 40px;">PASTE PROPERLY FORMATTED PEM DATA BELOW</div>
Update Server	<input type="text" value="74.93.12.113"/>
Ethernet Address	3C:98:BF:01:ff:12

4.7.1.3 Time Settings

This section allows the user to set the system clock. The RSC 1000 supports either NTP for automatic clock setting, or the user can set the time manually. Refer to section 3.6.8 for more details. Use the controls to select Automatic or Manual, the Time Zone and whether to use Daylight Savings time. Note: if you choose Manual clock settings, the page will show the RSC Time. Clicking on the time will bring up a calendar tool to allow you to change the settings. There is a “Now” button on the calendar tool that puts the time of your computer in the time field to make editing quicker.

TIME SETTINGS				
Type	<input type="radio"/> Automatic <input checked="" type="radio"/> Manual			
RSC Time	<input type="text" value="07/01/2016 13:45"/>			
Time Zone	UTC-8 (US Pacific Time) ▾			
Enable / Disable DST	<input checked="" type="radio"/> Enable <input type="radio"/> Disable			
DST On Point	Sun Mar 12, 2017 2:00			
	Week	Day of Week	Month	Time
	Second ▾	Sunday ▾	March ▾	02:00 ▾
DST Off Point	Sun Nov 6, 2016 2:00			
	Week	Day of Week	Month	Time
	First ▾	Sunday ▾	November ▾	02:00 ▾

4.7.1.4 Alarm Dispatch Configuration

This section is for setting up the SNMP and Email server information for querying the system and alarm transmission. See section 3.6.6.1 for more information on the SNMP settings. The SMTP settings are used to configure the system for sending email. Enter the email server address or URL in the SMTP Server field. Enter an IP port number that the server uses to accept SMTP protocol. The commonly used port number is 25. If your SMTP server requires authentication, enter a username and password. Lastly, enter a “From” email address that the RSC1000 will use to designate where the email was sent from. This needs to be a properly formatted email address. I.e. My_RSC1000@mycompany.com.

ALARM DISPATCH CONFIGURATION	
Incoming SNMP Port	<input type="text" value="161"/>
SNMP Read Community	<input type="text" value="QuEsT"/>
SNMP Write Community	<input type="text" value="TsEuQ"/>
SNMP sysContact	<input type="text" value="Unknown"/>
SNMP sysName	<input type="text" value="RSC1000-SLT"/>
SNMP sysLocation	<input type="text" value="SLT"/>
SMTP Server	<input type="text"/>
SMTP Server Port Number	<input type="text"/>
SMTP Auth Username	<input type="text"/>
SMTP Auth Password	<input type="text"/>
SMTP From Address	<input type="text"/>

4.7.1.5 Touchscreen Passwords

This section allows the user to enter or change the passwords used on the Touchscreen to protect the various menu options (see section 3.6.5).

TOUCHSCREEN PASSWORDS

Status Menu	<input type="text"/>
Alarms Menu	<input type="text"/>
Setpoints Menu	<input type="text"/>
Settings Menu	<input type="text"/>

4.7.2 Alarm Dispatch

The alarm dispatch menu is used to set the SNMP Trap server settings and email dispatch criteria when an alarm occurs in the system. Enter the dispatch information in both sections and press Save Settings to write the changes to memory. The Send Test Alarm button will send a test alarm trap and email to all active receivers. The system sends a Test Critical message and then a Test Clear message to ensure the receiver gets the message and function properly.

ALARM DISPATCH

SNMP DISPATCH

Number	Receiver IP	Version	Type	Community String
1.	<input type="text" value="192.168.1.99"/>	v1 v2	Trap Inform	<input type="text" value="InformYou"/>
2.	<input type="text" value="192.168.1.100"/>	v1 v2	Trap Inform	<input type="text" value="TeSt"/>
3.	<input type="text"/>	v1 v2	Trap Inform	<input type="text" value="Trap"/>
4.	<input type="text"/>	v1 v2	Trap Inform	<input type="text" value="Trap"/>

EMAIL DISPATCH

Save Settings

Send Test Alarm

4.7.2.1 SNMP Dispatch

The SNMP Dispatch section is where you enter the Trap Receiver IP address, the SNMP Version number, The type (trap or inform) and the community string used when sending the trap. Refer to section 3.6.6.2 for additional details.

SNMP DISPATCH					
Number	Receiver IP	Version		Type	Community String
1.	<input type="text" value="192.168.1.99"/>	<input type="radio" value="v1"/>	<input checked="" type="radio" value="v2"/>	<input type="radio" value="Trap"/> <input checked="" type="radio" value="Inform"/>	<input type="text" value="InformYou"/>
2.	<input type="text" value="192.168.1.100"/>	<input type="radio" value="v1"/>	<input checked="" type="radio" value="v2"/>	<input type="radio" value="Trap"/> <input checked="" type="radio" value="Inform"/>	<input type="text" value="TeSt"/>
3.	<input type="text"/>	<input type="radio" value="v1"/>	<input checked="" type="radio" value="v2"/>	<input checked="" type="radio" value="Trap"/> <input type="radio" value="Inform"/>	<input type="text" value="Trap"/>
4.	<input type="text"/>	<input type="radio" value="v1"/>	<input checked="" type="radio" value="v2"/>	<input checked="" type="radio" value="Trap"/> <input type="radio" value="Inform"/>	<input type="text" value="Trap"/>

EMAIL DISPATCH

4.7.2.2 Email Dispatch

Click on the triangle in the header to expand the Email Dispatch section. The system supports sending Emails to nine email addresses. Enter the Email address where you want alarms to be sent. The Subject line is programmable and this field allows you to enter a custom message that appears in the subject line of the Email. You may want to put the IP address of the system or anything specific to identify the system. The last column is a severity filter. You can choose to receive only certain severity levels. All severities also include Notice and Warning level alarm conditions. The system automatically sends a clear message only for the alarm severity level that you choose to send. I.e. if you select Critical alarms only, then the system only sends clear messages for those critical alarms when the problem is resolved.

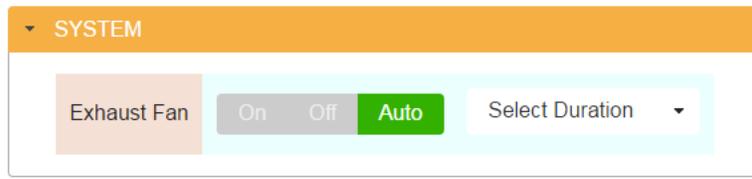
SNMP DISPATCH			
EMAIL DISPATCH			
Number	Recipient	Subject	Severity Filter
1.	<input type="text" value="Oncall@mycompany.com"/>	<input type="text" value="RSC 1000 Alarm"/>	Critical Only
2.	<input type="text"/>	<input type="text"/>	Critical, Major, and Minor
3.	<input type="text"/>	<input type="text"/>	Critical and Major
4.	<input type="text"/>	<input type="text"/>	Critical Only
5.	<input type="text"/>	<input type="text"/>	All Severities
6.	<input type="text"/>	<input type="text"/>	Disabled
7.	<input type="text"/>	<input type="text"/>	Disabled
8.	<input type="text"/>	<input type="text"/>	Disabled
9.	<input type="text"/>	<input type="text"/>	Disabled

4.7.3 Bypass

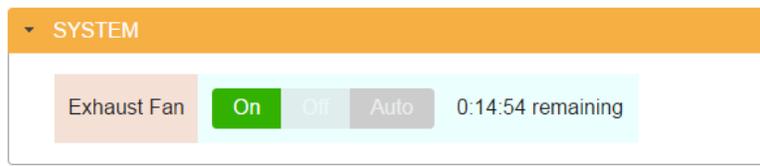
The bypass option is used to set bypasses for the system outputs, HVAC systems and testing of the alarm outputs. Refer to section 3.6.9 for more information on bypassing control modes.

4.7.3.1 System

Under the system menu is the ability to bypass the Exhaust Fan. Select the duration time first and then select On, Off or Auto to do the bypass.



The bypass will take effect and the display will change to show the time remaining. The bypass will clear when the timer reaches 0 or the user clicks on the Auto button.



4.7.3.2 HVAC

Select either HVAC 1 or 2 menu. Choose the duration time and then select ON or Off. Note the RSC 1000 will turn on the appropriate outputs to put the HVAC in the listed mode.

HVAC 1				
Fan	On	Off	Auto	Select Duration
Economizer	On	Off	Auto	Select Duration
Cool 1	On	Off	Auto	Select Duration
Heat 1	On	Off	Auto	Select Duration
Emergency Vent	On	Off	Auto	Select Duration

4.7.3.3 Alarm Output Testing

This section allows the user to test the alarm outputs. Choose On or Off for each point to test the physical alarm contacts the RSC 1000 uses for connection to the Switch overhead or alarm collection device. Note: the outputs will return to automatic mode once you navigate away from this section.

ALARM OUTPUT TESTING (Outputs return to automatic state after you leave this page)	
High Temp Stage 2	On Off
High Temp Stage 1	On Off
Low Temp	On Off
Smoke	On Off
HVAC Power Loss	On Off
HVAC Lockout	On Off
Controller Fault	On Off
Generator Running	On Off
Exhaust Fan	On Off

4.7.4 User Administration

This page is used to set the passwords and access levels for the various system passwords. The system uses Usernames of User1 through User5 plus Admin. Type the desired password for a Username and then select which privileges are available to that user. Privileges correspond to what menu options will be available on the menu navigation bar. Make sure you keep track of the Admin password if it is changed. **There is no backdoor password so if the Admin level is lost, you will have to cold start the system to set it back to factory default.** Press the Save Settings button to save your changes to memory.

USER ADMINISTRATION							
User	Password	Confirm Password	Privileges				
User1	<input type="text"/>	<input type="text"/>	Home	Status	Alarms	Setpoints	Settings
User2	<input type="text"/>	<input type="text"/>	Home	Status	Alarms	Setpoints	Settings
User3	<input type="text"/>	<input type="text"/>	Home	Status	Alarms	Setpoints	Settings
User4	<input type="text"/>	<input type="text"/>	Home	Status	Alarms	Setpoints	Settings
User5	<input type="text"/>	<input type="text"/>	Home	Status	Alarms	Setpoints	Settings
Admin	<input type="text"/>	<input type="text"/>	Home	Status	Alarms	Setpoints	Settings

4.7.5 Wizard Settings

This section is for making changes to the Setup Wizard settings. The initial configuration must be done on the Touchscreen during installation and startup. This page will then allow the user to change those configuration settings. Refer to section 3.1 for additional detail. Make the necessary changes and then click on the Save and Reboot button at the bottom of the page to save the new configuration and restart the system.

WIZARD SETTINGS

Temperature Units	<input checked="" type="radio"/> Fahrenheit <input type="radio"/> Celsius
Number of Zone Sensors	<input type="radio"/> One <input checked="" type="radio"/> Two
Controlling Sensor	<input type="radio"/> One <input type="radio"/> Two <input type="radio"/> Average <input checked="" type="radio"/> Highest
Supply Air Sensor Present	<input checked="" type="radio"/> Yes <input type="radio"/> No
Mixed Air Sensors Present	<input checked="" type="radio"/> Yes <input type="radio"/> No
Humidity Sensor Present	<input checked="" type="radio"/> Yes <input type="radio"/> No
Outside Air Sensor Present	<input checked="" type="radio"/> Yes <input type="radio"/> No
HVAC System Type	<input checked="" type="radio"/> Single Stage Direct Expansion <input type="radio"/> Two Stage Direct Expansion <input type="radio"/> Single Stage Heat Pump
Lead Lag Control Mode	<input checked="" type="radio"/> Lead-Lag <input type="radio"/> Lead-Standby <input type="radio"/> Single Unit
Economizer Control Method	<input type="radio"/> None Present <input type="radio"/> Integrated with HVAC <input checked="" type="radio"/> Modulated with Analog Outputs
Emergency Vent Mode on HVAC Units	<input checked="" type="radio"/> Yes <input type="radio"/> No
Exhaust Fan On with High Temp Level 2	<input checked="" type="radio"/> Yes <input type="radio"/> No
Supply Fan Operating Method	<input type="radio"/> Auto <input checked="" type="radio"/> Lead Always On <input type="radio"/> Both Always On
Fan Run Zone Temp Delta	<input type="text" value="0"/>
Fan Off Cycle Delay in Auto	<input type="text" value="0"/>
HVAC to Operate during Generator Power	<input type="radio"/> None <input checked="" type="radio"/> Lead <input type="radio"/> Both
Smoke Alarm Contact Wiring	<input checked="" type="radio"/> Normally Open <input type="radio"/> Normally Closed
Commercial Powerfail Wiring	<input checked="" type="radio"/> Normally Open <input type="radio"/> Normally Closed
Generator Running Contact Wiring	<input checked="" type="radio"/> Normally Open <input type="radio"/> Normally Closed
Gas Sensor Contact Wiring	<input checked="" type="radio"/> Normally Open <input type="radio"/> Normally Closed
Intrusion Contact Wiring	<input checked="" type="radio"/> Normally Open <input type="radio"/> Normally Closed
Auxilliary Input Connection	<input type="radio"/> Nothing <input type="radio"/> Fan Status <input type="radio"/> Filter Status <input checked="" type="radio"/> Economizer Feedback
Auxilliary Input Contact Wiring	<input type="radio"/> Normally Open <input checked="" type="radio"/> Normally Closed

4.7.6 Advanced Settings

The advanced options are where the user can do various maintenance or housekeeping functions within the system.

4.7.6.1 System Version & Update

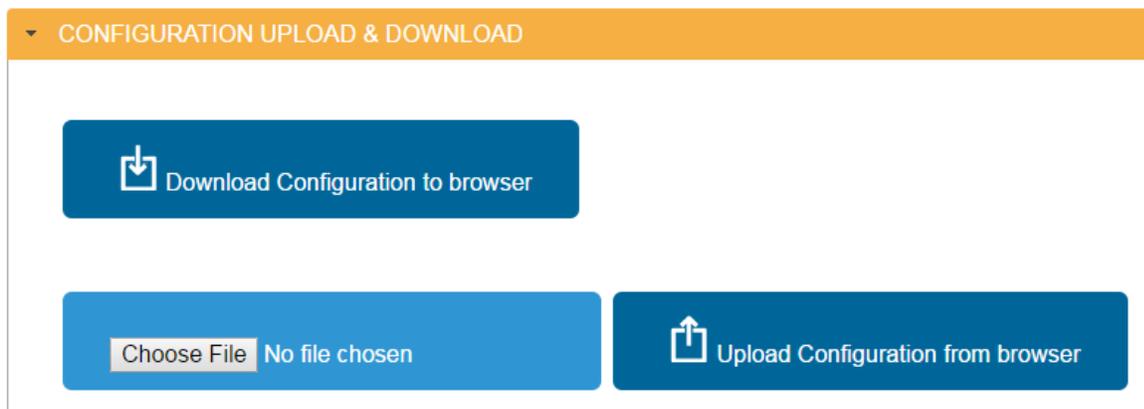
This section shows the current firmware version running in the system. The Check and Install Updates button tells the system to connect to the Update Server and check for any updates. If an update is available, the system will download it and ask that the user click on the Reboot button. After 60

seconds, the system will reboot automatically if the user doesn't press the button. See section 3.6.7.1 for additional details.



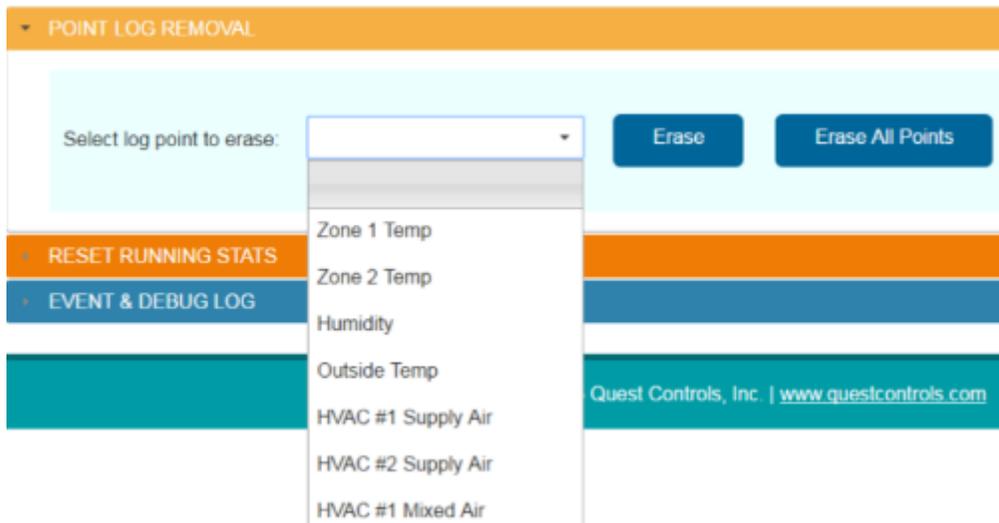
4.7.6.2 Configuration Upload & Download

This option allows the user to download a text file that contains all the configuration settings within the RSC 1000 system. Use this function to save a copy of your configuration to document the site. Also, you can take the configuration from one site and edit the information to send to another system for easy configuration. The format in the file is very specific and the RSC 1000 checks to ensure the contents are properly formatted before accepting the information on an upload. A status window will be displayed after the upload showing the results on the upload.



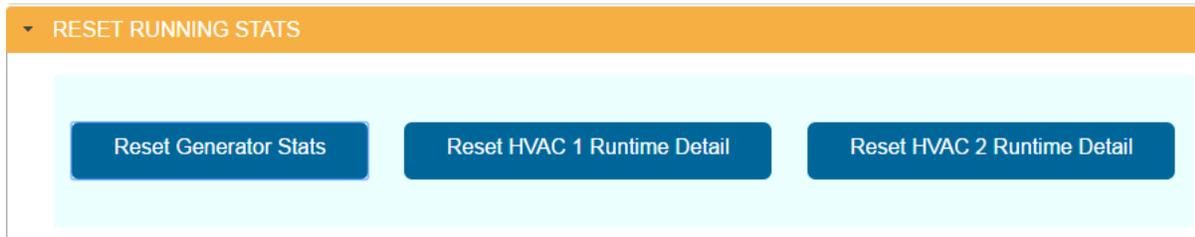
4.7.6.3 Point Log Removal

This menu option will allow the user to erase the history log data of a particular point or erase all points in the history log. This should be used sparingly, but might be useful after a major configuration change to clear all prior log data. Select a specific point from the dropdown and click on the Erase button. To remove all points from the history log, click on the Erase All Points button. Note the 24 hour and 30 day logs for the zone sensors and humidity sensor will be reset if you remove those points from the log file.



4.7.6.4 *Reset Running Stats*

This option allows the user to reset the timers on the status page for the HVAC and Generator run hour statistics. This includes the interval on timers and number of On/Off Cycles. Choose the timer you want to reset by clicking on the appropriate button. The web server will ask for confirmation prior before clearing the timers.



4.7.6.5 *Event & Debug Log*

This section is used for reviewing the system log. The system log keeps track of events and error conditions that may prevent the system from operating properly. For example, if the system cannot send alarms via either SNMP or email, the system will put an error message in the log. Use the categories button to select the type of issues to show and then choose the reporting level from the drop down list. The calendar tool is available for use if you're looking for an issue on particular dates. Select the settings you want for viewing the log and then click on the Regenerate System Log button to see the data in a text window. The data can also be downloaded to a text file by clicking on the Download Entire Log button. Contact Quest Controls, Inc. if you are experiencing an issue and need assistance with interpreting the event log.

EVENT & DEBUG LOG

Start Date: m End Date: m Error:

Categories:

```

Jul 1 11:21:02 2016 user.err alarmDist: 2670.153 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 30 17:22:26 2016 user.err QT: 105185.379 [QuestSubmenuWidget::settingsWidgetDestroyed] assertion failed <don't know who 1886942848 is -
expected 0>
Jun 30 16:27:36 2016 user.err alarmDist: 101850.680 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 29 15:30:00 2016 user.err alarmDist: 11995.131 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 24 17:00:05 2016 user.err alarmDist: 22309.221 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 24 16:28:06 2016 user.err alarmDist: 20390.290 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 24 11:12:51 2016 user.err alarmDist: 1474.971 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 23 18:19:36 2016 user.err alarmDist: 7956.550 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 23 16:23:28 2016 user.err alarmDist: 988.330 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 23 14:57:32 2016 user.err alarmDist: 319.350 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 23 14:01:09 2016 user.err alarmDist: 9408.789 [trapThread] sendTrap at index 2 not sent. Error code 1
Jun 21 11:50:40 2016 user.err alarmDist: 6538.904 [emailThread] sendEmail index 1 not sent. Error code 1
Jun 14 16:05:05 2016 user.err alarmDist: 931.690 [emailThread] sendEmail not sent. Error code 1
Jun 14 15:27:58 2016 user.err alarmDist: 772.600 [emailThread] sendEmail not sent. Error code 1
Jun 14 10:34:30 2016 user.err alarmDist: 1086.703 [emailThread] sendEmail not sent. Error code 1
Jun 14 09:02:44 2016 user.err alarmDist: 67675.672 [emailThread] sendEmail not sent. Error code 1

```

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Navigation: << < > >>

4.8 Logout

The last option on the Menu Bar is a Logout option. Clicking on that choice will log your password off the system. The system will then provide the Username/Password prompt so a new user can log into the system.

5 SNMP

The RSC 1000 can be managed by doing SNMP Sets and Gets to the system. Contact Quest Controls, Inc. for the RSC 1000 MIB and detailed instructions for monitoring and/or changing available Object Identifier (OID) supported by the system.

5.1 SNMP Digital Control Table

The rdiValue OID will have the status of each digital output used for HVAC control and exhaust fan control. A value of 1 means the output is in the ON state and a value of 0 means output is in the OFF condition.

Table OID .1.3.6.1.4.1.11476.6.1.3.1							
.1	.2	.3	.4	.5	.6	.7	
rdcDeviceIndex	rdcDirectoryIndex	rdcIndex	rdcDeviceName	rdcDirectoryName	rdcName	rdcValue	Index Value
0	0	0	quest_rsc_io0	digital_controls	exhaustFan	0	0 0.0
0	1	0	quest_rsc_io0	digital_controls1	hvacG	1	0 1.0
0	1	1	quest_rsc_io0	digital_controls1	hvacY1	0	0 1.1
0	1	2	quest_rsc_io0	digital_controls1	hvacEconDisable	0	0 1.2
0	1	3	quest_rsc_io0	digital_controls1	hvacW	0	0 1.3
0	1	4	quest_rsc_io0	digital_controls1	hvacEmergencyVent	0	0 1.4
0	1	5	quest_rsc_io0	digital_controls1	hvacY2O	0	0 1.5
0	1	6	quest_rsc_io0	digital_controls1	hvacAllBitmask	1	0 1.6
0	2	0	quest_rsc_io0	digital_controls2	hvacG	0	0 2.0
0	2	1	quest_rsc_io0	digital_controls2	hvacY1	0	0 2.1
0	2	2	quest_rsc_io0	digital_controls2	hvacEconDisable	0	0 2.2
0	2	3	quest_rsc_io0	digital_controls2	hvacW	0	0 2.3
0	2	4	quest_rsc_io0	digital_controls2	hvacEmergencyVent	0	0 2.4
0	2	5	quest_rsc_io0	digital_controls2	hvacY2O	0	0 2.5
0	2	6	quest_rsc_io0	digital_controls2	hvacAllBitmask	0	0 2.6

5.2 SNMP Digital Output Table

The rdoValue OID will have the status of each digital output used for alarm contacts. A value of 1 means the output is in alarm and a value of 0 means output is in the normal condition.

Table OID .1.3.6.1.4.1.11476.6.1.5.1							
.1	.2	.3	.4	.5	.6	.7	
rdoDeviceIndex	rdoDirectoryIndex	rdoIndex	rdoDeviceName	rdoDirectoryName	rdoName	rdoValue	Index Value
0	0	0	quest_rsc_io0	digital_outputs	alarmLed	0	0 0.0
0	0	1	quest_rsc_io0	digital_outputs	highTempStage2	0	0 0.1
0	0	2	quest_rsc_io0	digital_outputs	highTempStage1	0	0 0.2
0	0	3	quest_rsc_io0	digital_outputs	lowTemp	0	0 0.3
0	0	4	quest_rsc_io0	digital_outputs	smoke	0	0 0.4
0	0	5	quest_rsc_io0	digital_outputs	hvacPowerLoss	0	0 0.5
0	0	6	quest_rsc_io0	digital_outputs	hvacLockout	0	0 0.6
0	0	7	quest_rsc_io0	digital_outputs	controllerFault	0	0 0.7
0	0	8	quest_rsc_io0	digital_outputs	generatorRunning	0	0 0.8

5.3 SNMP Digital Input Table

The rdiValue OID will have the status of each digital input being monitored by the system. A value of 1 means the input has a closure present and a value of 0 means there is an open reading.

.1.3.6.1.4.1.11476.6.1.4.1							
.1	.2	.3	.4	.5	.6	.7	
rdiDeviceIndex	rdiDirectoryIndex	rdiIndex	rdiDeviceName	rdiDirectoryName	rdiName	rdiValue	Index Value
0	0	0	quest_rsc_io0	digital_inputs	hvac1LockoutRelayFail	0	0 0.0
0	0	1	quest_rsc_io0	digital_inputs	hvac1FanFilterStatus	0	0 0.1
0	0	2	quest_rsc_io0	digital_inputs	hvac2LockoutRelayFail	0	0 0.2
0	0	3	quest_rsc_io0	digital_inputs	hvac2FanFilterStatus	0	0 0.3
0	0	4	quest_rsc_io0	digital_inputs	commercialPowerFail	0	0 0.4
0	0	5	quest_rsc_io0	digital_inputs	generatorRunning	0	0 0.5
0	0	6	quest_rsc_io0	digital_inputs	gasAlarm	0	0 0.6
0	0	7	quest_rsc_io0	digital_inputs	smokeAlarm	0	0 0.7
0	0	8	quest_rsc_io0	digital_inputs	intrusion	0	0 0.8

5.4 SNMP Analog Output Table

The raoValue OID will have the status of each analog output. The value is the number of counts from the 12 bit D2A converter. 0 = 0% output and 4095 = 100% output.

.1.3.6.1.4.1.11476.6.1.6.1							
.1	.2	.3	.4	.5	.6	.7	
raoDeviceIndex	raoDirectoryIndex	raoIndex	raoDeviceName	raoDirectoryName	raoName	raoValue	Index Value
0	0	0	quest_rsc_io0	analog_outputs	hvac1Damper	0	0 0.0
0	0	1	quest_rsc_io0	analog_outputs	hvac1SupplyFan	0	0 0.1
0	0	2	quest_rsc_io0	analog_outputs	hvac2Damper	0	0 0.2
0	0	3	quest_rsc_io0	analog_outputs	hvac2SupplyFan	0	0 0.3

raoValue = raw counts of a 12 bit D2A converter.

5.5 SNMP Analog Input Table

The raiValue OID will have the status of each analog input being monitored by the system. The readings displayed will be their defined engineering units.

Table OID .1.3.6.1.4.1.11476.6.1.7.1								
.1	.2	.3	.4	.5	.6	.7	.8	
raiDeviceIndex	raiDirectoryIndex	raiIndex	raiDeviceName	raiDirectoryName	raiName	raiValue	raiConversionFactor	Index Value
0	0	0	quest_rsc_io0	analog_inputs	hvac1SupplyTemp	50.08 degF		0.0.0
0	0	1	quest_rsc_io0	analog_inputs	hvac1MixedAirTemp	55.99 degF		0.0.1
0	0	2	quest_rsc_io0	analog_inputs	zoneTemp1	73.9 degF		0.0.2
0	0	3	quest_rsc_io0	analog_inputs	hvac2SupplyTemp	45.15 degF		0.0.3
0	0	4	quest_rsc_io0	analog_inputs	hvac2MixedAirTemp	58.1 degF		0.0.4
0	0	5	quest_rsc_io0	analog_inputs	zoneTemp2	70.18 degF		0.0.5
0	0	6	quest_rsc_io0	analog_inputs	outdoorAirTemp	60.23 degF		0.0.6
0	0	7	quest_rsc_io0	analog_inputs	humiditySensor	70 1,0,100,percent		0.0.7
0	0	8	quest_rsc_io0	analog_inputs	plantCurrent1	10.42 currentLoop		0.0.8
0	0	9	quest_rsc_io0	analog_inputs	plantCurrent2	18.44 currentLoop		0.0.9

5.6 SNMP Application Status Table

The application table shows the various setpoints that are used throughout the system. The appValue OID will show the current value for the setting. This OID allows SNMP Sets to change the value. The SNMP manager must write a value of 1 to the commitValues OID to save changes made in this table.

RSC 1000 App Parameters

*Note: a value of 1 must be written to the commitValues (.1.3.6.1.4.1.11476.6.1.30.1) OID, after setting values in this table. This will write the new values to flash and tell the RSC 1000 to use the new values.

Table OID	.1.3.6.1.4.1.11476.6.1.10.1			
.1	.2	.3		
appTypeIndex	appNameIndex	appValue	Limits	Definition
var	comfort_cooling	770	500-800	Stage 1 cooling setpoint in comfort mode. Value is in tenths of a degree
var	comfort_heating	730	500-800	Stage 1 heating setpoint in comfort mode. Value is in tenths of a degree
var	comfort_mode_time	3600	0-14400	The amount of time comfort mode is active when enabled. Value is in seconds
var	comfort_shelter	750	500-800	Shelter setpoint in comfort mode. Cooling turns off when below this setting. Value is in tenths of a degree
var	cooling_stage2_delta	20	5-50	Degrees above the cooling setpoint to enable stage 2 cooling mode. Value is in 10ths
var	cooling_stage3_delta	20	5-50	Degrees above cooling stage 2 to enable stage 3 cooling mode. Value is in 10ths
var	cooling_stage4_delta	20	5-50	Degrees above cooling stage 3 to enable stage 4 cooling mode. Value is in 10ths
var	heating_stage2_delta	20	5-50	Degrees below the heating setpoint to enable stage 2 heating mode. Value is in 10ths.
var	lead_change_time	604800	0-1209600	Delay time before changing which unit is the lead system. Value is in seconds
var	min_off_cooling	120	0-600	The minimum time cooling must be off before it can be turned on. Value is in seconds
var	min_off_heating	120	0-600	The minimum time heating must be off before it can be turned on. Value is in seconds

var	min_on_cooling	120	0-600	The minimum time cooling must be on before turning off. Value is in seconds
var	min_on_heating	120	0-600	The minimum time heating must be on before turning off. Value is in seconds
var	normal_cooling	770	500-800	Stage 1 cooling setpoint in normal mode. Value is in tenths of a degree
var	normal_heating	730	500-800	Stage 1 heating setpoint in normal mode. Value is in tenths of a degree
var	normal_shelter	750	500-800	Shelter setpoint in normal mode. Cooling turns off when below this setting. Value is in tenths of a degree
econ	damper_change_down_pct	5	1-10	The amount of change the damper can close when the mixed air temperature is below the mixed air setpoint plus dead band. Value is in %
econ	damper_change_up_pct	5	1-10	The amount of change the damper can open when the mixed air temperature is above the mixed air setpoint plus dead band. Value is in %
econ	damper_dwell_time	60	10-300	The amount of time to wait before making a change in the damper position. Value is in seconds
econ	damper_min_pos_pct	5	0-20	The minimum position of the outside air damper. Value is in % from 0-100
econ	damper_mixed_air	500	450-650	The temperature to maintain for mixed air when in economizer mode. Value is in 10ths.
econ	damper_mixed_air_deadband	30	0-100	Mixed air dead band added to and subtracted from the mixed air setpoint to prevent the damper from changing too rapidly. Value in 10ths of a degree.
econ	float_max_change	50	0-100	The maximum amount of change allowed for level 1 and level 2 outside air setpoints to change automatically. Value is in tenths
econ	humidity_disabled	65	40-90	Economizers are disabled when the inside humidity is greater than this value. Value is in %RH

econ	humidity_dwll_time	900	300-3600	Shelter humidity must be greater than the disable setpoint for this delay time to disable economizer mode. Value is in seconds.
econ	humidity_enabled	50	40-90	Economizers mode is enabled when the humidity is below this setting. Value is in %RH
econ	osa_dwll_time	900	300-3600	Amount of time the outside air must be below level 1, between level 1 and 2 or above level 2 before economizer mode is determined. Value is in seconds
econ	osa_level_1	680	450-800	Outside air setpoint for economizer control. Level 1 value must be lower than Level 2. Value is in 10ths
econ	osa_level_2	750	450-800	Outside air setpoint for economizer control. Level 2 value must be higher than Level 1. Value is in 10ths
alarm	hvac1_clogged_filter_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_clogged_filter_severity	2	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac1_control_volt_lost_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_control_volt_lost_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac1_cooling_failed_alarm_temp	650	500-750	Unit one alarm threshold when calling for cooling and the supply temperature is above this value. Value is in 10ths of a degree
alarm	hvac1_cooling_failed_clear_temp	630	500-750	Unit one cooling fail alarm clear threshold when supply temperature is below this value. Value in 10ths of a degree
alarm	hvac1_cooling_failed_delay	900	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_cooling_failed_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm

alarm	hvac1_cooling_trouble_alarm_temp	100	0-400	Unit one cooling trouble alarm when the delta between controlling temp and supply temp is below this level. Value in 10ths of a degree
alarm	hvac1_cooling_trouble_clear_temp	150	0-400	Unit one cooling trouble alarm clear when the delta between controlling temp and supply temp is above this level. Value in 10ths of a degree
alarm	hvac1_cooling_trouble_delay	300	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_cooling_trouble_severity	1	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac1_fan_failed_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_fan_failed_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac1_heating_failed_alarm_temp	1100	900-1200	Unit one alarm threshold when calling for heating and the supply temperature is below this value. Value is in 10ths of a degree
alarm	hvac1_heating_failed_clear_temp	1150	900-1200	Unit one cooling fail alarm clear threshold when supply temperature is above this value. Value in 10ths of a degree
alarm	hvac1_heating_failed_delay	900	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_heating_failed_severity	1	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac1_lockout_alarm_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac1_lockout_alarm_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm

alarm	hvac2_clogged_filter_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_clogged_filter_severity	2	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac2_control_volt_lost_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_control_volt_lost_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac2_cooling_failed_alarm_temp	650	500-750	Unit two alarm threshold when calling for cooling and the supply temperature is above this value. Value is in 10ths of a degree
alarm	hvac2_cooling_failed_clear_temp	630	500-750	Unit two cooling fail alarm clear threshold when supply temperature is below this value. Value in 10ths of a degree
alarm	hvac2_cooling_failed_delay	900	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_cooling_failed_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac2_cooling_trouble_alarm_temp	100	0-400	Unit two cooling trouble alarm when the delta between controlling temp and supply temp is below this level. Value in 10ths of a degree
alarm	hvac2_cooling_trouble_clear_temp	150	0-400	Unit two cooling trouble alarm clear when the delta between controlling temp and supply temp is above this level. Value in 10ths of a degree
alarm	hvac2_cooling_trouble_delay	300	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_cooling_trouble_severity	1	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm

alarm	hvac2_fan_failed_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_fan_failed_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac2_heating_failed_alarm_temp	1100	900-1200	Unit two alarm threshold when calling for heating and the supply temperature is below this value. Value is in 10ths of a degree
alarm	hvac2_heating_failed_clear_temp	1150	900-1200	Unit two cooling fail alarm clear threshold when supply temperature is above this value. Value in 10ths of a degree
alarm	hvac2_heating_failed_delay	900	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_heating_failed_severity	1	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	hvac2_lockout_alarm_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	hvac2_lockout_alarm_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	power_commerical_fail_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	power_commerical_fail_severity	4	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	power_gen_failed_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	power_gen_failed_severity	4	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	power_gen_running_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200

alarm	power_gen_running_severity	4	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	shelter_door_open_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	shelter_door_open_severity	2	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	shelter_emergency_vent_mode_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	shelter_gas_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	shelter_gas_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	shelter_smoke_delay	5	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	shelter_smoke_severity	4	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	temp_high_humidity_alarm_level	80	50-100	Shelter high humidity alarm setpoint. Value in %RH
alarm	temp_high_humidity_clear_level	75	50-100	Shelter high humidity alarm clear threshold. Value in %RH
alarm	temp_high_humidity_delay	900	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	temp_high_humidity_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	temp_high_level1_alarm	800	750-1150	Shelter high temp alarm level one threshold. Value is in 10ths of a degree
alarm	temp_high_level1_clear	780	750-1150	Shelter high temp level one alarm clear threshold. Value is in 10ths of a degree

alarm	temp_high_level1_delay	300	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	temp_high_level1_severity	3	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	temp_high_level2_alarm	850	800-1200	Shelter high temp alarm level two threshold. Value is in 10ths of a degree
alarm	temp_high_level2_clear	820	800-1200	Shelter high temp level two alarm clear threshold. Value is in 10ths of a degree
alarm	temp_high_level2_delay	300	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	temp_high_level2_severity	4	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	temp_low_alarm	550	400-600	Shelter low temperature alarm setpoint. Value in 10ths of a degree.
alarm	temp_low_clear	580	400-600	Shelter low temperature alarm clear threshold. Value in 10ths of a degree.
alarm	temp_low_delay	300	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	temp_low_humidity_alarm_level	15	0-40	Shelter low humidity alarm setpoint. Value in %RH
alarm	temp_low_humidity_clear_level	20	0-40	Shelter low humidity alarm clear threshold. Value in %RH
alarm	temp_low_humidity_delay	900	0-7200	The delay time before the alarm is active. Supported values on the front panel are: 0, 5, 30, 60, 300, 900, 1800, 2700, 3600, 7200
alarm	temp_low_humidity_severity	2	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm
alarm	temp_low_severity	2	0-4	Severities are 0=notice, 1=warning, 2=minor, 3=major, 4=critical, 5=disable the alarm

Appendix A – Product Specifications

Specifications for the RSC 1000	
Part Number	150982
Mounting	Wall mount
Inputs	10 dry contact digital inputs (Normally Open/Closed), 7 Thermistor Inputs (10k Type3), and three 0-20 mA sensors
Digital Outputs	21 digital outputs - (13 SPST) 8 amp at 250 VAC, 5 amps at 300 VDC, (8 SPDT) 1 amp at 30 VDC, .5 amps at 125 VDC
Analog Outputs	4 analog outputs selectable for 0-10VDC or 4-20 mA
Power	24 VAC power from AC#1, AC#2 plus a separate 24 VAC or 18-65VDC
Front Panel	Color Touch Screen LCD 4.3" diagonal with 24-bit TrueColor. WQVGA resolution (480 x 272)
Serial Port	RS-485 (2 wire) Serial port supports Modbus RTU
Network Interface	Ethernet 10/100 Base-T
Protocols Supported	HTTP with a built-in Web Server, Telnet, SMTP (email), SNMP v1, v2c for polling and traps/informs for alarming
Logging	Logs data for inputs, outputs and alarms
Software	Built-in web server supports all modern web browsers (e.g. IE 6+, Firefox 1.5+, Chrome)
I/O Terminals	2 piece pull-off terminals for all field wiring
Battery	Long life lithium: 10 year shelf life, 1.5 years under load
Temp/Humidity Sensor Accuracy	Temp: $\pm 1^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$). Temperature Sensor Standard, Optional Remote Temperature/Humidity Sensor (PN 150749), Temp: $\pm 1^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$), Humidity: $\pm 3\%$ of range
Ambient Operating Temp	23 to 131 $^{\circ}\text{F}$ (-5 to 55 $^{\circ}\text{C}$), 0-95% RH Non-condensing
Dimensions	11.25"W x 16.25"H x 3.5"D (286 x 413 x 89 mm)
Weight	6 lb. (2.7 kg)
Warranty	1 year

**CAUTION - Battery May Explode If Mistreated. Do Not Recharge, Disassemble Or Dispose Of In Fire.*