



FOCUS GUIDE

NETWORK CONTROLLER

Configuration Guide for Prolon Focus Software

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1 - Network Controller

This guide will describe in detail the operating sequences and configuration variables used by the Proton series *Network Controller*.

The *Network Controller* is a communication module that performs several main functions. First and foremost, it acts as a communication interface to a Proton network via Ethernet, USB or RS485. It also manages the occupancy schedule and the outside temperature reading which it can distribute to any Proton controller on the network.

The *Network Controller* can be configured to poll any Proton controller and send email-based alerts upon user-selectable conditions and can also record trend logs for any controller on the network.

2 - Networking

Proton's *Network Controller* does not directly control any HVAC equipment itself. Instead, it distributes information and enriches the sequences available to other Proton controllers, making for a more effective overall system. Proton's default method of network communication is Modbus RTU over RS485.

2.1 - Shared Information

The Proton Network Controller can distribute the following information:

- **Occupancy Status:** The *Network Controller* can calculate up to sixteen different schedules, which can then be distributed to other controllers on the network as desired. It is important to note that the *Network Controller* does not automatically detect controllers and begin distributing schedules by itself. Each schedule must be manually assigned to the appropriate controller through the Proton Focus configuration software.
- **Outside Air Temperature:** The *Network Controller* can collect and distribute the outside air temperature to any controller on a Proton network. It is important to note that the *Network Controller* does not automatically detect controllers and begin distributing the outside temperature by itself. A valid source for the outside temperature reading must be determined, and then must be manually assigned to the receiving controllers through the Proton Focus configuration software.

The occupancy status sent by the *Network Controller* is limited simply to either 'Occupied' or 'Unoccupied' states. Currently there is no standby mode.

This status sent by the *Network Controller* will take priority over the occupancy state calculated internally by the receiving controller. However, if the receiving controller has a physical input dedicated to occupancy or occupancy override (such as a digital contact), that physical input's status will take priority over information received from the *Network Controller*.

If the receiving controller has a physical analog input dedicated to an outside temperature reading, then this physical input will take priority over the one received from the *Network Controller*.

This information is provided by the Proton *Network Controller* every ten to thirty seconds. Proton controllers are pre-configured to declare any received information invalid should 720 seconds elapse without any further update. Please review the respective guide of each controller for more information.



3 - Adding a Network Controller to a Focus Project

Prolon Focus is a free visualization and configuration software for all Prolon controllers. Once the *Network Controller* has been physically wired to a Prolon network, it's time to add it to your Focus project.

3.1 - Assigning Addresses

All controllers in a Prolon Modbus network need to be addressed, and these addresses must be unique on a given network. The factory default address of the Prolon **Network Controller** is 99. This address can be modified in the Device Properties configuration screen ([see p.28](#)) using the Prolon Focus software. Valid addresses range from 1 to 127.

3.2 - Adding the Controller to the Screen

Prolon **Network Controllers** can be added onto the screen by clicking on the “New Network Scheduler” button, found in the Devices Drag and Drop list on the left side of the Focus screen (Global View only):

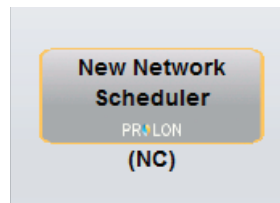


Figure 1 - New Network Scheduler Button

Focus will ask for the address of the controller, attempt to locate it, and add it on the screen if successful.

The **Network Controller** is the only device that is added in Global View since it does not belong to any particular system, but helps control the entire network as a whole.



4 - Network Controller Icon

When a *Network Controller* is added to a Focus project, it is represented by an icon. This icon displays the current time and is updated regularly. You can open the configuration screen for a *Network Controller* by double-clicking on its icon or right-clicking it and choosing the “Configure” option. The icon will instead display an empty field if the *Network Controller* is offline.



Figure 2 - Typical Network Controller Icon

4.1 - Icon Data

Real Time

The *Network Controller* icon displays the time provided by the real time clock of *Network Controller*. The day of the week is abbreviated on the left.

NOTE that the time can be displayed in either 12h or 24h format by changing the setting in the ‘Options’ menu, under ‘Units’, then ‘Time Format’.

4.2 - Icon Colors

The *Network Controller* icon changes color depending on the controller’s status.

- **Gray:** The *Network Controller* icon is gray when off-line or if data is not being received.
- **Green:** The *Network Controller* icon is green when it is online.



Figure 3 - Gray Icon



Figure 4 - Green Icon



4.3 - Icon Right-Click

At any time you can right-click the **Network Controller** icon to access a list of useful functions.

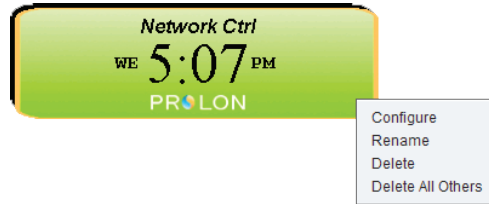


Figure 5 - Icon Right-Click for Network Controller

- **Configure:** This opens the configuration screen for the **Network Controller** (same as double-clicking the icon).
- **Rename:** Lets you rename the **Network Controller**. Names are limited to 16 characters.
- **Delete:** Removes the **Network Controller** from your network.
- **Delete All Others:** Removes all other Icons from the network view. This is useful for debugging purposes, for example when trying to exclusively establish communication with this controller, and the presence of the other controllers in your project is causing communications to slow down.



5 - Configuration of the Network Controller

To view the configuration of a **Network Controller** in detail, double-click on its icon to see its configuration screen. Use the menus in the top left corner to navigate between the different sections.

5.1 - Network Controller Home Page

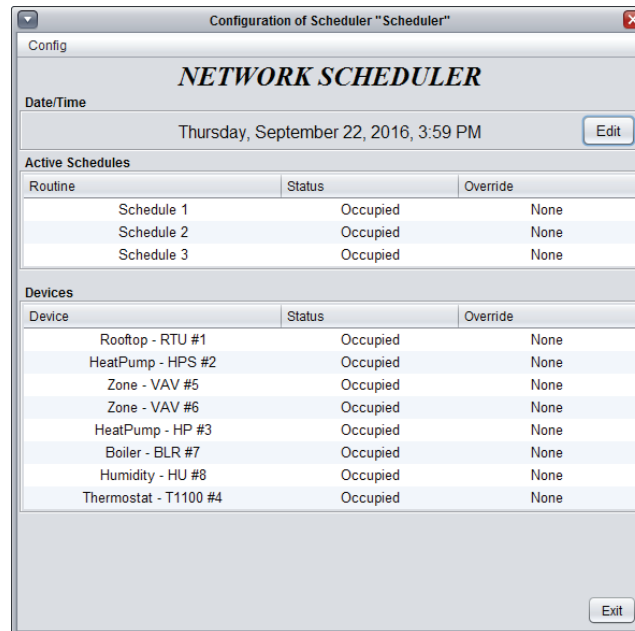


Figure 6 - Network Controller Home Screen

This screen shows the Occupancy status of all the schedules and devices that the **Network Controller** is managing.

5.1.1 - Real Time

The **Network Controller** device has an internal real time clock. The current date and time is displayed at the top of the Home screen. To edit the time, click on the "Edit" button.

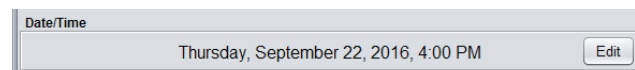


Figure 7 - Edit Time Button

A window appears allowing you to edit the time. Your computer's time is shown at the top of the window. You can copy your computer's time directly into the time of the **Network Controller** device using the "Copy" button, or simply edit the time yourself by directly typing it in the corresponding text box. A drop down list of time zones is also made available.

The use of daylight savings time can also be configured here. When set to automatic control, daylight savings will be enabled and disabled on Sunday at 2AM on the specified weeks.

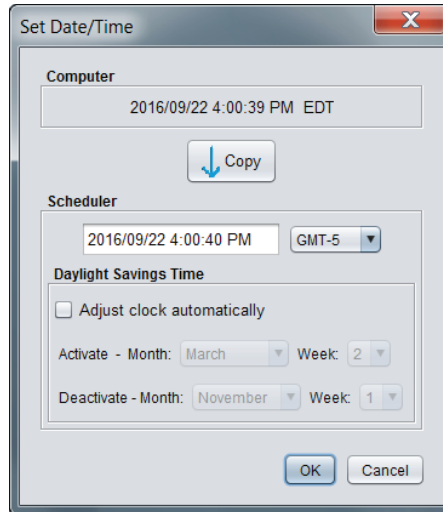


Figure 8 - Edit Time Dialog Box

Note that the time can be displayed in either 12h or 24h format by changing the setting in the 'Options' menu, under 'Units', then 'Time Format'.

5.1.2 - Active Schedules

This section displays the status of the various user-created schedules.

- **Routine:** The names of the user-created schedules. The factory default configuration of a **Network Controller** always includes an empty schedule named "Schedule 1".
- **Status:** The current occupancy status for each routine. This can either be 'Occupied' or 'Unoccupied'. There is no 'Standby' mode.
- **Override:** The current override status of each routine. Double-clicking on the text area here allows you to perform overrides on each routine. Any device receiving this routine will be affected by the override status.

Active Schedules		
Routine	Status	Override
Schedule 1	Occupied	None
Schedule 2	Occupied	None
Schedule 3	Occupied	Occupied

Figure 9 - Override Schedule Routine

The status of these routines is then distributed to any associated controllers.



5.1.3 - Devices

This section displays the status of the various controllers who are receiving their occupancy state from the **Network Controller**.

- **Device:** The name of the devices that are receiving their occupancy state from the **Network Controller**. Each name is accompanied by an abbreviation of the device's type, as well as its network address.
- **Status:** The current occupancy status for each device. This can either be 'Occupied' or 'Unoccupied'. There is no 'Standby' mode.
- **Override:** The override status for each device. Double-clicking on the text area here allows you to override the current occupancy status of the device. This does not affect the occupancy status of any other devices that follow the same routine as the overridden controller.

Device	Status	Override
Rooftop - RTU #1	Occupied	None
HeatPump - HPS #2	Occupied	None
Zone - VAV #5	Occupied	Occupied
Zone - VAV #6	Occupied	Unoccupied
HeatPump - HP #3	Occupied	None
Boiler - BLR #7	Occupied	None
Humidity - HU #8	Occupied	None
Thermostat - T1100 #4	Occupied	None

Figure 10 - Override Scheduled Device

5.2 - Schedule Distribution

This screen is used to assign schedules to various ProLon controllers.

Note that it is not necessary to send a schedule to every controller on the network: ProLon Master Controllers, such as Rooftop or Heatpump controllers, will automatically send their occupancy status to their respective zone controllers. Therefore, it is a best practice to only send schedule routines to Master Controllers.

It is only useful to send routines to Zone Controllers if they need to follow a different routine than their Master controller.

If a controller has a physical input dedicated to occupancy or occupancy override (such as a digital contact), that physical input's status will take priority over information received from the **Network Controller**.

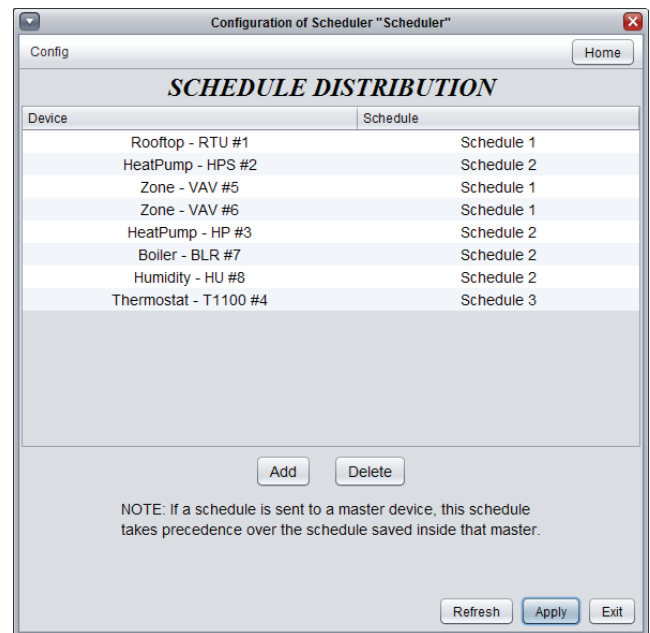


Figure 11 - Schedule Distribution Configuration Screen



5.2.1 - Adding/Removing Devices

- **Add:** Lets you add a device to the list of scheduled devices.
- **Delete:** Lets you delete a device from the list of scheduled devices.



Figure 12 - Dialog Box to Specify Address of Device to Add

5.2.2 - Assigning Schedules to Devices

The devices added to the distribution list appear on the top portion of the screen. You can now set different schedule routines to each listed device. To select a schedule, double click on the schedule **text area** and choose the desired schedule from the existing ones. Refer to the Weekly Routine section ([p.14](#)) to learn how to create a new schedule.

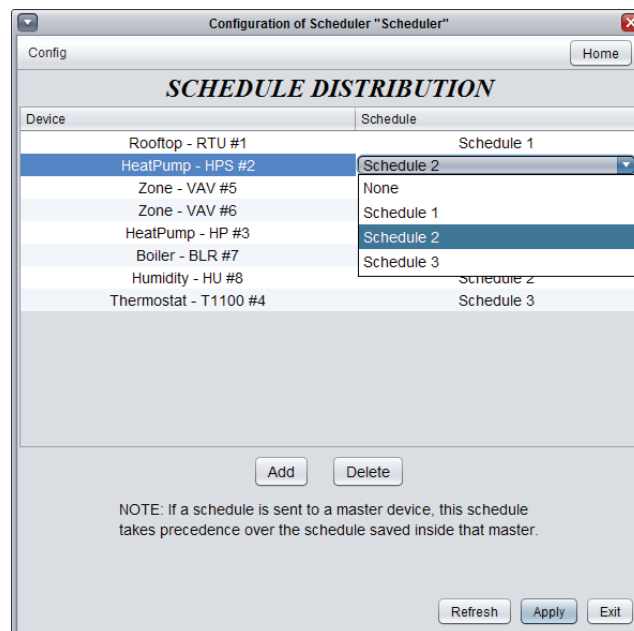


Figure 13 - Dialog Box to Specify a Device's Schedule



5.3 - Outside Temperature Distribution

This screen is used to collect and distribute the outside temperature reading to the other various Proton controllers.

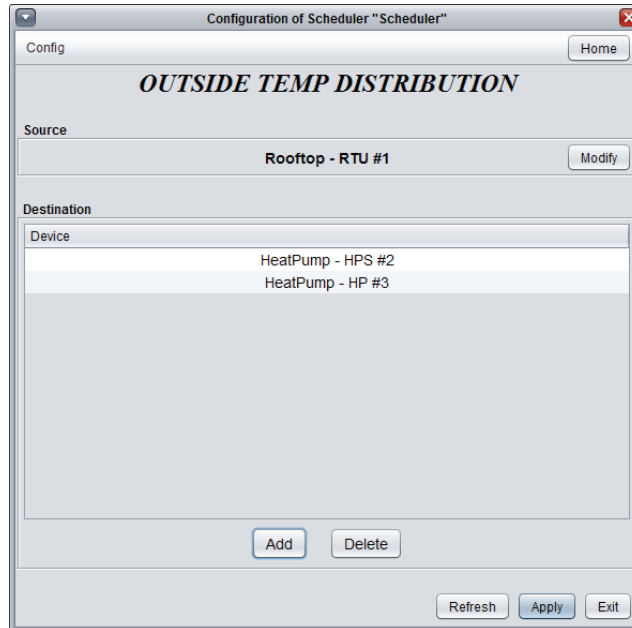


Figure 14 - Outside Temperature Distribution Configuration Screen

The **Network Controller** itself does not have an input for the outside temperature and relies on one of the controllers present on the network for this reading. Only one controller can be the source of the outside temperature reading for the entire network.

Note that it is not necessary to send the outside temperature reading to every controller on the network: Proton Master Controllers, such as Rooftop or Heatpump controllers, will automatically send their reading to their respective zone controllers. Therefore, it is a **best practice** to only send the outside temperature to Master Controllers.

Note that if the receiving controller has a physical analog input dedicated to the outside temperature, then this physical input will take priority over the one received from the **Network Controller**.



5.3.1 - Outside Temperature Source

This is where the source of the outside temperature reading is selected. Click the 'Modify' button to open outside temperature selection source window.

- **None (Disable this function):** When this is selected, no outside temperature reading will be distributed. Every master controller will then rely on its own temperature reading.
- **Device:** Choose the controller which will provide the outside temperature reading that is to be redistributed.

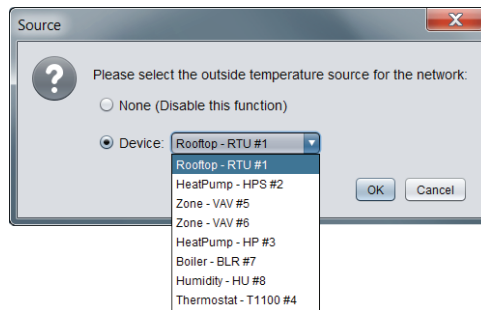


Figure 15 - Outside Temperature Source Selection

5.3.2 - Outside Temperature Destination

This defines the list of recipients for the outside temperature reading.

- **Add:** Adds another device to the list of outside temperature recipients.
- **Delete:** Deletes the selected device or devices from the outside temperature recipient list. Multiple devices can be selected by holding the 'Shift' button on the keyboard as they are selected.



Figure 16 - Adding an Outside Temperature Recipient



5.4 - Weekly Routines

This screen is used to configure the weekly occupancy schedules that are then distributed to the various controllers on the network.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday1	Holiday2
ON	-	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	-	-	-
OFF	-	-	-	-	-	-	-	12:00 AM	12:00 AM
ON	-	-	-	-	-	-	-	-	-
OFF	-	-	-	-	-	-	-	-	-
ON	-	-	-	-	-	-	-	-	-
OFF	-	-	-	-	-	-	-	-	-
ON	-	-	-	-	-	-	-	-	-
OFF	-	6:00 PM	6:00 PM	6:00 PM	6:00 PM	6:00 PM	-	-	-

Figure 17 - Weekly Routines Screen

5.4.1 - Creating/Deleting a Routine

- **New:** Creates a new schedule routine. When you click on the "New" button, a popup screen prompts you to enter the name or the schedule you want to create. The name you type here cannot contain more than 16 characters.
- **Delete:** Delete the routine currently selected.

Figure 18 - Dialog Box to Specify Name of Routine to Add



5.4.2 - Routine Configuration

- **Schedule Select:** At the top center of the screen there is a drop down list that allows you to select the schedule to configure from among the existing schedules. The factory default configuration of a **Network Controller** always includes an empty schedule named "Schedule 1".

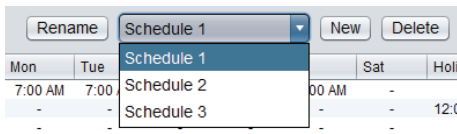


Figure 19 - Schedule Select

- **Rename:** The "Rename" button lets you change the name for the selected schedule.
- **Weekly Schedule Grid:** The Weekly Schedule Grid is used to define the occupancy routine for the selected schedule. Double-click a cell on the grid to edit it.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday1	Holiday2
ON	-	8:00 AM	-	-	8:00 AM	8:00 AM	-	9:00 AM	-
OFF	-	-	-	5:00 PM	12:00 PM	12:00 PM	-	11:00 AM	12:00 AM
ON	-	-	-	-	1:00 PM	1:00 PM	-	-	-
OFF	-	-	-	-	5:00 PM	5:00 PM	-	-	-
ON	6:00 PM	-	-	-	-	-	-	-	-
OFF	8:00 PM	-	-	-	-	-	-	-	-
ON	-	-	-	-	-	-	-	-	-
OFF	-	-	-	-	-	-	-	-	-

Figure 20 - Weekly Schedule Grid

The occupancy status only changes when a valid time is encountered on the weekly schedule grid. For example in the routine above, on Monday the device will be set to "Occupied" at 8:00 AM. On Wednesday at 5:00 PM, the device will be set to "Unoccupied" and remain so until the next valid time is encountered (8:00 AM the next day), where it becomes occupied again. The "Holiday" columns will replace a normal weekday anytime the current date has been set as a holiday ([see p.16](#)).

NOTE that the time can be displayed in either 12h or 24h format by changing the setting in the 'Options' menu, under 'Units', then 'Time Format'.

- **Copy/Paste:** The Copy/Paste function makes it easy to copy a particular day's schedule and apply it to other days of the week. Simply choose a day to copy from the drop down list, select one or more days to paste to then click the "Paste" button.

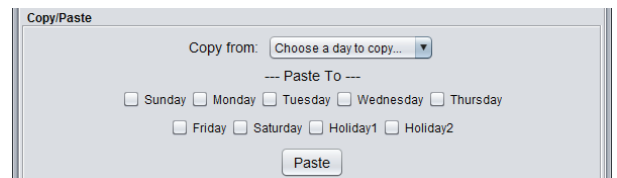


Figure 21 - Copy/Paste Function

- **Holiday Source:** There are two Holiday columns in the Weekly Schedule Grid. The purpose of these Holiday columns is to replace the normal schedule with these alternate schedules on special, userdefined dates.

The Holiday Source selection boxes determine which Holiday Calendar (see below) is attributed to which Holiday column.

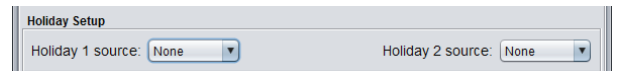


Figure 22 - Holiday Sources



5.5 - Holiday Calendar

This screen is used to define which dates count as holidays, on which the normal daily schedule will be replaced by an alternate, special holiday schedule. The calendar has no pre-defined holidays marked, allowing for complete customization of the holiday calendar upon initial configuration. The holiday calendar does not automatically recognize floating holidays (Labor Day, Memorial Day, etc.) and thus must be adjusted annually.



Figure 23 - Holiday Calendar Screen

5.5.1 - Creating/Deleting a Holiday Calendar

- **New:** Creates a new holiday calendar. When you click on the “New” button, a popup screen prompts you to enter the name of the holiday calendar you want to create. The name cannot contain more than 16 characters.
- **Delete:** Delete the holiday calendar that is currently selected.

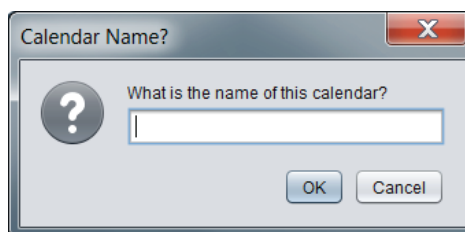


Figure 24 - Dialog Box to Name a Calendar



5.5.2 - Holiday Calendar Configuration

- **Calendar Select:** At the top center of the screen there is a drop down list that allows you to select the calendar to configure from all the existing calendars. The factory default configuration of a **Network Controller** always includes an empty calendar named "Calendar 1".
- **Rename:** The "Rename" button lets you chose a new name for the selected calendar.
- **Calendar Dates:** These are the special dates on which the normal schedule is replaced by a special alternate schedule ([see Weekly Routine Configuration, p.14](#)). To select/unselect a date, simply click on it. You can flip through the different months by clicking on the arrows at the bottom or by simply choosing the desired month from the drop down list of months.

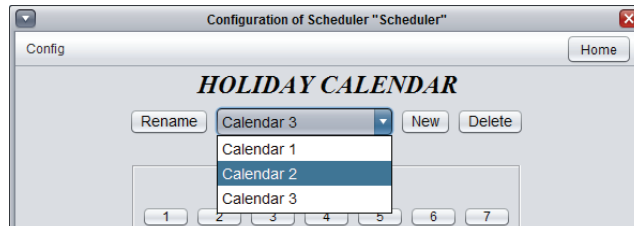


Figure 25 - Calendar Selection

5.6 - Alerts Configuration

The Alert system can be used to send out emails and push notifications* upon any user-defined conditions. This screen is used to select and configure those conditions. A total of 200 conditions can be created, keeping you apprised of any situation in a Proton system.

* Push notification available only on mobile devices such as smartphone and tablets using the free Proton Focus mobile app.

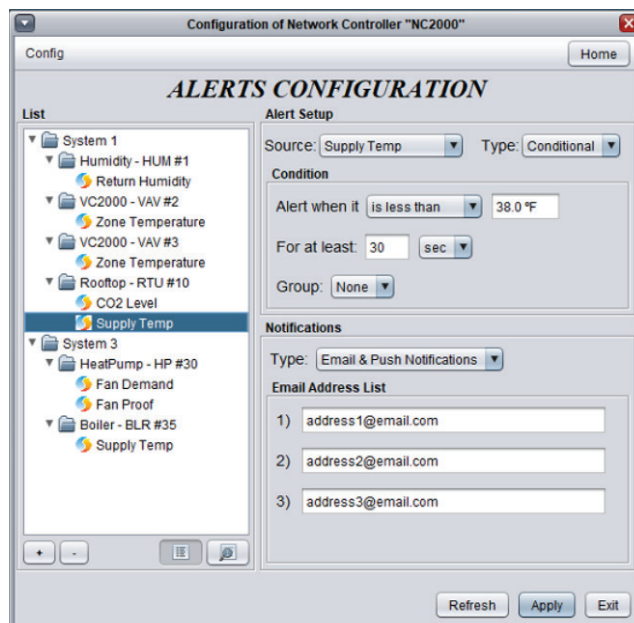


Figure 26 - Alerts Configuration Screen



5.6.1 - Add/Delete an Alert

Adding or Deleting Alerts is performed via the two buttons in the bottom left corner of the screen.

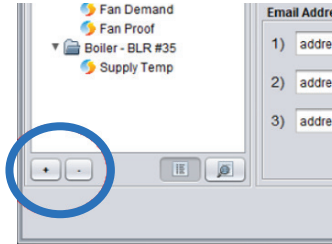


Figure 27 - Add & Delete Alerts Buttons

- **Add (+):** This button adds a new alert condition to the list. You are first required to identify the device or devices that will be the source of the alerts. Multiple devices can be selected from the list by holding the 'Ctrl' key on the keyboard as they are selected. Alternatively, a contiguous range of devices can be selected from the list by holding the 'Shift' key between the first and last devices in the range.
- **Delete (-):** Deletes the selected condition(s). Multiple alerts can be selected by holding the 'Ctrl' key on the keyboard as they are selected, or a contiguous range by holding the 'Shift' key.

The various details and conditions for each alert can be filled out in the Alert Setup section that will appear on the right side of the screen (see below).

5.6.2 - Alert Setup

This section defines the various conditions that will trigger the selected alert. There are two kinds of alert types: Conditional and Periodic.

Conditional

Conditional alerts are sent when a chosen value from the Proton System meets a particular condition that you have defined.

Alert Setup

Source: Zone Temperature Type: Conditional

Condition

Alert when it is greater than 85.0 °F

For at least 2 min

Group: None

Figure 28 - Conditional Alert

The condition must be met continuously for the complete duration specified before an alert can be sent. If there is an interruption, the timer will restart. Once an alert is finally triggered and sent, the condition must then be cleared for **fifteen** continuous minutes before this alert can be enabled again.



Group: The Group feature allows several conditional alerts to be grouped together so that a notification will only be sent once all conditions in the group have been met. Up to 100 groups are possible.

For example, if you require an alert specifically when the fan of an RTU stops even though the RTU is still calling for fan, this can only be done using the Group feature. The alert in this example depends on two separate conditions:

- ▷ Call for Fan = ON
- ▷ Proof of Fan = OFF

Setting alerts on either of these conditions alone will not produce the desired outcome: You do not want to receive an email any time there is a call for fan (which would happen every morning), and you also do not want to receive an email whenever proof of fan is lost (which would happen every night when the fan shuts down normally).

However, putting these two conditions in a group together will send out an email whenever there is a call for fan AND when proof of fan is not obtained. Adding a delay of 30 seconds or so to each condition ensures that you will not get false alarms during that brief period where the fan turns ON in the morning and proof of fan has not yet been obtained.

The Group feature allows for any combination of conditions to trigger an email alert, which can be as specific as you require and can span across multiple controllers. The alert system therefore offers a wide range of possibilities for debugging and proactively resolving system issues.

To easily view which conditions have been put into groups together, try switching the list to Group View (see below).

Periodic

Periodic alerts are sent at configurable time of day, every day, regardless of the current state of the source.

The screenshot shows a window titled "Alert Setup". At the top, there are two dropdown menus: "Source" set to "Zone Temperature" and "Type" set to "Periodic". Below this, there is a section labeled "Periodic" containing a text field "Every 24 hours at:" followed by a time input field set to "3:00 PM" and a "Send Now" button. At the bottom, there is a "Group:" dropdown menu set to "None".

Figure 29 - Periodic Alert

There is also a “Send Now” button which allows the alert to be sent immediately, enabled as soon as the NC2000’s configuration is applied.

Group: When the Group function is used with Periodic alerts, it simply sends any grouped alerts together in the same email or notification, instead of sending multiple, individual emails. Grouped Periodic alerts must all share the same alert time, and cannot be grouped with Conditional alerts.

5.6.3 - Multiple Simultaneous Configuration

During setup, it is possible to configure multiple alerts that share similar conditions or criteria in a single operation instead of selecting each one individually and setting them one at a time. To start, first select all the alerts that will share the same conditions by using the ‘Ctrl’ key, or select a contiguous range using the ‘Shift’ key:

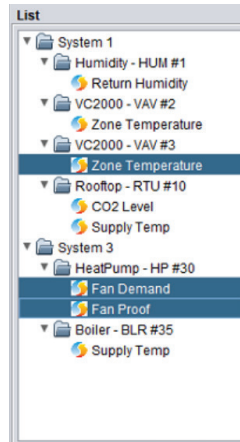


Figure 30 - Alert List

Now that the alerts are selected, the Alert Setup section will be modified to only display settings that these alerts can share. For example, selecting a humidity alert along with a temperature alert will show the delay and group fields, but the alert value field will be hidden since these two units do not match:

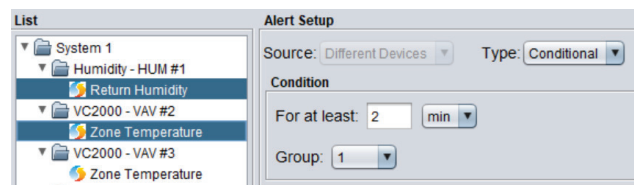


Figure 31 - Simultaneous Configuration Example

Once the setup is complete, press the 'Apply' button. All settings displayed in the Alert Section will be applied to all selected alerts. Any hidden settings will remain as they were.

5.6.4 - System View / Group View

To aid in visualising how the alerts have been assigned, Focus offers two viewing layouts: System View and Group View, which can be toggled using the buttons at the bottom right side, under the list:

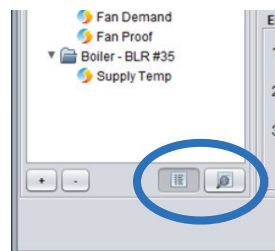


Figure 32 - System & Group View Toggle Buttons

The alerts are displayed in a tree hierarchy and arranged depending on the selected view.



- **System View:** All alerts are seated under their respective device, and each device is placed inside a folder representing their respective System in the project.
- **Group View:** All alerts are still seated under their respective device, but each device is now placed inside a folder representing the alert group to which the alert belongs.

5.6.5 - Notifications

The Proton NC2000 can provide two types of notifications: Emails and Push Notifications. In either case, the content of the alert message is the same.

- **Email:** The alerts can be sent to up to 3 separate email addresses. Note: You cannot chain multiple email addresses together using semicolons (;). The project does NOT need to be saved on the Cloud to obtain Email notifications.
- **Push Notifications:** Push Notifications will be sent exclusively to smart phones or tablets which have the Focus Mobile application installed. Additionally, the project itself must be saved to the Cloud and its Network Controller must be claimed (see Focus User Guide). Finally, each user who wants to receive the Push Notifications for a given project must enable them for that project using the Focus Mobile app (see Focus Mobile app guide).

5.7 - Datalogging Configuration

The Network Controller can record and store data pertaining to your Proton project. This information can then be used to analyze system performance. The datalogging screen is used to select the desired variables to be recorded and storage frequency of this information. Proton Focus also offers an Excel-based Graphing Utility which can plot the logged data onto a chart for more intuitive analysis.

5.7.1 - Add/Delete a Datalog

Adding or Deleting Datalogs is performed via the two buttons in the bottom left corner of the screen.

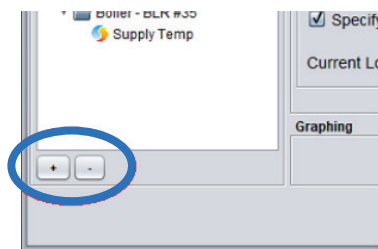


Figure 33 - Add & Delete Datalogs Buttons



- **Add (+):** This button adds a new datalog to the list. You are first required to identify the device or devices that will be the source of the datalogs. Multiple devices can be selected from the list by holding the 'Ctrl' key on the keyboard as they are selected. Alternatively, a contiguous range of devices can be selected from the list by holding the 'Shift' key between the first and last devices in the range.

The various details and conditions for each datalog can be filled out in the Log Description section that will appear on the right side of the screen (see below).

- **Delete (-):** Deletes the selected datalog(s). Multiple datalogs can be selected by holding the 'Ctrl' key on the keyboard as they are selected, or a contiguous range by holding the 'Shift' key.

5.7.2 - Log Description

This section defines the manner in which data will be polled for the selected datalog. There are two kinds of polling modes: Interval and Offset.

- **Interval:** The Network Controller will attempt to poll and store the selected datapoint at the specified frequency. The datapoint will be stored on the SD card regardless of its value. **Note:** If the Network Controller's communication workload is very busy, it may not be able to respect very small polling frequencies and will instead settle on the fastest possible interval it can achieve.
- **Offset :** The Network Controller will poll the datapoint as frequently as possible, but will only store the information on the SD card when the value of the datapoint changes by at least the offset specified below. This is a good method to save space on the SD card if you do not mind missing out on small variations of the datapoint.

Log Description
Source: Zone Temperature Mode: Interval
Condition
Log periodically every: 30 sec

Figure 34 - Interval Polling

Log Description
Source: Zone Temperature Mode: Offset
Condition
Log whenever it changes by: 1.0°F

Figure 35 - Offset Polling

5.7.3 - Multiple Simultaneous Configuration

During setup, it is possible to configure multiple datalogs that share similar conditions or criteria in a single move instead of clicking on each one individually and setting them one at a time. To start, first select all the datalogs that will share the same conditions by using the 'Ctrl' key, or select a contiguous range using the 'Shift' key:

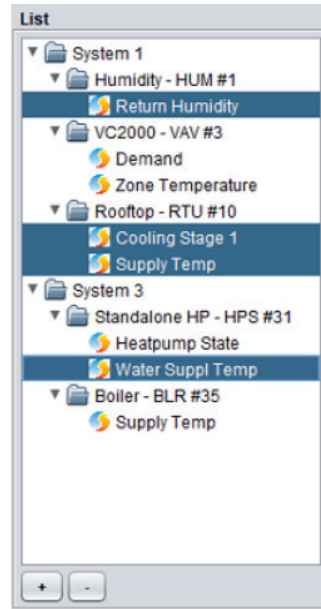


Figure 36 - Datalogs List

Now that the datalogs are selected, use the Log Description section to modify the Interval or Offset.

Note: The Offset value will not be configurable if the datapoints do not share the same unit.

Once the setup is complete, press the 'Apply' button. All settings displayed in the Log Description will be applied to all selected datalog.

5.7.4 - Log Control

This section is used to start and stop datalogging.

- **Start:** The recording of data will begin as soon as this button is pressed. If the contents of the Datalog List has been changed since starting the last log (new or altered data points), you will be prompted to first save the current data log before starting a new one, because the current log will be deleted. If the content of the Data Log List is the same, the Focus will offer you the option to start a new log, or to just continue on appending new data onto the current log. Note: You must press the "Apply" button to confirm any changes before the "Start" button will be enabled. The datalog cannot be downloaded while the log is running.
- **Stop:** The recording of data will stop as soon as the button is pressed. The datalog can only be downloaded when the recording is stopped.



5.7.5 - SD Card

This section displays the current status of the memory available on the SD card that is inserted in the Network Controller. (Note: SD card must be purchased separately.)

- **Used Space:** The amount of memory on the SD card that is currently occupied with files. These files are not necessarily only datalogs, but can include images, documents, etc... Clearing unnecessary files off the SD card can increase space available for logging.
- **Free Space:** The amount of memory on the SD card that is available for datalogging.
- **Total SD Card Size:** The total amount of memory on the SD card available for storage. It is common for this value to be slightly less than the SD card's stated capacity. This is because some of the listed capacity is used for formatting and other functions, and not available for data storage.

The Network Controller only accepts standard size SD cards. MiniSD and MicroSD cards can work but will require a standard size adapter to fit. The Network Controller accepts SDSC (Standard Capacity) and SDHC (High Capacity) cards. SDXC (Extended Capacity) can work as well but must be first formatted to FAT16 or FAT32 memory structures. The Network Controller works with any Speed Class of SD card.

Note: If all Space fields read "0 bytes", this means that the Network Controller does not detect a valid SD card in the SD card slot.

5.7.6 - Log File

This section displays the **current size of the datalog** saved on the SD card. There can only be one datalog per SD card.

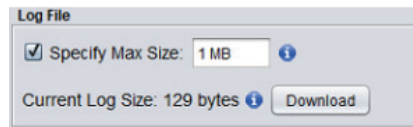


Figure 37 - Log File Section

If a new datalog with different data points is needed, download and save the current datalog first (or simply remove it and copy the file onto a PC) before beginning a new log, or else the current file will be overwritten. If you are simply continuing an existing log using the same data points as before, the Network Controller will just append the new data, and no information will be lost.

By resting the cursor on the **info** symbol adjacent to the **Current Prolon Log File Size** (), the following information is displayed:

- **Estimated time to download:** The amount of time it will take to download the datalog that is currently present on the SD card. This time will vary depending on the active connection method (Serial or Ethernet – Ethernet is shown when offline), and by the size of datalog itself.
- **Number of samples:** The amount of samples found in the datalog that is currently present on the SD card.
- **Percent of available space remaining:** The percentage of available space remaining when considering the specified maximum size (see below).



- **Download Button:** Downloads the current datalog onto your computer. Not available if the datalog is currently recording.

This section can also be used to specify the **maximum size of the datalog** to be recorded. It can be very useful to limit the size of a datalog if you plan on downloading it later over communication lines (Serial or Ethernet), so as to limit the download time due to very large files. If the checkbox is not selected, the Network Controller will use any available free space it finds to keep growing the datalog.

The minimum value for this field is 1 KB. Values can be expressed here in KB, MB and GB. If no units are typed, KBs are assumed.

Once the maximum file size has been reached, the datalog will continue to record information by overwriting the oldest data points with the new ones.

By resting the cursor on the **info** symbol next to the **Max Size** field (), the following information is displayed:

- **Estimated time to download:** The amount of time it will take to download a datalog that reaches the size specified in the Max Size field. This time will vary depending on the active connection method (Serial or Ethernet – Ethernet is shown when offline), and by the size of datalog itself.
- **Number of samples:** The amount of samples that will be recorded in a file that has reached the Max Size.
- **Log time:** The amount of time it will take for the datalog to reach the specified maximum file size. Note that this cannot be determined if any of the data points are being monitored in Offset mode.

If the download time is too long, consider physically removing the SD card and manually copying the datalog for quicker analysis. The log file can be found on the SD card under the name: PL_DTLOG.CSV.

5.7.7 - Graphing Utility

The data recorded by the Network Controller is provided in a simple Comma Separated Values file (CSV) which can be opened and utilized with any spreadsheet software.

For your convenience, Proton Focus provides an Excel-based Graphing Utility that builds preformatted graphs of your data, which can be used to zoom, scroll and manipulate the various data logs.

This Graphing Utility is installed alongside with the Proton Focus software under the name “Proton Log – Template.xls”. It is automatically started when the “**Open Graphing Utility**” button is clicked. The Graphing Utility works on Excel 97 and up.

Proton’s Graphing Utility makes use of macros to format and display graphs. Macros usually need to be authorized and enabled by the user upon first opening of the Graphing Utility through on-screen prompts. It will also prompt you to indicate the datalog CSV file to be used. Your datalog file is obtained by clicking the **Download** button.

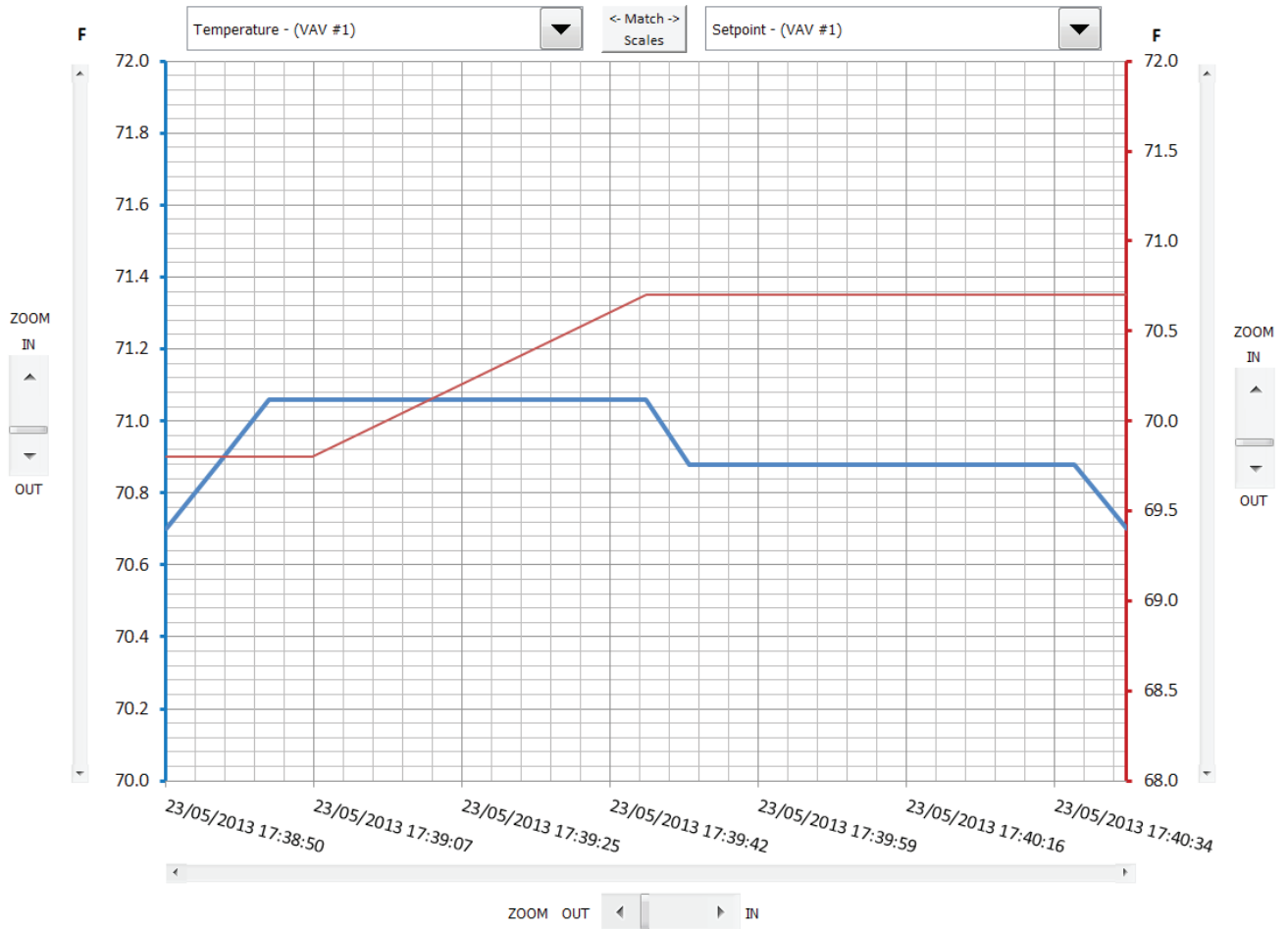


Figure 38 - Proton Graphing Utility

The Proton Graphing Utility can display two logged variables at the same time, selectable through **drop down** lists at the top of the screen. The selected variable on the left is represented by a blue line and the one on the right is represented by a red line.

By default, the Y scales are independently pre-formatted to best fit each data line. If the two logged variables have the same units of measurement (temperature, position, percentage, etc.), the **Match Scales** button can be used to force each Y scale to match, allowing for direct comparison between two data lines.

Both Y scales (values) and the X scale (time) can be scrolled or zoomed into at will.



5.8 - Communications Setup

The Proton **Network Controller** can communicate over various media. This screen is used to configure the communication settings for the Ethernet connection, as well as the baud rate for the RS485 ports.

Figure 39 - Communications Setup Screen

NOTE: A software reset must occur before any configuration changes to this page can take effect.

- **MAC Address:** This is the unique MAC address of the **Network Controller** sometimes used for router configuration. This value is not configurable.
- **IP Mode:** The method that the **Network Controller** will use to determine its IP address.
 - ▷ **Static:** The **Network Controller** uses the given IP Address, Subnet Mask and Default Gateway, which will remain constant.
 - ▷ **DHCP:** The **Network Controller** will request an IP Address from the network's router. It can change periodically.
- **Baud Rate:** The baud rate value used by the **Network Controller** to communicate over RS485. This applies to both the RS485 IN port and the RS485 OUT port. The default value is 57600bps.
- **Alerts & Logs:**
 - ▷ **Language:** Select the language to be used in email alerts and data logs.
 - ▷ **Units:** Select the units to be used in email alerts and data logs.
- **Allow Cloud Communication:** This checkbox activates or deactivates Proton's proprietary Cloud communication protocol, which is managed by the **Network Controller**.



5.9 - Device Properties

This screen shows all the intrinsic properties of the device you are configuring. This helps you determine its capabilities without having to visually inspect the device.

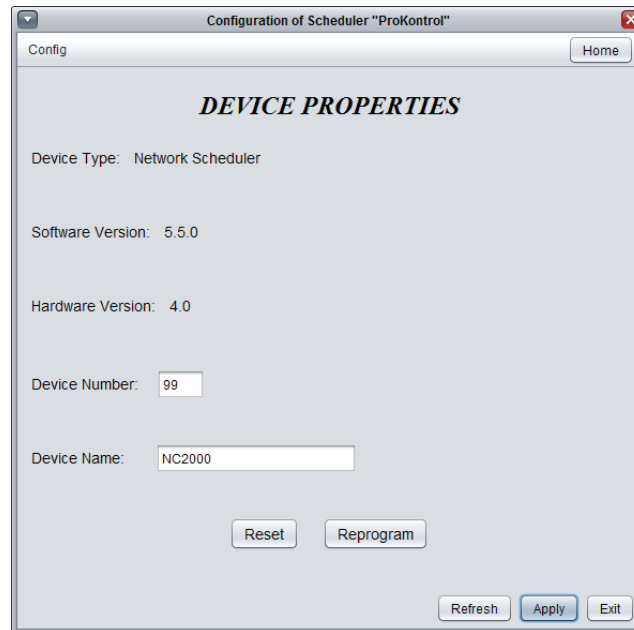


Figure 40 - Device Properties Screen

- **Device Type:** The type of controller you are configuring.
- **Software version:** The current software in the controller. The greater the software version, the more advanced the device is. Devices can be upgraded by reprogramming them (see “Reprogram”).
- **Hardware version:** This is the physical hardware platform of the controller. Different hardware has different features. The hardware can only be changed by replacing it physically.
- **Device Number:** The network address of the controller. The factory default setting of a Prolon **Network Controller’s** address is 99. You can change the address through the Focus software by typing a new number, clicking the “Apply” button, then resetting the device by clicking the “Reset” button. There is no physical means (dipswitch or other) to set the address of the **Network Controller**.
- **Device Name:** This field indicates the current name of the controller, which you can modify. Alternatively, you can just right-click on the icon and select the ‘Rename’ option.
- **Reset Device:** Causes the device to perform a reset. All configuration properties REMAIN SAVED. However, resetting the controller removes all active overrides. This function is useful for debugging purposes.
- **Reprogram:** This function is used to upgrade the controller to a new software version. Focus will begin by asking you for the BIN file that contains the software update. Software update BIN files can only be provided by Prolon. At the end of the procedure, Focus will automatically reapply all the parameters you have previously configured into the device.



6 - Factory Reset Tool

There is a feature in the ProLon Focus software that is unique to the **Network Controller**: a built-in tool that performs a factory reset. This feature is useful in case the IP address of the **Network Controller** is forgotten, if the **Network Controller** is stuck in update mode after a failed upgrade, or simply to erase all settings.

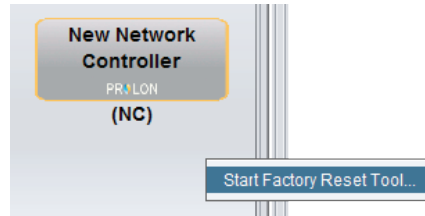


Figure 41 - Start Factory Reset Tool

One of the more practical aspects of this tool is that the factory reset is performed over a basic Ethernet connection, and **doesn't require any knowledge of the Network Controller's current IP setup**. As long as your computer currently has an IP address (fixed or through DHCP) and the **Network Controller** is on the same physical subnet as your computer (or directly connected), you will be able to run the tool.

Note: After the process is complete, the **Network Controller** will be back to using its default IP setup, at which point you may need to adjust your computer's IP setup to communicate with it.

- ▷ IP Address - 192.168.1.99
- ▷ Subnet Mask - 255.255.255.0
- ▷ Default Gateway - 192.168.1.99

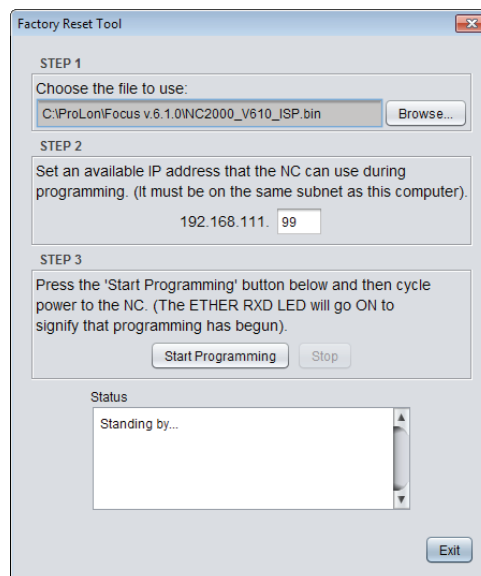


Figure 42 - Factory Reset Tool

1. The first step is to choose the upgrade file to use. These files are included during the ProLon Focus installation process and can be found in the ProLon installation folder (C:\ProLon\Focus v.6.1.0). By default, Focus will search for the files there first.
2. The next step is to provide an available IP address that the **Network Controller** can use during the reset procedure. You should provide an IP address that is not currently occupied by another device on your subnet. A way to detect



if an IP is available is to perform a Ping at that address. If no response is received, then that IP address is available. (If you are directly connected to the NC, any address will do, as long as it is not the same one your computer is using).

3. Press the Start Programming button and cycle power to the **Network Controller**. The Focus software will first detect and open a connection to the **Network Controller**:

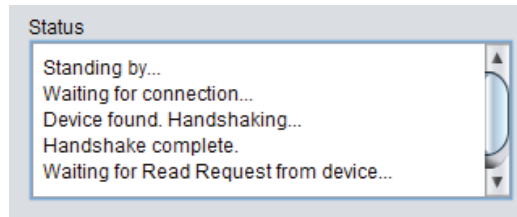


Figure 43 - Factory Reset - Initiating Connection

It will then start sending multiple programming blocks very quickly:

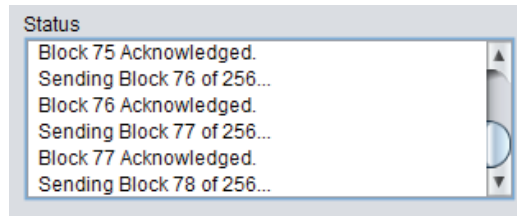


Figure 44 - Factory Reset Programming

Finally, if all block are acknowledged, then the **Network Controller** has been successfully reset back to factory default settings and will return to normal operation.

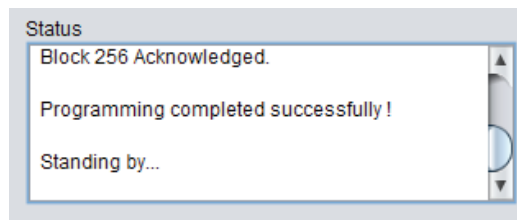


Figure 45 - Factory Reset Complete

REV. 7.3.0

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