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CENTRON PRESIDIO

USER GUIDE



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An Introduction...

Centron systems are designed to provide the ultimate in high-security environmental monitoring. A Centron will monitor any type of input, analyze for trouble conditions, and ensure that the appropriate people are notified in a timely manner, all the while providing a detailed record of all events. Due to sophisticated alarm condition analysis, the systems cause essentially no false alarms.

Each unit, whether an 8 input, 16 input, 32 input, 64 Input, or a 128 input unit, is a "Node" on the overall system. Each system can support a maximum of 100 Nodes for a total of 12,800 inputs. In addition to simply monitoring the status of inputs, the Node is capable of logic based on-off type output controls suitable for driving lights, thermostat functions, watering systems, etc. Each Centron Node maintains a log in non-volatile memory of all alarm events, error events, and periodic readings, in a database.

The Centron unit has an optional Touch-Screen panel that provides complete system wide access to the entire networked system. It functions as a fully capable workstation, allowing the user to view and program all Nodes, local and remote. These panels are also available in a stand-alone version that can be placed wherever they are needed throughout the facility.

Built into each Centron is the ability to alert the user should an alarm condition occur. The telephone on alarm functionality utilizes an array of configurable telephone lists to call an individual in the event of an alarm. Fully customizable, inputs or groups of inputs can be configured so that different telephone lists can be utilized to respond to different events. The email on alarm functionality can be used so that individuals can receive alerts at the time of an alarm.

The ability to collect information is just one side of monitoring inputs, the ability to get at and display that information in a straightforward manner is the other. Logging inputs at the configured system rate, the Centron shows periodic readings when conditions are normal. In the event of an alarm the Centron has the ability to increase the logging rate, record the time and nature of the alarm, the phone number contacted to report the alarm (if applicable), and the time when the alarm was corrected.

The Centron provides security at many different levels so that regardless if a user is inhibiting an alarm over the telephone or sitting in front of a computer, making changes to the alarm parameters of an input or making a change to the system, it will be logged. Users that are entered into the system can be given a variety of different permission levels thereby restricting access to only those portions of the system for which they are authorized. When the audit log records programming changes, it indicates what the conditions were prior to the change, what they are after the change, who made the change, and when they were made. Comments to document the changes, alarms, etc., can be added to the log, along with the name of the person making the entry, the time, and the date.

Utilizing supervised circuits, all probe wiring is monitored so that any problems will cause a trouble alarm and diagnostic message. If a probe wire is shorted or broken, the Centron will report an alarm. If the database cannot be written to, the Centron will report an alarm. Alarm disabling is supervised to ensure that alarms are not turned off and forgotten. An alarm cannot be inhibited without indicating when it is to come back on-line.

Centron systems are sophisticated, distributed processor, multi-tasking, real time, high security monitoring and control systems that are easy to use. All programming consists of plain English questions and answers. Consult the relevant Programming section in the manual or click on the Help button (?) on the menu bar for on-line help.

Installation

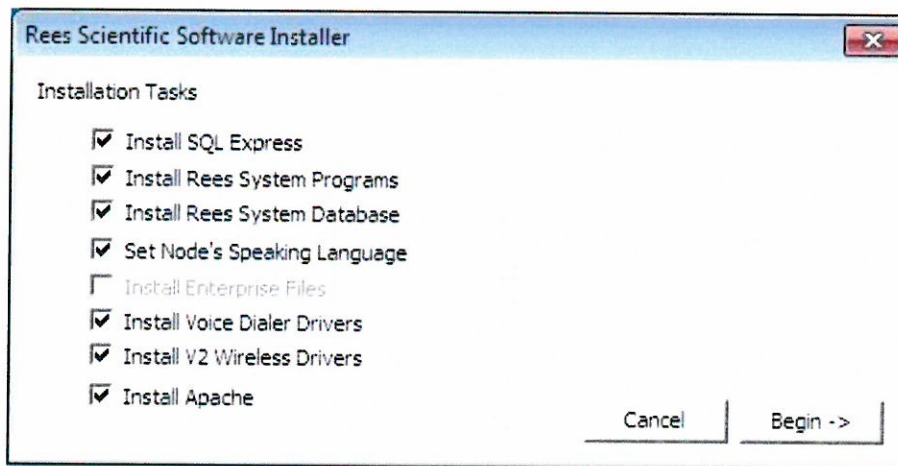
Requirements

Minimum Requirements	Recommended Requirements
Operating System- Windows XP 32-bit Windows 7 32-bit Windows 7 64-bit	Operating System- Windows 7 32-bit Windows 7 64-bit
Processor- Pentium III or higher	Processor- 2GHz or higher
Memory- 1GB of RAM or higher	Memory- 2GB of RAM or higher
Storage- 10GB of hard drive space *Additional space required for archival data	Storage- 20GB of hard drive space *Additional space required for archival data
USB- 2 available ports (1 additional USB port will be needed for every add-on Node)	USB- 4 available ports (1 additional USB port will be needed for every add-on Node) *2 available USB ports for Virtual Machines
Optical Drive- CD-R/RW for local backup	Optical Drive- DVD+- RW / DL for local backup
	Peripherals- Sound Card Printer
	Network Connection- Single Port 10/100/1000

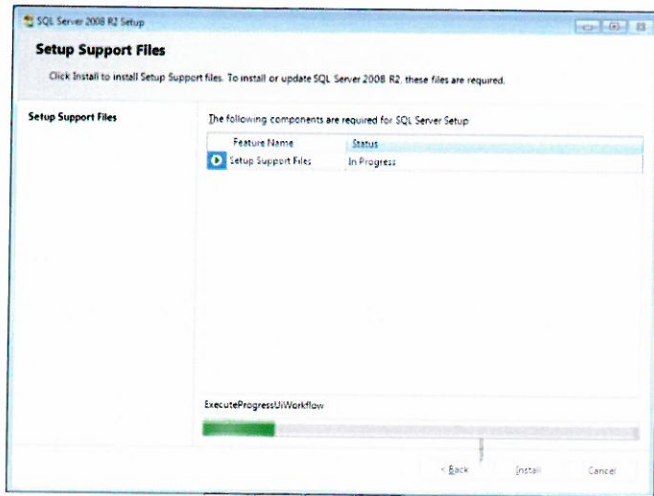
Software Installation

The software installation is comprised of a series of individual components for which minimal user interaction is needed. In order to proceed during the installation you will need to agree to any licensing terms and acknowledge any prompts indicating that a component is being installed or has finished. If during the installation you are prompted to update your system because of a missing component exit out of the installation and install any such software.

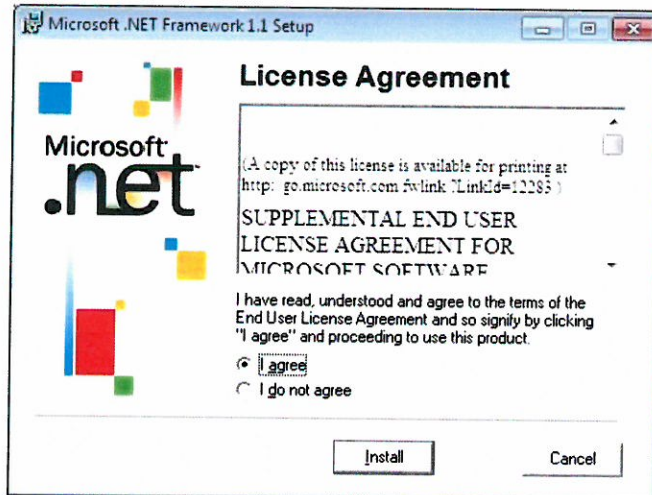
1. Close any applications you have currently running.
2. Insert the CD that came with your modem into your CD or DVD drive. The CD should automatically start and display an installation screen. If the CD does not start automatically, navigate to **My Computer** and double-click your CD or DVD drive icon.
3. When the installation screen appears select the modules that you want to install. If this is the first time you are installing the software check everything that is active and Click **Begin ->**.



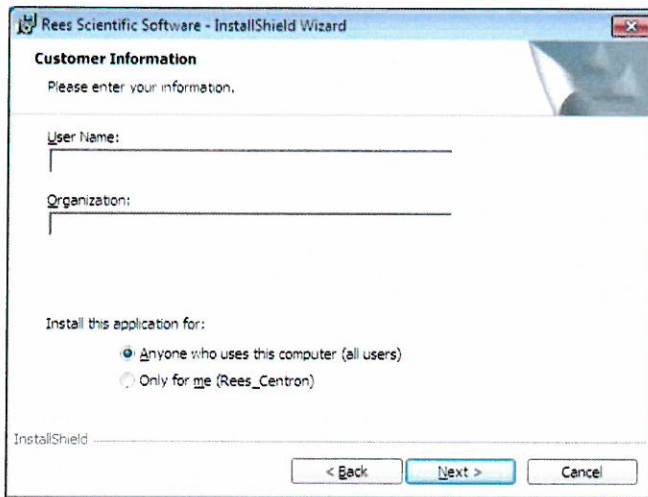
4. The software will begin with the installation of Microsoft SQL (Figure 2). When this portion of the install has completed you will be prompted with the new Rees password. Click **OK**



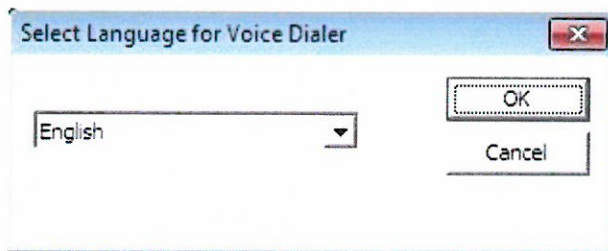
5. Microsoft .Net will install next. In order to proceed you will need to agree to the license and click **Install**. Once installed click **OK** on the .Net installation prompt.



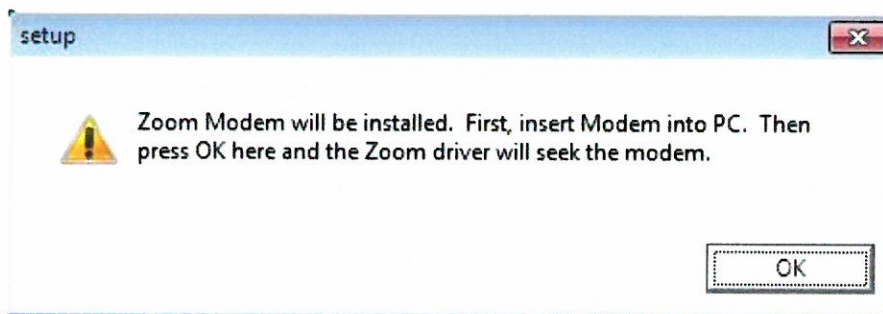
6. The Centron software will install next. In order to move on you will need to once again agree to the license. Enter your user name and organization where prompted, click **Next** and then **Install**.



7. Select the language that you want your voice dial-out messages to occur in and click **OK**.



8. The Voice Dialer is the next component to be installed. Locate the dialer that came with your system and plug it into an available USB port on the machine. Click **OK** in the box shown in Figure 6 to begin installation of the drivers for the device.



9. The final component of the software to be installed is Apache Web Server, an installation that will take place in the background. In order for the ReesWeb component of the software to work you will need to allow firewall access to Apache. If you are prompted by Windows Firewall as shown below in Figure 7 check off what is needed and click **Allow access**.



10. You will be prompted that the setup is complete. Click **OK** to finish the installation.

Suite Components

The software suite is comprised of multiple applications that work together, giving you a flexibility not seen in other systems. Though not always needed, some of these components enable you to do things such as archive time specific data, change databases, and test system connections. The commonly used programs are:

- Automatic Backup Utility
- Workstation
- Wireless Subsystem
- Voice Dialer Administrator

Automatic Backup Utility

The Automatic Backup Utility software is used to create and restore database backups. Designed to run in the background, a user can use the software to create a backup of their database at a fixed time every day, and store that backup in a location of their choosing.

Backup

Logon Account

Enter the user account that has permission to write to the backup location as indicated by the Backup Path.

Password

Enter the password of the Logon Account.

Domain

If the logon credentials you are using are for a domain, enter the domain name here.

Backup Path

Location used to store backups.

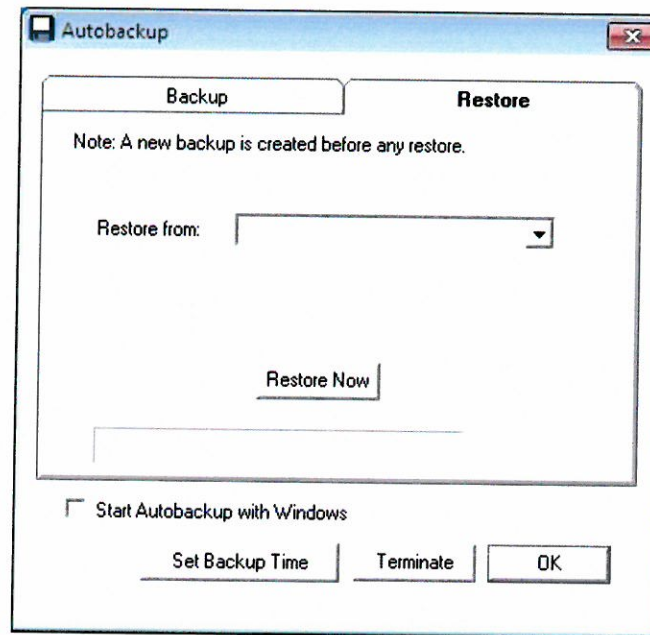
Set Backup Time

The Backup Time is the time at which backups will be created every day.

Terminate

Closes and stops Autobackup from running.

Restore



Restore from

Backup to restore from

Restore Now

Commences restoration

Workstation

The Workstation application is the heart of the software suite and is the location where day to day activities will take place. Designed to work at the console level the workspace enables a user to add new inputs, change input alarm parameters, print input data graphs...

Home Screen

The screenshot shows the Workstation application interface. The top ribbon bar includes tabs for Overview, Inputs/Outputs, Reports/Graphs, and Advanced. The Overview tab is active, showing a Quick Access Toolbar with icons for Open Node, Close Node, Edit Node, Global Options, Log In, Show Logins, View Windows, Inputs by Number, Zoom In, Zoom Out, Lower Map, and About... Help Index New Options Software.

On the left, the System Tree lists nodes from Global Overview to Node 21-Sidney Security. The main display area shows a floor plan with numbered nodes (1-147) arranged in a grid, divided into Upper Level and Lower Level. The floor plan is labeled "Demo Data 1/1/08-3/31/08".

On the right, the System-wide Running Log displays a table with columns: Date/Time, In/Out, Node, Condition, and Comment. The log shows a "Global Event" on 7/5/2012 at 3:10 PM with a "Login" condition and "No" comment.

Below the log, the Input Annunciator Panel shows three graphs for different probes: N1-007 - Probe 007, N1-038 - Probe 038, and N1-002 - Probe 002. Each graph displays a line plot of temperature over time, with status and limit information.

Labels with arrows point to the following components:

- Quick Access Toolbar**: Points to the top ribbon bar.
- Ribbon Bar**: Points to the top ribbon bar.
- System-wide Running Log**: Points to the log table.
- Current System Status**: Points to the left sidebar menu.
- System Tree**: Points to the left sidebar menu.
- Node(s) Window**: Points to the floor plan display.
- Input Annunciator Panel**: Points to the right sidebar graphs.

Quick Links






[Connecting a Zigbee Transmitter](#)
[Connecting a WiFi Transmitter](#)

[Connecting a Coordinator to the System](#)
[VoIP Setup](#)

Quick Access Toolbar

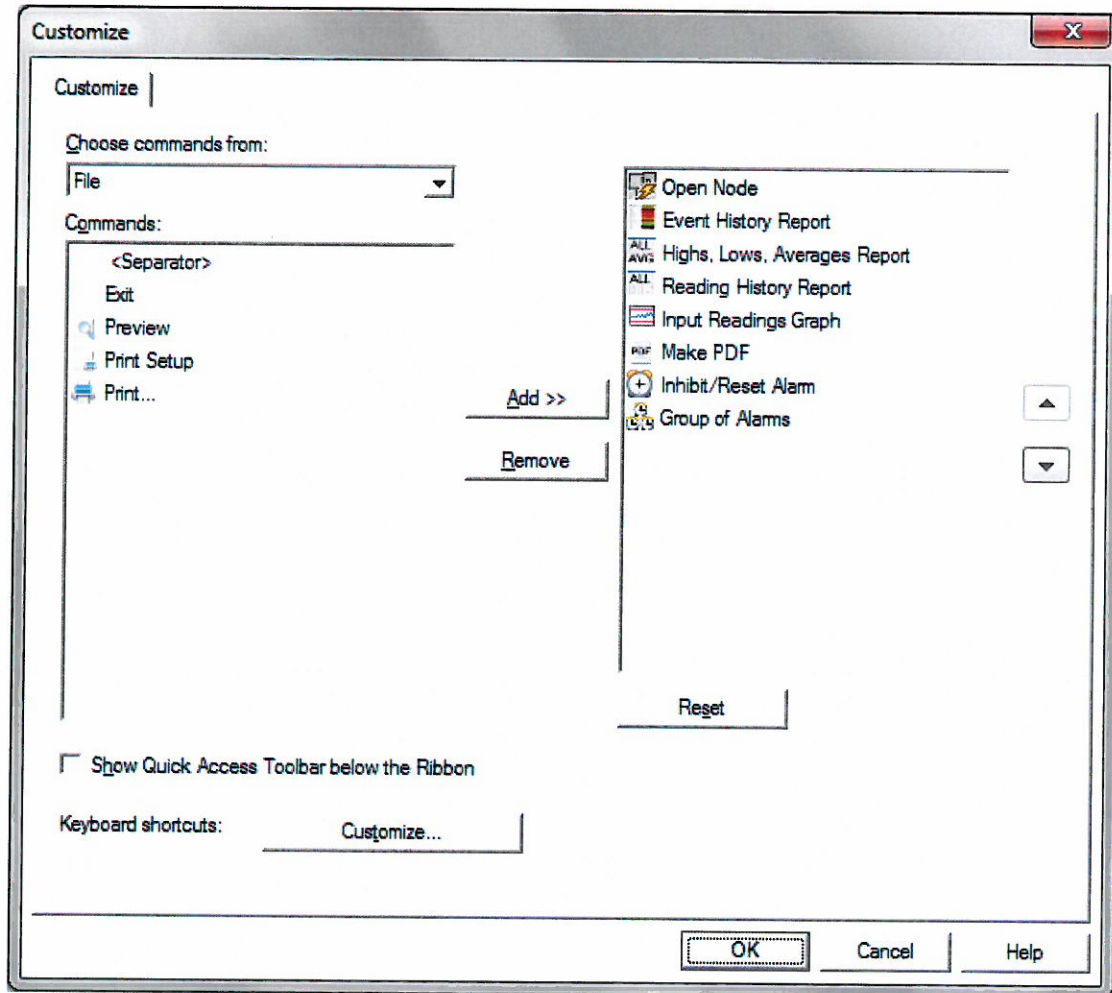


The default Quick Access Toolbar enables you to customize and rapidly access the most commonly used items.

Field	Description
 Inhibit/Reset Alarm	Shows the alarm control for a specific input
 Group of Alarms	Inhibit or reset multiple alarms.
 Print	Prints an active report. Only available when a report is opened.
 Print Preview	Print Preview for an active report.
 Customize	Enables you to both customize what icons appear on the quick access toolbar as well as the location of the toolbar itself.

More Commands

To add additional items to the Quick Access Toolbar select More Commands from the customize button located alongside the toolbar.



To add additional icons to the Quick Access Toolbar select the appropriate menu name from the drop-down list. Once you have navigated to the appropriate menu, select the icon you wish to add to your toolbar and either double-click it or press the Add >> button to move it into the toolbar list.

Choose Commands from:

Use this drop-down menu to select a pre-existing list from which to icons from.

Add>>

Once an icon has been selected in the left-hand pane press this button to move it into the right-hand toolbar menu.

Remove

To remove an icon from the right-hand toolbar menu first select it in the list and then press this button to remove it.

Up/Down

Use these buttons to change the order in which the icons appear on the Quick Access toolbar. To change the order, first select an item in the right-hand pane and then press the appropriate button to move it to its new location.

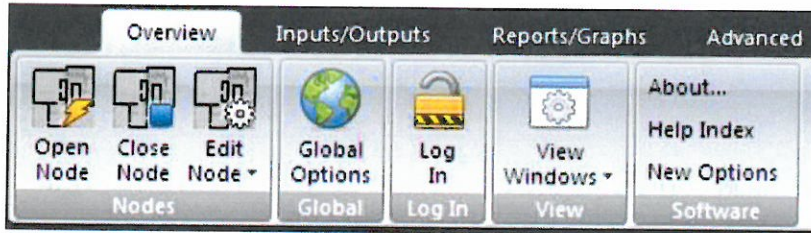
Reset

Press the Reset button to change your icons back to their default status.

Customize

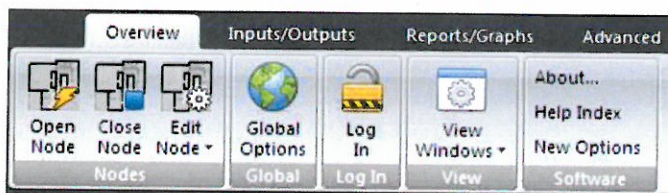
Press the Customize button to assign keyboard shortcuts to any item in the toolbar.




Ribbon Bar



The Ribbon bar enables you to quickly find the commands needed to perform a task. Organized in logical groups, commonly used functions are given icons while less used tasks are listed in submenus.

Overview (Environmental Node / Card Access Node)



Field	Description
 Open Node	Open a preexisting Node.
 Close Node	Close an open Node.
 Edit Node	Submenu container which houses the following functions: <div> <div> -Add New Node </div> <div> Add a new Node to the system. </div> <div> -Edit a Node </div> <div> Change an existing Node's name and referencing information. </div> </div>

-Delete a Node	Delete an existing Node.
-Node Power Alarm Programming	Change the Power Alarm monitoring notification settings. (Only available on Centron Tower and Wall mount units).
-Edit Logging Options	Change the Alarm and Normal data sampling intervals as well as both the transition period and pending alarm condition monitoring.
-Edit Node-Wide Options	Set general alarm phone parameters.
-Move Inputs or Outputs on Map	Enables you to move system icons on the map.
-Add/Remove Inputs from Lower Level Map	Enables you to change the location of inputs so that they appear on a map that is different than the default node map. (Only applicable if additional winmaps have been loaded).
-Set Icon Size and Style	Change the existing icon sizing.
-View Node Date/Time	Checks the current Node's date and time.
-Set System Date/Time	Set the current Node's date and time.



[Global Options](#)

Through this window you can set options such as requiring electronic signatures, enable password expiration, integrate Windows authentication, set validation information, program your email settings, set how dates are displayed, and turn on sounds for your system.



[Log In](#)

Enables you to login to the software.



Show which users are currently logged into the system and where they are logged in from.

[Show Logins](#)



[View Windows](#)

Submenu container that enables you to select which windows you would like present.

- | | |
|---------------------------|---|
| -Show Running Log | Displays the Running Log. |
| -Show System Tree | Displays the System Tree. |
| -Show Annunciator Window | Displays the graphical Annunciator Window |
| -Arrange Inputs By Number | Arranges the icons so that they are shown in numerical order. |



[Inputs by Number](#)

Temporarily sort all inputs on the system in numerical order.



[Zoom In](#)

Zoom In.



[Zoom Out](#)

Zoom Out.



[Lower Map](#)

Assign inputs to a Lower Level Map.

[About](#)

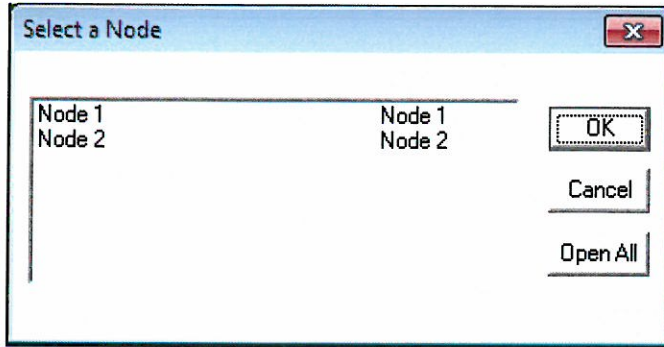
Tells you what version of the software you have and any major installed options that are currently on the system.

Help Index Brings you to the Help file.

[New](#)
[Options](#)

Add new options to the system.

Open Node



When this function is chosen, the program will establish communications with the selected Node and check both its date and time. If a discrepancy exists between the date and time of the Node that is currently open and the one you are trying to open you will be prompted for the correct values.

Close a Node

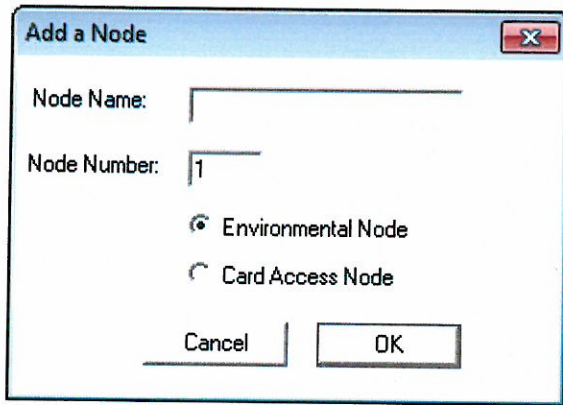
Any number of Nodes can be simultaneously opened on a desktop. Anytime a Node is closed, ongoing or active alarms will continue to be acted upon by the Node but no longer displayed on a workstation with that node closed.

Edit a Node

Refer to an individual section within the Edit a Node menu.

Add New Node

Use this function to add a new Node to the system. Enter a descriptive name for the Node that is indicative of the area being monitored (e.g. Building 1, Freezer Room) and select the type of node that you have: Environmental or Card Access. Use the Institution and Address fields located in the next window to further identify the Node.



Add a Node

Node Name:

Node Number:

☒ Environmental Node
☐ Card Access Node

Node Name:

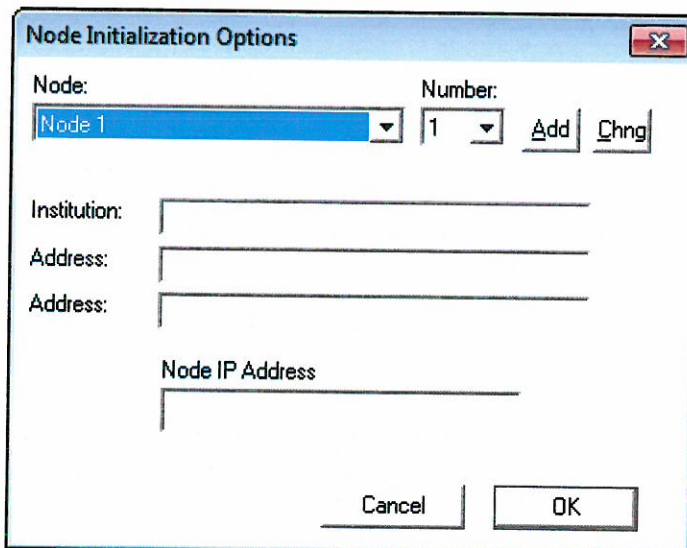
Enter a descriptive name for the Node that is indicative of the area being monitored (e.g. Building 1, Freezer Room).

Node Number:

Enter the number of the Node on the system. If this is the only Node on the system enter: 1.

Node Selection:

Environmental or Card Access



Node Initialization Options

Node: Number:

Institution:

Address:

Address:

Node IP Address

Add

Add another Node

Change

Change the initialization information for a Node

Institution & Address:

Enter identifiable information in these fields to further distinguish the Node.

Edit a Node

Select the Node you would like to edit. This option directs you to the Node Initialization window that is found when adding a new Node.

Delete a Node

Delete a node and any associated records from the database.

WARNING!!! All of the Readings and Alarm History files for the chosen Node will be deleted.

Node Power Alarm Programming

The Node Power Alarm Programming option is only available on Centron Tower and Wallmount units. Each Node monitors its battery charging current at both the Node itself and at every hardwired remote panel. If the charging current at the main panel fails the system will generate a power alarm. In the event of a power outage the Node will continue to run on the integrated battery backup however the monitor connected to the system will be off unless it has a separate battery backup unit. While the local alarm trips immediately the unit will not perform a telephone alarm callout until after a specific, independent, established delay time has been reached. If the Workstation software is running, the running log will indicate that input 129 is in alarm.

A Remote Panel battery charging failure will cause that remote panel to register a trouble alarm. This alarm can be caused by either the loss of AC power to the panel or if the panel has detected that its backup battery power source is no longer available. The Node will notify all network workstations of this problem and cause a beeping message to appear on the workstation desktop.

NOTE: The loss of power to or the failure of one or more hardwired MPX Remote Panels will not cause the failure of the complete system. Only the inputs connected to the panel(s) in question will not be functioning. Once the problems have been rectified, the system will return to normal operation automatically.

Power Alarm Options

Delay - Power Alarm to Dial-out: 0

Power Alarm Priority: 1

☐ Power Alarm to be Audible

Phone List: Phone List 1 Add

Email 1 to Notify on Alarm:

Cancel OK

Delay - Power Alarm to Dial-out:

This is the delay in minutes before the Node begins telephoning in the event of a power failure alarm. This power failure refers to an AC power failure to the node. Loss of AC power to an MPX Remote Panel will not generate a dial out alarm at the Node.

Power Alarm Priority:

Each input's alarm is given an alarm priority number which is set by the user. Alarms are answered in priority order. For instance, if the node is trying to telephone someone about a priority 5 alarm, and it receives a priority 4 alarm, it will discontinue telephoning for the priority 5 alarm after the current call is completed and begin telephoning for the priority 4 alarm. The default priority for a power alarm is 1.

Power Alarm to be Audible:

Alarms can be audible or silent. The power alarm defaults to silent on new systems because a power outage is usually readily apparent.

NOTE: Alarms programmed as silent are only silent at the Node. If the system is programmed to sound an alarm at the PC, this alarm will sound upon loss of power.

Phone List:

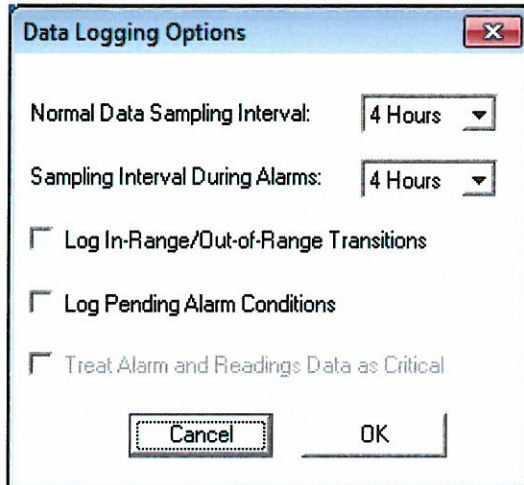
One of the Node's phone lists should be the 'power alarm list' so the node knows what numbers to call when there is a power problem. If one is not already programmed it can be added here by clicking the 'Add' button.

Email 1 to Notify on Alarm:

In the event of a power alarm an email will be sent to the address listed here.

Edit Logging Options

All of the data logging options are grouped together under this heading. The data logging options chosen here are valid for all of this node's inputs.



Normal Data Sampling Interval:

This is the rate at which the Node logs the current sensor readings when there are no existing alarms or inhibited inputs. Select the sampling interval as needed to review data and meet regulatory requirements.

Sampling Interval During Alarms:

This is the rate at which the node will log readings data during alarm situations. This rate is usually set higher than the normal sampling rate since most users want to monitor conditions more closely during alarm situations.

When the node is recording at the alarm rate, ALL inputs on the node are being recorded at this rate, even the ones not in alarm.

Log In Range/Out of Range Transitions

Enabling this option will cause the system to log every time a transition is made into and out of an alarm range. Choosing this option will cause a considerable number of logging events in cases where

an analog input is at the threshold of the alarm range. As such, turning this option on is not recommended unless it is required to log all such transitions.

Log Pending Alarm Conditions

Selecting this option will cause the system to log pending alarm conditions. An alarm is considered pending from the time an input exceeds its programmed high or low alarm limits until the end of the alarm delay time. Numerous situations occur every day where the temperature briefly goes into the alarm range as part of the normal operation of the equipment (e.g. the defrost cycle of a refrigerator) and then returns to the normal range within the individual input delay time. In addition, if an input is on the edge of its alarm range, turning this option on will cause a large number of events to be logged. It is recommended that this option not be set unless it is required to log all such transitions.

Edit Node-Wide Options

You can use this programming window to set an array of Node wide phone options. Options that are set here are applicable to all inputs on the Node.

Node Wide Options

Delay - Trouble Alarm to Dial-out (mins): 10 OK Cancel

Delay - Confirmation to Retry (mins): 30

Delay - Nobody Home to Retry (mins): 10

☒ Node Tone Dials ☐ Node Pulse Dials

☐ Require User's Telephone ID code to Acknowledge Phonecall

Rings Before Answer: 1 ☐ Allow Alarm Inhibit by Phone

Phone List Structure: 100 Lists of 10 Numbers

Node's Spoken ID:

Programming Instructions: No Instructions

Calibration Instructions: No Instructions

System Notes:

Delay-Trouble Alarm to Dial-out (mins):

If a sensor goes into alarm, there can be a delay, set in minutes, before the node begins an alarm telephone call sequence. The delay allows the people on-site to take care of the alarm before anyone

receives a telephone call. The alarm appears on the floor plan graphic on all active workstations, is logged to the running log, and the sonic alarm sounds, if programmed. This function is not to be confused with the "delay before alarm," which is set for each individual input in its own program.

Delay-Confirmation to Retry (mins):

This field indicates the amount of time that it takes for the Node to call the list again, starting from the top of the list, if an input continues to remain in alarm after a person acknowledges an alarm by pressing 0 on their telephone keypad. This allows the user time to notify the proper personnel to fix the alarm situation. (The sonic alarm is not turned off when the alarm is acknowledged over the phone.)

Delay-Nobody Home to Retry (mins):

The time listed here indicates the duration between the Node making repeat attempts at calling the users on a programmed telephone list after it has not received some sort of acknowledgement when first traversing the list. If the node does not get an acknowledgment from anyone over the telephone, it records a "nobody home" event in the database and in the running log. It will retry the list, for the input that is in alarm, after the time in minutes that is selected. Normally there is a short delay between calls to allow someone to call in to the node. A longer delay can be used to cut down on phone calls when nobody is home.

Node/Tone Dials:

Use this option to set the Node so that it is compatible with your existing analog phone system.

Require User's Telephone ID code to Acknowledge Phonecall:

Use of this option requires the recipient of a Node telephone call to enter their assigned Telephone ID code before acknowledging an alarm.

Rings Before Answer:

This option is used to specify the number of rings that will occur before the Node will answer when a user calls into the system (up to 99 rings). Typically, this value is set at 3 or 4 rings.

Allow Alarm Inhibit by Phone:

By checking this box an alarm can be inhibited over the telephone.

Phone List Structure:

The Phone List structure as set here determines the arrangement that the Node will use when performing telephone callouts. The current structure is: 100 lists of 10 numbers, 200 lists of 5 numbers, 250 lists of 4 numbers, 330 lists of 3 numbers and 500 lists of 2 numbers. The system automatically restructures all existing phone list programming.

Node's Spoken ID:

This option is obsolete but left in for backward compatibility. New systems should use recorded voice tags as a better alternative.

This option allows the user to program an 8 character alpha-numeric code which will identify the node during spoken messages. The name will be spelled out when the alarm call is made, i.e.: B I O D E P T. If an alphanumeric ID code is not used, the node will identify itself by its Node number.

Programming Instructions:

By selecting a preprogrammed checklist from the dropdown menu, every time an input is programmed, an instruction list regarding that event will be recorded in the Node events and system log.

Calibrations Instructions:

By selecting a preprogrammed checklist from the dropdown menu, every time an input is calibrated, an instruction list regarding that event will be recorded in the Node events and system log.

System Notes:

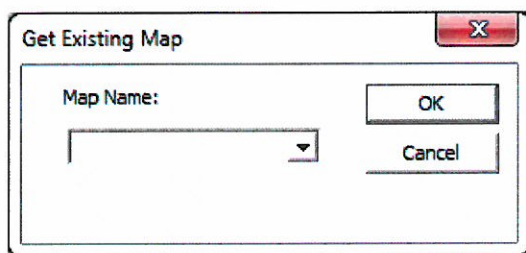
Enter any information you would like regarding the system in this location so that it is stored in a permanent location.

Move Inputs or Outputs on Map

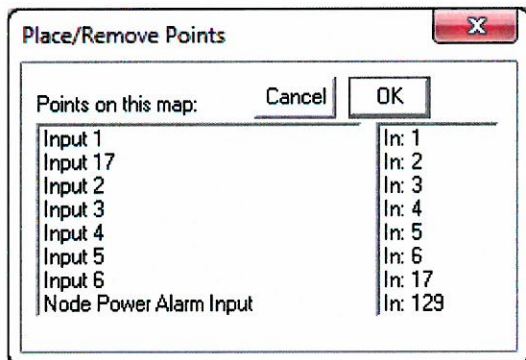
In order to move any inputs/outputs that are visible on a Node you must select this option. Once finished, unselect it to save their location.

Add/Remove Inputs from Lower Level Map

Using this option you can move non-trouble alarm Node icons to a different system map. Used to easily differentiate icons on large installations, system maps must be first loaded using the *Insert Map to Database* icon located in the *Upgrade* program before they will appear in the drop-down menu. Once configured, lower level maps are accessible by expanding the given Node in the System Tree Window.



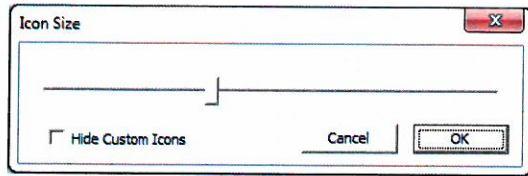
Use the drop down menu to select a map that was previously entered into the system.



Once a map is chosen select the icons that you would like to appear on the lower.

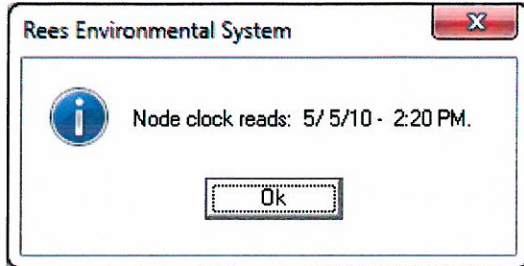
Set Icon Size and Style

Use the scroll bar to select an appropriate icon sizing.



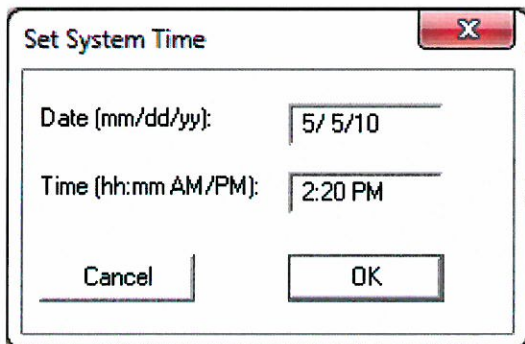
View Node Date/Time

View the Node's current date and time. In order to format the data so that it is shown in a different manner use the *International* settings found in *Global Options*.



Set System Date/Time

Enter the current date and time that you would like the Node to be set to. By pressing OK these changes are applied to both the Node as well as the machine hosting the Node.



When opening a Node, the software will automatically check its time against that of the hosting computer. If the times are more than 5 minutes apart the system will ask for and correct the date and time on both the Node and PC.

Global Options

The Global Options programming window enables you to configure computer specific data and options. Through the menuing system you can enable security options, set up validation and email server data, format the date, and configure the sound and printing options.

Security

Global Options

Security | Validation | Email Server | International | Sounds/Printing

Access Code Timeout Delay (Mins): 100

☐ Passwords Expire After: 0 Days. Min. Password Length: 0

☐ Enforce Password Complexity (1 Upper, 1 Lower, 1 Number, >1 Symbol)

☐ Electronic Signatures (21CFR.11) Required for Program/Alarm Changes

☐ Password Required for Read Only Access

☐ After 5 Failed Logins, Lock User Account and Notify Administrator

☐ Expect Comment to Explain User Actions

☐ Review and Approve Data Records w/ Electronic Signatures

☐ Review and Approve Data Records at Department Level

☐ Use Windows Password Authentication

☐ Rees System User = Windows Desktop User (no login needed)

Cancel OK

Access Code Timeout Delay (Mins):

This is the delay in minutes before the current user will be logged out. After a user's login has timed out they will be required to once again log into the system to perform any system functions.

Passwords Expire After/Min. Password Length:

By entering a value in either of these boxes the requisite option is enforced.

Enforce Password Complexity (1 Upper, 1 Lower, 1 Number, >1 Symbol)

If this policy is enabled passwords must meet the following complexity requirements and contain characters from all of the following categories:

- Uppercase characters (A through Z)
- Lowercase characters (a through z)
- Base 10 digits (0 through 9)
- Nonalphanumeric characters: ~!@#\$%^&* _-+=`|\O{}[];'"<>.,?/

Electronic Signatures (21CFR11) Required for Program/Alarm Changes:

When this option is selected, every time a program or alarm change is made, the user will be required to sign off on the change using their username and password. Designed to meet the “electronic signatures regulation” requirements of 21 CFR Part 11, changes are encapsulated as events and can be viewed through normal system reporting features.

Passwords Required for Read Only Access:

Use of this feature requires a user to be logged into the system before they can query the current state of an input/output. If this option is left unchecked, when a user is no longer logged into the system, by say logging out or having their access code timeout, any person who can walk up to the system can assess the state of an input/output without having to log in.

After 5 Failed Logins, Lock User Account and Notify Administrator:

After selecting this option, a user who has unsuccessfully tried to log in will, after 5 attempts at doing so, be locked out of the system. In order to reset a locked out user's password, another user who has the *Access Code* permission: *Modify Security Codes and Permissions* will need to login and perform that function. Further, the next time a user who has these permissions logs, in they will be prompted with the fact that a user has been locked out of the system.

Expect Comment to Explain User Actions:

When selected, modifications to system checkboxes and dialog boxes are prompted with a comment box. Note, in order to require a signature when commenting the additional option Electronic Signatures (21CFR11) Required for Program/Alarm Changes must also be checked.

Review and Approve Data Records w/Electronic Signatures:

When using this option, a user who has the *Access Code* permission: *Electronic Data Reviews and Approvals* can choose to approve a record during printout. In order to use this functionality a record must be opened using the *Print Preview* button. Upon closing the record the user will be prompted to Review, Approve, or Reject the record as seen below. Once the records are approved or rejected, they are seen as having an R placed next to them in an event log. Further, any printed event reports will have notation on them indicating as to whether the records on those reports were reviewed, approved, or rejected.

Review and Approve or Reject

Date Range: 5-5-10 - 12:00 AM to 5-5-10 - 2:03 PM

The Records in this Date Range Were:

☐ Reviewed

☐ Approved

☐ Rejected

Comment:

User: Password:

OK Cancel

Review and Approve Data Records at Department Level:

In order to use this option the *Departmental Approvals Support* software option must be purchased. When enabled, a user within an assigned department who holds the correct access permissions can make approvals for that department. Approvals take place in the same manner as when the *Review and Approve Data Records w/Electronic Signatures* option is enabled.

Use Windows Password Authentication:

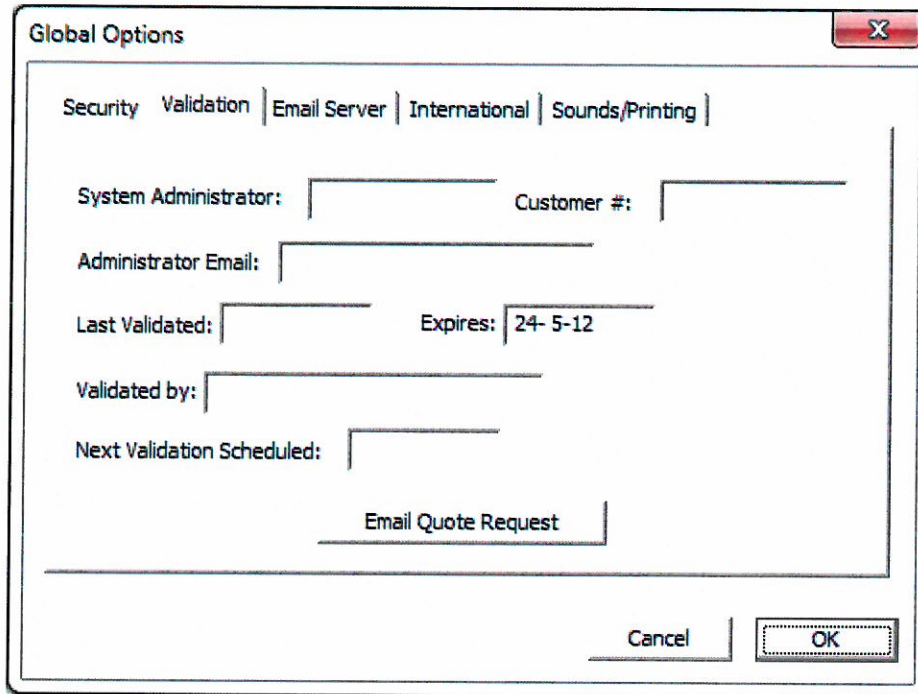
By using this feature, users that have Windows logins can log into the Node using their current credentials. In order to use this functionality an individual's username must first be added to the Node using the *Access Code* programming dialog, as this is what determines their access rights

within the system. To use this feature create a user in the Node that has the exact same name as your Windows login. Next, turn the "Windows Authentication" option on. Pay attention to the titles of the login boxes as differently titled boxes require you to enter different credentials. Those boxes with the words "Windows Authentication" in the title block require you to enter your Windows credentials, as those with the words "System Security" require you to enter your Node credentials. As a safety measure, it asks you to log in using "Windows Authentication". Once applied, all users will be authenticated against Windows before they are allowed to use the permissions that have been assigned to them within the Rees System. Users that already exist within the Rees System that do not have a corresponding Windows domain logon will no longer be able to log-in until you either create a corresponding Windows login, or change their user names within the Node to match their existing Windows login.

Rees System User = Windows Desktop User (no login needed)

When selected, the user that is currently logged into Windows will be automatically logged into the Workstation. If you wish that the current Windows user has supervisory access in the Node software create a user account with these privileges in the Node software before enabling this option.

Validation



The image shows a 'Global Options' dialog box with a red 'X' button in the top right corner. The 'Validation' tab is selected, showing fields for 'System Administrator', 'Customer #', 'Administrator Email', 'Last Validated', 'Expires' (set to 24-5-12), 'Validated by', 'Next Validation Scheduled', and an 'Email Quote Request' button. 'Cancel' and 'OK' buttons are at the bottom right.

Security	Validation	Email Server	International	Sounds/Printing
System Administrator: _____ Customer #: _____				
Administrator Email: _____				
Last Validated: _____ Expires: 24-5-12				
Validated by: _____				
Next Validation Scheduled: _____				
<input type="button" value="Email Quote Request"/>				
<input type="button" value="Cancel"/> <input type="button" value="OK"/>				

System Administrator:

This is a field used to record the name of your current system administrator. This field is used solely for reference purposes.

Customer #:

Enter your supplied customer number in this field for easier reference.

Administrator Email:

The email address listed here will be the account the Node uses to send emails from in the event that it needs to contact individuals should an alarm arise.

Last Validated:

Use this field to keep track of system validations. Enter the date your system was last validated.

Expires:

The date shown here indicates when your current system validation will expire. This field is calculated as being 1 year after your last validation.

Validated By:

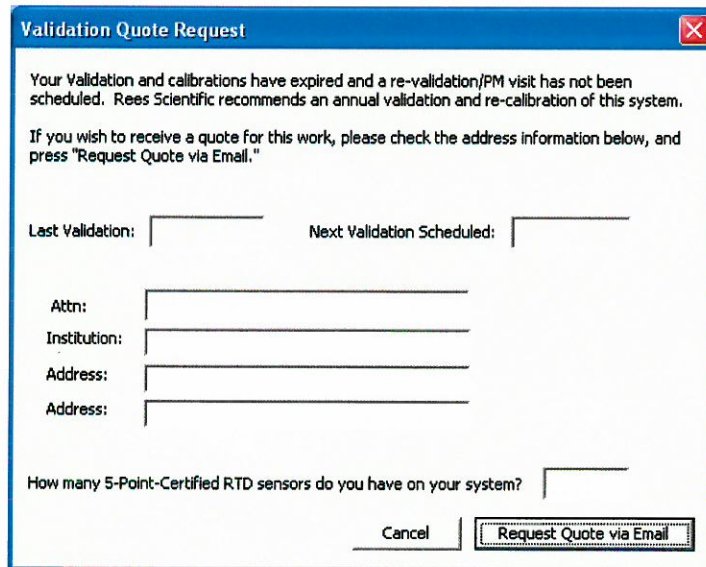
A reference field, the name of the individual who performed your last system validation can be entered here.

Next Validation Scheduled:

If scheduled, enter the date of your next validation here.

Email Quote Request:

When selected, an email will be generated and sent to Rees Scientific for the purpose of informing them that you would like a quote to validate your system. Fill in the necessary fields with your information, if not already populated, and press the *Request Quote via email* button to complete the request.



The dialog box titled "Validation Quote Request" contains the following text and fields:

Your Validation and calibrations have expired and a re-validation/PM visit has not been scheduled. Rees Scientific recommends an annual validation and re-calibration of this system.

If you wish to receive a quote for this work, please check the address information below, and press "Request Quote via Email."

Last Validation: Next Validation Scheduled:

Attn:

Institution:

Address:

Address:

How many 5-Point-Certified RTD sensors do you have on your system?

Buttons:

Email Server

The screenshot shows a 'Global Options' dialog box with a red close button in the top right corner. The 'Email Server' tab is selected, showing a series of tabs: Security, Validation, Email Server, International, and Sounds/Printing. Below the tabs are four text input fields: 'Email Server Addr:', 'Port:', 'Email From:', and 'Email Logon Account:'. Below these fields is a button labeled 'Test Email to Sys Admin'. At the bottom of the dialog are 'Cancel' and 'OK' buttons.

Email Server Addr:

The DNS or IP of an email server to which you have access to.

Port:

A port number which your email server accepts messages on. By default most email servers listen for messages on Port: 25.

Email From:

This is the account name that will be listed in the email as to where the email is coming from.

Email Logon Account:

The logon name of a person who has access to send messages for the email server listed under Email Server Addr. This field is only used for systems that require authentication prior to sending an email.

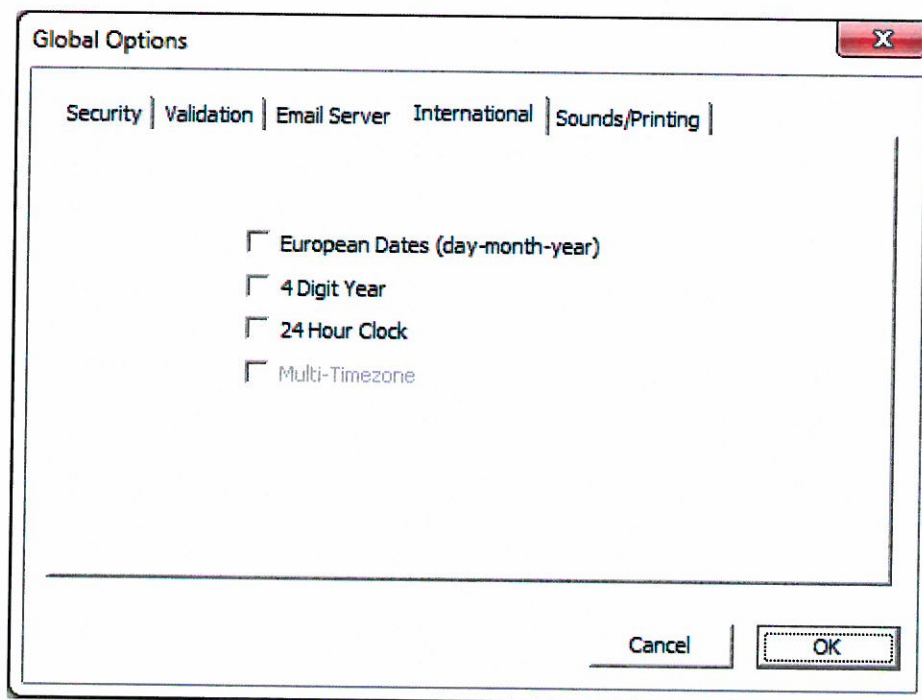
Email Logon Password:

This is the corresponding logon password of the user account listed in the *Email Logon Account* field.

Test email to Sys Admin:

By pressing this button a test email will be sent to the System Administrator's email as listed in the *Administrator Email* field, under *Validation*, inside *Global Options*.

International



European Dates (day-month-year):

By default the Node displays dates in the standard U.S. format, mm/dd/yy. For example, in the U.S. time format the date January 2nd, 1970 will be display as 01/02/70. By selecting this option, dates within the system will be displayed in a format common to many European countries, dd-mm-yy. For example the date January 2nd, 1970 will now be displayed as 02-01-70.

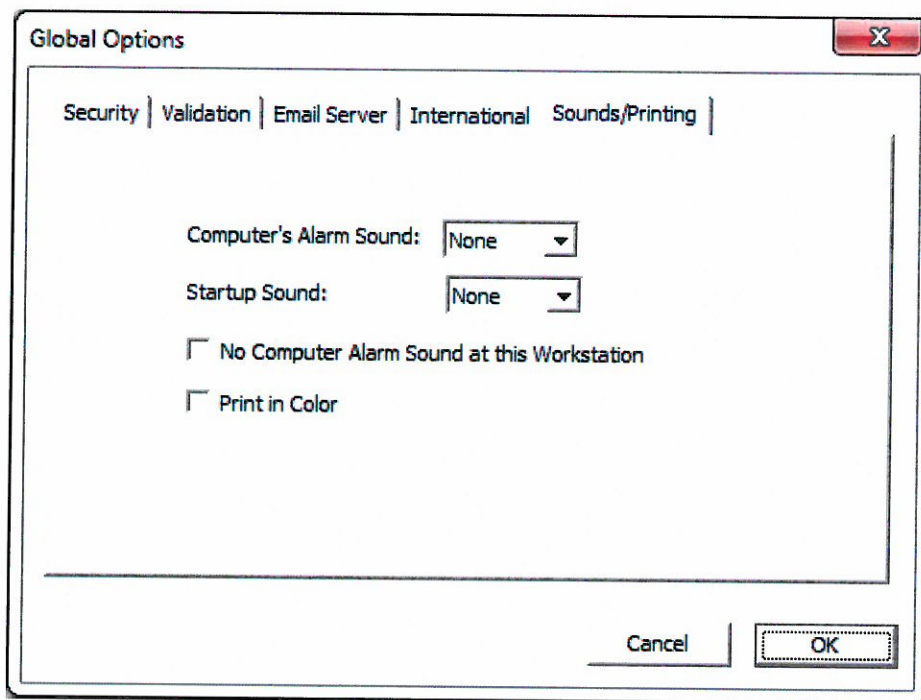
4 Digit Year

When selected, any dates that appear in the system will have their year formatting extended to 4 digits, yy will become yyyy. For example the date January 2nd, 1970 will now be displayed as 01/02/1970 with U.S. formatting or as 02-01-1970 with European formatting.

24 Hour Clock

The system, by default, is set to use a standard 12 hour A.M./P.M. clock. If necessary check this box to use a 24 hour (military) clock.

Sounds/Printing



Computer's Alarm Sound

When alarm reports come in from the Nodes, the computer will sound an alarm if a sound is selected here. This is a computer alarm and has nothing to do with a Node's sonic alarm (present only on Rees Scientific Tower and Wall mount units). (The node's alarm is programmed under the Program menu, Program Selected Input, Silent/Audible.)

In order for many of the sounds to be active, it will be necessary to install a Windows compatible sound card and speakers. (Click on the arrow to see the full selection.) Without one, only Speaker 1 and Speaker 2 sounds are active; the computer will beep to get attention when there is an alarm event. The alarms will only sound on active workstations.

NOTE: Programming an input to have a silent alarm will only make the alarm silent at the Node. The PC will still sound the alarm if a Computer Alarm Sound is chosen.

Startup Sound

Whenever the Node software is active on a workstation, there can be both audible and visual notification. Select one of the sounds available from the list. Note that the installation of a Windows compatible sound card will be necessary to activate all but Speaker 1 and Speaker 2 sounds. If there is no sound card installed, or if no startup sound is desired, select "None".

No Computer Alarm Sound at this Workstation

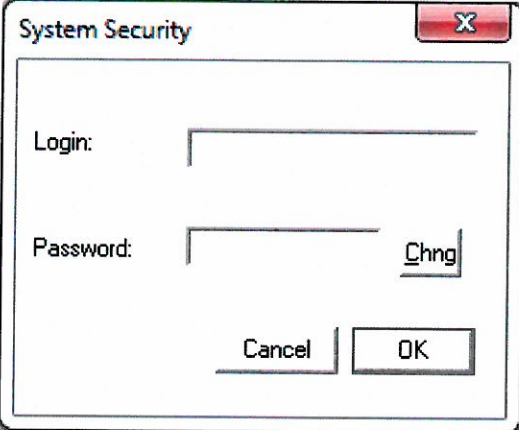
Use this option to disable any Workstation alarm sounds as described in the section *Computer's Alarm Sound*.

Print in Color

This option will configure the program to print all reports as they appear onscreen, in color. This should only be used when a color printer is attached to the computer and configured for use in Windows. Do not check this box if a color printer is not present. Alarm records will be underlined when not printed in color.

Log In

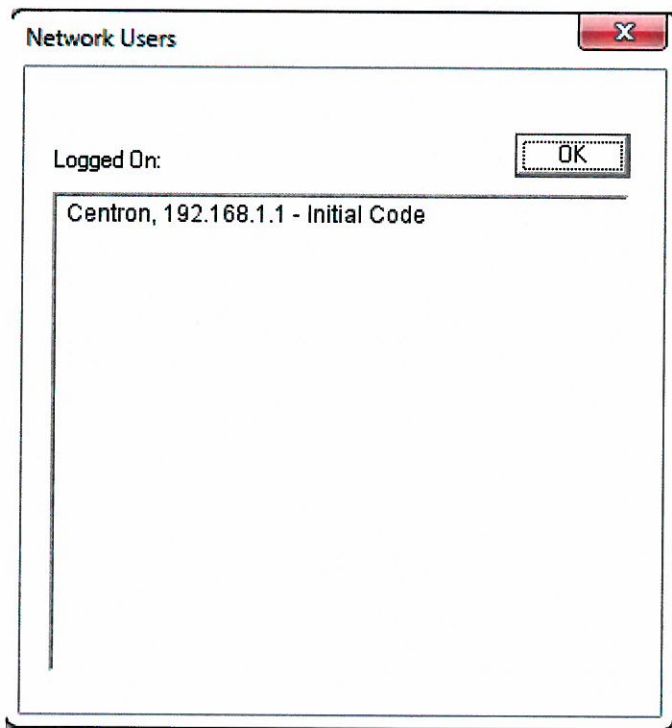
If a user name or password has been entered in error, or a user has been denied access to a feature, select the Log In menu item and re-enter the correct credentials. To change users while the system is running, select the Log In menu item. The current user will be logged out, and the System Security dialog will be produced, allowing the next user to login. To lock the system before leaving, press the "Log In" button, then Cancel. The next user will have to enter a passcode before proceeding.



The image shows a "System Security" dialog box with a standard Windows-style title bar containing a close button (X). The dialog contains two input fields: "Login:" and "Password:". The "Password:" field has a "Chng" button next to it. At the bottom of the dialog are two buttons: "Cancel" and "OK".

Show Logins

This option allows the user to see who else may be logged on at any given time. This option is useful if any changes requiring exclusive access to the Node such as adding a new node, deleting a node, upgrading a node, or other system-wide programming or options need to be made. For each person logged into the system, from left to right, you will see the computer name that an individual is logged on from, the IP address of that computer, and the current user that is logged into the system.



View Windows

The selections present in this category enable the user to quickly hide or display a given log/window. By right-clicking the title bar for any of the selectable windows each selection can be set to be docking, floating, or auto-hide.

When set to be floating a minimized version of the selected window can be moved anywhere any on the screen. When moving a floating window around the screen, the dock controls for that window will appear on screen. To dock the given window to a portion of the screen hover the selected window over the given control until it is highlighted and release the mouse button.

When set to be docking, a given window will anchor itself to the position it was last placed. In order to change the docking location drag the window around the screen and hover over the visible docking control location until it is highlighted. Release the mouse button to anchor the window to that portion of the screen.

If set to auto-hide the selected window will be mostly hidden with only a named anchor, descriptive of the window, present. When a user hovers over the named anchor the entire log/window once again reappears.

Show Running Log

By selecting this option you can make the Running Log visible on the screen.

Show System Tree

By selecting this option you can make the System Tree visible on the screen.

Inputs by Number

This option allows the temporary rearranging of icons in a numeric fashion. By selecting this option all inputs, outputs, and trouble alarms will be aligned in numeric order. Releasing the button will restore all icons to their original placement.

Zoom In

The Zoom In button allows the viewing of individual rooms or areas in greater detail. When a room has many inputs and outputs in it, the icons on the main floor plan graphic can overlap and it can be difficult to read the input numbers. The Zoom In function allows for a clearer picture of individual pieces of equipment and allows you to see exactly where they are located in the room. Zoom up and down between levels by clicking on the magnifying glass button on the tool bar. If an input or output is highlighted during a Zoom In, the window will be centered on that input or output. There are 10 levels of zoom.

Zoom Out

The Zoom Out button allows for zooming out of a zoomed in map. When a node map is at its normal size, the Zoom Out button has no effect. There are 10 levels of zoom.

Lower Map

When a lower level map has been loaded into the system any system input can be placed onto it. By using lower level maps large installation areas such as buildings and campuses can be visually divided so that only the local surroundings are present. In order to place an input on a lower level map first select the applicable input and then press the Lower Map button.

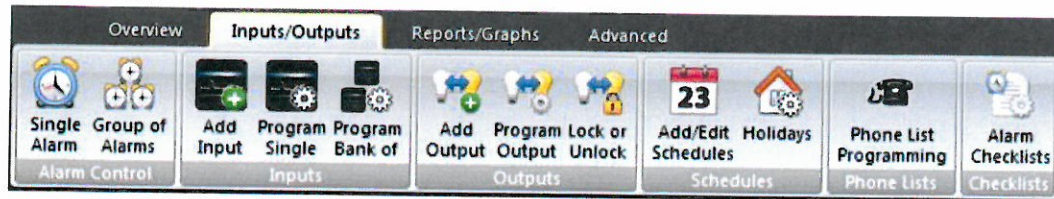
About







Tells you what version of the software you have and any major installed options that are currently on the system.

New Options

Use this screen to add new options to the system. In order to activate an option you must call into Tech Support and supply the code located at the bottom of the window. Once an option is activated on a Node, the system will have to be restarted before the option becomes active.

Inputs/Outputs (Environmental Node)



Field	Description
 Single Alarm	Handle alarm for specific inputs.
 Group of Alarms	Inhibit or reset multiple alarms.
 Add Input	Add an input to the system.
 Program Single Input/Output	Program the selected input or output.
 Program Bank of Inputs	Program a group/department of inputs.
 Add Output	Add an output to the system.



[Program
Output](#)

Program the selected input or output.



[Lock or
Unlock](#)

Override output logic by locking or unlocking an input.



[Add/Edit
Schedules](#)

Edit a Node's Schedule.



[Holidays](#)

Program a holiday into the system.



[Phone List
Programming](#)

Edit a Node's Phone List.



[Alarm
Checklists](#)

Program alarm checklists.

Single Alarm

When an input goes into alarm one can bring up the alarm parameters window in a few ways:

- Double clicking the selected input.
- Right-clicking the selected input and choosing the Manage Alarm option.
- By selecting it on the toolbar.

The Alarm Control box will show the alarm handling instructions for a particular input and allow the inhibiting or reset/enabling of the input in question. By using the menu, a user with the appropriate access code permission levels can follow the instructions programmed in the Alarm Control box and inhibit or reset/enable an input. The system will no longer act upon inhibited inputs and any such inputs will be automatically activated once the inhibit period has ended. **Note, the system will not allow you to manually type in a response to the alarm handling instructions from the alarm menu.** After adjudicating a given input's alarm, the comments for that alarm will be regenerated and must be commented on within the Running Log.

Instructions List (Instructions []):

If an input has been preprogrammed to use an instruction list it will appear here. **Note, the instructions list box is read-only, in order to comment on the list one must select the generated event in the Running Log.** Refer to the *Alarm Checklist* to create a new instruction set.

Inhibit Alarm for 15 minutes:

This will inhibit the selected input for a period of 15 minutes.

Inhibit Alarm for:

Inhibit an input for a custom time period of up to 9999 hours.

Reset/Enable Alarm:

This function allows you to bring an inhibited input back on-line immediately. In addition, it allows you to reset a latched alarm, acknowledge a non-latching event, or verify a “nobody home” condition.

User/Password:

User credentials used to certify and track how an alarm is dealt with. This is a required field.

Group of Alarms

Similar in aspect to the *Single Alarm* dialog window the Group of Alarms Alarm Control window enables you to deal with a batch of alarms at once. The department selection boxes enable you to select all inputs within a preconfigured department. Department groups can be set up using *Edit Departments*.

Alarm Control

Control All Alarms

☒ Inhibit All for 15 Minutes

☐ Inhibit All Alarms for: 0 Hours

☐ Reset/Enable All Alarms

Control Alarms By Department

Department: [Dropdown]

☐ Inhibit for 15 Minutes

☐ Inhibit for: 0 Hours

☐ Reset/Enable

User: Initial Code

Password: [Text Box]

Cancel OK

Inhibit All for 15 minutes:

When chosen all existing system alarms will be inhibited for 15 minutes.

Inhibit All Alarms for:

Inhibit all inputs for a custom time period of up to 9999 hours.

Reset/Enable All Alarms:

This function allows you to bring all inhibited inputs back on-line immediately. In addition, it allows you to reset any latched alarms, acknowledge all non-latching events, and verify a “nobody home” condition.

Department:

Select a preconfigured department of inputs. Departments can be setup using the *Edit Departments* function of the software.

Inhibit for 15 minutes:

When chosen, all existing system alarms that are within the selected department will be inhibited for 15 minutes.

Inhibit for:

Inhibit all department inputs for a custom time period of up to 9999 hours.

Reset/Enable:

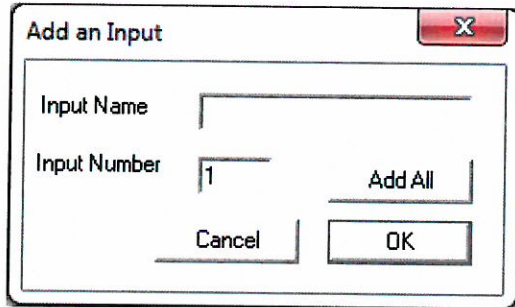
This function allows you to bring all inhibited inputs within the selected department back on-line immediately. In addition, it allows you to reset any latched alarms, acknowledge all non-latching events, and verify a “nobody home” condition within that group.

User/Password:

User credentials used to certify and track how an alarm is dealt with. This is a required field.

Add Input

Use the Add Input window to add new inputs to the system.



Input Name:

The name that you would like to attribute to the entered input number.

Input Number:

The input number represents the number of the input that you would like to add to the system. Valid input numbers are between 1 and 128. Inputs do not have to be added in numerical order.

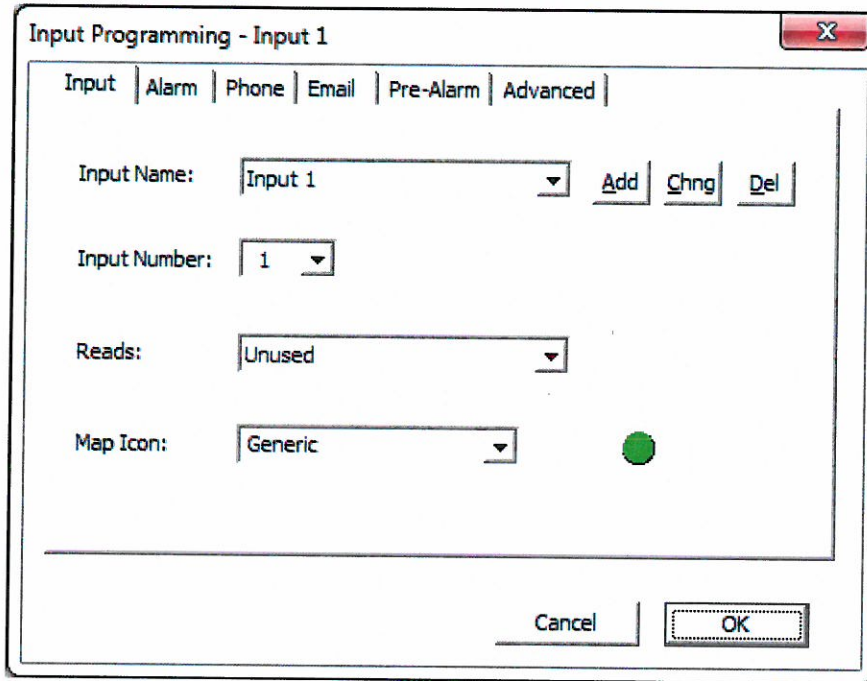
Add All:

Add all non-existing inputs to the system.

Program Single Input/Output

In order for the system to both have valid data and alarm correctly every input/output needs to be programmed correctly. Using the input/output programming dialog you can set the type of input that is being read by the system, the alarm and pre-alarm limits for that input, and the telephone and email on alarm parameters.

Input



Input Programming - Input 1

Input | Alarm | Phone | Email | Pre-Alarm | Advanced

Input Name: Input 1 Add Chng Del

Input Number: 1

Reads: Unused

Map Icon: Generic

Cancel OK

Input Name:

The input name reflects the previously entered moniker for the given input.

Add:

Add an input to the system. See *Add Input*.

Chng:

Change the existing name for the given input.

Del:

Delete the selected input from the system.

Input Number:

The input number reflects the assigned numerical designation for the input as designated by the input name on the system.

Reads:

In order to set up a given input you must correctly identify and select how that input is identified by the system. By clicking on Reads you can set the type of probe that is being read, the value of measurement for that probe, the scalar parameters for a linear transducer, and the ability to make an input a type of switch contact.

Temperature in Degrees C.:

The sensor probe will display its readings in degrees Centigrade.

Temperature in Degrees F.:

The sensor probe will display its readings in degrees Fahrenheit.

Thermistor Temperature Ranges

PROBE TYPE	RESISTOR	RANGE (DEG. C)		RANGE (DEG. F)	
1	1000 ohm	+40	to +105	+104	to +221
2	4990 ohm	-15	to +60	+5	to +140
3	30100 ohm	-58	to +10	-58	to +50
4	100000 ohm	-80	to -10	-112	to +14
Cryo 6	3.01K ohm	-200	to -125	-328	to -193

The best and most economical type of temperature probes are of the thermistor variety manufactured by Rees Scientific. Rees thermistor and thermocouple probes have type numbers that indicate their temperature ranges. After a temperature in degrees C. or degrees F. has been selected, a dialog will appear listing probe types. Click on the arrow at the right for the full range of temperature probe choices. Select the proper probe for the temperature range being measured.

When selected on the floor plan, the temperature for a selected thermistor type input will be shown to one-tenth of a degree. If the input is a high accuracy RTD probe or a linear transducer, the temperature will be shown in the calculated number of significant figures.

Non-Rees temperature probes must have linear analog outputs and they must be programmed as linear transducers (see below).

State of a Switch:

Switches can be programmed as SUPERVISED, ALARM-WHEN-HIGH, or ALARM-WHEN-LOW. Alarm limits are chosen automatically when an input is programmed as a "State of a Switch" type input.

If a switch input that is installed and programmed as described in this manual is indicating a reading that is significantly different than described below as "Normal", there is probably a wiring error or the wrong resistors have been installed. Rees Scientific suggests that both the pullup resistor and the end of line supervisory resistor be 100,000 (100k) Ohms, 1/4 watt, with a tolerance of at least 5%. These resistors are readily available from any electronics supplier.

A "SUPERVISED SWITCH" is one where the integrity of the wiring is monitored by the system. The switch can be programmed as either "Normally Open" (NO) or "Normally Closed" (NC). It is preferable that the switch be a "Normally Open" (NO) type as it will be easier to wire. A "Normally Open" switch is one that will CLOSE on alarm. Refer to the sensor probe wiring diagrams in this manual or on the inside of the lids of the MPX Remote Panels or Node.

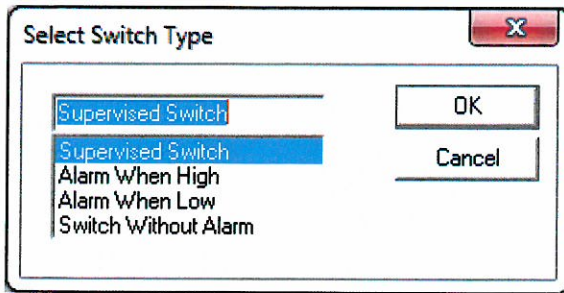
A properly wired and operating "Normally Open", supervised switch will have a "Normal" reading of 2.5 and an "ALARM" reading of either "0" indicating a switch closure, or "4.98" indicating that the wiring to the switch has become disconnected. A reading of "0" from a known normal switch indicates a possible short in the wiring to the switch. A reading of "4.98" from a known normal switch indicates that the wiring has become disconnected.

A properly wired and operating "Normally Closed" supervised switch will have a "Normal" reading of "2.5" and an "ALARM" reading of either "4.98" indicating an open switch, or "0" indicating that the wiring to the switch has become shorted. A reading of "0" from a known normal switch indicates a possible short in the wiring to the switch. A reading of "4.98" from a known normal switch indicates that the wiring to that switch has become disconnected.

An "ALARM WHEN HIGH" switch is a switch that is typically "Normally Closed" (NC) and OPENS on alarm. When properly wired, this input will display a "Normal" reading of "0.00", and an "Alarm" reading of 4.98". A reading of "4.98" from a known normal switch indicates that the wiring has become disconnected.

An "ALARM WHEN LOW" switch is a switch that is typically "Normally Open" (NO) and CLOSES on alarm. When properly wired, this input will display a "Normal" reading of "4.98", and an "Alarm" reading of "0". A reading of "0" from a known normal switch indicates that the wiring has become shorted.

Use a Supervised Switch unless there is a very good reason not to do so. Using a supervised switch means that a wire breakage or short will cause an alarm.

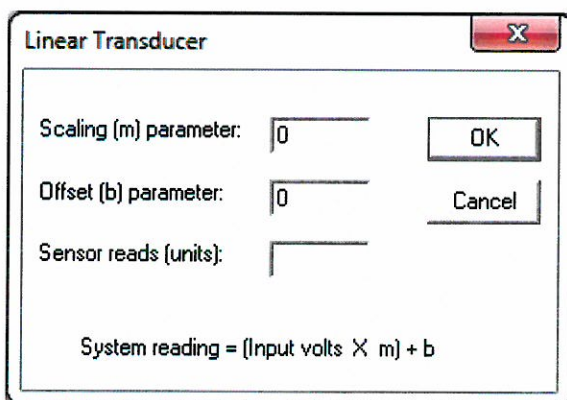


Linear Transducer:

Essentially any quantity to monitor (pressure, volume, humidity, flow, pH, salinity, fluid level, presence of water, etc.) can be monitored by the system using an appropriate sensor. Any sensor or instrument having a recorder output can be interfaced to either a Node's 0-5 volt analog inputs or a wireless transmitter's 0-2.5V input.

Linear output sensors or recorder outputs of sufficient signal level can be programmed as linear transducers. To select the proper sensor, you must know what quantity needs to be measured, what its normal range is, what the minimum and maximum readings are (to prevent sensor damage) and what substance/fluid/medium or type of equipment is being monitored. Note that such sensors convert their input reading (PSI, % Humidity, etc.) into an analogous voltage signal that can be sensed by the Node.

When a 4-20 milliamp or other linear sensor is programmed, start by selecting Linear Transducer as the type of sensor. In order to correctly program and visualize the sensor's readings enter an appropriate scaling factor (the 'm' parameter, or slope) and offset (the "b" parameter, or intercept) as calculated by the formulas below.



Scaling factor:

$$m = \frac{\text{top of input reading scale} - \text{bottom of input reading scale}}{\text{top of voltage scale} - \text{bottom of voltage scale}}$$

Offset:

$$b = -(m * \text{bottom of voltage scale}) + \text{bottom of input reading scale}$$

Specific values to be plugged into the equation can be found in either the manufacturer's specifications for an individual sensor or the accompanying installation sheet. For example: when using a 0 to 50 PSI, 4-20 milliamp sensor with a 249 ohm precision resistor, the 4 to 20 milliamps will correspond with 0.996 to 4.98 volts.

$$\text{Thus: } m = \frac{50-0}{4.980-0.996} = 12.550$$

$$b = -(12.550 * 0.996) + 0 = -12.5$$

When properly programmed, the linear transducer will read accurately in the units chosen.

To program a humidity sensor with a 4 to 20 mA output, use the following values:

$$m = \frac{100-0}{4.980-0.996} = 25.1$$

$$b = -(25.100 * 0.996) + 0 = -25.000$$

If the sensor has a 0 to 5 volt output, divide by 5

$$m = \frac{100-0}{5.0-0.0} = 20$$

Schedule Checking Sensor

This probe type expects a voltage greater than 2.5 volts when the selected schedule is ON and a voltage less than 2.5 volts when the schedule is OFF. Any other situation constitutes an alarm condition. Use this type of sensor to notify if lights in an animal facility do not follow their proper schedule.

Input/Group Inhibiting Input:

Input/Group Enabling Input:

These will enable or inhibit a group of inputs for a programmed period of time. Use a button, card reader, or any switch contact closure to inhibit or enable the grouped inputs. Be aware that

when a button is used, there is no accountability, as no access code was entered. Alarm Group Inhibiting / Enabling Inputs work with alarm groups. These alarm groups are set in the Edit Departments function found under the Advanced tab. Once a group has been defined, program the alarm group by choosing "Alarm Group Inhibiting/Enabling Input" as the type of input. When selecting "Alarm Inhibiting Input" as the input type a new screen appears:

The screenshot shows a dialog box titled "Program an Input" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Input:** A dropdown menu showing "Input 1".
- Number:** A dropdown menu showing "1".
- Buttons:** "Add", "Chng", and "Del" buttons are located to the right of the "Number" dropdown.
- Reads:** A dropdown menu showing "Input/Group Inhibiting Input".
- Inhibit For (Mins):** A text input field containing "0.00".
- Alarm Group:** A dropdown menu showing "In: Input 1".
- Buttons:** An "Add" button is located to the right of the "Alarm Group" dropdown.
- Icon:** A dropdown menu showing "Generic".
- Buttons:** "Cancel" and "OK" buttons are located at the bottom right of the dialog.

Enter the length of time that the alarm should be inhibited and press OK. To add an alarm group name, click on Add next to the "Alarm Group" arrow.

NOTE: The Alarm Enabling Input screen is very similar, except that there is no time parameter to enter.

The screenshot shows a dialog box titled "Program an Input" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Input:** A dropdown menu showing "Input 1".
- Number:** A dropdown menu showing "1".
- Buttons:** "Add", "Chng", and "Del" buttons are located to the right of the "Number" dropdown.
- Reads:** A dropdown menu showing "Input/Group Enabling Input".
- Alarm Group:** A dropdown menu showing "In: 2".
- Buttons:** An "Add" button is located to the right of the "Alarm Group" dropdown.
- Icon:** A dropdown menu showing "Generic".
- Buttons:** "Cancel" and "OK" buttons are located at the bottom right of the dialog.

Unused:

Program an input as unused to take it out of the system.

NOTE: Programming an input as "UNUSED" will not delete the input from the system. The input's name and programming parameters will remain intact. However, any calibration offset that has been applied to this sensor will be erased. It will be necessary to recalibrate any input that has

been made UNUSED. To completely remove the input from the system, use the "DEL" button from the "Program Selected Input/Output" menu.

Map Icon:

Use the selection of available icons to choose a specific icon to portray a physical piece of equipment in the node window. These icons will be displayed when the node window is sized to fit them or when the node window is zoomed in.

Alarm

Input Programming - Input 1

Input | **Alarm** | Phone | Email | Pre-Alarm | Advanced

Alarm Limits: 0 To: 0

Alarm Sound: Audible

Alarm Delay (mins): 0

Persistence: Non-Latching

Alarm Schedule: Always On Add

Alarm Checklist: No Instructions Add

Cancel OK

Alarm Limits:

The value to the left of the "To:", the "Low Limit", defines the lowest possible reading that the probe can reach before it will generate an alarm. Careful selection of this alarm limit will go a long way towards preventing false alarms. Reviewing readings and alarm data will be useful in determining the best "Low Limit" for a particular piece of equipment. In many cases, the expected range of temperature in a refrigerator or freezer is in fact greater than one would expect. This is particularly true in non-laboratory grade equipment.

The value to the right of the "To:", the "High Limit", defines the highest possible reading that the probe can reach before it will generate an alarm. Once again, careful selection of this limit will help to prevent false alarms. Consideration should be given to defrost cycles and other transitory events when choosing a high limit.

Alarm Sound:

Each prebuilt Node has a built-in audible (sonic) alarm. This option determines whether this particular input's alarm will cause it to sound. If the audible alarm is not selected, the node still logs the alarm and proceeds to activate its alarm relay and/or call its phone list.

NOTE: Selecting the Silent Alarm option for an input will cause that input's alarm to be silent at the Node. If the system is programmed to sound an alarm at the PC, (See Global Option Programming under the Program menu) it will sound the alarm for every input. This is a global option and the PC alarm cannot be turned on or off for individual inputs.

Alarm Delay (mins):

When an input goes outside its normal limits, a delay timer will start. Use it to prevent transient events such as refrigerator door openings and defrost cycles from setting off false alarms. Set the appropriate delay (in minutes) for the input being programming. This is the time the input will wait before going into alarm. The Node notes that the temperature or other parameter is out of range, but if the condition corrects itself within this delay time, the Node does not register an alarm or dial-out. Anytime an input has exceeded its high or low limits it is considered a "Pending Alarm". The option to log pending alarms can be selected in "Logging Options", found under the Edit Node menu.

In the case of security alarms (latching switch but not latching temperature alarm types), an alarm indication causes the alarm to latch immediately and this delay time provides time to inhibit the alarm while the problem is investigated. After the delay time, the alarm will trip if the input is not disabled (inhibited).

Persistence:

Alarms may be either latching or non-latching. With non-latching alarms, the alarm will cease when conditions return to normal. For example, if a freezer temperature rises above the alarm trigger when the door is held open, and then returns to normal when the door is closed, the alarm will self-cancel. Analog alarms such as temperature can be programmed as either latching or non-latching. If programmed to latch, the "latch" will not engage during the alarm delay time (pending alarm), but will latch after it goes into alarm.

Security alarms should be programmed as latching. With a latching alarm, even when the original alarm condition is corrected, the alarm remains on. For example, if a door that must remain closed is forced open, and is subsequently closed, the alarm will remain on even after the door is closed. With a latching switch, the "latch" will engage immediately and the alarm delay time (pending alarm) becomes an entry delay which allows time to reset or inhibit the alarm before it actually activates. Typically, security alarms are programmed as Latching Alarms with an alarm delay of "0".

Alarm Schedule:

All inputs will default to the "Always On" mode unless a specific Alarm Schedule is selected.

Alarm Schedules allow the control of when a particular input's alarm will be active. When an alarm follows a schedule, the alarm is on when the schedule is on, and the alarm is off (inhibited) when the schedule is off. For example, if the Node is used to monitor security sensors in a facility, the system can be programmed to automatically inhibit the alarms on those inputs in the morning and reactivate them automatically at night.

Select the name of the schedule from the list of schedule names from the drop-down list box. The schedules can be programmed directly from this menu or they can be programmed from the *Add/Edit Schedules* ribbon item. To add a new schedule name and then edit the schedule while in the input programming window, just click on the 'Add' button and type in the name of the new schedule. A dialog will appear asking to edit the schedule. Clicking yes will produce the schedule programming dialog box. There are sixty-four 24-hour schedules in addition to the 'Always On' mode.

Alarm Checklist:

There are twenty different alarm instruction forms/checklists to choose from. Whenever an alarm is responded to, the alarm instruction screen will appear. There can be questions to answer, instructions to be initialed upon completion, whatever standard operating procedures are required etc.

Select the instruction list required from the list of programmed alarm handling lists, or add an instruction list name by clicking the Add button. Note that list number 20 is dedicated to the power alarm instruction list. Once a list has been added or selected, the system will display the checklist, allowing modification. Alarm handling instructions can also be programmed from the *Alarm Checklist* ribbon item.

Phone

The screenshot shows a window titled "Input Programming - Input 1" with a close button (X) in the top right corner. Inside the window, there are several tabs: "Input", "Alarm", "Phone", "Email", "Pre-Alarm", and "Advanced". The "Phone" tab is currently selected. Below the tabs, there are four settings:

- Telephone Alarm:** A dropdown menu with "Never" selected.
- Day/Night Schedule:** A dropdown menu with "Always Use Same List" selected, followed by an "Add" button.
- Day Phone List:** A dropdown menu with "Phone List 1" selected, followed by an "Add" button.
- Night Phone List:** A dropdown menu with "Phone List 1" selected, followed by an "Add" button.

At the bottom of the window, there are "Cancel" and "OK" buttons.

Telephone Alarm:

In the event of an alarm, and a voice dialer is present, there are three telephone options that can be chosen: never telephone, telephone after delay, telephone immediately. If the option to telephone is chosen, the Node will commence calling individuals on the input's selected phone list.

Day/Night Schedule:

This allows the user to set the Node so that it uses either the same or different phone lists for day and night or weekdays and weekends. Use the menu to see a list of previously entered phone schedule names, or click on Add in order to type in a new schedule name. Program/edit an existing schedule by selecting it from the menu. Once a schedule has been created with its ON and OFF cycles, select normal (Day) and alternate (Night) phone lists. The default (Always Use Same List) uses only one list and does not allow the selection of a second phone list. If "Never" is selected as the telephoning option, the scheduling functions will be disabled.

Day Phone List:

This option allows the selection of the phone list an input will call when the schedule is ON or not defined. Using the Add button will allow for the entry of new phone lists in the Phone List Programming dialog.

Night Phone List:

These options are used with the phone schedule. When a Schedule is ON, the system uses the normal (Day) phone list. When the schedule is OFF, the system uses the alternate (Night) list. Use this function when it is necessary to use different telephone lists for different shifts, holidays, etc. Click on the arrow to open the list of available list names or select Add to enter a new list name. Program/edit the list here or under *Phone List Programming*.

Email

The screenshot shows a dialog box titled "Input Programming - Input 1" with a close button (X) in the top right corner. The dialog has several tabs: "Input", "Alarm", "Phone", "Email", "Pre-Alarm", and "Advanced". The "Email" tab is currently selected. Inside the dialog, there are three checkboxes under the label "Send Emails for:": "Alarm Events", "Return to Normal Events", and "Alarm Inhibit Events". Below these are three text input fields labeled "Send All Emails To:", "After 15 minutes, send to:", and "After 30 minutes, send to:". At the bottom of the dialog, there is a note: "NOTE: Enter multiple email Addresses separated by semicolons." and two buttons: "Cancel" and "OK".

Send Emails for:

Use the checkboxes at the right as a selection for when alert emails will be generated and sent.

Alarm Events:

Designated users will receive an email whenever an Alarm event occurs.

Return to Normal Events:

Designated users will receive an email whenever a previous Alarm event returns to a Normal condition.

Alarm Inhibit Events:

Designated users will receive an email whenever an Alarm event has been inhibited.

Send All Emails To:

Enter as many e-mail addresses that fit in the designated space to alert when an input goes into alarm. Use different e-mail addresses for each input or use Program a Bank of Inputs to assign the same e-mail address(es) to multiple inputs. Separate different addresses by using a semicolon.

After 15 minutes, send to:

Enter as many e-mail addresses that fit in the designated space to alert when an input remains in alarm for more than 15 minutes. Separate different addresses by using a semicolon.

After 30 minutes, send to:

Enter as many e-mail addresses that fit in the designated space to alert when an input remains in alarm for more than 30 minutes. Separate different addresses by using a semicolon.

Pre-Alarm

Input Programming - Input 1

Input | Alarm | Phone | Email | Pre-Alarm | Advanced

☐ Show Pre-Alarm Alerts on Map

☐ Pre-Alarm Sonic Alert at Node

☐ Pre-Alarm trips Node's Alarm Relay

☐ Pre-Alarm Sends Email Alerts

Low Alert Limit: 0

High Alert Limit: 0

Delay before Alert: 0

Cancel OK

Show Pre-Alarm Alerts on Map:

When selected, pre-alarm alerts as designated by the pre-alarm limits at the bottom of the window will appear on the Node map. When in pre-alarm, inputs will appear as a different color as compared to the Normal condition.

Pre-Alarm Sonic Alert at Node:

Similar to the sonic alarm that occurs when an input goes into alarm, an input will trigger the alarm when an input crosses the pre-alarm limits.

Pre-Alarm trips Node's Alarm Relay:

If selected, the Node's built-in Alarm Relay will trigger whenever an input is in pre-alarm. (Only applicable to Rees Scientific Tower and Wall mount units.)

Pre-Alarm Sends Email Alerts:

Notifies email recipients, as entered on the Email tab, whenever a pre-alarm condition occurs.

Advanced

Input Programming - Input 1

Input | Alarm | Phone | Email | Pre-Alarm | **Advanced**

Logging Rate for Advanced Reports: Global Rate

☐ Comment is Required for this Input

Node's Alarm Relay: Activate On Alarm

Input's Spoken ID:

Telephone Calling Priority: 1

Cancel OK

Logging Rate for Advanced Reports:

The maximum logging rate for the Node's inputs for validated reports is set at 5 minutes. For unvalidated reports inputs can be logged at rates as fast as 1 minute. Select custom rates for applicable reports as listed in *Advanced and Custom Reports*, found under *Other* in the *Reports/Graphs* ribbon bar.

Comment is Required for this Input:

When selected, modifications to this input are prompted with a comment box. Note, in order to require a signature when commenting the additional option *Electronic Signatures (21CFR11) Required for Program/Alarm Changes* must also be checked.

Node's Alarm Relay:

If selected, the Node's built-in Alarm Relay will trigger whenever an input is in alarm.

(Only applicable to Rees Scientific Tower and Wall mount units.)

Input's Spoken ID:

NOTE: This is an obsolete feature left in the system for backward compatibility. New systems should use recorded voice tags as a better alternative.

This allows the user to program an alphanumeric message to be spoken when the node identifies an input. It can accept up to 8 characters and the name will be spelled out when the alarm call is made, i.e. L A B 2 4 8 F R.

Telephone Calling Priority:

Alarms with lower priority numbers will be handled first in the event of multiple alarms. Type in a number between 1 and 100. It is not necessary to assign a different priority to each input. They can all be left as Priority 1 (default).

Program Bank of Inputs

This function allows you to program specific parameters of any inputs that exist within a preexisting department/input group. Enter the name of the group/department to be programmed and check off the items to be changed. Parameters are the same as when programming an input.

Add Output

Use the Add Input window to add new inputs to the system.

Output Name:

The name that you would like to attribute to the entered output number.

Input Number:

The number of the output that you would like to add to the system. Valid output numbers are between 1 and 64. Outputs do not have to be added in numerical order.

Program Output

In order for the system to correctly relay actions using outputs every output needs to be programmed correctly. Using the programming dialog you can set the conditions that will trigger an output.

Program Outputs

Output 1 1 Add Chng Del

☒ Turn ON logic Minimum ON time: 0 Minutes

☐ Turn OFF Logic Minimum OFF time: 0 Minutes

☐ Log Output On/Off Events Flush Control Wizard Light Control Wizard

Turn ON If 1: Unused

Cancel OK

Add:

Add an output to the system. See *Add Output*.

Chng:

Change the existing name for the given input.

Del:

Delete the selected input from the system.

Turn ON logic:

Turn OFF logic:

This will allow you to specify the logic that will determine when a particular output relay is turned on or off by automatic control. The logic programmed will apply to the selected output.

The Program Outputs dialog box appears with "Turn ON" logic already selected in the logic box. The condition statement says: "Turn ON If (output number): Unused".

Minimum ON time:

Minimum OFF time:

This option is useful when programming thermostats for HVAC applications as it allows the user to set minimum on and off times. If the room heater is to turn on when the temperature input goes below 65°F, and a minimum ON time is not set, as soon as the room warms up to 65° the heater will turn off again. To prevent the heater from constantly turning ON and OFF minimum ON and OFF times can be set. This is also useful for certain types of equipment that must not be turned on and off rapidly (i.e. motors and compressors need to 'come up to speed, to run,' and then to 'wind down'). In these circumstances if they are turned on and off incorrectly damage to the equipment results. Select the desired output and enter the minimum on time and/or the minimum off time at the prompt.

Log Output On/Off Events:

By enabling this option any on and off events for the current output will be logged by the system.

Flush Control Wizard:

Use the Flush Control Wizard as an automated method to open and close solenoids in a water distribution network. Using the wizard you can automatically open 1 solenoid or stagger the opening of 2 solenoids in order, so that a resource such as water could be conveyed down a pipe at a given time.

Drain:

The output that you would like to open/flush at the time programmed below.

Two Stage Flush System:

When selected, the wizard will allow you to choose a second output that will act as the Bypass solenoid to use in accord with the Drain solenoid. The Bypass solenoid will turn on approximately 30 seconds after the Drain solenoid starts, and turn off approximately 30 seconds before the Drain solenoid stops.

Schedule:

This is the schedule that the Flush Control Wizard uses to dictate when the Drain solenoid turns on and off.

Note!!! If a previously configured schedule is selected from the drop down menu it will be overwritten with the start and stop times as indicated here by the Flush At: and Mins fields.

Flush At:

Enter the time that you would like the flush cycle to start in this location.

Mins:

This is the length of time that the flush cycle will run for. The minimum amount of time that the cycle can run for is 1 minute if you are using just a Drain solenoid, 2 minutes if a Bypass solenoid is also in use.

Light Control Wizard:

Use the Light Control Wizard as an automated method to control the lighting scheme for a room/hallway/building. Using the wizard you can automate the process of turning all the lights on and off in a given area or simulate diurnal lighting by staggering a second set of lights.

Lighting Program Wizard

Stage 1 Out: Output 1 1

Schedule: [Dropdown]

Scheduled On Time: 6:00 AM Off Time: 6:00 PM

☐ Two Stage Lighting System

Stage 2 Out: [Dropdown]

Schedule (2): [Dropdown]

Stage 2 On Time: 6:00 AM Off Time: 6:00 PM

☐ Use Light Cycle Monitoring Input: [Dropdown]

☐ Use Light Override Pushbutton: [Dropdown]

☐ Check to Override Stage 2 instead of 1

Override for: [Field] Mins

OK Cancel

Stage 1 Out:

The output that you would like to activate at the time programmed below.

Schedule:

This is the schedule that the Light Control Wizard uses to dictate when the Stage 1 output turns on and off.

Note!!! If a previously configured schedule is selected from the drop down menu it will be overwritten with the start and stop times as indicated here by the Scheduled On Time: and Off Time: fields.

Scheduled On Time:

Enter the time that you would like the lighting cycle to start in this location.

Off Time:

Enter the time that you would like the lighting cycle to end in this location.

Two Stage Lighting System:

If you choose to stagger a second set of lights so that they turn on at a later time, select this box.

Stage 2 Out:

The output that you would like to activate at the time programmed below.

Schedule (2):

This is the schedule that the Light Control Wizard uses to dictate when the Stage 2 output turns on and off.

Note!!! If a previously configured schedule is selected from the drop down menu it will be overwritten with the start and stop times as indicated here by the Stage 2 On Time: and Off Time: fields.

Stage 2 On Time:

Enter the time that you would like the lighting cycle to start in this location.

Off Time:

Enter the time that you would like the lighting cycle to end in this location.

Use Light Cycle Monitoring Input:

When selected, the chosen input will be reprogrammed as a schedule checking input. If you have an applicable sensor, use this option to monitor the state of the lights in the controlled area.

Use Light Override Pushbutton:

Use this option to specify the use of a manual override. If set, the selected input will be reprogrammed as a State of a Switch Pushbutton. When activated the pushbutton will override the light cycle for the amount of time entered in the **Override for:** section below.

Check to Override Stage 2 instead of 1:

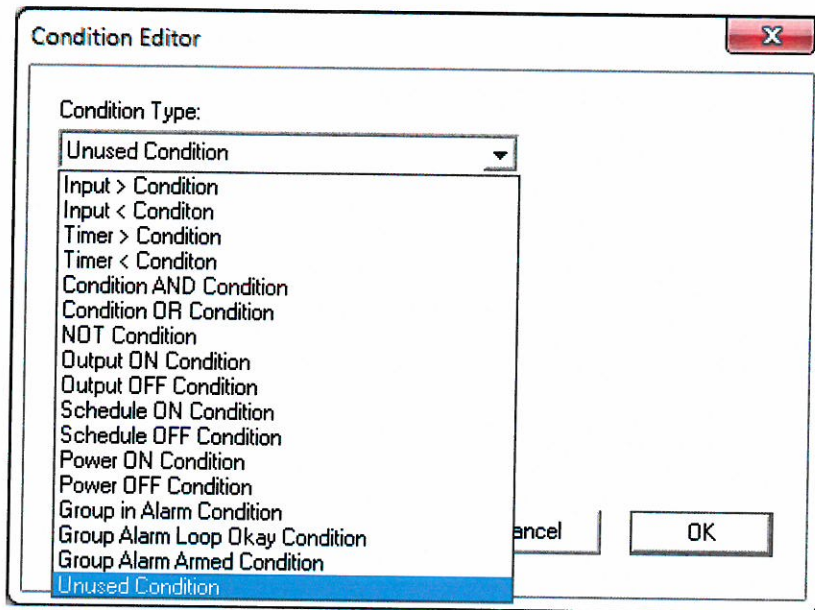
If you select this option the Light Override Pushbutton will activate the Stage 2 Out relay instead of the Stage 1 Out relay.

Override for:

This is the amount of time that the Light Override Pushbutton will activate the given stage relay for. If the option to use a Light Override Pushbutton is checked, a number > 1 must be entered in this field.

Programming Window:

Clicking on the condition statement brings up the Condition Editor. The condition type is listed as "unused condition" at this point. Click on the arrow to see a list of conditions that can be made to turn on the selected output.



Available condition types are:

Input > (greater than) Condition

Input < (less than) Condition

Timer > Condition

Timer < Condition

Condition AND Condition

Condition OR Condition

NOT Condition

Output ON Condition

Output OFF Condition

Schedule ON Condition

Schedule OFF Condition

Power ON Condition

Power OFF Condition

Group in Alarm Condition

Group Alarm Loop Okay Condition

Group Alarm Armed Condition

Unused Condition

Condition Editor

When one of these conditions is chosen, the system will assign UNUSED conditions as necessary. Program the additional unused conditions that dictate when the timer should start, what should be ANDed with what, etc. Use the 'Input Greater Than' and 'Input Less Than' conditions to set up thermostat type functions. For specific information about any of the choices, look for the choice itself below.

Use Turn OFF logic to turn off the output. Click on the Turn OFF Logic button and the logic dialog box will show "Turn OFF If (output number): Unused." Click on this line and the Condition Editor opens showing the condition type as Unused. Open the window and select "Condition > (greater than)" and then select the input that will provide the turn OFF logic. Type in the temperature that will trigger the turn off. This output will turn the Lab heater on when the temperature goes below 68.0°F and then turn it off when the temperature goes above 75.0°F. Since many compressors need to remain on or off for a minimum period of time type in minimum On and Off times here. This will keep the heater from constantly turning on or off every time the temperature goes above or below the logic threshold, especially when the limits are close together.

NOTE: Insure that the turn-on and turn-off conditions do not become true at the same time or the output will toggle on and off.

Input > Than

Input < Than

When the Input < (less than) or Input > (greater than) condition is chosen as the turn ON condition, the Condition Editor box will ask you to select the input and reading that will turn on the output. To select the input whose temperature will act as the Turn-On condition click on the arrow to view all the inputs in the user's department/group.

Timer > Condition

Timer < Condition

Use this function to program delays in logic sequences. For example, to turn something on 60 seconds after something else, use the condition timer > 60 seconds. Timers start to count up from zero when the start condition is true (as long as the reset condition is not true). Timers reset to zero and remain there as long as the reset condition is true.

Condition AND Condition

Select this to turn an output ON/OFF when two conditions are true. For example, a thermostat might need to turn on (if the temperature is too low) AND (if the HVAC schedule is ON.)

Condition OR Condition

Select this to turn an output ON/OFF when either of two conditions are true. For example, a thermostat might be programmed to be on (if the temperature is below 55) OR (if the temperature is below 70 AND the HVAC schedule is on).

NOT Condition

Select this to turn an output ON/OFF when something is NOT true. For example, an output will turn on if a schedule is ON. That same output can turn off if the schedule is NOT on. When the NOT condition is selected from the Condition Editor it will show the condition to be NOTed in the "NOT this condition": box. Change the selection in this box from UNUSED, to one of the previously programmed conditions, or press Ok. If Ok is pressed, select the unused condition from the Program Outputs dialog box in order to program it.

Output ON Condition

Output OFF Condition

Output 'On' conditions are true as long as the output is 'On'. They can be used to make some outputs depend on others. Blink type functions can be set 2up by using an output 'On' condition to turn on a timer that turns the output 'off,' etc.

Schedule ON Condition

Schedule OFF Condition

Schedule conditions are true when the corresponding 7 day schedule is on. Use them to control light cycles, watering cycles, set back thermostat functions, etc.

Power ON Condition

Power OFF Condition

Power ON conditions are true if AC power to the node is on and the power alarm jumper in the node is installed properly. A power failure causes the outputs to go to the 'Off' state. Restoration of power causes the outputs to wait for about 30 seconds in the 'Off' state before returning to computer control. Use the power 'Off' condition to set the motor driving outputs off. Then use the output 'on' condition to allow for an orderly turn on.

(Only available on Centron Tower and Wall mount units)

Group in Alarm

Outputs can also be controlled by using input 'Group Alarm' conditions. This is useful in security applications. This condition can be used to turn on an output (such as a remote audible alarm) when any input in the group is in alarm. Select the input group first (from the node's list of input groups) before selecting the input condition that will trigger the alarm. If any input in the selected group meets that condition, the alarm will sound.

Group Alarm Loop Okay

This condition can be used to turn on an output (such as a security loop OK indicator) when all the inputs in the group are within normal range (OK). For example, if all the windows and doors are closed, the alarm loop indicator shows green. If it is red, check security precautions before leaving the facility. Select the input group/department to be monitored.

Group Alarm Armed

This condition can be used to turn on an output (such as an audible warning) whenever any input in the group has been activated to alarm (armed). Select the input group/department to be monitored.

Programming Examples

Example: Aux Heater

The sample below shows a typical output use. The Aux. Heater will "Turn ON if: the Greenhouse temp. probe input is less than 50°F. and the Main Heater has been ON for 30 minutes." The timer starts counting when the Main Heater turns ON and resets when the Main Heater is OFF. Use "Turn OFF if:" to set the Aux. Heater to turn off.

Start by selecting Turn ON if #-: Condition AND Condition as the first condition type. Click OK so that the two new conditions are added to the logic box. Click on each additional condition (shown as unused) to select the condition type required.

Aux Heater Logic:

Turn ON If 1: Condition 2 AND Condition 3

Condition 2: Green House Temp. < 50. deg. F.

Condition 3: Condition 4 AND Condition 5

Condition 4: Main Heater ON

Condition 5: Timer 3 > Condition (1800 seconds) *Main heater*

(Condition 3) has been on for 30 min.

Timer 3 Starts If: Main Heater ON

Timer 3 Resets If: Main heater OFF

Turn OFF If 8: NOT Condition 1

Example: Animal Watering System

In an animal watering system a basic sequence of events is as follows. First, the drain valve opens at a specific time of the day, then after about a minute, the pressure bypass valve opens (this increases the pressure in the line from about 5 PSI to 15 PSI) and increases the flushing flow. After the system runs for about 5 minutes, the pressure bypass valve closes, and then the drain valve closes about a minute later. This logic is programmed as follows:

Drain Valve Logic:

Turn ON If 1: Watering Schedule ON

Turn OFF If 2: Condition 3 AND Condition 4

Condition 3: Watering Schedule OFF

Condition 4: Timer 1 > 60 seconds

Timer 1 Starts If: Watering Schedule OFF

Timer 1 Resets If: Watering Schedule ON

This makes the drain valve turn on with the watering schedule and turn off 60 seconds after the watering schedule turns off.

Pressure Bypass Valve Logic:

Turn ON If 5: Timer 2 > 60 seconds

Timer 2 Starts If: Watering Schedule ON

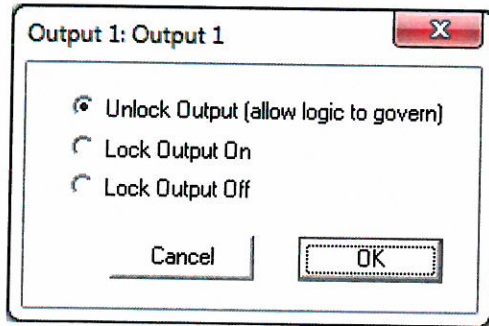
Timer 2 Resets If: Watering Schedule OFF

Turn OFF If 6: Watering Schedule OFF

This makes the bypass valve turn on 60 seconds after the watering schedule turns on and turn off when the watering schedule turns off. Next, program the watering schedule to turn ON for the desired water flowing time (perhaps 5 minutes) on the days of the week required for the watering system to flush.

Lock or Unlock Outputs

In certain situation it may become beneficial to lock an output so that it is continuously remains in the same state. Use the Lock Outputs functionality to engage/disengage an output until it is once again manually overridden. Once locked, outputs will show up as having a yellow border with a blue interior.



Unlock Output (allow logic to govern):

By using this option the selected output will revert to using its previously programmed parameters.

Lock Output On:

If selected the given output will stay in a continuously latched ON state until disengaged.

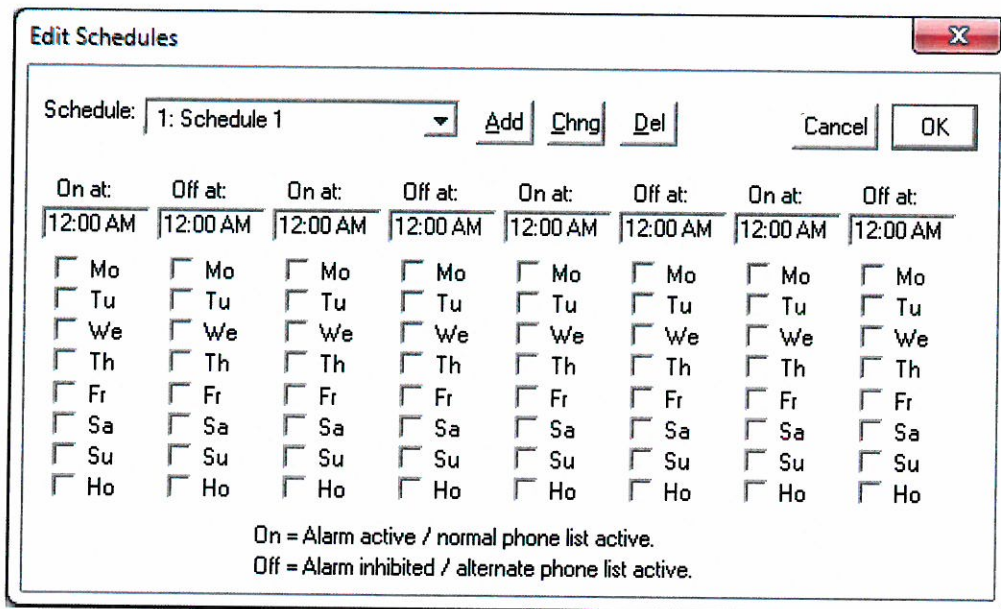
Lock Output Off:

If selected the given output will remain in a continuously latched OFF state until disengaged.

Add/Edit Schedules

Using the schedules option you can establish the time and days that the alarms are ON and OFF. All schedule positions are 'continuously on' until they are named and a schedule is programmed. All inputs are also 'continuously on' until they are assigned to a specific schedule. Alarms are turned off (inhibited) during an alarm's programmed OFF times.

Schedules can be attached to inputs or outputs.



Schedule: 1: Schedule 1 Add Chng Del Cancel OK

On at:	Off at:	On at:	Off at:	On at:	Off at:	On at:	Off at:
12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM
<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo
<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu
<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We
<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th
<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr
<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa
<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su
<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho

On = Alarm active / normal phone list active.
 Off = Alarm inhibited / alternate phone list active.

Add

This function allows you to add a new schedule name. To add a new schedule, click on the Add button and type in the new name. Proceed to edit the schedule.

Change

Change the name of an existing schedule by clicking on the Chng button.

Del

Delete a schedule by clicking on the Del button. If any inputs or outputs that use the schedule are deleted, a message appears advising which inputs and outputs need to be reprogrammed prior to deleting the schedule.

Edit Schedules:

This allows the specification of ON times, OFF times, and active days for each schedule. This data will all be sent to, and stored in, the Node. There can be up to four On/Off times programmed for each day. (If all the check boxes are unchecked, the schedule will be on all the time.)

Program a Schedule

Edit Schedules

Schedule: 2: Day/Night Phone Schedul

On at:	Off at:	On at:	Off at:	On at:	Off at:	On at:	Off at:
5:00 PM	8:30 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM
<input checked="" type="checkbox"/> Mo	<input checked="" type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo
<input checked="" type="checkbox"/> Tu	<input checked="" type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu
<input checked="" type="checkbox"/> We	<input checked="" type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We
<input checked="" type="checkbox"/> Th	<input checked="" type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th
<input checked="" type="checkbox"/> Fr	<input checked="" type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr
<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa
<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su
<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho

On = Alarm active / normal phone list active.
Off = Alarm inhibited / alternate phone list active.

The schedule shown above is a typical phone schedule which is on from 5:00 P.M. to 8:30 A.M. week nights. The alternate schedule is active during the day from Monday to Friday, and all the time on weekends.

If it is necessary for the scheduling to be different on holidays, such as for security schedules, use one of the four on/off times, set the holiday schedule, and click on holiday under those times. Go to Holiday Programming to enter holiday dates.

Notes on Schedules:

If an alarm is enabled or disabled during an ON time or OFF time, the input will be enabled/disabled for the period of time specified and then resume its normal schedule, be it during an ON time or OFF time.

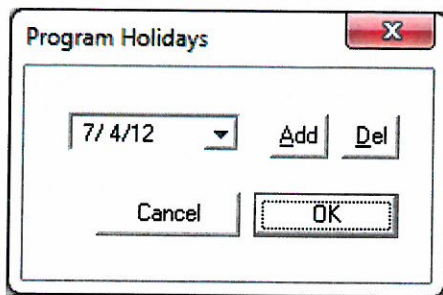
When setting up a telephone schedule, when the schedule is ON, the normal(Day) phone list is called; when the schedule is OFF, the alternate(Night) list is the one called.

When a scheduled alarm is reset/enabled, if the schedule would have the alarm revert to an inhibited status, the system will advise and ask to reset (input reverts to scheduled status) or enable (input's alarm becomes active).

Holidays

This function allows having alarms, outputs, or schedule checking inputs to be treated differently on holidays. Enter holiday dates in the mm/dd/yy format (dd-mm-yy if the European date option is on)

manually or by using the dropdown selection window. The dates entered onto this list will be applied to schedules when holiday is selected as an active day. There are 20 holiday exceptions.



Add

Click on the Add button and enter the date of any new holiday. Enter the date in manually or use the drop down selection window to choose the date from the built-in calendar.

Del

To delete a holiday, select it and click Delete. There will be a message asking to confirm removal of this date.

NOTE: Holidays will need to be updated each year. Some holidays, such as Memorial Day, Labor Day, and Thanksgiving, etc., do not always fall on the same date.

Phone List Programming

The phone list programming feature is the conduit by which users' telephone numbers are added to the system. Broken into two sections, users are first added to the Master Directory from which they can be added to individual phone lists. Up to 1000 entries can be added to the Master Directory

Master Directory

Add>>

Chng>>

Del>>

To add names and numbers to the Master Directory click on the left hand *Add>>* button. Enter the person's name and phone number into the master directory, last name first, since the name list is kept in alphabetical order. To change or delete an existing entry first select the individual from the list. Change a preexisting entry by clicking on the *Chng>>* button and adding the correct information. Delete an entry by clicking the *Del>>* button. Deleting a name from the master list will automatically remove it from all Node phone lists.

When entering a phone number, entries are limited to the numbers 0-9 and the following special characters:

- , 3 Second Pause
- . 3 Second Pause
- * Same as pressing * on phone pad

Same as pressing # on phone pad

All other characters are ignored.

Node's Phone List

The phone lists store the telephone numbers that the node will use in the event of an alarm. Using the Master Directory entries, phone lists can be generated in the following schemes: 100 lists of 10 numbers each, 200 lists of 5 numbers, 250 lists of 4 numbers, 330 lists of 3 numbers, or 500 lists of 2 numbers each. Each input can have a specific list assigned to it. In the event of an alarm on that particular input, the node will call all the numbers on the phone list until an acknowledgement is received.

Each input can be assigned two phone lists; a normal list and an alternate. Which lists are used is determined by the phone schedule that has been selected, and the telephone option. A common use for the two phone lists is a Day/Night calling schedule. One phone list containing the numbers of people who will respond to the alarm during working hours can be established, and another list for those responding after hours.

The phone dialog box will display the name of the currently selected Node Phone List. To select a particular named phone list, click on the down arrow at the right of the Node's Phone List box. A list of all of the currently defined Node Phone Lists, in alphabetical order, will be shown. The user names and phone numbers associated with the selected Phone List Name will appear in the box below it.

Add

Chng

Del

To add, change, or delete a node's phone list name, use the buttons to the right of the list name. To add new lists to the Node click the *Add* button. To change or delete an existing entry first select the Phone list from the list. Change a preexisting entry by clicking on the *Chng* button and adding the correct information. Delete an entry by clicking the *Del* button.

Adding Master Directory users to a Node phone list.

To add a name/number to a node's phone list from the Master Directory, select the name in the directory and click the >>*Add*>> button at the top of the page. The name and number will appear on the right side, under the name of the phone list. Continue adding names to the list in this manner until done.

To delete a name/number from a Node's list, select it and press the delete button on the right. This will remove the name from this phone list, will remain on the master list and on any other node phone lists.

To find which phone list an individual Master Directory entry is located in select it in the Master Directory and click the >>*Find*>> button. If the entry is located in an existing list it will be automatically selected in the Node's Phone List window.

A name's position on the list specifies the order in which it will be called by the node. When adding names to the node list, each name will be added above the last one, so the last name added will be the first name called. To select a specific position for a name being added, highlight the name that will be immediately below the new one and then add the new name. The name will be inserted above the highlighted name.

Alarm Checklists

The Alarm Checklists option enables you to setup a series of questions that should be answered whenever an alarm is handled on the system.

Add/Edit Alarm Handling Instruction Lists

List name:

NOTE: The text that you enter above will be inserted into all comments about alarms that use these instructions. You may put square brackets [] into the notes to allow the person responding to the alarm to enter a response.

The user has the option to create up to 20 different forms detailing standard operating procedures to be followed during an alarm. The groups of questions or instructions for the Alarm Control box can have spaces for 'Yes/No' answers, a person's initials, comments, etc. Individual inputs can be assigned to any one of the 20 alarm instruction lists. The selected alarm instruction list will appear in the Alarm Control box whenever it is opened. Select which instruction list goes with which input when programming the input.

After the alarm has been handled, respond to the alarm instructions by going to the running log and selecting the event that was just handled. Bring up the Alarm Control box by double clicking on the event. Answer the alarm questions and then add any necessary comments or explanations. The questions and responses and comments, with name, date, and time, are logged to the running log and electronically signed and dated. Responses will become an unalterable part of the permanent record.

To see the recorded responses, select the *Node Events* button from the *Reports/Graphs* ribbon bar. Select the type of report and double click on the event. At this time add additional comments to further document the situation. Previously entered responses or comments cannot be modified.

Add/Edit Alarm Handling Instruction Lists

List name: 1: -20 Freezer Add Chng Del

1) Does the freezer have power? []
 2) Is the door securely closed? []
 3) Have you moved the contents? []
 4) Have you notified your supervisor? []

NOTE: The text that you enter above will be inserted into all comments about alarms that use these instructions. You may put square brackets [] into the notes to allow the person responding to the alarm to enter a response.

Cancel OK

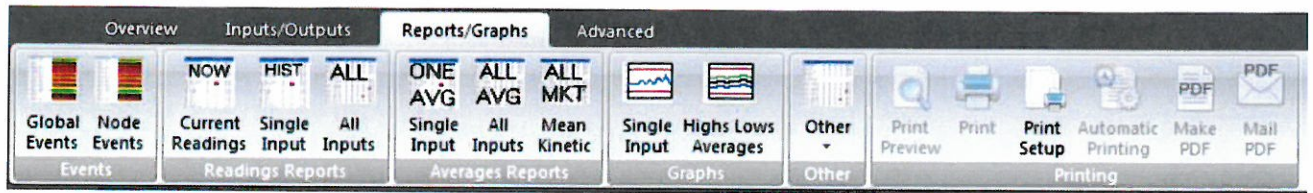
Add







Chng

Del

Add up to 20 alarm instruction lists by pressing the 'Add' button. Enter the new name in the "Add Instruction List Name" dialog box. Place the cursor in the instruction box below and type in whatever questions, instructions, etc. that should be followed. Square brackets [] should be used to request user responses. The system will recognize these and will expect responses to be entered between the brackets. To change or delete an existing entry first select the list from the dropdown window. Change a preexisting entry by clicking on the *Chng* button and adding the correct information. Delete an entry by clicking the *Del* button.

Reports/Graphs (Environmental Node)



Field	Description
 Global Events	Generate a report detailing global events on the system.
 Node Events	Create an events report using selectable options, detailing events on the system.
 Current Readings	Generate a report showing current readings on the system.
 Single Input	Display a report displaying a single input's readings.
 All Inputs	Generate a report showing the readings for all of the Node's inputs.
 Single Input Averages	Displays a report detailing the daily averages for a given input.



[All Input
Averages](#)

Create a report detailing the daily averages for all of the Node's inputs.



[Mean
Kinetic
Temperature](#)

Display the mean kinetic temperature for all applicable Node inputs.



[Single Input
Graph](#)

Graph displaying a single input's readings.



[Highs Lows
Averages
Graph](#)

Graph displaying a single input's high's, lows, and averages.



Other

Submenu container which houses the following functions:

-Node Program	Displays the Node Program printout
-Export Reading	Export readings data to a txt file.
-Input Names by Number	Displays the Node's inputs in numerical order.
-Alphabetic Input Names	Display the Node's inputs, according to their name, in alphabetical order.
-Master Phone Directory	Presents the Master phone directory and all of the individuals in it.
-Master Access Code Directory	Displays all the system's users and the rights they have been assigned.

[-Advanced and
Custom Reports](#)

Brings up the advanced reporting menu.



[Print
Preview](#)

View the printed layout of your document.



[Print](#)

Prints the current document.



[Print
Setup](#)

This dialog will allow you to set specific options for the printers connected to your system.



[Automatic
Printing](#)

Use this dialog to automatically print or email any opened reports.



[Make
PDF](#)

Creates a pdf document of the currently opened report.

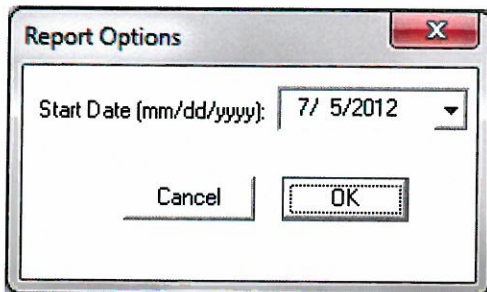


[Mail
PDF](#)

Generates and places a pdf of the currently opened report in a user-sendable email message.

Global Events

Using the Global Events report a user can readily grasp Node wide changes that were made using the Global Options dialog.

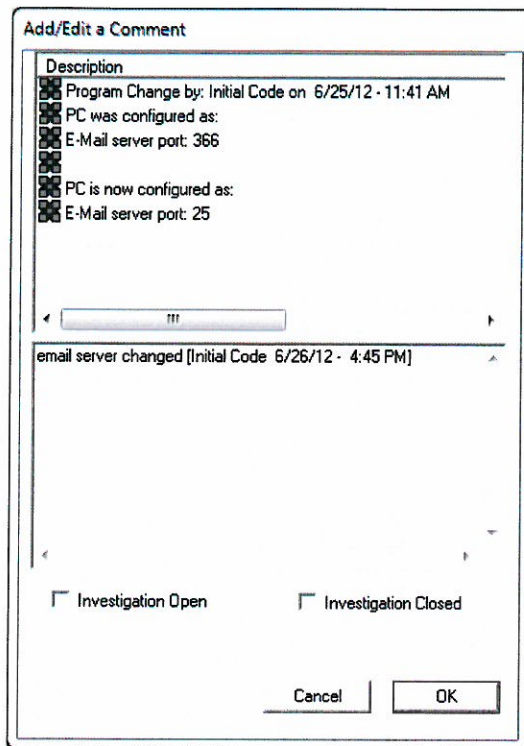


Within the report, individual changes are listed by date and time, with the type of change being listed to the right of the screen. Once located, an event can be further investigated by double-clicking on the selection.

Node 1: Node 1 Global Events x	
6/13/12 10:24AM	Program Change Initial Code
6/13/12 10:33AM	Login Initial Code
6/13/12 10:36AM	Program Change Initial Code
6/13/12 10:36AM	Program Change Initial Code
6/13/12 10:41AM	Login Initial Code
6/13/12 10:50AM	Logout Initial Code
6/13/12 10:50AM	Login Initial Code
6/13/12 10:51AM	Login Initial Code
6/13/12 1:21PM	Program Change Initial Code
6/14/12 4:34PM	Logout Initial Code
6/15/12 3:06PM	Login Initial Code
6/15/12 3:22PM	Logout Initial Code
6/15/12 3:22PM	Login Initial Code
6/18/12 2:59PM	Login Initial Code
6/18/12 3:41PM	Login Initial Code
6/19/12 4:51PM	Login Initial Code
6/22/12 1:22PM	Login Initial Code
6/25/12 9:14AM	Login Initial Code
6/25/12 9:17AM	Login Initial Code
6/25/12 11:02AM	Login Initial Code
6/25/12 11:02AM	Login Initial Code
6/25/12 11:00AM	Login Initial Code
6/25/12 11:40AM	Program Change Initial Code
6/25/12 11:41AM	Program Change Initial Code
6/25/12 11:41AM	Program Change Initial Code
6/25/12 11:41AM	Program Change Initial Code
6/25/12 11:43AM	Program Change Initial Code
6/25/12 11:44AM	Program Change Initial Code
6/25/12 11:44AM	Program Change Initial Code
6/25/12 11:44AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:49AM	Program Change Initial Code
6/25/12 11:57AM	Logout Initial Code
6/25/12 11:57AM	Login Initial Code
6/25/12 11:57AM	Program Change Initial Code
6/25/12 11:58AM	Login Initial Code
6/25/12 11:59AM	Program Change Initial Code
6/25/12 12:00PM	Program Change Initial Code
6/25/12 12:00PM	Program Change Initial Code

The comment window is a repository for past changes. The upper window (description window) reflects what changes were made, when, and by whom. The lower window (comments window) reflects individual comments in addition to being the location for the preprogrammed alarm handling

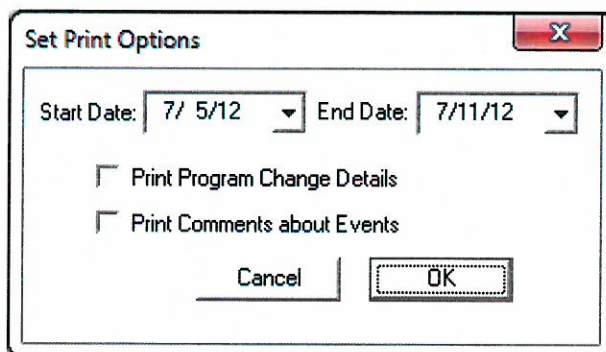
instruction form. Once open, comments can be added to further clarify a change. Once a comment has been added it becomes read-only and is electronically signed and dated. Additional comments can be added to an event at any time.



The 'Add/Edit a Comment' dialog box contains a 'Description' section with a list of events, each preceded by a small icon. The events are: 'Program Change by: Initial Code on 6/25/12 - 11:41 AM', 'PC was configured as:', 'E-Mail server port: 366', 'PC is now configured as:', and 'E-Mail server port: 25'. Below this list is a horizontal scrollbar. Under the scrollbar, the text 'email server changed [Initial Code 6/26/12 - 4:45 PM]' is visible. At the bottom of the dialog, there are two checkboxes: 'Investigation Open' and 'Investigation Closed'. At the very bottom are 'Cancel' and 'OK' buttons.

Print Preview

When previewing the Global Events report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.



The 'Set Print Options' dialog box features a title bar with a close button (X). It contains two date pickers: 'Start Date: 7/ 5/12' and 'End Date: 7/11/12'. Below these are two checkboxes: 'Print Program Change Details' and 'Print Comments about Events'. At the bottom are 'Cancel' and 'OK' buttons.

Start Date

End Date

Use these fields to enter the appropriate dates for your report.

Print Program Change Details

If selected, the report will additionally list and detail any program changes that were made to the system.

Print Comments about Events

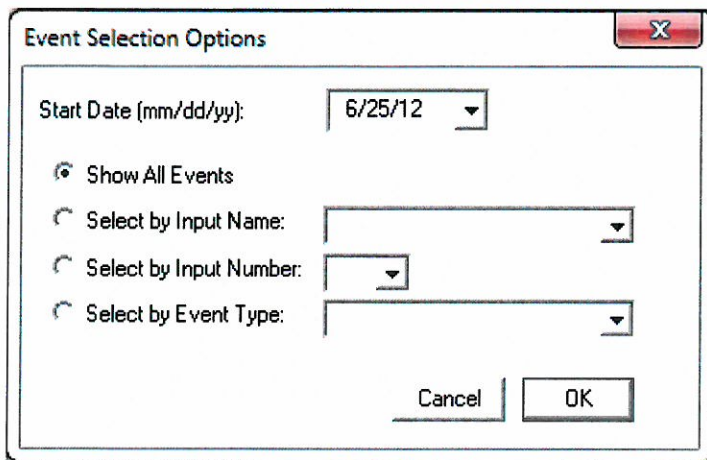
When selected, any additional comments that were entered into the system will be visible in the final report.

Node Events

Similar to the Global Events Report in style, the Node Events Report is a collection of events on the current Node. Due to the vast amount of data available, the report can be dialed down to show specific items. If more than one Node is open the report will disclose information pertaining to the selected Node.

Event Selection Options

When a report is generated, a dialog box will appear that allows the selection of the starting date and the specifics of the report.



The image shows a dialog box titled "Event Selection Options" with a close button (X) in the top right corner. Inside the dialog, there is a "Start Date (mm/dd/yy):" label followed by a date field containing "6/25/12" and a dropdown arrow. Below this, there are four radio button options: "Show All Events" (which is selected), "Select by Input Name:", "Select by Input Number:", and "Select by Event Type:". Each of the last three options is followed by a dropdown menu. At the bottom of the dialog, there are "Cancel" and "OK" buttons.

Type in the start date for the report and then choose from one of the listed options.

Show All Events

If chosen the report will reflect all events that occurred on the system, regardless of type.

Select by Input Name/Select by Input Number

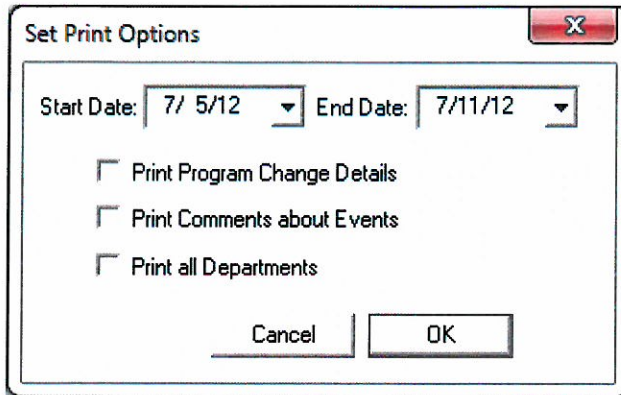
If "Select by Input Name" or "Select by Input Number" is chosen, click on the arrow on the right to display the list of input names or numbers. The system will locate the exact records of interest and display them on the screen, color coded by event. Alarm events are highlighted in red, pending and inhibited alarms are in yellow, programming changes are in black, output changes are in blue, and normal readings are in green.

Select by Event Type

If chosen, the report will show all instances of that type of event for all inputs in the user's department/group, or in the whole Node if the user has access to all the Node's inputs. Selectable types are by: Alarm Messages, Alarm Disabled, Alarm Reset, Disable Group of Alarms, Reset Group of Alarms, Disable All Alarms, Reset All Alarms, Error Messages, Program Changes, Calibrations, and Maintenance Items.

Print Preview

When you print preview the Node Events report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

A screenshot of a Windows-style dialog box titled "Set Print Options". It features a close button (X) in the top right corner. Below the title bar, there are two date fields: "Start Date:" followed by a text box containing "7/ 5/12" and a dropdown arrow, and "End Date:" followed by a text box containing "7/11/12" and a dropdown arrow. Below these fields are three unchecked checkboxes: "Print Program Change Details", "Print Comments about Events", and "Print all Departments". At the bottom of the dialog are two buttons: "Cancel" and "OK".

Start Date

End Date

Use these fields to enter the appropriate dates for your report

Print Program Change Details

If selected, the report will additionally list and detail any program changes that were made to the system.

Print Comments about Events

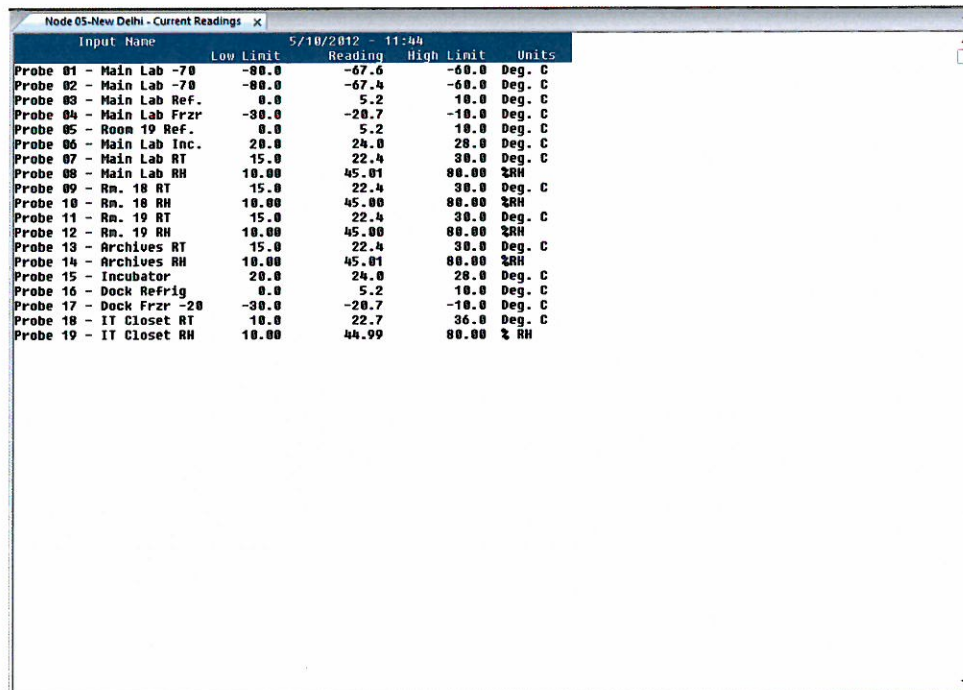
When selected, any additional comments that were entered into the system will be visible in the final report.

Print all Departments

By selecting the Print all Departments checkbox the final report will include details from every department.

Current Readings

The Current Readings report is an account of all inputs on the designated Node and their respective readings. Providing a means of instant documentation for the system, the report lists each probe alongside their current reading in addition to both the programmed low and high alarm limits and the units of measurement. Probes that are programmed as unused will be shown as having a reading of “0.00”.



Input Name	Low Limit	Reading	High Limit	Units
Probe 01 - Main Lab -70	-80.0	-67.6	-60.0	Deg. C
Probe 02 - Main Lab -70	-80.0	-67.4	-60.0	Deg. C
Probe 03 - Main Lab Ref.	0.0	5.2	10.0	Deg. C
Probe 04 - Main Lab Frzr	-30.0	-20.7	-10.0	Deg. C
Probe 05 - Room 19 Ref.	0.0	5.2	10.0	Deg. C
Probe 06 - Main Lab Inc.	20.0	24.0	28.0	Deg. C
Probe 07 - Main Lab RT	15.0	22.4	30.0	Deg. C
Probe 08 - Main Lab RH	10.00	45.01	80.00	%RH
Probe 09 - Rm. 18 RT	15.0	22.4	30.0	Deg. C
Probe 10 - Rm. 18 RH	10.00	45.00	80.00	%RH
Probe 11 - Rm. 19 RT	15.0	22.4	30.0	Deg. C
Probe 12 - Rm. 19 RH	10.00	45.00	80.00	%RH
Probe 13 - Archives RT	15.0	22.4	30.0	Deg. C
Probe 14 - Archives RH	10.00	45.01	80.00	%RH
Probe 15 - Incubator	20.0	24.0	28.0	Deg. C
Probe 16 - Dock Refrig	0.0	5.2	10.0	Deg. C
Probe 17 - Dock Frzr -20	-30.0	-20.7	-10.0	Deg. C
Probe 18 - IT Closet RT	10.0	22.7	36.0	Deg. C
Probe 19 - IT Closet RH	10.00	44.99	80.00	%RH

Print Preview

When using the print preview button with the Current Readings report the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Single Input Readings

The Single Input Readings report allows you to view the readings for a selected time frame of any individual probe in a user's access group.

Node 3 - Input 3 Reading History					
Date	Time	Low Limit	Reading	High Limit	Units
7/ 5/2012	3:50 PM	-50.0	-13.3	50.0	Deg. C
7/ 5/2012	3:51 PM	-50.0	-13.3	50.0	Deg. C
7/ 5/2012	4:03 PM	-50.0	-13.3	50.0	Deg. C
7/ 5/2012	8:00 PM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	12:00 AM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	4:00 AM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	8:00 AM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	12:00 PM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	2:51 PM	0.0	-13.3	50.0	Deg. C
7/ 6/2012	2:52 PM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	2:56 PM	-50.0	-13.3	-50.0	Deg. C
7/ 6/2012	2:57 PM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	3:11 PM	0.0	-13.3	50.0	Deg. C
7/ 6/2012	3:11 PM	-50.0	-13.3	50.0	Deg. C
7/ 6/2012	4:12 PM	-50.0	-13.3	50.0	Deg. C
7/ 9/2012	8:27 AM	-50.0	-13.3	50.0	Deg. C
7/ 9/2012	9:07 AM	-50.0	-13.3	50.0	Deg. C
7/ 9/2012	10:19 AM	-50.0	-13.3	50.0	Deg. C
7/ 9/2012	12:00 PM	-50.0	-13.3	50.0	Deg. C
7/ 9/2012	4:00 PM	-50.0	-13.3	50.0	Deg. C
7/ 9/2012	8:00 PM	-50.0	-13.3	50.0	Deg. C
7/10/2012	12:00 AM	-50.0	-13.3	50.0	Deg. C
7/10/2012	4:00 AM	-50.0	-13.3	50.0	Deg. C
7/10/2012	8:00 AM	-50.0	-13.3	50.0	Deg. C
7/10/2012	9:12 AM	-50.0	-13.3	50.0	Deg. C
7/10/2012	12:00 PM	-50.0	-13.3	50.0	Deg. C
7/10/2012	3:39 PM	-50.0	-13.3	50.0	Deg. C

Enter the start date at the date prompt. If desired, select the option to use a fixed 3 decimal format (98.000°F.), an option that can be used for validation purposes, and press ok. If the 3 decimal format is not chosen, the system will calculate and show only significant figures. Once open, the readings information is presented in chart format with the Node and input name shown in the window header. In the body of the report you will find the date, time, low limit, reading, and high limit shown for each of the recorded time intervals.

Print Preview

When previewing the Single Input Readings report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Set Print Options

Start Date: 7/ 5/12

End Date: 7/11/12

☐ Print all Inputs in Department: All Inputs

Note: You can only print for departments that are subsets of your own.

Cancel

OK

Start Date

End Date

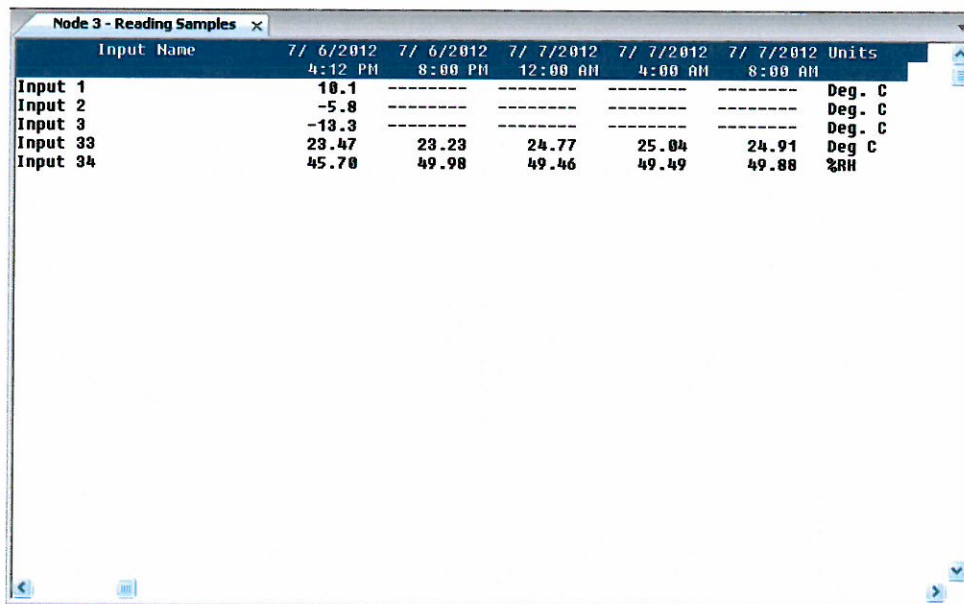
Use these fields to enter the appropriate dates for your report.

Print All Inputs in Department:

The use of this option enables you to print preview the single input readings for a selected department by selecting it in the drop down menu to the right. If this option is left unchecked the report will only reflect the currently selected input.

All Inputs Readings

The All Inputs Readings report allows you to view the readings for a selected time frame of all inputs in a Node within a given user's access group.

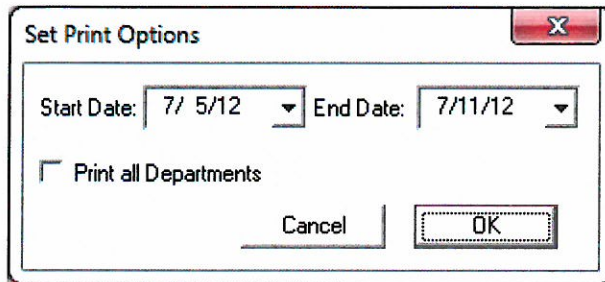


Input Name	7/ 6/2012 4:12 PM	7/ 6/2012 8:00 PM	7/ 7/2012 12:00 AM	7/ 7/2012 4:00 AM	7/ 7/2012 8:00 AM	Units
Input 1	10.1	-----	-----	-----	-----	Deg. C
Input 2	-5.8	-----	-----	-----	-----	Deg. C
Input 3	-13.3	-----	-----	-----	-----	Deg. C
Input 33	23.47	23.23	24.77	25.04	24.91	Deg. C
Input 34	45.70	49.98	49.46	49.49	49.88	%RH

When looking at the data, the input names will be on the left side, and dates/times along the top. Use the window's vertical slide to find a particular input and the horizontal slide to further locate an appropriate date and time. To further identify any reading click and hold it with the left mouse button to make the name and input number appear. In the report, readings that fall outside their normal limits are highlighted in red. If there is no data in the readings history file, the screen will show only the input names and units.

Print Preview

When you print preview the Node Events report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

A screenshot of a 'Set Print Options' dialog box. It has a title bar with a close button (X). Inside, there are two date pickers: 'Start Date: 7/ 5/12' and 'End Date: 7/11/12'. Below these is a checkbox labeled 'Print all Departments' which is currently unchecked. At the bottom right are 'Cancel' and 'OK' buttons.

Start Date

End Date

Use these fields to enter the appropriate dates for your report.

Print All Departments

The use of this option enables you to print preview all input readings for a Node by department. If this option is left unchecked, and the current user is valid in a selected department, the report will only reflect the user's department. By selecting this option departmental readings for the designated time period will be grouped and shown one after another in the report.

Single Input Averages

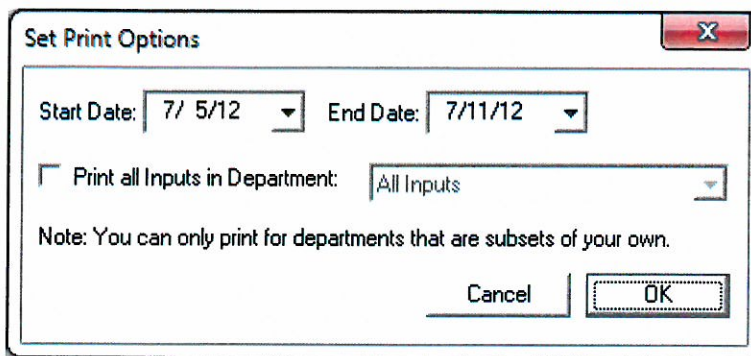
The Single Input Averages report allows you to view the daily high, low, and average readings of any individual probe in a user's access group.

Node 3 - Input 3 Reading History					
Date	Time	Day's Low	Average	Day's High	Units
7/ 9/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/10/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/11/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/12/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/13/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/14/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/15/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/16/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
7/17/2012	24 Hours	-13.3	-13.3	-13.3	Deg. C
END of Date Range in Database					

Enter the start date at the date prompt. If desired, select the option to use a fixed 3 decimal format (98.000°F.), an option that can be used for validation purposes, and press ok. If the 3 decimal format is not chosen, the system will calculate and show only significant figures. Once open, the readings information is presented in chart format with the Node and input name shown in the window header. In the body of the report you will find the date, time, the day's low reading, the day's average reading, the day's high reading, and the units of measure. Use the window's vertical slide to find an appropriate date and time. Daily averages are calculated from midnight to midnight and include in the average all readings samples and any readings reported due to alarm events. In the report, readings that fall outside their normal limits are highlighted in red. If there is no data in the readings history file, the screen will show only the date and time.

Print Preview

When previewing the Single Input Averages report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

A screenshot of a 'Set Print Options' dialog box. It features a title bar with a close button (X). The main area contains two date pickers: 'Start Date' set to '7/ 5/12' and 'End Date' set to '7/11/12'. Below these is a checkbox labeled 'Print all Inputs in Department:' which is currently unchecked, followed by a dropdown menu showing 'All Inputs'. A note below the checkbox reads: 'Note: You can only print for departments that are subsets of your own.' At the bottom right are 'Cancel' and 'OK' buttons.

Set Print Options

Start Date: 7/ 5/12 End Date: 7/11/12

☐ Print all Inputs in Department: All Inputs

Note: You can only print for departments that are subsets of your own.

Cancel OK

Start Date

End Date

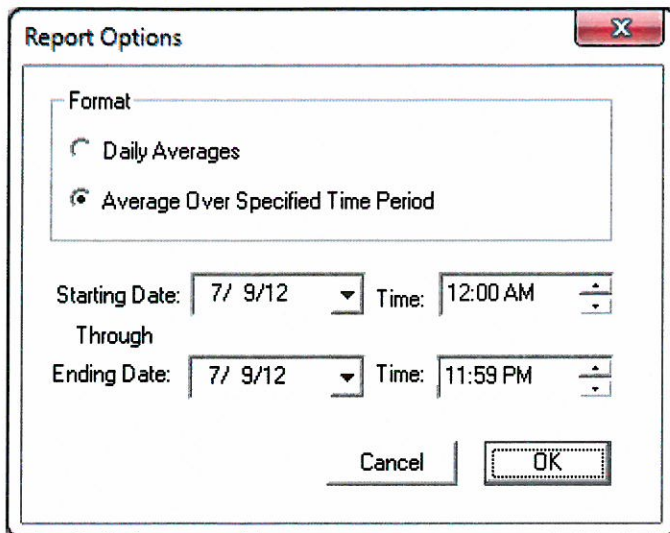
Use these fields to enter the appropriate dates for your report.

Print All Inputs in Department:

Use of this option enables you to print preview the single input averages for a chosen department by selecting it in the drop down menu to the right. If this option is left unchecked the report will only reflect the currently selected input.

All Inputs Averages

The All Inputs Averages report allows you to view the daily high, low, and average readings of all probes in a user's access group.

The image shows a 'Report Options' dialog box with a title bar containing a close button (X). Inside the dialog, there is a 'Format' section with two radio buttons: 'Daily Averages' and 'Average Over Specified Time Period'. The 'Average Over Specified Time Period' option is selected. Below this, there are two rows of date and time selection. The first row is for the 'Starting Date' and 'Time', with the date set to '7/ 9/12' and the time to '12:00 AM'. The second row is for the 'Ending Date' and 'Time', with the date set to '7/ 9/12' and the time to '11:59 PM'. At the bottom of the dialog are 'Cancel' and 'OK' buttons.

Report Options

Format

☐ Daily Averages

☒ Average Over Specified Time Period

Starting Date: 7/ 9/12 Time: 12:00 AM

Through

Ending Date: 7/ 9/12 Time: 11:59 PM

Cancel OK

Upon selecting the All Inputs Averages report you will be met with the Report Options window. Using the selection options you can choose what time period you would like the averages report to inform on.

Daily Averages

Daily averages are calculated from midnight to midnight and include in the average all logged readings samples, including those logged due to alarm events.

Average Over Specified Time Period

Averages over a specified time period are calculated from the starting date/time to the ending date/time and include in the average all logged reading samples including those logged due to alarm events. The minimum time span for a report is 1 minute. When choosing a time span the report will only utilize data points within the specific chosen range, regardless if the span extends past the last reading. While a report may be generated over a time period where a reading was not captured, the generated document will state that the next data point in time is the average.

Input Name	Day's Low	Day's Avg	Day's High	Units
Input 1	10.0	10.1	10.1	Deg. C
Input 2	-5.8	-5.7	-5.7	Deg. C
Input 3	-13.3	-13.3	-13.3	Deg. C
Input 33	22.14	24.71	26.92	Deg C
Input 34	50.61	56.77	60.82	%RH

Once open, the readings information is presented in chart format with the Node name shown in the window header. In the body of the report you will find the date and time range, input name, the day's low reading, the day's average reading, the day's high reading, and the units of measure. Use the window's vertical slide to find an appropriate input. In the report, readings that fall outside their normal limits are highlighted in red. If there is no data in the readings history file, the screen will only show the date and input number.

Print Preview

When using the print preview button with the All Input Averages report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Set Print Options

Start Date: 7/ 5/12 End Date: 7/11/12

☐ Print all Departments

Cancel OK

Start Date

End Date

Use these fields to enter the appropriate dates for your report.

Print All Departments

The use of this option enables you to print preview all input readings for a Node by department. If this option is left unchecked, and the current user is valid in a selected department, the report will only reflect the user's department. By selecting this option departmental readings for the designated time period will be grouped and shown one after another in the report.

Mean Kinetic Averages

The Mean Kinetic Averages report is method by which one can assess the environmental stability of a sample over time within a non-isothermal environment. Required by the USP and FDA wherever pharmaceuticals or perishables are stored, the report enables a user to determine if improper storage or handling of goods has occurred. The Mean Kinetic Temperature takes into account all of the variations that have occurred over a time period and calculates the constant temperature that would have produced equivalent spoilage on the product.

Mean Kinetic Temperatures are calculated using readings data collected from the system according to the formula:

$$MKT = \frac{\frac{\Delta H}{R}}{-\ln \left(\frac{e^{\frac{-\Delta H}{R \cdot T_1}} + e^{\frac{-\Delta H}{R \cdot T_2}} + e^{\frac{-\Delta H}{R \cdot T_3}} \dots + e^{\frac{-\Delta H}{R \cdot T_n}}}{n} \right)}$$

MKT = Mean Kinetic Temperature

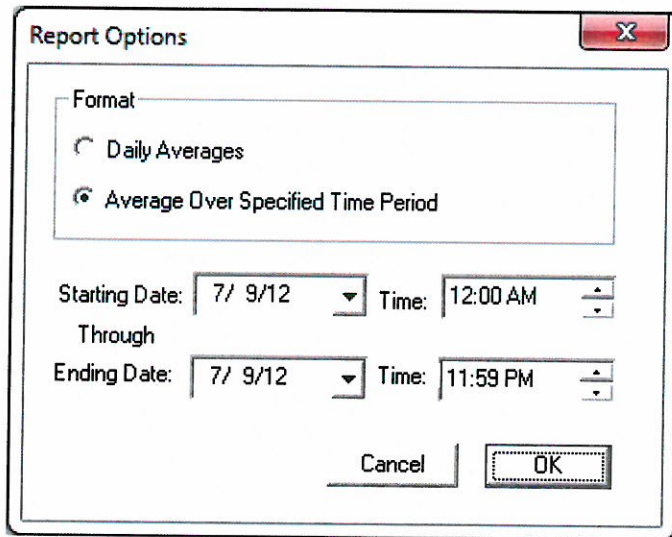
ΔH = Heat of Activation = $83.144 \frac{kJ}{mol}$ (**USP recommended typical value)

R = Universal Gas Constant = $8.3144 * 10^{-3} \frac{kJ}{mol K}$

T_n = Temperature at each data point

n = Number of data points

A new term for this expression is calculated for each 15 minute time interval. If there is no data available for any particular 15 minute interval, previous data is used and the term is calculated. This integration process provides that time periods where the system logged at a faster rate are equally represented with time periods where the system.



The image shows a 'Report Options' dialog box with a title bar containing a close button (X). Inside the dialog, there is a 'Format' section with two radio buttons: 'Daily Averages' and 'Average Over Specified Time Period'. The 'Average Over Specified Time Period' option is selected. Below this, there are two rows of date and time selection fields. The first row is labeled 'Starting Date:' and 'Time:', with values '7/ 9/12' and '12:00 AM' respectively. The second row is labeled 'Through' and 'Ending Date:', with values '7/ 9/12' and '11:59 PM' respectively. At the bottom of the dialog are 'Cancel' and 'OK' buttons.

Upon selecting the Mean Kinetic Averages report you will be met with the Report Options window. Using the selection options you can choose what time period you would like the averages report to inform on.

Linear Transducers and MKT Reports

In order for a Linear Transducer to appear in the MKT report, the unit of measure for that input has to be entered as "Deg C" or "Deg F" as denoted in the input programming field "Sensor Reads (units)".

Daily Averages

Daily averages are calculated from midnight to midnight and include in the average all logged readings samples, including those logged due to alarm events.

Average Over Specified Time Period

Averages over a specified time period are calculated from the starting date/time to the ending date/time and include in the average all logged reading samples, inclusive of those logged due to alarm events. The minimum time span for a report is 1 minute.

Input Name	Nbr	Deg C	Kelvin
Input 1	1	10.1	283.2
Input 2	2	-5.7	267.4
Input 3	3	-13.3	259.8
Input 33	33	24.7	297.9
Input 34	34	-	-

The report option will have start and end dates for the report. It will calculate the Mean Kinetic Temperature for each day over the date range specified. It will list these temperatures in centigrade and Kelvin for each temperature probe on the system.

Once open, the readings information is presented in chart format with the Node name shown in the window header. In the body of the report you will find the date and time range, input name, input number, the temperature in degrees Celsius, and the temperature in Kelvin. Use the window's vertical slide to find an appropriate input. Non-temperature inputs will be listed with a hyphen to signify no data.

Reporting Example

Example:

A system is setup so that it logs readings 6 times a day normally (every 4 hours) and 96 times a day during alarms (every 15 minutes). The program will use the first reading of the day (12:00 AM) for each 15 minute interval until the next reading at 4:00 AM. The system will then use the 4:00 AM reading for each 15 minute interval until the next actual reading at 8:00 AM, etc. If the system is inhibited or goes into alarm at any point and the recording rate is speeded up to every

15 minutes, then the actual readings will be used for the 15 minute intervals. Note that in the example below, the system went into alarm at 12:15. Readings were then taken again at 12:30, 12:45, and again at 1:00 PM, at which time the temperature returned to the normal range. The 1:00 PM temperature was then used in the calculations until the next scheduled reading at 4:00 PM.

Readings data from system:

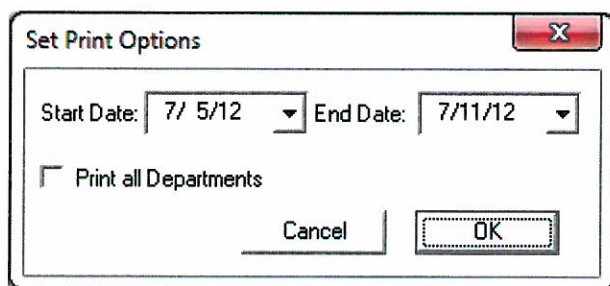
Time	Degrees C	Degrees K	
12:00AM	22.918	296.068	(Program uses 22.918 for 16 readings)
4:00AM	22.918	296.068	(Program uses 22.918 for 16 readings)
8:00AM	39.185	312.335	(Program uses 39.185 for 16 readings)
12:00PM	38.347	311.497	(Program uses 38.347 for 1 reading)
12:15PM	9.446	282.596	(Program uses 9.446 for 1 reading)
12:30PM	10.179	283.832	(Program uses 10.179 for 1 reading)
12:45PM	9.883	283.033	(Program uses 9.883 for 1 reading)
1:00PM	24.768	297.918	(Program uses 24.768 for 12 readings)
4:00PM	22.918	296.068	(Program uses 22.918 for 16 readings)
8:00PM	23.185	296.335	(Program uses 23.185 for 16 readings)

$$\text{Numerator: } \frac{\Delta H}{R} = 10,000, \quad n = 96 \frac{\text{readings}}{\text{day}}$$

$$MKT = 28.44$$

Print Preview

When using the print preview button with the Mean Kinetic Averages report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.



The image shows a 'Set Print Options' dialog box with a title bar containing a close button (X). Inside the dialog, there are two date selection fields: 'Start Date:' with a dropdown menu showing '7/ 5/12' and 'End Date:' with a dropdown menu showing '7/11/12'. Below these fields is a checkbox labeled 'Print all Departments' which is currently unchecked. At the bottom of the dialog are two buttons: 'Cancel' and 'OK'.

Start Date

End Date

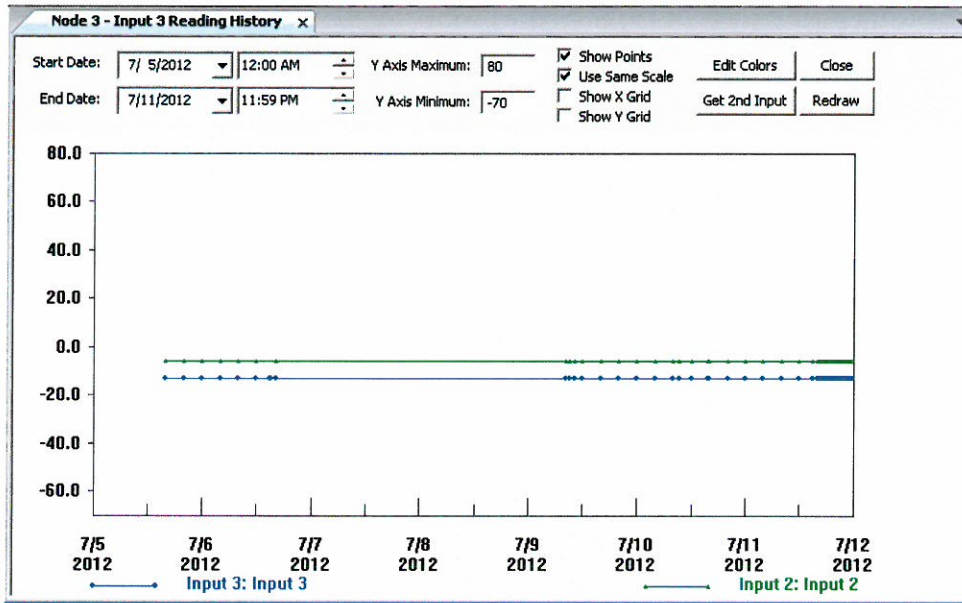
Use these fields to enter the appropriate dates for your report.

Print All Departments

The use of this option enables you to print preview all input readings for a Node by department. If this option is left unchecked, and the current user is valid in a selected department, the report will only reflect the user's department. By selecting this option departmental readings for the designated time period will be grouped and shown one after another in the report.

Single Input Graphs

The Single Input readings graph allows you to graphically ascertain the readings of up to 2 simultaneous inputs over a designated time period.



Select the input to graph by clicking on the input in the Node. When the graph window opens it will automatically show the last week's data for the single selected input on the graph, or the last dates chosen since the workstation program was launched. Use the graph window to choose a different start/end date, to select a second graphing point, set the graphical axis limits, show/hide the graphing grid, and change the graph's colors.

Start Date

End Date

Use the date controls to enter an appropriate time period for which the graph will report on. Change the start and end dates as well as the individual times for the graph by entering them in the appropriate boxes or choosing them in the drop-down selection window.

Y Axis Maximum:

Y Axis Minimum:

Enter the appropriate minimum and maximum so that the Y axis on the resulting graph is concentrated on the data to which you want to focus. If multiple inputs have been added to a graph and the *Use Same Scale* option is left unchecked, the primary, only the left-hand side Y-axis will be affected by these settings.

Show Points

When selected, individual data points will become noticeable on the graph by way of a circle indicating the reading.

Show Alarm Limits

If a second input has not been added to the graph, the Show Alarm Limits checkbox will be present. When selected, the alarm limits for the already chosen input will show on the graph.

Use Same Scale

Only present if more than one input is being graphed, the Use Same Scale selection box allows you to toggle between having single or multiple Y-axes. If the option is selected, a single unitless scale will be present on the left-hand side of the graph on the primary Y-axis. If the option is unchecked a secondary Y-axis will appear to the right of the graph for which the second input will be scaled against.

Show X-Grid

Show Y-Grid

The option to show the X and Y axis gridlines can be individually turned on and off by selecting the requisite checkboxes. If a second input has been added to the graph multiple X-axis gridlines will be present, each being drawn in the same color as the input.

Edit Colors

Using the edit colors dialog you can set the colors that you would like to use for the background, alarm limits, Y-axis in the body of the graph (not on the left or right side of the graph window), X-axis time font, input 1, and input 2. To set a color for an item choose among the preselected options present in the drop-down menu or by going to the extended options located, by pressing Other.

Get 2nd Input

To graph a 2nd simultaneous input select it on the Node and then press this button. While a 2nd input cannot be deleted from a graph once it has been added, one can change the second input by selecting another from the Node and once again pressing this button.

Redraw

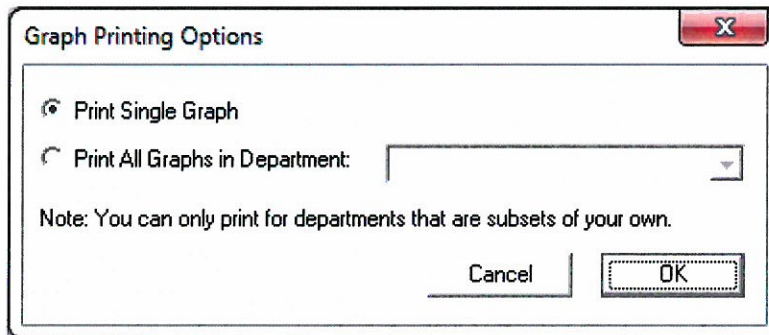
Use the Redraw button to refresh the graph after making changes to the graphing parameters.

Close

Close the currently opened graph window.

Print Preview

When using the print preview button with the Readings Graph you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.



Print Single Graph

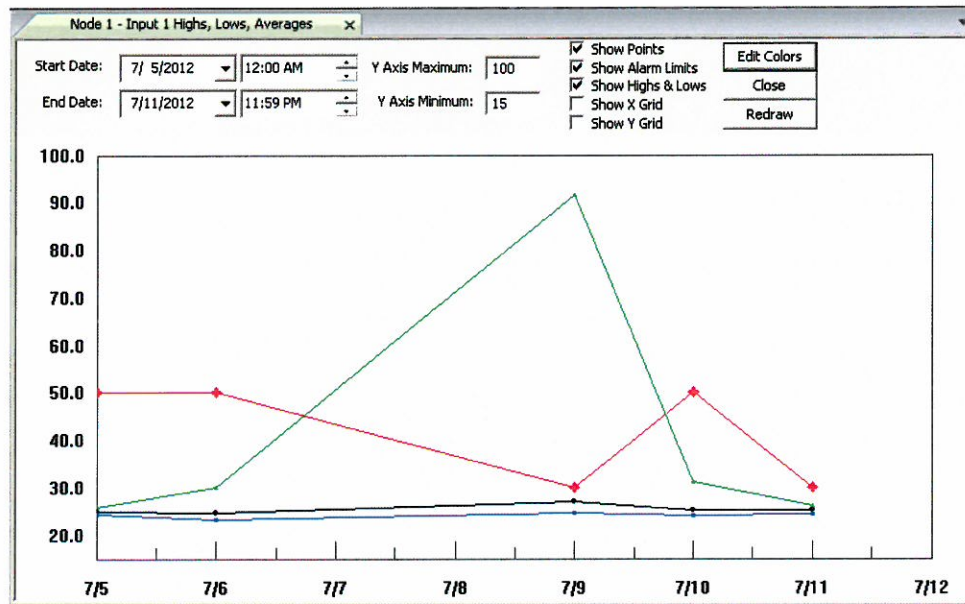
If selected only the current input's graph will be previewed.

Print All Graphs in Department:

By choosing this option all of the graphs for the selected department will be previewed.

Highs, Lows, Averages Graph

The Highs, Lows, Averages graph allows you to graphically ascertain the average daily readings of an input over a designated time period.



Select the input to graph by clicking on the input in the Node. When the graph window opens it will automatically show the last week's data for the single selected input on the graph, or the last dates chosen since the workstation program was launched. Once graphed, data points for average readings are characterized by black circles, high limits as green triangles, low readings as blue squares, and the high and low alarm limits as addition signs. Use the graph window to choose a different start/end date, set the graphical axis limits, show/hide the graphing grid, and change the graph's colors.

Start Date

End Date

Use the date controls to enter an appropriate time period for which the graph will report on. Change the start and end dates as well as the individual times for the graph by entering them in the appropriate boxes or choosing them in the drop-down selection window.

Y Axis Maximum:

Y Axis Minimum:

Enter the appropriate minimum and maximum so that the Y axis on the resulting graph is concentrated on the data to which you want to focus.

Show Points

When selected, individual data points will become noticeable on the graph by way of a circle indicating the reading.

Show Alarm Limits

If a second input has not been added to the graph, the Show Alarm Limits checkbox will be present. When selected, the alarm limits for the already chosen input will show on the graph.

Show Highs and Lows

If selected, the daily highs, lows, and averages will be shown on the graph over the designated time period.

Show X-Grid

Show Y-Grid

The option to show the X and Y axis gridlines can be individually turned on and off by selecting the requisite checkboxes. If a second input has been added to the graph multiple X-axis gridlines will be present, each being drawn in the same color as the input.

Edit Colors

Using the edit colors dialog you can set the colors that you would like to use for the background, alarm limits, Y-axis in the body of the graph (not on the left side of the graph window), X-axis time font, daily highs, average readings, and daily lows. To set a color for an item choose among the preselected options present in the drop-down menu or by going to the extended options, located by pressing Other.

Redraw

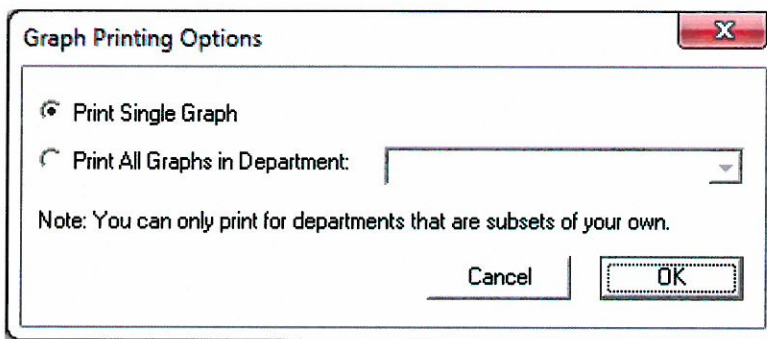
Use the Redraw button to refresh the graph after making changes to the graphing parameters.

Close

Close the currently opened graph window.

Print Preview

When using the print preview button with the Highs, Lows, and Averages Graph you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.



Print Single Graph

If selected only the current input's graph will be previewed.

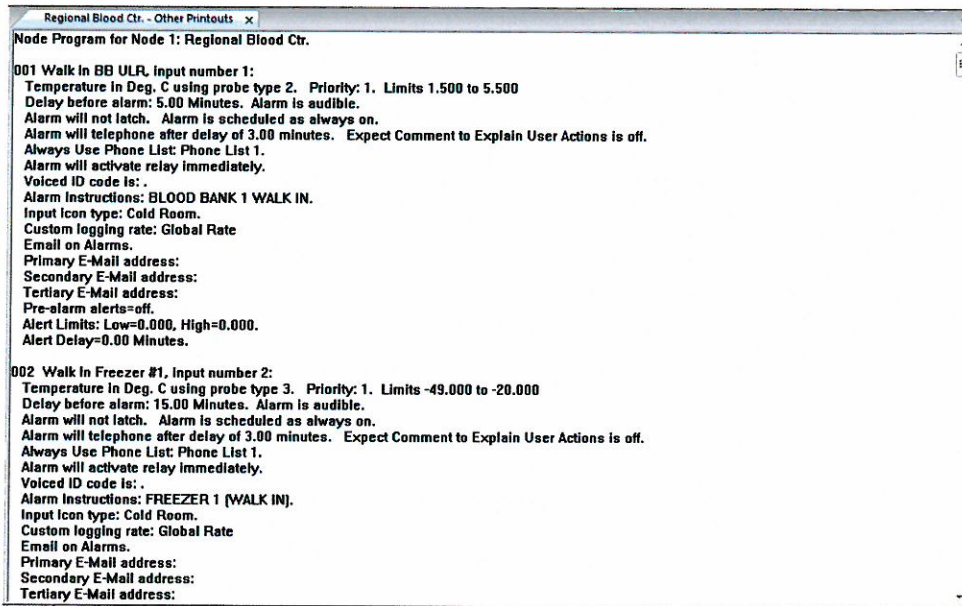
Print All Graphs in Department:

By choosing this option all of the graphs for the selected department will be previewed.

Other

Node Program

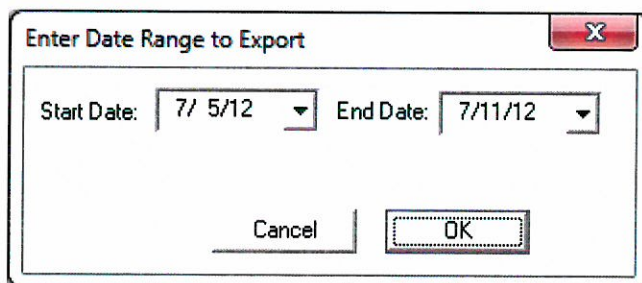
The Node Program report prints out a description of the entire user program for a user's department for the selected node. If a user's access code has All Departments access, then the printout will be the entire Node's program. Keep a copy of this for records.



Print Preview

When using the print preview button with any of the reports listed in Other, the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Export Readings



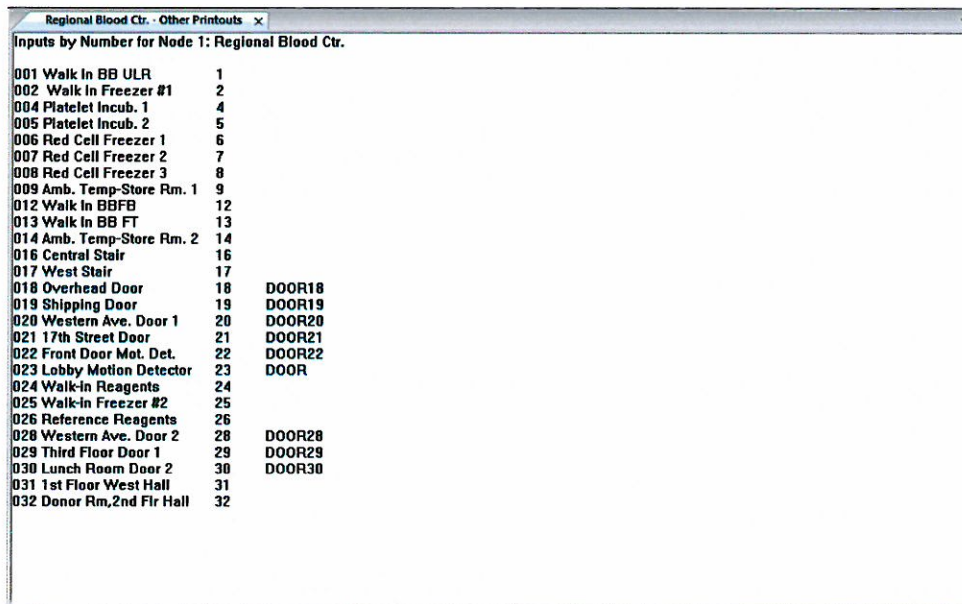
Data history is stored in an encrypted database for security and cannot be altered. This function creates a new unencrypted file (readings.txt) on the hard drive that can be used for reporting purposes. Readings Samples only are exported. When an export file is created, all readings samples for all inputs over a selected date range are exported. Use the export window to select the start and end date for the exported report.

Print Preview

When using the print preview button with any of the reports listed in Other the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Input Names by Number

The Input Names by Number report prints out the Node's input names in numerical order. Keeping this list near the telephone will assist in diagnosis when the system telephones to report an input in alarm. A user's access will determine which inputs are printed.



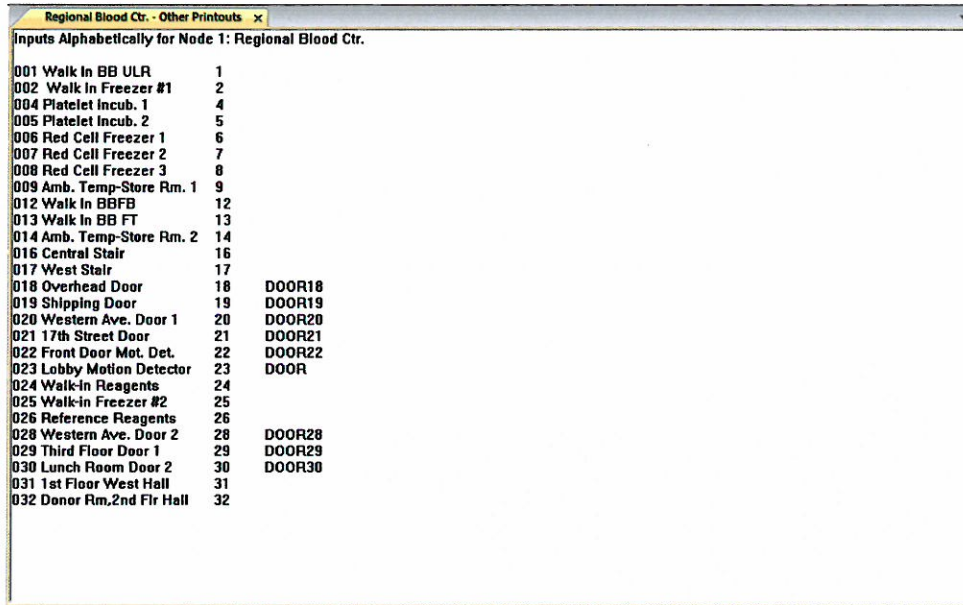
Inputs by Number for Node 1: Regional Blood Ctr.		
001 Walk In BB ULR	1	
002 Walk In Freezer #1	2	
004 Platelet Incub. 1	4	
005 Platelet Incub. 2	5	
006 Red Cell Freezer 1	6	
007 Red Cell Freezer 2	7	
008 Red Cell Freezer 3	8	
009 Amb. Temp-Store Rm. 1	9	
012 Walk In BBFB	12	
013 Walk In BB FT	13	
014 Amb. Temp-Store Rm. 2	14	
016 Central Stair	16	
017 West Stair	17	
018 Overhead Door	18	DOOR18
019 Shipping Door	19	DOOR19
020 Western Ave. Door 1	20	DOOR20
021 17th Street Door	21	DOOR21
022 Front Door Mot. Det.	22	DOOR22
023 Lobby Motion Detector	23	DOOR
024 Walk-In Reagents	24	
025 Walk-In Freezer #2	25	
026 Reference Reagents	26	
028 Western Ave. Door 2	28	DOOR28
029 Third Floor Door 1	29	DOOR29
030 Lunch Room Door 2	30	DOOR30
031 1st Floor West Hall	31	
032 Donor Rm. 2nd Fir Hall	32	

Print Preview

When using the print preview button with any of the reports listed in Other the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Alphabetic Input Names

The Alphabetic Input Names report prints out the Node's input names in alphabetical order, followed by the input number. A user's access will determine which inputs are printed.



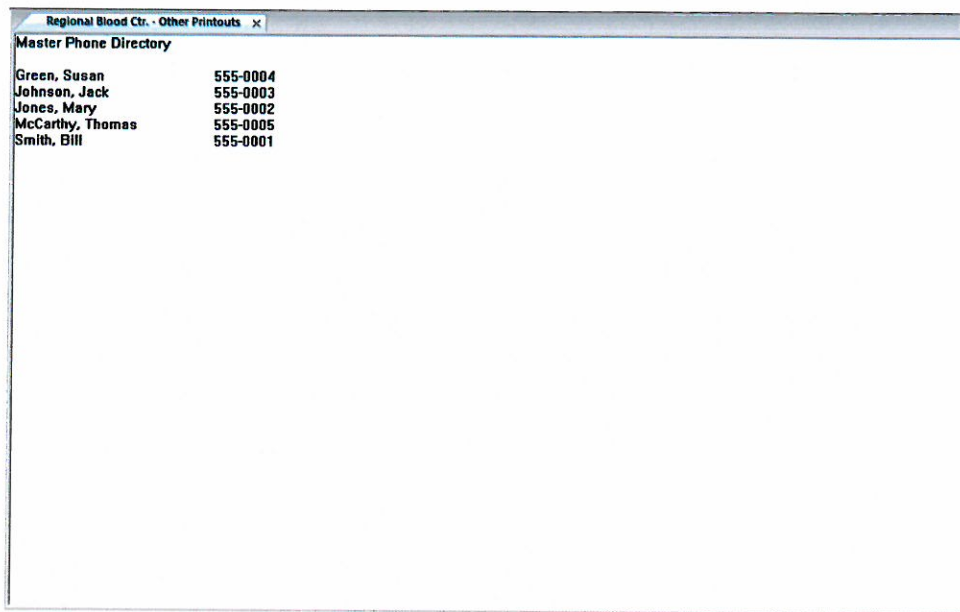
Inputs Alphabetically for Node 1: Regional Blood Ctr.		
001	Walk In BB ULR	1
002	Walk In Freezer #1	2
004	Platelet Incub. 1	4
005	Platelet Incub. 2	5
006	Red Cell Freezer 1	6
007	Red Cell Freezer 2	7
008	Red Cell Freezer 3	8
009	Amb. Temp-Store Rm. 1	9
012	Walk In BBFB	12
013	Walk In BB FT	13
014	Amb. Temp-Store Rm. 2	14
016	Central Stair	16
017	West Stair	17
018	Overhead Door	18 DOOR18
019	Shipping Door	19 DOOR19
020	Western Ave. Door 1	20 DOOR20
021	17th Street Door	21 DOOR21
022	Front Door Mot. Det.	22 DOOR22
023	Lobby Motion Detector	23 DOOR
024	Walk-In Reagents	24
025	Walk-in Freezer #2	25
026	Reference Reagents	26
028	Western Ave. Door 2	28 DOOR28
029	Third Floor Door 1	29 DOOR29
030	Lunch Room Door 2	30 DOOR30
031	1st Floor West Hall	31
032	Donor Rm.2nd Fir Hall	32

Print Preview

When using the print preview button with any of the reports listed in Other the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Master Phone Directory

The Master Phone Directory report prints out all of the names and phone numbers that are in the master telephone directory. Entries will be shown in alphabetical order.



Master Phone Directory	
Green, Susan	555-0004
Johnson, Jack	555-0003
Jones, Mary	555-0002
McCarthy, Thomas	555-0005
Smith, Bill	555-0001

Print Preview

When using the print preview button with any of the reports listed in Other the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Master Access Code Directory

The Master Access Code Directory report prints out all of the security codes and names that are in the master directory. Supervisory permissions are needed to access this function.

Regional Blood Ctr. - Other Printouts x	
Master Security Code Directory	
Appleton, Jane	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Appleton, John	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Brown, Danny	Enabl, Dis1L
Clancy, Lary	Enabl, Dis1L
Cole, Lorna	Enabl, Dis1L
Green, Jack	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Green, Susan	Enabl, Dis1L
Initial Code	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Jackson, George	Enabl, Dis1L
Johnson, Jack	Enabl, Dis1L
Johnson, Mary	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Jones, Bill	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Jones, Mary	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
McCarthy, Susan	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
McCarthy, Thomas	Enabl, Dis1S
Olson, Gina	Enabl, Dis1L
Rand, Chris	Enabl, Dis1L
Rand, Jane	Enabl, Dis1L
Smith, Bill	Enabl, Dis1L
Warner, Cathy	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master, Reset, Super
Warner, John	Enabl, Dis1L, DisML, ProgC, Progl, ProgO, Cals, Apvls, Phons, Master
Wilson, Cathy	Enabl, Dis1L
Wilson, Thomas	Enabl, Dis1S

Print Preview

When using the print preview button with any of the reports listed in Other the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Advanced and Custom Reports

The Advanced and Custom Reports feature contains an array of non-standard reports which enable you to get what would otherwise be extended information from the system. Using the set of preconfigured reports, information can be broken down by events, inputs, departments, or Nodes. Though not always applicable, individual options can be selected even if they are not relevant for the given report.

Advanced and Custom Reports

Calibration Report by Selected Nodes.rpt
 Cardholders by Entry Access Groups.rpt
 Daily Averages by Selected Inputs with Graphs.rpt
 Departments By Node.rpt
 Deviation Analysis + Graphs + Events Selected by Inputs.rpt
 Deviation Analysis + Graphs Selected by Inputs.rpt
 Deviation Analysis Selected by Inputs.rpt
 Events - Global.rpt
 Events by Input by Selected Depts.rpt
 Events by Selected Inputs.rpt
 Events by Selected Nodes + Comments.rpt
 Events by Selected Nodes.rpt
 Graphical Summary Report - All Equipment Types.rpt
 Graphical Summary Report - Ultracolds Only.rpt
 Graphs by Selected Inputs.rpt
 Inputs - Unused by Selected Nodes.rpt
 Inputs by Alarm Insts by Type by Selected Nodes.rpt
 Inputs by Type by Selected Nodes Detail.rpt
 Inputs by Type by Selected Nodes.rpt
 Maintenance Log by Selected Nodes.rpt
 Outputs with Incomplete Conditions.rpt
 Phone Lists By Selected Nodes.rpt
 Readings with Graphs by Selected Inputs.rpt
 Schedules By Selected Nodes.rpt
 Users by Department by Selected Nodes.rpt
 Users on Call Lists to Nodes to Lists to Inputs.rpt
 Weekly Averages by Selected Inputs with Graphs.rpt

Selectors for Events and Readings Reports

Starting: 7/05/12 Through: 7/11/12

☐ Select by Input(s):

001 Walk In BB ULR	1
002 Walk In Freezer #1	2
004 Platelet Incub. 1	4
005 Platelet Incub. 2	5
006 Red Cell Freezer 1	6
007 Red Cell Freezer 2	7
008 Red Cell Freezer 3	8

☐ Select by Dept(s):

Ambient Temperatures
Door Switches
ENVIRONMENT
Incubators
Motion Detectors
PERINTV

☐ Select by Node(s):

Regional Blood Ctr.
Regional Doors

Selectors for Events Reports

☐ Select Events by Type:

All Error Event Types
All Alarm Status Changes
All Alarm Inhibits

☐ Select Events by Status:

Acknowledged
In Alarm
In Alarm Range
In Normal Range
Nobody Home

☐ Select Only Events With Comments
☐ Select Only Events Without Comments
☐ Select Only Events With Investigation Open
☐ Select Only Events with Investigation Open and Not Investigation Closed

Report Title:

Exit Launch Report

Report Selection Window:

Use this window to select the specific report that you would like to generate.

Report Title:

After making a selection this field will auto-populate with the name of the report. Leave the title as is or replace/append it with the name that you would like to attribute to the given report.

Selectors for Events and Readings Reports

Use these choices to select applicable options for the chosen report. Use the shift or ctrl keys to select more than one option at a time. To choose from the available options first enable the checkbox to the left of a given window.

Selectors for Events Reports

Applicable only to reports that include events on the system, use these options to further dial-down a designated report. By clicking on an available button any and all options that meet the criteria of that button will be automatically selected.

Print Preview

Refer to the print preview instructions located under an individual report for complete options.

Print Report

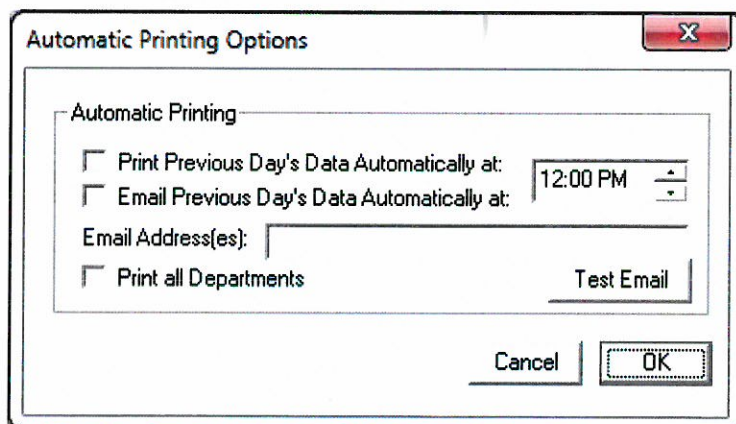
When printing a report you will first be met with a menu that is specific to the document you are trying to print. Refer to the printing instructions located with an individual report for complete options. Once a report is generated you will be met with the Windows Print dialog. Refer to the Print Setup instructions for general print options.

Print Setup

The Page Setup option allows you to choose the printer you would like to use for printing reports. Using the dialog you can set additional options such as the paper size and source, paper orientation, and additional printer options. Refer to your printer's documentation or the Windows help files for questions regarding Print Setup.

Automatic Printing

By using the Automatic Printing options, any available report can be automatically generated for daily review. Generally using the same options that are present when print/print previewing a report, additional options are sometimes present when generating a report.



The image shows a Windows-style dialog box titled "Automatic Printing Options". It contains several controls for setting up automatic printing and email notifications. At the bottom are "Cancel" and "OK" buttons.

Automatic Printing Options	
Automatic Printing	
<input type="checkbox"/> Print Previous Day's Data Automatically at:	12:00 PM
<input type="checkbox"/> Email Previous Day's Data Automatically at:	
Email Address(es):	
<input type="checkbox"/> Print all Departments	Test Email
Cancel OK	

For the Print option to be active, you must first select the report or graph that you wish to have printed out every day.

Print Previous Day's Data Automatically at:

Input the time of day that you would like the report to be generated at.

Email Previous Day's Data Automatically At:

Email Address(es):

To automatically email the report at the selected time choose this option and enter any applicable email addresses in the space provided. Use the *Test Email* button to ensure that the intended recipients do in fact receive the email.

NOTE: The report must be up on screen if it's to be printed. If you choose to have reports automatically printed out each day, and the computer and printer are off-line at that time or the report window was closed, the reports will not print out. To have a report print out automatically, the workstation program must be running, the report window must be on the screen, and the printer must be on. In order to send emails using the system, it must be first setup in *Global Options*.

NOTE: All automatic printouts cover the time period from 12:00 A.M. to 12:00 A.M., even if they are printed out at 4:00 P.M.

Additional Options

When choosing to automatically print a report each document has its own options. The options below may or may not be present in every report.

Include Comments

When selected, any additional comments that were entered into the system will be visible in the final report.

Print/Include all departments

The use of this option enables you to print all input readings for a Node by department. If this option is left unchecked, and the current user is valid in a selected department, the report will only reflect the user's department. By selecting this option departmental readings for the designated time period will be grouped and shown one after another in the report.

Print/Include Program Change Details

If selected, the report will additionally list and detail any program changes that were made to the system.

Print Four Hour Data Automatically

To have the system automatically print out the report every four hours select this option.

Print All Departments

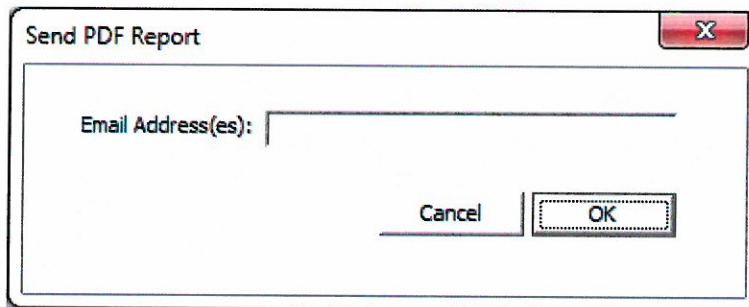
If you would like the report to print all inputs in departments select this box.

Make PDF

To create a pdf document of a report choose this option. Once initiated, the system will first display the standard print/print preview dialog, automatically creating a pdf when you press OK. While a separate pdf creator is not needed to make use of this feature, an applicable viewer must be present to open any such document.

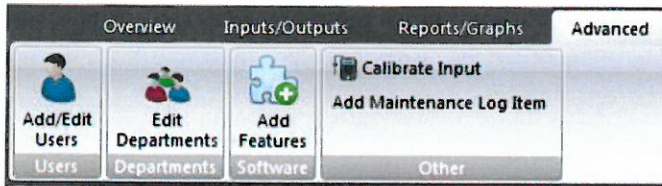
Email PDF





To automatically send reports via email select the Email PDF button. Utilizing either Microsoft Outlook or the system's built-in ability to send email, the system will first display the standard print/print preview dialog. Upon completion, if the system on which you are running has Outlook installed, a new email containing a pdf of the attachment will be created. In the event that the system on which you are running does not have Outlook installed, the software will use its built-in ability to send email and display a window asking you to enter the recipient's email address(es).



NOTE: In order to send emails using the system, it must be first setup in *Global Options*.

Advanced (Environmental Node)



Field	Description
 Add/Edit Users	Add or Edit System Users
 Edit Departments	Select the Inputs that belong to a department
 Add Features	Install new software options
 Calibrate Input	Trim the calibration of a sensor
Maintenance Log	Add a Maintenance Log Item to Event Log

Add/Edit Users

Unless otherwise set, when a user first logs onto the Node, they must enter their access code so that the system recognizes their individual access and permissions levels. By correctly adding and structuring users, individual duties and supervisory functions can be assigned to the correct staff. In order to access the System Access Codes dialog a user must have either *Reset Passwords for Non-Admin Accounts* or *Modify Security Codes and Permissions* privileges. The system will not allow the user to edit or delete their own access code.

Edit System Access Codes

User: Appleton, Jane Add Chng Del

Login: Appleton, Jane

Department: <All Departments> Add

☒ Valid in this Node

☐ Code is locked out

Permissions:

- ☒ Enable Alarms
- ☒ Inhibit Single Alarms for up to: 15 Min.
- ☒ Inhibit Single Alarms for a Long Time
- ☒ Inhibit Multiple Alarms for a Long Time
- ☒ Program the Card Access System
- ☒ Program Environmental System Inputs
- ☒ Program Environmental System Outputs
- ☒ Calibrate Inputs
- ☒ Electronic Data Reviews and Approvals
- ☒ Program Node Phone Lists
- ☒ Program Master Phone List
- ☒ Reset Passwords for Non-Admin Accounts
- ☒ Modify Security Codes and Permissions

Make Valid in All Nodes Cancel OK

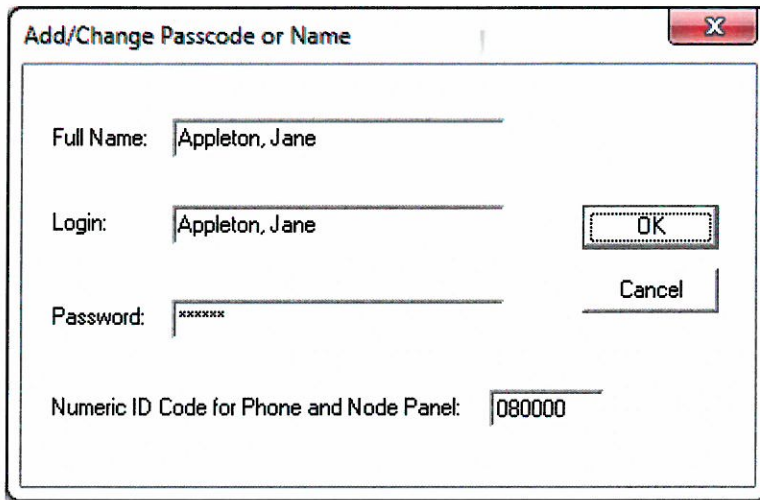
User:

The User field displays the user name that has current context. Use the Add, Chng, and Del buttons to modify the system users.

Add

Chng

Use the Add and Chng buttons to modify the system's users. When you click the Add or Chng buttons the following dialog will appear. If you are adding a new user the fields will appear blank.



Full Name: Appleton, Jane

Login: Appleton, Jane

Password: xxxxxx

Numeric ID Code for Phone and Node Panel: 080000

OK

Cancel

Full Name:

This is the name of the user that will appear in the User box when editing System Access Codes.

Login:

The login name represents how this user will be referenced in the system. This is the name that the user will have to enter when logging into the system and also the name that will appear in system reports.

Password:

The password reflects the credentials that are necessary when logging into the system or signing off on system changes (if required). Password rules are designated in *Global Options*.

Numeric Id Code for Phone and Node Panel:

The Numeric ID Code for a user reflects the credentials used whenever an individual is interrogating the system via phone. Since it is singularly used to identify individuals over the phone this number is unique within the system and must be different for every user.

Del

Delete the selected user from the system

Login:

The current user's login name will displayed here. Unable to be edited in this box, use the Chng button to make any needed changes.

Valid in this Node

Once a name and passcode have been entered, it must be valid in a node. After a name has been added to the system use the Valid in this Node checkbox to make a user valid in a given Node. Once selected all the other options become active.

To remove a name from a specific node, open that node, open "Edit System Access Codes" and uncheck the "Valid in this Node" box. This will remove that person's access to the specific node. The name and permissions will remain on the master directory.

Department:

Setup using either the *Edit Departments* button found on the ribbon bar or the Add button to the right, users can be associated with a given department. Once a department has been created, users can be associated with and only see inputs and outputs grouped to that department. To assign a passcode permission to work with all inputs and outputs, assign the "All Departments" permission. To restrict a passcode to a specific group of inputs, select the group from the list of group names.

Code is locked out

If a user becomes locked out of the system or you wish to lock a user out of the system temporarily, the unchecking/checking of this option will dictate their access to the system. Normally, a user will be locked out of the system if the option is selected in *Global Options* and that user has repeatedly supplied incorrect credentials to the system.

Permissions:

Select an individual's user permissions by checking the box to the left of a given permission level. Click OK to confirm. The choices are:

Enable Alarms

Inhibit Single Alarms for Up to X Minutes

Inhibit Single Alarms for a Long Time

Inhibit Multiple Alarms for a Long Time

Program the Card Access System

Program Environmental System Inputs

Program Environmental System Outputs

Calibrate Inputs

Electronic Data Reviews and Approvals

Program Node Phone Lists

Program Master Phone List

Reset Passwords for Non-Admin Accounts

Modify Security Codes and Permissions

Selecting every item on the menu will give a user all permissions. Any individual who is assigned all permissions levels can make changes throughout the program.

When a user does not maintain the correct permission levels, such as being unable to program an input or inhibit an alarm, login using a username that has supervisory permissions and edit their access code. Examine the master directory to confirm the user's level of permission and if it is valid in the node. Run a test on all newly entered or modified codes to make sure they are functioning as they should.

Make Valid in All Nodes

In a multi-Node system, use this option to assign the selected user with their given permissions in every node.

Edit Departments

Using departments to segment individual inputs and outputs allows you to easily program, inhibit, and assign individualized groups. Once created a whole group of freezers per se can be programmed alike and then assigned to a user whose job it is to only look after that group.

Edit Department/Input Group

Group Name: **1: SECURITY** Add Chng Del

Inputs in group:

Input Name	Address
009 Amb. Temp-Store Rm. 1	9
012 Walk In BBFB	12
013 Walk In BB FT	13
014 Amb. Temp-Store Rm. 2	14
016 Central Stair	16
017 West Stair	17
018 Overhead Door	18
019 Shipping Door	19
020 Western Ave. Door 1	20
021 17th Street Door	21
022 Front Door Mot. Det.	22
023 Lobby Motion Detector	23
024 Walk-in Reagents	24
025 Walk-in Freezer #2	25
026 Reference Reagents	26
028 Western Ave. Door 2	28
029 Third Floor Door 1	29
030 Lunch Room Door 2	30
031 1st Floor West Hall	31
032 Door Rm 2nd Flr Hall	32

Cancel OK

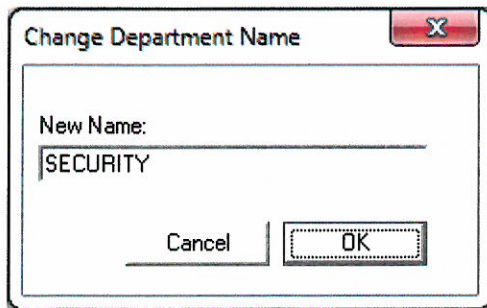
Group Name:

Use this box to select the group that you would like to edit.

Add

Chng

Use the Add and Chng buttons to modify the system's departments. When you click the Add or Chng buttons the following dialog will appear. If you are adding a new department the fields will appear blank.



New Name:

Enter the name of the department you would like to create in this field. Press OK to save your work.

Inputs in group:

Use either one of the boxes to select the inputs that you would like to associate with the chosen department. To disassociate an input with a given group deselect it. As an input is selected in either list it will become selected in the other. The inputs in the list to the left are arranged alphabetically; the list to the right organizes them in numerical order. \

Add Features

Use this screen to add new options to the system. In order to activate an option you must call into Tech Support and supply the code located at the bottom of the window. Once an option is activated on a Node, the system will have to be restarted before the option becomes active.

Calibrate Input

While sensors are created to detect readings only along a certain range, final adjustments or calibrations on the outputs of these sensors may be needed to ensure that the system is correctly reading them. Calibrations of equipment and the probes in these settings are best performed when the environment is stable. As such, and whenever possible, calibration of inputs such as temperature sensors are best performed when immersed in a dampening medium such as liquid glycol or sand. Whenever calibrations are performed adequate time must be allowed for the sensing environment, the sensor connected to the system, and the calibration equipment to equilibrate. It should not be necessary to calibrate thermistor probes more than a degree or so, or thermocouple probes more than a few percent of the difference from ambient. All calibrations will be documented in the running log or can be otherwise viewed in the event database.

Calibrate a Linear Transducer

Calibrate a Linear Transducer
X

This data entry may take place at a time other than the time when calibration was tested. If so the offset calculated will be identical regardless of the time of data entry. However, it is essential that the NIST meter and the Rees system are read at the same time and the data noted for entry into the boxes below.

	Scaling (m) parameter:	Offset (b) parameter:	System Reading
Rees System Reading When Independent Standard Was Read:	20.000	0.000	16.797
Reading of Independent Standard at the Same Time:	20	0.000	16.797

System reading = (Input volts X m) + b

Calculate
Cancel
Calibrate

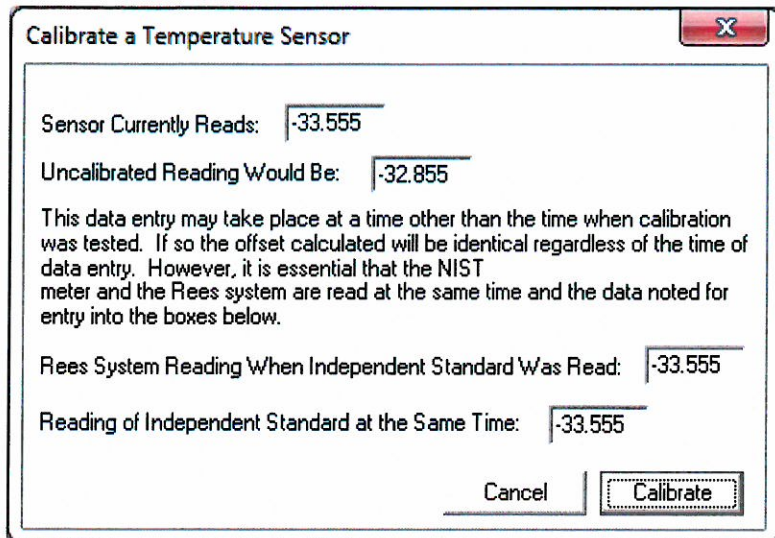
System Reading

This is the value the system was reading at the time the actual calibration was done. DO NOT enter data in this box unless the data is being entered into the computer at a time later than the calibration was actually done. The calibration offset will automatically be calculated.

Reading of Independent Standard at the Same Time:

When calibrating a linear transducer enter the reading of the calibration device in the System Reading box where it intersects the Reading of Independent Standard at the Same Time field. Once entered, press the Calculate button to generate an offset for the input. Press Calibrate to automatically place the Scaling and Offset parameters into the input's programming parameters. If you are taking the calibration readings for input at a later time, enter both the reading from the system and the reading of the calibration device in the appropriate boxes and then press Calculate.

Calibrate a Temperature Sensor



Calibrate a Temperature Sensor

Sensor Currently Reads:

Uncalibrated Reading Would Be:

This data entry may take place at a time other than the time when calibration was tested. If so the offset calculated will be identical regardless of the time of data entry. However, it is essential that the NIST meter and the Rees system are read at the same time and the data noted for entry into the boxes below.

Rees System Reading When Independent Standard Was Read:

Reading of Independent Standard at the Same Time:

Reading of Independent Standard at the Same Time:

When calibrating a linear transducer enter the reading of the calibration device in the Reading of Independent Standard at the Same Time field. Once entered, press the Calibrate button to automatically change the reading parameters for the input. If you are taking the calibration readings for input at a later time, enter both the reading from the system and the reading of the calibration device in the appropriate boxes and then press Calibrate.

Add Maintenance Log Item

Use the Maintenance log to keep track of events that the system does not automatically track. Enter items such as a freezer breaking down, movement of probes, and other system changes that in the future can or would be questioned and might require explanation.

Add/Edit a Comment

Description

- ☒ 7/ 5/12 - 11:51 AM
- ☒ Regional Blood Ctr.
- ☒ Maintenance

☐ Investigation Open ☐ Investigation Closed

Cancel OK

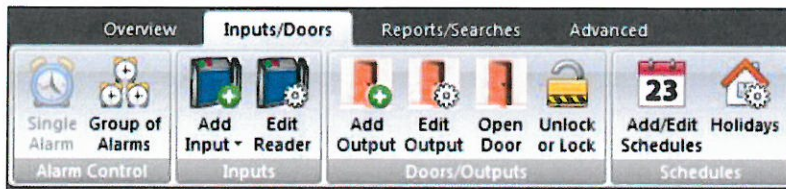
Description






The upper window (description window) reflects what time the notes will be entered at, for what location (Node name), and the fact that it is a maintenance item being added.

Comment Window

The comment window is a repository for any items you wish to enter. Once open, comments can be added to further clarify a change to the system. Once a comment has been added it becomes read-only and is electronically signed and dated. Additional comments can be added to an event at any time.

Inputs/Doors (Card Access Node)



Field	Description
 Single Alarm	Handle alarm for specific inputs.
 Group of Alarms	Inhibit or reset multiple alarms.
 Add Input	Submenu container which houses the following functions: <div> <p>-Add Reader Add a new reader to the system.</p> <p>-Add Input Add an Input to the system.</p> </div>
 Edit Reader	Program the selected input, reader, or relay.
 Add Output	Add an output to the system.



[Edit
Output](#)

Program the selected output.



[Open Door](#)

Open a door or auxiliary relay.



[Unlock or
Lock](#)

Set or release a relay override on an output.



[Add/Edit
Schedules](#)

Edit a Node's Schedule.



[Holidays](#)

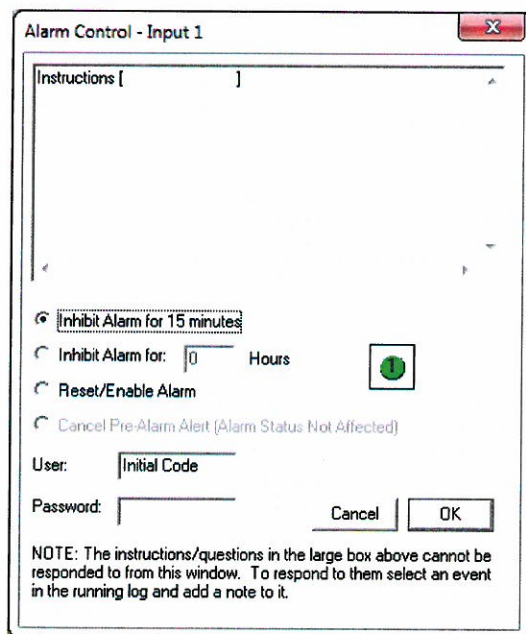
Program a holiday into the system.

Single Alarm

When an input goes into alarm one can bring up the alarm parameters window in a few ways:

- Double clicking the selected input.
- Right-clicking the selected input and choosing the Manage Alarm option.
- By selecting it on the toolbar.

The Alarm Control box will show the alarm handling instructions for a particular input and allow the inhibiting or reset/enabling of the input in question. By using the menu, a user with the appropriate access code permission levels can follow the instructions programmed in the Alarm Control box and inhibit or reset/enable an input. The system will no longer act upon inhibited inputs and any such inputs will be automatically activated once the inhibit period has ended. **Note, the system will not allow you to manually type in a response to the alarm handling instructions from the alarm menu.** After adjudicating a given input's alarm, the comments for that alarm will be regenerated and must be commented on within the Running Log.



Instructions List (Instructions []):

If an input has been preprogrammed to use an instruction list it will appear here. **Note, the instructions list box is read-only, in order to comment on the list one must select the generated event in the Running Log.** Refer to the *Alarm Checklist* to create a new instruction set.

Inhibit Alarm for 15 minutes:

This will inhibit the selected input for a period of 15 minutes.

Inhibit Alarm for:

Inhibit an input for a custom time period of up to 9999 hours.

Reset/Enable Alarm:

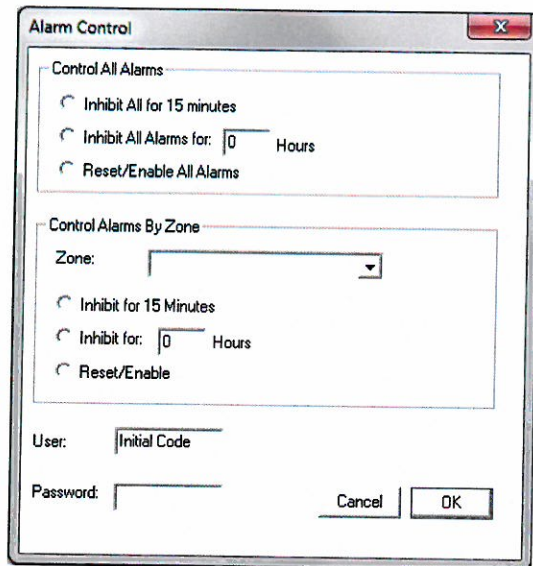
This function allows you to bring an inhibited input back on-line immediately. In addition, it allows you to reset a latched alarm, acknowledge a non-latching event, or verify a “nobody home” condition.

User/Password:

User credentials used to certify and track how an alarm is dealt with. This is a required field.

Group of Alarms

Similar in aspect to the *Single Alarm* dialog window the Group of Alarms Alarm Control window enables you to deal with a batch of alarms at once. The department selection boxes enable you to select all inputs within a preconfigured department. Department groups can be set up using *Edit Departments*.



Inhibit All for 15 minutes:

When chosen all existing system alarms will be inhibited for 15 minutes.

Inhibit All Alarms for:

Inhibit all inputs for a custom time period of up to 9999 hours.

Reset/Enable All Alarms:

This function allows you to bring all inhibited inputs back on-line immediately. In addition, it allows you to reset any latched alarms, acknowledge all non-latching events, and verify a "nobody home" condition.

Department:

Select a preconfigured department of inputs. Departments can be setup using the *Edit Departments* function of the software.

Inhibit for 15 minutes:

When chosen, all existing system alarms that are within the selected department will be inhibited for 15 minutes.

Inhibit for:

Inhibit all department inputs for a custom time period of up to 9999 hours.

Reset/Enable:

This function allows you to bring all inhibited inputs within the selected department back on-line immediately. In addition, it allows you to reset any latched alarms, acknowledge all non-latching events, and verify a “nobody home” condition within that group.

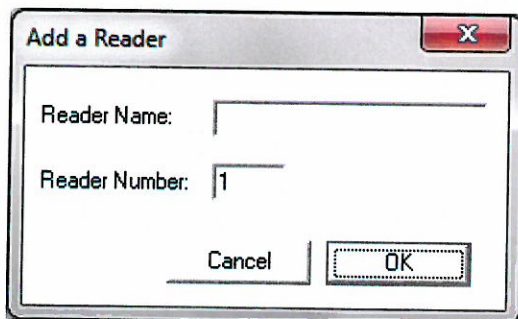
User/Password:

User credentials used to certify and track how an alarm is dealt with. This is a required field.

Add Input

Add Reader

Use the Add Input window to add new inputs to the system.



The image shows a standard Windows-style dialog box titled "Add a Reader". It has a close button (X) in the top right corner. Inside the dialog, there are two labeled input fields: "Reader Name:" followed by a text entry box, and "Reader Number:" followed by a text entry box containing the digit "1". At the bottom of the dialog, there are two buttons: "Cancel" and "OK".

Reader Name:

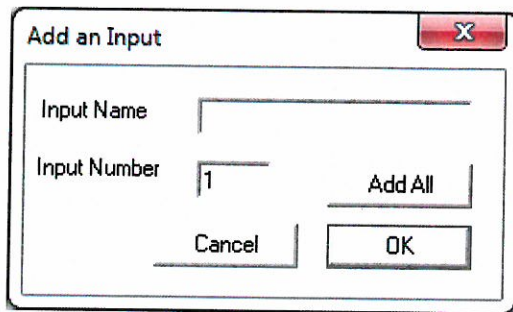
The reader name is the designation that you would like to attribute to the entered reader.

Reader Number:

The reader number represents the number of the input that you would like to add to the system. Inputs do not have to be added in numerical order.

Add Input

Use the Add Input window to add new inputs to the system.



The screenshot shows a standard Windows-style dialog box titled "Add an Input". It features a close button (X) in the top right corner. The main area contains two text input fields. The first field is labeled "Input Name" and is currently empty. The second field is labeled "Input Number" and contains the number "1". To the right of the "Input Number" field is a button labeled "Add All". Below the "Input Number" field are two buttons: "Cancel" on the left and "OK" on the right.

Input Name:

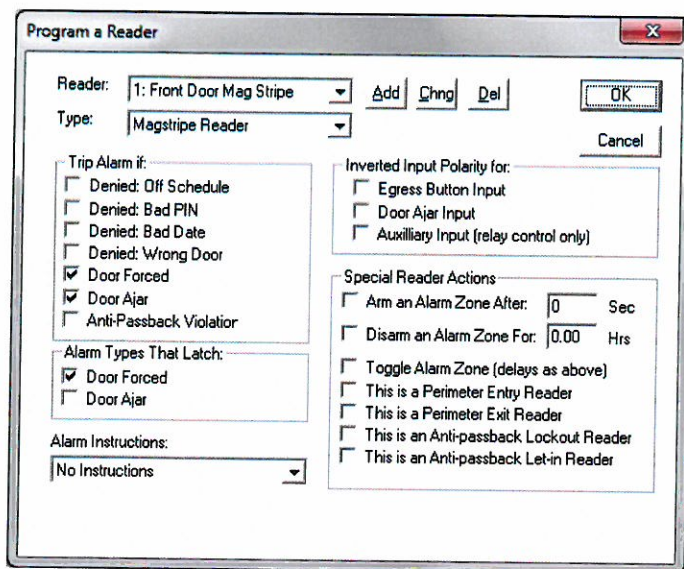
The name that you would like to attribute to the entered input number.

Input Number:

The input number represents the number of the input that you would like to add to the system. Valid input numbers are between 1 and 128. Inputs do not have to be added in numerical order.

Edit Reader

Each door in the access control system will have an associated card reader. This is the device that mounts near the door to be controlled, and will allow access through the door. The system supports various types of readers.



Program the reader by selecting the reader icon that was just added (if it isn't already highlighted), then clicking on Program a Selected Input/Output/Camera in the Program Menu. The dialog box below will appear.

NOTE: There is no separate menu item to allow you to delete a card reader. This is done from the Program Menu, by selecting the Delete button after the name of the card reader has been chosen.

Click on the down arrow to see a list of all the reader names currently programmed in the system. Then click on the one you want to program. If the name does not appear on the list, use the Add button to put it on the list.

Add / Change / Delete Reader Name

These three buttons allow you to manipulate the currently defined reader names. To add a new input, press the Add button. To change the name of any input, just select that input from the list and then press the Chng button. If you want to delete an input, press the Del button. You will be asked if you really want to delete that input. Each change you make will be documented in the program change log.

Reader Type

This is where you select the type of reader that is attached to the reader controller in the selected reader position. Select the type from the drop down list that appears when you press the down facing arrow.

Trip Alarm if :

There are 7 sources that could be used to trigger an alarm event. Decide here just which of these conditions you want to trigger an alarm. Access will be denied if:

A person is Off Schedule (not scheduled to be entering at that time)

A person enters a Bad PIN number

The date is one for which a person's card is not valid (a weekend, after school year, etc.)

A person is at a wrong door (one that a person is not scheduled to use)

Do you want an alarm to trip if any of these conditions occur?

The door is forced (opened without swiping a valid card)

The door is ajar (left open longer than the programmed entrance time)

The auxiliary input is tripped

Make your selection here. You may choose more than one source; usually "door ajar" and "door forced" would be checked.

Alarm Types that Latch

Alarm types can be latching or non-latching. With non-latching alarms, the alarm will cease when conditions return to normal. For example, if a door is held open causing a door ajar alarm, when the door is closed, the alarm will reset.

Security alarms should be programmed as latching. With a latching alarm, even when the original alarm condition is corrected, the alarm remains on. For example, if a door that must remain closed is forced open, and is subsequently closed, the alarm will remain on even after the door is closed.

Select the items you want to be latching alarms: Door Forced, Door Ajar, or Aux (Auxiliary) Input Tripped.

Alarm Instructions

This is where you select the alarm instructions that will appear in the alarm control box when you are handling an alarm. Choose the proper list from the drop down box. If the list of instructions you require does not currently exist, you must exit this dialog box and select Alarm Instruction Programming from the Program Menu. In the Alarm Instruction Programming function you can list the instructions you want followed or ask a series of questions to be answered after the alarm is resolved. Each set of questions/instructions is then given a specific name. The system can have up to 20 sets of instructions.

Inverted Polarity For:

The system accepts either high or low inputs to trigger an action. This item allows you to switch the polarity of the various inputs to accommodate normally closed switches such as egress buttons and door ajar inputs.

Egress Button Input:

This is normally high and goes to low when it is pressed, to allow the door to open. Whether or not you need to change the polarity depends on the requirement of your particular hardware.

Door Ajar:

This is normally low when the door is closed. If the door opens, it changes to high. If you want an alarm if the door is left ajar, you would program the input to alarm when high.

Auxiliary Input:

This input can be used to trip a relay by selecting that option when programming the relay. Normally, the relay will trip (pulse on) when the auxiliary input goes from high to low. Selecting inverted polarity for the input will cause the relay to trip when the auxiliary input goes from low to high.

Special Reader Actions

Arm an Alarm Zone After:

This option allows a user to turn on an alarm zone (i.e. all perimeter alarms, etc.) after a user defined delay. This option is usually used on a perimeter exit reader to cause after-hours users to automatically reactivate the alarm as they leave. If a “Zone Alarm Loop” indicator relay is used to activate an LED in the exit area, then the LED will blink during the activation delay, then stay on when the alarm zone becomes armed.

Disarm an Alarm Zone For:

This option allows a user to turn OFF an alarm zone (i.e. all perimeter alarms, etc.) for a user defined time period. That way, a cardholder entering an area controlled by a zone will disable or inhibit all alarms in that area. This is generally used on a perimeter entry reader to inactivate the alarm group when an after-hours worker enters the building. This is useful so that alarms (PIRs, etc.) are not set off as the cardholder moves through the alarm zone area.

Toggle Alarm Zone

This option allows a user to turn off or turn on an alarm zone depending on its current status (i.e. an armed zone will be inhibited or an inhibited zone will be armed.) This option is usually used for an alarm control panel reader. Such a panel will have a loop indicating LED turned on by a “Zone Loop Indicator” relay, an armed indicator LED turned on by a “Zone Armed Indicator” relay and a card reader programmed to “toggle” the alarm zone. The user, leaving or entering a facility, will run his or her card through the reader to toggle the alarm zone on or off depending on its current status as indicated by the LEDs.

Perimeter Entry Reader

This defines a reader for security as well as time and attendance purposes. A perimeter entry reader will “clock” the entry of cardholders as they swipe their cards at this reader.

Perimeter Exit Reader

This defines a reader for security as well as time and attendance purposes. A perimeter exit reader will “clock” the egress of cardholders as they swipe their cards at this reader. Cardholders will also no longer appear on the “Who’s Here” list. This option provides verification of who has exited the building to prevent passback violations.

Anti-Passback

This term refers to restricted access on entrance and exit. An anti-passback door would have a card reader/keypad on both sides of the door. This would limit a reader controller to operating only 2 doors, since each door would have two card reader inputs, making a total of 4 inputs.

Anti-Passback Lockout Reader

This enables a reader to signal to a door to deny entrance to a cardholder if the card that they have used for attempted entry access is already detected on the system. The event is logged and access is denied. This provides true passback protection for total facility security.

Anti-Passback Let-In Reader

This enables a reader to signal to a door to allow entrance to a cardholder even though the card that they have used is already detected on the system. The anti-passback violation will be logged and an alarm will be triggered. The access granted event will also be logged on the system and the door will allow access to the cardholder.

Add Output

Use this option to define an output on the system. The output can be a door relay or auxiliary relay. The quad (4 door) reader controller has 4 door relays *and* 4 auxiliary relays. The dual (2 door) reader controller has 2 door relays *and* 2 auxiliary relays. The relay is shown on the floor plan as a blue square when the output is ON and a blue diamond when the output is OFF. Once an output has been added to the system, it must be programmed.

Relay Name

Enter a name for the relay up to 25 characters in length. The name should describe the physical location or action the relay will perform. This name will appear on the drop down list in the programming dialog box.

Relay Position Number

The system will enter the next available relay number in this box. If this is not the number of the relay you want to add, highlight the existing number and replace it.

The relay number depends on the physical location of the relay with respect to the reader controller to which it is attached. The program assigns 4 relay positions for each reader controller (even if the reader controller is a two door model). Use the following formula to determine the proper relay number: $(\text{Reader Controller Number (0 to 15)} \times 4) + \text{Door Position on Reader Controller (1 to 4)}$. For instance, you are adding door relay number 1 on reader controller number 2; the relay number would be: $(2 \times 4) + 1 = 9$.

Relay Types

You can choose two different relay types: a door relay or an auxiliary relay. The reader controller will support one of each of these outputs for each reader input. Although the programming of the system is flexible enough to allow you to activate either relay with the same triggering events, the door relay is usually used to open the door, and the auxiliary relay is used to control some other external function.

Door Relay Definition

Each door in the access control system will have an associated door lock. This is the device that will prevent access through the door by keeping it closed electrically. The reader controller will enable or disable the locking device depending upon its programming.

Auxiliary Relay

An auxiliary relay usually controls some other external event than the door lock (see: Door Relay). The auxiliary relay can be used for alarm output, to control scheduled events, or to provide logic functions for whatever might need to be controlled.

Add a Door Relay

Each door in the access control system will have an associated door lock. This is the device that will prevent access through the door by keeping it closed electrically. The reader controller will enable or disable the locking device depending upon its programming.

In order for each node to recognize that a lock exists, the following steps must be taken to add the door relay to the node:

Program the relay by selecting the icon that was just added (if it isn't already highlighted), then clicking on Program a Selected Input/Output/Camera in the Program Menu.

There are two styles of door locks available from Rees Scientific, Maglocks, and Electric Strikes.

Maglocks

Maglocks are the most versatile. The standard lock supports up to 1200 pounds of force, and may be mounted on any type of door or gate that closes against a fixed stop. The maglock consists of an electromagnet that mounts on the fixed frame, and a strike plate that mounts on the moving door. The door is locked when power is applied, and the door opens when power is removed.

The lock provides a two wire status signal (dry contact closure) that indicates when the door is secure. This is connected to the door switch closure input (DA) on the reader controller. The other

two wires on the maglock are connected to the 24 volt DC power supply controlled by the reader controller. It draws only 3 watts of power.

Electric Strikes

Using an electric strike is much more difficult than using a maglock from a logistical standpoint. Their installation has to be coordinated much more closely with the existing door hardware and frame. It is also more critical that the alignment is correct for proper operation.

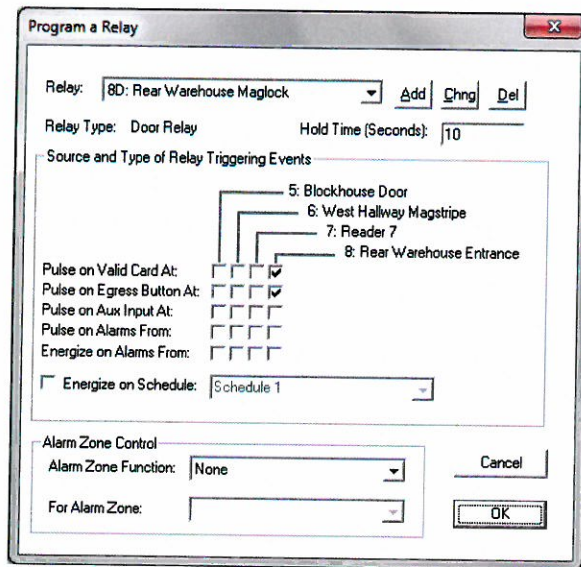
You must first decide if you require a 'fail-safe' or 'fail-secure' strike. When power is removed from a fail-safe strike, there is free egress in and out of the building. A fail-secure strike locks the doors when power is removed.

NOTE: Fail-secure strikes may require alternate means of access during a fire to meet local fire codes.

The door switch is built into the strike which will monitor the latchbolt. This dry contact switch is wired into the DA input of the reader controller. The other two wires on the strike are connected to the 24 volt DC power supply controlled by the reader controller. The solenoid draws 16 Watts inrush and 6 Watts seated.

Edit Output

You must select the input, output or camera you want to program in order to open the "Program Selected Input/Output/Camera" dialog box. If you have selected an output (relay), the Program a Relay dialog box will appear.



Relay Name

Click on the down arrow to see a list of all the relay names currently programmed in the system. Then click on the one you want to program. If the name does not appear on the list, use the Add button to put it on the list.

Relay Number

The relay number depends on the physical location of the relay with respect to the reader controller to which it is attached. The program assigns 4 relay positions for each reader controller (even if the reader controller is a two door model). Use the following formula to determine the proper relay number: (Reader Controller Number (0 to 15) x 4) + Door Position on Reader Controller (1 to 4). For instance, you are adding door relay number 1 on reader controller number 2; the relay number would be: $(2 \times 4) + 1 = 9$.

Add / Change / Delete a Relay Name

These three buttons allow you to manipulate the currently defined relay names. To add a new output, press the add button. To change the name of any output, just select that output from the list and then press the change (Chng) button. If you want to delete an output, press the delete (Del) button. You will be asked if you really want to delete that output. Each change you make will be documented in the program change log.

Relay Type

You can choose two different relay types: a Door Relay or an Auxiliary Relay. The reader controller will support one of each of these outputs for each input (reader). Although the programming of the system is flexible enough to allow you to activate either relay with the same triggering events, the Door Relay is usually used to open the door and the Auxiliary Relay is used to control some other external event. This is defined when you Add a Relay Output.

Hold Time:

This is the amount of time (in seconds) that the relay will remain energized. The default is 30 seconds, which will allow enough time for a person to swipe his card and get through the door, but not long enough to allow a second person access to the door after the first person has gone through. This time is also used to determine how long the door remains open before a Door Ajar alarm is generated. The Door Ajar alarm will be activated 30 seconds *after* the hold time.

If an independent door switch (not the one in a Maglock) is being used to determine when the door is opened or closed, the relay will automatically de-energize when the door is closed, it will *not* remain open for the complete hold time. This switch should be wired into the Door Ajar (DA) input of the reader controller.

Relay Source

Each reader controller can have up to 4 readers that will act as the source for an action which will trigger an output relay. The names (and the associated numbers) of these readers will appear across the top of the programming grid. A check mark in the grid will connect the reader to the trigger event. You can have multiple readers triggering one relay and you can have multiple events affect one reader.

Relay Trigger Event

There are 5 events that can be programmed to activate each relay: "Pulsing" a relay will allow doors or auxiliary relays that are normally scheduled to be locked to be opened momentarily for a number of reasons. A variety of events can be used to trip a door lock or auxiliary relay so it will momentarily open.

Pulse on Valid Card At:

This will pulse the relay on for the specified hold time when a valid card number has been used at the specified reader. (For example, a valid card is run through the swipe reader next to the door and the door unlocks to allow entry.)

Pulse on Egress Button At:

This will pulse the relay on for the specified hold time when the Egress button associated with the specified reader has been pressed. (For example, a person in the building pushes a button next to the door to leave the building— no card swipe is required.)

Pulse on Aux Input At:

This will pulse the relay on for the specified hold time when the Auxiliary Input associated with the specified Reader has been activated. (For example, a receptionist or guard "buzzes in" a visitor.)

Pulse on Alarms From:

This will pulse the relay on for the specified hold time when an alarm associated with the specified reader has been activated. (EXAMPLE: an alarm is triggered which causes the door to remain unlocked for a specified hold time.)

Energize on Alarms From:

This will turn on the relay when an alarm associated with the specified reader has been activated. It will remain energized until the alarm has been cleared. (For example, an alarm is triggered at a reader which then causes the door to lock until the alarm event has been addressed and cleared.)

Relay Programming Matrix

This Programming Matrix is a series of checkboxes that link the trigger events along the left side to the Source Readers along the top. When a check mark is placed in the box (by clicking once on the box) the event in the row will be linked to the reader in the column.

NOTE: This programming is limited to a single reader controller. For instance, you cannot pulse a relay on reader controller 1 from a reader on reader controller 2.

Energize on Schedule

When this box is checked, the relay will turn on whenever the specified schedule is active. The schedule name must be selected from the drop down list. If the schedule is not on the current list of names, you need to cancel this dialog box, and select schedule programming first.

Alarm Zone Control Functions

To better understand this programming option in Program a Relay, it is important to understand what an alarm zone is. A group of alarm inputs and/or a group of readers are combined to create an “alarm zone.” Then, for instance, if any input in a particular area goes into alarm, the alarm zone in that area will go into alarm and appropriate action such as sounding an alarm siren or dialing the alarm service will occur.

Alarm Zone Control in ‘Program a Relay’ allows you to program a relay to indicate the alarm status of the zone and switch external devices on or off depending on that status.

A relay programmed as a “Zone Loop Indicator” output will show if all of the sensors in the zone are currently indicating a normal condition. This indicates that the alarm zone is ready to be armed. This is usually used to activate an LED on an alarm annunciator panel.

A “Pending Alarm Indicator” will show if any of the sensors in the zone have been tripped and are waiting out the alarm delay before going into alarm.

An “Alarm Output Relay” turns on when any sensor in the zone goes into alarm. This can be used to activate sirens and/or to activate a dialer to dial the alarm service or to activate a voice dialing system such as the one in the Series II environmental system.

A “Zone Armed Indicator” will indicate whether an alarm zone is armed. An alarm zone may be scheduled to “arm” after regular working hours, for example, and to automatically “disarm” between

the regular working hours of 8:30 AM and 5:00 PM. When a reader is used to activate an alarm zone after a delay, the “Zone Armed Indicator” for that zone will blink until the zone arms, then it will stay on. The “Zone Armed Indicator” is an LED on the alarm annunciator panel that is activated when the reader is swiped. .

A “Zone Arming Indicator” is a separate LED that will indicate when an alarm zone is about to be armed. If you program a reader to activate an alarm zone after a delay, a relay programmed as a zone arming indicator will turn on during the delay, and will turn off when the alarm zone activates

If you wish the “Zone Arming Indicator” to blink during the arming delay period, select “Blinking Arming Indicator”.

Once the function of the relay has been determined, the Alarm Zone (previously programmed in Alarm Zone Programming) for which it functions needs to be chosen. For example: the Alarm Zone Function may be as “Loop Indicator” for the user programmed zone “Perimeter Alarm Zone.”

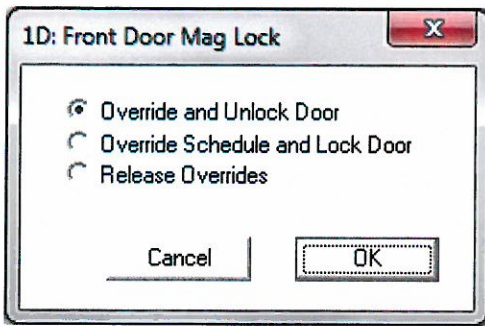
Open Door

Doors that are normally scheduled to be locked may need to be opened for various reasons. A variety of events can be used to trip a door lock relay so it will momentarily open. This can be done with a mechanical switch, or directly through the computer using this option.

You must select the output you want to turn on by first clicking on the icon in the node window. The relay will turn on for the amount of time programmed under Hold Time for the selected output. This can be used by a receptionist or guard to “buzz in” a visitor.

Unlock or Lock

Doors are normally locked in an Access Control System, but they can be programmed to be open on a set schedule. The front door of a building may be open during normal business hours, for instance. However, there are times when you want the door to remain locked even if it is scheduled to be open, or vice versa. In order to do this you can use the Unlock or Lock option to override the programmed settings.



You must first select the output you want to override by clicking on an applicable icon in the Node window.

Override and Unlock Door

Overrides the current schedule and unlocks the door. The door will remain unlocked until you release the override.

Override Schedule and Lock Door

Override the current schedule and locks the door. The door will remain unlocked until you release the override.

Release Overrides

Releases any overrides. This returns the door back to its normal state.

Add/Edit Schedules

Create different schedules by which inputs/users can be validated against using the Add/Edit Schedules option. Name the different schedules and then set up the times and days of the week when the alarms are ON and OFF for each named schedule. All schedules are “continuously on” until they are named and a schedule is programmed. All inputs are also “continuously on” until they are assigned to a specific schedule. Alarms are turned off (inhibited) during an alarm's programmed OFF times.

Schedules can be attached to output relays and access groups in the access control system and inputs or outputs in the environmental system.

Schedules are Node type specific. The schedules you program for the Access Control Node will not be valid in Environmental Nodes.

On at:	Off at:	On at:	Off at:	On at:	Off at:	On at:	Off at:
12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM
<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo	<input type="checkbox"/> Mo
<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu	<input type="checkbox"/> Tu
<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We	<input type="checkbox"/> We
<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th	<input type="checkbox"/> Th
<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr	<input type="checkbox"/> Fr
<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa	<input type="checkbox"/> Sa
<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su	<input type="checkbox"/> Su
<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho	<input type="checkbox"/> Ho

Add / Program Schedules

Schedules are the specific times that users have access to certain reader groups. A schedule can also be associated with a specific door, to enable it to automatically lock & unlock at various times of the day.

Schedules are assigned names to identify them. For instance, a schedule called “Working Hours” could be set up as 9:00 AM to 5:00 PM, Monday through Friday.

You also enter dates that the unit will recognize as Holidays. You can enter up to 32 dates. These may be used on the schedules by checking the [Ho] box.

Creating and Using Schedules

Schedules are a flexible method for activating a certain event, based on the time of day, and/or day of the week. They are used with inputs to determine the active monitoring time, and with relays/outputs to determine when an output is turned on or off. When a schedule is active, reader/input monitoring will take place. When the schedule is inactive, the alarms for that particular input will be inhibited.

In the Access Control system, the schedule can only be applied to an output relay. When the schedule is on, the relay is energized, and vice versa. The system is normally wired so that when the relay is energized (schedule is on) the door is open.

Active Schedule

A schedule is ACTIVE when the current time falls between the ON time and OFF time for the particular day as programmed. For instance, a schedule is programmed to turn on at 8:00AM, Monday through Friday and OFF at 5:00PM, Monday through Friday. It also has an additional ON time of 12:00PM on Saturday and an additional OFF time of 6:00PM on Saturday. The following chart shows the status of a reader/input at various times and days.

If the current Time/Day is: Status

4:00AM - Monday	Off
11:00AM - Wednesday	On
6:00PM - Friday	Off
3:00PM – Saturday	On

Edit a Schedule

The following Screen allows you to completely edit any of the 8 schedules. You can add new schedules or modify existing ones.

NOTE: The On = Alarm active / Normal phone list active and Off = Alarm inhibited / Alternate phone list active note at the bottom of the dialog box applies to Environmental Systems Only. It is not present on the Access Control Dialog.

Add / Delete / Change Keys

These keys allow you to add a new schedule, delete an existing schedule, or change the name of a schedule. When you press the Add button a New Name window opens. Enter the new name and then program the new schedule.

Inputs attached to the schedule that you want to delete will revert to 'always on' after the schedule has been deleted.

Schedule ON Time

You may select to program your time periods with either 12 hour or 24 hour (military time) formats. This choice is made in Global Options.

You can have up to 4 on / off time groups for each schedule. After you have entered the “turn on” time in the 00:00 AM or 00:00 PM format, you indicate the days that schedule will be active by clicking on the box next to the day's name. An X will appear in the box.

When a scheduled alarm is ON its alarm is active.

Schedule OFF Time

Once you have turned on a schedule, you have to turn it off. You must turn off each of the 4 Off/On time groups that you have turned on. Do this by entering the Off time, in 00:00 AM or 00:00 PM format. Indicate on which days the schedule will go off at that time by clicking on the day's name box.

Scheduling Holiday On & Off Times

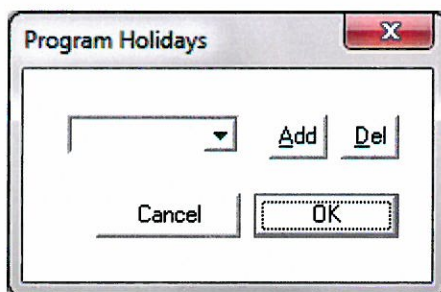
You can set different on and off times for holidays if you wish. These schedules will activate whenever there is a holiday. Click on the Add button and type the date of the holiday. Use the mm/dd/yy format. Keep adding dates, one at a time, until all holiday dates are entered. You can delete any date by high-lighting the date and pressing Delete. All of your holiday schedules will become active on these dates.

Days of the Week

When setting up a schedule, enter the times when the schedule will be ON and OFF. Under each time entry is a list of the days of the week plus the letters Ho for holiday. Select which days this on/off time is to be active.

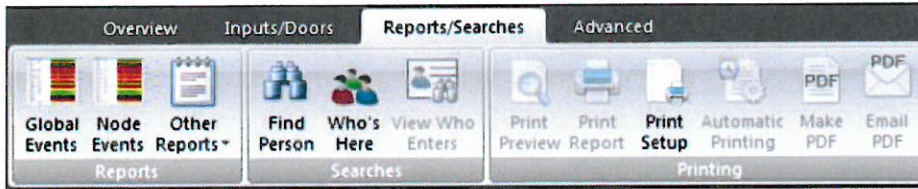
Holidays




This function allows you to have alarms, outputs, or schedule checking inputs be treated differently on holidays. Holiday data is stored in the Node. Enter holiday dates in the mm/dd/yy format (dd-mm-yy if the European date option is on). The dates you enter onto this list will be applied to schedules when you select holiday as an active day. You may have up to 20 holiday exceptions.



Click on the Add button and enter the date of any new holiday. To delete a holiday, select it and click Delete. You will see a confirmation message asking if you are sure you want to remove this date. Holiday dates are programmed globally for all nodes on the access control system. All nodes must be open during holiday date programming.

Reports Searches (Card Access Node)



Field	Description
 Global Events	Generate a report detailing global events on the system.
 Node Events	Create an events report using selectable options, detailing events on the system.
 Other Reports	<p>Submenu container which houses the following functions:</p> <div> <p>-Time and Attendance Generate a time and attendance report.</p> <p>-Program Printout Create a complete program printout</p> <p>-Input/Elevator Program Print input parameters, security zones, floor groups, and floor access groups.</p> <p>-Cardholder Database Print the cardholder database</p> <p>-System Users List the system's Access Codes.</p> <p>-Advanced and Custom Reports Brings up the advanced reporting menu.</p> </div>



[Find
Person](#)

Find the last time a person entered.



[Who's
Here](#)

Show a list of people in the building.



[View Who
Enters](#)

Show card database records at a selected reader



[Print
Preview](#)

View the printed layout of your document.



[Print
Report](#)

Prints the current document.



Print Setup

This dialog will allow you to set specific options for the printers connected to your system.



[Automatic
Printing](#)

Use this dialog to automatically print or email any opened reports.



[Make PDF](#)

Creates a pdf document of the currently opened report.

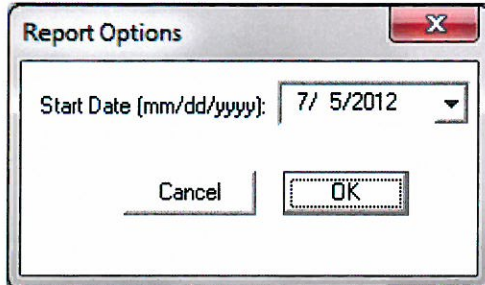


[Email PDF](#)

Generates and places a pdf of the currently opened report in a user-sendable email message.

Global Events

Using the Global Events report a user can readily grasp Node wide changes that were made using the Global Options dialog.

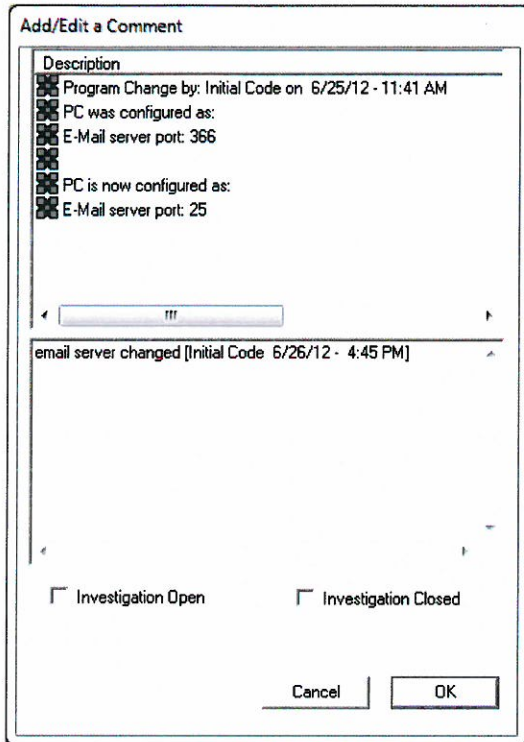


Within the report, individual changes are listed by date and time, with the type of change being listed to the right of the screen. Once located, an event can be further investigated by double-clicking on the selection.

Node 1: Node 1 Global Events x	
6/13/12 10:24AM	Program Change Initial Code
6/13/12 10:33AM	Login Initial Code
6/13/12 10:36AM	Program Change Initial Code
6/13/12 10:36AM	Program Change Initial Code
6/13/12 10:41AM	Login Initial Code
6/13/12 10:50AM	Logout Initial Code
6/13/12 10:50AM	Login Initial Code
6/13/12 10:51AM	Program Change Initial Code
6/13/12 1:21PM	Logout Initial Code
6/14/12 4:34PM	Login Initial Code
6/15/12 3:06PM	Login Initial Code
6/15/12 3:22PM	Logout Initial Code
6/15/12 3:22PM	Login Initial Code
6/18/12 2:59PM	Login Initial Code
6/18/12 3:41PM	Login Initial Code
6/19/12 4:51PM	Login Initial Code
6/22/12 1:22PM	Login Initial Code
6/25/12 9:14AM	Login Initial Code
6/25/12 9:17AM	Login Initial Code
6/25/12 11:02AM	Login Initial Code
6/25/12 11:02AM	Login Initial Code
6/25/12 11:40AM	Login Initial Code
6/25/12 11:40AM	Program Change Initial Code
6/25/12 11:41AM	Program Change Initial Code
6/25/12 11:41AM	Program Change Initial Code
6/25/12 11:41AM	Program Change Initial Code
6/25/12 11:43AM	Program Change Initial Code
6/25/12 11:44AM	Program Change Initial Code
6/25/12 11:44AM	Program Change Initial Code
6/25/12 11:44AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:47AM	Program Change Initial Code
6/25/12 11:49AM	Program Change Initial Code
6/25/12 11:57AM	Program Change Initial Code
6/25/12 11:57AM	Logout Initial Code
6/25/12 11:57AM	Login Initial Code
6/25/12 11:57AM	Program Change Initial Code
6/25/12 11:58AM	Login Initial Code
6/25/12 11:58AM	Program Change Initial Code
6/25/12 11:59AM	Program Change Initial Code
6/25/12 12:00PM	Program Change Initial Code
6/25/12 12:00PM	Program Change Initial Code

The comment window is a repository for past changes. The upper window (description window) reflects what changes were made, when, and by whom. The lower window (comments window) reflects individual comments in addition to being the location for the preprogrammed alarm handling

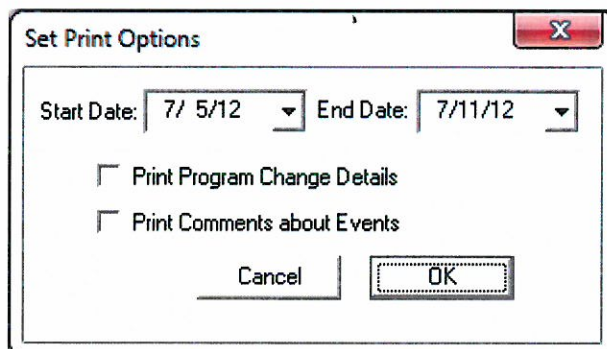
instruction form. Once open, comments can be added to further clarify a change. Once a comment has been added it becomes read-only and is electronically signed and dated. Additional comments can be added to an event at any time.



The 'Add/Edit a Comment' dialog box contains a 'Description' section with a list of events, each preceded by a small icon. The events are: 'Program Change by: Initial Code on 6/25/12 - 11:41 AM', 'PC was configured as:', 'E-Mail server port: 366', 'PC is now configured as:', and 'E-Mail server port: 25'. Below this list is a text area containing the comment 'email server changed [Initial Code 6/26/12 - 4:45 PM]'. At the bottom, there are two checkboxes: 'Investigation Open' and 'Investigation Closed', both of which are unchecked. The dialog also features 'Cancel' and 'OK' buttons.

Print Preview

When previewing the Global Events report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.



The 'Set Print Options' dialog box has a title bar with a close button (X). It contains two date pickers: 'Start Date' set to '7/ 5/12' and 'End Date' set to '7/11/12'. Below these are two checkboxes: 'Print Program Change Details' and 'Print Comments about Events', both of which are unchecked. The dialog also features 'Cancel' and 'OK' buttons.

Start Date

End Date

Use these fields to enter the appropriate dates for your report.

Print Program Change Details

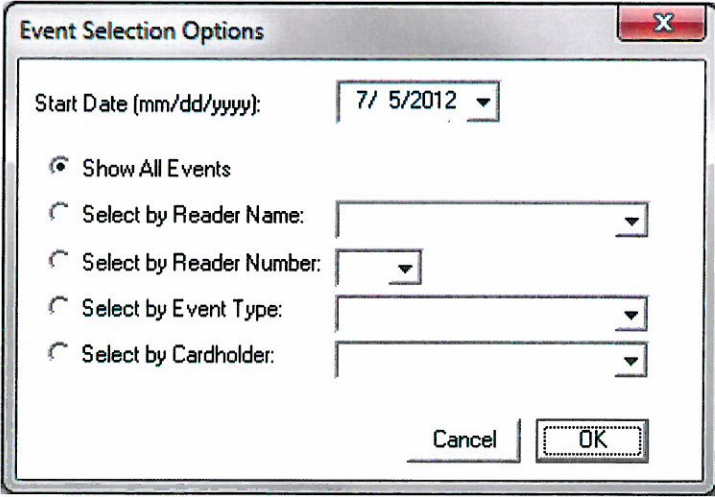
If selected, the report will additionally list and detail any program changes that were made to the system.

Print Comments about Events

When selected, any additional comments that were entered into the system will be visible in the final report.

Node Events

Similar to the Global Events Report in style, the Node Events Report is a collection of events on the current Node.



The image shows a dialog box titled "Event Selection Options" with a standard Windows-style title bar (minimize, maximize, close buttons). The dialog contains the following elements:

- A label "Start Date (mm/dd/yyyy):" followed by a date selection field showing "7/ 5/2012" with a dropdown arrow.
- A group of five radio buttons for selection criteria:
 - ☒ Show All Events
 - ☐ Select by Reader Name: followed by a text input field and a dropdown arrow.
 - ☐ Select by Reader Number: followed by a dropdown arrow.
 - ☐ Select by Event Type: followed by a text input field and a dropdown arrow.
 - ☐ Select by Cardholder: followed by a text input field and a dropdown arrow.
- At the bottom right, there are two buttons: "Cancel" and "OK".

This item will show the events on screen and allow you to print them out. The following option dialogs will allow you to customize your event report. Type in the start date for your report and then select from the event report options shown below.

Start Date

Enter the starting date for the report. The first event printed will start from this date or the closest date following this date.

Show All Events

All events for this node are shown in date/time order.

Select by Reader Name

Click on the arrow to see a list of the Reader names on this node. Select the Reader for this report. Only those events that contain the selected Reader will be printed.

Select by Reader Number

Click on the arrow to see a list of Reader numbers on this node. Select the Reader for this report. Only those events that contain the selected Reader number will be printed.

Select by Event Type

Click on the arrow to see a list of the different event types. The report will print a list of only those event messages, arranged in date/time order. Events are occurrences other than routine readings and indicate changes made to the system or problems that have occurred. The following event types are recorded.

Access Granted

Denied: Off Schedule

Denied: Bad PIN

Denied: Bad Date

Denied: Wrong Door

Passback Violation

Door Forced

Door Ajar

Input Alarm

Program Changes

Alarm Inhibit

Access Granted

This event occurs when a cardholder swipes his card through an active reader and the system unlocks the door. The cardholder is allowed through the door (proper reader group) during this specific time (proper schedule in access group).

Denied: Off Schedule

If a cardholder tries to gain access through a door during a time when he is not allowed entry (schedule in access group not on), the system will generate this event. The access groups are programmed in the Access Group Programming option.

Denied: Bad PIN

When a card reader has been programmed as a magstripe with PIN or Wiegand with PIN, in addition to swiping the card, the user must enter a 4 character Personal Identification Number. If this number is not entered correctly within approximately 2 seconds after swiping the card, this event will be generated. The PIN number is set in Card Database Programming.

Denied: Bad Date

When an access group has expired (the current date is earlier than the Start Date or later than the Expiration Date) this event will be generated after the card is swiped. The dates are programmed in the Access Group Programming option.

Denied: Wrong Door

This event occurs when a cardholder swipes his card through an active reader and the system denies access (doesn't unlock the door). The cardholder is not allowed through this particular door. His Access Group does not contain a Reader Group that contains this door.

Passback Violation

This event is generated when a user's card is presented for entry into the facility when the person is already inside. The Rees Access Control System recognizes the card as being in violation since the card user is still logged as being in the facility. Doors can be programmed to log this event and open the door or to log this event and deny access.

Door Forced

A door forced event will occur when a door has been opened without the corresponding card swipe or Egress Request. This can happen when a door is forced open (lock overpowered). If the door switch shows a door open without the Egress Input or a valid card accompanying it, this event will register.

Door Ajar

When a door is left open 30 seconds longer than the relay hold time, this event will be generated. This can happen when someone props a door open after gaining access.

Input Alarm

Whenever the Reader Controller recognizes a digital signal on the auxiliary input, this event will be generated. There is an auxiliary input associated with each reader on the reader controller.

Program Changes

This is the event that is recorded when any program change is made to any one particular node. Changing any programmed parameter will make an entry into the events log. These changes can be individually annotated.

Alarm Inhibit

This event is generated when a user inhibits one or more alarms from the Alarms Menu or through the toolbar alarm icon.

Select by Cardholder

Click on the arrow to see a list of currently programmed cardholders, by name, on this node. Select the particular cardholder for this report. Only those events that contain the selected cardholder will be printed.

Select by Event Type

Alarm Reset/Enable

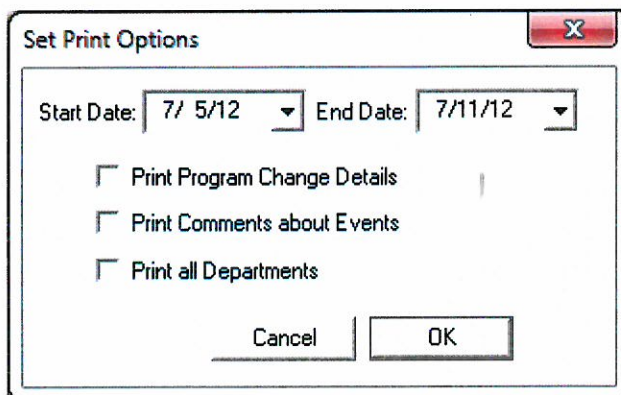
When you reset or enable an inhibited alarm, it is registered in the event log, along with your name, the date, and for how long the alarm was inhibited.

Program Change

Node specific program changes are logged here, giving the parameters before the change, the name of the person who changed them, and the date and time of the change.

Print Preview

When you print preview the Node Events report you will be met with a few options that will help you further distinguish the information that you would like to see. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.



The image shows a 'Set Print Options' dialog box with a title bar and a close button (X). Inside the dialog, there are two date pickers: 'Start Date' set to '7/ 5/12' and 'End Date' set to '7/11/12'. Below these are three unchecked checkboxes: 'Print Program Change Details', 'Print Comments about Events', and 'Print all Departments'. At the bottom are 'Cancel' and 'OK' buttons.

Start Date

End Date

Use these fields to enter the appropriate dates for your report

Print Program Change Details

If selected, the report will additionally list and detail any program changes that were made to the system.

Print Comments about Events

When selected, any additional comments that were entered into the system will be visible in the final report.

Print all Departments

By selecting the Print all Departments checkbox the final report will include details from every department.

Select by Cardholder

You can print out a list of events by cardholder with this option. Just click on the down facing arrow and select the cardholder name from the list.

Other Reports

Time and Attendance

The Time and Attendance Report lets you set up a time profile for groups of employees working on the same time shift. You can now create and save Time and Attendance reports for different groups of people working on different shifts. You can further sort a report, within a shift, by department, job level, individual person, etc., whatever you need.

Time and Attendance Report Setup

Period Start: Period End:

Employees:

☐ Appleton, Bill
☐ Appleton, Cathy
☐ Appleton, Jack
☐ Appleton, Jane
☐ Appleton, John
☐ Appleton, Lorna
☐ Appleton, Mary
☐ Appleton, Susan
☐ Appleton, Thomas
☐ Brown, Cathy

Shift Start:

Shift End:

Breaks

	Start Time:	End Time:
1:	<input type="text"/>	<input type="text"/>
2:	<input type="text"/>	<input type="text"/>
3:	<input type="text"/>	<input type="text"/>
4:	<input type="text"/>	<input type="text"/>

Clock In Reader Group:

Clock Out Reader Group:

Period Start:

Period End:

Dates must be entered in the period start and end fields in order to print a report. If you forget to enter them, a reminder window will appear. Once you have entered the dates, click on OK and the report will appear on screen.

Load a Report Setup File

To retrieve a report, click on *Load a Report Setup File* button. A window will open and you can choose the report you need from the list of report .prn files that you have previously saved.

Save a Report Setup File

Once you have the report set up the way you want it, you can save it for future use by clicking on the *Save a Report Setup File* button. A window will open asking you to name the .prn file. You can

repeat the cardholder selection process to create as many report forms as you need for each time shift.

Employees

Under Employees you will see a list of all the cardholders in your database. Choose the individuals that are on a shift or that you otherwise wish to appear in the report by selecting them in the window.

Shift Start:

Shift End:

Type in the start and end times for the shift you wish to report on.

Clock In Reader Group

Clock Out Reader Group

Select the designated reader groups that this shift uses to clock IN and OUT on. They will be highlighted as you select them.

Breaks

Type in the start and end times for any set breaks.

Print Preview

When using the print preview button with any of the reports listed in Other, the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Program Printout

This report will list all of the following programming details for the currently selected node. For the Access Control Nodes the following information is available:

All Readers and Relays with their associated programming.

NOTE: Data is organized alphabetically by name with readers first, then relays.

All Cardholder information: Entry Access Groups, Reader Groups, Schedules and Holiday programming

Nodewide and Global Configurations.

Input/Elevator Program

This report will list all of the following programming details for the currently selected node. For the Access Control Nodes the following information is available:

All Inputs: Security inputs (PIR, window bugs, etc.), temperature and other sensors, and their associated programming.

NOTE: Data is organized alphabetically by input name.

Alarm Zone Inputs and Readers

Floor Access (Elevator) Groups

Print Preview

When using the print preview button with any of the reports listed in Other, the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Cardholder Database

The cardholder database consists of many different fields. This printout consists of the 3 fields of required data in the database: cardholder name, card number, and access group. This report allows you to print out a master list of all cardholders on the system along with their card numbers and access groups. Only someone with supervisory authority can access this report.

Print Preview

When using the print preview button with any of the reports listed in Other, the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

System Users

This report will show all of the names, access codes, and permission levels in the Master Access Code Directory, sorted by name. You will need supervisory level permission to view this information.

Print Preview

When using the print preview button with any of the reports listed in Other, the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Advanced and Custom Reports

The Advanced and Custom Reports feature contains an array of non-standard reports which enable you to get what would otherwise be extended information from the system. Using the set of preconfigured reports, information can be broken down by events, inputs, departments, or Nodes. Though not always applicable, individual options can be selected even if they are not relevant for the given report.

Advanced and Custom Reports

Calibration Report by Selected Nodes.rpt
 Cardholders by Entry Access Groups.rpt
 Daily Averages by Selected Inputs with Graphs.rpt
 Departments By Node.rpt
 Deviation Analysis + Graphs + Events Selected by Inputs.rpt
 Deviation Analysis + Graphs Selected by Inputs.rpt
 Deviation Analysis Selected by Inputs.rpt
 Events - Global.rpt
 Events by Input by Selected Depts.rpt
 Events by Selected Inputs.rpt
 Events by Selected Nodes + Comments.rpt
 Events by Selected Nodes.rpt
 Graphical Summary Report - All Equipment Types.rpt
 Graphical Summary Report - Ultracolds Only.rpt
 Graphs by Selected Inputs.rpt
 Inputs - Unused by Selected Nodes.rpt
 Inputs by Alarm Insts by Type by Selected Nodes.rpt
 Inputs by Type by Selected Nodes Detail.rpt
 Inputs by Type by Selected Nodes.rpt
 Maintenance Log by Selected Nodes.rpt
 Outputs with Incomplete Conditions.rpt
 Phone Lists By Selected Nodes.rpt
 Readings with Graphs by Selected Inputs.rpt
 Schedules By Selected Nodes.rpt
 Users by Department by Selected Nodes.rpt
 Users on Call Lists to Nodes to Lists to Inputs.rpt
 Weekly Averages by Selected Inputs with Graphs.rpt

Report Title:

Exit Launch Report

Selectors for Events and Readings Reports

Starting: 7/05/12 Through: 7/11/12

☐ Select by Input(s):

001 Walk In BB ULR	1
002 Walk In Freezer #1	2
004 Platelet Incub. 1	4
005 Platelet Incub. 2	5
006 Red Cell Freezer 1	6
007 Red Cell Freezer 2	7
008 Red Cell Freezer 3	8

☐ Select by Dept(s):

Ambient Temperatures	
Door Switches	
ENVIRONMENT	
Incubators	
Motion Detectors	
PERINTV	

☐ Select by Node(s):

Regional Blood Ctr.	
Regional Doors	

Selectors for Events Reports

☐ Select Events by Type:

Account Locked	
Acknowledged	
Alarm Status Change	
Bad Thermocouple	
BuddyWatch	
Public Area	

☐ Select Events by Status:

Acknowledged	
In Alarm	
In Alarm Range	
In Normal Range	
Nobody Home	

☐ Select Only Events With Comments
☐ Select Only Events Without Comments
☐ Select Only Events With Investigation Open
☐ Select Only Events with Investigation Open and Not Investigation Closed

Report Selection Window:

Use this window to select the specific report that you would like to generate.

Report Title:

After making a selection this field will auto-populate with the name of the report. Leave the title as is or replace/append it with the name that you would like to attribute to the given report.

Selectors for Events and Readings Reports

Use these choices to select applicable options for the chosen report. Use the shift or ctrl keys to select more than one option at a time. To choose from the available options first enable the checkbox to the left of a given window.

Selectors for Events Reports

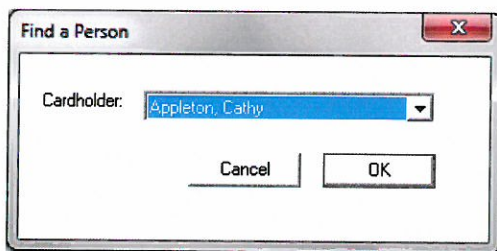
Applicable only to reports that include events on the system, use these options to further dial-down a designated report. By clicking on an available button any and all options that meet the criteria of that button will be automatically selected.

Print Preview

When using the print preview button with any of the reports listed in Other, the document will be automatically generated without any options. Once generated, use the Page Up and Page Down buttons to scroll through the report and the left mouse button to zoom in and out.

Find Person

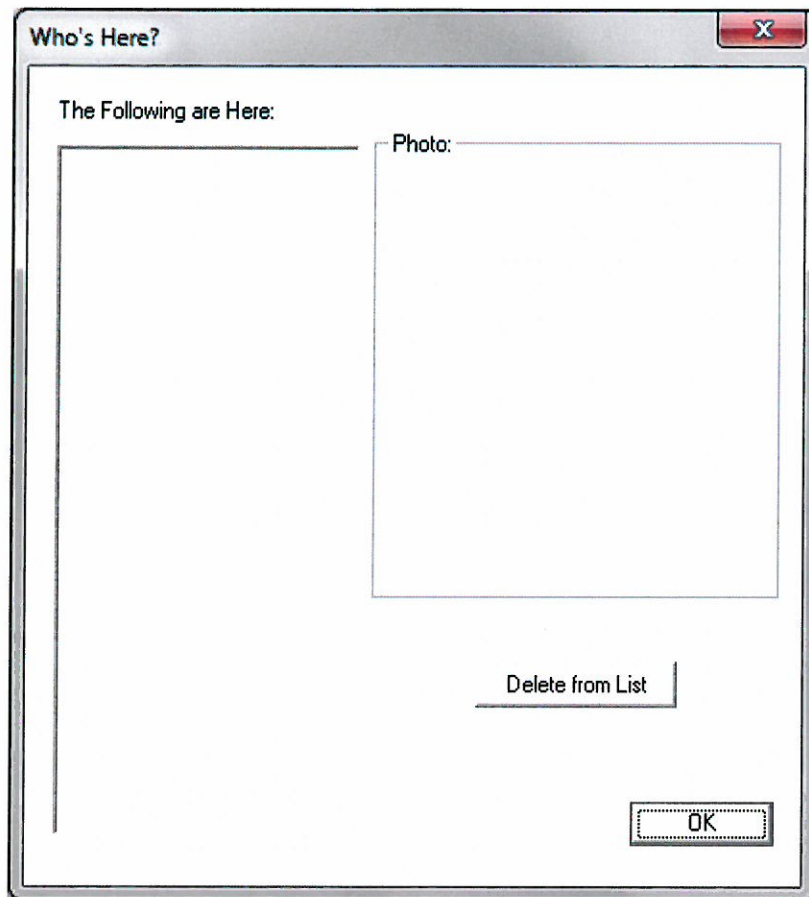
Select the name of the person you wish to find from the drop down list.



The program will search through the database of events and locate the last event recorded for that card. Once selected, and after pressing OK, the system will display the detail box at the icon for the last door accessed. If the system cannot find an event for the person chosen within the previous 24 hour period, you will receive a 'Can't Find That Person' message.

Who's Here

When you choose this function, a dialog box will appear which shows the names of all cardholders present in the facility.



When you click on a cardholder's name, a picture of the cardholder will appear if present.

View Who Enters

This feature may be used for each reader on the system. To use this feature first select the reader that you wish to monitor by clicking on it in the node window. When a person uses the chosen reader the data entered into the database for that cardholder, including his/her picture, will be displayed in this window. The receptionist or guard can then compare this picture to the actual person gaining access.

You can resize the window so only the person's name and picture show. The information will remain on screen until the next person uses the reader, or the window is closed.

Print Preview

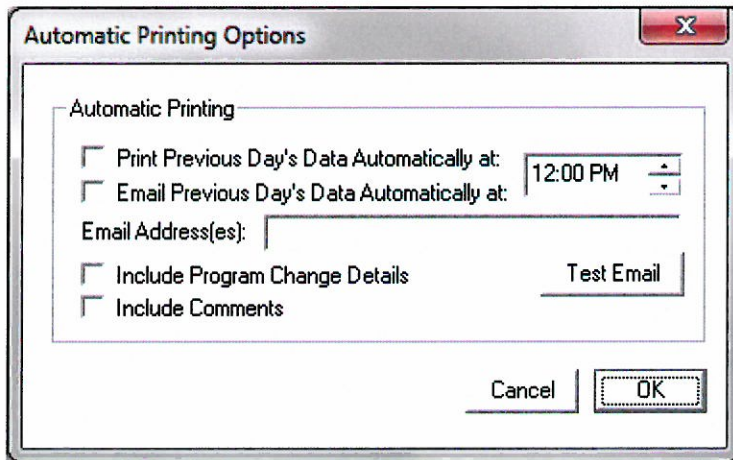
Refer to the print preview instructions located under an individual report for complete options.

Print Report

When printing a report you will first be met with a menu that is specific to the document you are trying to print. Refer to the printing instructions located with an individual report for complete options. Once a report is generated you will be met with the Windows Print dialog. Refer to the Print Setup instructions for general print options.

Automatic Printing

By using the Automatic Printing options, any available report can be automatically generated for daily review. Generally using the same options that are present when print/print previewing a report, additional options are sometimes present when generating a report.



For the Print option to be active, you must first select the report or graph that you wish to have printed out every day.

Print Previous Day's Data Automatically at:

Input the time of day that you would like the report to be generated at.

Email Previous Day's Data Automatically At:

Email Address(es):

To automatically email the report at the selected time choose this option and enter any applicable email addresses in the space provided. Use the *Test Email* button to ensure that the intended recipients do in fact receive the email.

NOTE: The report must be up on screen if it's to be printed. If you choose to have reports automatically printed out each day, and the computer and printer are off-line at that time or the report window was closed, the reports will not print out. To have a report print out automatically, the workstation program must be running, the report window must be on the screen, and the printer must be on. In order to send emails using the system, it must be first setup in *Global Options*.

NOTE: All automatic printouts cover the time period from 12:00 A.M. to 12:00 A.M., even if they are printed out at 4:00 P.M.

Print/Include Program Change Details

If selected, the report will additionally list and detail any program changes that were made to the system.

Include Comments

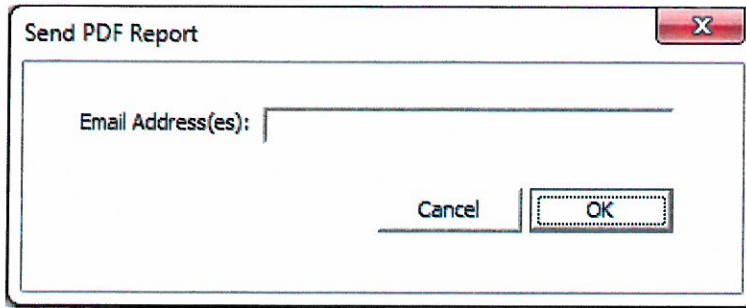
When selected, any additional comments that were entered into the system will be visible in the final report.

Make PDF

To create a pdf document of a report choose this option. Once initiated, the system will first display the standard print/print preview dialog, automatically creating a pdf when you press OK. While a separate pdf creator is not needed to make use of this feature, an applicable viewer must be present to open any such document.

Email PDF

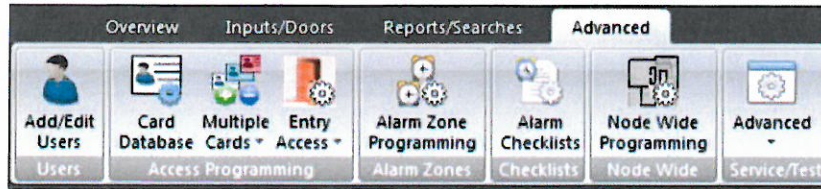
To automatically send reports via email select the Email PDF button. Utilizing either Microsoft Outlook or the system's built-in ability to send email, the system will first display the standard print/print preview dialog. Upon completion, if the system on which you are running has Outlook installed, a new email containing a pdf of the attachment will be created. In the event that the system on which you are running does not have Outlook installed, the software will use its built-in ability to send email and display a window asking you to enter the recipient's email address(es).







A screenshot of a software dialog box titled "Send PDF Report". The dialog box has a standard Windows-style title bar with a close button (X) in the top right corner. Inside the dialog, there is a text input field preceded by the label "Email Address(es):". Below the input field, there are two buttons: "Cancel" and "OK". The "OK" button is highlighted with a dashed border, indicating it is the default action.

NOTE: In order to send emails using the system, it must be first setup in *Global Options*.

Advanced (Card Access Node)



Field	Description
 Add/Edit Users	Add or edit system users
 Card Database	Program the card database
 Multiple Cards	Submenu container which houses the following functions: <div> <p>-Add a Bank Add a bank of cards to the system at once.</p> <p>-Delete a Range Delete a range of cards on the system at once.</p> </div>
 Entry Access	Submenu container which houses the following functions: <div> <p>-Reader Groups Modify the system's reader groups.</p> <p>-Entry Access Groups Add, change, or delete Entry Access groups.</p> </div>

[-Elevator Floor Groups](#) Add or program a floor group for elevator control.

[-Floor Access Groups](#) Program floor access groups.



[Alarm Zone Programming](#)

Program alarm zones.



[Alarm Checklists](#)

Program alarm checklists.



[Node Wide Programming](#)

Program Node-wide, Card Access system changes.



[Advanced](#)

Submenu container which houses the following functions:

[-Read Raw Card](#) Read raw data from a card.

[-Calibrate Analog Input](#) Trim the calibration of a sensor.

[-Hide Access Granted Events in Running Log](#) Selection to prevent Access Granted events from appearing in the Running Log.

[-Sync All Controllers](#) Scan and verify/sync each controller's programming with the master copy.

Add/Edit Users

Unless otherwise set, when a user first logs onto the Node, they must enter their access code so that the system recognizes their individual access and permissions levels. By correctly adding and structuring users, individual duties and supervisory functions can be assigned to the correct staff. In order to access the System Access Codes dialog a user must have either *Reset Passwords for Non-Admin Accounts* or *Modify Security Codes and Permissions* privileges. The system will not allow the user to edit or delete their own access code.

Edit System Access Codes

User:

Login:

☒ Valid in this Node

☐ Code is locked out

Permissions:

- ☒ Enable Alarms
- ☒ Inhibit Single Alarms for up to: Min.
- ☒ Inhibit Single Alarms for a Long Time
- ☒ Inhibit Multiple Alarms for a Long Time
- ☒ Program the Card Access System
- ☒ Program Environmental System Inputs
- ☒ Program Environmental System Outputs
- ☒ Calibrate Inputs
- ☒ Electronic Data Reviews and Approvals
- ☒ Program Node Phone Lists
- ☒ Program Master Phone List
- ☒ Reset Passwords for Non-Admin Accounts
- ☒ Modify Security Codes and Permissions

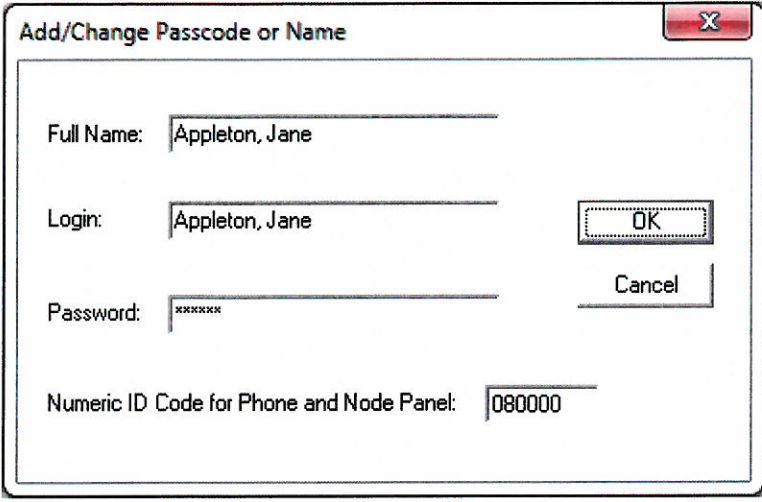
User:

The User field displays the user name that has current context. Use the Add, Chng, and Del buttons to modify the system users.

Add

Chng

Use the Add and Chng buttons to modify the system's users. When you click the Add or Chng buttons the following dialog will appear. If you are adding a new user the fields will appear blank.

A screenshot of a Windows-style dialog box titled "Add/Change Passcode or Name". The dialog has a standard title bar with a close button (X). Inside, there are four text input fields: "Full Name:" containing "Appleton, Jane", "Login:" containing "Appleton, Jane", "Password:" containing "xxxxxx", and "Numeric ID Code for Phone and Node Panel:" containing "080000". To the right of the input fields are two buttons: "OK" and "Cancel".

Full Name:

This is the name of the user that will appear in the User box when editing System Access Codes.

Login:

The login name represents how this user will be referenced in the system. This is the name that the user will have to enter when logging into the system and also the name that will appear in system reports.

Password:

The password reflects the credentials that are necessary when logging into the system or signing off on system changes (if required). Password rules are designated in *Global Options*.

Numeric Id Code for Phone and Node Panel:

The Numeric ID Code for a user reflects the credentials used whenever an individual is interrogating the system via phone. Since it is singularly used to identify individuals over the phone this number is unique within the system and must be different for every user.

Del

Delete the selected user from the system

Login:

The current user's login name will displayed here. Unable to be edited in this box, use the Chng button to make any needed changes.

Valid in this Node

Once a name and passcode have been entered, it must be valid in a node. After a name has been added to the system use the Valid in this Node checkbox to make a user valid in a given Node. Once selected all the other options become active.

To remove a name from a specific node, open that node, open "Edit System Access Codes" and uncheck the "Valid in this Node" box. This will remove that person's access to the specific node. The name and permissions will remain on the master directory.

Code is locked out

If a user becomes locked out of the system or you wish to lock a user out of the system temporarily, the unchecking/checking of this option will dictate their access to the system. Normally, a user will be locked out of the system if the option is selected in *Global Options* and that user has repeatedly supplied incorrect credentials to the system.

Permissions:

Select an individual's user permissions by checking the box to the left of a given permission level. Click OK to confirm. The choices are:

Enable Alarms

Inhibit Single Alarms for Up to X Minutes

Inhibit Single Alarms for a Long Time

Inhibit Multiple Alarms for a Long Time

Program the Card Access System

Program Environmental System Inputs

Program Environmental System Outputs

Calibrate Inputs

Electronic Data Reviews and Approvals

Program Node Phone Lists

Program Master Phone List

Reset Passwords for Non-Admin Accounts

Modify Security Codes and Permissions

Selecting every item on the menu will give a user all permissions. Any individual who is assigned all permissions levels can make changes throughout the program.

When a user does not maintain the correct permission levels, such as being unable to program an input or inhibit an alarm, login using a username that has supervisory permissions and edit their access code. Examine the master directory to confirm the user's level of permission and if it is valid in the node. Run a test on all newly entered or modified codes to make sure they are functioning as they should.

Make Valid in All Nodes

In a multi-Node system, use this option to assign the selected user with their given permissions in every node.

Card Database

Each employee needs to be issued a card with a unique card number. This will allow the employee access to the facility according to a pre-defined access group. The system must be told which employee has which card. There is also additional data that can be entered for each cardholder and kept in the cardholder database. The system will support up to 32,000 employees. Our installers will enter up to 25 cards during the installation. The customer must enter the remaining cardholders.

To add, change or delete individual cardholders you must select Card Database Programming from the Program Menu.

NOTE: A card will not function correctly until the template and site code are correctly configured in the Nodewide Programming options.

Cardholder:

Click on the down arrow to see a list of all the cardholder names currently programmed in the system. Then click on the one you want to program. If the name does not appear on the list, use the 'Add' button to put it on the list. The System will not allow duplicate cardholder names.

Add / Change / Delete

These three buttons (Add, Chng, Del) allow you to manipulate the currently defined cardholder names. To add a new name, press the add button. The Add a Card dialog box (see below) will appear. Type in the name of the new cardholder and his or her access card number. This is also where you assign the new cardholder to an access group. Click on the down arrow to see the list of access groups in the system. To change the name of any cardholder, just select that cardholder from the list and then press the change (Chng) button. If you want to delete a cardholder, press the delete

(Del) button. You will be asked if you really want to delete that name. Each change you make will be documented in the program change log.

Card Number

This is the field where you enter the card number for the particular employee. The system will accept up to a 12 digit number (although you can enter more than 12 in the field). This number cannot be an arbitrary number. It **MUST** correspond to the number encoded on the card that the employee will use to gain access. The number is usually printed somewhere on the card. However, if the number cannot be located, the card can be read by the system to ascertain the number that has been encoded. In order to do this you must select Read a Raw Card from the Program Menu.

NOTE: In order for the cards to function correctly, the site code and template must also be correctly set for the type of cards that are being used. For information on site codes and templates, see Node Wide Programming.

Personal ID Number (PIN)

The PIN Number is only required when using a keypad *with another technology reader*, for instance, a magstripe swipe reader with keypad PIN. When using a keypad alone, the card number is the number that gets entered on the keypad; the PIN is not used. Leading zeros are not required to be entered into this field. When using a PIN, 4 characters **must** be entered even if fewer numbers are entered in the PIN field. For instance, the PIN number is entered in the field as 123. After swiping the card the employee must enter 0123 (4 characters) in order to gain access.

Entry Access Group

Click on the down arrow to see a list of all the Entry Access Groups currently programmed in the system. Then click on the one you want to assign to the selected cardholder. If the Entry Access Group does not appear on the list, you **cannot** add it at this point. You must exit this screen and select Access Group Programming from the Program Menu.

Floor Access Group

Click on the down arrow to see a list of all the Floor Access Groups currently programmed in the system. Then click on the one you want to assign to the selected cardholder. If the Floor Access Group does not appear on the list, you **cannot** add it at this point. You must exit this screen and go to the Program Menu. Select "Elevator Floor Access Programming" and click on Floor Access Group Programming from the sub-menu.

Department

This is field that is not required for proper operation of the access control system. It will accept any alphanumeric characters entered from the keyboard. It does not necessarily have to contain the name of the employee's department, but this is the recommended usage. This field, along with the other non-required fields, will be displayed when you choose the Show Who Enters option or Show Cardholder Data option from the toolbar.

Alarm Control Zone

Click on the down arrow to see a list of all the Alarm Control Zones currently programmed in the system. Then click on the one you want to assign to the selected cardholder. If the Alarm Control Zone does not appear on the list, you **cannot** add it at this point. You must exit this screen and go to the Program Menu. Select Alarm Zone Programming by clicking on it and a dialog box will allow you to choose inputs and readers to create an alarm zone.

Address

The address fields are not required for proper operation of the access control system. They will accept any alphanumeric characters entered from the keyboard. They do not necessarily have to contain the employee's address, but this is the recommended usage. These fields, along with the other non-required fields, will be displayed when you choose the Show Who Enters option or Show Cardholder Data option from the toolbar.

Cardholder Data

These fields are not required for proper operation of the access control system. They will accept any alphanumeric characters entered from the keyboard. They do not necessarily have to contain the data as shown in the label above the field, but this is the recommended usage. These fields, along with the other non-required fields, will be displayed when you choose the Show Who Enters option or Show Cardholder Data option from the toolbar.

Cardholder Picture

If you want to have a picture of each cardholder to place in the record, it can be done in two ways.

1.) You can use a digital camera, capture board, or scanner to take a picture of the cardholder and then acquire the image using a TWAIN interface. TWAIN defines a standard software protocol and

application programming interface (API) for communication between software applications and image acquisition devices. It provides a consistent, easy integration of image data between sophisticated input devices such as digital cameras, desktop and hand-held scanners, still video, or image capture boards, and software applications.

The scanner or camera you will be using to capture the picture into the cardholder database will come with a TWAIN driver. Once this is installed on your computer, you just need to click the 'Acquire Photo' button to import the image into the database. (Both the digital camera and the video capture board are available from Rees Scientific.) When you press the 'Acquire Photo' button the Rees Program transfers control to the TWAIN device. When the capture has been completed, the Bitmap (.BMP) image is saved to disk and stored in the database.

2.) When a TWAIN device such as a digital camera is not available you can scan a regular photo into Photoshop®, Paintbrush®, or any of a number of programs that convert an image into a bitmap (.bmp) file and then load the .BMP file by pressing the 'Load BMP' button. Color scanners are commonly available and can be connected to any convenient computer in order to generate the bitmap photo. If the .BMP image is available, place it on the computer that contains the database, press the 'Load a BMP' button, and select the location of the .BMP photo. The image is saved to disk and stored in the database.

Picture Database

The Cardholder database consists of 3 fields of required data: Cardholder Name, Card Number, and Access Group. The rest of the fields are optional, as is the picture. However, by including a picture in the Cardholder database, several features built into the program become more usable.

The Show Who Enters option from the Window Menu, will be able to automatically call up the picture from the database when the cardholder swipes his card. You can then make a definite ID. There is also a Show Cardholder Picture button on the toolbar that enables you to call up the picture from the database when you have a reader event highlighted on the Event Report or on the Running Log.

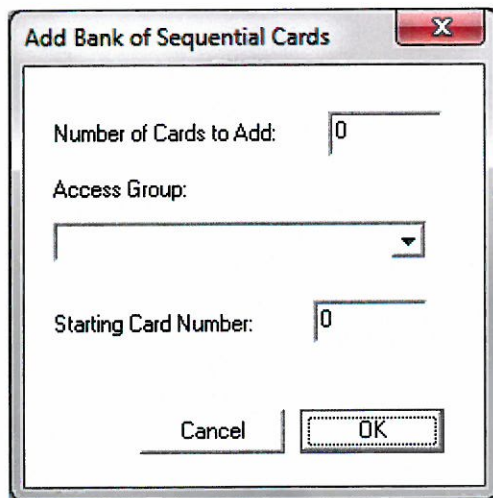
Once you have scanned all the users' pictures into the database, you can take full advantage of the 'Show Who Enters' feature. You can open a window for one or more doors on the system that will automatically display the picture of the person entering. This can be compared to the actual person entering (either in person or through a CCTV system) for positive ID of the cardholder.

Pictures are placed into the database in two ways: You can directly scan them in through a TWAIN compatible scanner or camera, or you can select an existing .BMP file and use it as the picture.

Multiple Cards

Add a Bank

If you want to issue a large group of sequentially numbered cards you can program a bank of cards, with specific access rights, in this window. Once the cards have been added to the system use the Card Database programming window to make changes to specific data such as name and PIN numbers. Being able to program a bank of cards easily can be particularly useful. You can, for instance, create a Visitors access group, which has limited access, and is good for only the current date. Another use would be for students' cards that have the same access rights and start and expire on the same day. Each dormitory could be programmed as a bank of cards, with the individual students' names added later. Any changes are automatically downloaded to the appropriate controllers.



The screenshot shows a Windows-style dialog box titled "Add Bank of Sequential Cards". It has a standard title bar with a red close button (X). The dialog contains three labeled input fields: "Number of Cards to Add:" with a text box containing the value "0", "Access Group:" with a dropdown menu, and "Starting Card Number:" with a text box containing the value "0". At the bottom of the dialog are two buttons: "Cancel" and "OK".

Number of Cards to Add:

Enter the number of cards that you need in this field.

Access Group:

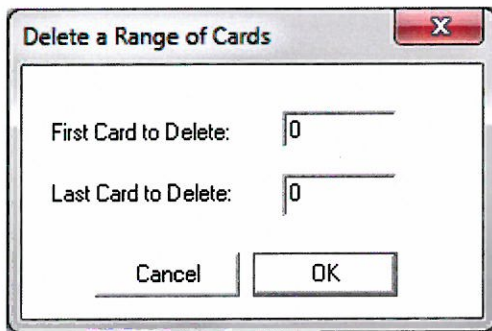
The group of cards added to the system will belong to the access group that is chosen here. Use the drop-down menu to select a preexisting access group.

Starting Card Number:

Enter the starting card number for the group of cards you wish to add to the system in this field. A warning will pop up if another card already exists that is in the number range you specify here.

Delete a Range

This function allows you to delete a range of cards from the cardholder database. Enter the card numbers of the first and last cards in the range.



Delete a Range of Cards

First Card to Delete: 0

Last Card to Delete: 0

Cancel OK

Entry Access

Reader Groups

To tell the system which doors a specific card will have access to, you must first group the doors into reader groups. The reader groups consist of similar doors. For instance, all the doors that lead outside could be given the designation "Perimeter Doors". One door can be in multiple reader groups. A door in the "Perimeter Doors" group could also be in a group called "All Doors".

Edit Reader Group									
Group Name:	REAR DOOR [Add] [Chng] [Del]								
Readers in group:	<table border="1"> <tr> <td>read</td> <td>1</td> </tr> <tr> <td>REAR DOOR</td> <td>2</td> </tr> <tr> <td>SHIPPING DOOR</td> <td>3</td> </tr> <tr> <td>STAFF DOOR</td> <td>5</td> </tr> </table>	read	1	REAR DOOR	2	SHIPPING DOOR	3	STAFF DOOR	5
read	1								
REAR DOOR	2								
SHIPPING DOOR	3								
STAFF DOOR	5								
<div>Cancel</div> <div>OK</div>									

Group Name:

Select an existing reader group using the drop-down menu. To add additional groups or to change an existing group name use the add/change buttons located to the right of the drop-down menu. Up to 128 reader groups can be added to the system.

Readers in group:

Select the individual readers from the list that you wish to assign to the selected group name.

Entry Access Groups

An entry access group is an association of readers and schedules. An entry access group determines when a cardholder has access to a reader group. When groups of people are using the same sets of doors on the same schedules, these doors and schedules can be combined into entry access groups. When you assign people to the entry access group, they are automatically allowed entry into all of the doors in the group, on all of the schedules designated for the group. An entry access group can be just one reader group attached to one schedule, or it can be several reader groups, each with its own schedule.

Edit Entry Access Group

Group Name:

Access Rights:	Reader Group:	Access Schedule
<input type="button" value="Add >>"/>	SHIPPING DOOR	24HR
<input type="button" value="Del >>"/>	REAR DOOR	WORK
	STAFF DOOR	WORK

Starting Date:

Expiration Date:

If, for example, you wanted to create an entry access group called Employees for your office personnel, you might select the building entry reader group with a schedule that was valid from 8:00 AM to 6:00 PM; and select the office doors reader group to be valid for the company working hours of 8:30 AM until 5:30 PM.

If you wanted to create an entry access group for those supervisors who had total access to the facility, 24 hours a day, you could create a reader group that contained all the doors in the facility and the schedule would be on for 24 hours. The entry access group could be named Supervisors. New personnel could be given their appropriate access rights by assigning them to an appropriate entry access group, the programming having already been done.

Entry access groups are created in the same manner as reader groups. First you must name the entry access group. You can then add individual readers, and/or reader groups, to the entry access group. Each reader or reader group is also attached to a specific access schedule. Each entry access group can have up to 8 reader group/schedule associations.

Group Name:

Select an existing reader group using the drop-down menu. To add additional groups or to change an existing group name use the add/change buttons located to the right of the drop-down menu. To add a new name, press the Add button. To change the name of any group, select that group from the list and then press the Chng button. If you wish to delete an access group, select the name of the

group you wish to delete and press the Del button. Before deleting an existing group you must reprogram any cardholder using that group.

You may enter up to 300 Access Groups. To add, delete, or change an access group select Access Group Programming from the Program Menu.

Access Rights:

Use the Add and Del buttons located under Access Rights to assign new doors to the group. Once added the reader and its associated scheduled working time will appear in the window to the right.

Starting and Expiration Dates

These are the dates between which a particular access group will be valid. If someone assigned to this access group uses his card and the current date is before the Start date or after the Expiration date, the reader will not respond to the card. The system will log an event as "Denied: Bad Date". If you do not have starting or ending dates, leave these fields blank, and the card will always be valid.

Elevator Floor Groups

This option restricts the cardholder to specific floors in a multi-story facility via the elevator controls. For example, a technician who works in the toxicology department may have access to Floors 2 and 3 where the department primarily resides. However, this person may be restricted from accessing Floors 4 and 5 where the residue analysis department resides. The Floor Access Group name can be defined here.

Edit Floor Group

Group Name: Add Chng Del

Controlling Reader:

Floor Relays in group:

REAR DOOR	1D
SHIPPING DOOR	2D
STAFF DOOR	3D

Cancel OK

Group Name:

Select an existing reader group using the drop-down menu. To add additional groups or to change an existing group name use the add/change buttons located to the right of the drop-down menu. To add a new name, press the Add button. To change the name of any group, select that group from the list and then press the Chng button. If you wish to delete an access group, select the name of the group you wish to delete and press the Del button.

Controlling Reader:

A controlling reader will act to limit access to a certain user-defined group of floors. Similar to establishing reader groups, this option is used in conjunction with “floor access groups”. When programming a cardholder, this option allows you to choose which floors the cardholder may access.

Floor Relays in Group:

Select any relays that wish to place in the selected group.

Setting Up an Elevator Control

There are five steps that must be followed in order to program an elevator control:

- Define the relays for floor control.

- Create a relay group and place the relays in that group.

- Define a schedule for the elevator control that you have chosen (or added).

- Make an access group.

- Assign this access group to individual cards in the database.

Creating a Relay Group

- Select Elevator Floor Groups, located under Entry Access, from the ribbon bar.

- Add a new name for your floor group, or select a name from a group already on the list.

- Select a controlling reader from the list in the drop down box.

- Click the output relay(s) [floor(s)] in the 'Floor Relays in Group' box to select the relays that you want in the group.

Create a Schedule

- Select or add a schedule by selecting Edit Schedules from the ribbon bar.

- Program the on and off times for this elevator schedule and click OK

Create an Access Group

- Select Floor Access Groups, located under Entry Access, from the ribbon bar.

- Select the name of the group who will use the elevator, or add a new group name to the list by clicking on the Add button.

The Add Floor Access Rights dialog box will appear. Click on the arrow at the end of the box to select the group that you will 'Allow Entry to'.

Click on the arrow to the right of the 'Schedule' box to choose the time during which this group will have access.

Select Card Database programming from the ribbon bar.

Click on the arrow to the right of the Cardholder box and select the cardholder who will have permission to use the elevator, from the list. If you need to, you can add a new cardholder by clicking on the Add button.

Click on the arrow to the right of the Floor Access Group box and select the name of the access group that you created. (This is the group that will have permission to use the elevator.)

Now, whenever anyone in this group swipes his or her card through the controlling reader (assigned when you created a relay group) the elevator will allow them access to the designated floor.

Floor Access Groups

A Floor Access Group is an association of elevator floor groups. When groups of people are using the same elevator floors on the same schedules, these floors can be combined into floor access groups. When you assign people to the floor access group, they are automatically allowed entry into all of the floors in the group, on all of the schedules designated for the group.

Edit Floor Access Group

Group Name: Floor1 Add Chng Del

	Floor Group	Access Schedule
Access Rights:	FloorGroup1	WORK

Add >>
Del >>

Cancel OK

Group Name:

Select an existing elevator floor group using the drop-down menu. To add additional groups or to change an existing group name use the add/change buttons located to the right of the drop-down menu. To add a new name, press the Add button. To change the name of any group, select that group from the list and then press the Chng button. If you wish to delete a elevator floor group, select the name of the group you wish to delete and press the Del button. Before deleting an existing group you must reprogram any cardholder using that group.

Access Rights:

Use the Add and Del buttons located under Access Rights to assign new floors to the group. Once added the floor group and its associated scheduled will appear in the window to the right.

Alarm Zone Programming

A group of alarm inputs can be linked with a group of readers to create what is commonly referred to as an "Alarm Zone." If any input in a particular alarm zone goes into alarm, the alarm in that area will sound. If a security alarm goes off, the security alarm sirens will go off. The status of an alarm zone's inputs and readers can be checked with a Zone Loop indicator output. Such an output will

show if all the sensors in the group are all okay or whether some of the sensors are outside of normal. This can be used to signal whether the alarm is in a condition where it will go off if activated; for example, “Are all the doors and windows closed?” The alarm will show a red light to signal that it is not ready to be activated until the alarm condition is remedied.

Name:

Select an existing alarm zone using the drop-down menu. To add additional alarm zones or to change an existing alarm zones use the add/change buttons located to the right of the drop-down menu. To add a new name, press the Add button. To change the name of any zone, select that zone from the list and then press the Chng button. If you wish to delete a zone, select the name of the group you wish to delete and press the Del button.

Sometimes you may want to set the alarm even if all the inputs in the group are not okay. You can set the alarm, wait for the alarm to go off, and then inhibit that particular input for a set period of time.

NOTE: Alarm zones are node specific. All inputs in a zone must be in the same node. Within a node, inputs may be in more than one alarm zone.

Inputs:

Select any inputs you wish to place in the alarm zone by selecting them in this window.

Readers:

Select any readers you wish to place in the alarm zone by selecting them in this window.

How to Set Up an Alarm Zone

Select Alarm Zone Programming from the ribbon bar.

Define the zone. (Add a name and then select which inputs are going to be part of the zone.)

Select the card reader that you will use to enable the zone.

Go to the map and select the reader that you have chosen to enable the zone.

Select Program Selected Input/Output/Camera from the ribbon bar.

Under Special Reader Actions, click on the box to the left of Arm an Alarm Zone after ____ seconds. Fill in the number of seconds you want the reader to wait before going into alarm.

Go back to the map and select the reader that you want to disarm the zone.

Go back to Program an Alarm Zone, and under Special Reader Actions check the box to the left of Disarm an Alarm Zone for ____ hours. Fill in the number of hours the alarm zone should be off and click OK.

Go back to the map and select the relay output that you are going to use as the alarm indicator.

Return to Program Selected Input/Output/Camera. Under Alarm Zone Control select whatever function you need from the list that pops down when you click on the arrow to the right of the box. Choose from:

None

Loop Indicator

Pending Alarm Indicator

Alarm Output Relay

Zone Armed Indicator

Zone Arming Indicator

Blinking Arming Indicator

Select the Alarm Zone for which this indicator will be used (the one that we added before).

Now that the zone and indicator are defined, you have to select which cards in the card database will be entitled to use this function. (Who will have permission to turn the alarms in a particular zone on or off.) Go to the Card Database and under Alarm Zone Control select the name of the alarm zone that you have created.

NOTE: Even though a reader is defined, you must also have an input defined on the controller you used for the arming or disarming control. For example: Controller #1 has Reader #1 defined as Control Zone Arming. In order for that reader to arm the zone correctly, the controller must also have an input defined. It can be any type of input on any reader controlled by that controller.

If an input is not already defined for the controller selected to control the alarm zone, program an input. Now, whenever the people entitled to use the alarm zone function swipe their cards through the designated reader, the alarm zone will be turned on or off.

Alarm Checklists

The system's user has the option to create up to 20 different "forms" detailing standard operating procedures to be followed during an alarm. These groups of questions or instructions for the Alarm Control box can have spaces for "Yes/No" answers, a person's initials, comments, etc. Individual inputs can be assigned to one of the 20 alarm instruction lists. The selected alarm instruction list will appear in the Alarm Control box whenever it is opened. You select which instruction list goes with which input when you are programming the input.

Add/Edit Alarm Handling Instruction Lists

List name: 3: FREEZER (RBC) Add Chng Del

IS DOOR OPEN OR BEEN OPEN?
 IS FROST BUILD UP EXCESSIVE?
 DIGITAL THERMOMETER READING____. RECORDER REA
 THIRD ALARM? (NOTIFY SUPERVISOR IF YES)

NOTE: The text that you enter above will be inserted into all comments about alarms that use these instructions. You may put square brackets [] into the notes to allow the person responding to the alarm to enter a response.

Cancel OK

After the alarm has been handled, you respond to the alarm instructions by going to the running log and selecting the event that you just handled. You can bring up the Alarm Control box by double clicking on the event. Answer the alarm questions and then add any necessary comments or explanations. The questions and your responses and comments, with your name, date, and time, are logged to the running log and electronically signed and dated.

To see the recorded responses, Node Events from the ribbon bar. Select the type of report you want and double click on the event. After you enter your access code, the alarm control box, with your responses, appears. At this time you can add additional comments to further document the situation. You cannot, however, modify previously enter responses or comments.

List Name:

Select an existing list using the drop-down menu. To add additional lists or to change an existing one use the add/change buttons located to the right of the drop-down menu. To add a new name, press the Add button. To change the name of any list, select it from the list and then press the Chng button. If you wish to delete a list, select it and press the Del button.

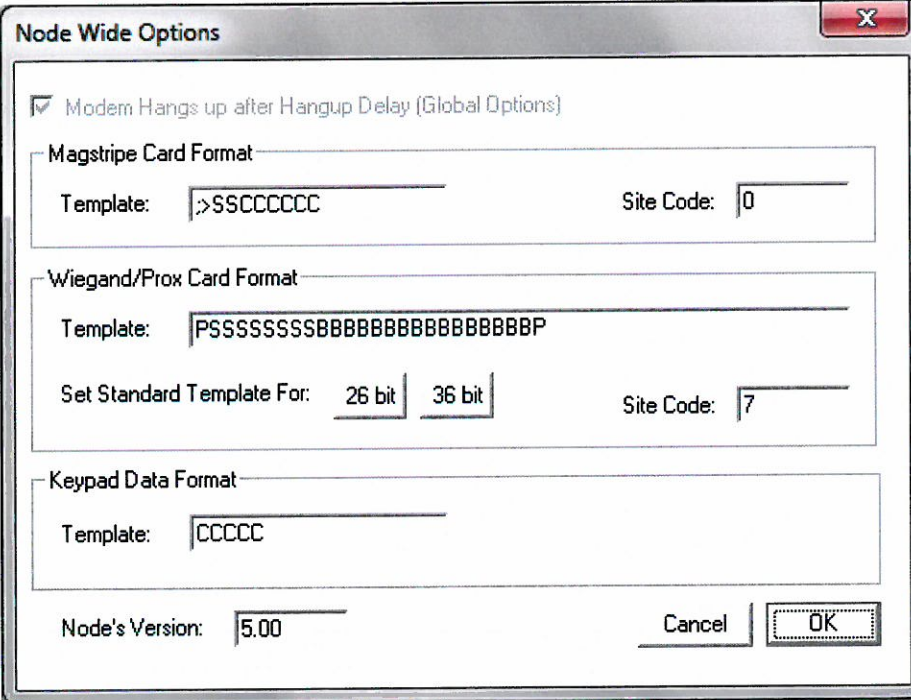
Checklist Window

Place the cursor in the instruction box below and type in whatever questions, instructions, etc. that you want followed. Square brackets [] should be used to request user responses. The system will recognize these and will expect responses to be entered between the brackets.

Alarm handling instructions lists are node specific. You can create up to 20 alarm handling instruction lists for each node on your system.

Node Wide Programming

The following parameters apply to all of a selected node's readers. Before the system will recognize a valid card, the template and site code **must** be defined for each type of reader in use.



The image shows a Windows-style dialog box titled "Node Wide Options". It contains several sections for configuring card formats and a "Node's Version" field. At the bottom are "Cancel" and "OK" buttons.

Node Wide Options	
<input checked="" type="checkbox"/> Modem Hangs up after Hangup Delay (Global Options)	
Magstripe Card Format	
Template:	;>SSCCCCC
Site Code:	0
Wiegand/Prox Card Format	
Template:	PSSSSSSSSBBBBBBBBBBBBBBBBBP
Set Standard Template For:	26 bit 36 bit
Site Code:	7
Keypad Data Format	
Template:	CCCCC
Node's Version:	5.00
<div>Cancel</div> <div>OK</div>	

Magstripe Card Format

Template:

Each reader type has its own template string that dictates how the card data will be interpreted. This provides tremendous flexibility but is somewhat complicated and is different for magstripe and Wiegand interfaces. In the magstripe template, each character in the template string represents a single character on the card as follows:

Magstripe Template Codes:

;	Start Code
>	Initial Character
S	Site Code Digit
C	Card Digit Number
I	Issue Level Digit
X	Don't Care

If you are not sure of the card template, you can run the card through the reader and select Read Raw Card from the Program Menu. This will show you the data that is encoded on the card. There are usually one or more leader characters and a series of numbers that correspond to the site code and card number. Once you know the card number, you can isolate that from the data shown, and determine the rest of the template.

NOTE: The system will ignore all characters after the card number. For instance, if you see the following raw card number: ;>03000153?7X the system will recognize this as card number 153 with a site code of 3 using the default template (;>SSCCCCC). The ?7X will be ignored.

Site Code

You must enter the site code, for the particular group of cards you want to use, in this field. The site code allows a company to use the same card numbers at two different facilities. You cannot mix site codes within the same technology reader. This site code and any leading characters, as defined by the template, **must** be present on **every** card used for the system to grant access.

Wiegand / Prox Card Format

Template:

The Wiegand card is encoded in a binary (computer language - ones and zeros) format. There are two standard formats, a 26 bit format and 36 bit format. In the 26 bit format each character in the template string represents a single digit on the card as follows:

PSSSSSSSSBBBBBBBBBBBBBBBBBP

Wiegand Template Codes:

P	Parity Bit
S	Site Code Digit in Binary
B	Card Digit Number in Binary

The P at the beginning and at the end are parity bits and can be ignored for this discussion. The eight S characters designate the site code. This is an eight bit binary number that can be converted to a decimal number (0 to 255) for the site code. The decimal number, not the binary number, is entered into the reader controller as the site code. The next 16 bits, designated with the B code, will yield a decimal number from 0 to 65,535. This is the card number. The conversion from binary to decimal is not that difficult and can be accomplished in Windows Calculator by entering it as a type Bin and changing it to a type Dec.

Each bit in a binary string is associated with a decimal number. To convert, you take each position that is occupied with a 1 and add their decimal weights together. For Instance, the 8 bit number 00100110 may be converted as follows:

Decimal Weights	128	064	032	016	008	004	002	001
Binary Number	0	0	1	0	0	1	1	0

Conversion: $32 + 4 + 2 = 38$

The same process is used with a 16 bit number. The decimal weights double with each succeeding position as you go left.

If you are not sure of the card template, you can run the card through the reader and select Read Raw Card from the Program Menu. This will show you the data that is encoded on the card as a series of ones and zeros.

Site Code:

You must enter the site code, for the particular group of cards you want to use, in this field. The site code allows a company to use the same card numbers at two different facilities. You cannot mix site codes within the same technology reader. The site code and any leading characters as defined by the template **must** be present on **every** card for the system to grant access.

Standard Template:

These buttons will automatically insert a standard template string into the template field. The 26 bit template is used on a majority of sites. When in doubt, choose this one. The 36 bit is not as common and is used as a custom template.

If you are unsure of the card template, you can run the card through the reader and select Read Raw Card from the Program Menu. This will show you the data that is encoded on the card as a series of ones and zeros.

Keypad Data Format

Template:

The keypad template lets the system know how many characters must be entered on the keypad reader to denote the proper card number. Each character is designated by the letter C. For instance, if the template is CCCCC, a user who has been assigned a 'card number' of 199 will have to enter 00199 on the keypad for the door to open. If the template is shorter than the actual card number, access will not be granted.

NOTE: This template is NOT utilized for a card reader with PIN option. The PIN option is always 4 characters long and cannot be changed using the keypad template.

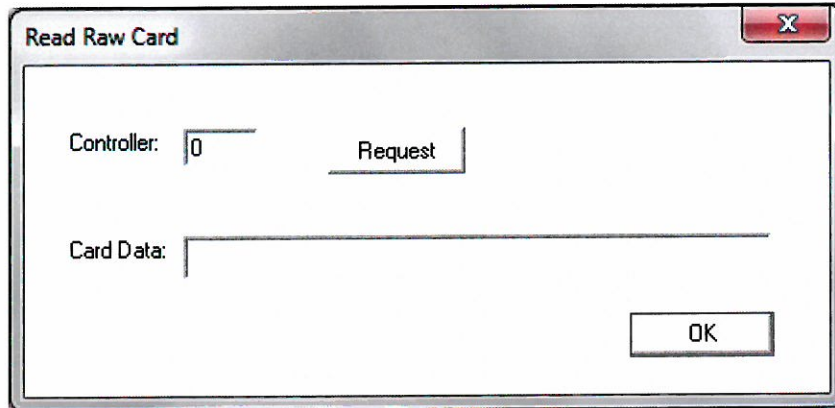
Node's Version

This number cannot be changed by the user. It is a read only field that designates the Prom (firmware) version of the reader controller node. This is not to be confused with the software version which is shown by selecting About on the ribbon bar.

Advanced

Read Raw Cards

This function has been included as a system installation aid. When trying to determine the template or site code of an existing card so that it can be correctly set in Node Wide Programming, the card can be swiped through an installed reader.



Read Raw Card

Controller: 0 Request

Card Data:

OK

Controller:

The reader controllers are numbered from 0 (1st reader controller) to 15 (last reader controller) in the node. Enter the appropriate controller number in this box.

Request:

When pressed the program will display the data read off the last card swiped through any of the 4 readers on the specified reader controller.

Calibrate Analog Input

While sensors are created to detect readings only along a certain range, final adjustments or calibrations on the outputs of these sensors may be needed to ensure that the system is correctly reading them. Calibrations of equipment and the probes in these settings are best performed when the environment is stable. As such, and whenever possible, calibration of inputs such as temperature sensors are best performed when immersed in a dampening medium such as liquid glycol or sand. Whenever calibrations are performed adequate time must be allowed for the sensing environment, the sensor connected to the system, and the calibration equipment to equilibrate. It should not be necessary to calibrate thermistor probes more than a degree or so, or thermocouple probes more than a few percent of the difference from ambient. All calibrations will be documented in the running log or can be otherwise viewed in the event database.

Calibrate a Linear Transducer

This data entry may take place at a time other than the time when calibration was tested. If so the offset calculated will be identical regardless of the time of data entry. However, it is essential that the NIST meter and the Rees system are read at the same time and the data noted for entry into the boxes below.

	Scaling (m) parameter:	Offset (b) parameter:	System Reading
Rees System Reading When Independent Standard Was Read:	1.000	0.000	2.500
Reading of Independent Standard at the Same Time:	1.000	0.000	2.500

System reading = (Input volts X m) + b

Calculate

Cancel Calibrate

System Reading

This is the value the system was reading at the time the actual calibration was done. DO NOT enter data in this box unless the data is being entered into the computer at a time later than the calibration was actually done. The calibration offset will automatically be calculated

Reading of Independent Standard at the Same Time:

When calibrating a linear transducer enter the reading of the calibration device in the System Reading box where it intersects the Reading of Independent Standard at the Same Time field. Once entered, press the Calculate button to generate an offset for the input. Press Calibrate to automatically place the Scaling and Offset parameters into the input's programming parameters. If you are taking the calibration readings for input at a later time, enter both the reading from the system and the reading of the calibration device in the appropriate boxes and then press Calculate.

Hide Access Granted Events in the System Log

This option allows the user to hide the access granted events on the Running Log. This is an advantage when there are numerous access granted events on the system. By hiding these routine events, the user will be able to see more easily (and respond more quickly to) alarm events or other events that may need attention. While the access granted events will not be seen in the running log, they will be logged to the Events History for this Node database.

Sync All Controllers

When there is more than one access control node as part of the Monitoring System, the global parameters listed below are normally synchronized across all of the nodes without programming each of the nodes separately. The following global parameters will automatically update:

Card Database

Schedules

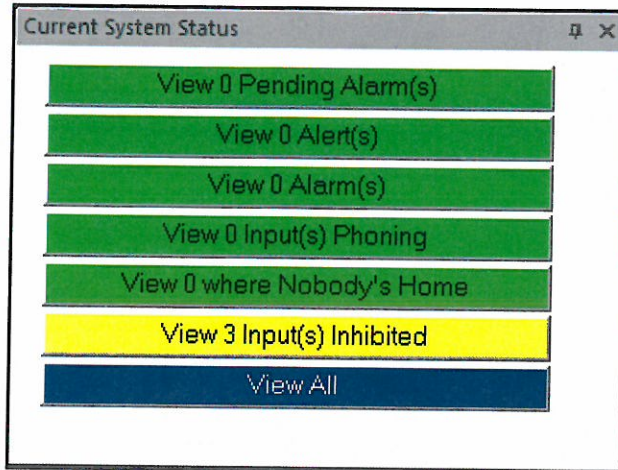
Holidays

Entry Access Groups

Floor Access Groups

Program a single Node with the desired options. When you are done programming that Node, the system will ask you if you want to synchronize all of the other card access nodes by presenting a dialog box.

Current System Status



The Current System Status window is a summary tool that is used to display the general health of the system. When displayed, the status window condenses statistics across all open Nodes, relaying crucial alert and alarm information to the end-user. Click on any button to get a summary of alerts.

View Pending Alarms(s)

The View Pending Alarm(s) button is actively updated to show the number of inputs whose alarms are pending. In order for a pending alarm to show up on the system an input's alarm parameters have to be setup as using an alarm delay.

View Alert(s)

Use the View Alert(s) button to discover any inputs that have gone into a pre-alarm alert. In order for the system to recognize a pre-alarm condition for an input the parameters for that object have to be set up in its programming.

View Alarm(s)

Displaying the total number of alarms on the system, press the View Alarm(s) button to view a list of offending inputs. Alarms are judged by the programming parameters for an individual input.

View Input(s) Phoning

For systems with telephoning alerting enabled, whenever an input has activated a telephone alert it will be visible here. Press the View Input(s) Phoning button to display a list of inputs that are in alarm and have triggered a phone call.

View where Nobody's Home

After an input has tried to alert all the individuals on its programmed phone list and not received a response, the system will log a Nobody's Home event; this button will reflect that status. By pressing the View where Nobody's Home button a list of all inputs that have triggered this status will appear.

View Input(s) Inhibited

To view a list of all inputs that are inhibited on the system press the View Input(s) Inhibited button. The button itself is updated to reflect the total number of currently inhibited inputs on the system.

View All

By pressing the View All button a record containing every item listed in an individual entry in the Current System Status Window will be generated.

System Wide Running Log

The System Wide Running Log documents everything that happens for all Nodes that are open on the desktop at the time of the event. The Running Log records all alarm events, alarm comments and responses, alarm inhibits, programming changes, and input calibrations. When it is open it displays the date/ time, input/output number, Node name, event condition, and comments, for all open nodes, as they occur and as such serves as a live event viewer. The conditions are color-coded and represented as the following: red represents an alarm condition, black a program change, yellow a pending alarm, and green signifies a login, logout, or an input returning to its normal range. Click on any entry to see the details of any individual item within the log.

Date/Time	In/Out	Node	Condition	Comment
7/ 5/2012 - 3:12 PM		Global Event	Login	No
7/ 5/2012 - 3:14 PM	8	Node 03-Madison	Program Chan...	Yes
7/ 5/2012 - 3:15 PM	49	Node 02-Bejing	Program Chan...	Yes
7/ 5/2012 - 3:15 PM	26	Node 04-Madrid	Program Chan...	Yes
7/ 5/2012 - 3:16 PM	7	Node 08-Dallas	Program Chan...	Yes
7/ 5/2012 - 3:16 PM	7	Node 08-Dallas	Program Chan...	Yes
7/ 5/2012 - 3:16 PM	7	Node 08-Dallas	-76.8 In Alarm	No
7/ 5/2012 - 3:17 PM	7	Node 08-Dallas	Program Chan...	Yes
7/ 5/2012 - 3:17 PM	7	Node 08-Dallas	-76.8 Normal	No

Left-clicking on the detail box will produce the "Add/Edit a Comment" box. If the Running Log entry is an alarm event, and the input in alarm has an alarm handling instruction list, that instruction list will appear in the "Add/Edit a Comment" box. Questions can now be responded to, instructions initialed, and comments added to document events. Any responses will be electronically signed and dated for accountability. Responses cannot be changed after initial entry, although additional comments can be made. If the event is a programming event or input calibration, add comments and document the reasons for the changes.

Add/Edit a Comment

Item	Description
<input checked="" type="checkbox"/> Date/Time	7/ 5/2012 - 3:16 PM
<input checked="" type="checkbox"/> Node	Node 08-Dallas
<input checked="" type="checkbox"/> Report type:	-76.8 In Alarm
<input checked="" type="checkbox"/> Input Name:	Probe 007 -80 Frz. (304)
<input checked="" type="checkbox"/> Input Number:	7
<input checked="" type="checkbox"/> Input Reading:	-76.8 Deg. C
<input checked="" type="checkbox"/> Low Limit:	-90.0 Deg. C
<input checked="" type="checkbox"/> High Limit:	-80.0 Deg. C

☐

☐ Investigation Open ☐ Investigation Closed

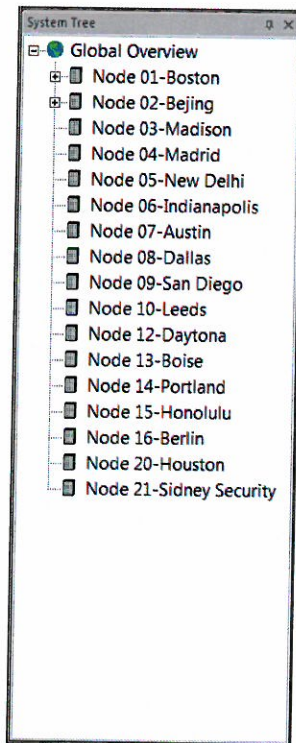
Cancel OK

Nodes write their data directly to the database server. If there is no connection to the database server, events that occurred since a Node was last connected to the server will be uploaded to the server once a connection is re-established.

NOTE: While the System Wide Running Log is not available for printing, a list of events by Node is available by selecting "Node Events" from the reporting menu.

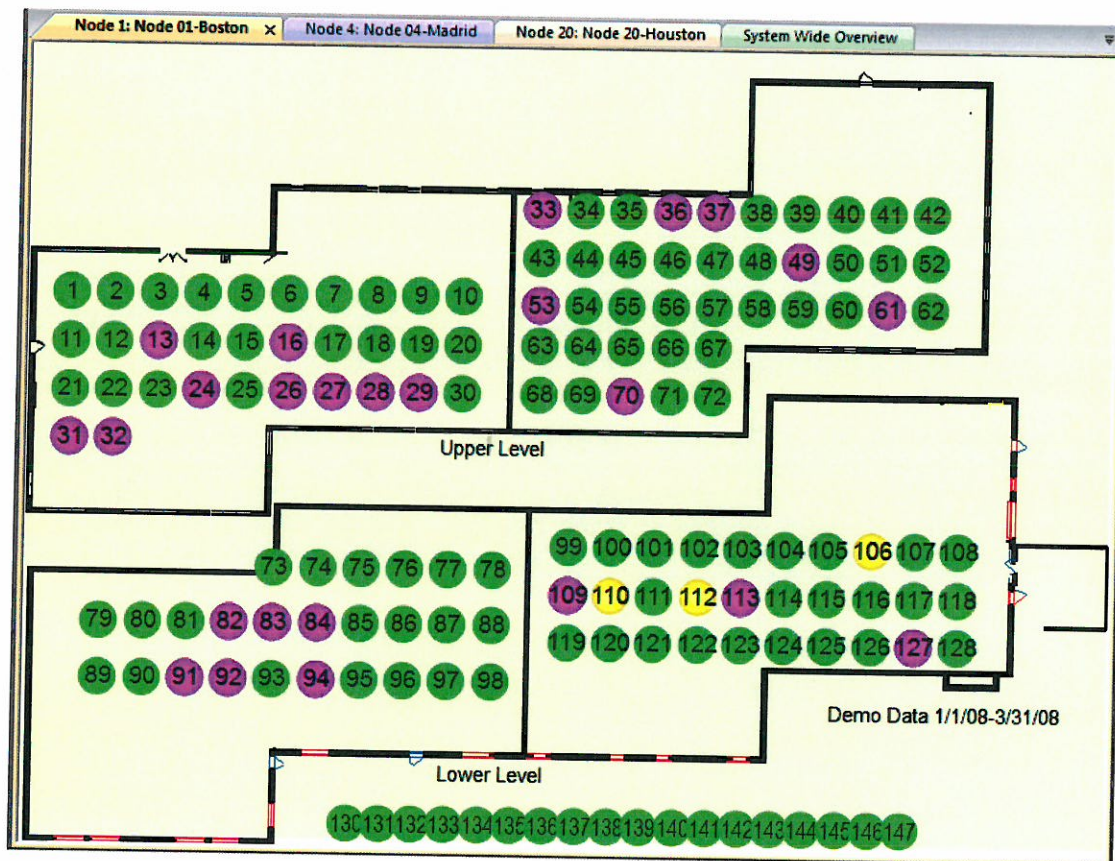
System Tree

The System Tree is an account of all currently open Nodes on the system. Use the Nodes section of the Ribbon bar or the close button at the top of every Node to open/close accessible Nodes. Within the tree you will find Nodes listed in numeric order, with individual sub maps attached to applicable Nodes. For Nodes with sub maps use the expand/collapse buttons to the left of a Node to access smaller zones.



Nodes/Reports Window

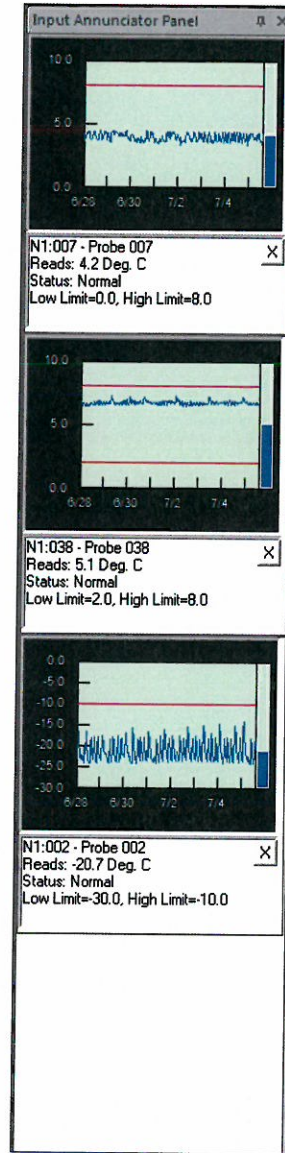
The Nodes Window is a representation of all open Nodes and reports on the system in addition to housing the System Wide Overview. Able to display every open Node on the system, and up to 10 reports/graphs, only the last few objects will be accessible via tabs in the window. Based on the current viewing resolution of the monitor, objects that cannot fit within the tabbed interface are placed in the drop-down menu.



When an individual Node, report, or window object is selected it will gain context. If an object that is not currently visible is selected it will appear in the left most position within the window, supplanting the space in the window for the right most object. To move an object's position simply drag it to the position that you would like. To access those objects that are not currently visible, but open, use the drop down arrow in the upper right-hand corner of the window.

Input Annunciator Panel

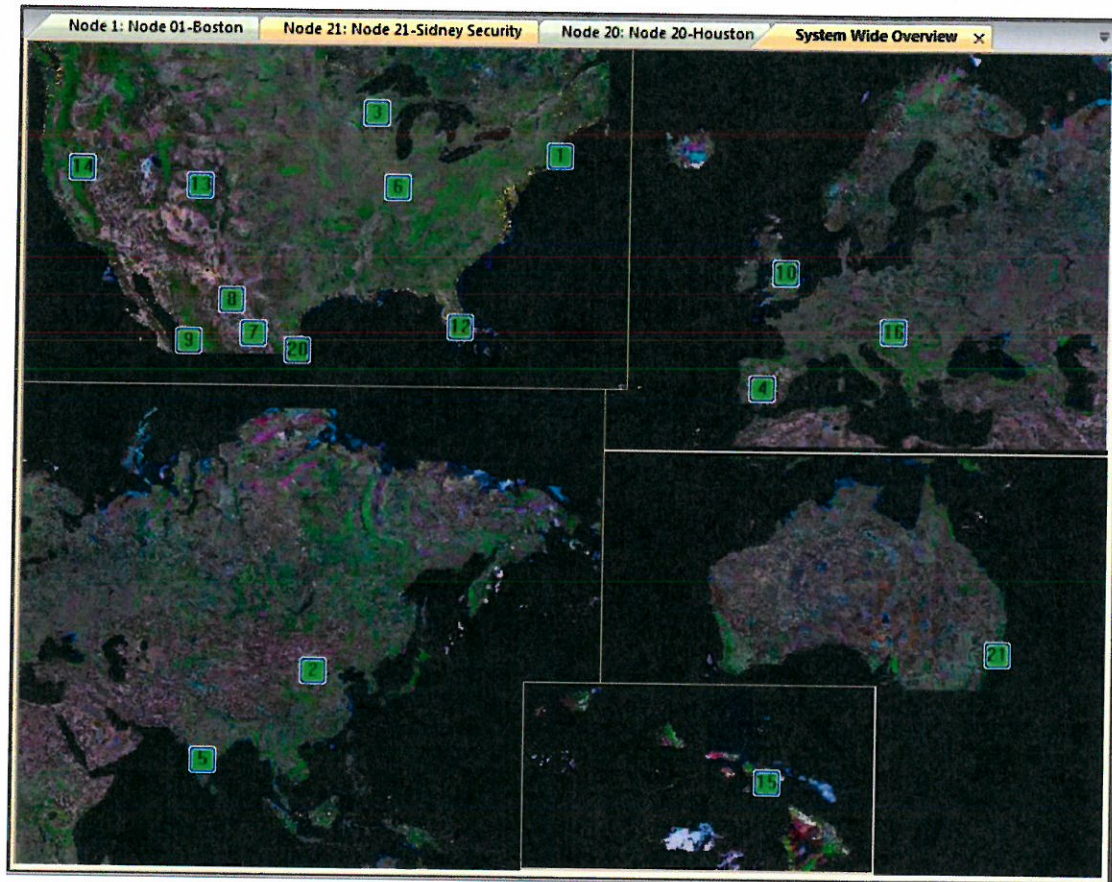
The Input Annunciator Panel serves to house mini-graphs of selected inputs. Graphs within the window automatically show the last 7 days of data in a condensed, easy to see format.



To place a graph in the panel, right-click an available programmed input and select the “Add Mini-Graph Annunciator” option. To close a graph simply drag it off the panel window or hit the X button associated with an individual graph. To rearrange the order of objects within the panel simply drag the graph you would like to see repositioned to its new location.

System Wide Overview

The System Wide Overview provides the end user with an ability to see the status of all of their open Nodes against a backdrop.



If the System Wide Overview is open, whenever an input on an open Node goes into alarm, the representative icon in the overview will turn red. By placing a background image in the overview one can easily ascertain the location of a given Node.

Wireless Subsystem

The Wireless Subsystem Administrator allows a user to configure the system to accept a wide variety of different technologies. Using the application the Node can be configured to accept a mix of wired and wireless inputs, outputs, and be configured to talk to other building systems using BACnet. Used strictly as a backend configuration module the Wireless Subsystem Administrator is the governing director of data.

Wireless Subsystem Administrator Home Screen

Serial #	Input	Last Call	Input Status	Temp (TPT2)	Temp (TPT3)	Temp (TPT4)	Temp (TPT6)	4-20 mA	0-5 Volts
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

The Wireless Subsystem Administrator home screen enables you to quickly ascertain the data flow on the system. The screen is divided into the following sections: Activation and Authorization, MPX Panel number and type, Wireless configuration, Input Window, and various test buttons.

There are two different radio technologies that can be used in the V2 Wireless subsystem. The most common are 2.4 GHz radios using Zigbee technology to provide the most reliable and flexible radio communication scheme that is currently possible. Zigbee is an international standard for network communications via radio that is specifically designed for systems such as this. Under the Zigbee protocol our radios communicate using the most reliable mode of radio communication currently available. This DSSS (Direct Sequence Spread Spectrum) communication is a method by which each bit transmitted is spread out in "chips" over a number of frequencies in a predetermined sequence. The method, originally used by the military to prevent jamming, is widely known for its resistance to interference and its reliability of communication.

The Zigbee standard also allows for each of our radios to relay for the others. That is, any sensor can become a repeater/router for the others. Being a router requires power, and the routers must therefore be plugged into AC power.

Most of the 2.4 GHz modules in a given network will be running on battery. When the devices run on battery, they sleep most of the time in order to conserve battery life, and are therefore unable to relay for other devices. Such devices are called End Point Devices.

The V2 Devices

These devices contain a radio transceiver, and a separate microcontroller along with flash memory, RAM, four analog to digital converter channels, four universal input configuration networks, a battery, a battery monitor, and a power supply that can be connected to AC power.

Each of the four channels can be a completely different input on the system. Obviously, using all four channels reduces hardware cost. However, these wires should NOT be run for long distances. In general, use multiple channels from a unit when the wires are in the same room. Otherwise, use multiple units and leave the extra inputs unused. When systems are specified, the sales people will estimate how many total units to use. The orders will specify how many inputs are licensed. These will be all the inputs that are permitted, even though more hardware inputs will be present. System add-ons will NOT be quoted lower with the assumption that “existing” channels will be used.

How They Work

The Zigbee Radios

These Zigbee radio transceivers can operate on any of 16 different channels in the 2.4 GHz range. All units can both transmit and receive, and all units listen before they talk. These units do not step on each other like the Rees Scientific Version 1 wireless units. All transmissions are DSSS (Direct Sequence Spread Spectrum) transmissions that are extremely resistant to interference.

The WiFi Radios

The WiFi radio transceivers operate over 13 channels in the now ubiquitous 2.4 GHz WiFi range. Capable of connecting to 802.11 b/g/n networks, modules that use these radios make use of ever larger WiFi backbones found in today's businesses. These radios are capable of the following encryption types: Open, WPA-PSK, WPA2-PSK.

Device Programs

The V2 Devices contain three programs actually. Each chip has a manufacturer supplied loader program. We use this program, along with a “dongle” to load our boot loader program. Our boot loader has the basic capability of communicating on the radio to allow an upload of the main program via radio. The main program takes care of reading the inputs, reporting the readings, logging the readings data into its 7 day flash memory log, and, most important of all, re-establishing communications if they should be interrupted.

The main program and the boot loader can be upgraded automatically over the radio in all of the units via the Wireless Subsystem Administrator.

Different device types have different serial number structures. The last 2 digits are the version number. The second digit indicates the class of the device as follows:

- 10XX - Standard V2-U1, -U2, or -U4 module
- 12XX - V2-TH or V2-THL temperature/humidity or temperature/humidity/light device.
- 13XX - V2-DP differential pressure device.
- 14XX - V2-MPX device.
- 15XX - V2-INBOX device to place inside a freezer or refrigerator.
- 16XX - V2-CH-BASE chirper base device to pick up the signals of chirper modules.

Sleep Mode

Most of the 2.4 GHz devices sleep most of the time. They are not monitoring their buttons, and they are not listening to the radio while they are sleeping. Thus you will sometimes need to wait for the devices to wake up before they will respond to you. This happens when you press a button (other than the reset button), and this happens when you try to get their attention via radio. These devices use vastly less power when sleeping than when awake. The batteries will last for about 60 hours of wake time, as compared to about a year of normal sleeping-and-pulsing usage.

The 2.4 GHz radios use more power when they are not in good communication with the coordinator. Thus their batteries **MUST** be disconnected when they are not fully commissioned and in service.

Associated and Disassociated

The radios “associate” with the next one up in the chain. They can’t communicate unless they are associated with another radio on the network. The coordinator is given a PAN ID(usually 1007 for the first network, 1008 for the next, etc) by the installer. When the coordinator starts, it will seek an open channel on the given PAN ID and then use it. As the other devices successfully join the network, they will memorize the PAN ID. Later, they will **NOT** join a network that has a different PAN ID unless you manipulate the RESET, PING, and JOIN buttons as described below.

It is extremely important that each coordinator on a given site be given a unique PAN ID. V2 modules can choose to associate with coordinators far away that you think are out of range. When they do so, they will **NOT** communicate with the controller you are expecting them to communicate with.

Firmware Upgrades via Radio

Upgraded firmware can be transmitted into these units via radio. This is done using the Wireless Subsystem Administrator. The module firmware is contained in two files, image.img and smimage.img that are normally located in the same folder (c:\reessystem) as the Wireless Subsystem Administrator program. These files can be replaced with new versions that can then be squirted via radio into the modules.

There are two methods. To upgrade a single module, select the module either from the dropdown box, or from the list of inputs. On the Module control box, you will see a button labeled “StrtUpgd”. Press this button. After a few minutes, the box to the right should begin to count up as the module program is sent. Wait till it is done, and the new firmware should boot. Once it does, you should see the new version number under “Version” in the list of inputs.

Occasionally, the download gets interrupted in the middle. When this happens, eventually the watchdog in the module will reboot the module and it will enter its bootloader. This simpler

program will show up in the Wireless Subsystem Administrator inputs list either as a version number in the 100s or you will see that it “ticks” but stays offline. In that event, try the upgrade again.

If all else fails, and a unit enters a non-recoverable state, you can force it to run the boot loader by pressing the RESET button, then waiting for the blue LED, then pressing the PING button. The unit will then run the boot loader and accept a new program over the radio. If this also doesn’t work, replace the module and tag the one being replaced to indicate that it got messed up during a field upgrade. The factory can re-image these units.

The Wireless Subsystem Administrator can also upgrade all units in the network automatically. There is a check-box on the main screen that will start this operation. There is also a box that indicates Update EOLs. This box allows you to selectively update either the routers or the End of Line devices. Normally, it is recommended to update the routers first, and then the End of Line devices.

Channel 25 and 26

These channels are sometimes selected especially because they are completely outside the normal WiFi spectrum in the United States. These channels are normally blocked from use in the 2.4 GHz radio modules and in the Wireless Subsystem Administrator. If you want to use these channels, you can block other channels and open these up using the Channels dialog box.

NOTE: Due to potential cross-talk, you should not open up more than 12 consecutive channels.

NOTE: The sensor modules will not normally communicate on channels 25 or 26 because these channels are masked off just as they are at the coordinator end as controlled by the Wireless Subsystem Administrator. To get the sensor module radios to operate on channels 25 or 26, you should press the JOIN button one more time after setting the PAN ID as described above. The blue LED will blink one more time letting you know that the change was accepted. Once the change is accepted, channels 11, 12, 13, and 14 will be masked off in the module, and all the rest will be open. This can only be done with firmware versions 1016 and above.

With earlier versions it was still possible to use channels 25 and 26. To do so, you would mask off channels 11, 12, 13, and 14 in the Wireless Subsystem Administrator, then get all of the sensor modules communicating, then make sure that all were “pinged” (because the ping sent them the modified channel mask that would open up use of 25 and 26). Once this was done, the rest of the channels could be masked off except for 25 and 26, and the radios would find the coordinator on 25 or 26.

High-Power Radios

There are higher powered radios available that can be helpful to span larger distances. These radios can be either coordinators or sensor module radios and are fit in place replacements for the stock

radios. Before changing the radios, it is necessary to decide which to change. Zigbee Wireless communications are bi-directional. Normally you will change the radio in a router that is placed near a collection of sensors, and that will then allow the whole collection to communicate further by relaying their communications. On the other end of the bi-directional communication, you will either put the high-powered radio in another router, or replace the coordinator with one.

Each of the higher power radios is shipped with an antenna. First generation high power kits are shipped with an additional capacitor while newer generation products have that component integrated into the board. To install them in a sensor module, unplug the existing radio and set it aside. Plug in the high-powered radio being careful to get its screw connector to exit the box via the existing hole. Install the capacitor across the battery terminals being careful to respect the polarity of the capacitor, which is clearly marked on it and on the battery terminals. Install the antenna and close the box.

To replace the radio in a USB coordinator, you should first note that coordinators and sensor radios are different. The coordinators are color coded with red dots or red paint. To replace the onboard coordinator, you will take the coordinator apart carefully. The external box covers an internal pod that is held together by an adhesive label and small plastic tabs. Normally you should remove the adhesive labels first, and then gently slide a screwdriver under the tabs in the front to pry the unit open. Replace the radio, and, if a hole for the antenna doesn't exist in the outer enclosure, drill a hole for it in the side in such a way that the wires will not be broken when the wire exiting the enclosure is pulled. Install the antenna and close the box.

To replace the radio in a NET Coordinator, you should first note that coordinators and sensor radios are different. The coordinators are color coded with red dots or red paint. To replace the onboard coordinator, simply remove the existing and plug in the replacement allowing its antenna connector to exit the enclosure from the existing hole. Install the antenna and close the box.

The Blue LED

The blue LED indicates a number of things. Generally, when the unit is awake, the LED is lit, and when the unit transmits data, the LED blinks. The LED also blinks to indicate signal strength during a ping session.

The Ping Button

This is a multi-use button. It is used to configure the PAN ID, but it is also used to ping the base and show signal strength.

When (and only when) the Wireless Subsystem Administrator is up at the base station, and none of the sub-dialog boxes are displayed, you can begin a ping session from the end device or routing transmitter by pressing and holding the PING button. You will need to hold this button until the unit

wakes up (LED lights). Then release the button and wait. Sometimes it takes a minute for the radios to figure out the routing from the coordinator to the radio in your hand, and then, a bunch of pings will come through at once. This is normal. Once the routing has been worked out, and by the radios the PING session is proceeding smoothly, the blue LED blinks to indicate signal strength. Many clicks indicate a strong signal. When the signal drops below two clicks, the signal is weak enough to be suspect.

In the Wireless Subsystem Administrator, you will see the actual signal strength in -dBm. Larger numbers indicate weaker signals. Numbers above 75 show weak signals.

NOTE: the signal strength shown is the last packet received. This might NOT be the pinging packet from the coordinator. Mostly, the readings are stable, but rely on repeated pinging to get a good answer.

The JOIN Button – Setting up a System

The normal method of setting up these systems is to install one coordinator at a time, start the Wireless Subsystem Administrator, then choose the number of clicks to set the PAN ID.

To set the PAN ID that a unit is on, press the RESET button first, then, after the blue LED comes on release the RESET button and press the JOIN button. The LED should go out. Press the Ping button repeatedly to count up to the desired PAN ID. Each press should result in a single LED flash.

This will completely reset the radio parameters and join it with the desired PAN.

NOTE: It is very important to make sure that the PAN ID for each coordinator is unique. Otherwise, the possibility exists that a radio may join the wrong coordinator. If it does, then it will be happy and will never properly communicate with the base coordinator that you are setting up.

NOTE: The radio communications can be set to be encrypted as follows. In the [NODE] section of the centron.ini file place the entry "Encrypted=1". This will activate encryption for ALL V2 Zigbee modules. Then, when setting the clicks for each module, press JOIN twice after you have clicked PING the desired number of clicks as described above. This works with firmware versions 1X21 and above and Presidio software.

Coordinators

Coordinators are a main component of each Zigbee network and operate as the base station for an individual mesh. Each Coordinator on a system has a unique PAN (Network ID) for which each Zigbee device on that network must be programmed. Coordinators can be either directly connected to a computer or communicate over the network.

USB Coordinators

There is only one USB Coordinator per Zigbee network and it will determine the PAN (Network ID) and the operating channel. The other devices on the Zigbee network will “join” the network starting at the coordinator.

NET Coordinators

Areas that are outside the reach of USB coordinators can be coupled to the system using the Zigbee NET devices. These are network-connected coordinators that then manage a completely independent network of Zigbee devices. Due to the fact that individual end devices have integrated buffering capabilities, Zigbee NET devices do not need and do not have any buffering capability. Each NET comes with an integrated 4 hour battery backup, and up to 20 of them can be coupled to a single Node.

End Devices

Endpoint Devices or “End” devices are battery-powered units that monitor inputs and join to a coordinator or a router. The device that the End Device joins to becomes its “Parent”. Coordinators and routers can only have 8 children. Thus, you need at least one router or coordinator for each 8 Endpoint Devices. Endpoint Devices wake up every 25 seconds and take a reading.

Routers

Routers are Zigbee devices that are always-on which serve to relay transmissions for other devices. In the system these devices are exactly the same as the others, but they are plugged into AC power. In router mode, the battery is used only as a battery backup. Routers transmit their readings every 15 seconds.

When you plug an Endpoint Device into AC power, after about 15-30 seconds it will “Promote” to become a router. If you remove AC power from a router, it will “Demote” to become an End Device. If the device has been a router for less than an hour, it will demote within about 15 to 30 seconds. After an hour, the units will remain routers for four hours, after which time they will “Demote”. This is done to support full network function for four hours after a power outage.

NOTE: While Zigbee Routers come with an integrated battery backup, that backup is intended to power the device only during power outages and provides approximately 100 hours of total reserve. Care should be taken to avoid the continued plugging and unplugging of these devices as the battery will be quickly depleted.

System Alerts

The Low-Battery/AC Power Alarm

All of the devices monitor their battery voltage and the AC line voltage. Endpoint Devices will show a battery alarm when the battery gets weak. Router devices will show a power alarm immediately if they lose AC power.

Watchdog Timer

Each unit has an internal watchdog timer that will reboot them if the program should crash for any reason.

Error Log

Each unit maintains an internal error log somewhat like the Centron.txt file. This log can be downloaded for diagnostics using the Wireless Subsystem Administrator. Critical events such as loss of communication, router promotion/demotion, radio associated/disassociated, reboot, software upgrade and so on are logged.

Wireless Subsystem Administrator

Wireless Subsystem Administrator

Request Code: ☒ MPX 1 ☐ MPX 5

Activation: ☐ MPX 2 ☐ MPX 6

☐ MPX 3 ☐ MPX 7

Re-License ☐ MPX 4 ☐ MPX 8

Serial #	Input	Last Call	Input Status	Temp (TPT2)	Temp (TPT3)	Temp (TPT4)	Temp (TPT6)	4-20 mA	0-5 Volts
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Field	Description
Request Code/Activation:	You must authorize the Wireless Subsystem Administrator before many functions will work.
Re-License	This allows you to re-license the Node for a specific number of inputs etc.
MPX (1-8)	These radio buttons decide which panel is being displayed. Choose between the following: <div> <div>Wired</div> <div>Existing hardwired MPX panels with 4-pin din connectors.</div> <div>Wireless</div> <div>Version 1 Wireless devices.</div> </div>

BACnet	Expose the Node's inputs to other BACnet devices.
Zigbee	Version 2 Zigbee mesh devices.

Generate Wireless Inputs.txt File This will print the results of the Wireless Subsystem Administrator test.

Program V1 Connection Opens the V1 programming window.

Program V2 Connection Opens the V2 programming window.

Input Display Window Displays every input added to the system.

Serial #	This shows the V2 device serial number and channel listed.
Lastcall	Last time a chirp from the device was heard.
Missed Chirps	Number of times the device has failed to chirp at the expected time during this test run.
Signal Strength	Strength measured from the last chirp – The Wireless Subsystem Administrator pings each device in sequence. Strength is in -dBm. High numbers in the high 70s are weak signals, low numbers are strong. Units reporting signal strengths of greater than about 75 should be moved to locations with better signals.
Age of Ping	Endpoint devices chirp every 25 seconds. Routers chirp every 15 seconds.
Input Status	Shows OK and if it is a router (-R) or Endpoint (-E).
Version	Shows the software version of the device.
Reads	Shows the current reading.
Type	Shows the type of input as programmed within The Wireless Subsystem Administrator.

Battery Voltage	Shows the battery voltage for End of Line devices.
Supply Voltage	Shows the mains supply voltage.

Ping All Modules This sends a Ping broadcast to help get the units ready for the
Wireless Subsystem Administrator test.

Restart Test Clears the test parameters such as the missed chirp count.

Program V1 Connection

Connect V1 Device

Com: <None>

IP1: 155.155.1.210

IP2:

IP3:

IP4:

IP5:

IP6:

IP7:

IP8:

IP9:

IP10:

Nothing

RF-NET-BUF

Nothing

Nothing

Nothing

Nothing

Nothing

Nothing

Nothing

Nothing

Nothing

MPXs Assigned

OK

Cancel

Connect and Program Remotes

Field	Description
Com:	COM port number of a locally connected Receiver or BUF device. Select the applicable COM port from the list.
IP (1-10)	IP address of any available RF-NET devices. Manually enter the IP address of a device.
Drop-down selection	Select the applicable device type from the list
MPXs Assigned	Select the applicable MPX panel that the device will be assigned to using. The leftmost box refers to Panel#1, the rightmost box to Panel#8.
Connect and Program Remotes	Connect and program the system to use any entered devices.

Program V2 Connection

Connect V2 Device

Scan for V2Nets

Com: <None>

	Clicks	CH	Chg	Connect
IP1: 155.155.1.121	OK	MPX	Chg	Connect
IP2: 155.155.1.178	2	12	Chg	Connect
IP3:			Chg	Connect
IP4:			Chg	Connect
IP5:			Chg	Connect
IP6:			Chg	Connect
IP7:			Chg	Connect
IP8:			Chg	Connect
IP9:			Chg	Connect
IP10:			Chg	Connect
IP11:			Chg	Connect
IP12:			Chg	Connect
IP13:			Chg	Connect
IP14:			Chg	Connect
IP15:			Chg	Connect
IP16:			Chg	Connect
IP17:			Chg	Connect
IP18:			Chg	Connect
IP19:			Chg	Connect
IP20:			Chg	Connect

OK Cancel

Modules Authorized: 128

00000000-00000000

☐ AutoUpdate ☐ Update non-routers

☐ Use Wifi ☐ Program Wifi Modules

Field	Description
Scan for V2Nets	Automatically scans the network and populates a resident list of available Zigbee NET devices.
Com:	COM port number of a locally connected USB Coordinator device. Select the applicable COM port from the list.
IP (1-20)	IP address of any available Zigbee NET devices. Manually enter the IP address of a device or use the drop-down menu to select from the existing list.
Clicks	The Network ID of a connected Coordinator. MPX-NET devices do not have an ID and as such a connected device will show as being

“OK”.

CH	The applicable channel that the connected Coordinator is currently using. MPX-NET devices do not have a channel and as such this field will be populated with the moniker “MPX”.
Chg	This button allows you to change the channel or PAN for this coordinator.
Connect	Press this button to connect to an applicable Coordinator.
Modules Authorized	The number of Zigbee modules currently that the system is currently licensed for.
Drop-down Selection Window	The serial number of any connected Zigbee Endpoint modules. MPX-NET devices will be listed as being all 0's with only rightmost digits populated.
AutoUpdate	Check this box to update the software in all Zigbee devices on the system.
Update non-routers	Update only end devices.
Use Wifi	Adds the ability to use modules with the Node that employ WiFi.
Program Wifi modules	Opens the Wifi programming window.

Zigbee Device Control Dialog

When one of the Zigbee devices is selected in the dropdown box by its individual serial number the device control dialog box will appear. This box allows control over a specific module and shows the data being received from the device in real time.

Field	Description
Add Inputs	Select the input number from a specific module that you would like to add to the system in this box.
Ping Mode	Check this box and The Wireless Subsystem Administrator will begin actively pinging the selected Zigbee device.
Get Error Log	Retrieve and view the error log from the device
StartUpgrade	Upgrade the software in the device.
Cmd	Fill in a specific command to send to the device or to its coordinator.
Param	Fill in a parameter for the command.
SendLocal	Send the command to the coordinator.
SendRemote	Send the command to the specific V2 device.

Received Data Box	Shows the data sent by the device in the last chirp.
Large Data Box	Results from current process.
Count	Counts the chirps received.
Output-8 Board	Set the device to control an output board as selected by the dropdown box.
Single Beeping	Set the alarm output number for a module with an internal piezo buzzer alarm.
Single Continuous	Set the alarm output number for a module with a single output relay or piezo buzzer.

Select Channels Dialog

Select Channels

Clicks: 2 PAN: 1009

Current Channel = 12

OK

Cancel

Unusable Channels

- ☒ Channel 11
- ☐ Channel 12
- ☐ Channel 13
- ☐ Channel 14
- ☐ Channel 15
- ☐ Channel 16
- ☐ Channel 17
- ☐ Channel 18
- ☐ Channel 19
- ☐ Channel 20
- ☐ Channel 21
- ☐ Channel 22
- ☐ Channel 23
- ☒ Channel 24
- ☒ Channel 25
- ☒ Channel 26

Channels 11, 24, 25, and 26 default to unusable.

Note: Do not open more than 12 contiguous channels. Radios can crosstalk between channels separated by 12. High powered radios cannot use 11, 25, or 26.

This channel structure will be pushed into remote units by Testwireless pings. If you change the channel to one that was previously masked off and sent to the remote units, you will lose connection.

To open up the mask again in a remote unit, press JOIN after RESET, and reset PAN ID.

Reset Coordinator

Cmd: Parm:

SendLocal

155.155.1.178: 0013A200-404893BD Log contains fro

This dialog allows you to change the Clicks (Network ID) or the channel for one of the Zigbee networks. Caution – If you change the Network ID, you may have to go around to all of the Zigbee devices and press RESET then JOIN, then PING for the appropriate number of clicks to get them to accept the new ID. The network ID should normally be assigned before the devices are deployed. Each coordinator on a site should be assigned a unique Network ID so that the devices will know whom they are supposed to talk to.

Field	Description
Clicks	Enter the number of Clicks (Network ID) that you would like the given Coordinator to be addressed to.
Unusable Channels	Select channels that are not to be used in this dialog.
Cmd:	Fill in a specific command to send to the coordinator.
SendLocal	Send the command to the coordinator.

Experience has shown that coordinators can be overwhelmed with too many radios attempting to join the network at the same time. If this should occur, it may become necessary to press the Reset Coordinator button, which will issue a hard reset to the coordinator.

WARNING: Do not connect more than 40 modules to a single coordinator. It can lead to an avalanching crash situation wherein the modules overwhelm the coordinator and all units go offline.

WARNING: Make sure PAN IDs are unique on a given site. Otherwise modules may join the wrong coordinator.

Guidelines for Installation

Mixing Technologies

These units can be mixed and matched with wired, Version 1 wireless, and/or with BACNet sensors. Using the Wireless Subsystem Administrator each bank of 16 inputs can be programmed as a virtual remote panel using a different technology.

Connecting Sensors and Wire Lengths

These units all have four universal inputs. The inputs are configured using input jumpers in the same way that remote panels are configured. In addition, there is a Temperature/Humidity unit, and a Temperature/Humidity/Light unit. Wires should not be run long distances from these units. In general, if the sensor is in a different room, use a different unit. Do not run the wires for more than 25 feet.

Any sensor on any Zigbee Endpoint device or Router can become any input on the system. There is no need for them to be sequential or any other such restriction.

Licensing of Inputs

All jobs will be specified with a specific number of sensors. The transmitters specified will be 1 input, 2 input or 4 input units. This does NOT have anything to do with the actual hardware capability of the devices. All devices are actually 4 input units (except for the T/H and T/H/L units.)

The number of inputs specified will be licensed through the Wireless Subsystem Administrator. Once a Node is licensed for a specific number of inputs, additional units will not be able to be added to the system until this number is increased.

During installation, you may find a need for routers that are just for relaying. Units can be dedicated for this purpose.

Bootup of Node and the V2 Logs

When you start the Node program it begins downloading the logs from the devices. Because they are sleeping, and because the logs can be large, this process can take quite a while. For 22 devices, experience says that the process will finish in about 7 minutes.

The download is intelligently managed. There is a parameter stored in the database that shows the last time that all of the devices were up-to-date. The Node will normally only download data that occurred since that date.

NOTE: The Node can be started with a /z option which will cause it to ignore this parameter and download all available data.

Deployment of Zigbee Devices

During installation the best rollout will occur by deploying routers first. Place them in their approximate locations based upon their given range. Return to the Wireless Subsystem Administrator and look at all of the applicable signal strengths, relocating any that show up as weak.

Note that these devices can associate to the WRONG device and can show a weak signal when they should see a strong one. To avoid this, be careful to make sure devices are associated with the router or coordinator that you intend them to be associated with.

The routers will probably be on battery and thus Endpoint Devices (LED out) as you place them. When you plug them in, they will disassociate as Endpoints and re-associate as routers. This will cause them to locate the nearest router and the wrong device pairing will not occur.

Once the routers are placed satisfactorily the Endpoint Devices can be placed as needed. Keep careful notes of all module placements.

NOTE: As you place the Endpoint Devices, be sure to press the RESET-JOIN-PING sequence to place them on the correct PAN and to ensure that they associate with the nearest router.

The Test

The test is now a combined Wireless Version 1 and V2 test. Both tests run simultaneously and a failure of either one will show as a failure of the test. When you are done, you will get a printout such as below.

Wireless Test Status after 34 Minutes: PASSED!

-----Version 1 Wireless Inputs-----

Inpt	Serial #	Avg Pred	Location
33:	28997F3000000073	11 1.0	Location: _____
34:	7096515C00000000	8 0.7	Location: _____
65:	7106636000000000	9 0.8	Location: _____
66:	6085405400000000	9 0.6	Location: _____
67:	6085405400000000	9 0.6	Location: _____
81:	284A041E00000096	12 1.1	Location: _____
82:	28C8B42700000086	11 0.8	Location: _____
83:	28C8B42700000086	11 0.8	Location: _____
84:	28B598270000008D	10 0.8	Location: _____

Version 1 Wireless Input Test Status: PASSED!

-----Zigbee (Version 2) Inputs-----

Inpt	Serial #	Missed Signal	Location
		Count	Strength
1:	0013A200-400A0F0F:1	0 70	Location: _____
2:	0013A200-400A0F0F:2	0 70	Location: _____
3:	0013A200-400A3DF0:1	0 56	Location: _____
4:	0013A200-400A3DF1:1	0 52	Location: _____
5:	0013A200-403E1502:4	0 61	Location: _____
6:	0013A200-400A3E00:1	0 58	Location: _____
7:	0013A200-400A3DEE:1	0 52	Location: _____
8:	0013A200-400A3D5C:1	0 49	Location: _____
9:	0013A200-400A3D37:1	0 50	Location: _____
10:	0013A200-400A3D51:1	0 50	Location: _____
11:	0013A200-400A3D43:1	0 52	Location: _____
12:	0013A200-400A3D59:1	0 53	Location: _____
13:	0013A200-400A3D5F:1	0 58	Location: _____
14:	0013A200-400A3D50:2	0 51	Location: _____
15:	0013A200-400A3D58:3	0 50	Location: _____
16:	0013A200-400A3D57:4	0 49	Location: _____
49:	0013A200-400A3D4E:2	0 48	Location: _____
50:	0013A200-400A3D4D:1	0 47	Location: _____
51:	0013A200-400A3D4D:2	0 47	Location: _____
52:	0013A200-400A3D4D:3	0 47	Location: _____
53:	0013A200-400A3D48:1	0 64	Location: _____
54:	0013A200-400A3D4C:1	0 56	Location: _____

55: 0013A200-400A3D4F:1 0 57 Location: _____
 56: 0013A200-400A3D52:1 0 54 Location: _____
 57: 0013A200-400A3D55:1 0 48 Location: _____
 58: 0013A200-400A3D5F:2 0 58 Location: _____
 59: 0013A200-400A3DFE:1 0 65 Location: _____

Zigbee Input Test Status: PASSED!

-----Bacnet Inputs-----

Inpt	BacnetID	M	B	Units
------	----------	---	---	-------

-----Bacnet Names-----

Note: The BacnetID (e.g. "13-6-0") is a unique identifier of a bacnet input.
 It is the Device ID, followed by the Object ID, followed by the object type.

Assigning an IP Address

Lantronix Device Installer

The Net Coordinators can be configured using the Lantronix Device Installer Program.

Software Installation

Install the Lantronix Device Installer by running the **V2NetDeviceInstaller.exe** program found in the *C:\V2WirelessDrivers* folder of the node.

If this program is not in the folder, it can be found on the installation.

Hardware Setup

Apply power to the Net Coordinator using the 7.5 Volt DC wall transformer.

Connect the device to either a workstation running the DeviceInstaller (using the red crossover cable) *or* to an active network drop

Assigning an IP Address

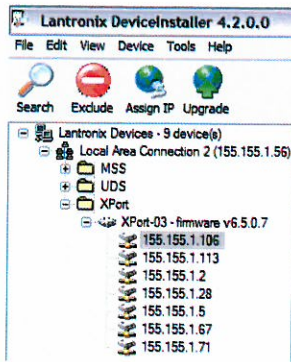
Click Start -> Programs -> Lantronix -> DeviceInstaller -> DeviceInstaller

Select the unit from the list of Lantronix devices found on the local network.

NOTE: If the Net Coordinator was connected to the network and no devices were found in the Lantronix program, try connecting the unit directly to the workstation using a crossover cable *or* use the **ARP** method found in section 3 of this manual.

Expand the *Xport* folder from the left window pane and highlight the IP that was automatically assigned (using DHCP) to the device.

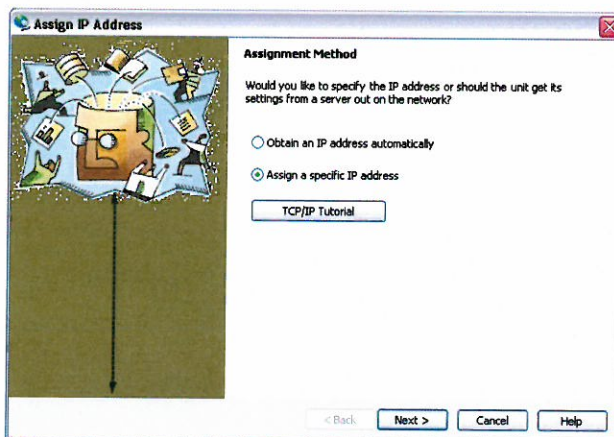
NOTE: If multiple IP's appear it may be necessary to disconnect a NET Coordinator then click the *Search* icon to see which IP address disappears from the list. The IP will reappear after the unit is reconnected.



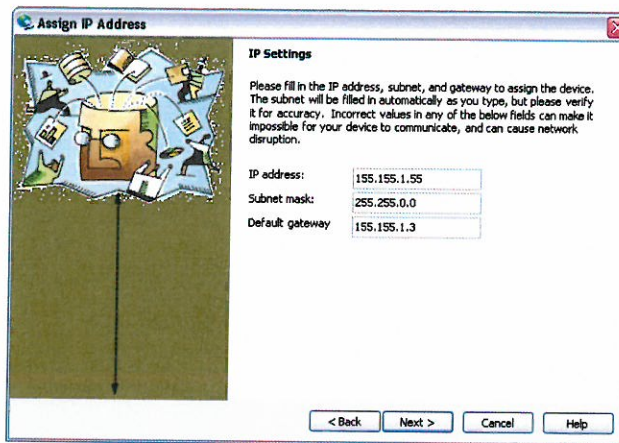
Click the **Assign IP** icon.

If prompted, enter the hardware address (on the product label) and click **Next**.

Select **Assign a specific IP address**, then click **Next**.



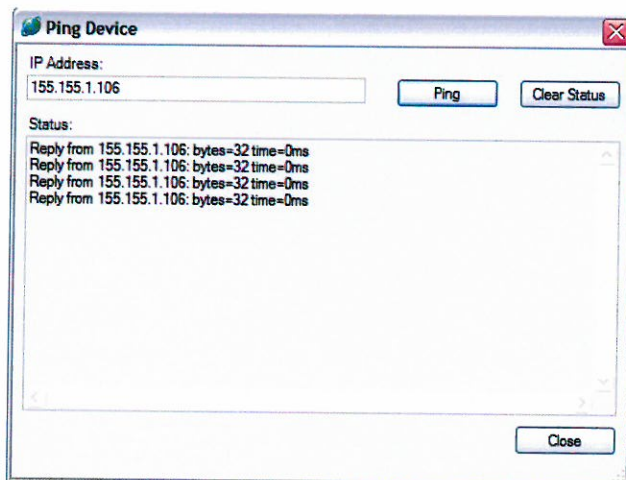
Enter the desired *IP address*, *Subnet mask*, and *Default gateway*, then click **Next**.



Click **Assign**, wait for confirmation message, then click **Finish**.

Select the device from the main window list and select **Ping** from the **Tools** menu. The *Ping Device* dialog box will show the IP address of the selected unit.

Click the **Ping** button and the results will display in the Status window.



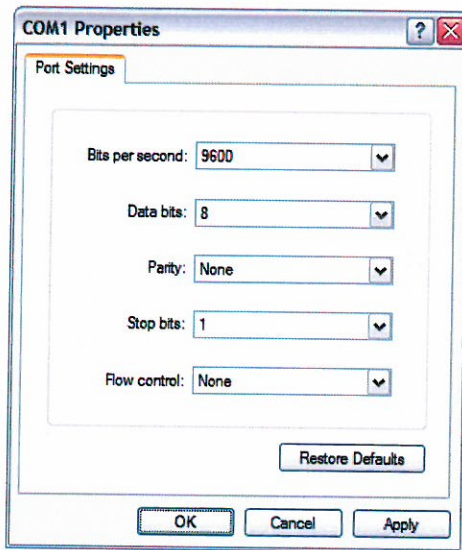
Note: If you do not receive Reply messages, make sure the unit is attached to the network properly and the IP address assigned is valid for the particular network segment you are working with. If you are not sure, check with your systems administrator.

Click the **Close** button to close the dialog box and exit the program.

Serial Port Login

To assign the IP address and other network settings using a serial connection:

After connecting the NET device to a workstation's serial port, run Windows Hyperterminal with the default port settings of 9600 baud, 8 bits, no parity, 1 stop bit, no flow control. Click **OK** to connect.



To enter Setup Mode, cycle the unit's power (power off and back on). After power-up, the self-test begins and the red Diagnostic LED starts blinking. You have one second to enter three lowercase "x" characters.

NOTE: The easiest way to enter Setup Mode is to hold down the x key while powering up.

Select 0 (Server Configuration) and follow the prompts until you get to IP address.

Enter the new IP address, subnet mask, and gateway.

Select 9 to save and exit Setup Mode. The unit performs a power reset.

ARP and Telnet

If the unit has no IP address, you can use the Address Resolution Protocol (ARP) method to assign a temporary IP address:

Open a Windows command prompt: *Start -> Run: cmd*

Enter the following command line (where 191.12.3.77 is just a temporary IP address and 00-20-4A-XX-XX-XX-XX is the MAC address found on the inside of the device.

```
arp -s 191.12.3.77 00-20-4A-XX-XX-XX-XX
```

Open a Telnet connection to port 1 by entering the telnet command below. The connection fails quickly, but the unit temporarily changes its IP address to the one designated in this step.

```
telnet 191.12.3.77 1
```

Open a Telnet connection to port 9999, and press **Enter** within *five* seconds to go into Setup Mode. If you wait longer than five seconds, the unit reboots.

```
telnet 191.12.3.77 9999
```

Select 0 (*Server Configuration*) and follow the prompts until you get to IP address.

Enter the new IP address, subnet mask, and gateway.

Select 9 to save and exit Setup Mode. The unit performs a power reset.

DHCP

The unit ships with a default IP address of **0.0.0.0**, which automatically enables DHCP. If a DHCP server exists on the network, it automatically provides the unit with an IP address, subnet mask, and gateway when the unit boots up.

You can use the DeviceInstaller software to search the network for the DHCP-assigned IP address and add it to the list of devices retrieved.

You can determine your unit's DHCP-assigned IP address in Monitor Mode. When you enter Monitor Mode from the serial port with network connection enabled and issue the NC (Network Communication) command, you see the unit's IP configuration.

NOTE: This DHCP address does not appear in the unit's Setup Mode or in Web Manager.

AutoIP

The unit ships with a default IP address of 0.0.0.0, which automatically enables Auto IP within the unit. AutoIP is an alternative to DHCP that allows hosts to obtain an IP address automatically in smaller networks that may not have a DHCP server. A range of IP addresses (from 169.254.0.1 to 169.254.255.1) have been explicitly reserved for AutoIP enabled devices. Do not use this range of Auto IP addresses over the Internet.

If your unit cannot find a DHCP server, and you have not manually assigned an IP address to it, the unit automatically selects an address from the AutoIP reserved range. Then, your unit sends out a (ARP) request to other nodes on the same network to see whether the selected address is being used.

If the selected address is not in use, then the unit uses it for local subnet communication.

If another device is using the selected IP address, the unit selects another address from the AutoIP range and reboots. After reboot, the unit sends out another ARP request to see if the selected address is in use, and so on.

AutoIP does not replace DHCP. The unit continues to look for a DHCP server on the network. If it finds a DHCP server, the unit switches to the DHCP server-provided address and reboots.

NOTE: If a DHCP server is found, but it denies the request for an IP address, the unit does not attach to the network, but waits and retries.

AutoIP can be disabled by setting the unit's IP address to 0.0.1.0. This setting enables DHCP but disables AutoIP.

V2-MPX Product Family:

V2-MPX:

Installation and Setup:

The V2-MPX module transmits its signal wirelessly to a nearby V2-NET or USB Coordinator. Care should be taken locating the V2-MPX module so that its transmissions are not blocked by obstructions that would limit reliable signal reception.

The V2-MPX module should be located adjacent to the MPX Panel. This makes for the shortest possible distance for the home run wiring and power connection.

Power Connection:

Power for the V2-MPX can be obtained directly from the +5 Volt DC that is available in the MPX Panel. On older style MPX Panels (MX2 panels with green screw terminal connectors) the power can be obtained from any of the +5 terminals on any input connector.

If connecting to an RJ45 connector based MPX panel, plug an RJ45 cable (MOD-45-CORD) into any unused input and connect the V2-MPX power connection to the Brown / White wire (+5 VDC) and the Blue (GND) wire of the cable. Turn DIP switch position #7 "ON" to provide +5 VDC power to the V2-MPX module.

If all inputs are in use on an RJ45 connector based MPX Remote Panel, the V2-MPX can be powered either by its own AC Adapter (V2-TRANS) or by connecting to the Brown / White wire (+5 VDC) and the Blue (GND) wire of one of the sensor input cables. NOTE: This would require that the sensor input cable be cut and spliced externally. This work should only be done by experienced installers.

If the V2-MPX module is powered by its own AC adapter, the adapter must remain plugged in at all times. The lithium cell located in the V2-MPX module will be exhausted rapidly if used as the only source of power for the V2-MPX. This battery is intended to act as a backup during brief periods of power outage only.

Configuring the V2-MPX:

To configure the V2-MPX the PAN ID of the radio located in the V2-MPX module must be set. If adding the V2-MPX to an existing V2 Wireless system, the PAN ID must match that of the rest of the system that is communicating with the V2-NET or coordinator that is being used by this V2-MPX module.

To determine the PAN ID of the V2-NET or Coordinator open the Wireless Subsystem Administrator.exe program and press the *Program V2 Connection* button. See Figure 1.

To set the PAN ID that a unit is on, press the RESET button first, then, after the blue LED comes on, press the JOIN button. The LED should go out. Press the PING button repeatedly to count up to the desired PAN ID. Each press should result in a single LED flash.

This will completely reset the radio parameters and join it with the desired PAN.

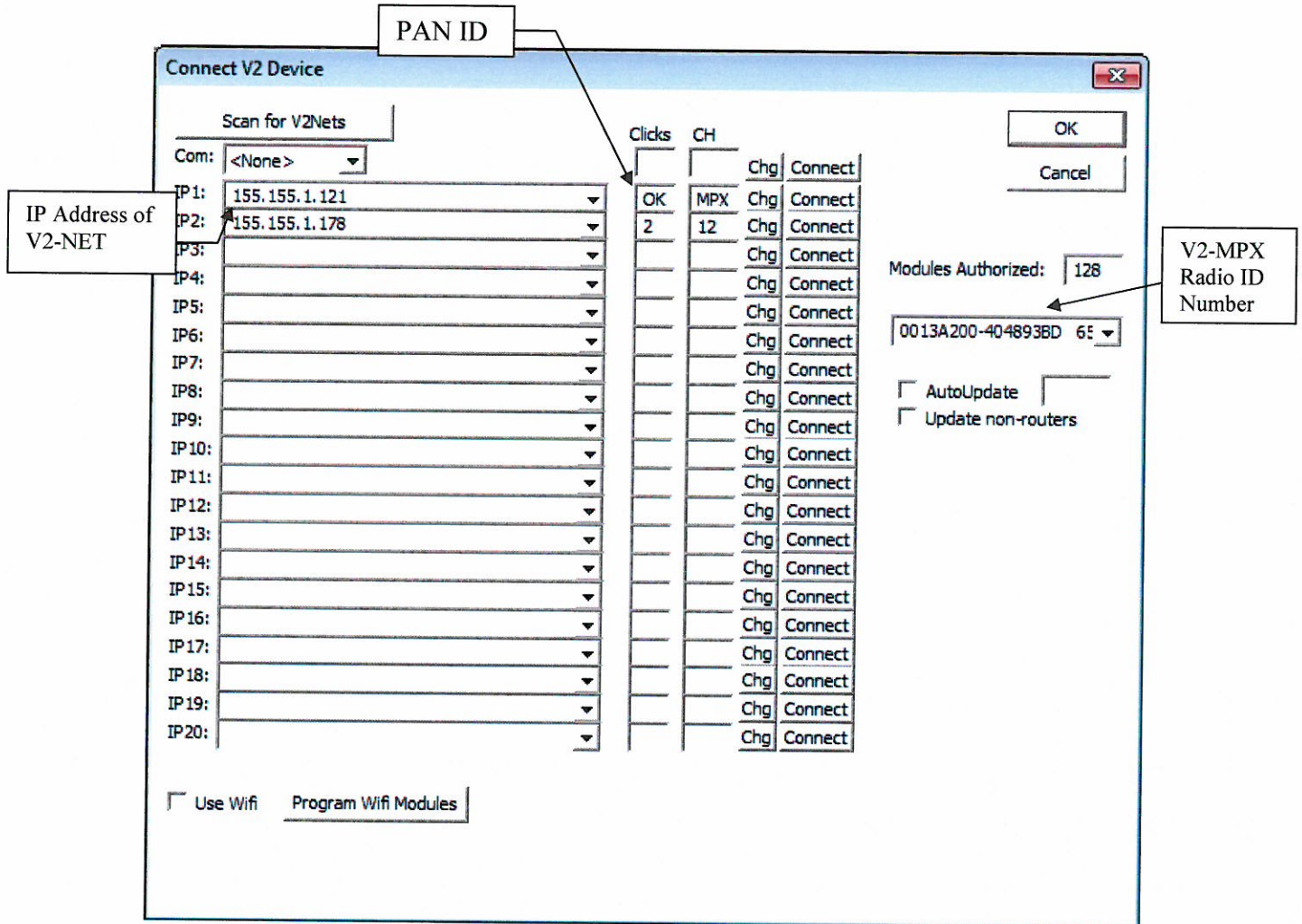


Figure 1: The Connect V2 Devices configuration

In the Wireless Subsystem Administrator window set an MPX panel to Zigbee.

Click the dropdown menu arrow to locate the MPX Radio ID number in the Connect V2 Devices window. Select the MPX Panel that you wish to configure.

Click on the number to display the dialog box shown in Figure 2 below.

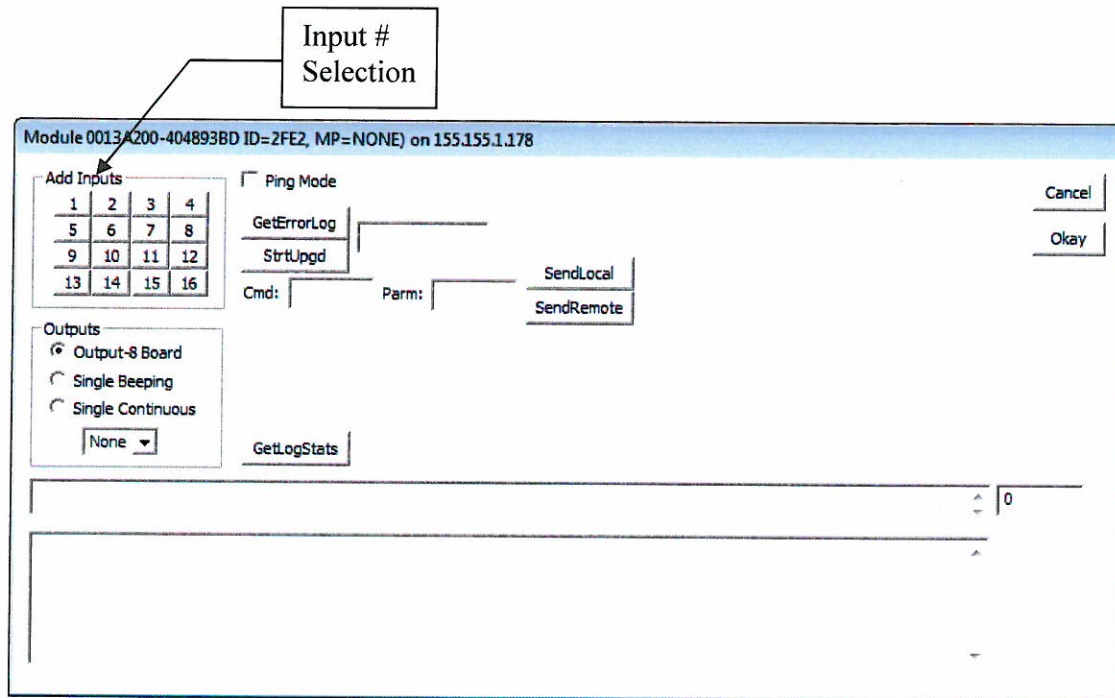


Figure 2:

Click on the number of the input you wish to add. The dialog box shown in Figure 3 below will appear.

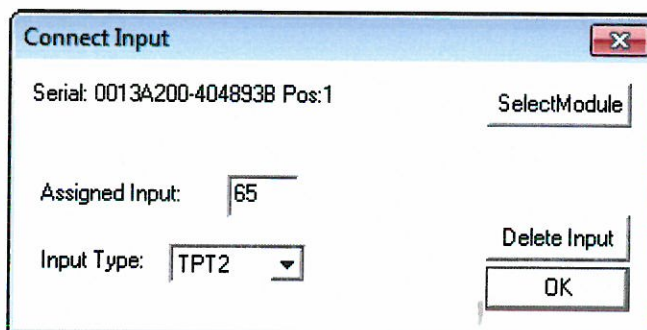


Figure 3.

From the “Input Type” dropdown box, select the type of sensor connect to the input. The example in Figure 3 shows a TPT2 temperature probe. Click “OK” when finished.

Continue to select input numbers and their configurations until all used inputs on MPX Panel #1 have been added. When finished, click the “Okay” button on the right hand side of the dialog box as shown in Figure 2.

Wireless Subsystem Administrator

Request Code: A389629 ☐ MPX 1 Zigbee ☐ MPX 5 Zigbee

Activation: ☐ MPX 2 Wireless ☐ MPX 6 Zigbee

Re-License: ☐ Authorize ☒ MPX 4 Zigbee ☐ MPX 8 Zigbee

Program V1 Connection

Program V2 Connection

Generate Wireless Inputs.txt File

Serial #	Input	Last Call	Missed Chirps	Signal Strength	Age of Ping	Input Status	Version	Reads	Type	Module ID	Parent ID
155.155.1.121:1	49	10	11			OK-E	1419	26.622	TPT2	0000	
155.155.1.121:2	50	10	11			OK-E	1419	34.625	TPT3	0000	
155.155.1.121:3	51	10	11			OK-E	1419	-23.732	TPT4	0000	
155.155.1.121:4	52	10	11			OK-E	1419	4.998	Volts	0000	
155.155.1.121:5	53	10	11			OK-E	1419	4.998	Volts	0000	
155.155.1.121:6	54	10	11			OK-E	1419	4.998	Volts	0000	
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											

Cancel

Ok

☒ Show Parents

☐ Show Batteries

☐ Show Connections

☐ Show DutyCycles

☐ Show Log Stats

Ping All Modules

Restart Test

Total Missed Chirps: 66 Worst Input: 49 3.3 Min Test: INCOMPLETE

Figure 4. The Wireless Subsystem Administrator Window with MPX Panel #4 Inputs Shown.

Figure 4 above shows what the the Wireless Subsystem Administrator window will look like for MPX Panel #4 after adding inputs. In this example, 6 inputs have been added.

The procedure should be repeated for each MPX Remote Panel that will be connected using a V2-MPX module until all inputs have been added. Modifications to the configuration can be made at any time.

V2-MPX-NET:

Installation and Setup:

Power Connection:

The V2-MPX-NET module is powered by its own regulated 7.5 volt DC adapter which must remain plugged in at all times. The battery located in the V2-MPX-NET module will be exhausted rapidly if used as the only source of power. This battery is intended to act as a backup during brief periods of power outage only. **The battery will support the unit for a period of approximately 4-hours.** Once AC power is restored, the battery will automatically recharge.

NOTE: There is no power switch on the V2-MPX-NET unit. This is done to prevent the unit from being accidentally turned off, causing a lapse in communication. The unit is shipped with the lead acid battery installed, but disconnected internally. **The battery leads must be connected to the battery prior to putting the unit in service.**

WARNING: DO NOT use any other type of power adapter other than the one supplied with the unit. In the event of the failure of this power supply, contact Rees Scientific for a replacement. The use of the wrong type of power supply can result in the failure of the NET module or damage to the backup battery.

Configuring the V2-MPX-NET:

To configure the V2-MPX-NET, an IP address must first be assigned to the module. Open the Wireless Subsystem Administrator and press the *Program V2 Connection* button. Activation will be required for initial use or after seven days. Contact Rees Scientific Tech Support for activation.

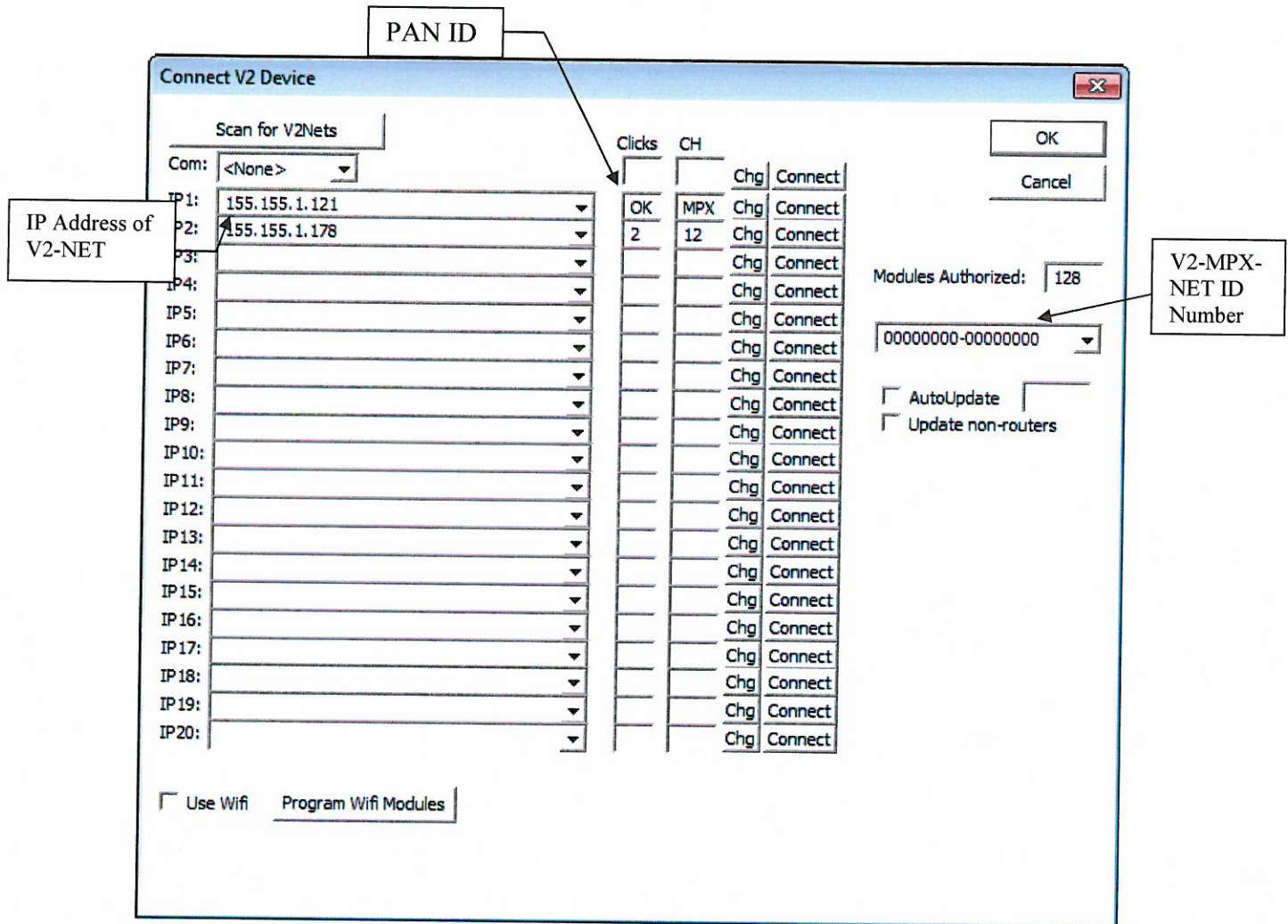


Figure 5: Connect V2 Devices configuration

Click the dropdown menu arrow to locate the MPX Panel ID number in The Wireless Subsystem Administrator. Select the MPX Panel that you wish to configure. This number represents MPX Panel #1. 00000000-00000000.

Click on the number to display the dialog box shown in Figure 6 below.

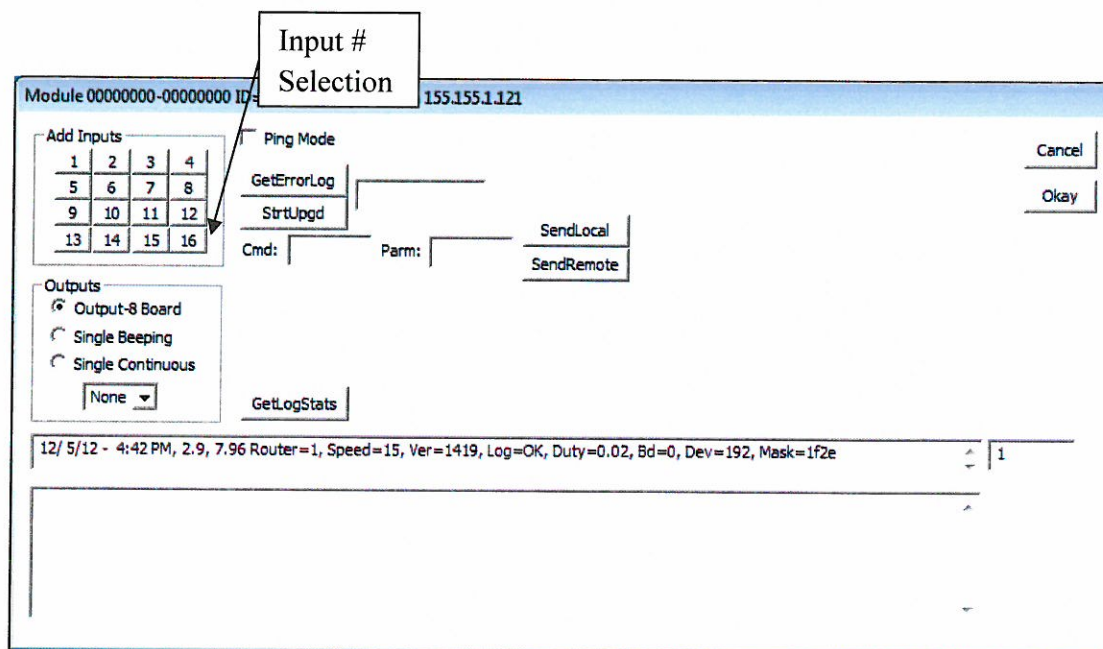


Figure 6:

Click on the number of the input you wish to add. The dialog box shown in Figure 7 below will appear.

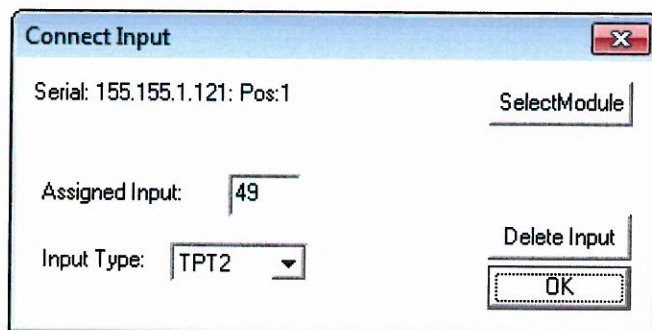


Figure 7.

From the “Input Type” dropdown box, select the type of sensor connect to the input. The example in Figure 7 shows a TPT2 temperature probe. Click “OK” when finished.

Continue to select input numbers and their configurations until all used inputs on MPX Panel #4 have been added. When finished, click the “Okay” button on the right hand side of the dialog box as shown in Figure 8.

Wireless Subsystem Administrator

Request Code: A389623 ☐ MPX 1 Zigbee ☐ MPX 5 Zigbee ☐ Program V1 Connection

Activation: ☐ MPX 2 Wireless ☐ MPX 6 Zigbee ☐ Program V2 Connection

Re-License: ☒ Authorize ☐ MPX 3 Bacnet ☐ MPX 7 Zigbee

☐ MPX 4 Zigbee ☐ MPX 8 Zigbee

Serial #	Input	Last Call	Missed Chirps	Signal Strength	Age of Ping	Input Status	Version	Reads	Type	Module Parent ID
155.155.1.121:1	49	10	11			OK-E	1419	26.622	TPT2	0000
155.155.1.121:2	50	10	11			OK-E	1419	34.625	TPT3	0000
155.155.1.121:3	51	10	11			OK-E	1419	-23.732	TPT4	0000
155.155.1.121:4	52	10	11			OK-E	1419	4.998	Volts	0000
155.155.1.121:5	53	10	11			OK-E	1419	4.998	Volts	0000
155.155.1.121:6	54	10	11			OK-E	1419	4.998	Volts	0000
55										
56										
57										
58										
59										
60										
61										
62										
63										
64										

☒ Show Parents
☐ Show Batteries
☐ Show Connections
☐ Show DutyCycles
☐ Show Log Stats

Total Missed Chirps: 66 Worst Input: 49 3.3 Min Test: INCOMPLETE

Figure 8. The Wireless Subsystem Administrator Window with MPX Panel #1 Inputs Shown.

Figure 8 above shows what the Wireless Subsystem Administrator window will look like for MPX Panel #4 after adding inputs. In this example, 9 inputs have been added.

Repeat the procedure described above for each V2-MPX-NET that will be used on the system. Once complete, close The Wireless Subsystem Administrator by clicking the “Ok” button. Launch / restart the Node to which you were adding inputs in the Wireless Subsystem Administrator.

Open the Workstation program and select the appropriate Node to begin adding and programming the inputs added to The Wireless Subsystem Administrator.

V2-MPX-NET-UP:

V2-MPX Board Installation:

The V2-MPX Boards are mounted to the carrier as shown in Figure 36. The boards for MPX Panels 1 through 4 are located on the bottom layer with the boards for MPX Panels 5 through 8 installed on the top layer.

The Carrier is supplied with preinstalled standoffs and screws to install all eight V2-MPX boards. The bottom boards are secured to the factory installed stand offs on the carrier using the female-male stand-off that is threaded into the stand-off on the carrier. The Phillips head screws inserted into the end of the female to male stand-off are used to secure the top V2-MPX board if connecting MPX Panels 5 through 8.

NOTE: All unused hardware should remain with the carrier for future use.

V2-MPX Board Wiring:

The V2-MPX boards connect to the home run cables from the existing or new MPX Remote Panels. If upgrading from a Centron carrier based system, the DIN connectors located on the end of the cables will need to be removed. The wire colors referenced in Figures 9 and 38 are for standard 3-conductor, shielded cable typically installed by Rees Scientific.

Connect the wires to the connector on the V2-MPX board as shown in Figure 9. Figure 10 shows the corresponding connections at the MPX Panel's home run connector.

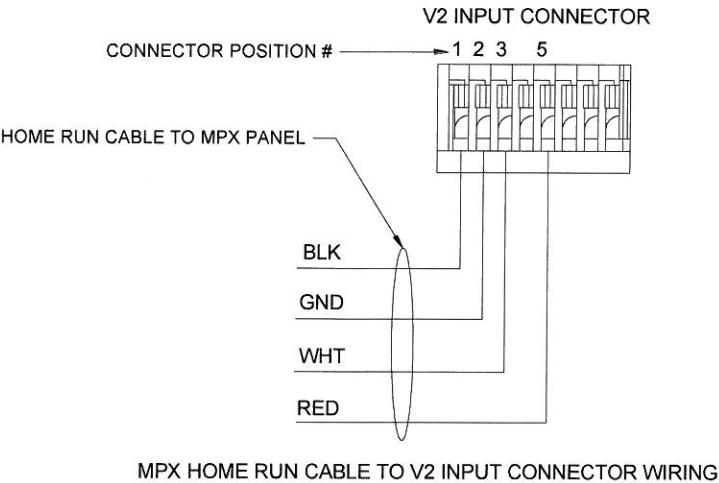


Figure 9: V2-MPX Board wiring

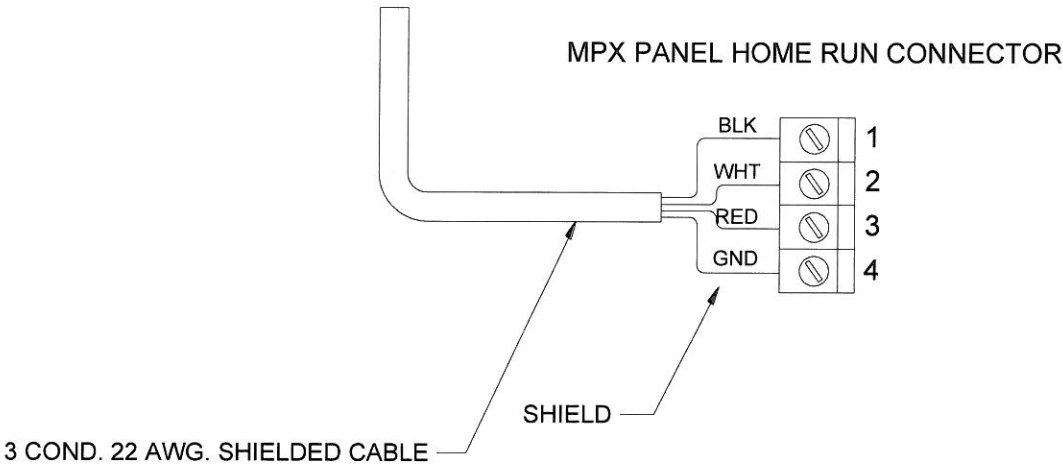


Figure 10: MPX Panel Home Run Connector

V2-MPX-NET-UP Programming:

The V2-MPX-NET-UP is configured in the same way as a standard V2-MPX module and V2-NET device. Refer to the previous chapter on setting up and programming the V2-MPX-NET product for configuration information.

V2-MPX-NET-UP Battery Backup:

The V2-MPX-NET-UP uses a 6 volt @ 10 Amp Hour lead acid battery. This is the same type of battery that was furnished with the original Centron System. This battery sits loosely in the bottom of the enclosure. See Figure 27. The battery is charged by the power supply through the large diode and self-resetting fuse located on the wiring harness terminal block.

WARNING: In the event that an older Series II system is being converted to the V2-MPX-NET-UP, the original 12 volt battery supplied with the Series II must be replaced with a new 6 volt @ 10 Amp Hour lead acid battery. Order Rees Scientific Part # .CENTRON-BAT.

Audible Alarms

The V2 transmitter modules can be equipped with an internal audible alarm. The alarm consists of a piezo beeper with connector that plugs onto the 4-pin programming header inside of a V2 transmitter module. See Figure 11. After the configuring in the Wireless Subsystem Administrator, the alarm is programmed as an “output” in the Workstation software.

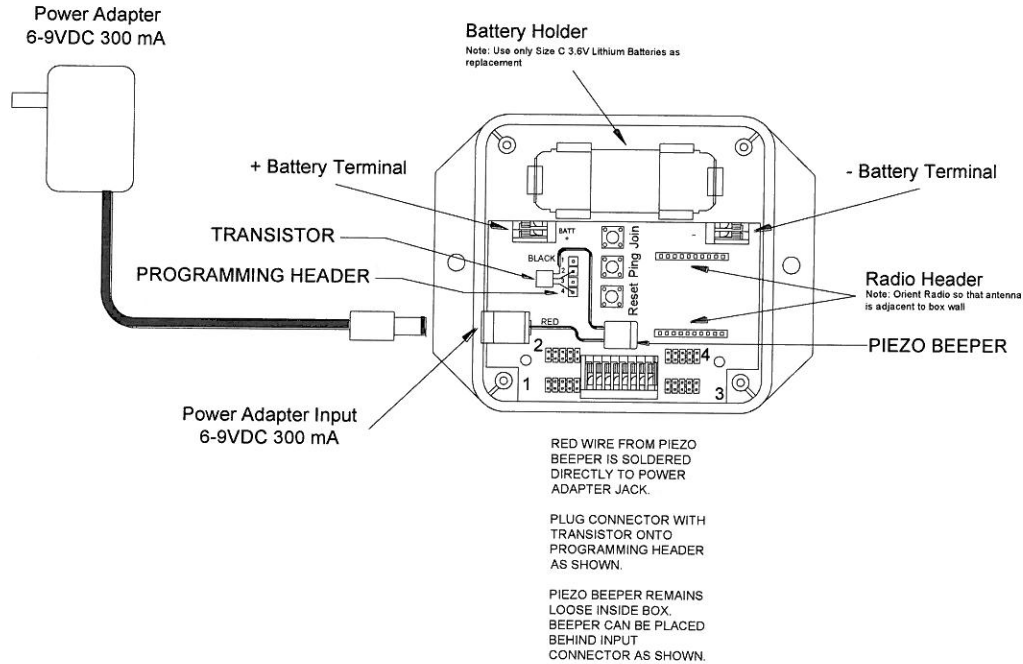


Figure 11.

The transistor that is attached to the connector that plugs onto the 4-pin programming header activates the beeper. The red wire from the piezo beeper is soldered to the rear terminal of the power adapter input located on the left side of the V2 enclosure.

NOTE: The transmitter module MUST be used with an external 6 volt DC wall transformer (.V2-TRANS) when using the audible alarm. The audible alarm does not operate on battery-powered units, or in the event of a power failure.

Once connected, the piezo beeper can be placed behind the green input connector as shown in Figure 11.

Remove any covering from the face of the beeper that blocks the sound hole.

Audible Alarm Programming:

The audible alarms are configured using the Wireless Subsystem Administrator.

To set up a Zigbee module to use an audible alarm:

1. Select the module that contains the audible alarm from the drop down box as indicated in Figure 12.

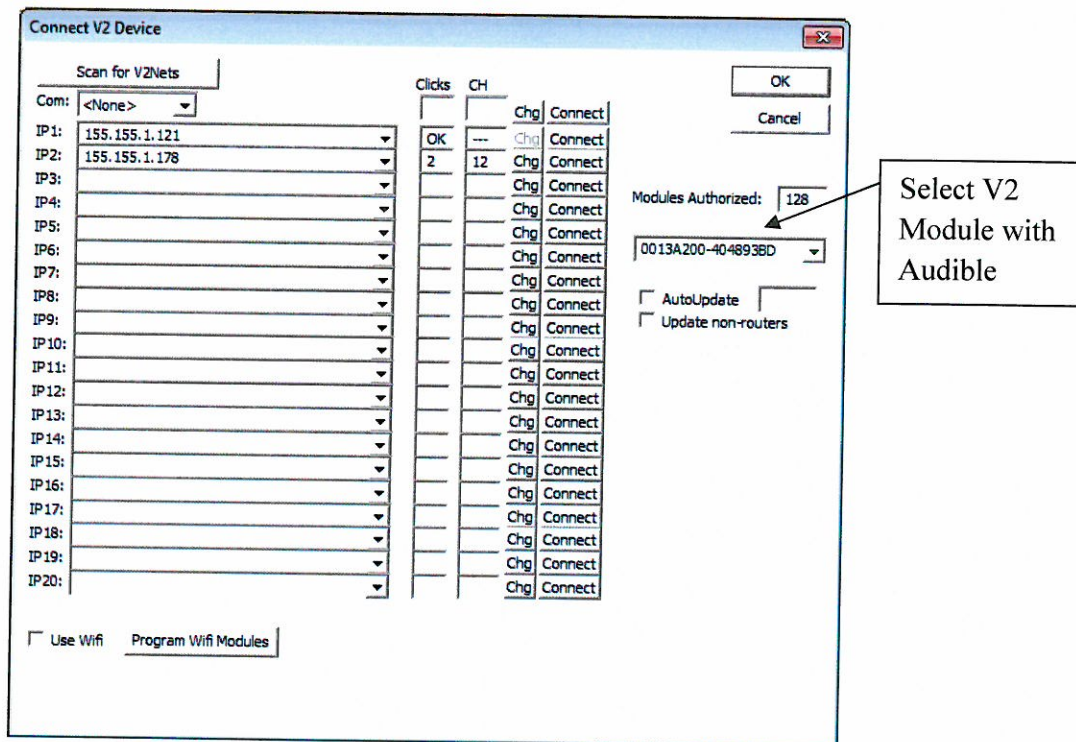


Figure 12.

2. Select the type of beeping action and Output number. Click 'Okay'.

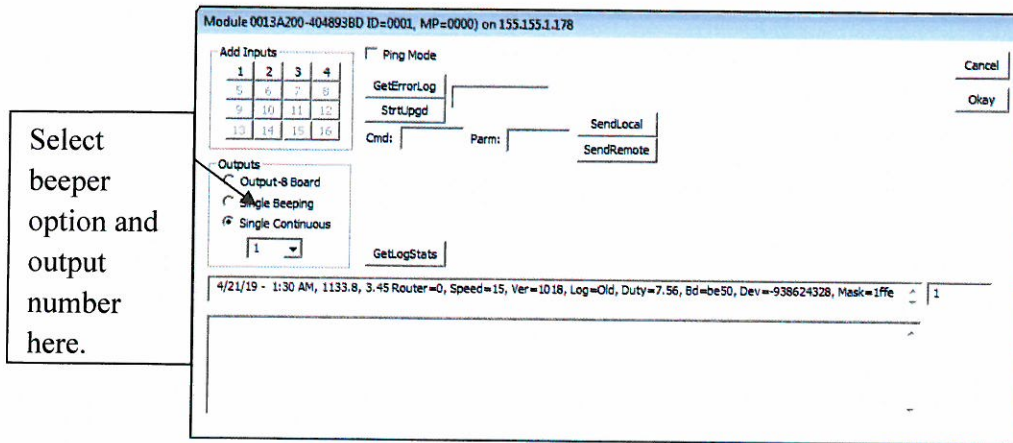


Figure 13.

3. Close the Wireless Subsystem Administrator.
4. Start the Node program.
5. Open the Workstation program.
6. Add Outputs for the modules that contain Audible Alarms.

NOTE: The output Numbers must correspond with the number programmed in the Wireless Subsystem Administrator. See Figure 13.

Programming the Audible Alarm Outputs:

The audible alarm in a Zigbee module can be set to activate under any condition that can be programmed into the Node's Output Programming logic. In most applications, the audible alarm will be used to signal an alarm from an input that is connected to the module containing the audible alarm. However, the alarm is not restricted to the input conditions of the module where it is installed.

While the audible alarm can be programmed to activate on a wide variety of conditions, the typical alarm situation will be to have the audible alarm activate on an out of range condition from one of

the inputs connected to the Zigbee module that contains the audible alarm. The easiest way to do this is to create a “Department / Input Group” and associate the inputs on the given module with that group. See Figure 14.

The use of Input Groups and Group in Alarm / Group NOT in Alarm programming for control of the audible alarm in the Zigbee module is the easiest way to provide a local audible alarm for a system. This method ensures that programming changes made by the customer with respect to alarm limits, delays, etc. will not affect the operation of the audible alarm. In simple terms, when the Node is in alarm for an input in the group, the local alarm in the module will sound.

NOTE: The alarm in the Node and the local alarm in the Zigbee module operate independently of each other. An input that is programmed as “silent” in the input programming can still sound the local alarm in the module.

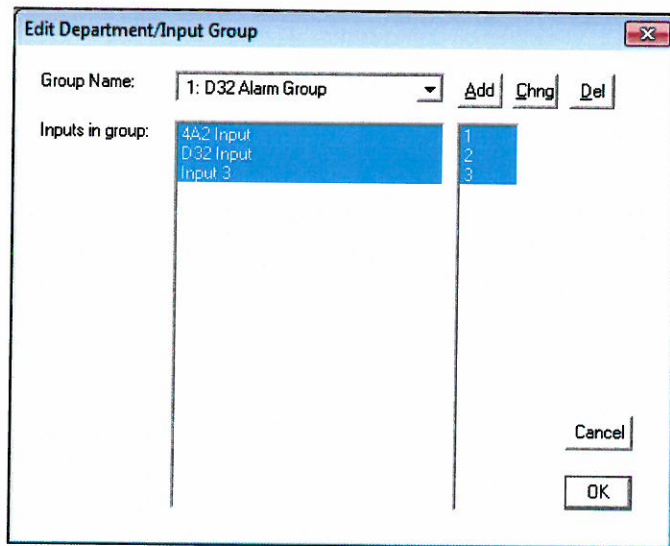


Figure 14.

In Figure 14, the “D32 Alarm Group” has input 1 in the group. If there are multiple inputs connected to the Zigbee module that contains the audible alarm, they can also be added to the group if desired. Note that the audible alarm will activate when ANY input in the group goes into alarm. There is no way to differentiate as to which input on a multi-input module with an audible alarm is actually out of range when the alarm sounds.

Figure 15 shows the Turn ON logic for Output 1. Based on this programming, the audible alarm will activate when the input(s) in the “D32 Alarm Group” go into alarm.

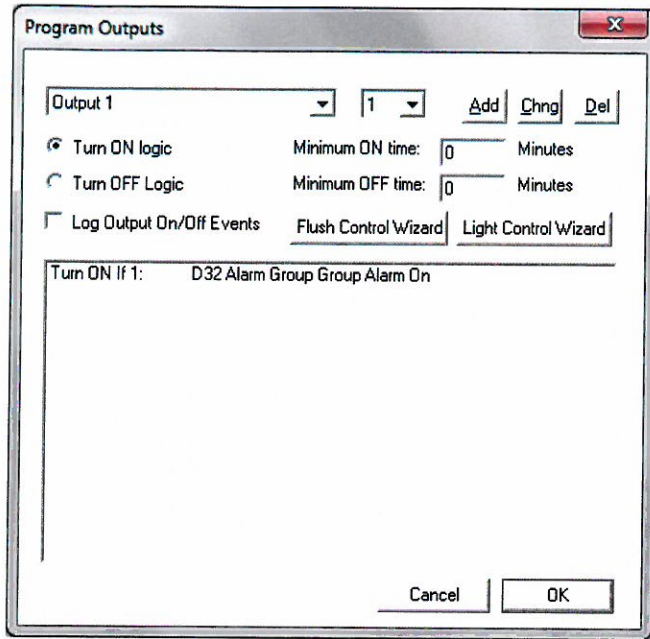


Figure 15.

Figure 16 shows the Turn OFF logic for Output 1. Based on this programming, the audible alarm will go off when the input(s) in the “D32 Alarm Group” return to normal range.

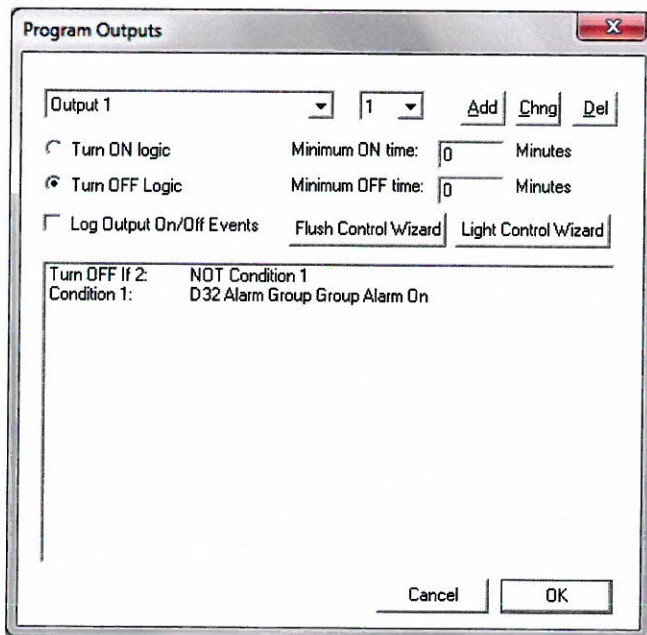


Figure 16.

Testing the Audible Alarm Outputs:

It is recommended that the functionality of the audible alarm be tested after installation and programming. Figure 17 shown that Input 1 (D32 Input) is in alarm and Output 1 is “ON”. The audible alarm in the Zigbee module will be sounding. When the alarm is inhibited, the output will turn odd and the audible alarm will stop. See Figure 18.

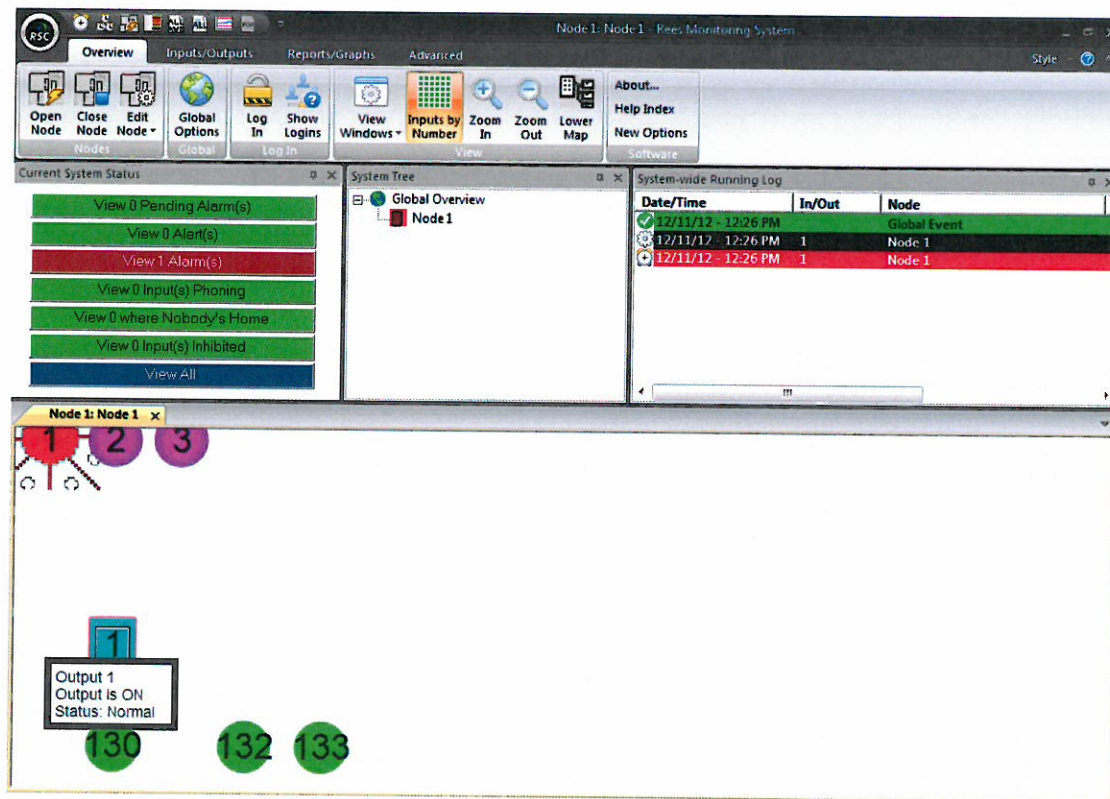


Figure 17

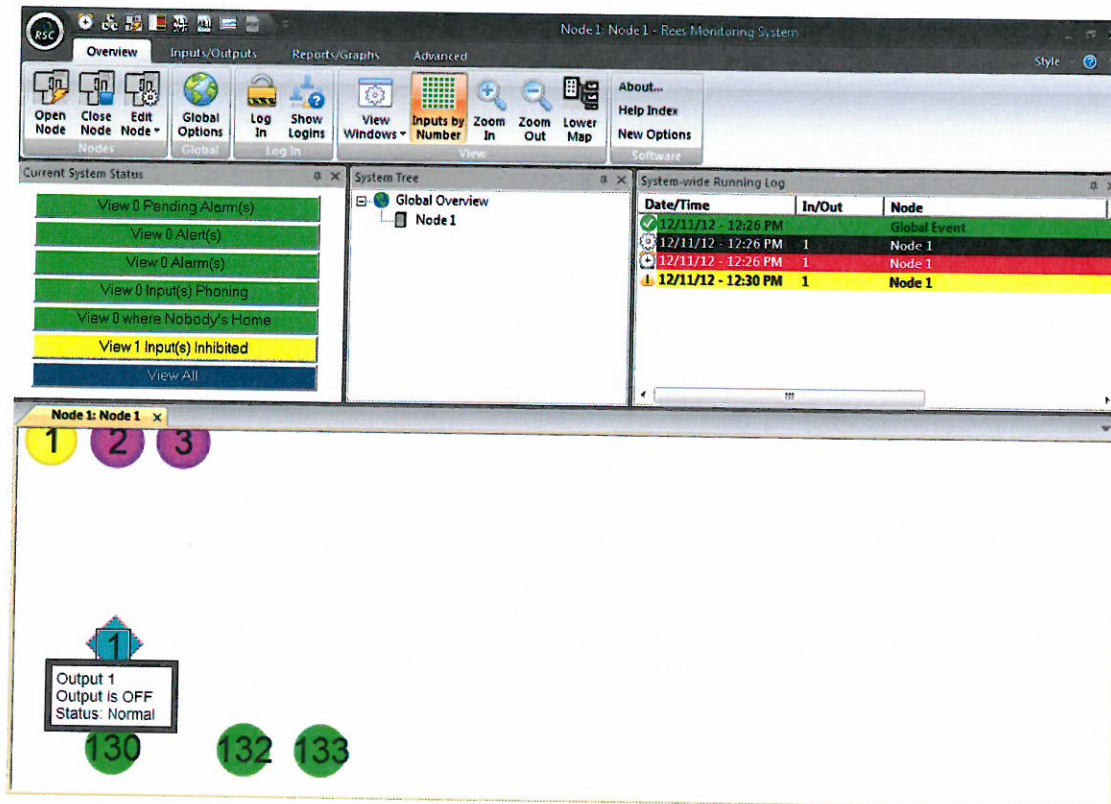


Figure 18.

Locking an output “On” can be used to test the output functionality and to activate the audible alarm. When the output is locked “On” as shown in Figure 19, the audible alarm in the Zigbee module will sound. It may take several seconds for the audible alarm to begin sounding after the output is locked “On”. This is normal. Remember to unlock the output when finished to restore the output to normal operation.

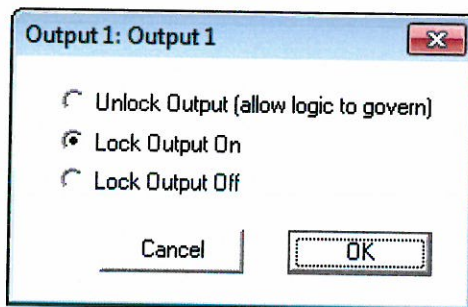


Figure 19.

Advanced Programming of Audible Alarm Outputs:

The output logic that controls the function of the audible alarm is not limited to the use of “Group in Alarm / Group NOT in Alarm” programming. Since the audible alarm is controlled by a virtual output in the Node, it can be programmed to activate on any set of conditions that the user desires, limited only by constraints of the conditions list in the output-programming selector in the Workstation software. The uses are limited only by the imagination of the user.

The audible alarm is not limited to sounding only on alarms from sensors that are connected directly to the V2 module that contains the audible alarm. The audible alarm can be used even if NO sensors are connected to the V2 module, or it can be made to sound on alarms from other V2 modules on the same Node. This type of function can be used to make a V2 Module with a beeper into a wireless remote audible alarm.

Outputs

Wireless Output-8 and Output 8-PWR:

Output-8 Panels can be controlled using a Zigbee wireless module. Rather than connecting the Output-8 board's communication port to an MPX Remote Panel, the port is connected to the 4-pin programming header in the Zigbee Module using a special cable. (Part # V2-OUTPUT-CBL)

The Output-8 board can be connected to its own Zigbee Module or to any nearby Zigbee Module by extending the cable as needed. The Output-8 board should be located as close as practical to the devices being controlled to minimized wire runs.

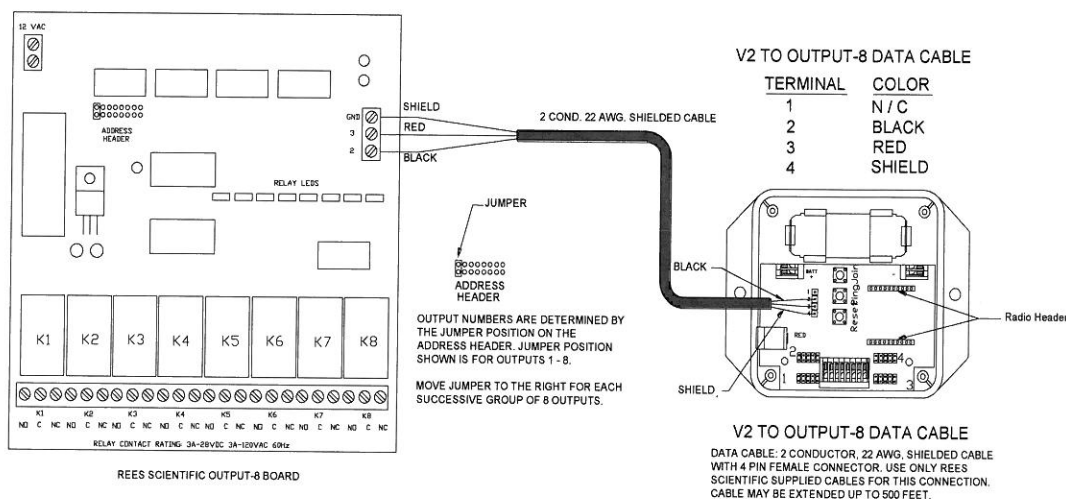


Figure 20:

Connection of Zigbee module to Output 8 board

Installing the V2 to Output 8 Data Cable:

The Output-8 Data Cable connects the Zigbee Module to the Output 8 board. It connects between the Programming Header on the module and the Data Cable Connector located on the right side of the Output 8 board.

To install Output-8 Data Cable:

1. Install the Output 8 panel in the desired location.

2. Install a Zigbee End Device near the Output Panel, or run a 2 conductor, 22 AWG Shielded Cable from the location of the Output 8 Panel to a nearby module.
3. Connect the Output Cable to the programming header on the Zigbee Module as shown in Figure 20. A ¼" hole may be drilled in the side of the module's enclosure to admit the cable. An alternative method would be to cut a notch in the side of the enclosure below the cover to allow the cable to exit and the cover to be secured to the base of the enclosure.
4. Replace the cover on the Zigbee module.

Configuring the Wireless Subsystem Administrator for the V2 to Output 8 Panel:

To configure the Output 8 Panel in the Wireless Subsystem Administrator:

1. Open the Wireless Subsystem Administrator and select the Zigbee Module that is connected to the Output 8 Panel. See Figure 21.

Wireless Subsystem Administrator

Request Code: A389269 ☐ MPX 1 Zigbee ☐ MPX 5 Zigbee

Activation: ☐ MPX 2 Wireless ☐ MPX 6 Zigbee

Re-License ☐ MPX 3 Bacnet ☐ MPX 7 Zigbee

☐ MPX 4 Zigbee ☐ MPX 8 Zigbee

Serial #	Input	Last Call	Missed Chips	Signal Strength	Age of Ping	Input Status	Version	Reads	Type	Module Parent ID
0013A200-404893B	49	4	0			ON-E	1018	29,837	TPT2	0001
50										
51										
52										
53										
54										
55										
56										
57										
58										
59										
60										
61										
62										
63										
64										

☒ Show Parents ☐ Show Batteries
☐ Show Connections ☐ Show DutyCycles
☐ Show Log Stats

Total Missed Chips: 0 Worst Input: 0 0.5 Min Test: INCOMPLETE

Figure 21:

2. Double click the Series Number of the V2 Module in the Wireless Subsystem Administrator. See Figure 22.

Connect Input

Serial: 0013A200-404893B Pos:1

Assigned Input: 49

Input Type: TPT2

Figure 22:

3. Click the "Select Module" button in the dialog box as shown in Figure 22. This will open the ReesZigbee Dialog box as shown in Figure 23.

4. Select “Output 8 Board” and the Output number range for the Output 8 board being controlled as shown in Figure 23.

NOTE: The jumper on the Address Header located on the Output 8 Board (See Figure 20) must be set to match the corresponding Output Number range selected in the Wireless Subsystem Administrator.

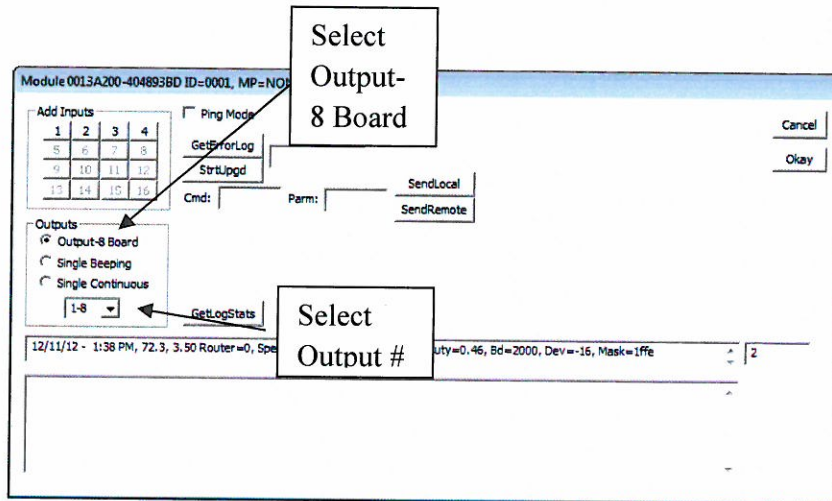


Figure 23:

5. After making the appropriate selections, click “Okay” in the dialog box to accept the settings.

6. Click “OK” in the main the Wireless Subsystem Administrator dialog box to accept all settings.

7. Launch the Node program and open the Workstation program. Add and program the outputs as required.

8. Once the Outputs are added, they can be tested for basic functional control by using the “Lock Output ON” and “Lock Output OFF” feature found under the “Program” menu in the workstation software.

NOTE: Unlike a hardwired Output 8 panel, the response of the actual output relays to manual lock “On” / lock “Off” commands and normal programming parameters, may not be instantaneous. It

may take upwards of a minute or so for the command to be sent to the Zigbee module controlling an Output 8 board and the command being executed by the Output 8 board's relays.

WARNING: Due to possible response delays that are inherent in wireless systems, a wirelessly controlled Output 8 Board should not be used in a control application where the operation of the Output 8 board's relays to perform a critical control function at a precise time or based on an input condition is required. Consult the factory for application specific recommendations.

Troubleshooting

Zigbee modules produce a debug output on their serial port pins. This can be read using Hyperterminal connected to a specific dongle that is available from Rees Scientific. Their debug output consists of the following items:

Communications:

ChannelU_0_1008 – Chirping on 1008, can't find coordinator. Main program is running.

ChannelL_0_1008 – Same but boot loader is running.

Disassociated – Jumped off of the network.

Associated – Jumped back on.

Noradio/NetDown_0_1 – Not chirping because waiting. Radios must wait after going offline before trying again.

Xmit_1_3 – Transmitted. First digit shows 1 if response was requested, second digit = failed requests.

Diss/await_1_1 – Not transmitting, First digit, 1=Radio is disassociated, Second Digit, 1=waiting coordinator response.

Frame – Another radio logged onto network.

Misc:

PingButton – The ping button has been pressed. The button may be stuck.

ForceSleep – The radio refused to go to sleep and is being forced to save battery. If this happens constantly, it indicates a bad connection between radio sleep lines and the processor.

TLH Only Items:

SensorNotRdy – It knows it's a TLH, but had a read error.

BadAskHum – It knows it's a TLH but sensor didn't respond right to humidity request.

BadAsktemp – It knows it's a TLH but sensor didn't respond right to temperature request.

Temp_2403 – Knows it's a TLH, good read showing 24.03 degrees

Hum_4105 – Knows it's a TLH, good read showing humidity 41.05 %.

If you see neither Temp nor Hum on every read cycle, it doesn't know it's a TLH and has an electronic problem.

Wiring Diagrams:

V2-U

The following diagrams show the wiring of sensors to an End Device U module. The module can accept TPT-2, 3, 4, and CRYO-6 Thermistor temperature sensors, as well as 4-20mA, and 0-5 volt* output sensors (*=with voltage divider).

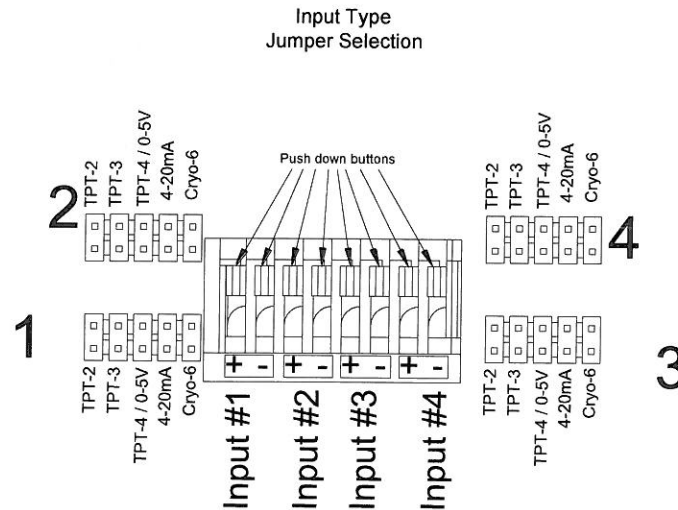


Figure 24: U Module Input Connector

Figure 24 shows the input connector and probe type jumper headers. All wiring from sensor probes connects to this connector. The jumper headers are used to select the appropriate probe type.

Thermistor Probes:

Vendor supplied TPT type Thermistor probes are connected directly to the + and – connections on the input of the End device modules. Place the jumper over the appropriate pins on the input header for the probe type in use.

TPT type Thermistor probes come with 6' of cable. This wire can be extended if necessary up to a maximum length of 25 feet.

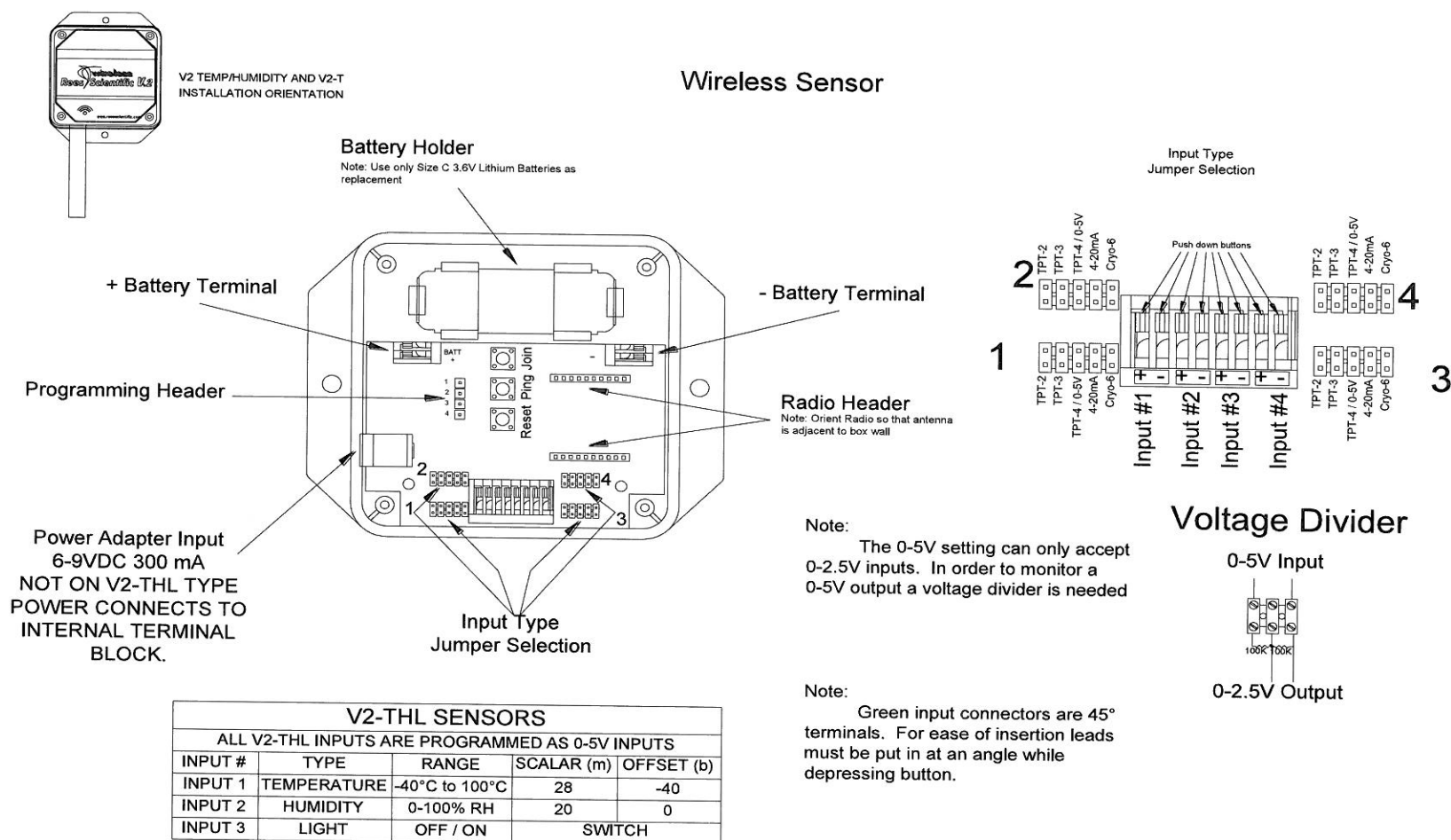


Figure 25: Wireless Module Details

0 to 5 volt Sensors:

Wireless modules can accept the signal from sensors that output 0-5 volts DC if a voltage divider is used to convert the signal to 0-2.5 volts DC. Refer to Figure 25 for details.

Switch Contacts:

V2 modules can be used to monitor dry contacts (switches). The switch contacts can be Normally Open (NO), Normally Closed (NC), Normally Open, Supervised, or Normally Closed, Supervised. Supervised switch contacts allow for the monitoring of the wiring between the switch and the V2 module. This is done through the use of a 100k-Ohm resistor being installed in parallel or series with the switch. See Figure 26.

Programming Switch Contacts:

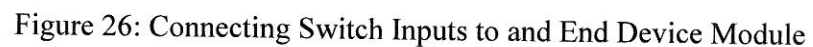
The Monitoring System interprets the readings from switch contacts as a voltage between 0 and 5 volts DC. The Node can be programmed to interpret these voltages as the “State of a Switch”. The system offers the options of “Supervised Switch”, “Alarm when Low”, “Alarm when High”, or “Switch Without Alarm”.

Switch inputs can also be programmed as a “Linear Transducer” with a scalar (M) of 1 and an Offset (B) of 0 will configure the system to read the switch as a voltage. A closed switch will be interpreted as 0 volts, whereas an open switch will read 5 volts. Supervised switches will read 2.5 volts when in their normal state.

Switch Monitoring Notes:

Wireless modules do not monitor their inputs continuously. Endpoint Devices wake up every 25 seconds to take a reading and Routers transmit their readings every 15 seconds.

Therefore, it is possible for an event such as a momentary switch contact closure to go unnoticed. This can be problematic if the switch contact is being used in a security or other transitory application such as monitoring door openings or motion detection. In order for the module to detect an alarm, the switch must be in the alarm state when the reading is taken.



4-20mA Sensors:

Wireless modules can be used to monitor the output from a sensor that outputs a 4-20mA signal. The sensor can be either loop powered, (2 wire) or internally powered (3 or 4 wire). Loop powered sensors will require a 24-volt DC regulated power supply. This power can be obtained from either a wall transformer type power supply, (Part # .V2-4-20TRANS) or a battery backed up power supply. (Part # .HUM-BAT-BACK) 3 and 4 wire type sensors derive their power from the internal power (AC Line) of the equipment and do not require a separate power supply.

Figure 27 shows the wiring for 4-20mA sensors to an Endpoint Module. The drawing shows a wall transformer type power supply. Be sure to carefully observe polarity when connecting power to the sensor.

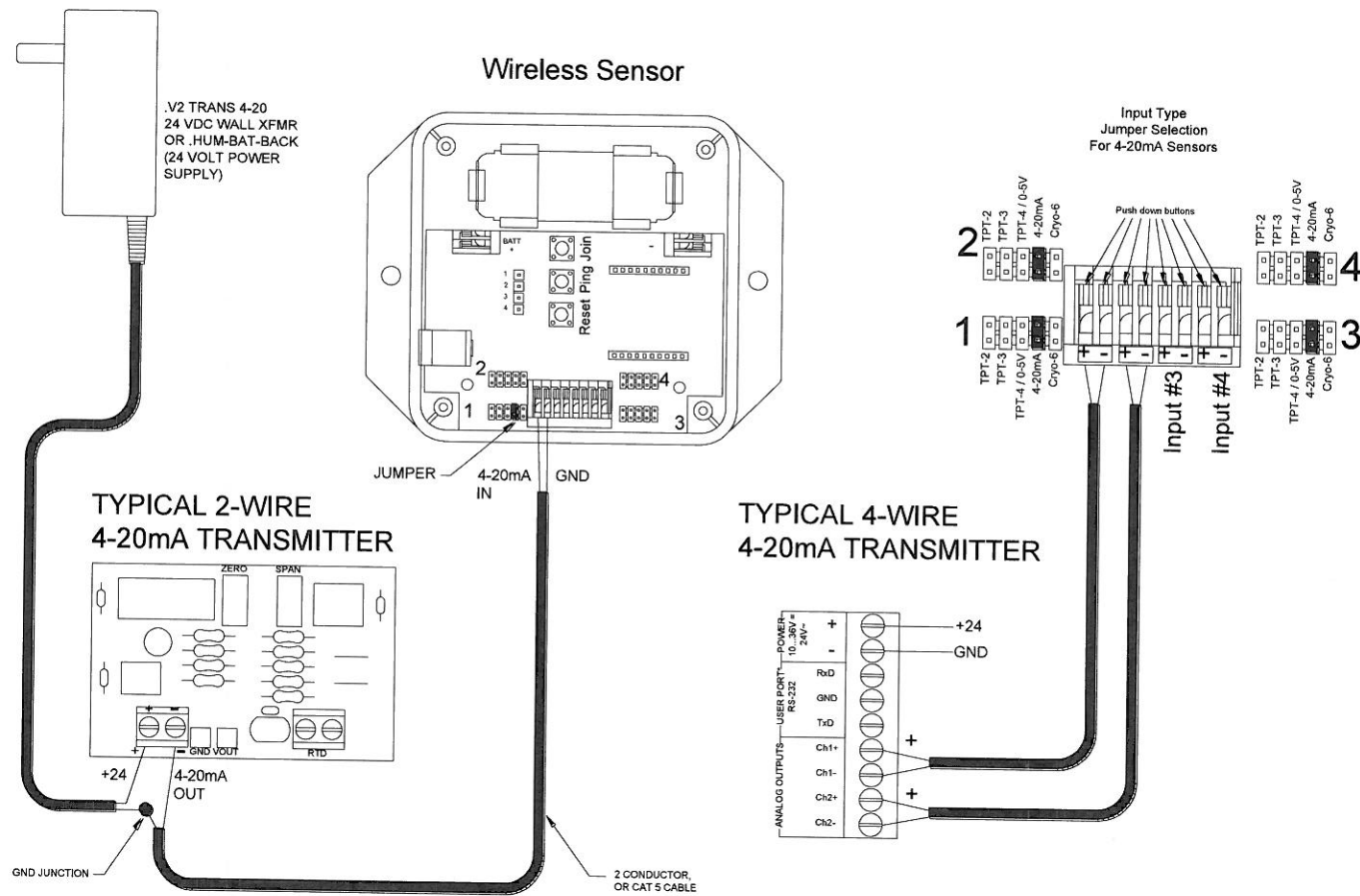


Figure 27: Connecting 4-20mA Output Sensors to an End Device Module

V2-THL:

THL (Temp, Humidity Light) sensors are self-contained sensors that provide separate outputs for each signal. These sensors should always be installed with the sensor protecting tube pointing **down**. See Figure 25.

	A	B	C	D	E
1	V2-THL SENSORS				
2	ALL V2-THL INPUTS ARE PROGRAMMED AS 0-5V INPUTS				
3	INPUT #	TYPE	RANGE	SCALAR (m)	OFFSET (b)
4	INPUT 1	TEMPERATURE	-40°C to 100°C	28	-40
5	INPUT 2	HUMIDITY	0-100% RH	20	0
6	INPUT 3	LIGHT	OFF / ON	SWITCH	

Figure 26: V2-TLH Signals and Programming Parameters

Power Adapter:

THL sensors do not have a power adapter jack installed in them. These sensors are frequently used in wet locations, and the power jack would allow water to be admitted to the inside of the case causing failures.

In the event that it becomes necessary to plug the THL sensor into AC power for the purpose of turning the module into a router, the wire from the wall transformer will need to be inserted through a user made hole in the case of the module. Care should be taken when making the hole so as not to damage the internal working of the module. The hole should be made just large enough to admit the wire.

The wires from the wall transformer connect to the terminal block located inside of the THL module. The terminal block has a Red and Black wire. The **Red** wire is “+” and the **Black** wire is “-“. Use a volt meter to determine the proper polarity of the transformer wire.

V2-DP:

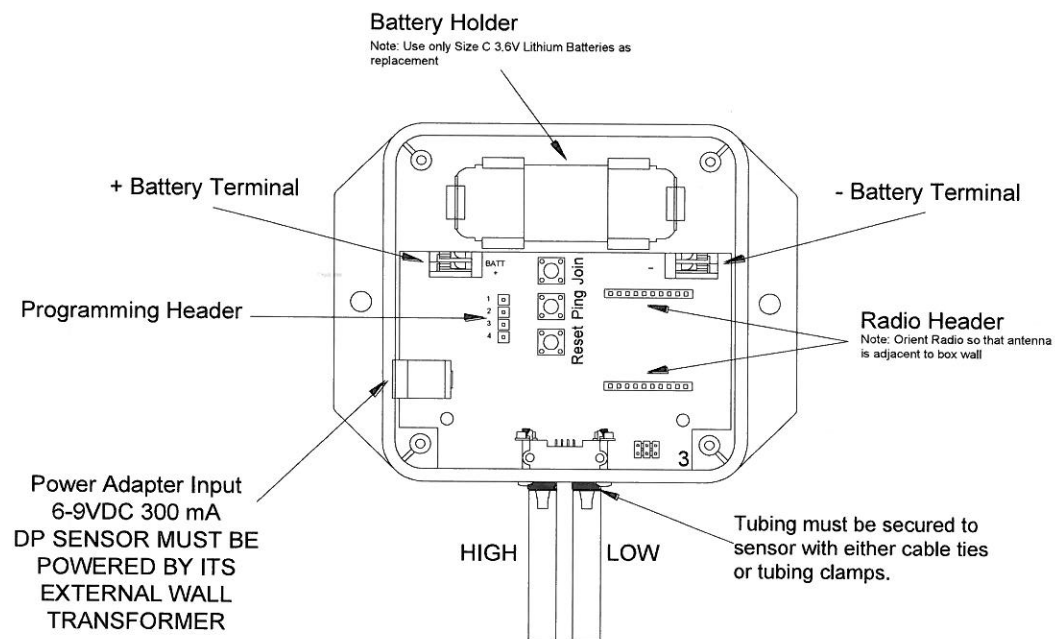
Figure 27 shows the DP differential pressure sensor. This sensor monitors differential pressure over a range of $-2''$ to $+2''$ of water column. Use $3/16''$ ID tubing to connect to the hose connections on the unit. It is recommended that cable ties or hose clamps be used to secure the tubing to the module.

Note: The DP sensor **MUST** be powered using the external wall transformer. The life of the internal battery will be reduced significantly if the module is not connected to AC power.



V2 -DP SENSOR
INSTALLATION ORIENTATION

DP Wireless Sensor



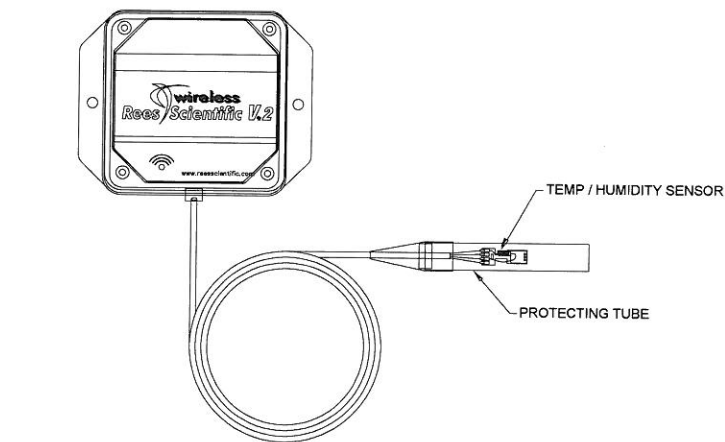
V2-DP SENSORS				
V2-DP INPUTS ARE PROGRAMMED AS 0-5V INPUTS				
INPUT #	TYPE	RANGE	SCALAR (m)	OFFSET (b)
INPUT 1	Differential Pressure	-2" to 2" WC	0.8	-2

Figure 27: DP differential pressure sensor:

V2-TH-REM:

The TH-REM module is a combination temperature/relative humidity sensor with a remote probe. The probe is suitable for monitoring the temperature and humidity levels in equipment such as stability chambers or other locations where it is undesirable to place the sensor module itself due to environmental conditions or poor radio transmission.

The programming parameters for the TH-REM sensor are shown in Figure 28 below.



TEMP / HUMIDITY SENSOR WITH REMOTE PROBE

	A	B	C	D	E
1	V2-TH-REM				
2	ALL V2-TH-REM INPUTS ARE PROGRAMMED AS 0-5 VOLT				
3	INPUT #	TYPE	RANGE	SCALAR (m)	OFFSET (b)
4	INPUT 1	TEMPERATURE	-40°C to 100°C	28	-40
5	INPUT 2	HUMIDITY	0-100% RH	20	0
6					

Figure 28: TH-REM Sensor

V2-MPX Product Family:

The V2-MPX Product Family includes all components and modules used to interface wired systems, whether existing or newly installed, to the Virtual Centron and Enterprise Centron systems. These products include the following Rees Scientific part numbers: V2-MPX, V2-MPX-NET, MPX-NET-RJ24, and the V2-MPX-NET-UP. These devices provide connection of MPX Remote Panels either directly to the existing TCP/IP network, or to the network via wireless transmission to a nearby V2-NET or coordinator.

Installation and operation of the various modules are covered separately. However, these modules may be combined and used together to suit a wide variety of applications.

NOTE: All of the modules in the V2-MPX Family of products require software Build 1014 or higher.

V2-MPX:

The V2-MPX module converts a standard, wired MPX Remote Panel to a wireless, data buffering MPX Panel. The module connects to the 3-conductor, shielded, home run cable that would otherwise be connected to the back of the Node. The module contains a standard V2, 2.4GHz radio that transmits to a nearby V2-NET.

The V2-MPX module is typically located next to the MPX Panel, but if necessary, the home run cable can be extended to bring the V2-MPX module closer to the location of the V2-NET.

The V2-MPX module is powered either by the +5 Volt DC power from the MPX Panel or from its own wall transformer power supply. NOTE: The V2-MPX module must be plugged into AC power at all times. The lithium battery in the V2-MPX module provides power during periods of power outage only. Do not operate the V2-MPX module exclusively on battery.

Figures 29 and 30 show the connection of the V2-MPX module to the home run connector of the MPX Remote Panel.

NOTE: 3 conductor, shielded cable must be used for the connection of the MPX Panel to the V2-MPX module. Do not use CAT5 type cable for this connection.

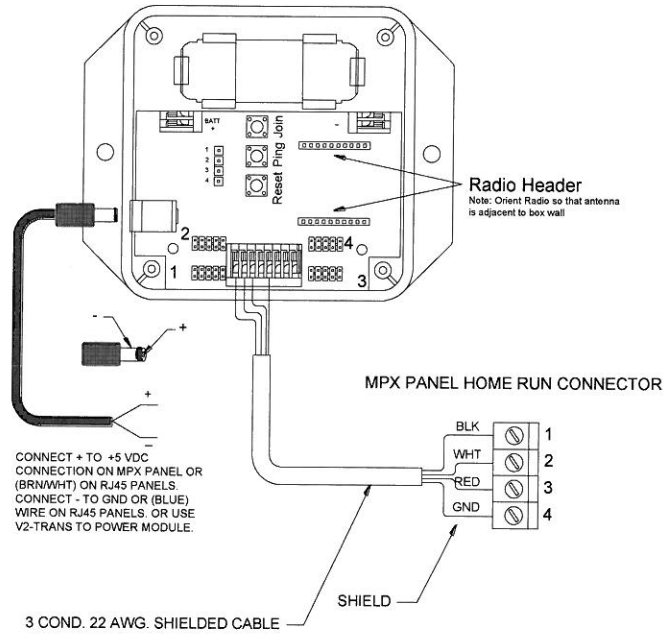


Figure 29: V2-MPX Module Wiring and Power Connections

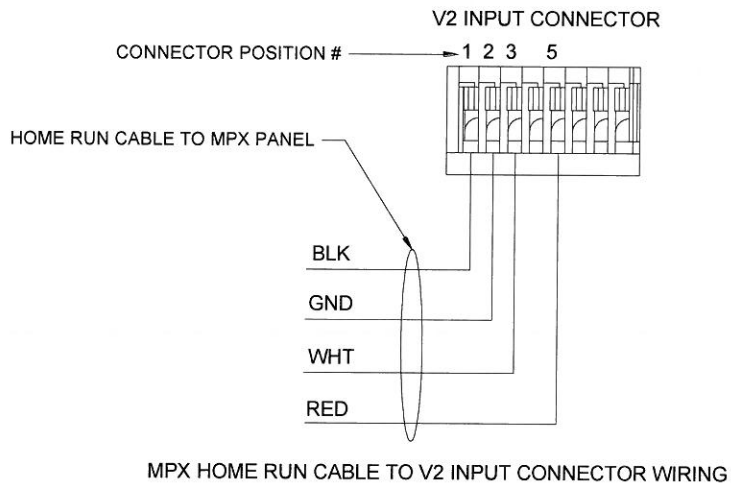


Figure 30: V2-MPX Input Connector Wiring

V2-MPX-NET:

The V2-MPX module converts a standard, wired MPX Remote Panel to a network connected, data buffering MPX Panel. The unit is available as a stand-alone module that can be connected to any MPX Panel, (Part #V2-MPX-NET) or bundled with either a standard MPX panel (part # MPX-NET-RJ45) or with an MPX Panel and 24-volt DC power supply. (Part # MPX-NET-RJ-24) In the case of the MPX-NET-RJ-24 model, the V2-MPX-NET module is located inside of the enclosure that contains the MPX Panel and power supply.

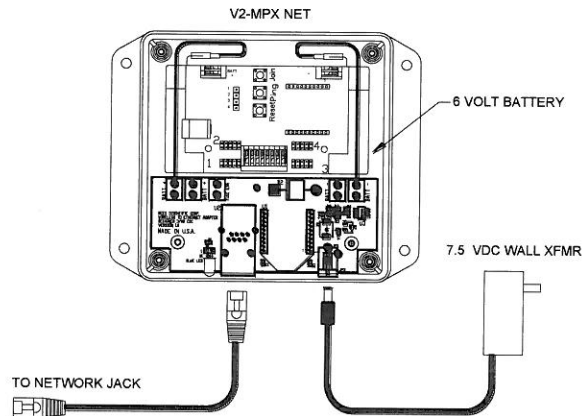


Figure 31: Power and Network Connections

Figures 32 and 33 show the connection of the V2-MPX-NET module to the home run connector of the MPX Remote Panel.

The V2-MPX-NET module connects to the 3-conductor, shielded, home run cable that would otherwise be connected to the Node.

NOTE: 3 conductor, shielded cable must be used for the connection of the MPX Panel to the V2-MPX module. Do not use CAT5 type cable for this connection.

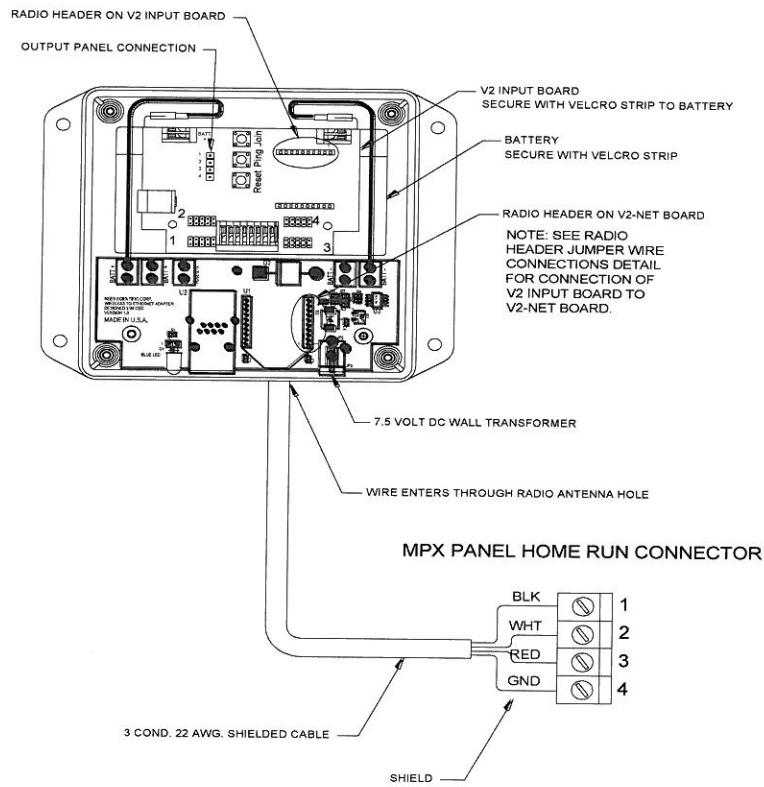


Figure 32: V2-MPX-NET Module Wiring and Power Connections

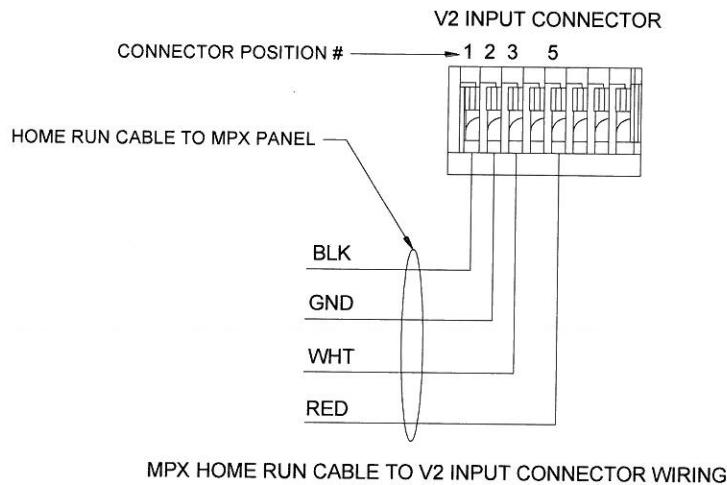


Figure 33: V2-MPX-NET Input Connector Wiring

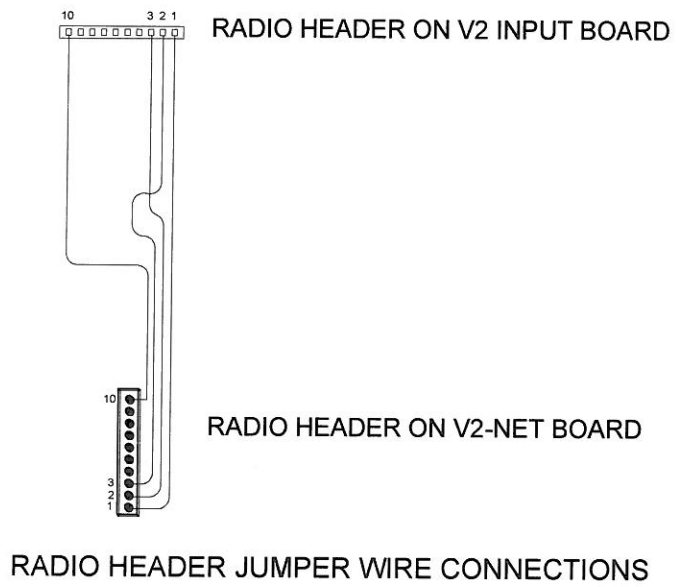


Figure 34: Radio Header Jumper Wire Connections:

V2-MPX-NET-UP:

The V2-MPX-NET-UP converts any existing wall mount style Series II or Node using conventional wired MPX Remote Panels to work with software base Virtual Centron, or Enterprise Centron systems. The conversion requires that the existing Centron Node carrier, or Series II main circuit board be disconnected and removed from the enclosure prior to the installation of the V2-MPX-NET-UP board carrier panel.

The V2-MPX-NET-UP carrier panel is supplied with a pre-installed NET board and wiring harness along with a 7.5 volt DC brick style power supply. See Figures 35 and 36 for assembly details. NOTE: In Figure 35, the wiring harness has been partially removed for clarity.

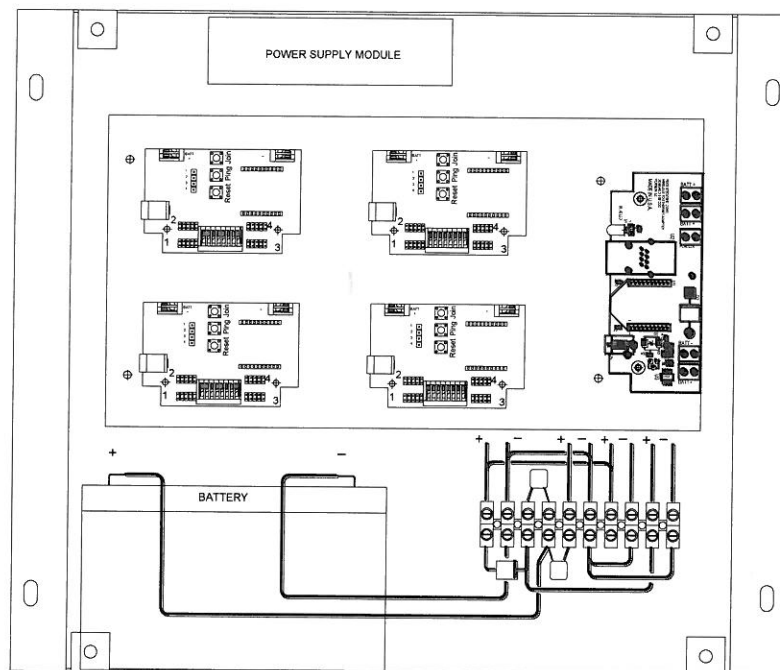


Figure 35: V2-MPX-NET-UP Carrier Panel Installation

The carrier holds up to eight, (8) V2-MPX boards in a double stack arrangement. All hardware necessary to mount up to eight V2-MPX boards is supplied pre-installed on the carrier. Unused hardware should be left in place for future use.

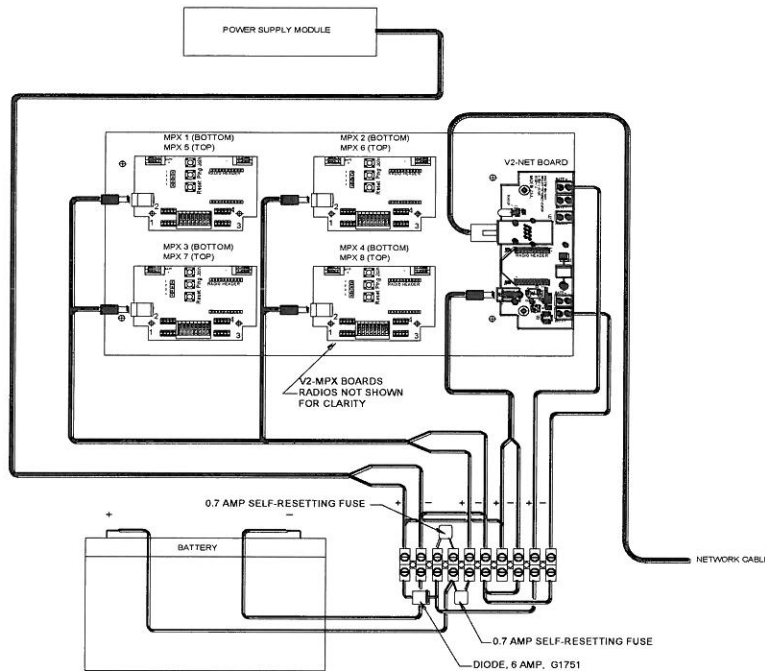


Figure 36: Wiring Harness Details

Power Supply:

The power supply for the V2-MPX-NET-UP is a regulated, 7.5 Volt DC, @ 3 Amp brick style module equipped with an IEC type connection for a power cord suitable for the country of installation. The power supply operates on a voltage of 100 to 240 Volts AC, 50/60 Hz and is suitable for use in all countries. The power supply should be located at the top of the enclosure and secured with the supplied Velcro strips.

A standard power cord with an IEC connector is used to supply AC power to the power supply module. This cord can be either plugged into a nearby outlet, or connected to the AC Power terminal block if the original unit was hard wired to the AC line.

The power supply powers the V2-MPX boards as well as the V2-NET module. It also provides power to recharge the battery.

WARNING: The power supply included with the V2-MPX-NET-UP is a module with a **REGULATED** voltage output. In the event of the failure of the power supply module, replace only with a similar type obtained from Rees Scientific. Failure to use the proper power supply module can result in the failure of the unit and possible damage due to applying excessive charge voltage to the battery.

Wiring Harness:

The wiring harness is furnished with connectors to power up to eight, (8) V2-MPX boards, as well as the V2-NET module. Unused power connectors should be secured so as to prevent their contacting circuit boards.

NOTE: The power connectors for the V2-MPX Boards and the NET module are not interchangeable. DO NOT use a power connector intended for a V2-MPX board to power the NET module.

The terminal block is mounted in the lower right hand side of the rear enclosure as shown in Figure 35. It can be secured with the Velcro strips supplied with the assembly. The self-resetting fuses located on the terminal block provide short circuit and overload protection for both the battery and V2-MPX boards.

WARNING: Risk of Fire: Do Not modify or otherwise alter the wiring connections on the terminal block. Do not bypass fuses. Protect from short circuits by ensuring that there are no stray bare wires such as exposed shield wire that could come into contact with battery terminals or terminal block.

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REES SCIENTIFIC CORPORATION
1007 WHITEHEAD ROAD EXT
TRENTON, NEW JERSEY 08638

CE Declaration of Conformity

Manufacturer: Rees Scientific Corporation
1007 Whitehead Road Ext.
Trenton, NJ 08638
609-530-1055 FAX 609-530-1094
www.ReesScientific.com

Model: V2 Wireless Monitoring and Control system

Type of Equipment: Wireless Environmental Monitoring System

Applicable Standards: EN61010-1 Safety Requirements for Electrical Equipment for measurement, Control, and Laboratory Use – Part 1 General Requirements (2001)

ETSI EN 300 440-2 v1.1.2 "Electromagnetic Compatibility and Radio Spectrum Matters; Short Range Devices Radio Equipment to be Used in the 1 GHz to 40 GHz Frequency Range; Part 2: Harmonized EN Under Article 3.2 of the R&TTE Directive (2004)."

ETSI EN 301 489-1, "Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) Standard for Radio Equipment and Services; Part 1: Common Technical Requirements (2008-02)."

Testing Body: Green Mountain Electromagnetics
Middlebury, VT

I, the Undersigned, hereby declare that the equipment above conforms to the above listed Standards, when used in accordance with the manufacturers specifications.

Place of Issue: Trenton, NJ

A handwritten signature in cursive script, appearing to read 'Rees Thomas', written over a horizontal line.

Date of Issue: August 11, 2008

Rees D. Thomas PhD - President

TELEPHONE: 609-530-1055 - MAIN FAX: 609-530-1094 - SALES FAX: 609-530-1854 - E-MAIL: SALES@REESSSCIENTIFIC.COM

Interference

Certain types of devices, notably certain types of 2.4 GHz cordless telephones, are well known to interfere with WIFI. This is a serious issue in places that have come to depend on WIFI. Some have had to get rid of such devices at considerable expense and don't want to add new such devices to their site. This is highly understandable, but there are devices that interfere and devices that don't. Understanding which is which and why there is a difference can open a site to a much more productive use of the precious 2.4 GHz spectrum.

WIFI uses specific channels within the 2.4 GHz band and modulates its transmissions using DSSS modulation. This is very important to understand. DSSS (Direct Sequence Spread Spectrum) modulation spreads the WIFI signal out over a channel width of 23 MHz to reduce or eliminate interference from FIXED CHANNEL conventional radio transmissions. In this it is highly effective.

WIFI uses DSSS. Interference Slows you Down

DSSS spreads the WIFI signal out, but it is still restricted to a limited band within the 2.4 GHz spectrum. Any access point will occupy its 23 MHz, but this constitutes less than a third of the total available spectrum. There are other frequencies available to other devices that will not interfere.

However, WIFI is vulnerable to ANY transmission within its specific 23 MHz band. It is important to understand that WIFI will not stop working just because a transmission interferes. WIFI with DSSS is highly robust. DSSS helps punch the signal through even when there is some interference on the frequency. In addition, WIFI is a system of packets, acknowledgments, and retries. If DSSS fails to get the packet through on the first try, it will slow the transmission down but not stop it. This though, is undesirable. It is particularly undesirable to some sites who have replaced WIFI-interfering cordless phones with VOIP that goes over the WIFI. The slowdown can cause poor voice quality.

FHSS Stomps on WIFI

Many cordless phones and other devices, use FHSS (Frequency Hopping Spread Spectrum) transmissions. FHSS transmissions, as their name implies, hop all over the band. There is no WIFI channel that is safe from a 2.4 GHz FHSS device. Devices that require significant band-widths are a particularly serious problem. All wireless devices that transmit voice or video, such as video senders, wireless CCTV cameras, and cordless phones require significant bandwidth and have been proven to interfere significantly with WIFI. These

devices have caused so many problems that some IT professionals now refuse to allow ANY new 2.4 GHz devices onto their sites.

Can Zigbee Modules Interfere with my Sensitive Equipment?

The fact that the 2.4 GHz Zigbee wireless transmissions are essentially identical to WIFI transmissions means that if WIFI doesn't interfere, then neither will the Zigbee Wireless Modules.

Avoiding Interference

How to Prevent Interference on Your Site

Use only DSSS devices

DSSS devices have a specific frequency band in which they operate. They do not randomly jump around the spectrum like FHSS devices, and therefore are much more well behaved when many devices must co-exist.

Keep Track of the Channels Assigned

Check the frequencies of each device and each WIFI access point. Make sure that no two devices that are within WIFI range are given the same frequency-band assignment.

Microwave Ovens can Leak at 2.4 GHz

Make sure your microwave ovens aren't leaking.

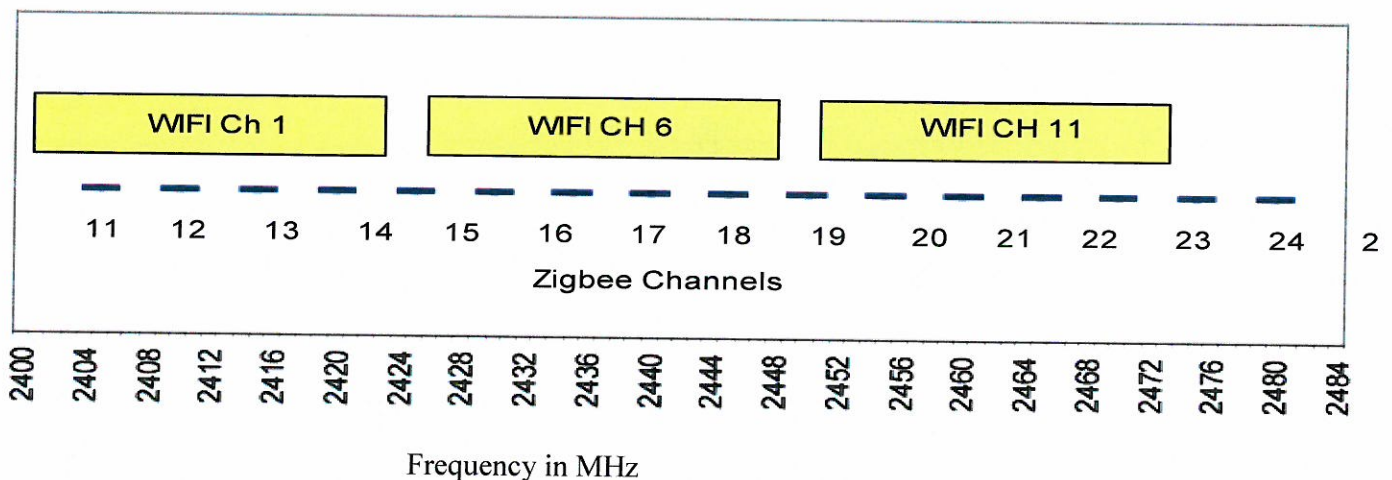
Zigbee Modules can Operate Outside the WIFI spectrum

There are two frequency channels that can be used by Zigbee Modules that are entirely outside the WIFI spectrum. Using these channels prevents any possibility of interference with WIFI.

The 2.4 GHz Zigbee Wireless Modules operate using the Zigbee standard. Most of the Zigbee channels are within the same 2.4 GHz spectrum that is used by WIFI (802.11), but two of the channels are ENTIRELY OUTSIDE OF IT. In addition, the Zigbee channels are only 2 MHz wide as opposed to the 23 MHz for the WIFI channels. Module transmissions are weaker than WIFI and will not interfere at all if they are not on the local access point's channel.

Match up the Frequencies to Prevent Interference

WIFI (802.11) has been assigned 11 (US/Canada, 13 elsewhere) channels that are 23MHz wide each. The WIFI channels 1 to 11 are overlapping. This can be done because of the packet-based nature of the WIFI transmissions. When different nearby access points operate on adjacent channels, the overlap will cause communications to slow down, but everything still works due to the packet-based, listen-before-you-talk, and retry based protocol. However, superior WIFI performance is achieved if nearby access points are on non-overlapping WIFI channels as shown below.



This diagram also shows the locations of the Zigbee (802.15.4) channels. Obviously, the Zigbee Modules can be configured such that they will be in the same region of the spectrum as an operating WIFI access point. If this is done, the WIFI communications will be slowed down, as will the Zigbee communications. Both systems listen before they talk, both systems transmit packets and both systems retry their transmissions. Thus, in general, both systems will still communicate, but it is an undesirable situation.

To avoid this situation the Zigbee NET Coordinator automatically looks for an empty channel before it starts operation. Thus, if a coordinator is placed near a WIFI access point, it will automatically choose a non-interfering channel. Parts of the Zigbee network near a different access point can be placed on a different coordinator, which will then also not interfere.

It is recommended that if possible, the WIFI access points be placed on only 2 of the overlapping channels, and that the Zigbee network modules be set to operate on the portion of the spectrum that is not used by these two channels. This will eliminate overlap and interference completely.

An additional possibility is to program the Zigbee network to operate on channels 25 and 26. These channels don't overlap any of the WIFI channels. However, this has the drawback that modules that use higher-powered radios, often used for longer communication runs, cannot operate on these two channels. Thus, more network connections for the NET devices will be required.

Wireless-Interference Avoidance – 1st Line of Defense

Zigbee do a large number of different things to prevent interference from affecting their performance. The first line of defense lies in the basic technique of Direct Sequence Spread Spectrum transmission (DSSS) which is extremely resistant to interference. Wikipedia has the following to say about DSSS:

Direct-sequence spread-spectrum transmissions multiply the data being transmitted by a "noise" signal. This noise signal is a pseudorandom sequence of 1 and -1 values, at a frequency much higher than that of the original signal, thereby spreading the energy of the original signal into a much wider band.

The resulting signal resembles white noise, like an audio recording of "static". However, this noise-like signal can be used to exactly reconstruct the original data at the receiving end, by multiplying it by the same pseudorandom sequence (because $1 \times 1 = 1$, and $-1 \times -1 = 1$). This process, known as "de-spreading", mathematically constitutes a correlation of the transmitted PN sequence with the PN sequence that the receiver believes the transmitter is using.

For de-spreading to work correctly, the transmit and receive sequences must be synchronized. This requires the receiver to synchronize its sequence with the transmitter's sequence via some sort of timing search process. However, this apparent drawback can be a significant benefit: if the sequences of multiple transmitters are synchronized with each other, the relative synchronizations the receiver must make between them can be used to determine relative timing, which, in turn, can be used to calculate the receiver's position if the transmitters' positions are known. This is the basis for many satellite navigation systems.

The resulting effect of enhancing signal to noise ratio on the channel is called process gain. This effect can be made larger by employing a longer PN sequence and more chips per bit, but physical devices used to generate the PN sequence impose practical limits on attainable processing gain.

If an undesired transmitter transmits on the same channel but with a different PN sequence (or no sequence at all), the de-spreading process results in no processing gain for that signal. This effect is the basis for the code division multiple access (CDMA) property of DSSS, which allows multiple transmitters to share the same channel within the limits of the cross-correlation properties of their PN sequences.

As this description suggests, a plot of the transmitted waveform has a roughly bell-shaped envelope centered on the carrier frequency, just like a normal AM transmission, except that the added noise causes the distribution to be much wider than that of an AM transmission.

In contrast, frequency-hopping spread spectrum pseudo-randomly re-tunes the carrier, instead of adding pseudo-random noise to the data, which results in a uniform frequency distribution whose width is determined by the output range of the pseudo-random number generator.

Benefits

- Resistance to intended or unintended jamming
- Sharing of a single channel among multiple users
- Reduced signal/background-noise level hampers interception (stealth)
- Determination of relative timing between transmitter and receiver

This technique is also used by WIFI, but with a different PN sequence. Thus the CDMA property will even allow the two to transmit in the same channel at the same time and both can get through.

Wireless-Interference Avoidance – 2nd Line of Defense

Zigbee Modules send their transmissions in packets with error correction codes. Partial or incorrect packets are rejected. Every transmission is acknowledged and there are three retries before a transmit effort will be abandoned.

If a transmission fails to get through, the module will wait 25 seconds, and then try the entire transmission sequence again. This repeats until transmission succeeds, or additional steps are needed.

Wireless-Interference Avoidance – 3rd Line of Defense

If all transmissions from a module fail to get through for about three minutes, the module will reset its radio to factory defaults, reprogram it from scratch, and scan all of the user-configured Zigbee channels looking for its PAN (network identifier). Once it finds its network, it will log back on, and then begin attempting to communicate as before.

Wireless-Interference Avoidance – 4th Line of Defense

If communications from lots of the modules on a network fail, then the Node will reboot the coordinator, reset it to factory defaults, reprogram it from scratch, and then change the channel that it was operating on. Once this is done, all of the various modules in the field will find the new channel and log onto the network which will now be on an entirely different frequency.

Wireless-Interference Avoidance – 5th Line of Defense

All Zigbee modules have a 7 day buffer for readings history data recorded at 15 minute intervals. This data will not be lost regardless of the communication status of the device. In addition, if any of the modules are offline for longer than a user-programmed period of time, the system can be programmed to dial-out and inform maintenance personnel.

Wireless - Other Defenses

Zigbee Modules are all battery backed up, they all have internal battery monitoring that can cause a dialed-out alarm, they all have Watchdog timers capable of resetting them in case of a crash, and their transmissions are monitored from the Node.

It really is That Simple

Some wish to doubt that it is that simple. I have heard it all before, they say, and yet XXXX interfered. Science refutes superstition. All radios produced today are required to be certified by FCC. They are not permitted to radiate significant levels of RF energy outside of their assigned transmission frequency. Keep the frequencies separate and you prevent interference.

Summary

Zigbee Wireless modules are designed to operate on busy sites that use WIFI. These modules are designed specifically so that they will NOT interfere. They are further designed specifically for high-security monitoring. As such, they have many different defenses to enhance reliability, to protect against radio interference, and to ensure monitoring and alarming integrity. The sum of all of their defenses makes them the most reliable monitoring solution possible in a wireless device.

Voice Dialer Administrator

The Voice Dialer Administrator (Tapitest) allows a user to setup the dialing methods that the system will use. Among other things, you can use the utility to select the dialing callout method that the system will use, perform an actual dial-out, and confirm the voice functionality of the system.

Voice Dialer Administrator Home Screen

SelectPrimary / SelectBackup:

Allows you to select the voice modem or VoIP account for use as an alarm telephone dialing option.

Dialing Prefix:

This allows you to append a dialing prefix to all of the numbers dialed. This is particularly intended for Failover Nodes where the prefix may be different for the Main Node and the Failover Node.

Initialize Modem:

Initializes and assigns a specific alarm telephone dial-out method for use with the system.

Test Backup Dialer:

Check this box to run tests on the backup dialer instead of the primary dialer.

Debug Voip:

Check this box to show a log of the entire VoIP conversation.

Dial:

Enter a valid phone number in this location to test the system's dial-out capabilities.

SetRings:

Allows you to call the system and check for correct functionality with inbound calls.

Hangup:

Hangs up the current in-progress phone call.

TestVoice:

Press this button to test the actual voice functionality of the system during a test phone call.

VoIP Settings Window

SIP Account for VOIP

SIP Server: callcentric.com OK

SIP Proxy: Cancel

SIP User: 1777555555

Domain: callcentric.com

Authorization User:

Password: *****

Transport: Auto

Public IP Addr: Auto

Public IP Port: Auto

STUN Server:

☐ ICE

Account Type: SIP Service Provider

The VoIP settings window represents the account settings that are available when connecting to a SIP VoIP telephone provider. As shown above, it is not a requirement that all such settings be entered for a successful connection. Before the setup is attempted, the end-user must get both the appropriate and required parameters from their IT department regarding these settings. The commonly used settings are:

SIP Server:

The actual SIP VoIP server that the system will connect to

SIP User:

The ID of the user that is authenticating with the VoIP server

Domain:

The domain name of the VoIP server. This is typically the same as the SIP Server name.

Password:

The authenticating password of the SIP User. This field is sometimes left empty depending upon the type of authentication used with a SIP VoIP provider.

Account Type:

The type of connection that will be made. Select SIP Service Provider when connecting to a SIP Server. Choose VoIP Dialer when connecting to a Rees Scientific VoIP Dialer.

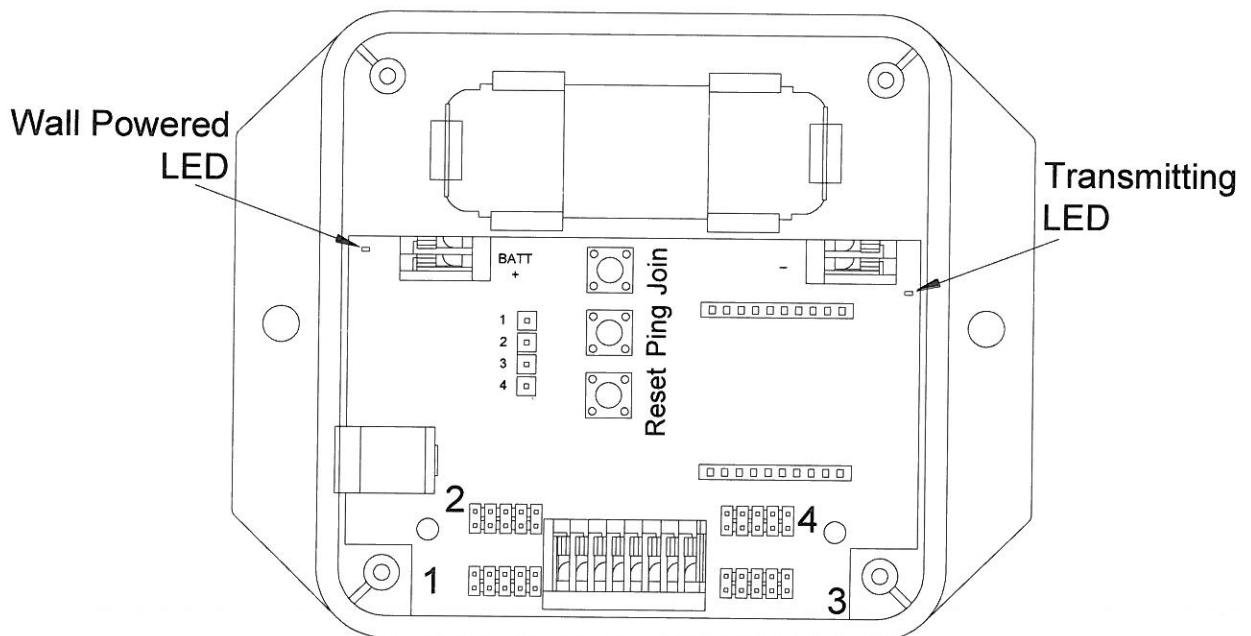
The above parameters represent the most commonly used and typically the minimum set of parameters required for connection to a SIP VoIP server. Additional parameters may be entered into their requisite fields.

How-Tos

Connecting a Zigbee Transmitter

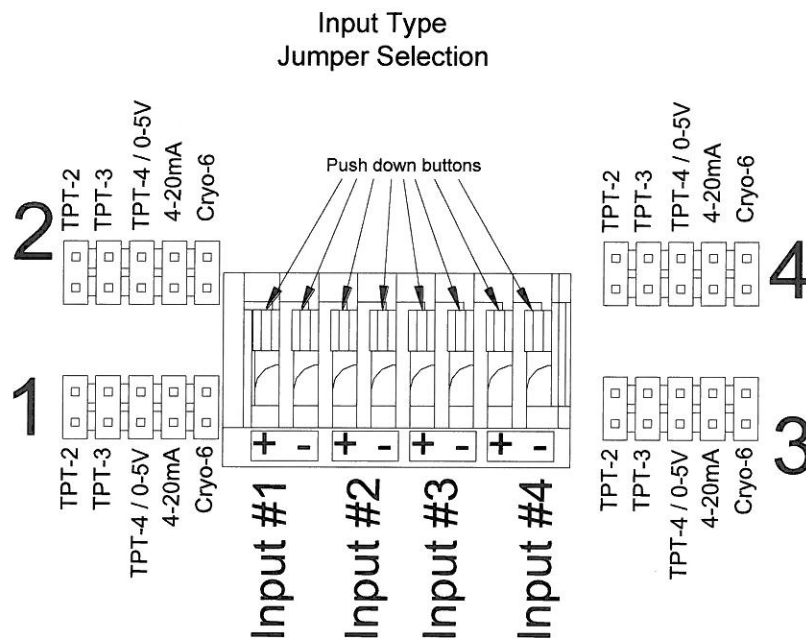
When using a wireless system the most basic of functions involves connecting an endpoint device to the system. Luckily if the base that the transmitter is connected to is already setup this process should take no longer than 30 seconds. While wireless transmitters may come in a variety of models, each looking slightly different, the steps below will enable you to quickly connect a majority of the devices to the system.

1. Connect a wireless coordinator to the system. For instructions on doing this follow the FAQ “Connecting a Coordinator to the System”. Ensure that Wireless Subsystem Administrator is authorized and verify the channel that the receiver is listening on.
2. Locate a wireless transmitter. Take the cover off the module and orient it so that the battery is located towards the top. Take note of the location of the three buttons on the board, “Reset”, “Ping”, and “Join” as well as the two LEDs.



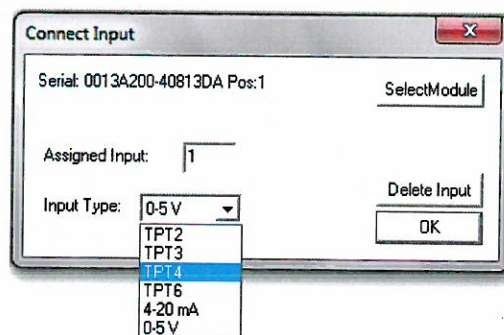
3. Verify that the device has power and is either plugged into the wall or running on battery. If the device is using a wall power supply the Wall Powered LED will be lit. If the device is not using a wall power supply check that the battery is functional by quickly pressing and releasing the *Reset* button. By quickly depressing the *Reset* button the Transmitting LED should turn on.

4. Plug the wire ends for the probe that you wish to monitor into the green connector at the bottom of the box. Models with built-in sensors are wired directly to the board (Temp/Humidity/Light, DP). The first two slots on the green input connector, from the left, are input 1, the second two slots input 2, the third two...
5. After a probe has been inserted into the correct slot in the green connector a jumper must be set for that probe before it will read correctly. Surrounding the green connector are a series of jumper blocks, each set corresponding to a different input on the board as indicated by the directly adjacent number. Use the figure below to place a jumper on the correct set of pins corresponding to the input type and location of the inserted probe. Only one jumper should be set for any given probe input.



6. The transmitter must be paired with a corresponding coordinator by programming it to use the same channel that the coordinator is set for. In order to program the wireless transmitter use the following sequence
 - a. Press the *Reset* button, wait till the Transmitting LED lights up, and release the Reset button.
 - b. Hold down the *Join* button until the Transmitting LED turns off.

- c. Repeatedly press the *Ping* button the number of times that the receiver it is connecting to is programmed for in terms of the number of clicks (e.g. If the receiver is programmed for 12 clicks press the *Ping* button 12 times.) Every time that you press the *Ping* button the Transmitting LED will briefly flash. If you miss a flash of the Transmitting LED start over from step a.
7. Open the Wireless Subsystem Administrator program on the computer that is hosting the Node software.
8. Set at least 1 MPX panel to the type “Zigbee” and press the Program V2 Connection button located toward the upper right hand corner.
9. Make sure that the Coordinator receiver that you confirmed in Step 1 is connected to the system by verifying that the Clicks channel located adjacent to the Coordinator is populated with a number. If a number is not present in the Clicks box press the *Connect* button located next to a given Coordinator.
10. Once a transmitter is talking to a Coordinator the serial number of that transmitter will appear in the drop-down window located on the right-hand side. Select a serial number from the drop-down window to add/edit a transmitter’s inputs. If a Coordinator has just been connected to the system wait at least 30 seconds before querying the serial number drop-down box for the given transmitter.
11. The upper left-hand corner of the transmitter window lists the available inputs for the module in-hand. Select a given input number (1-4) corresponding to the location that the probe has been inserted into the transmitter.
12. The final configuration step involves setting the input number and type as shown in the picture below. The input number that the input is assigned to can be changed by entering a different number in the location labeled “Assigned Input:”. The input type can be changed by selecting the appropriate type in the drop-down list. Any input type that is selected has to correspond with the given probe that is physically inserted into the transmitter. TPT types represent specific sensors sold only by Rees Scientific, while 4-20mA and 0-5V are generic types that many devices output.



13. The device can now be seen in the Wireless Subsystem Administrator at the input number specified in Step 12.

Wireless Subsystem Administrator

Request Code: ☒ MPX 1 ☐ MPX 5

Activation: ☐ MPX 2 ☐ MPX 6

Re-License ☐ MPX 3 ☐ MPX 7

☐ MPX 4 ☐ MPX 8

Serial #	Input	Last Call	Missed Chips	Signal Strength	Age of Ping	Input Status	Version	Reads	Type	Module ID	Parent ID
0013A200-40813DA9:1	1	14	0			OK-E	1018	0.001	Volts	0002	0000
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
	16										

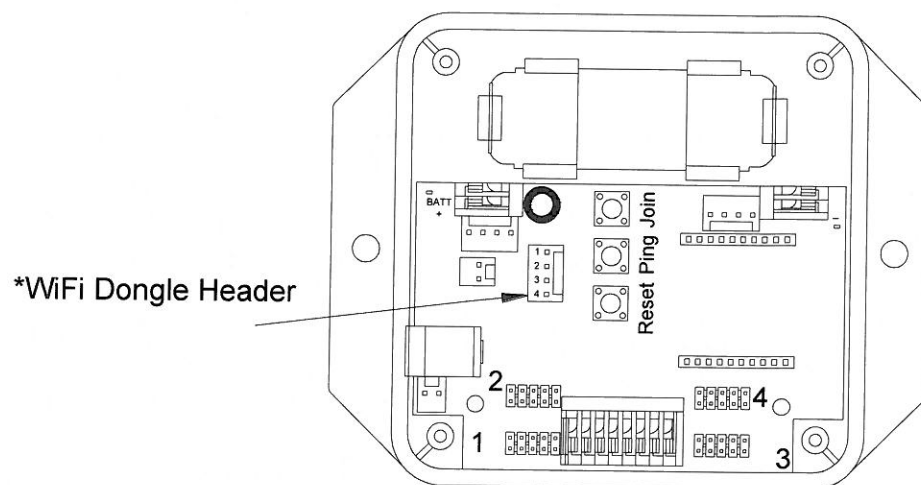
☒ Show Parents
☐ Show Batteries
☐ Show Connections
☐ Show DutyCycles
☐ Show Log Stats

Total Missed Chips Worst Input: Min Test:

Connecting a WiFi Transmitter

When using a wireless system the most basic of functions involves connecting an endpoint device to the system. WiFi transmitters unlike other wireless transmitters only use the existing WiFi backbone to communicate with the Monitoring System. Capable of using Open Authentication, WPA-PSK, and WPA2-PSK, you will need a programming dongle, a WiFi signal, and the WiFi network's SSID and authentication credentials to connect one of these modules to your system.

1. On the computer that houses the Node software, plug the WiFi programming dongle into an available USB port. Plug the other end of the WiFi dongle into the module as shown below.



2. Start the Wireless Subsystem Administrator and press the “Program V2 Connection” button. You will see the window below.

Connect V2 Device

Scan for V2 Devices

Com: <None>

	Clicks	CH	
IP1:			Chg Connect
IP2:			Chg Connect
IP3:			Chg Connect
IP4:			Chg Connect
IP5:			Chg Connect
IP6:			Chg Connect
IP7:			Chg Connect
IP8:			Chg Connect
IP9:			Chg Connect
IP10:			Chg Connect
IP11:			Chg Connect
IP12:			Chg Connect
IP13:			Chg Connect
IP14:			Chg Connect
IP15:			Chg Connect
IP16:			Chg Connect
IP17:			Chg Connect
IP18:			Chg Connect
IP19:			Chg Connect
IP20:			Chg Connect

OK

Cancel

Modules Authorized: 128

AutoUpdate

Update non-routers

☒ Use Wifi Program Wifi Modules

3. Select the "Use WiFi" checkbox found in the lower left-hand corner and press the "Program WiFi Modules" button. The window below will appear.

Program Wifi Modules

Programming Cable on Com: Com12

Wif Network ID:

Security Type: <None>

Security Key: *

Centron Node's IP: 155.155.1.20

Listening on IP Port: 9750

Wait for Module

OK Cancel

4. The COM port that the dongle is connected to your computer on should appear in the "Programming Cable on Com:" box. If the COM port is incorrect, select the correct port from the drop down menu.
5. Enter your WiFi Network ID and Security Key into the requisite boxes and select the Security Type from the drop down window. Press the "Wait for Module" button.
6. On the module, you will need to press RESET then JOIN in succession. After this the blue LED should blink several times rapidly, confirming that the module has received the information. After you see the rapid blinking light, disconnect the module from the dongle, and press its reset button. Keep the programming window on the screen and repeat this procedure as necessary until all of your modules have been programmed.

7. Once the modules have been programmed they should begin to talk to the IP address listed as the Centron Node's IP, as listed in the Program WiFi Modules window shown above. In order to see the modules you will need to go back to the Connect V2 Devices window and select a given module by serial number from the dropdown on the right-hand side.

Connect V2 Device

Scan for V2 Devices

Com: <None>

	Clicks	CH	Chg	Connect
IP1:			Chg	Connect
IP2:			Chg	Connect
IP3:			Chg	Connect
IP4:			Chg	Connect
IP5:			Chg	Connect
IP6:			Chg	Connect
IP7:			Chg	Connect
IP8:			Chg	Connect
IP9:			Chg	Connect
IP10:			Chg	Connect
IP11:			Chg	Connect
IP12:			Chg	Connect
IP13:			Chg	Connect
IP14:			Chg	Connect
IP15:			Chg	Connect
IP16:			Chg	Connect
IP17:			Chg	Connect
IP18:			Chg	Connect
IP19:			Chg	Connect
IP20:			Chg	Connect

OK
Cancel

Modules Authorized: 128

00000023-A746D221 1
00000023-A7498F24 4
Autopoint

☐ Update non-routers

☒ Use Wifi Program Wifi Modules

Connecting a Coordinator to the System

A majority of Wireless devices communicate with the system by connecting to a base receiver, otherwise known as a Coordinator. Once connected a variety of input devices can be connected for use with the system. While Coordinators may come in a variety of models, each looking slightly different, the steps below will enable you to quickly connect a majority of the devices to the system.

1. Plug a Coordinator device into its applicable location (USB or Network Jack) and if necessary power the device with the transformer supplied with the module. USB Coordinator devices do not need an external power supply.
2. Open the Wireless Subsystem Administrator program on the computer that is hosting the Node software. The program can be found in either the Windows Start menu or on the desktop.
3. Once open ensure that the Wireless Subsystem Administrator is authorized and at least 1 MPX panel is set to Zigbee. In the figure below you can tell that the program is authorized since the *Authorize* button is greyed out. In order to authorize the program you will have to place a call into Rees Scientific Technical Support to get an authorization number.

Wireless Subsystem Administrator

Request Code: A315622

Activation:

Re-License Authorize

Generate Wireless Inputs.txt File

<input checked="" type="radio"/> MPX 1	Zigbee	<input type="radio"/> MPX 5	Zigbee
<input type="radio"/> MPX 2	Zigbee	<input type="radio"/> MPX 6	Zigbee
<input type="radio"/> MPX 3	Zigbee	<input type="radio"/> MPX 7	Zigbee
<input type="radio"/> MPX 4	Zigbee	<input type="radio"/> MPX 8	Zigbee

Program V1 Connection

Program V2 Connection

4. Press the *Program V2 Connection* button to bring up the *Connect V2 Device* dialog box. The left-hand side of the resulting screen represents all Coordinators that can be connected to the system.

Scan for V2 Devices		Clicks	CH	Chg	Connect
Com:	Com8 - V2 Device	2	23	Chg	Connect
IP1:	155.155.1.108 (00-20-4A-C9-8F-2B)	3	12	Chg	Connect
IP2:				Chg	Connect
IP3:				Chg	Connect
IP4:				Chg	Connect
IP5:				Chg	Connect
IP6:				Chg	Connect
IP7:				Chg	Connect
IP8:				Chg	Connect
IP9:				Chg	Connect
IP10:				Chg	Connect
IP11:				Chg	Connect
IP12:				Chg	Connect
IP13:				Chg	Connect
IP14:				Chg	Connect
IP15:				Chg	Connect
IP16:				Chg	Connect
IP17:				Chg	Connect
IP18:				Chg	Connect
IP19:				Chg	Connect
IP20:				Chg	Connect

5. When linking a USB type Coordinator to the system the device can be connected to the system using the upper-most *COM:* slot. Use the drop-down list to select the appropriate COM port that the USB Coordinator is plugged into. To verify the appropriate COM port of the USB Coordinator choose the device with the appended *V2 Device* label or use the Ports section of Windows Device Manager and plug/unplug the USB Coordinator to see what port the device is using.

When linking a Net type Coordinator to the system the device can be connected by entering the IP of the module in an IP (1-20) slot. To scan for all devices on the network press the *Scan for V2 Devices* button to refresh the listing. Match the appropriate serial number/MAC address of the Net Coordinator with one of the devices listed. The serial number/MAC address of the Coordinator can be obtained by removing the lid of the module and reading the 12-digit address printed on top of the device to which the Ethernet wire plugs into.

6. After selecting a Coordinator device, either by choosing a COM port or IP address of the module, you will have to connect it to the system before it works. Press the *Connect* button located adjacent to a selected Coordinator to connect it to the system.

7. If you are connecting multiple Coordinators to the system each Coordinator must be on a different number of Clicks. The Clicks for a given Coordinator represent the PAN ID that devices connecting to that Coordinator will use, a number that those devices will have to be programmed to. To change the number of Clicks for a Coordinator press the *Chg* button next to a given Coordinator. At the top of the resulting window enter an appropriate number of Clicks that you would like to use and press OK.

VoIP Setup- SIP Service Provider

The screenshot shows a window titled "SIP Account for VOIP". Inside, there are several input fields and dropdown menus. The "SIP Server" field contains "callcentric.com". The "SIP User" field contains "1777777777". The "Domain" field contains "callcentric.com". The "Transport" dropdown is set to "Auto". The "Public IP Addr" dropdown is set to "Auto". The "Public IP Port" dropdown is set to "Auto". The "Account Type" dropdown is set to "SIP Service Provider". There are "OK" and "Cancel" buttons on the right side of the dialog.

Fig 1. SIP VoIP Account Settings

1. Obtain the necessary parameters required to connect to the customer supplied SIP VoIP provider.
2. If you are testing the VoIP setup using the VoIP toolset, unzip the downloaded VoIP files to a directory on the computer that will be running the Rees Scientific software. Open the directory. If you are not using the downloaded VoIP files and have installed the full Node software, proceed to the ReesSystem folder found on your hard drive.
3. In the directory locate and run the file TapiTest.exe.
4. Within Tapitest, click the **SelectPrimary** button. Select the **New VOIP Account** option in the selection window and press OK.

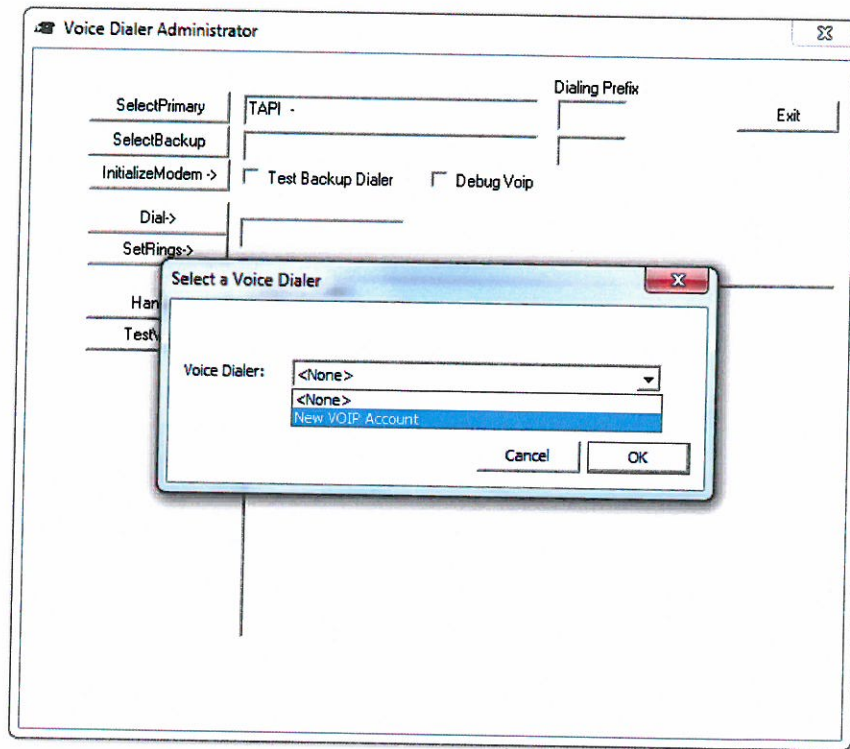


Fig 2. Voice Dialer Administrator (Tapitest.exe)

5. In the VoIP account settings page, enter the required parameters into their relevant sections as shown in Fig 1. Press OK.
6. Pressing OK will bring you back to the original Voice Dialer Administrator window. If the parameters you entered were correct, and the software was able to make a successful connection to the SIP VoIP server, the resulting window will display this information. A successful connection is shown in Fig.3 below. If any errors are encountered, or if the connection was unsuccessful, they will also be listed. An unsuccessful connection attempt is shown in Fig.4 below. If errors are encountered, verify your account settings as entered in the VoIP account settings page. Do not proceed until you are successfully connected to the VoIP server.

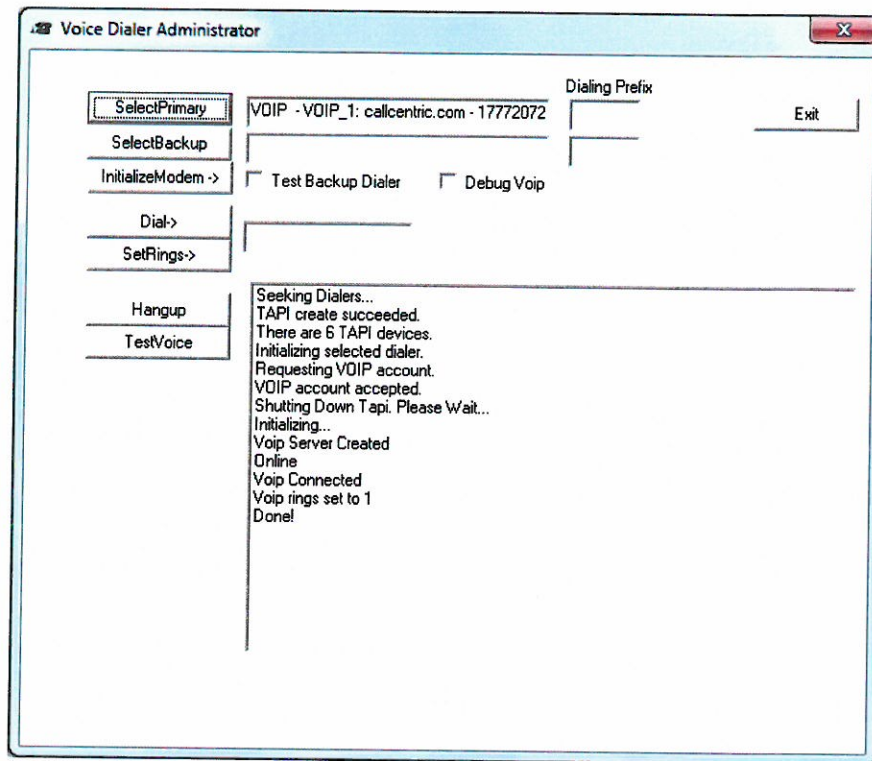


Fig 3. Successful connection to VoIP Server

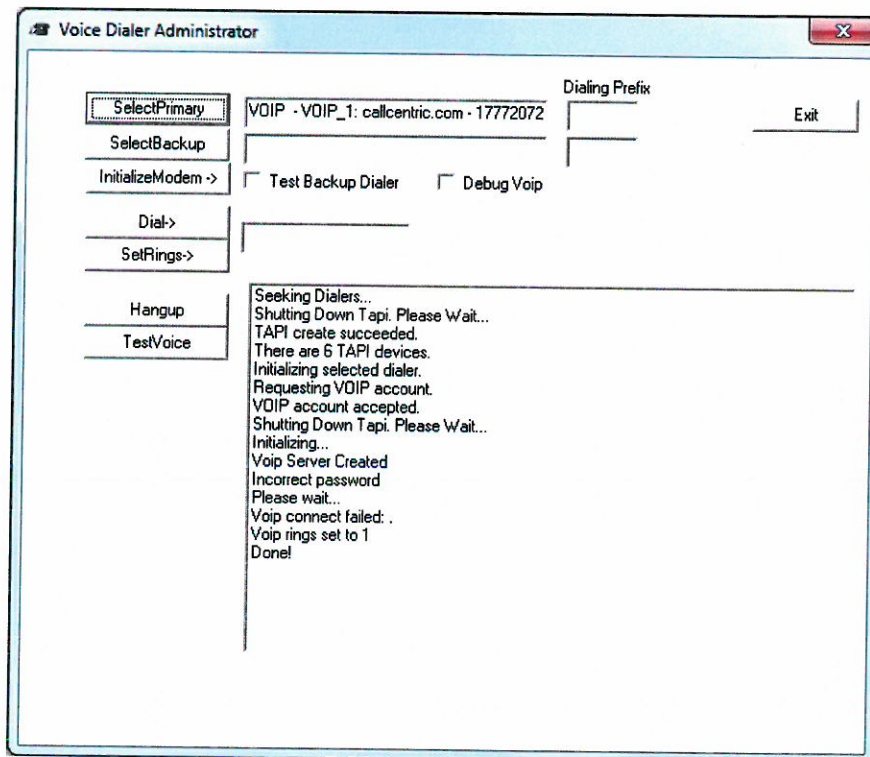


Fig 4. Unsuccessful connection attempt.

7. Once you are connected to the VoIP server you will have to verify the ability of the system to perform an actual telephone call. In the Voice Dialer Administrator window enter the phone number of a nearby phone into the box located directly adjacent to the buttons labeled **Dial->** and **SetRings->**. When entering the phone number be sure to follow the dialing conventions of the phone system, entering any dialing prefixes (e.g. "1", "9", "9,") as needed. If applicable, use the comma symbol to represent a pause in the dialing of a phone number for systems requiring such an attribute.

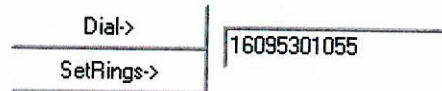


Fig 5. Entering a phone number.

8. Once the phone number has been entered, press the **Dial->** button. If successful, you should hear the phone whose phone number you entered ring; answer the call.

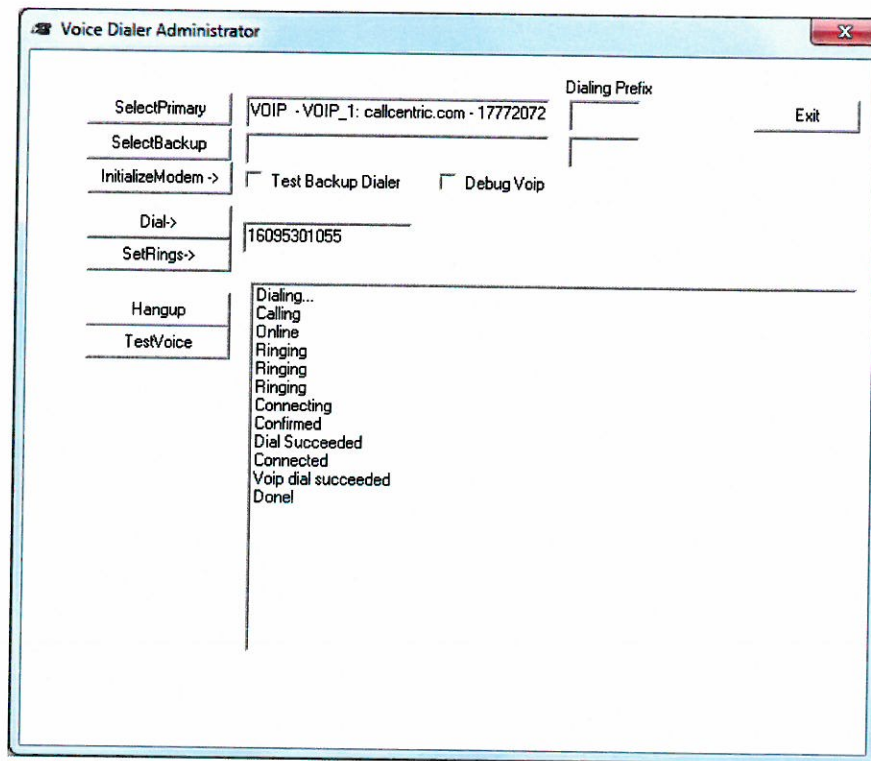


Fig 6. Voice Dialer Administrator window after successfully calling a telephone.

9. In the Voice Dialer Administrator window press the **TestVoice** button. Once you press the button you should hear a message on the telephone. If you fail to hear anything do not proceed.

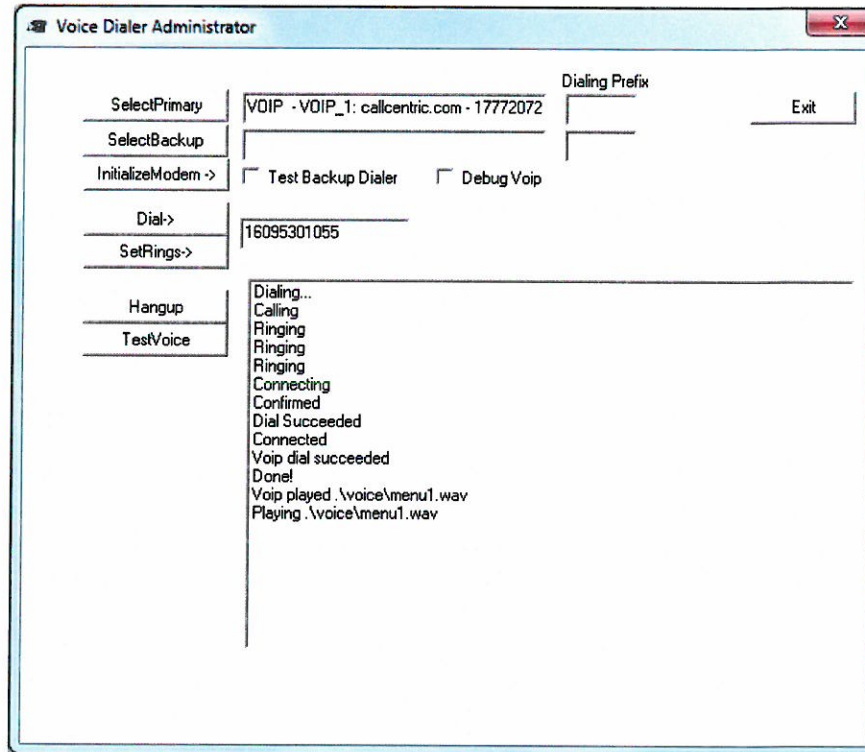


Fig 7. Voice Dialer Administrator window after successfully playing the message.

10. After hearing the system prompt message, the last step is to check whether or not the system is capable of receiving input from the telephone. Using the telephone, press the numbers 1-9 & 0 in sequence, followed by the # sign. After every button is pressed you should see the resulting indication in the Voice Dialer Administrator window.

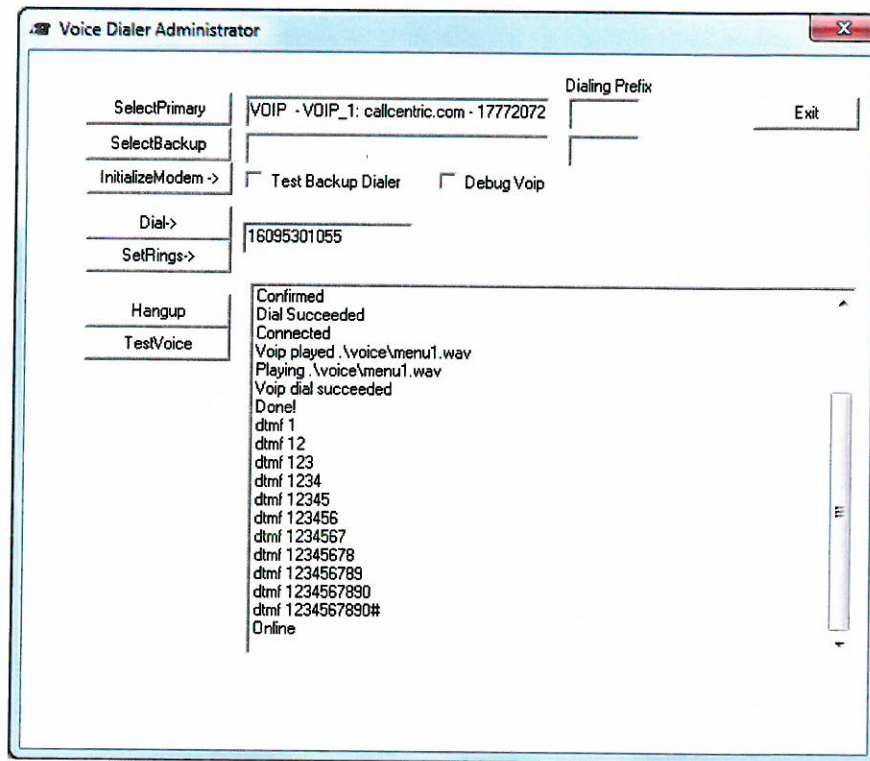


Fig 8. Voice Dialer Administrator window after successfully logging the telephone input.

11. Take a screenshot of the Voice Dialer Administrator window showing the successful telephone input and send the screenshot to the individual who sent you these instructions. You can take a screenshot by simultaneously pressing the Ctrl and Print Screen buttons and pasting the captured image into a program such as MSPaint.

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