USER MANUAL

ECOM NANO™

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Technology Integration for Energy Conservation & Higher Efficiency

Document conventions

The following symbols are used to draw attention to important information.

The exclamation symbol is used to highlight material that requires caution or thought before implementation.

The light bulb symbol is used to highlight helpful information and practices.

Abbreviations

TCP/IP	: Transmission Control Protocol/Internet Protocol.
IP address	: Internet Protocol address.
SSL	: Secure Sockets Layer
LAN	: Local Area Network
NO/NC	: Normally Open/Normally Close.
I/O	: Input/Output.
LED	: Light Emitting Diode.
CSV	: Comma Separated Values.
CE	: European Conformity.
FCC	: Federal Communications Commission.
RoHS	: Restriction of Hazardous Substances Directive.
MAC address	: Media Access Control address.
SP	: Set Point.
DB	: Dead Band.
RTC	: Real Time Clock.
Sec	: Seconds.
Min	: Minutes.
IE	: Internet Explorer.
SMTP	: Simple Mail Transfer Protocol .
XML	: Extensible Markup Language.
+/-	: Positive (+)/Negative (-).
SNMP	: Simple Network Management Protocol. SNMP is widely used in network management for network monitoring.
WPA	: Wi-Fi Protected Access, a security protocols and security certification program developed by the Wi-Fi Alliance to secure wireless computer networks.
WPA2	: Wi-Fi Protected Access II, a security protocols and security certification program developed by the Wi-Fi Alliance to secure wireless computer networks.

Contents

1 OVERVIEW

ECOM NANO is an IP based programmable controller that can be used for a variety of control, monitoring and energy conservation applications. The user friendly web based interface and advanced design of the ECOM NANO provide simple setup, installation and programming options. ECOM NANO combines the convenience of web access with real-time onboard control and data logging into a cost effective facility management system. ECOM NANO can be standalone or integrated to any IT or BAS platform by means of XML data exchange communication.

ECOM NANO has an expandable hardware architecture that can be scaled to meet the varying requirements of applications. Up to three expander boards per ECOM NANO can be added for increased point capacity (32 inputs and 36 outputs). In addition, the ECOM NANO supports a host of interfaces that include Bluetooth, Modbus, USB, RS485, Wi-Fi and GSM for wireless communications. Email, SNMP, and SMS handle system notifications and alarms while the onboard LCD display provides a local view of inputs, outputs, alarms and configurations.

ECOM NANO is technology rich with Ethernet ready hardware, built-in web server, and TCP/IP stacks that enable the controller to be accessible across Wired / Wireless LANs and the Internet. The static web pages are dynamically updated with real-time data of inputs/outputs, schedules, timers, counters, complex variables, kWh values and pseudo points. Integrated control logic enables control of output channels using custom, complex programming conditions.

This manual covers ECOM NANO features. Examples are used to help facilitate quick setup and functional use of the ECOM NANO.

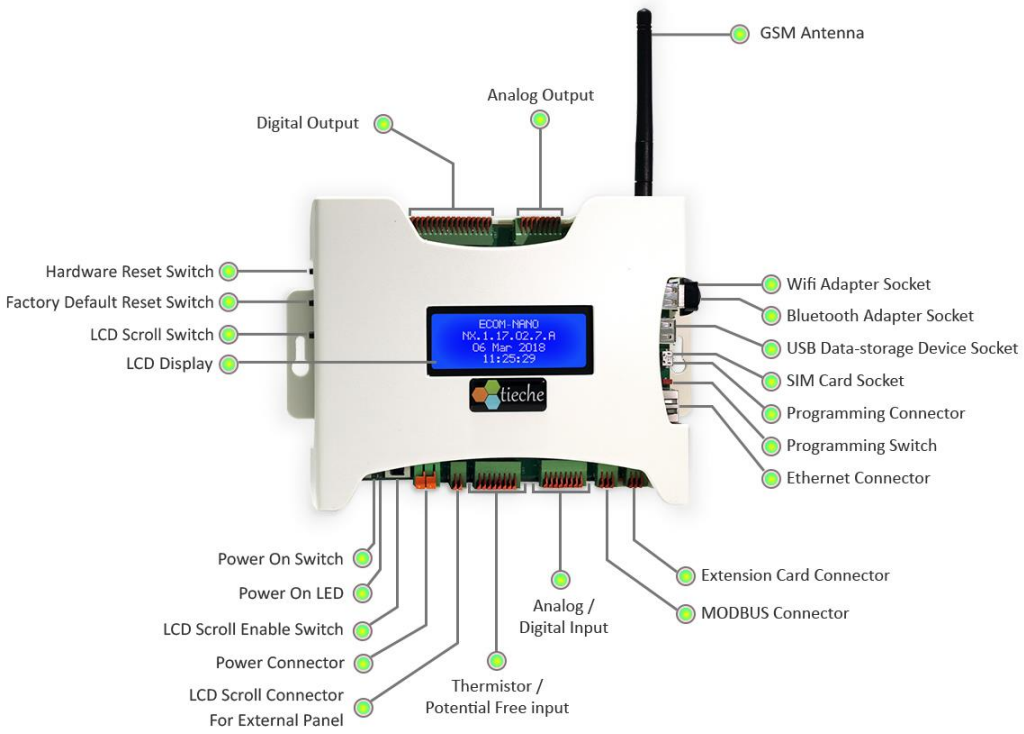
1.1 GETTING STARTED

1.1.1 PACKAGE CONTENTS

The ECOM NANO is shipped ready to install. This package contains the below items.

1. ECOM NANO
2. Ethernet cable
3. Power supply
4. Mounting screws
5. Quick start guide

1.1.2 PHYSICAL LAYOUT AND DIMENSIONS



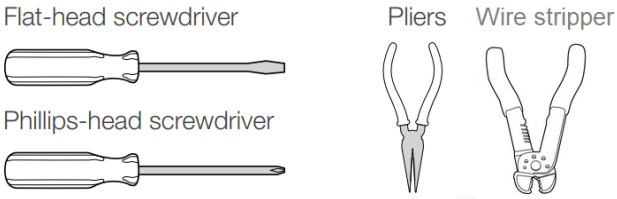
1.1.3 PRODUCT FEATURES

Protocol	64 Schedules
TCP/IP (IPv4 and IPv6)	Daily/Weekly/Monthly Schedules with selection option for holidays
DHCP: Dynamic Host Configuration Protocol	**64 Alarms**
Modbus: Supports RTU in master mode with up to 32 devices	Alarms with email and SMS notification
GSM: Global System for Mobile	**64 kWh**
XML: Extensible Markup Language	kWh calculator for single phase and three phase
SNMP: Simple Network Management Protocol	**44 Switching Table**
SMTP: Provides standard email communication for broadcasting email alarms. Supports SSL security.	User programmable Switching Tables to control Digital Outputs and Events through simplified ladder logic
Inputs	**4 Programs (P & PI Control)**
4 selectable binary/10K (Type-II) thermistor inputs	Proportional/Proportional Integral (P/PI) programs for closed loop control
4 selectable voltage/binary inputs	**8 Programs (T Basic)**
Expandable through ECOM NANO-X expansion modules – maximum of 32 inputs	Custom program using T basic
Outputs	Supports up to 100 lines per Program
4 analog and 8 digital outputs	**4 Dash Boards**
Expandable through ECOM NANO-X expansion modules – maximum of 36 outputs	Custom dashboards with on board graphics
Security	**Backup/Restore**
SSL	Simple Backup & Restore functions via USB
User Access	**Data logging**
3 password protected user access levels	Live data logging for up to 8 points
Up to 10 user accounts	On board memory data log
128 Counters	USB data log
64 Time based Counters with reset option	CSV download option
64 Event based Counters with reset option	Data log graphing capability
64 Timers	**Alerts**
Event based Timers with reset option	Controller power on alert email
64 Complex Variables	Alarm email notification
Values calculated through mathematical functions +, -, *, /, ( ), Sum, Product, Median, Avg, Min, Max	Alarm SMS notification
32 Events	Alarm notification on web pages
Events (Pseudo digital points)	SNMP
4 Global Variables	**Recovery**
Network shareable values for integrated control between multiple ECOM NANO controllers	Factory default reset option
64 Set Points	**Warranty**
Fixed as well as variable Set Points	2 Years
	Certification
	RoHS
	CE
	FCC Part 15-Subpart B-Class A

2 INSTALLATION

2.1 REQUIREMENTS

The ECOM NANO requires a PC with an Ethernet connection for programming and basic tools for mounting and installing the ECOM NANO.



2.2 UNPACKING

To begin the installation process, unpack the contents of the box. The package contains the below items.

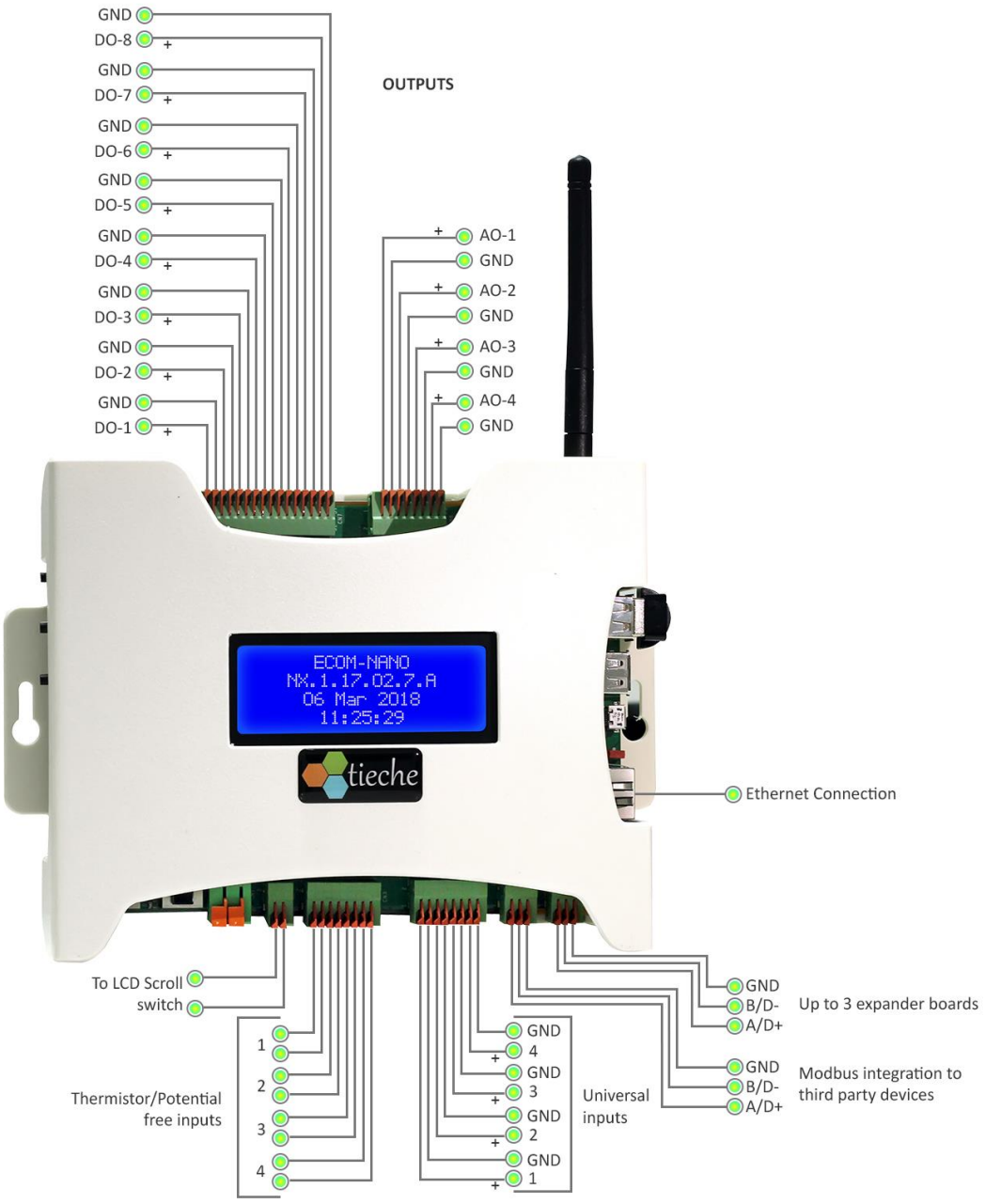
1. ECOM NANO
2. Ethernet cable
3. Power supply
4. Mounting screws
5. Quick start guide

2.3 INSTALLATION & POWER CONNECTION

- Disconnect power supply before installation to prevent electrical shock and equipment damage.
- Make all connections in accordance with national and local electrical codes. Use stranded copper conductors only.
- Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.
- Avoid locations where severe shock or vibration, excessive moisture or corrosive fumes are present.
- Power supply should not exceed 12.6 VDC.
- Digital and Analog input should not exceed 10 VDC.

- Secure the ECOM NANO module to the wall using screws.
- Connect 12 VDC positive (+) and negative (-) wires to the power connector.
- Toggle the power switch to the ON position. The power LED will turn ON.
- It takes approximately 20 seconds for ECOM NANO to boot up. Once ready, the LCD screen will display the following screen.

2.4 WIRING DIAGRAM



3 COMMUNICATION

3.1 SETTING UP ECOM NANO

Power on the ECOM NANO, connect the Ethernet cable from ECOM NANO to the PC directly or via Ethernet switch.

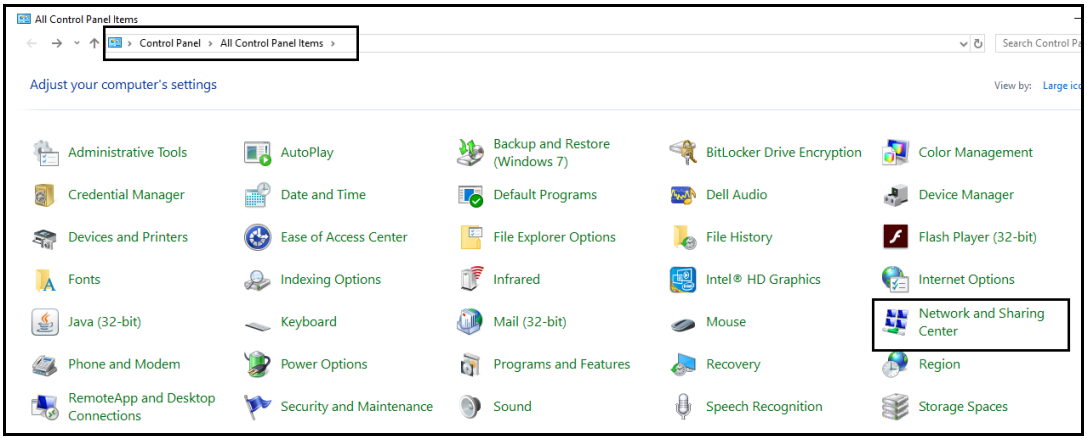
ECOM NANO and PC direct connection

ECOM NANO and PC connection through Ethernet switch

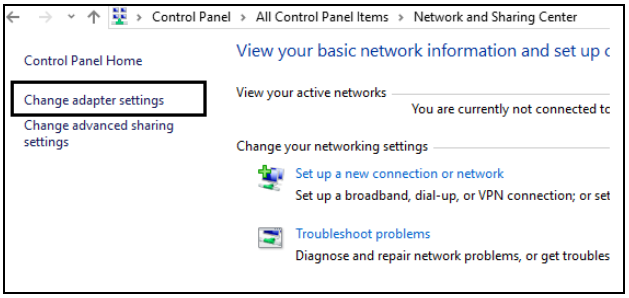
3.2 SETTING UP THE PC

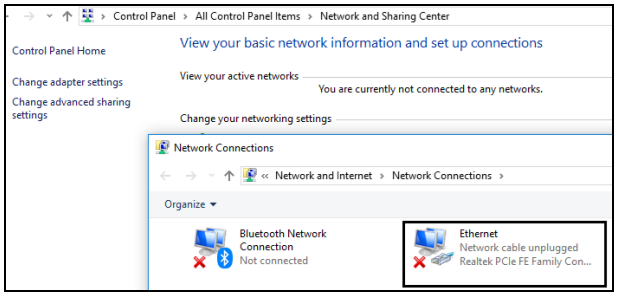
The pictures shown below are with reference to Microsoft Windows 10. The settings may vary for different versions of Windows.

From the Windows start menu, go to Control Panel and click Network and Sharing Center.

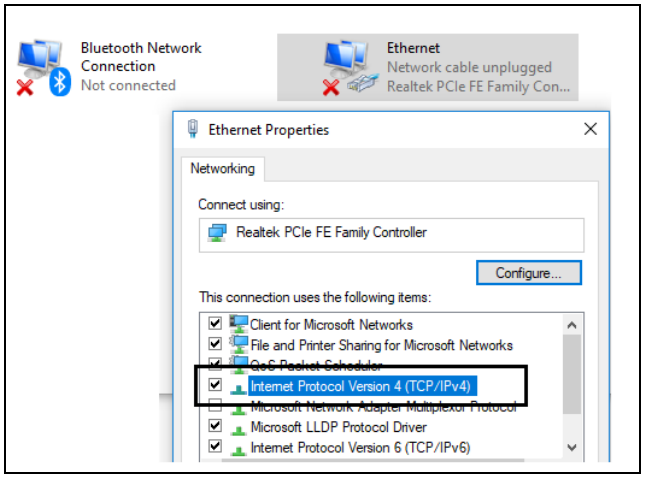


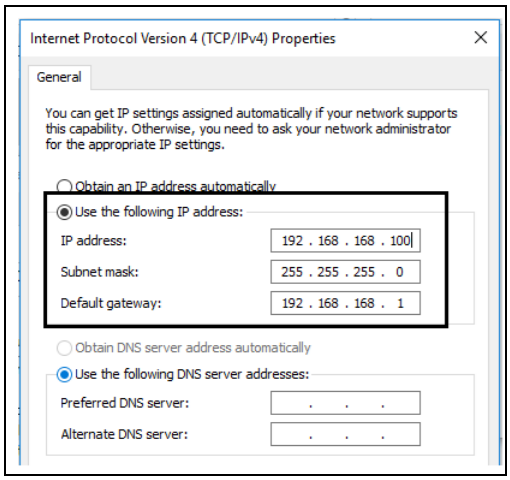
Open Change adapter settings and double click on Ethernet adapter.





Double click on Internet Protocol Version 4(TCP/IPv4) and select “Use the following IP address”.





The default IP address of the controller is 192.168.168.99. Configure PC with the IP configuration shown in the above picture.
DNS server is not required for initial setup. These fields can be left blank.
Click OK and Close out of the Network Connections.

4 USER INTERFACE

4.1 LOGIN

Browser compatibilty – IE 11 & above, latest versions of Google Chrome, Safari and Mozilla Firefox

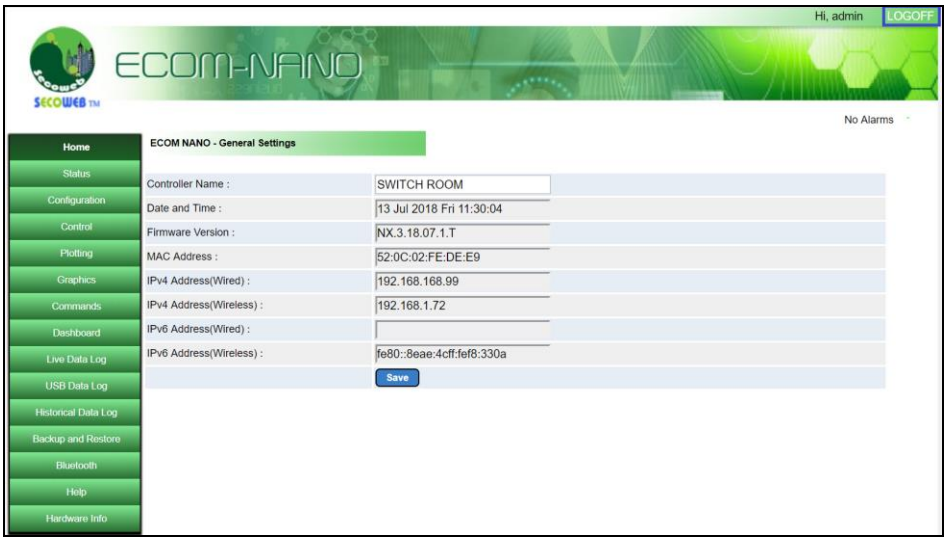
Launch web browser and enter 192.168.168.99 (default controller IP address) in the address bar.

Enter the default username and password and click Login
User name : admin
Password : default@Ec0M$

Once logged in, go to network settings page of ECOM NANO and change the IP Address (Refer to section *Error! Reference source not found.*)

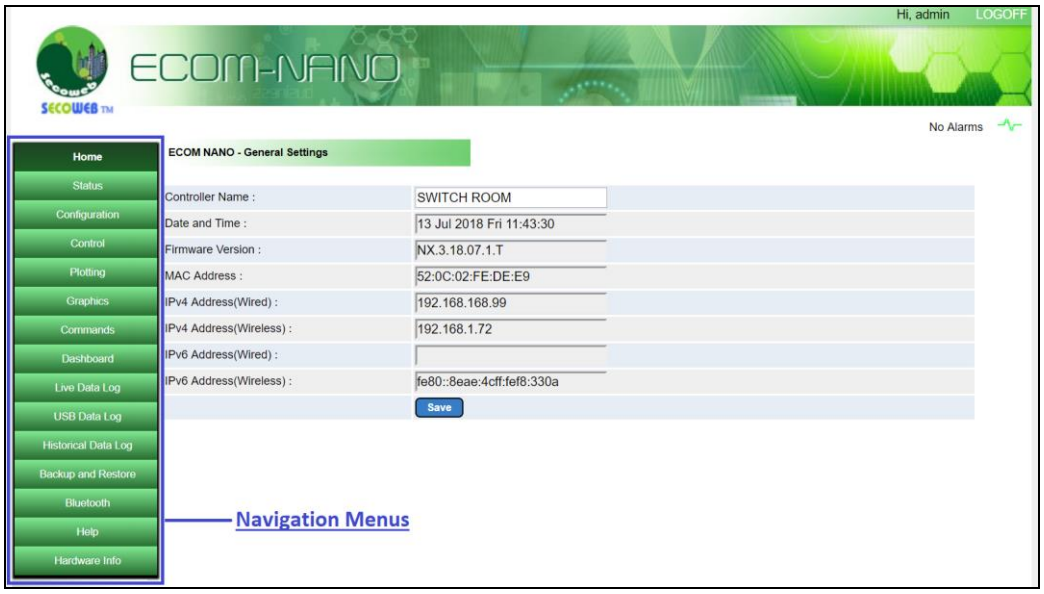
4.2 LOGOFF

Use the LOGOFF to log out the application.
Use LOGOFF on any page to exit application.



4.3 HOME

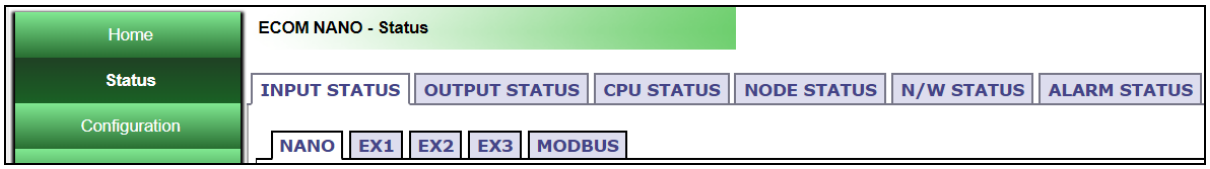
Successful login displays the home page with the general settings for the ECOM NANO.



- Controller Status : Controller Online
  : Controller Offline
- Alarm Status : Active Alarms . Click to navigate to alarm page
  : No Alarms No Alarms . Click to navigate to alarm page
- Controller Name : Change controller name by entering a new name and click Save
- Date and Time : Date and Time (24 hour format)
- Firmware Version : Firmware Version
- MAC Address : MAC Address
- IPv4 Address(Wired) : Current wired IPv4 Address
- IPv4Address(Wireless): Current Wireless IPv4 Address
- IPv6 Address(Wired) : Current Wired IPv6 Address
- IPv6 Address(Wireless): Current Wireless IPv6 Address

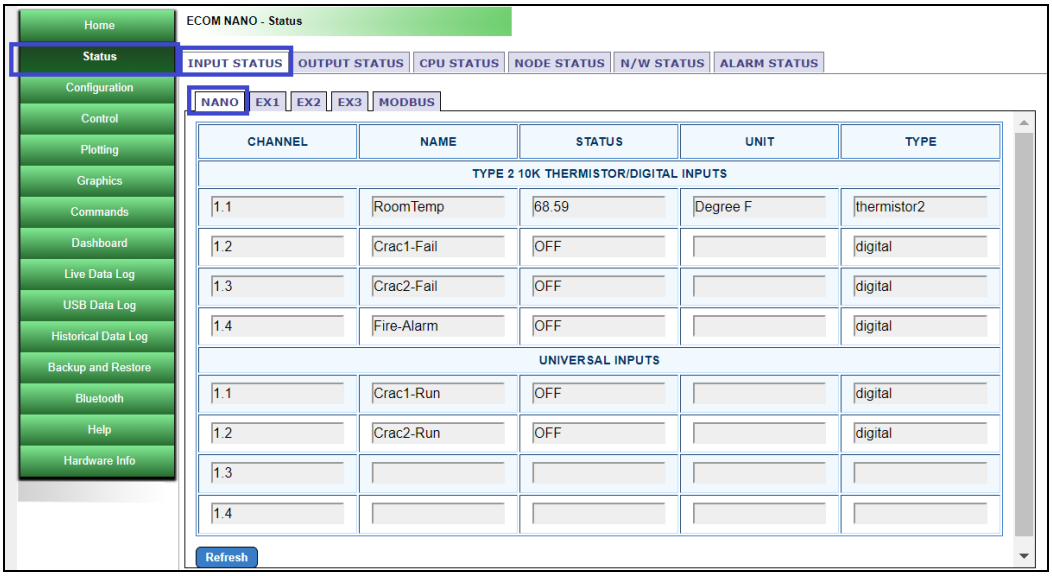
4.4 STATUS

This section displays the real-time status of the following.



4.4.1 INPUT STATUS - NANO

Displays real-time status of the configured ECOM NANO inputs.
Go to **Configuration** menu to configure inputs.

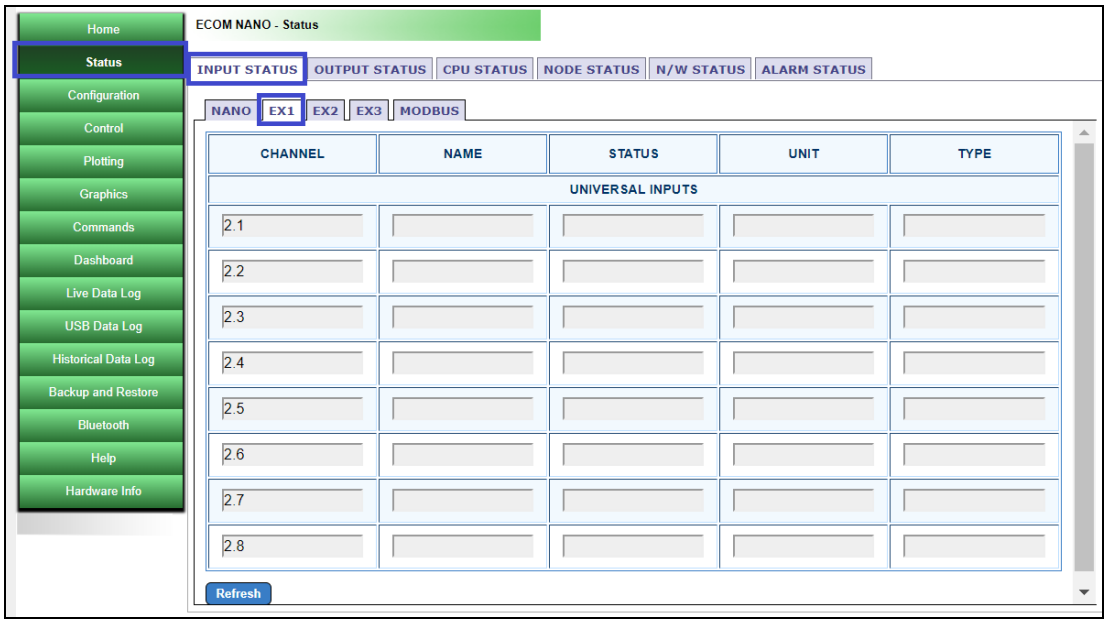


- CHANNEL : Channel number.
- NAME : Channel name.
- STATUS : Status/Value of the channel.
- Unit : Unit of measure of the channel.
- Type : Type of the channel – thermistor/digital/5V/10V

Click  to refresh this page.

4.4.2 EX1/EX2/EX3

Displays real-time status of the configured inputs in expansion modules.
Go to **Configuration** menu to configure inputs.



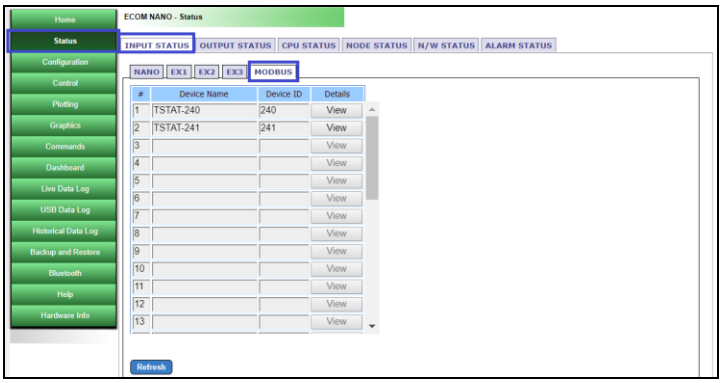
- CHANNEL : Channel number.
- NAME : Channel name.
- STATUS : Status/Value of the channel.
- Unit : Unit of measure of the channel.
- Type : Type of the channel – digital/5V/10V

Click 

to refresh this page.

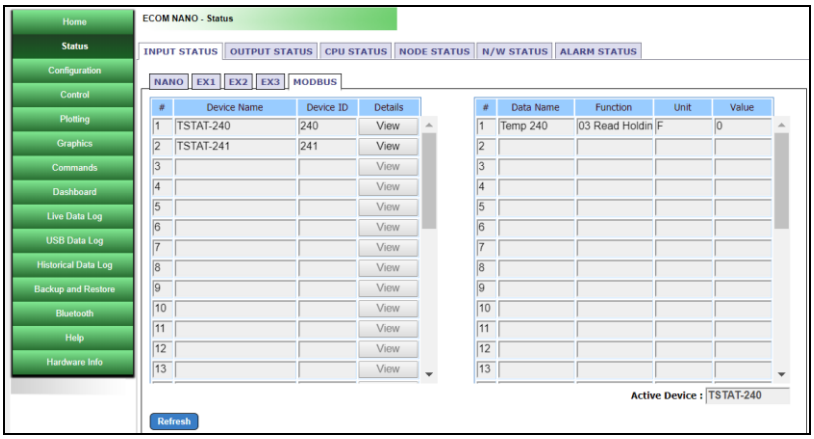
4.4.3 MODBUS

Displays real-time status of the configured MODBUS points.
Go to **Configuration** menu to configure inputs.



- Device Name : Device Name.
- Device ID : Device ID.

Click View to display the correcsponding modbus device status.



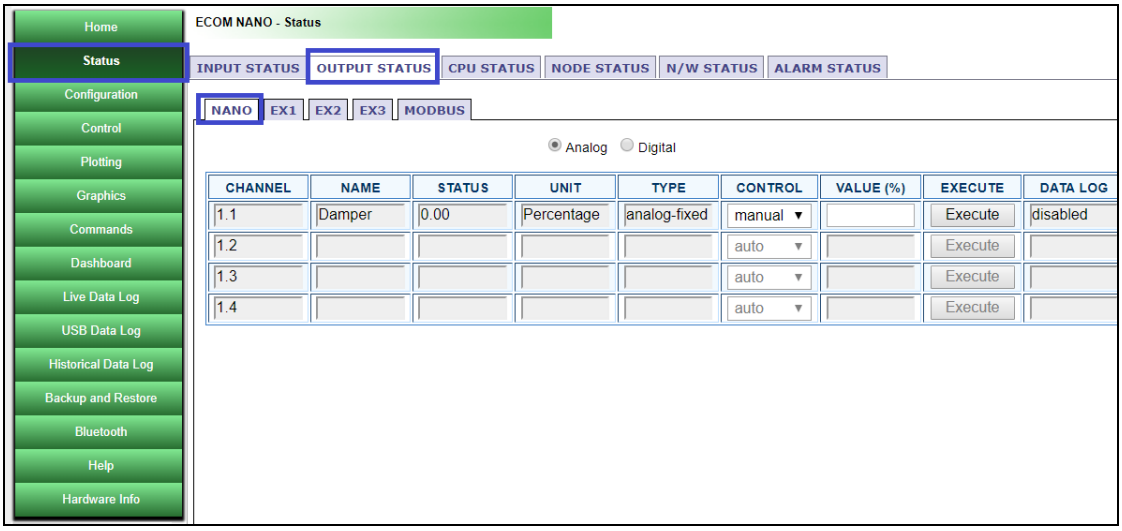
- Data Name : Name of Modbus point.
- Function : Modbus functions

  01 Read Coil Status, 02 Read Input Status
  03 Read Holding Registers, 04 Read Input Registers
  05 Force Single Coil, 06 Preset Single Register
  15 Force Multiple Coils, 16 Preset Multiple Registers
- Unit : Unit of measure.
- Value : Value of the point.
- Active Device : Name of the active device.

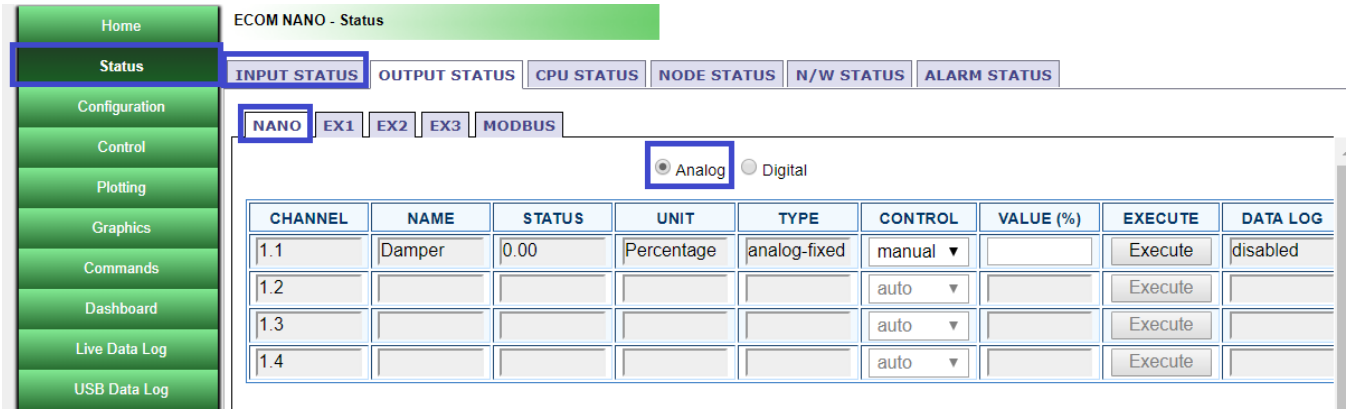
Click Refresh to refresh this page.

4.4.4 OUTPUT - NANO

Displays real-time status of the configured ECOM NANO outputs.
Go to **Configuration** menu to configure outputs.

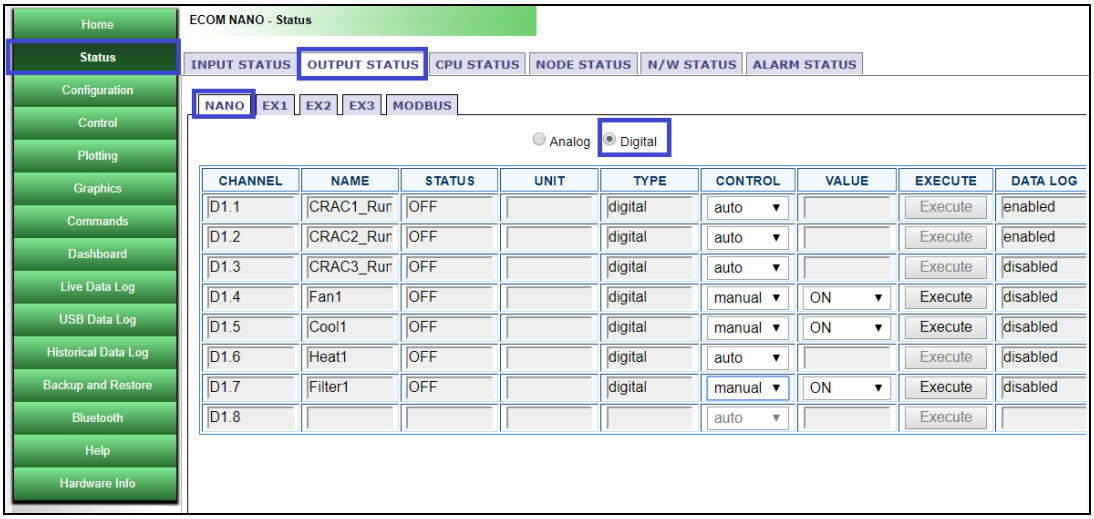


Analog Output Status



- CHANNEL : Channel number.
- NAME : Channel name.
- STATUS : Status/Value of the channel.
- UNIT : Unit of measure of the channel.
- TYPE : Type of the channel – analog/analog-fixed.
- CONTROL : Select Auto/Manual
- VALUE (%) : Change CONTROL to Manual and enter VALUE in %.
- Click Execute to apply the VALUE. The STATUS changes to the new value.

Digital Output Status

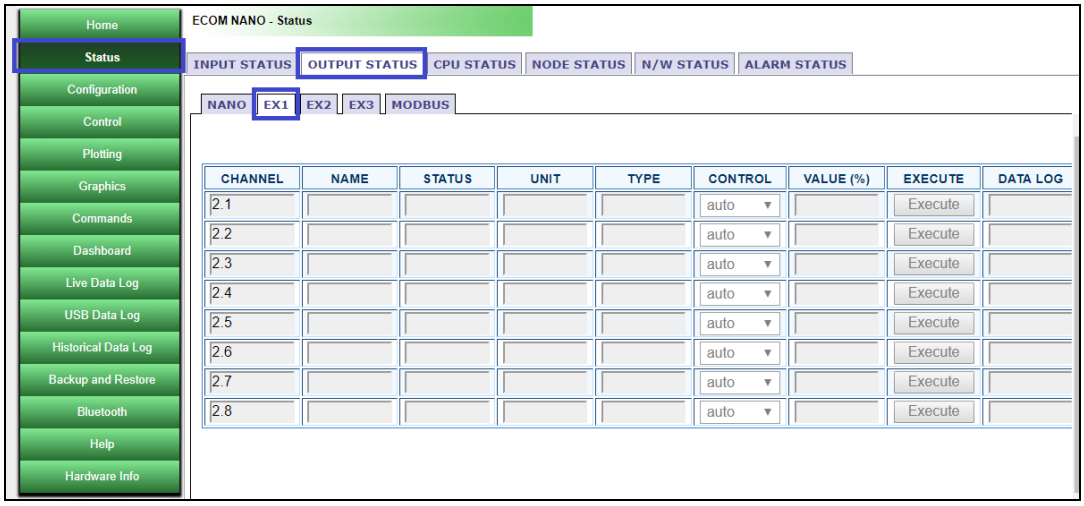


- CHANNEL : Channel number.
- NAME : Channel name.
- STATUS : Status/Value of the channel.
- UNIT : Unit of measure of the channel.
- TYPE : Type of the channel – digital.
- CONTROL : Select Auto/Manual.
- VALUE : Change CONTROL to Manual and select VALUE (ON/OFF).
- DATALOG : Datalog enabled/disabled.
- Click Execute to apply the VALUE. The STATUS changes to the new value.

Digital points are controlled using SWT (Switching Table) and ASI (T-Script).
Analog points are controlled using PGM (Programs) and ASI (T-Script).
Output need to be in Auto mode to be controlled using Switching Tables, Programs and Scripts.

4.4.5 EX1/EX2/EX3

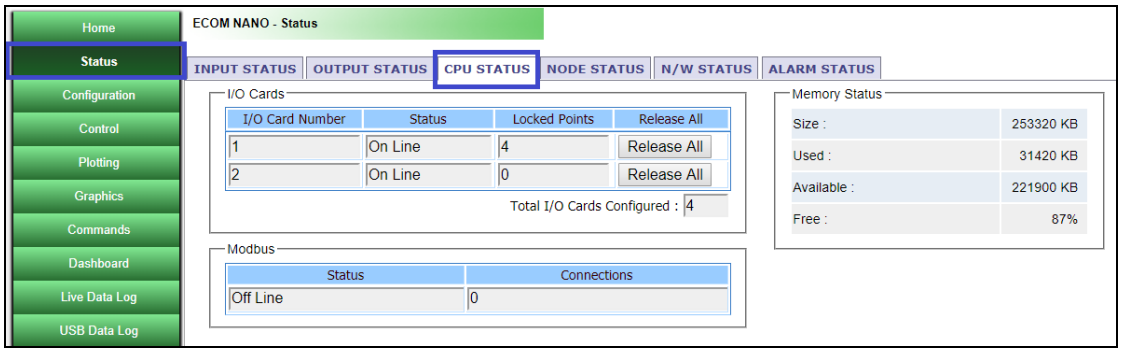
Displays real-time status of the configured outputs in expansion modules.
Go to **Configuration** menu to configure outputs.



- CHANNEL : Channel number.
- NAME : Channel name.
- STATUS : Status/Value of the channel.
- UNIT : Unit of measure of the channel.
- TYPE : Type of the channel – analog/digital.
- CONTROL : Select Auto/Manual
- VALUE : Change CONTROL to Manual and enter VALUE in % if the output is Analog and ON/OFF if the output is Digital.
- DATALOG : Datalog enabled/disabled.
- Click Execute to apply the VALUE. The STATUS changes to the new value.

4.4.6 CPU

Displays the status of I/O cards, Memory and Modbus.



I/O Cards

- I/O Card Number : I/O card number - 1 represents ECOM NANO built-in I/O card. I/O card number – 2 to 4 represents expansion cards.
- Status : Online/Offline.
- Locked Points : Number of points in Manual mode.
- Total I/O-Cards Configured : Number of I/O card configured.
- Click Release All to release the points and change it to Auto mode.

Modbus

- Status : Online/Offline.
- Connections : Number of Modbus connections.

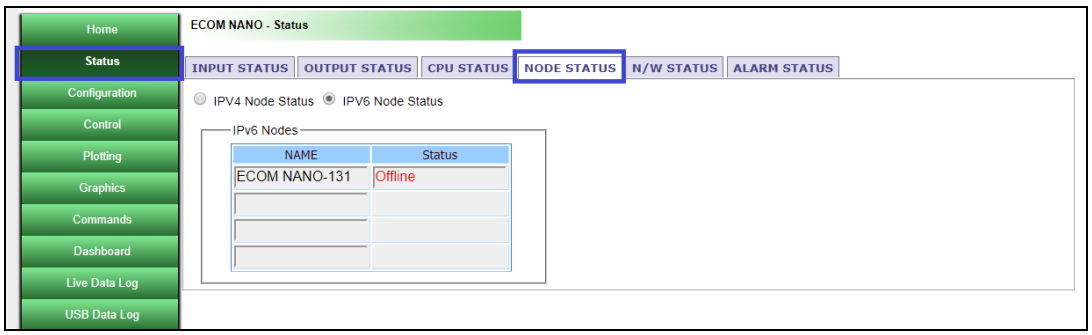
Memory Status

- Size : Total memory.
- Used : Used memory.
- Available : Available memory.
- Free : Percentage of free memory.

Locked points: Outputs configured in manual mode

4.4.7 NODE

Displays online/offline status of network devices.
Go to **Configuration** menu to configure Node.

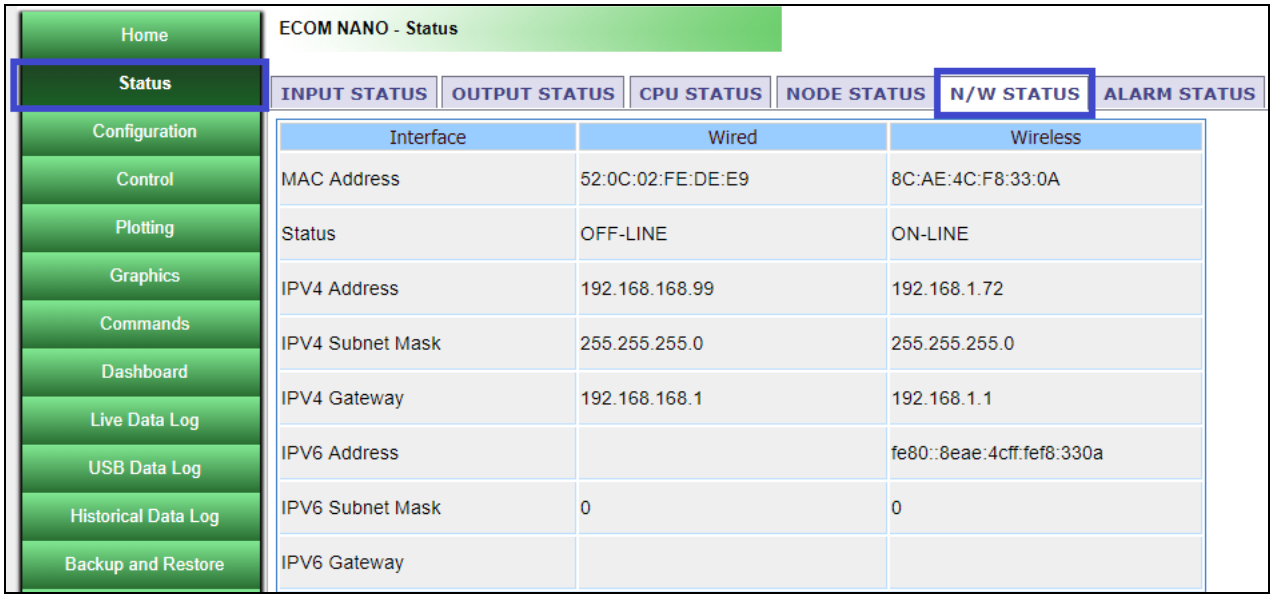


Select IPv4 /IPv6 node status.

Name : Name of the node.
Status : Online/Offline.

4.4.8 NETWORK

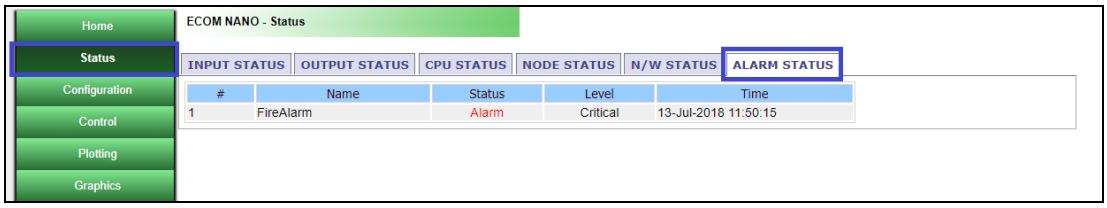
Displays the following IPv4 and IPv6 wired/wireless network details.
Go to **Configuration** menu to configure Network.



- MAC Address : Wired and wireless MAC address.
- Status : Wired and wireless network status - Online/Offline.
- IPV4 Address : Wired and wireless IPv4 network address.
- IPV4 Subnet Mask : Wired and wireless IPV4 subnet mask.
- IPV4 Gateway : Wired and wireless IPv4 gateway.
- IPV6 Local Address : Wired and wireless IPv6 local address.
- IPV6 Subnet Mask : Wired and wireless IPV6 subnet mask.
- IPV6 Gateway : Wired and wireless IPv6 gateway.

4.4.9 ALARM

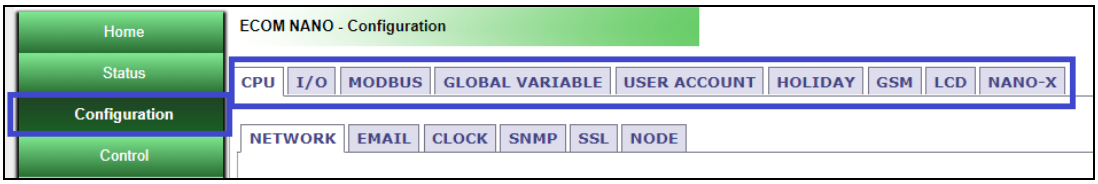
Displays Alarm status.
Go to **Control** menu to configure Alarm.



- Name : Alarm name.
- Status : Status of alarm - Alarm/Normal.
- Level : Alarm level – Critical/High/Medium/Low.
- Time : Time of status change.

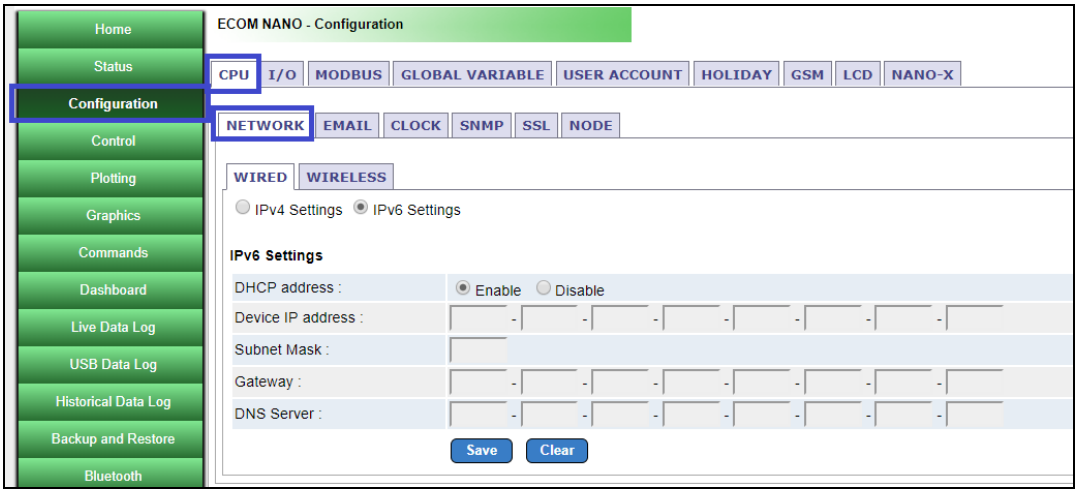
4.5 CONFIGURATION

This section is used to configure the following.



4.5.1 CPU - NETWORK

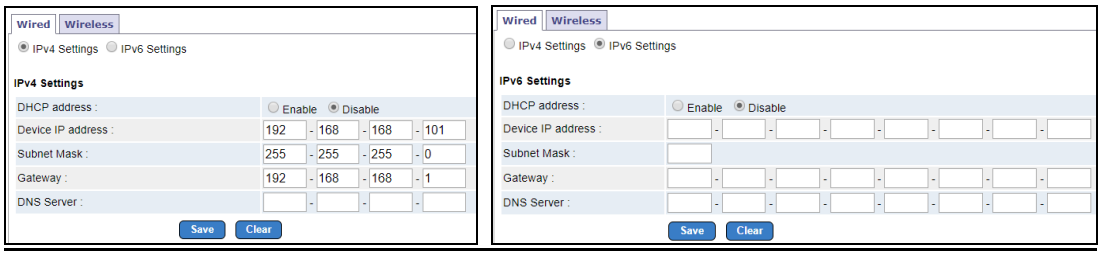
This section is used to configure wired(**IPv4/IPv6**)and wireless(**IPv4/IPv6**) network settings.



4.5.1.1 WIRED (IPv4/IPv6)

This section is used to configure wired IPv4/IPv6 network settings.

Static IP address configuration

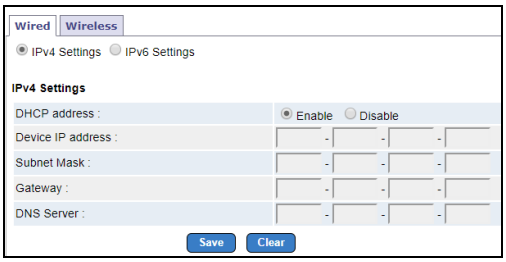


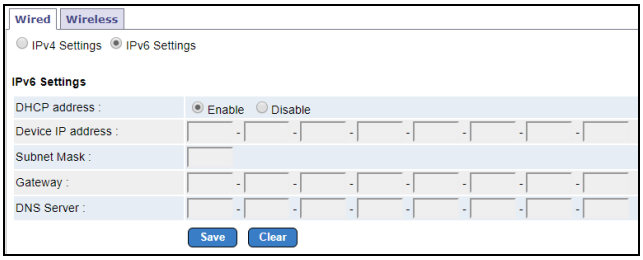
- Select DHCP Disable for DHCP Address.
- Enter the IPv4/IPv6 address, Subnet Mask, Gateway and DNS Server (Optional).
- Click Save.

Connect the controller and PC to the network having the same IP address range of ECOM NANO.
Restart ECOM NANO. Type in the newly configured IP address in the browser to access the controller.

Dynamic IP address configuration

The only way to identify the IP address of the ECOM NANO once it is set to DCHP is by means of the email sent out during boot up of the controller. Make sure the email settings are properly configured and working before changing the settings to DHCP.





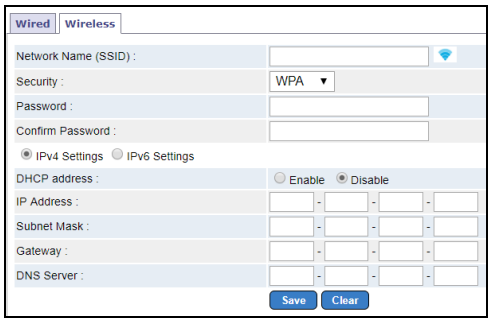
- Select DHCP Address Enable and click 

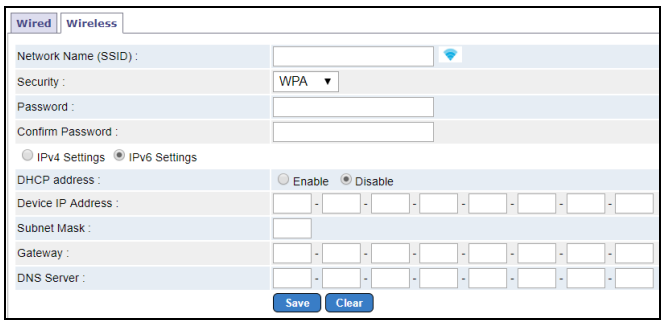
.
- Restart ECOM NANO. Type in the dynamically assigned IP address from the boot up email to access the controller.

For sample boot up email refer APPENDIX C – EMAIL SAMPLES.

4.5.1.2 WIRELESS (IPv4/IPv6)

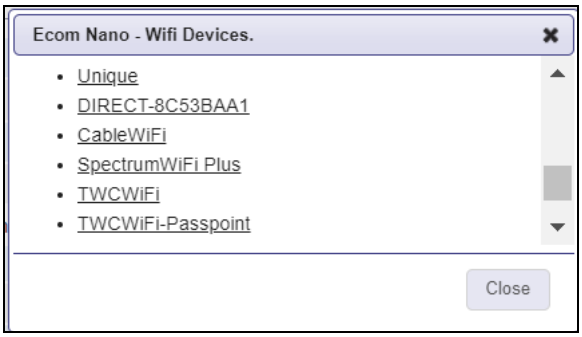
This section is used to configure wireless IPv4/IPv6 network settings.





Static IP address configuration

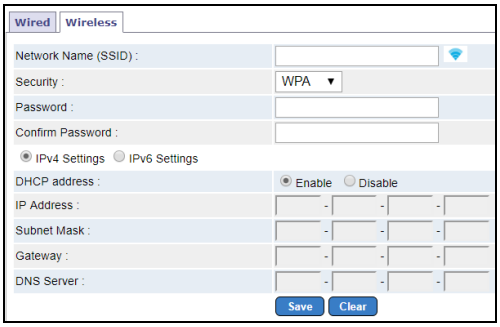
- Click  . Select wireless network from the list.

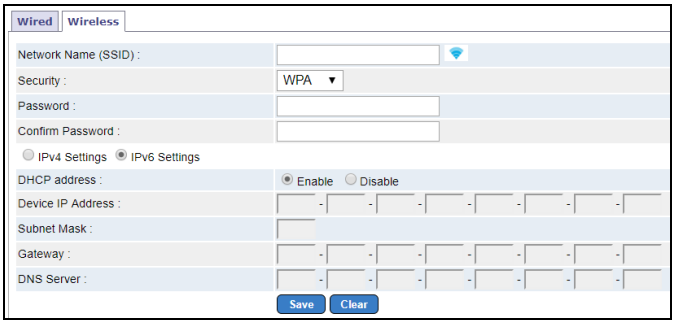


- Select security and provide password (WPA/WPA2)
- Enter WiFi password.
- Confirm password.
- Select IPv4/IPv6 Settings
- Select DHCP Address Disable.
- Provide the IPv4 address, Subnet Mask, Gateway and DNS Server (Optional).
- Click  .
- Connect the controller and PC to the network having the same IP address range of ECOM NANO.
- Restart ECOM NANO. Type in the newly configured IP address in the browser to access the controller.

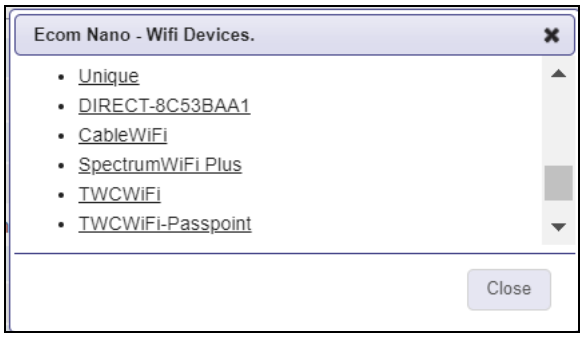
Dynamic IP address configuration

The only way to identify the IP address of the ECOM NANO once it is set to DCHP is by means of the email sent out during boot up of the controller. Make sure the email settings are properly configured and working before changing the settings to DHCP.





- Click  . Select wireless network from the list.



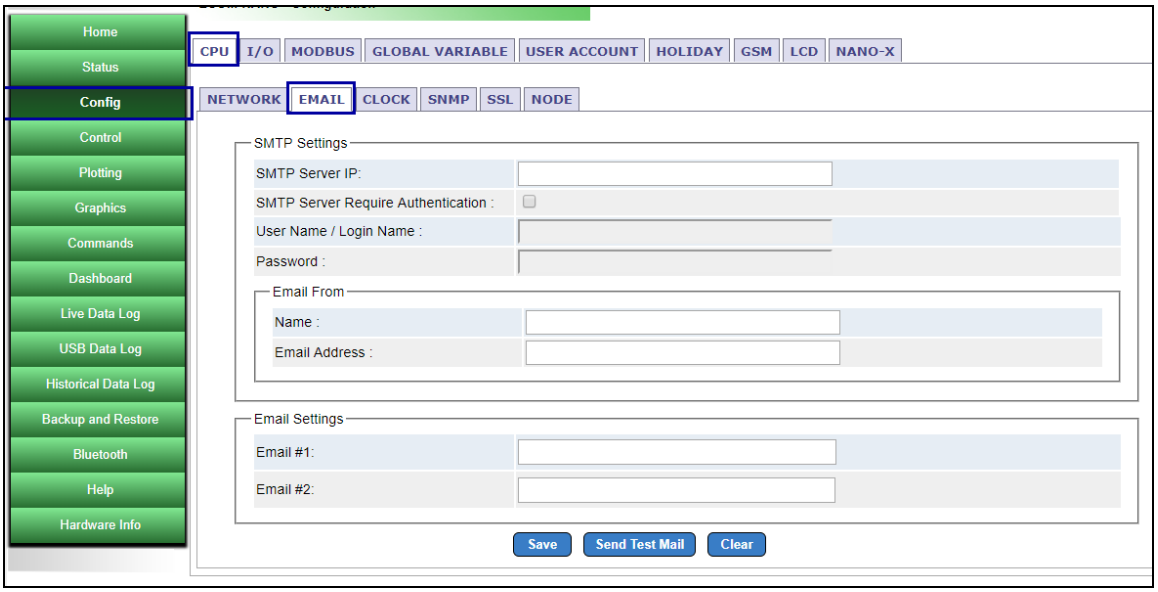
- Select security and provide password (WPA/WPA2)
- Enter WiFi password.
- Confirm password.
- Select IPv4/IPv6 Settings
- Select DHCP Address Enable.
- Click 

.
- Connect the controller and PC to the network having the same IP address range of ECOM NANO.
- Restart ECOM NANO. Type in the dynamically assigned IP address from the boot up email to access the controller.

For sample boot up email refer APPENDIX C – EMAIL SAMPLES

4.5.2 EMAIL

This section is used to configure email settings.

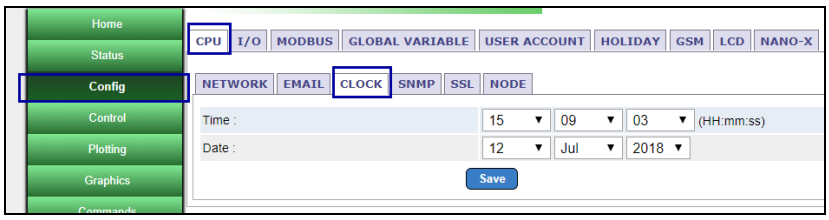


- SMTP Server Address : Enter SMTP server address.
- SMTP server authentication : Select if authentication is required for the email server.
- User name/Login name : Enter username for the account.
- Password : Enter password for the account.
- Name : Enter name of the sender.
- Email Address : Enter email address of the sender.
- Email #1 : Enter recepient1 email address. This email address is used to send boot up email and alarm emails.
- Email #2 : Enter recepient2 email address. This email address is used to send boot up email and alarm emails (Not mandatory).
- Click Save.
- Click Clear to remove email settings.
- Click Send Test Mail. A test email is sent to the recipient email address.

For sample test email refer APPENDIX C – EMAIL SAMPLES.

4.5.3 CLOCK

This section is used to configure time and date.

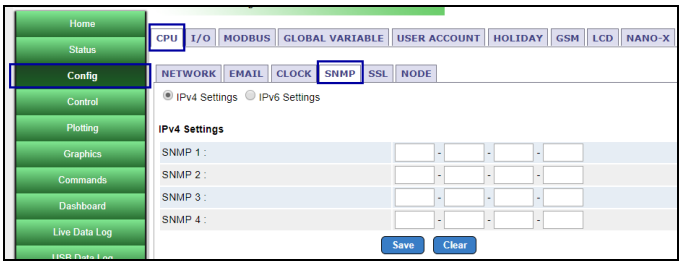


- Set time.
- Set date.
- Click Save.

New date and time is displayed on the Home page.

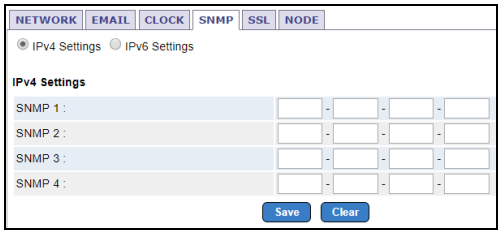
4.5.4 SNMP

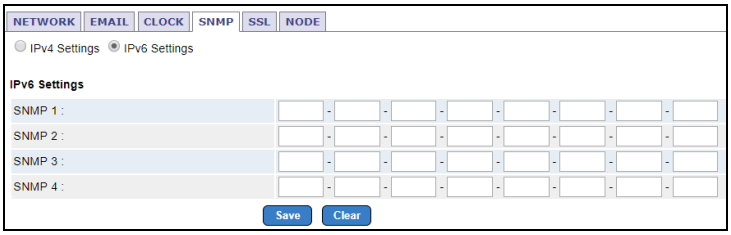
This section is used to configure up to four IP addresses (IPv4 /IPv6) to which SNMP messages is sent.



Once alarm is triggered, ECOM NANO sends SNMP messages.

IPv4/IPv6 Settings

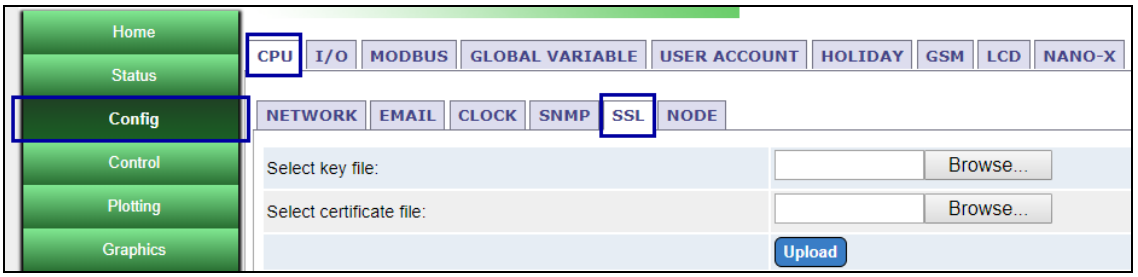




- Enable IPv4/IPv6 Settings.
- Enter IPv4/IPv6 address.
- Click Save.
- Click Clear to remove SNMP IP addresses.

4.5.5 SSL

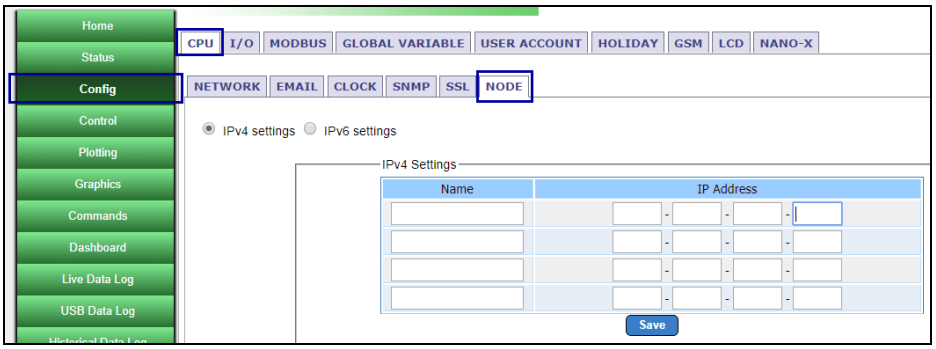
This section is used to upload SSL certificate and key file for secure web access.



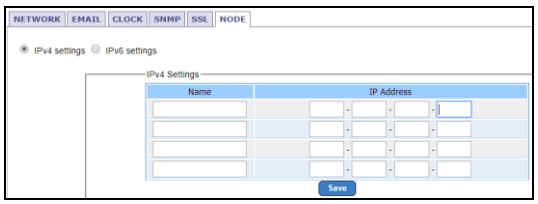
- Click Browse... to select SSL key
- Click Browse... to select SSL certification
- Click Upload.

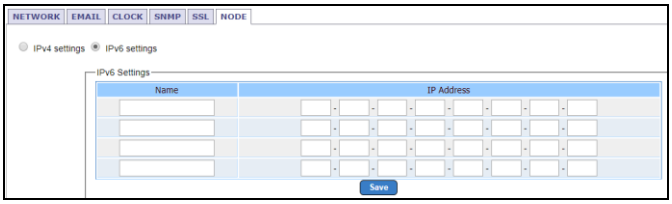
4.5.6 NODE

This section is used to configure up to four networked devices. ECOM NANO continuously monitors the devices and display the status as Online/Offline in Node Status page.



IPv4/IPv6 Nodes

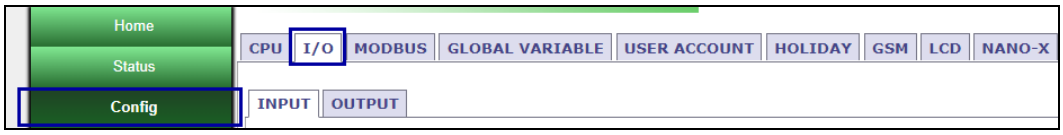




- Select the IPv4/IPv6 Setting
- Enter the node name(15 characters) and IPv4/IPv6 address
- Click Save.

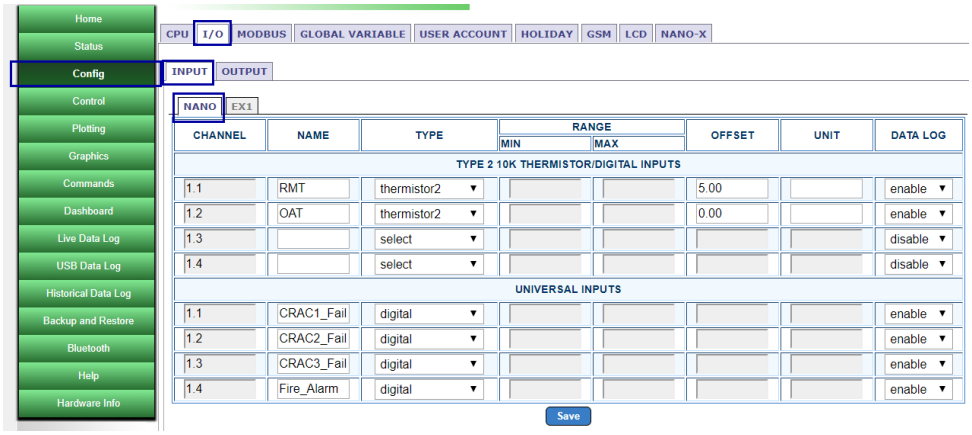
4.5.7 I/O

This section is used to configure inputs and outputs.



4.5.7.1 INPUT - NANO

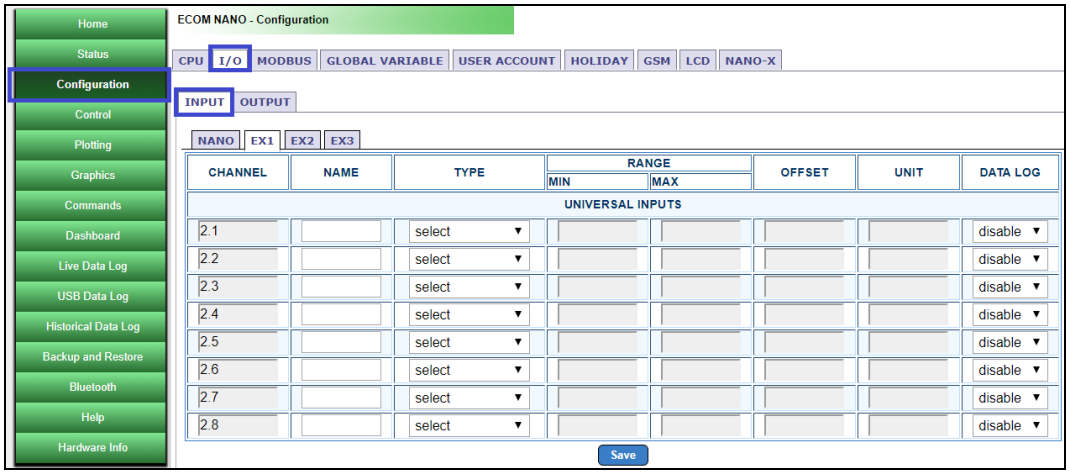
This section is used to configure ECOM NANO inputs.



- NAME : Enter name of the input (up to 30 characters).
- TYPE : Select Analog 5V, Analog 10V, Digital, Thermistor (10K-Type II).
- MIN : Enter minimum value for analog input.
- MAX : Enter maximum value for analog input.
- OFFSET : Enter the value for offset correction for Analog 5V/Analog 10V/Thermistor. Offset can be positive or negative.
- UNIT : Enter description for unit of measure for Analog 5V/Analog 10V/Thermistor.
- DATALOG : Select enable/disable data logging.
- Click Save.

4.5.7.2 EX1/EX2/EX3

This section is used to configure expansion card inputs.
Go to **NANO-X** in **Configuration** menu to enable EX1/EX2/EX3.

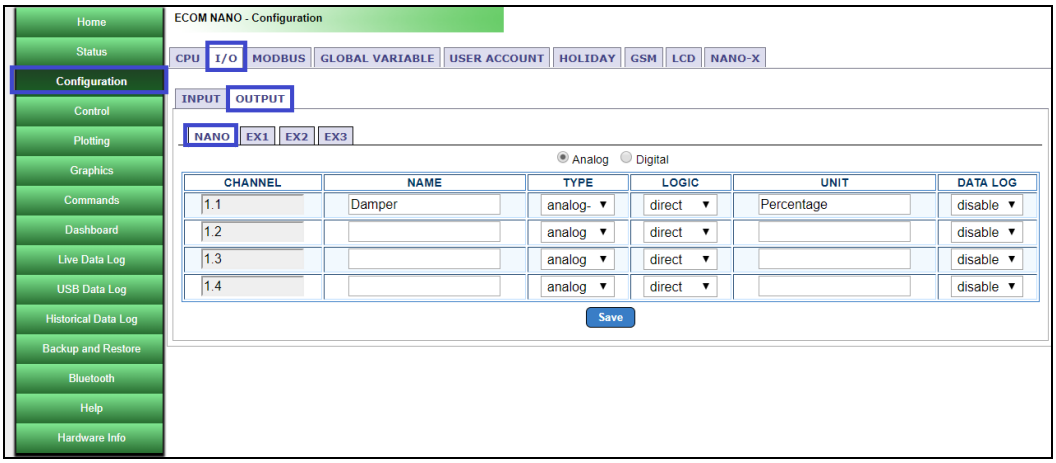


- NAME : Enter name of the input (up to 30 characters).
- TYPE : Select Digital , 5V, 10V.
- MIN : Enter minimum value for analog input.
- MAX : Enter maximum value for analog input.
- OFFSET : Enter the value for offset correction for 5V/ 10V.
  Offset can be positive or negative.
- UNIT : Enter description for unit of measure for 5V/ 10V.
- DATALOG : Select enable/disable data logging.
- Click 

.

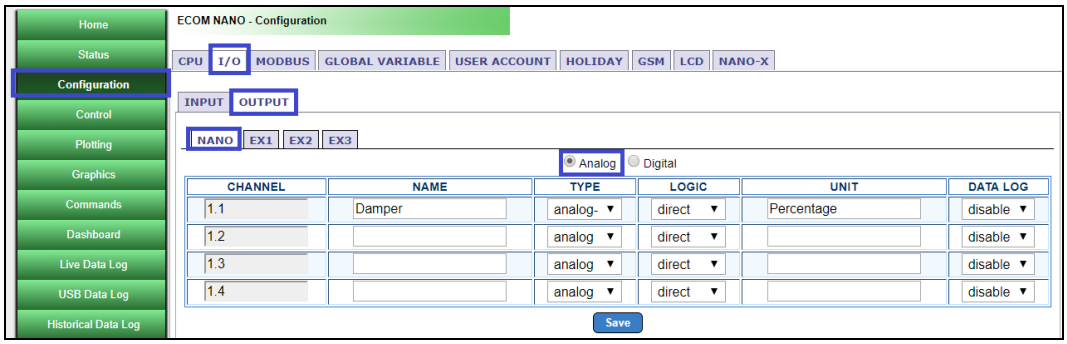
4.5.7.3 OUTPUT - NANO

This section is used to configure ECOM NANO outputs.



Analog outputs

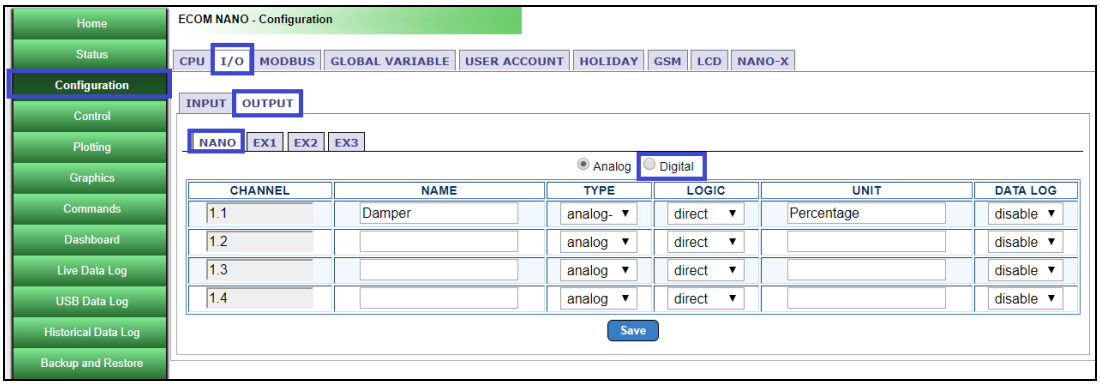
This section is used to configure analog outputs.



- NAME : Enter name of the output (up to 30 characters).
- TYPE : Select analog/analog-fixed.
- LOGIC : Select direct/reverse.
- UNIT : Enter unit of measurement of the channel.
- DATALOG : Select enable/disable data logging.
- Click Save.

Digital outputs

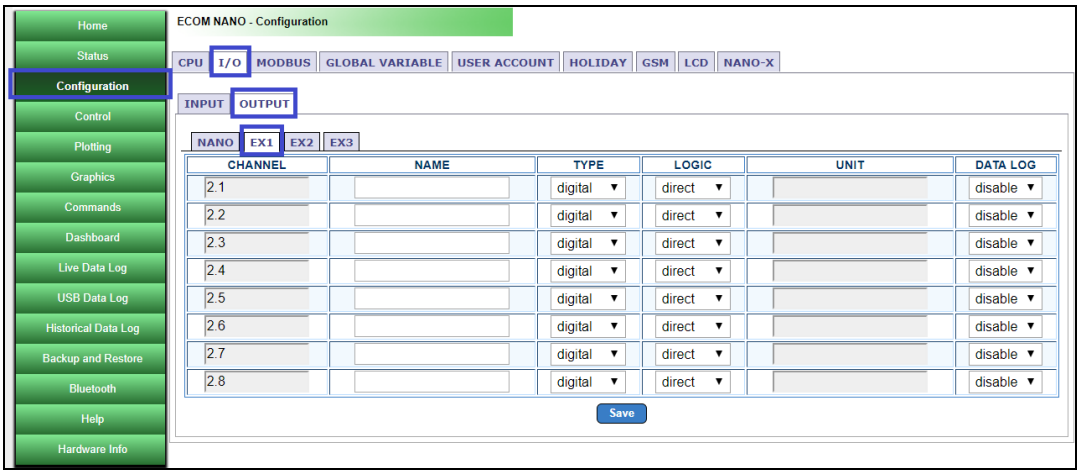
This section is used to configure digital outputs.



- NAME : Enter name of the output (up to 30 characters).
- TYPE : Digital.
- LOGIC : Select direct/reverse.
- DATALOG : Select enable/disable data logging.
- Click Save.

4.5.7.4 EX1/EX2/EX3

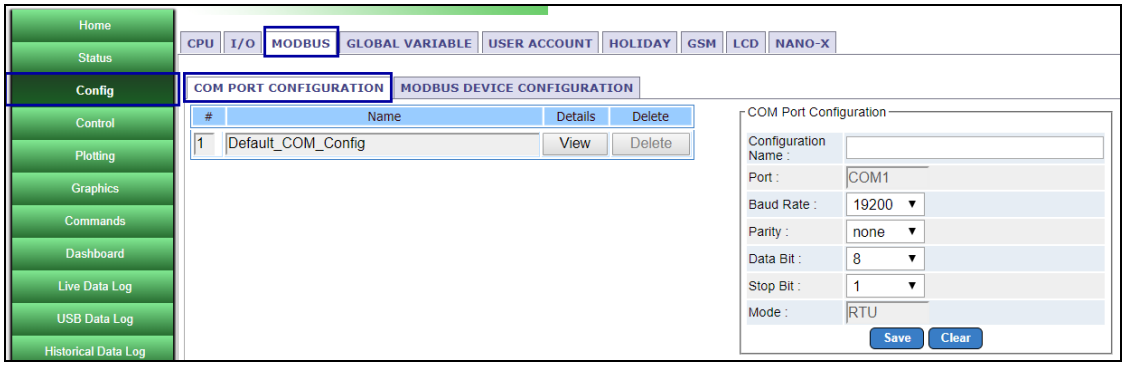
This section is used to configure expansion card outputs.



- NAME : Enter name of the output (up to 30 characters).
- TYPE : Digital.
- LOGIC : Select direct/reverse.
- DATALOG : Select enable/disable data logging.
- Click Save.

4.5.8 MODBUS – PORT CONFIGURATION

This section is used to configure RS485 Modbus communication.



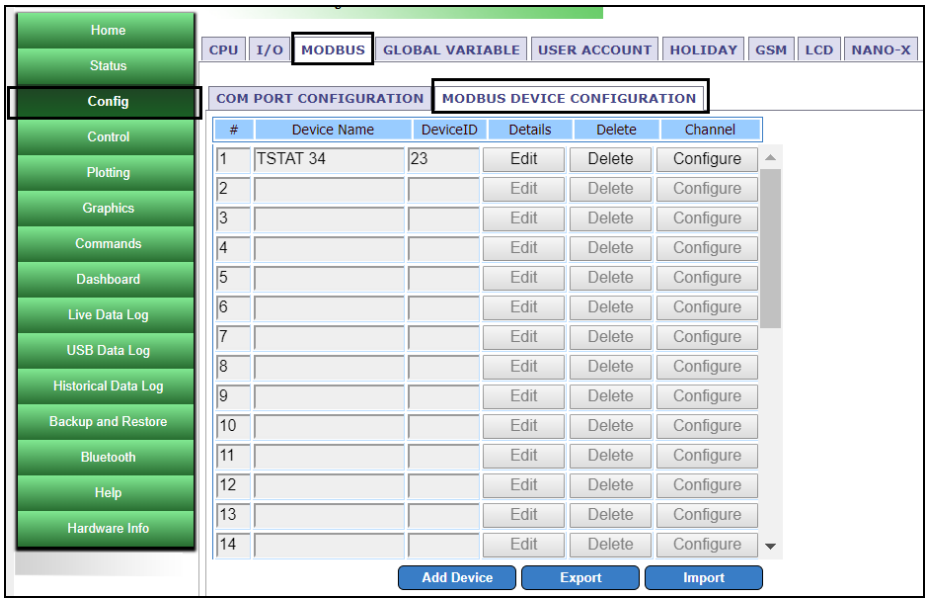
Maximum 10 configurations can be added. One default configuration is available.

- Configuration Name : Enter name of the port (up to 30 characters).
- Port : COM1.
- Baud rate : Select buad rate -9600/19200/38400/57600/115200.
- Parity : Select parity -None/Even/Odd/Mark/Space.
- Data bit : Select data bit - 8/7/6/5.
- Stop bit : Select - 1/1.5/2.
- Mode : RTU.
- Click Save.
- Click Clear to clear the fields.

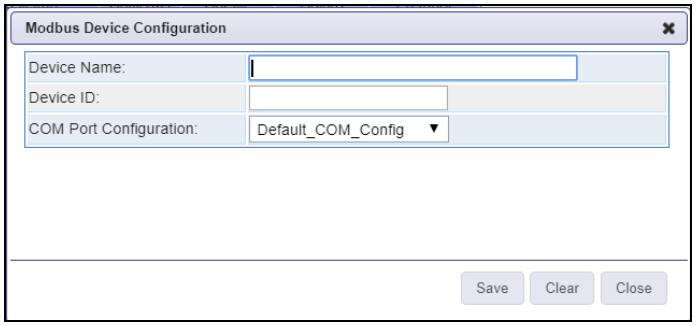
Once configured, the ports are listed in Add Device in MODBUS DEVICE CONFIGURATION.

4.5.9 MODBUS DEVICE CONFIGURATION

This section is used to configure Modbus device.

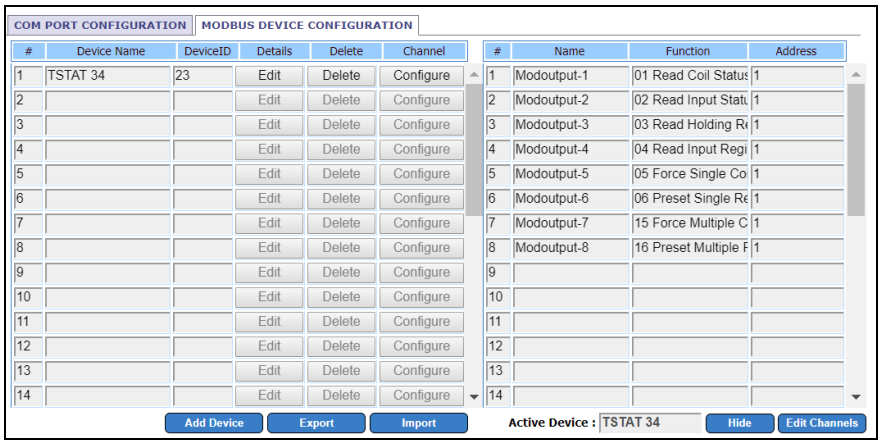


- Click **Add Device**.

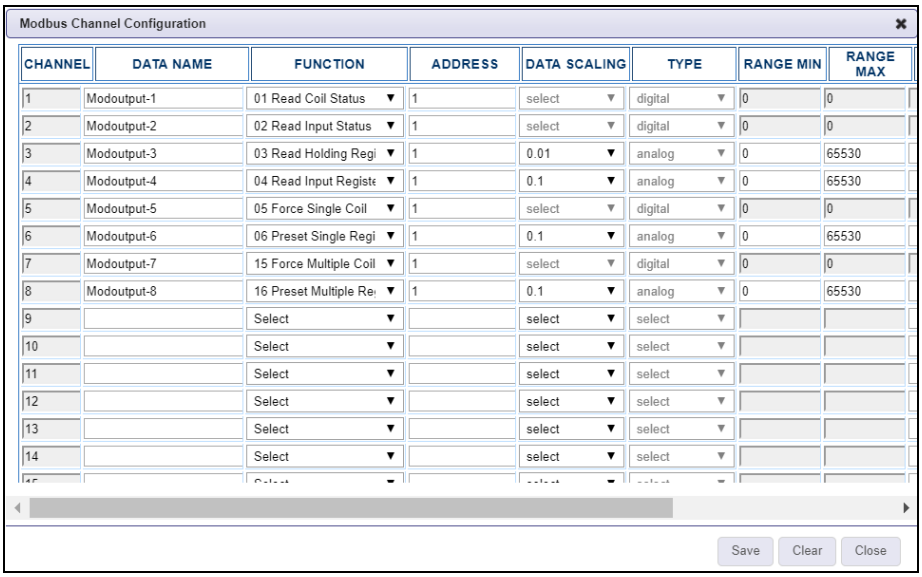


- Device Name : Enter name of the device (up to 30 characters).
- Device ID : Enter device ID.
- COM Port Configuration : Select Port Configuration from the drop down list.
- Click Save.
- Click Clear to clear the fields.
- Click Close to close the screen.
- Newly added device is listed in Modbus device configuration page.

- Click Configure to enable configuration for the modbus device.



- The status window of the selected modbus port is displayed on the right side.
- Click Hide to hide the status window.
- Click Edit Channels to configure the modbus points.



- DATA NAME : Enter name of the data (up to 30 characters).
- FUNCTION : Select the function

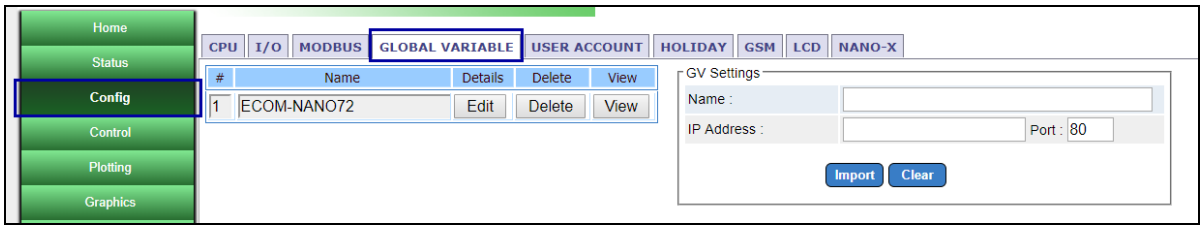
  01 Read Coil Status, 02 Read Input Status
  03 Read Holding Registers, 04 Read Input Registers
  05 Force Single Coil, 06 Preset Single Register
  15 Force Multiple Coils, 16 Preset Multiple Registers
- ADDRESS : Enter the address form data to do read/write functions.
- DATA SCALING : Select the scaling factor to be applied for the read value (0.01/0.1/1/10/100)
- TYPE : This field will be automatically gets updated by the selection of FUNCTION (for FUNCTIONS 01/02/05/15 – TYPE is Digital and for FUNCTIONS 03/04/06/16 – type is Analog)

- RANGE MIN : Enter the minimum range for analog type.
- RANGE MAX : Enter the maximum range for analog type.
- UNIT : Enter the unit name (7 characters).
- DATA LOG : Enable/disable datalog.
- DATA TYPE : Select data type - signed(16 bit), unsigned(16 bit), signed(32 bit), unsigned(32 bit).

- Click Save.
- Click Clear the fileds.
- Click Close to close the pop up window.

4.5.10 GLOBAL VARIABLE

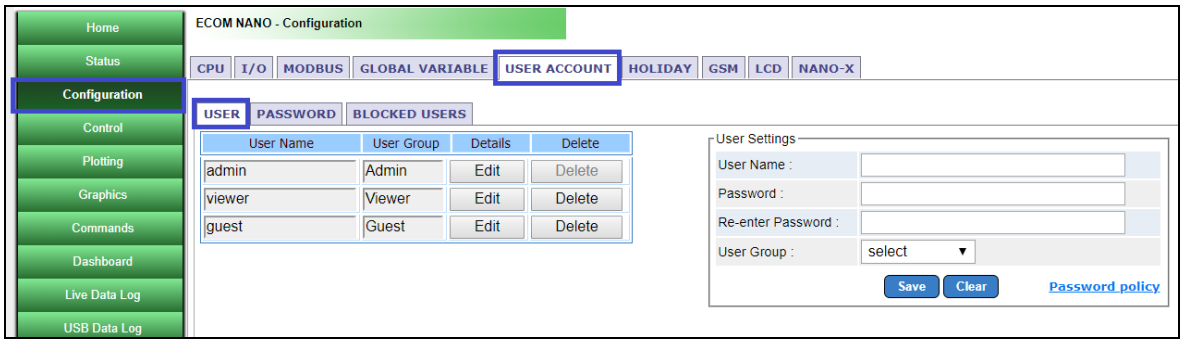
This section is used to import global variable points from other ECOM NANO's in the same network.
ECOM NANO can import up to four global variables.



- Name : Enter name of the ECOM NANO controller be Imported (up to 30 characters).
- IP address : Enter IP address of the ECOM NANO to be imported. Global variable supports only IPv4.
- Port : For ECOM Nano the port number is 443.
- Click Import to import the Global Variables.
-
- Click Clear to clear.
- Click View to view the global variable.
- Click Edit to edit.
- Click Delete to delete the point.

4.5.11 USER ACCOUNT - USER

This section is used to configure user accounts and view the blocked users. Up to 10 user accounts can be configured.



The configured users are listed on the left.

- User Name : User Name
- User Group : User Group – Admin, Viewer, Guest.
- Click Edit to edit the details of a user.
- Click Delete to delete a user. The default user **admin** cannot be deleted

<u>Add/Edit Users</u>

- Name : Enter name of the user.
- Password : Enter password.
- Re-enter password : Re-enter the password.
- User Group : Select user group - Admin/Viewer/Guest.

  Admin : Can view and edit all data.
  Viewer : Can only view the data.
  Guest : Has view only access to 4 web pages – Home, Graphics, Dashboard and Hardware Info pages.

- Click Save to save the user.
- Click Clear to clear.

Default users

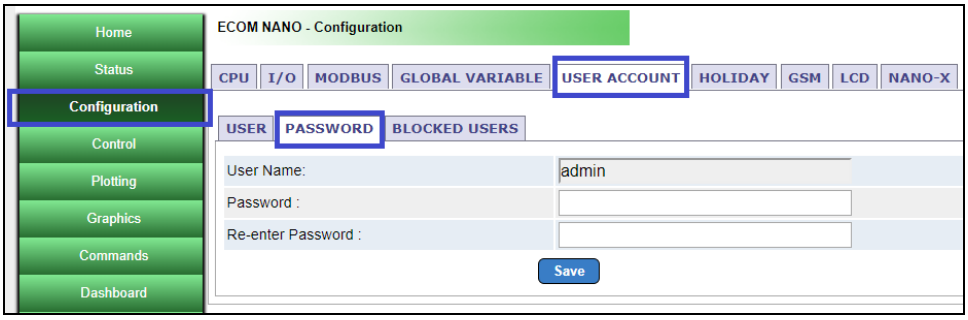
- UserName: admin Password: default@Ec0M$
- UserName: viewer Password: password@Ec0M$
- UserName: guest Password : guest@Ec0M$

Password policy

- Password must contain 8 characters.
- Maximum password length is 30 characters.
- Password must contain one capital letter(A-Z).
- Password must contain one small letter(a-z).
- Password must contain minimum one special character only
- from the following (!,@,#,$,%,&).
- Password must contain one number(0-9).

4.5.12 PASSWORD

This section is used to change the password of the logged in user.

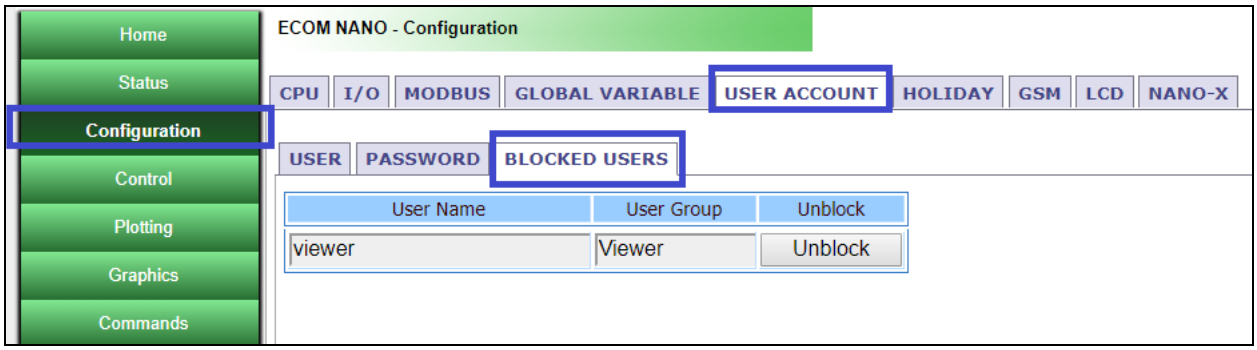


Username : Displays current user.
Password : Enter password.
Re-enter password : Re-enter password.

Click Save to save the new password.

4.5.13 BLOCKED USERS

This section is used to view the list of blocked users and to unblock.

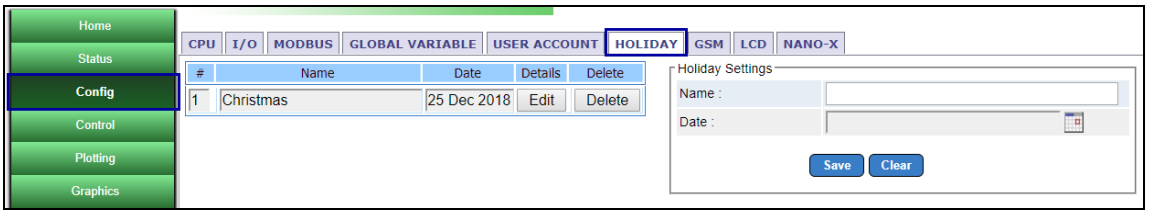


Click Unblock to unblock user. Only admin users can unblock a user.

Ten attempts with wrong password will block a user.

4.5.14 HOLIDAY

This section is used to configure holidays. Up to 32 holidays can be configured.



The configured holidays are listed on the left.

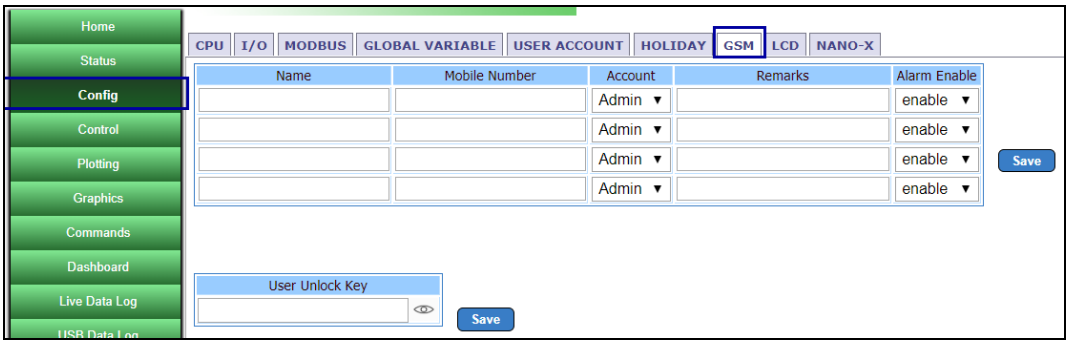
- Name : Holiday name.
- Date : Date of the holiday.
- Click Edit to edit holiday configuration.
- Click Delete to delete a holiday.

Add/Edit Holiday

- Name : Enter holiday name.
- Date : Select holiday date from calender
- Click Save to save the holiday.
- Click Clear to clear.

4.5.15 GSM

This section is used to configure GSM settings. Up to 4 mobile numbers can be configured.



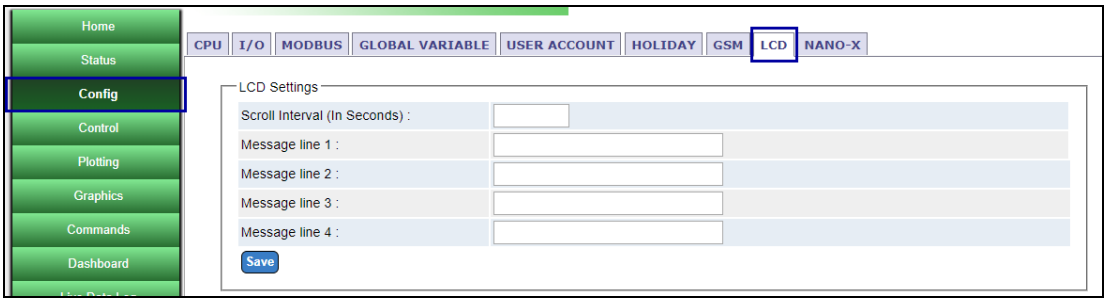
- Name : Enter name (30 characters).
- Mobile number : Enter the mobile number with country code (Eg. +18051234567)
- Account : Admin.
- Remarks : Enter remarks.
- Alarm enable : Enable/Disable. Alarm notification is send to the user only if this Is enabled.
- Click Save to save the details.
- User unlock key : Enter key (4 digit number). Eg. 1234.
- Click Save to save the key.

- Use country code before mobile numbers.
- Lock and unlock key is common for all 4 users.
- After unlocking the controller using the key, it will go to locked state if idle for 5 minutes.
- Depending on the request it takes 20 to 30 seconds to get a response from the controller.

Refer Appendix F for SMS commands and Sample SMS received

4.5.16 LCD

This section is used to configure LCD screen messages. Supports up to 20 characters.



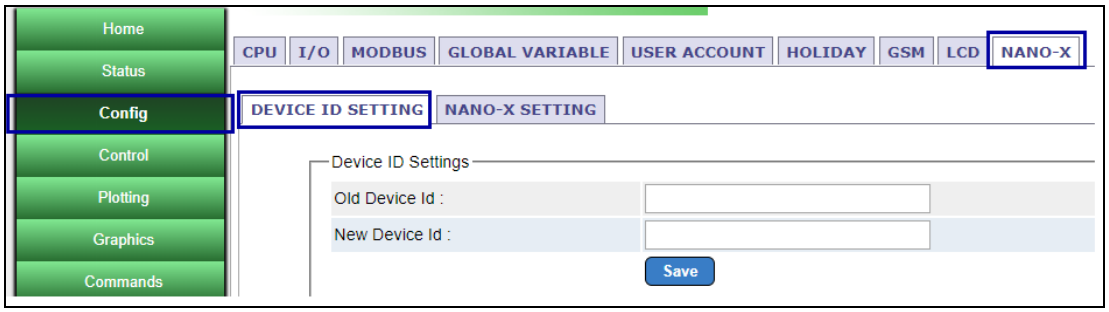
- Scroll Interval : Enter Scroll Interval (1 - 999 Seconds)
- Message line 1 : Enter the message for row-1
- Message line 2 : Enter the message for row-2
- Message line 3 : Enter the message for row-3
- Message line 4 : Enter the message for row-4
- Click 

to save.

Once configured, these messages are displayed in LCD screen under message section.

4.5.17 NANO-X – DEVICE ID SETTINGS

This section is used to configure expansion cards EX1/EX2/EX3. One expansion card is connected and configured at a time.

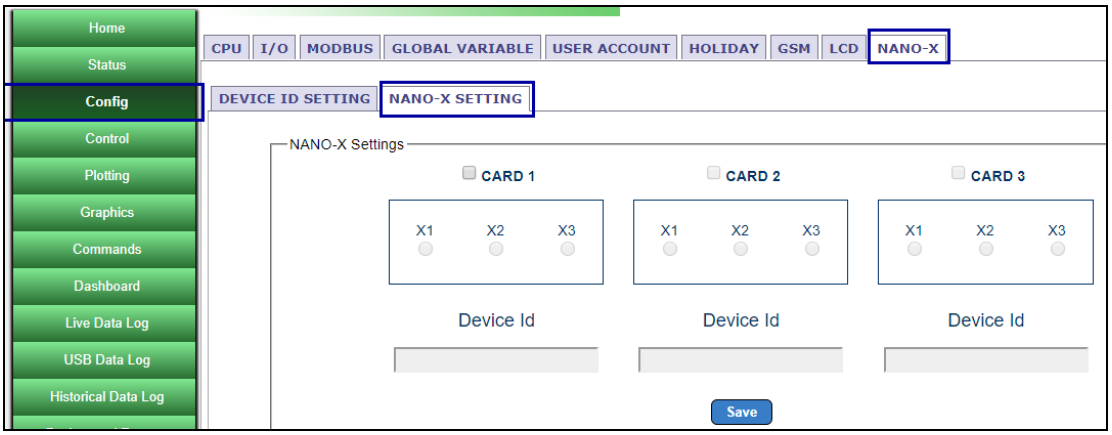


This section is used to configure device id for EX1/EX2/EX3.

- Old device ID : Enter old device ID (default ID is 255)
- New device ID : Enter new device ID.
- Click Save to save.

4.5.18 NANO-X SETTINGS

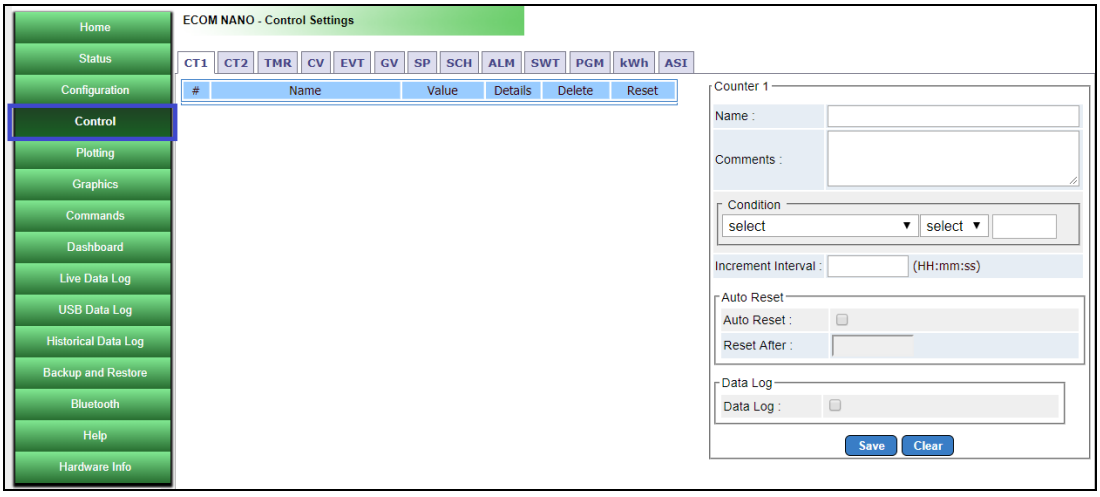
This section is used to select the expansion card type.



- CARD 1/CARD 2/CARD 2 : Select card.
- X1/X2/X3 : Select card type.
- Device Id : The configured device Id is displayed here.
- Click Save to save.

4.6 CONTROL

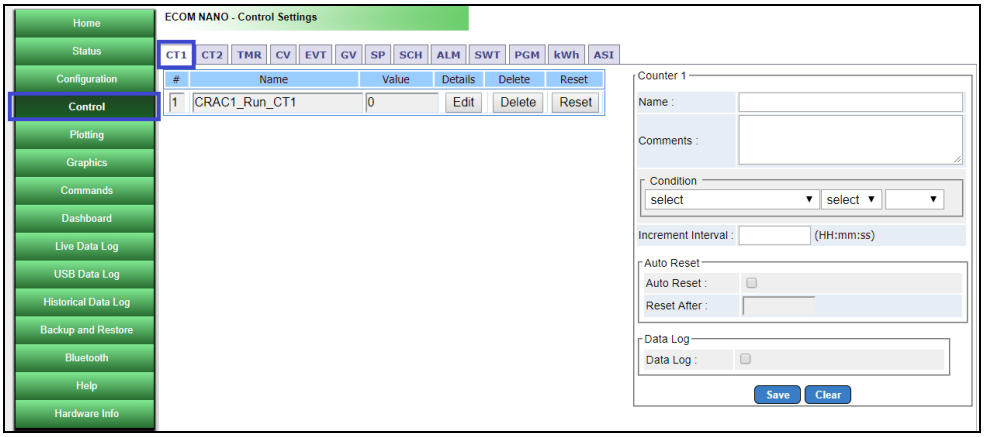
This section is used to configure and view status of the following control points/programs.



- CT1 : Counter-1 (Up to 64).
- CT2 : Counter-2 (Up to 64).
- TMR : Timer (Up to 64).
- CV : Complex Variable (Up to 64).
- EVT : Event (Up to 32).
- GV : Global Variable (Up to 04).
- SP : Set point (Up to 64).
- SCH : Schedule (Up to 64).
- ALM : Alarm (Up to 64).
- SWT : Switching Table (Up to 44).
- PGM : Program (Up to 04).
- kWh : kWh Calculator (Up to 64).
- ASI : Application Specific Instruction (Up to 8).

4.6.1 COUNTER1 (CT1)

Configure time based counter



The configured counters are listed on the left.

- Name : Counter Name.
- Value : Current value.
- Details : Edit counter. Clicking on the Edit button will load the counter details to the right. Make changes to the counter and click Save .
- Delete : Delete counter. Click Delete button to delete the counter. Asks for a confirmation before deleting the counter.
- Reset : Reset counter to 0. Asks for a confirmation before resetting the counter.

- Editing and saving the counter will reset the counter to 0.
- Deleting a counter which is used in other controls or programs will cause undesired results in places where it is used.

Add/Edit counter

Name : Enter name of the counter.
Comments : Enter comments.
Condition : Specify the condition for counting. The counter starts counting once the condition is True.
Select analog/digital point.
For analog points the condition will be less than (<), greater than (>), equal to (=) or not equal to (NOT =) a numeric value.
For digital points the condition will equal to (=) or not equal to (NOT =) ON/OFF.
Increment interval : Increment interval in hour:minute:seconds.
Auto Reset : Select Auto Reset to automatically reset a counter when it reaches a Certain value.
Reset After : Specify the value after which the timer should reset.
Data Log : Select to enable data logging.

Click 

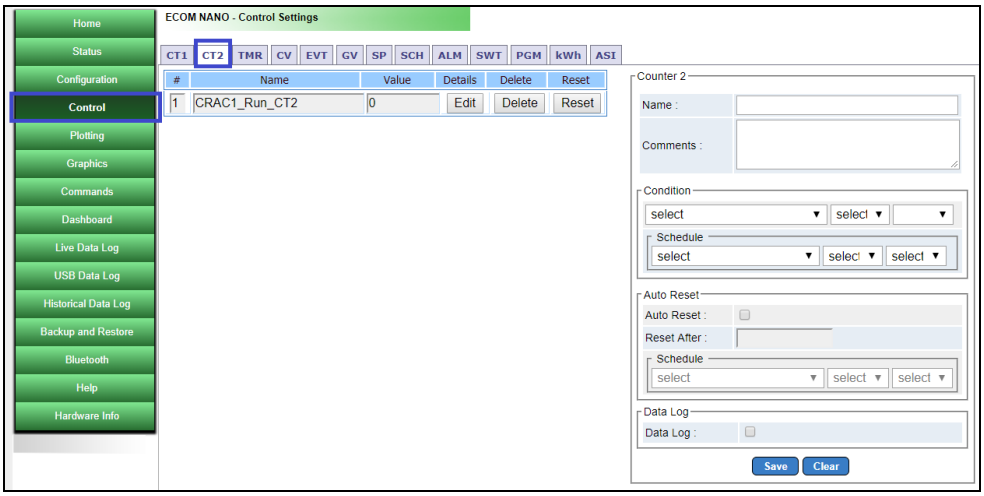
to save the counter.

Click 

to clear the counter.

4.6.2 COUNTER2(CT2)

Configure event based counter



The configured counters are listed on the left.

- Name : Counter Name.
- Value : Current value.
- Details : Edit counter. Clicking on the Edit button will load the counter details to the right. Make changes to the counter and click Save .
- Delete : Delete counter. Click Delete button to delete the counter. Asks for a confirmation before deleting the counter.
- Reset : Reset counter to 0. Asks for a confirmation before resetting the counter.

- Editing and saving the counter will reset the counter to 0.
- Deleting a counter which is used in other controls or programs will cause undesired results in places where it is used.

Counter 2 counts only when the condition is True. It will again count only once the condition becomes False and then again turns True.
Eg. If Counter 2 is used to count the number of times a Door is open, It will count 1 when the digital point Door is ON. To count 2, the Door will have to be OFF and again turned ON.

Add/Edit counter

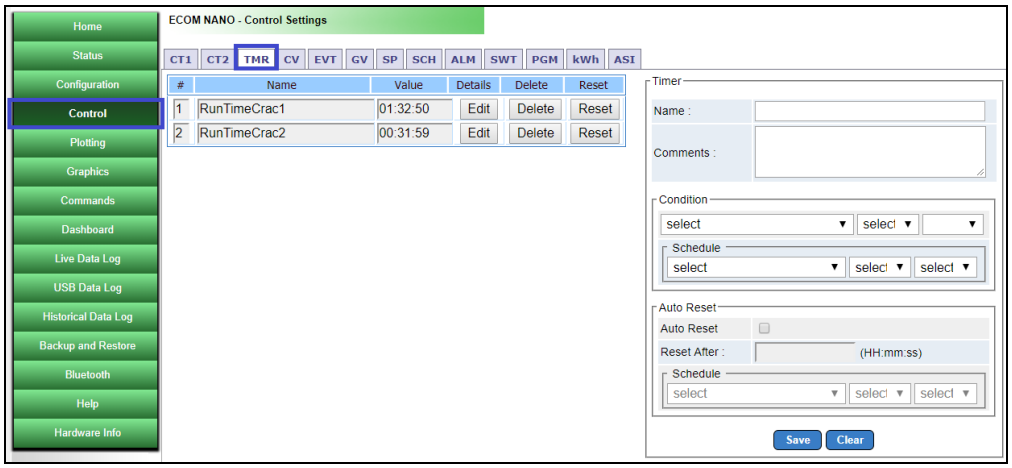
- Name : Enter name of the counter.
- Comments : Enter comments.
- Condition : Specify the condition for counting. The counter starts counting once the condition is True.
  Select analog/digital point.
  For analog points the condition will be less than (<), greater than (>), equal to (=) or not equal to (NOT =) a numeric value.
  For digital points the condition will equal to (=) or not equal to (NOT =) ON/OFF.
- Schedule : Select a schedule, specify equal to (=) or not equal to (NOT=) and select ON/OFF. The counter will start counting only when the **Condition** and **Schedule** is True.
- Auto Reset : Select Auto Reset to automatically reset a counter when it reaches a certain value.
- Reset After : Specify the value after which the timer should reset.
- Schedule : Select a schedule, specify equal to (=) or not equal to (NOT=) and select ON/OFF. The auto reset will work only when the count exceeds the **Reset After** value and the **Schedule** is True.
- Data Log : Select to enable data logging.
- Click 

to save the counter.
- Click 

to clear the counter.

4.6.3 TIMER

Configure Timer



The configured timers are listed on the left.

- Name : Timer Name.
- Value : Current value.
- Details : Edit counter. Clicking on the Edit button will load the timer details to the right. Make changes to the timer and click Save .
- Delete : Delete timer. Click Delete button to delete the timer. Asks for a confirmation before deleting the timer.
- Reset : Reset timer. Asks for a confirmation before resetting the timer.

- Editing and saving the timer will reset the timer.
- Deleting a timer which is used in other controls or programs will cause undesired results in places where it is used.

Add/Edit timer

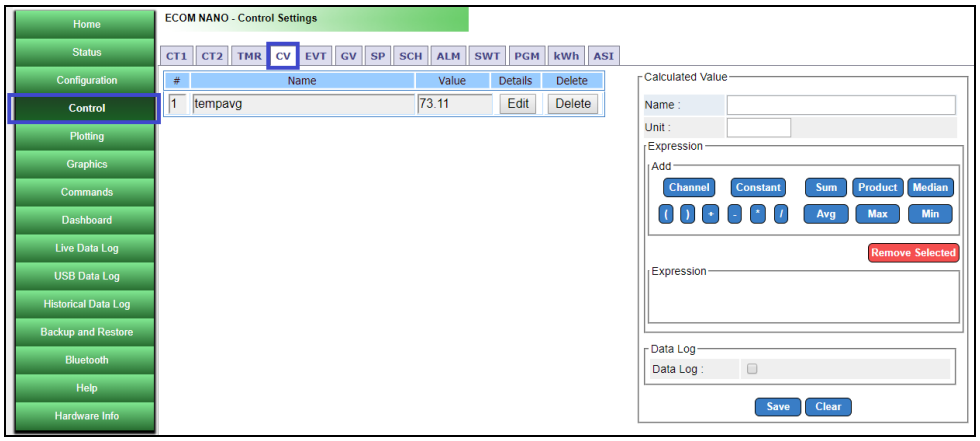
- Name : Enter name of the timer.
- Comments : Enter comments.
- Condition : Specify the condition for timer to start. The timer starts once the condition is True.
  Select analog/digital point.
  For analog points the condition will be less than (<), greater than (>), equal to (=) or not equal to (NOT =) a numeric value.
  For digital points the condition will equal to (=) or not equal to (NOT =) ON/OFF.
- Schedule : Select a schedule, specify equal to (=) or not equal to (NOT=) and select ON/OFF. The timer will start counting only when the **Condition** and **Schedule** is True.
- Auto Reset : Select Auto Reset to automatically reset a counter when it reaches a certain value.
- Reset After : Specify the value (in hh:mm:ss format) after which the timer should reset.
- Schedule : Select a schedule, specify equal to (=) or not equal to (NOT=) and Select ON/OFF. The auto reset will work only when the value exceeds the **Reset After** value and the **Schedule** is True.
- Data Log : Select to enable data logging.
- Click 

to save the timer.
- Click 

to clear the timer.

4.6.4 COMPLEX VARIABLES

Configure complex variables

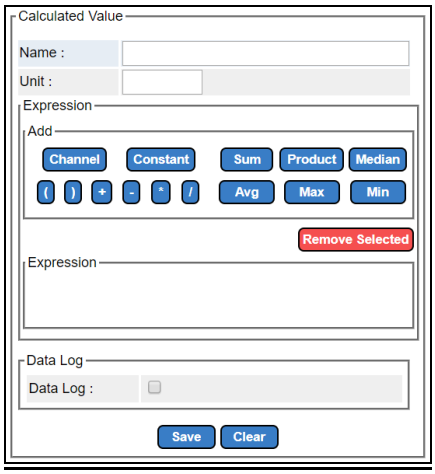


The configured CVs are listed on the left.

- Name : Complex Variable Name.
- Value : Current value.
- Details : Edit Complex Variable. Clicking on the Edit button will load the CV details to the right. Make changes to the Complex Variable and click Save .
- Delete : Delete Complex Variable. Click Delete button to delete the Complex Variable. Asks for a confirmation before deleting the Complex Variable.

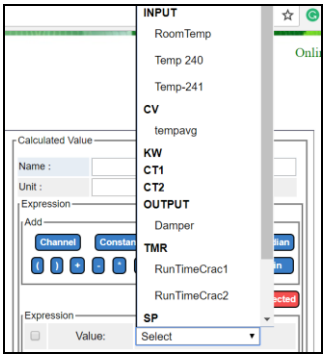
- Deleting a Complex Variable which is used in other controls or programs willcause undesired results in places where it is used.

Add/Edit Complex Variable

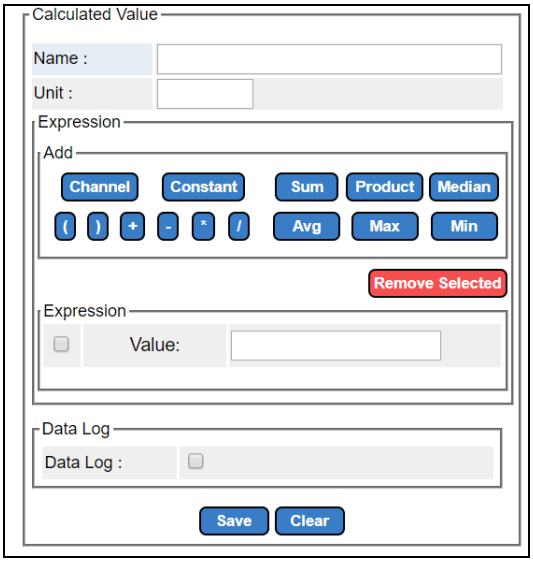


- Name : Enter name of the Complex Variable.
- Unit : Unit for the Complex Variable.
- Expression : Following expressions are available to construct a Complex Variable

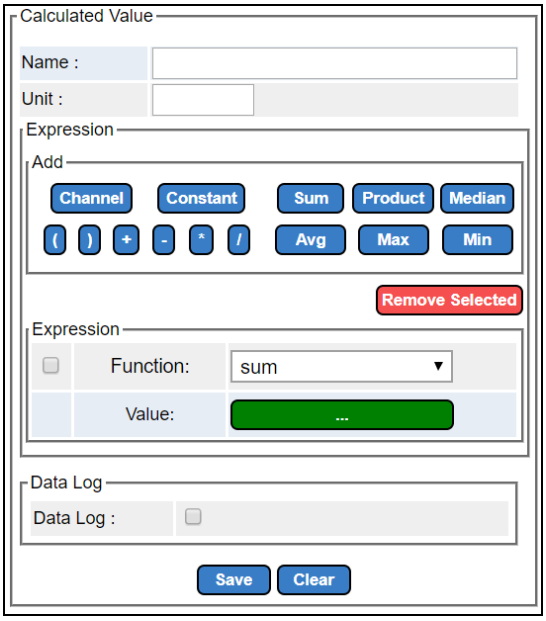
Channel - Click on Channel to pick a Channel from the controller.



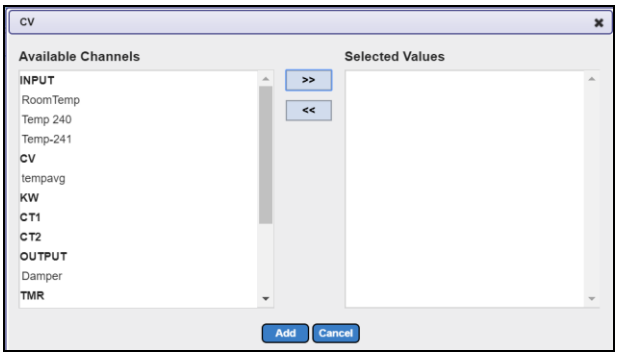
Constant - Click and enter a constant value.



Sum – Click to sum the values

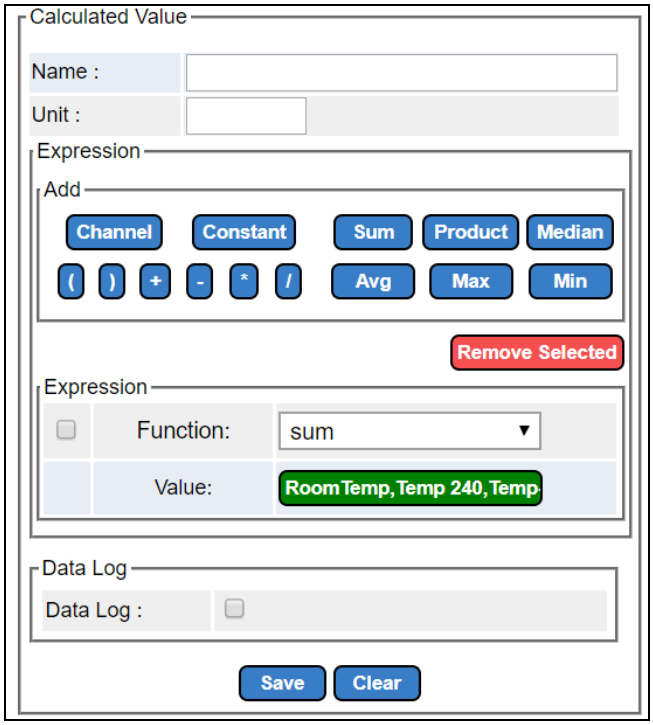


... - Click to select values

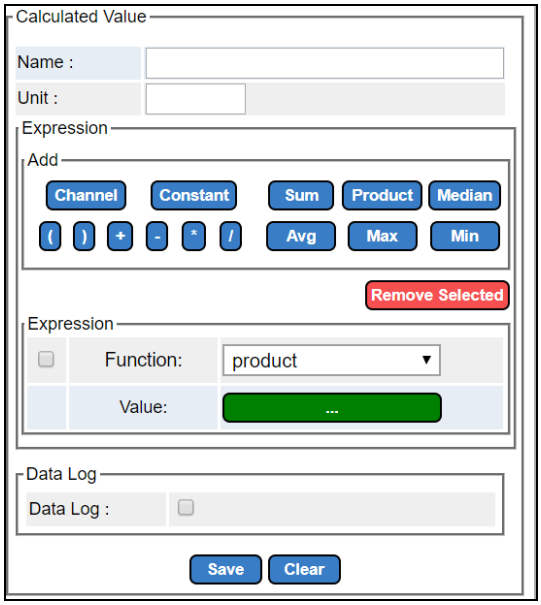


Select values from the left column and click >> to add.
Added values can be removed by selecting them and clicking <<

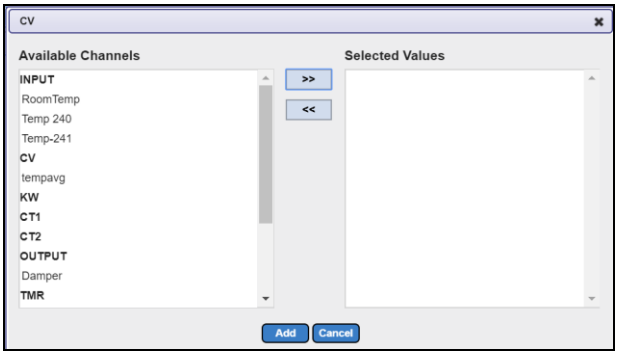
Click Add to add the values or Cancel to exit.



Product – Product of values

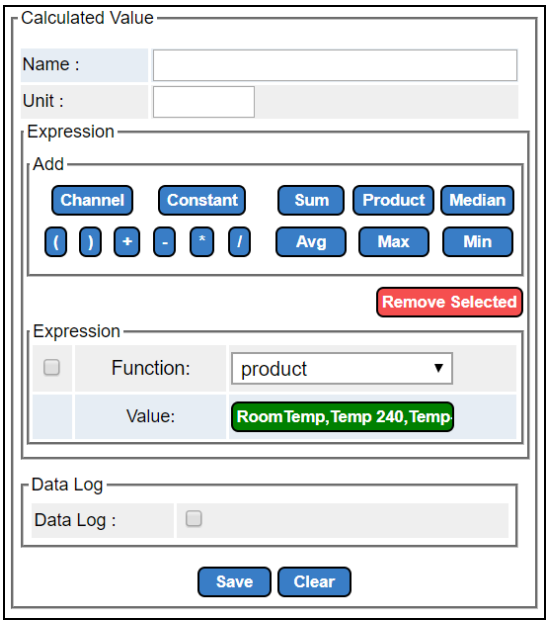


--- - Click to select values

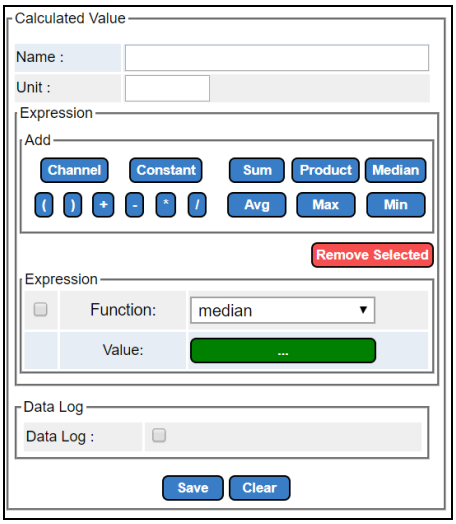


Select values from the left column and click >> to add. Added values can be removed by selecting them and clicking <<.

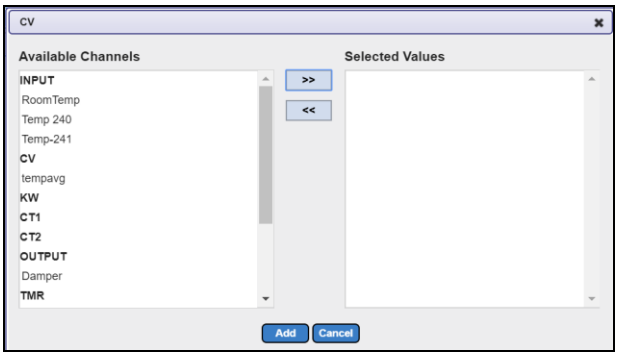
Click Add to add the values or Cancel to exit.



Median – Median of values

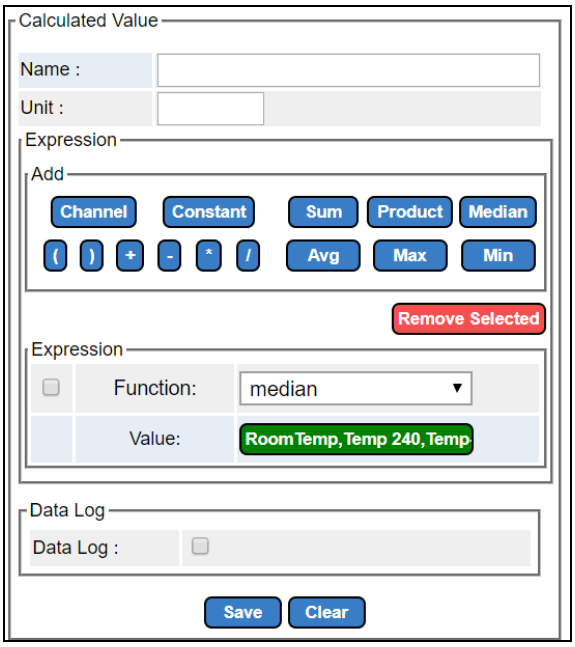


... - Click to select values

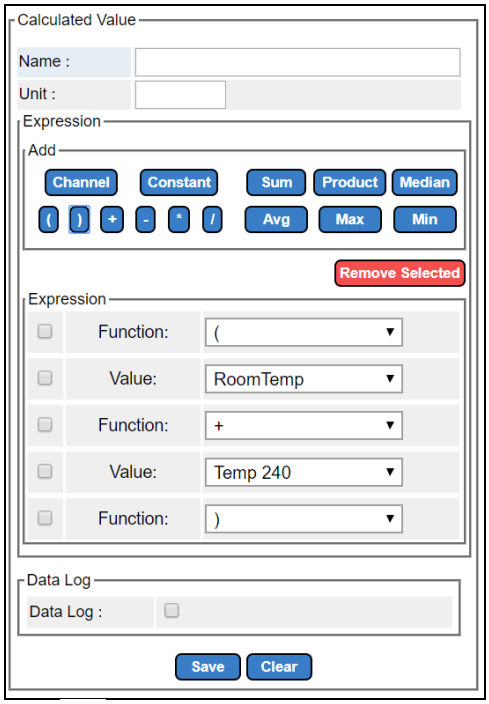


Select values from the left column and click >> to add. Added values can be removed by selecting them and clicking <<.

Click Add to add the values or Cancel to exit.



( ) - Brackets



Click (open a bracket, add expression and close the bracket by clicking), the closing bracket.

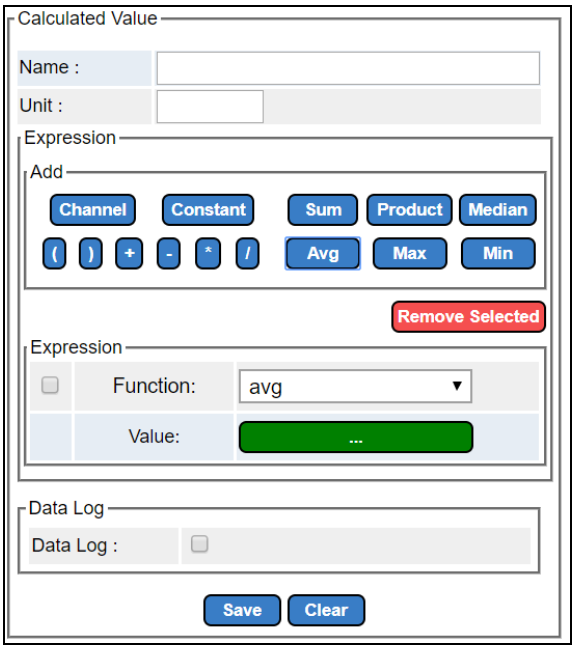
\+ - Click to add two values.

\- - Click to subtract two values.

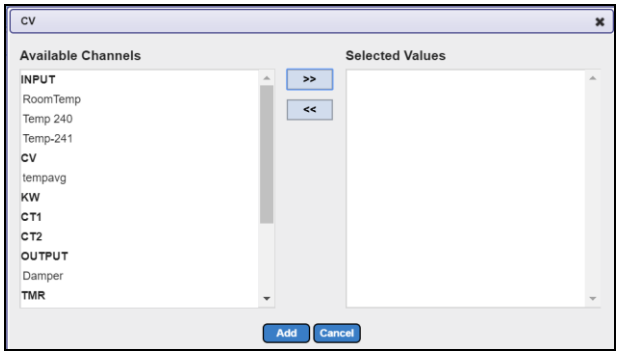
* - Click to multiply two values.

/ - Click to divide two values.

Avg - Average



- Click to select values



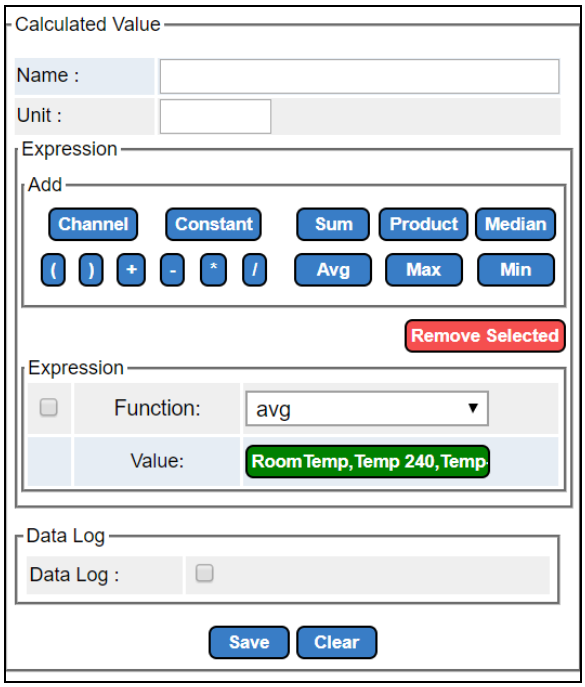
Select values from the left column and click 

to add. Added values can be removed by selecting them and clicking 

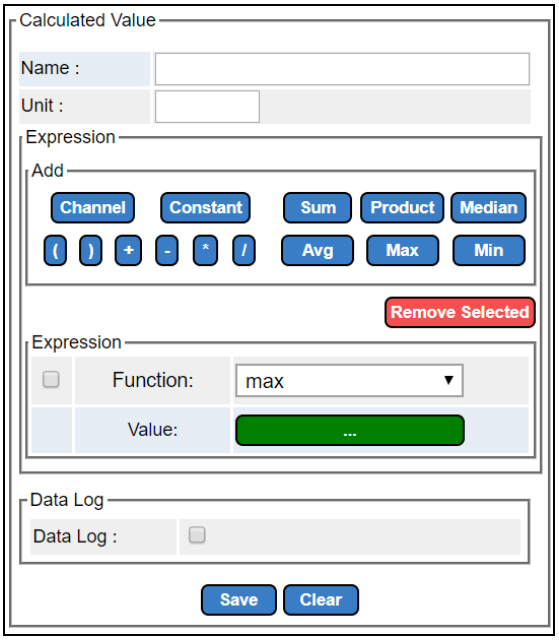
Click 

to add the values or 

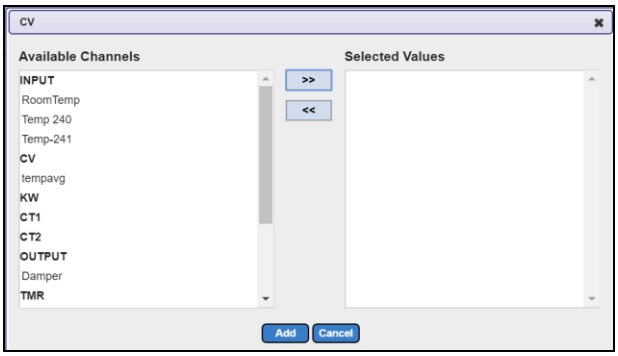
to exit.



Max - Maximum

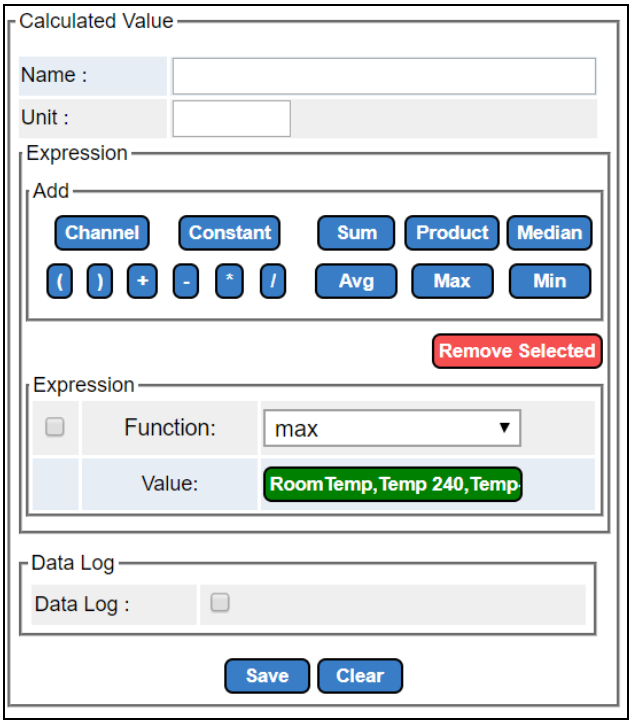


... - Click to select values

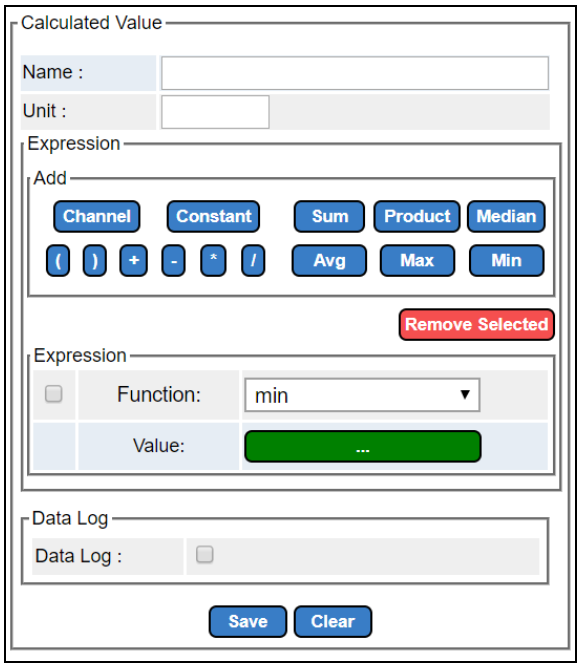


Select values from the left column and click >> to add. Added values can be removed by selecting them and clicking <<

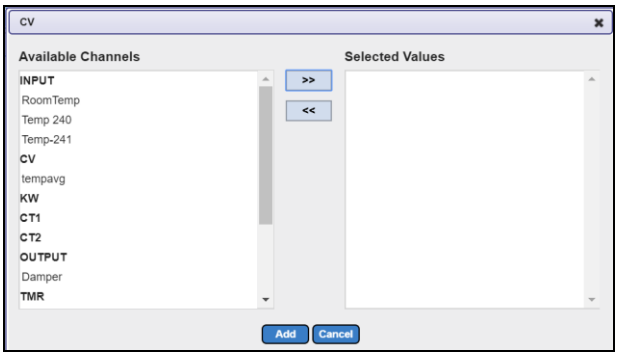
Click Add to add the values or Cancel to exit.



Min - Minimum

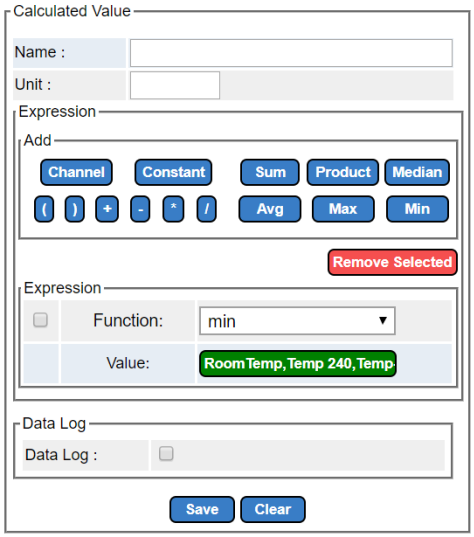


... - Click to select values

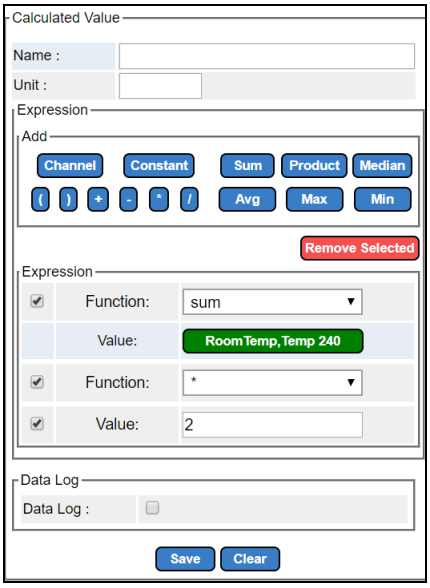


Select values from the left column and click >> to add. Added values can be removed by selecting them and clicking <<.

Click Add to add the values or Cancel to exit.



Remove Selected - Remove expressions.



Select the Function or Value to be removed and click Remove Selected.

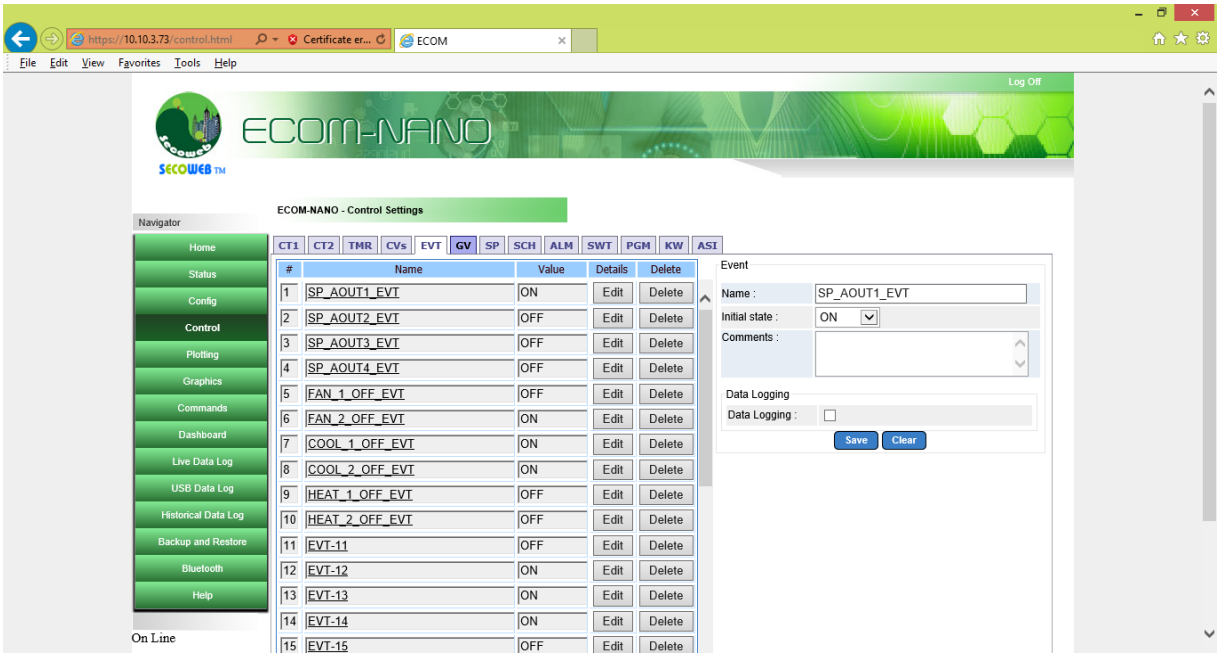
Data Log : Select to enable data logging.

Click Save to save the Complex Variable.

Click Clear to clear the Complex Variable.

4.6.5 EVT

Configure Events.
Events are pseudo digital points which comes handy in switching tables, programs and scripts.



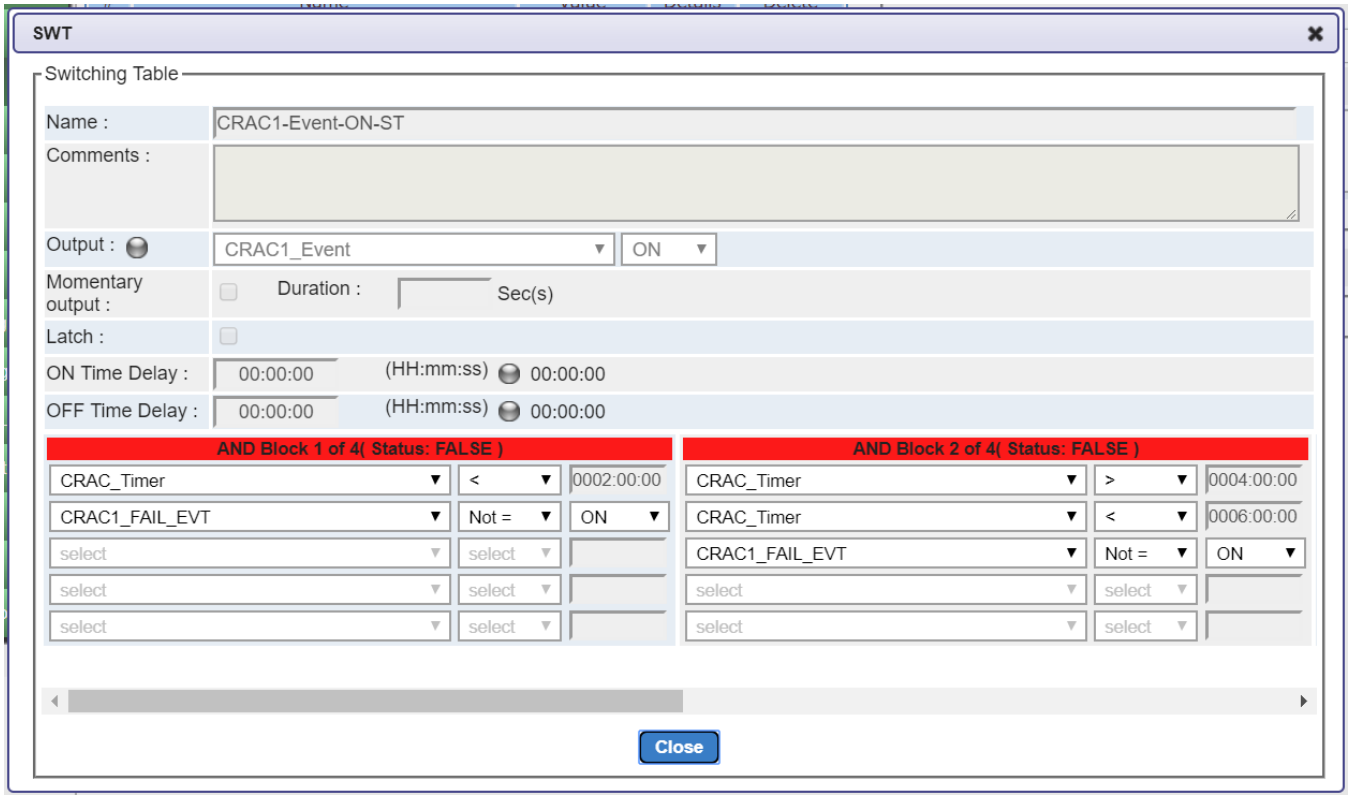
The configured events are listed on the left.

- # : Event number.
- Name : Event Name.
- Value : Current value.
- Details : Edit Event. Clicking on the Edit button will load the event details to the right. Make changes to the event and click Save .
- Delete : Delete Event. Click Delete button to delete the Event. Asks for a confirmation before deleting the Event.

- Deleting an Event which is used in other controls or programs will cause undesired results in places where it is used.

The Events used in Switching Tables are displayed as links. Hovering the mouse over it shows the Switching Table to which the Event is attached. See picture below.

Clicking on the Event will display the view only status of the switching table.



Add/Edit Event

Name : Enter name of the Event.
Initial State : Select ON or OFF.
Comments : Enter comments.
Data Log : Select to enable data logging.

Click Save to save the Event.

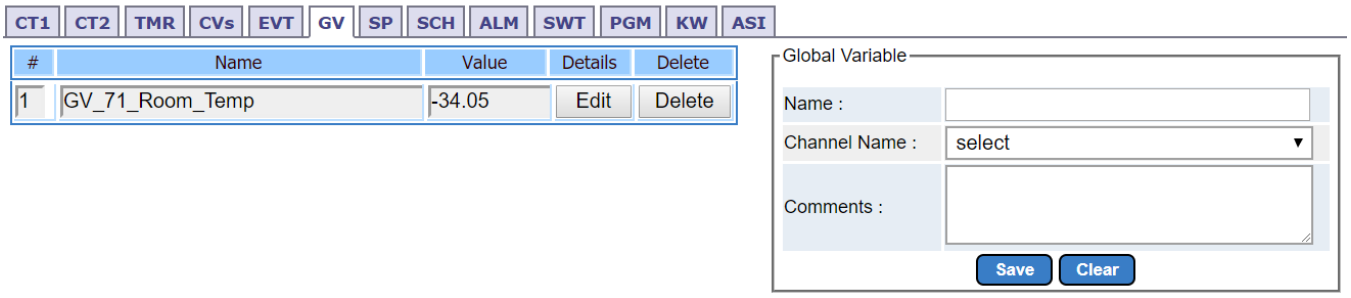
Click Clear to clear the Event.

4.6.6 GV

Configure Global Variables.

- Global Variables are used to share data points across multiple ECOM Controllers. Inputs, Outputs, Counters, Timers (value in seconds), CVs, Events, Set points, Schedules and KW points can be configured as Global Variables.

Navigation: **HOME → CONTROL → GV**

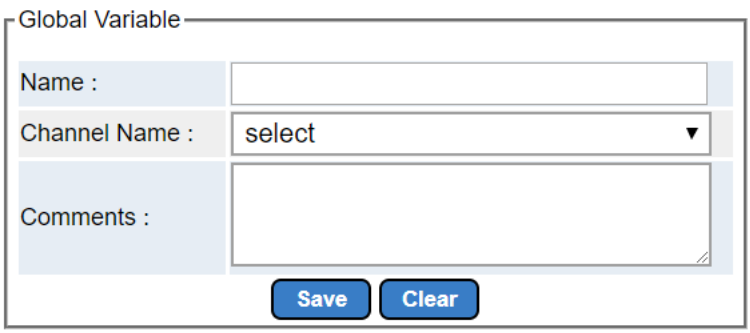


The configured Global Variables are listed on the left.

- # : Global Variable number.
- Name : Global Variable Name.
- Value : Current value.
- Details : Edit Global Varibale. Clicking on the Edit button will load the Global Varibale details to the right. Make changes to the Global Varibale and click Save .
- Delete : Delete Global Variable. Click Delete button to delete the Global Variable. Asks for a confirmation before deleting the Global Varibale.

- Deleting a Global Variable which is used in other controls or programs will cause undesired results in places where it is used.

Add/Edit Global Variable



Name : Enter name of the Global Variable.
Channel Name : Select the Channel.
Comments : Enter comments.

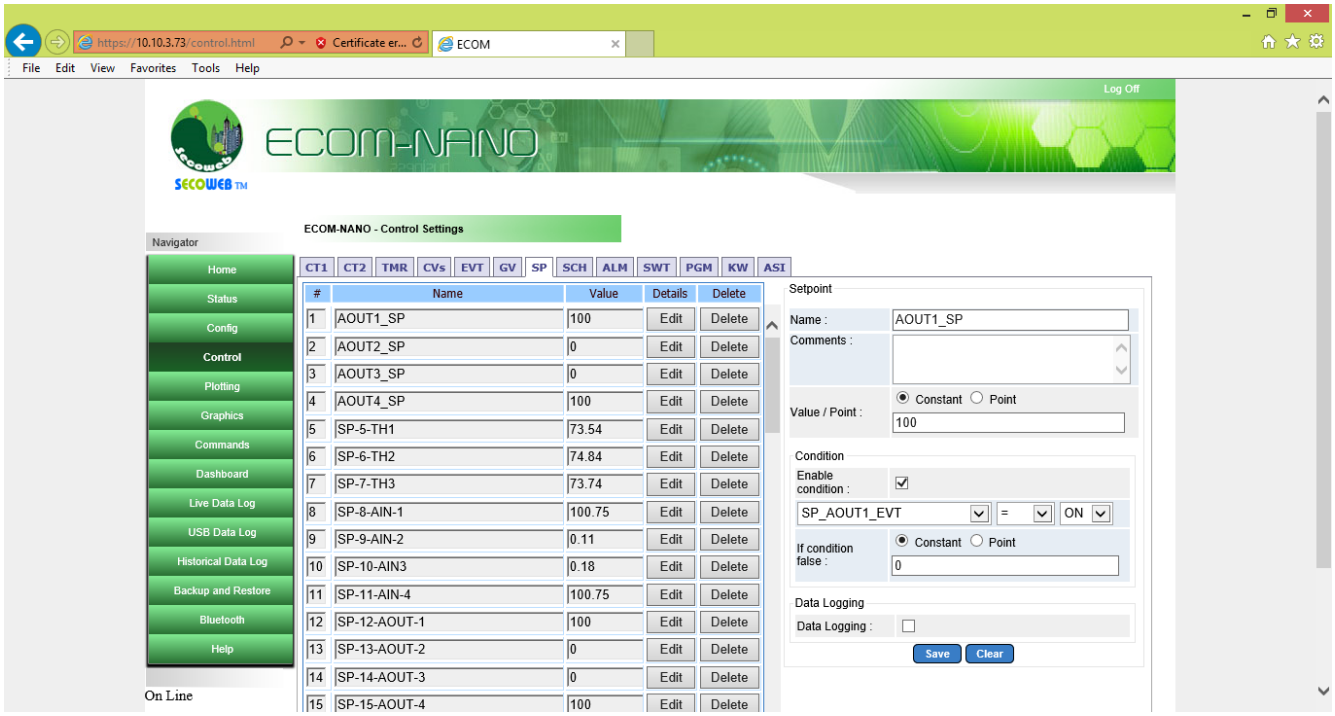
Click Save to save the Global Varibale.

Click Clear to clear the Global Varibale.

Refer Section .... to know how to use the Global Variable

4.6.7 SP

Configure Set Points.
Navigation: **HOME → CONTROL → SP**



The configured Set Points are listed on the left.

- # : Set Point number.
- Name : Set point Name.
- Value : Current value.
- Details : Edit Set Point. Clicking on the Edit button will load the Set Point details to the right. Make changes to the Set Point and click Save .
- Delete : Delete Set Point. Click Delete button to delete the Set Point. Asks for a confirmation before deleting the Set Point.

- Deleting an Set Point which is used in other controls or programs will cause undesired results in places where it is used.

Add/Edit Set Point

Name : Enter name of the Set Point.
Comments : Enter comments.
Value/Point : There is option to either enter a constant value or pick a point. Select Constant to enter a value. Select Point to pick a point.
Condition : Select Enable Condition to add a condition.
For analog points the condition will be less than (<), greater than (>), equal to (=) or not equal to (NOT =) a numeric value.
For digital points the condition will equal to (=) or not equal to (NOT =) ON/OFF.
If condition false : There is option to either enter a constant value or pick a point. Select Constant to enter a value. Select Point to pick a point.
If the condition is True then the value on the top section will be used as the Set Point. If the condition is False, then the value below is used.
Data Log : Select to enable data logging.

Click 

to save the Event.

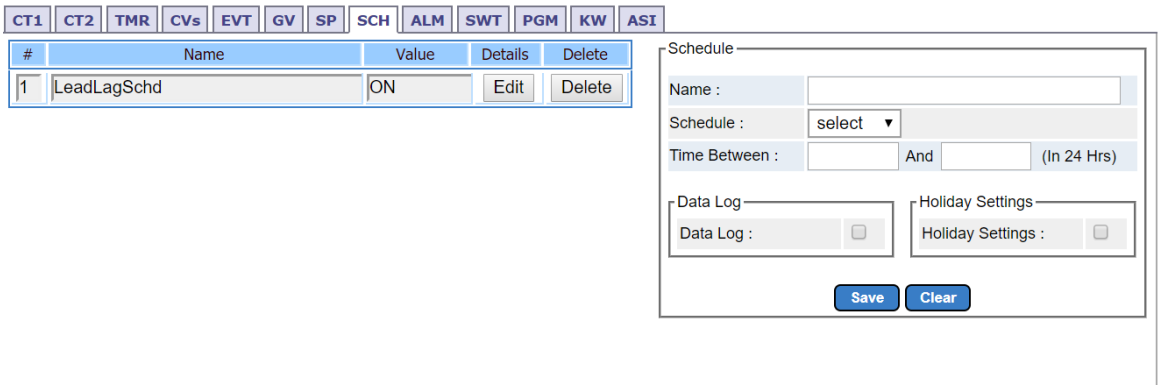
Click 

to clear the Event.

Paste example screen shot

4.6.8 SCH

Configure schedules.
Navigation: **HOME → CONTROL → SCH**

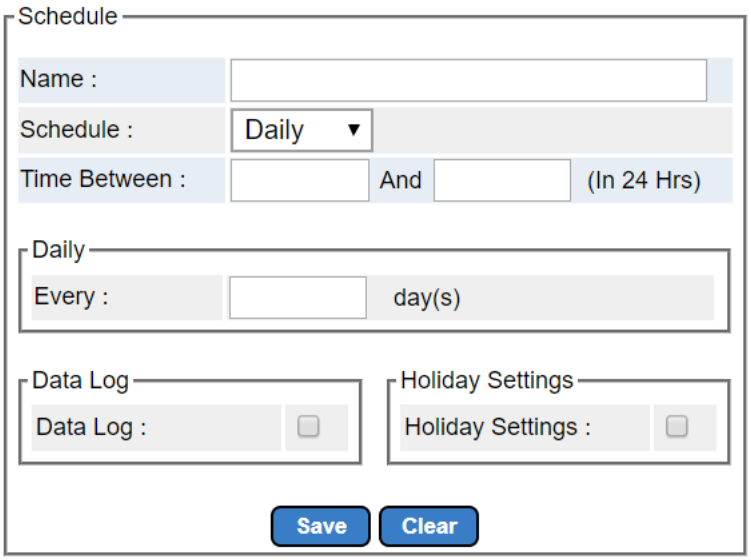


The configured Schedules are listed on the left.

- # : Schedule number.
- Name : Schedule Name.
- Value : Current value.
- Details : Edit Schedule. Clicking on the Edit button will load the Schedule details to the right. Make changes to the Schedule and click Save .
- Delete : Delete Schedule. Click Delete button to delete the Schedule. Asks for a confirmation before deleting the Schedule.

- Deleting an Schedule which is used in other controls or programs will cause undesired results in places where it is used.

Daily Schedule



Name : Enter name of the schedule (Up to 20 characters).
Schedule : Select DAILY.
Time Between : Enter start time and end time in 24-hour format.
Every : Enter duration/frequency of days for this schedule. For example, setting Every 5 days will run the schedule on every 5th day.
Data Log : Select to enable data logging.
Holiday Settings : Select Holiday Settings to apply Holidays to the schedule.

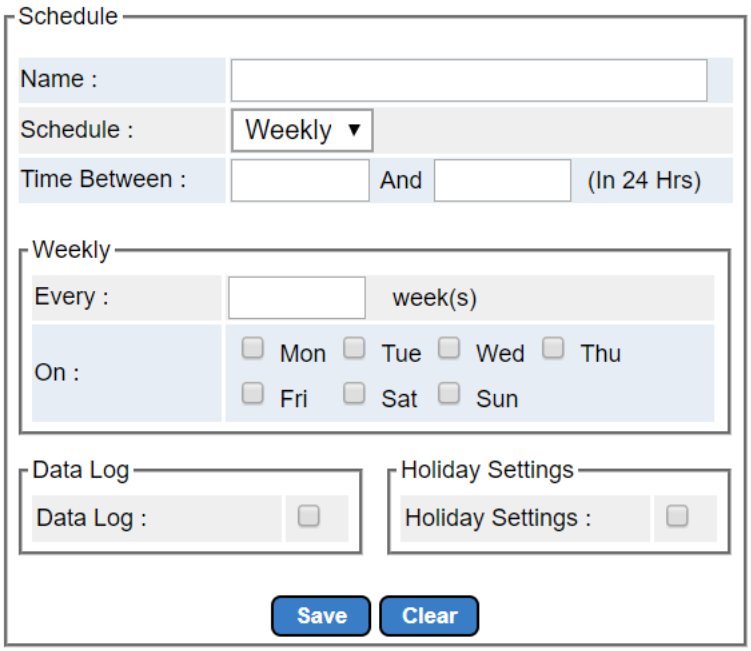
Refer Holiday Section on how to configure Holidays.

Click Save to save the Schedule.

Click Clear to clear the Schedule.

The schedule in the above picture turn on at 8.00 AM and turn off at 5.00 PM every single day. In the daily section, if Every is configured for 2 days, the schedule will turn on every alternate day.

Weekly schedule



- Name : Enter name of the schedule (Up to 20 characters).
- Schedule : Select WEEKLY.
- Time Between : Enter start time and end time in 24-hour format.
- Every : Enter the duration/frequency of weeks.
- On : Select day of the week on which the schedule need to run. For example, setting Every 2 weeks and selecting Monday will run the schedule on Monday every alternate week.

Data Log : Select to enable data logging.

Holiday Settings : Select Holiday Settings to apply Holidays to the schedule.

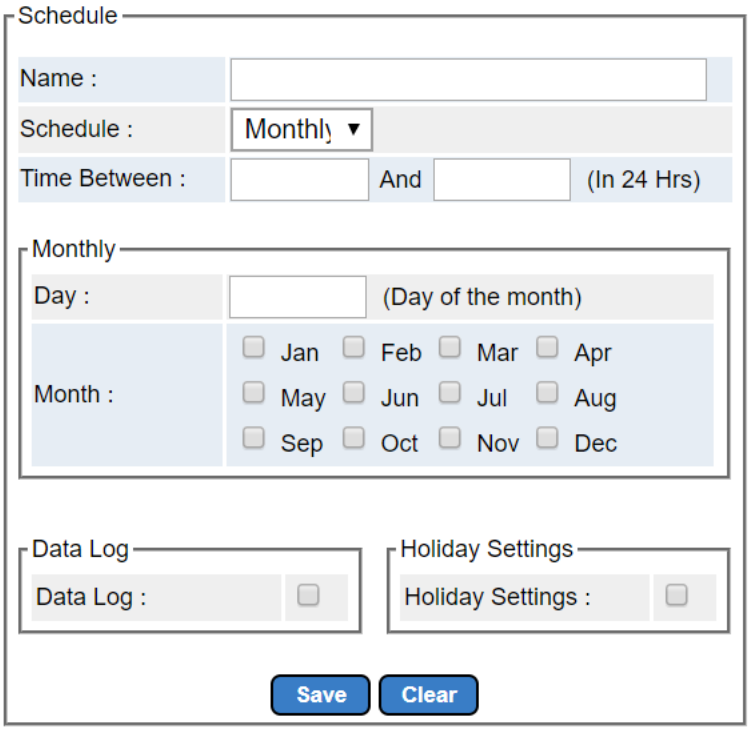
Refer Holiday Section on how to configure Holidays.

Click Save to save the Schedule.

Click Clear to clear the Schedule.

The schedule in the above picture turn on at 8.00 AM and turn off at 5.00 PM from Monday to Friday every week.

Monthly schedule



- Name : Enter name of the schedule (Up to 20 characters).
- Schedule : Select MONTHLY.
- Time Between : Enter start time and end time in 24-hour format.
- Day : Enter day of the month.
- Month : Select the month for the schedule.
  For example, setting Day to 1 and selecting January will run the schedule every 1st day of January.

Data Log : Select to enable data logging.

Holiday Settings : Select Holiday Settings to apply Holidays to the schedule.

Refer Holiday Section on how to configure Holidays.

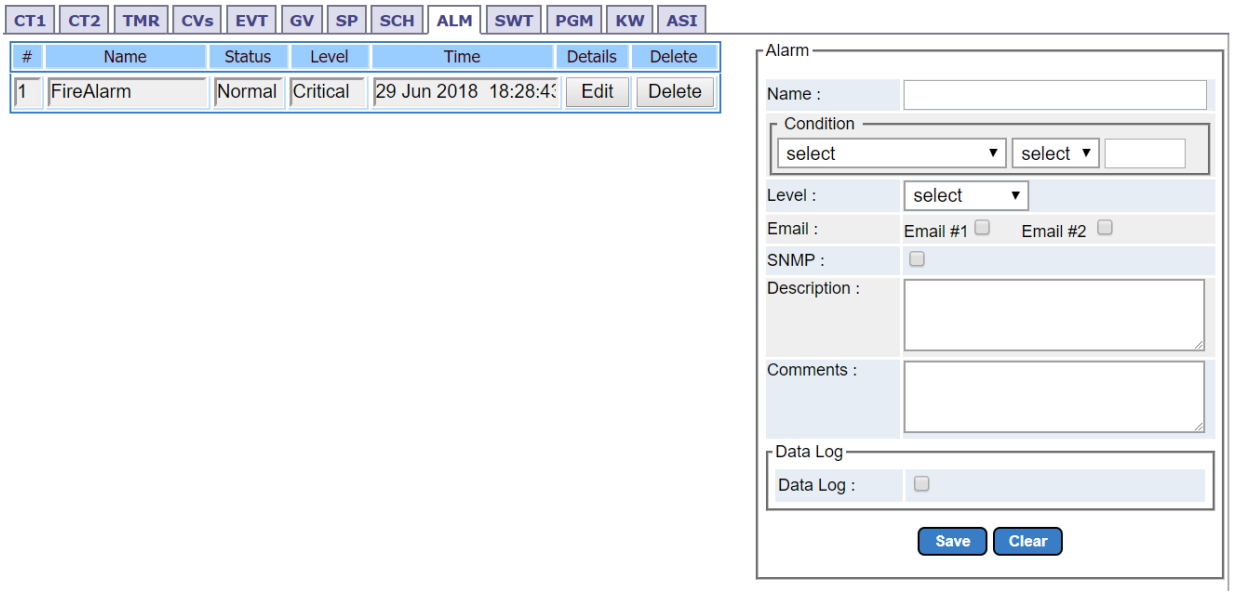
Click Save to save the Schedule.

Click Clear to clear the Schedule.

The schedule in the above picture turn on at 11:00:00 PM and turn off at 11:59:59 PM on 31st December.

4.6.9 ALM

Configure alarms.
Navigation: **HOME → CONTROL → ALM**

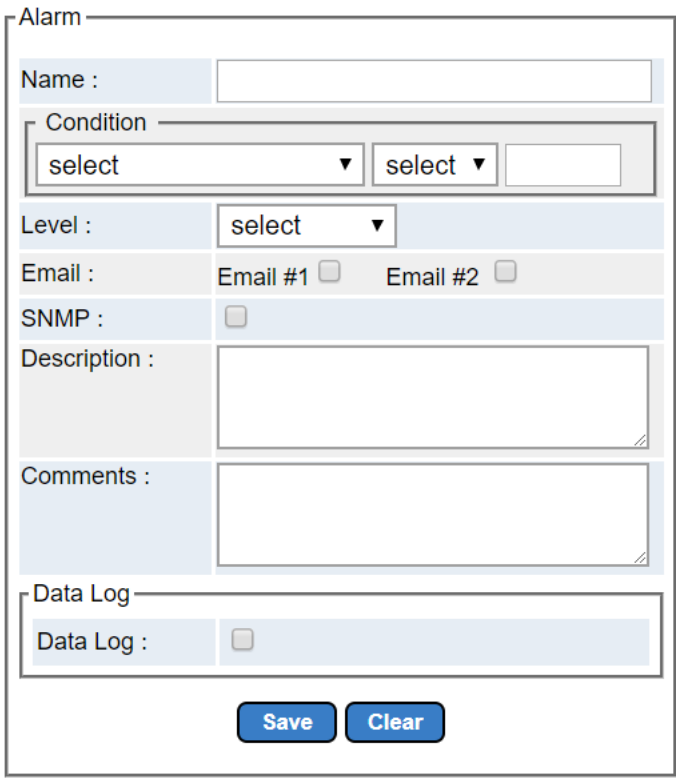


The configured Set Points are listed on the left.

- # : Alarm number.
- Name : Alarm Name.
- Status : Alarm Status – **Alarm** or **Normal**.
- Level : Critical/High/Medium/Low.
- Time : Date/Time of status change.
- Details : Edit Alarm. Clicking on the Edit button will load the Alarm details to the right. Make changes to the Alarm and click Save .
- Delete : Delete Alarm. Click Delete button to delete the Alarm. Asks for a confirmation before deleting the Alarm.

- Deleting an Alarm which is used in other controls or programs will cause undesired results in places where it is used.

Add/Edit Alarm



Name : Enter name of the Alarm.

Condition : Specify the condition for Alarm. The Alarm gets triggered once the condition is True.
Select analog/digital point.
For analog points the condition will be less than (<), greater than (>), equal to (=) or not equal to (NOT =) a numeric value.
For digital points the condition will equal to (=) or not equal to (NOT =) ON/OFF.

Level : Select Critical/High/Medium/Low.

Email : Select recepient Email #1/ Email # 2 for sending email alerts to email IDs configured in the Email section.

Description : Enter description.

Comment : Enter comment.

Data Log : Select to enable data logging.

Click Save to save the Alarm.

Click Clear to clear the Alarm.

Paste example screen shot

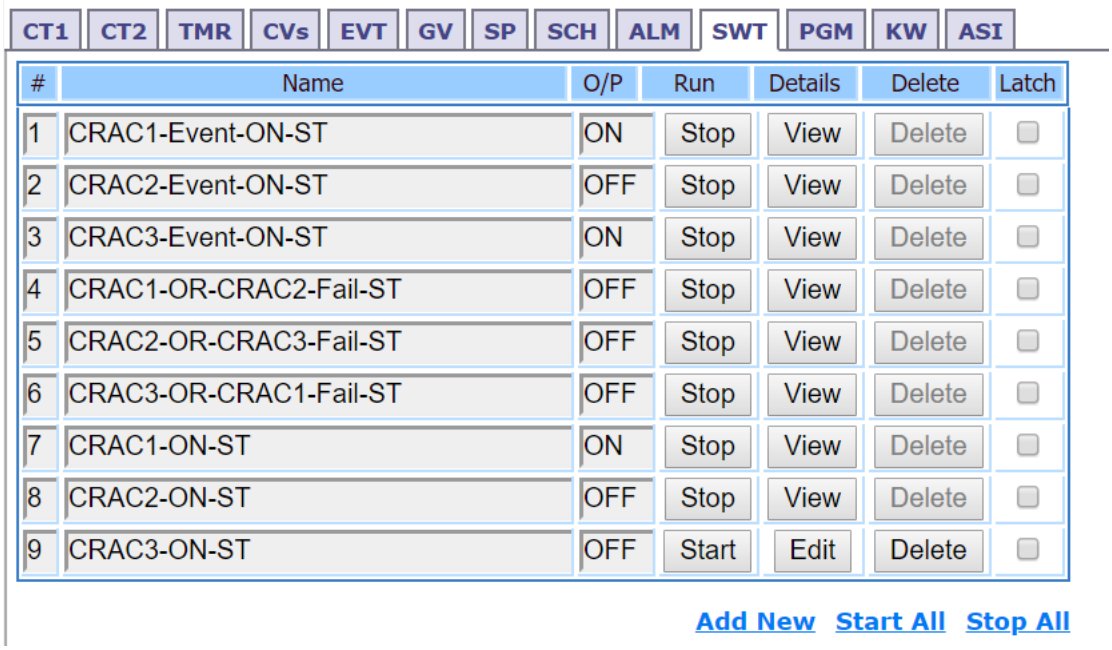
If any active alarms are present, all pages display an alarm icon  on the top right corner of the screen and display No Alarms when there are no active alarms.

For sample alarm email refer APPENDIX C – EMAIL SAMPLES

4.6.10 SWT

Configure switching tables.
Switching table is an easy to use ladder logic for controlling digital outputs and event (pseudo digital points).

Navigation: **HOME → CONTROL → SWT**



The configured Switching Tables are listed.

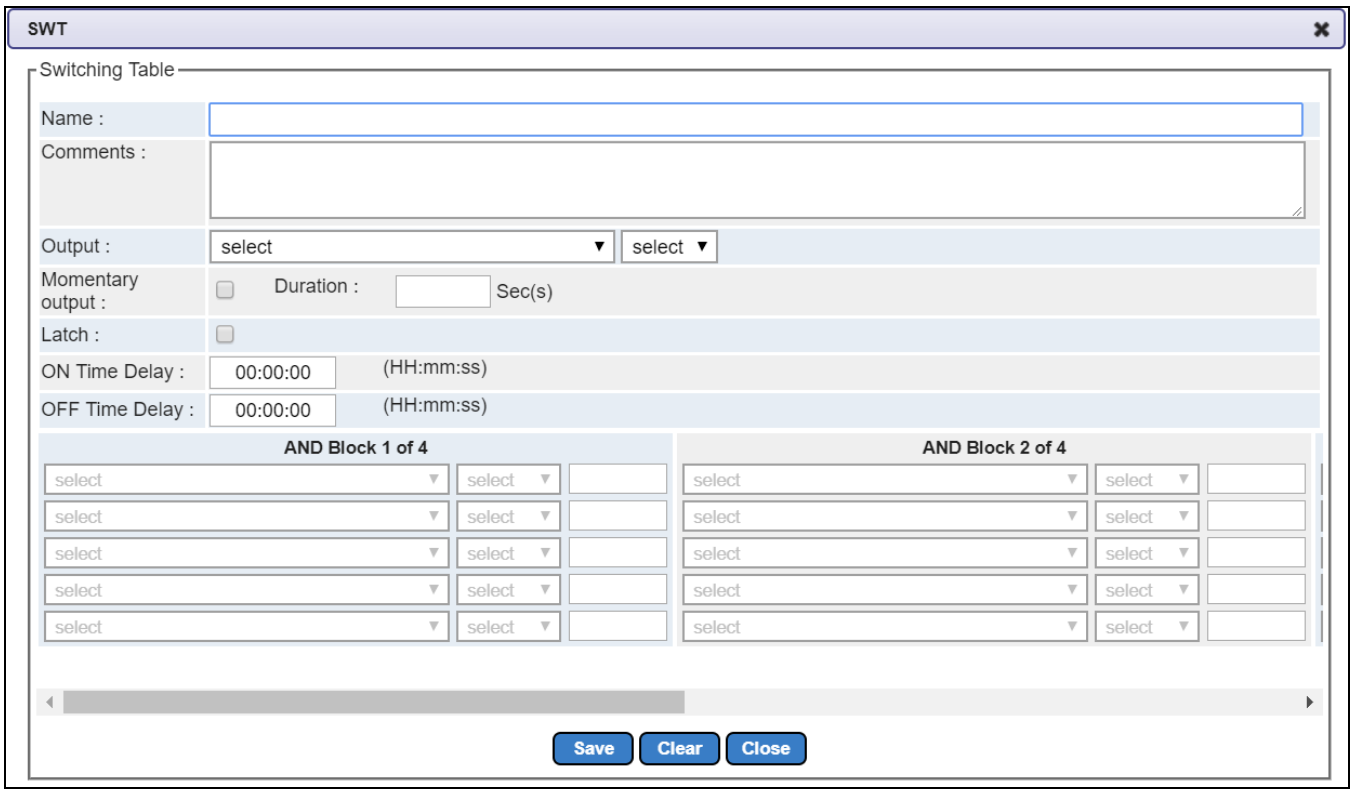
- # : Switching Table number.
- Name : Switching Table Name.
- O/P : Status of the Switching Table.
- Run : Click Start / Stop to start/stop Switching Table.
- Details : Edit/View Switching Table.
  Click Edit to make changes to a Switching Table. Switching Table should be in Stopped state for editing.
  A running Switching Table can be viewed. Click on View to view the status of the Switching Table.
- Delete : Delete Switching Table. Click Delete to delete the Switching Table. Asks for a confirmation before deleting the Switching Table. A Switching Table should be in stopped state to delete it.
- Latch : This will be selected if Latch is enabled in the Switching Table. Latch can be disabled without stopping the Switching Table by deselecting this.

Add New - Add new Switching Table

Start All - Start all Switching Tables

Stop All - Stop all Switching Tables.

Add new Switching Table



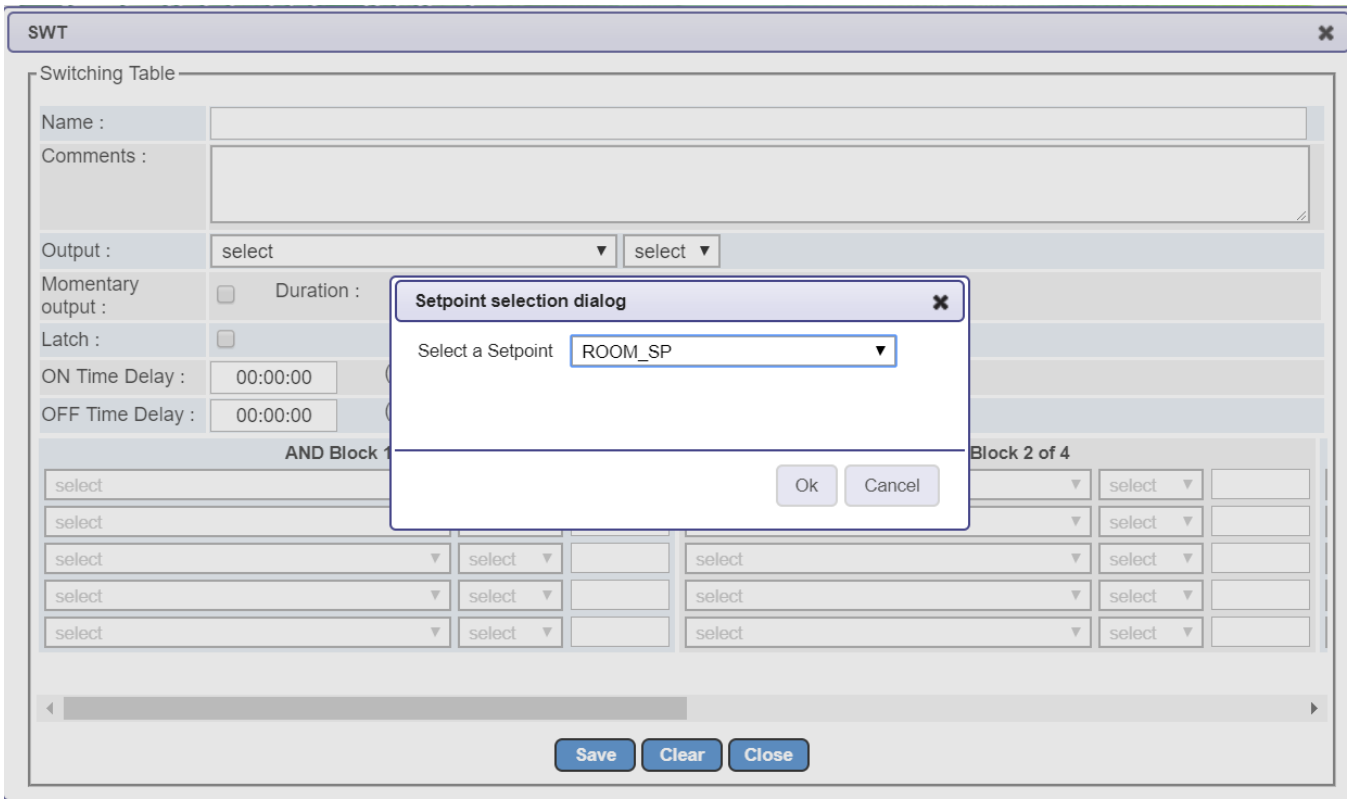
Name : Enter Switching Table name.
Comments : Enter comments.
Output : Select the Output/Event to be controlled and specify whether it should be ON or OFF when the Switching Table condition turns True.
Momentary output : Select if the Output/Event is controlled only momentarily. When the Switching Table condition is True the Output/Event will change the state for the specified duration and goes back to the earlier state.
Duration : Duration for the momentary output to be in the specified state.
Latch : Select Latch to retain the status once the Switching Table turns True. For Eg. If Latch is selected for a Switching Table to turn Fan ON when the Room Temperature goes about 72 F, Fan will turn ON and will remain ON even when the Room Temperature goes below 72 F.
ON Time Delay : Enter ON Time Delay in hh:mm:ss format. Once the Switching Table condition is True, the Output/Event will be turned ON only after the time delay.
OFF Time Delay : Enter OFF Time Delay in hh:mm:ss format. Once the Switching Table condition is False, the Output/Event will be turned OFF only after the time delay.

There are four AND Blocks in a Switching Table. Each AND Block can have up to 5 entries. All the

conditions in the AND Block should be True for the whole AND Block to become True.

Specify the condition in AND Block. Select analog/digital point. For analog points the condition will be less than (<), greater than (>), equal to (=) or not equal to (NOT =) a numeric value. For digital points the condition will equal to (=) or not equal to (NOT =) ON/OFF.

Right click on the value columns to bring up Set Point. Select a Set Point and click OK.

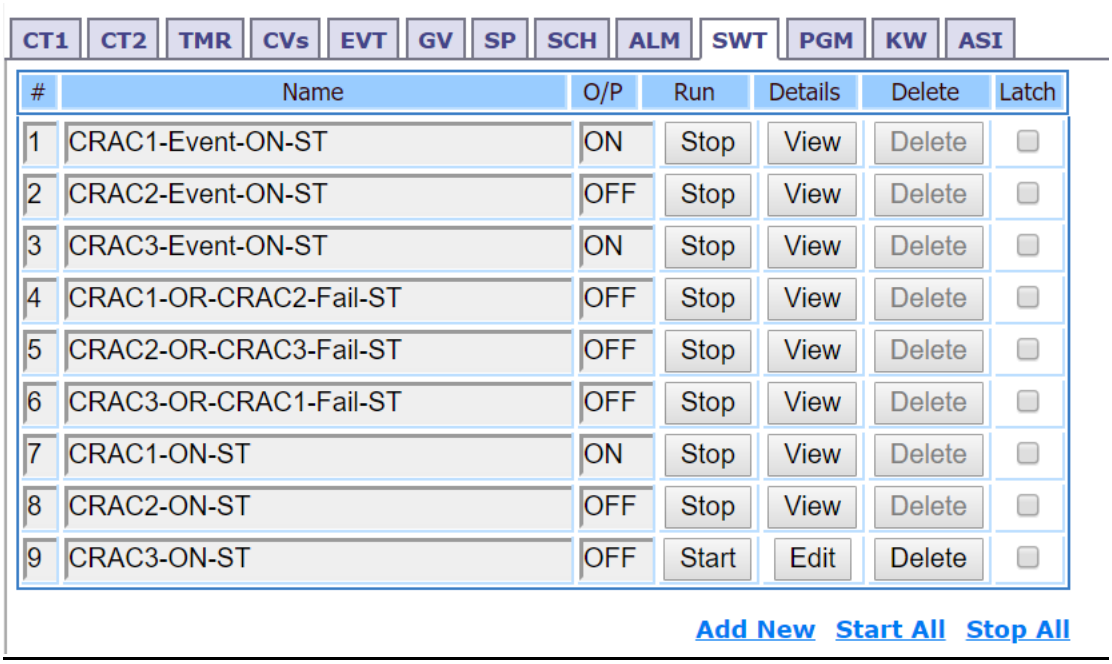


Click **Save** to save the Switching Table.

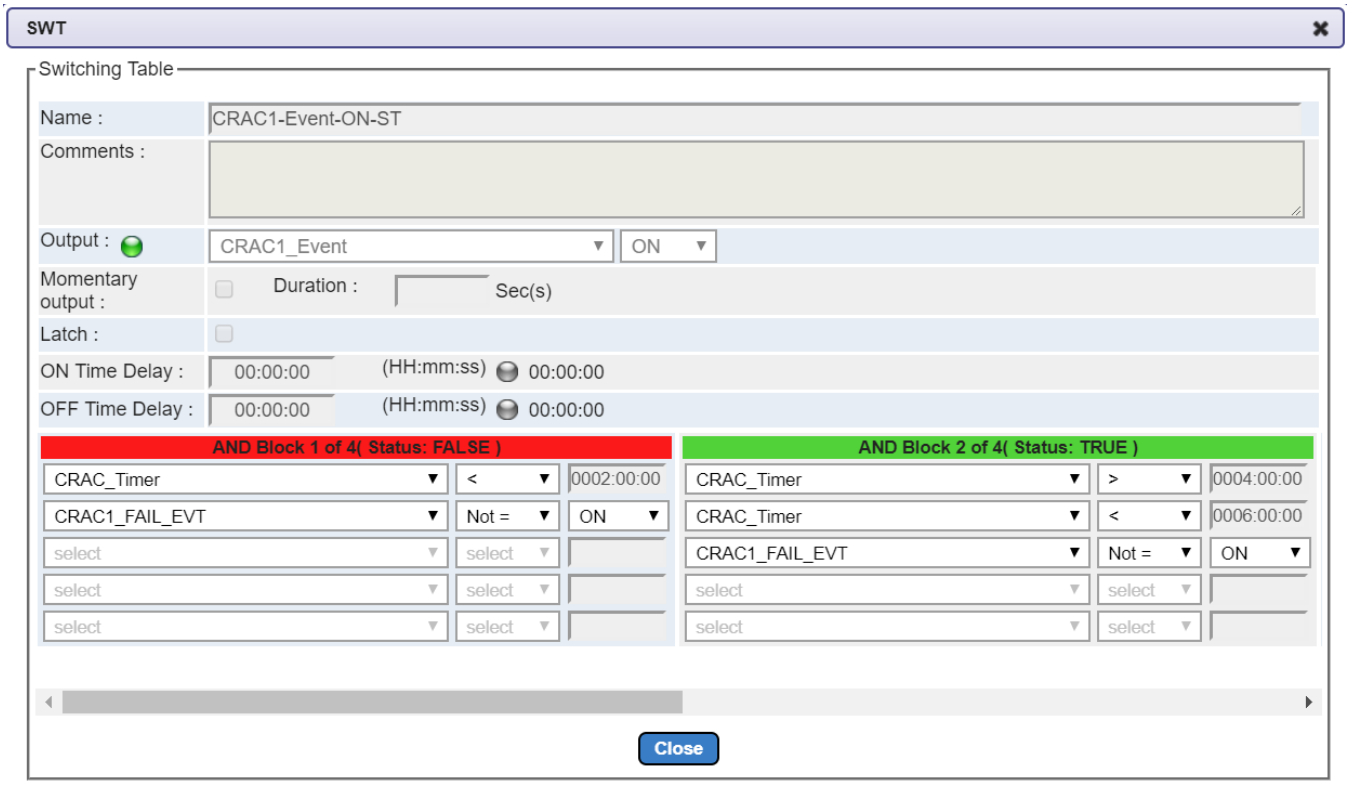
Click **Clear** to clear the Switching Table.

Click **Close** to close the Switching Table.

Viewing a running Switching Table



Click View to view a running Switching Table.

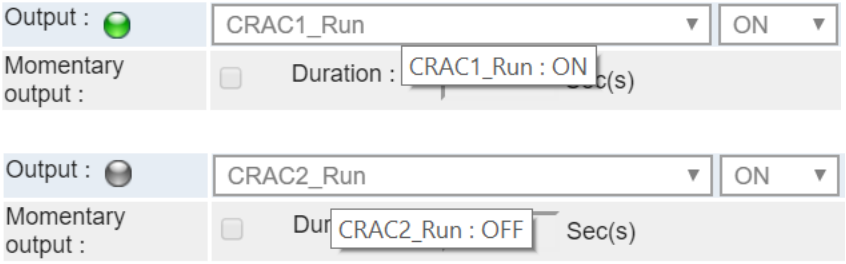


The status of each AND Block is represented by Green (True) and Red (False) as shown in the figure below.
The Switching Table will be True if even one of the AND Block is True.

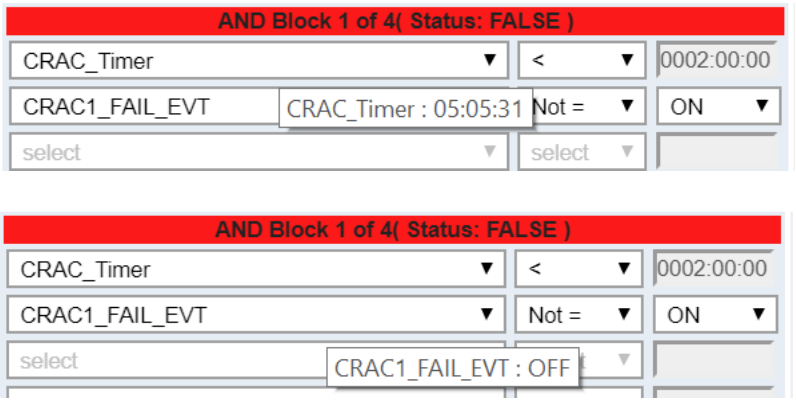
The status of the running Switching Table is represented near the Output. The Green LED represents the

Switching Table condition as True and the grey LED represents it as False.

Hover the mouse over the Output to view the status of the Output/Event.



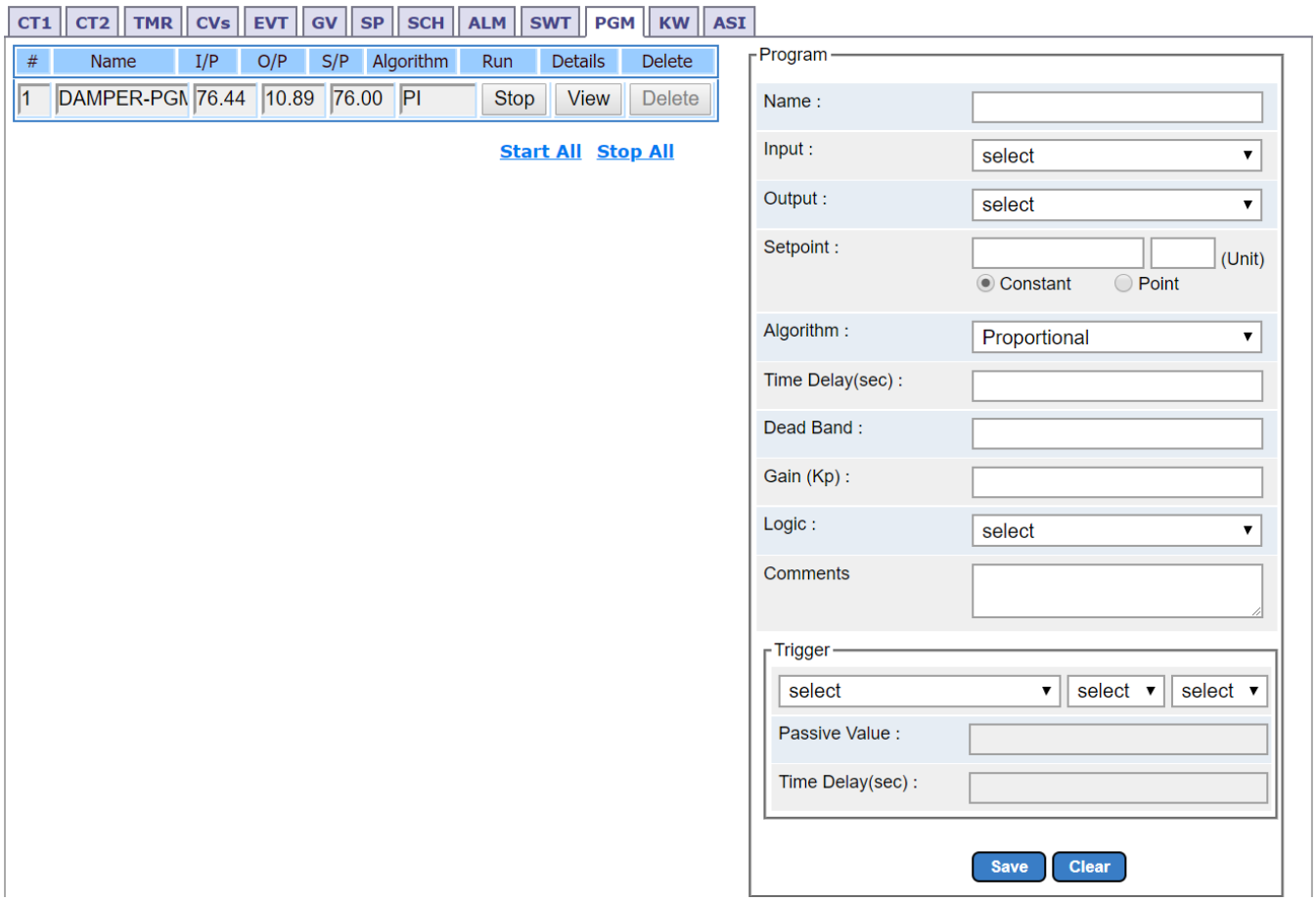
Hover the mouse over the Switching Table conditions to view the status/value.



4.6.11 PGM

Configure Programs.
Programs are used to control Analog points using Proportional/Proportional Integral logic.

Navigation: **HOME → CONTROL → SWT**



The configured Programs are listed on the left.

- # : Program number.
- Name : Program Name.
- I/P : Input status.
- O/P : Output status.
- S/P : Set Point.
- Algorithm : P – Proportional, PI – Proportional Integral.
- Run : Click Start / Stop to start/stop Program.

- Details : Edit/View Program.

  Click Edit to make changes to a Program. Program should be in Stopped state for editing.

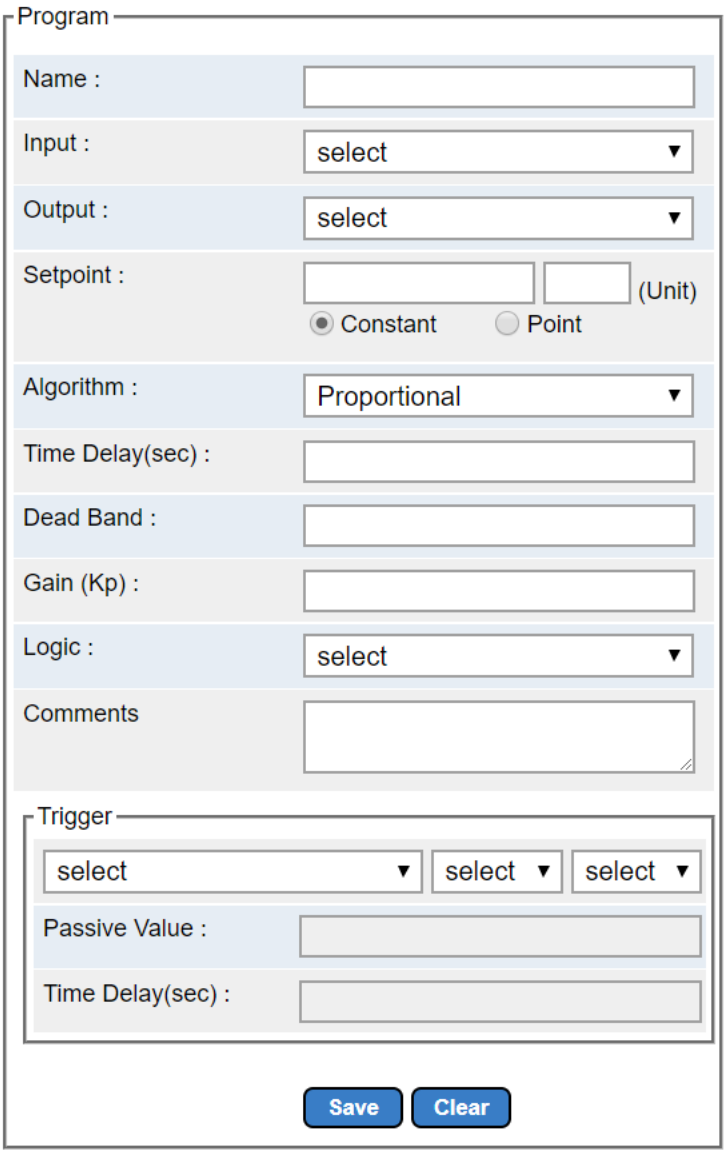
  A running Program Table can be viewed. Click on View to view the status of the Program.

- Delete : Delete Program. Click Delete to delete the Program. Asks for a confirmation before deleting the Program. A Program should be in stopped state to delete it.

Start All - Start all Programs.

Stop All - Stop all Programs.

Add new Program



Name : Enter Program Name.
Input : Select Input.
Output : Select Analog output that need to be controlled.
Set Point : Enter or select Set Point. Select Constant to enter the Set Point value or Select Point and pick a Set Point. The Program tries control the Output so that the Input stays in the range of the Set Point.
Unit : Unit for Set Point.
Algorithm : Select Proportional or Proportional Integral Algorithm.
Time Delay (secs) : Enter time delay in seconds. This represents the delay in controlling the Output.
Dead Band : Enter Dead Band. This is a range in which no action is performed.
(E.g. Setpoint = 70 , Dead band = 10. Then Dead band region= 65 to 75.
Gain (Kp) : Enter Gain.
Logic : Select Direct or Reverse.
Comments : Enter comments.
Trigger : Select the Trigger condition. Only Digital values can be chosen for a Trigger.
Passive Value : Enter Passive Value. The Output is set to the Passive Value if the Trigger

condition is False. Once the Trigger condition is True, then the Program will control the Output.

Time Delay (sec) : Enter Time Delay. Time Delay for the Passive Value.

Click 

to save the Program.

Click 

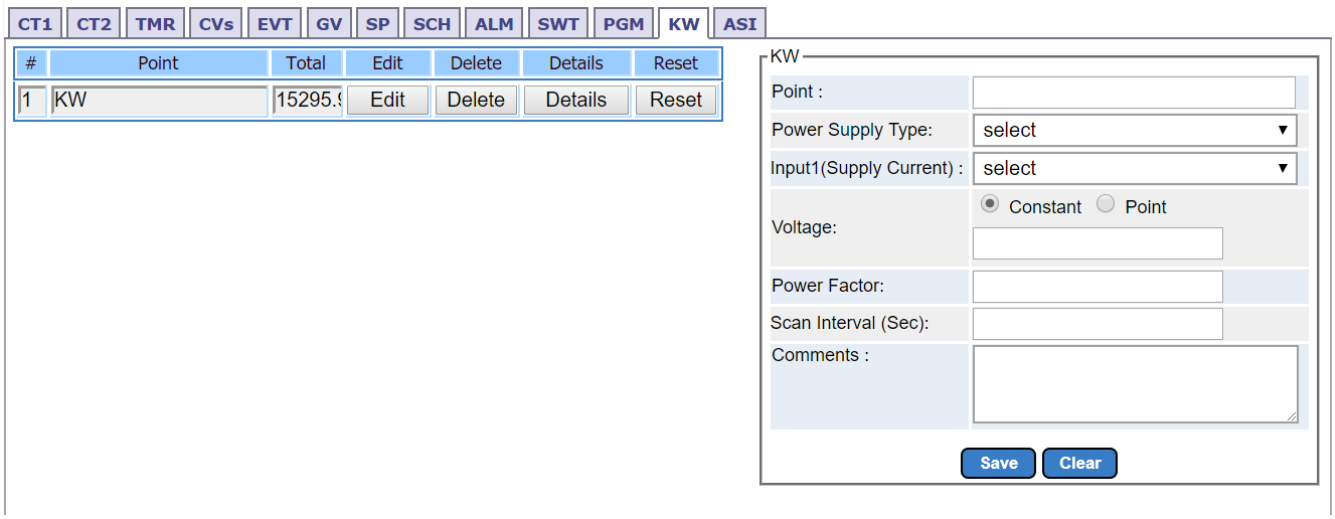
to clear the Program.

Add caution

The Analog output should be in **Auto** mode for the Program to control it. To change to Auto mode

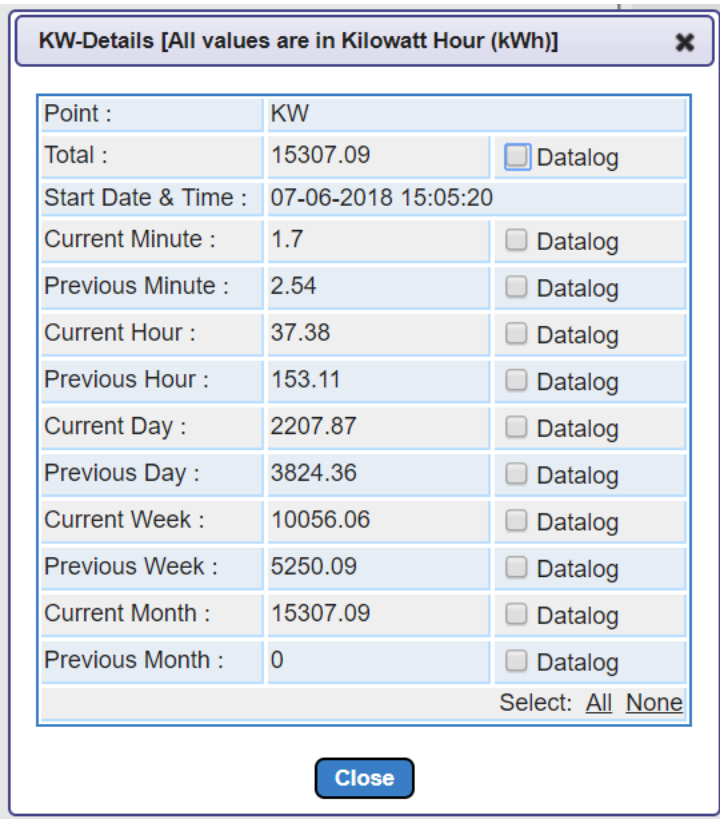
4.6.12 kWh

Configure kWh.
Navigation: **HOME → CONTROL → kWh**



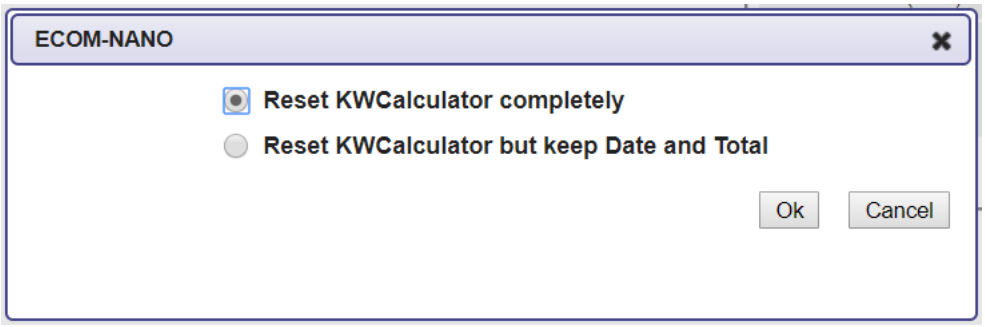
The configured kWh are listed on the left.

- # : kWh number.
- Point : Point Name.
- Total : Total kWh.
- Edit : Edit kWh.
  Click Edit to make changes to kWh.
- Delete : Delete kWh. Click Delete to delete the kWh. Asks for a confirmation before deleting the kWh.
- Details : Click Details to display the details of kWh.



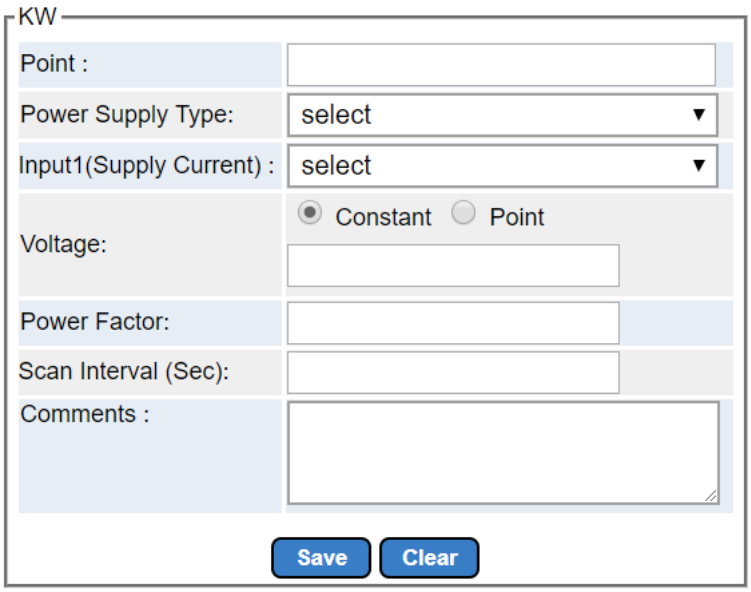
Select Datalog to enable data logging.
Click All to log all points.
Click None to deselect all points.

- Reset : Click Reset to reset the kWh values. There are two options for reset.

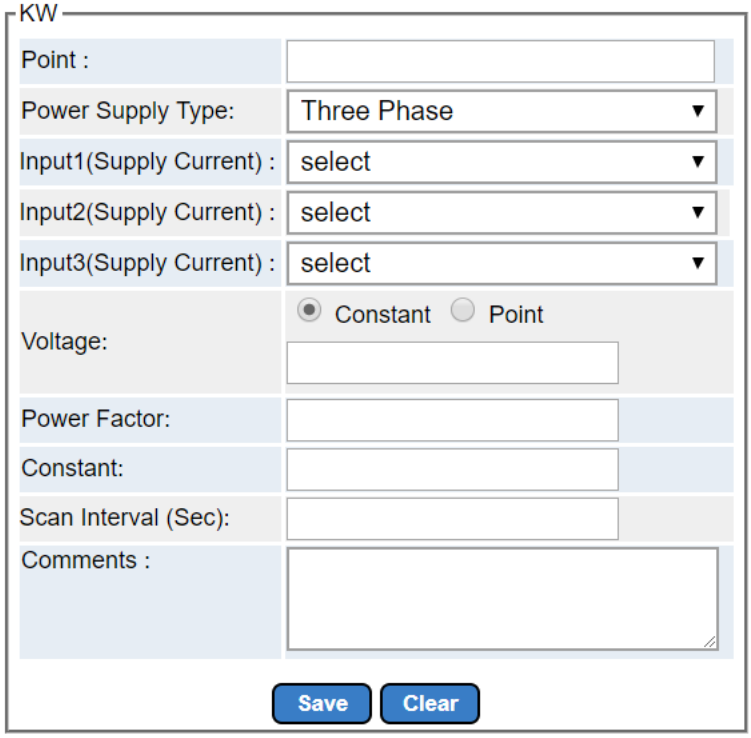


Reset kWh calculator completely will reset the whole values.
Reset kWh calculator but keep Date and Total will retain the Total till date and resets all other values.

Add kWh



Point : Enter kWh point name.
Power Supply Type : Select Single Phase/Three Phase.
Input1 (Supply Current) : Select channel. If Power Supply Type is Single Phase, only one Input need to be selected as shown in the above picture. If the Power Supply Type is Three Phase then three inputs need to be selected as shown below.



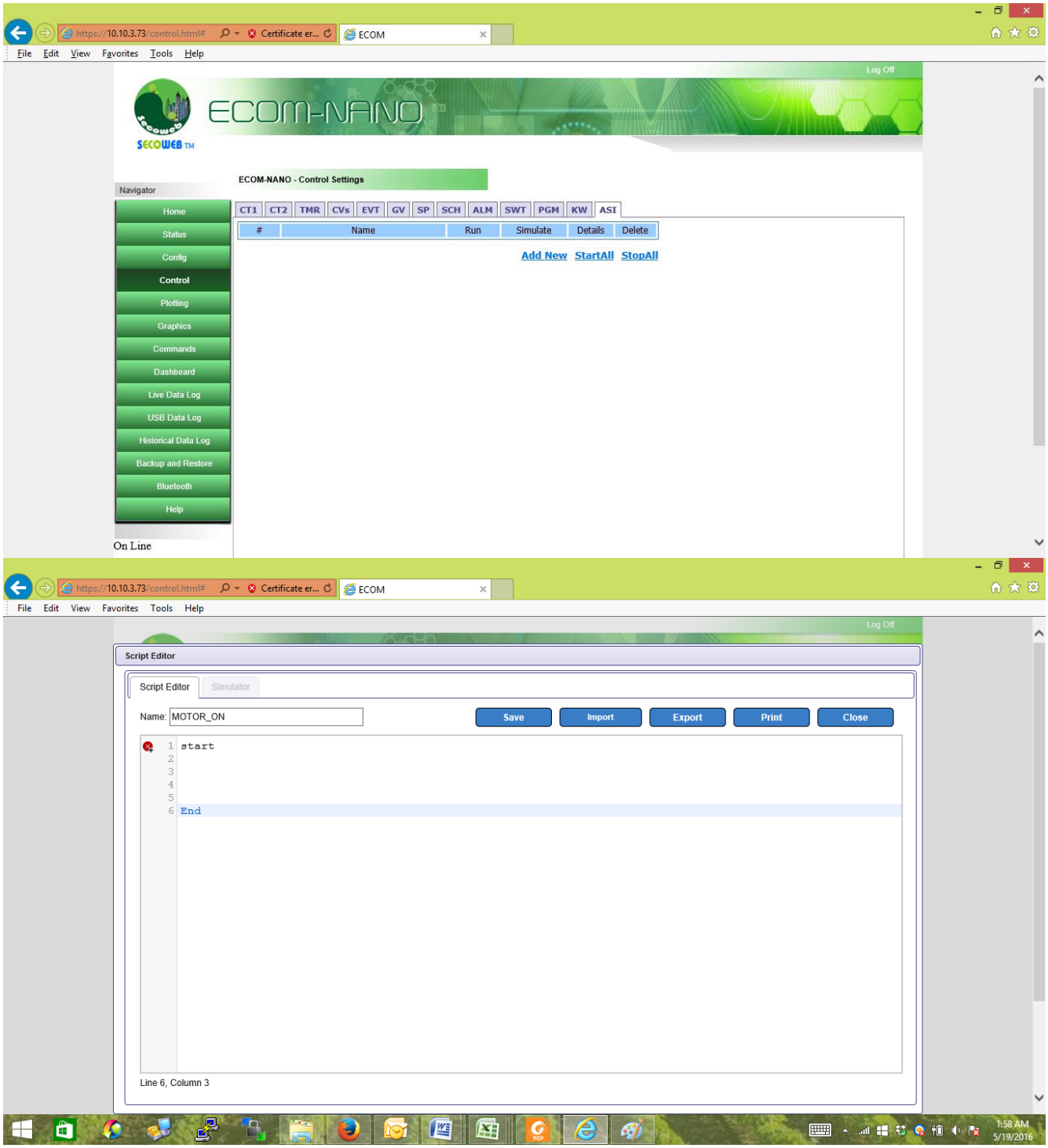
Voltage : Voltage can be a constant of a Point. Select Constant to enter a value or Select a Point.
Power Factor : Enter Power Factor.
Constant : Constant for kWh calculation. The default is 1.73.

Scan Interval (Sec) : Enter Scan Interval in seconds. The default is 3 seconds.
Comments : Enter comments.

Click  to save the kWh.

Click  to clear the kWh.

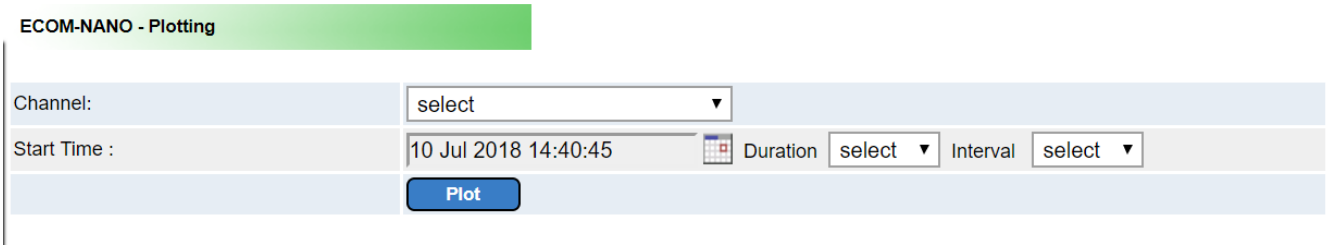
4.6.13 ASI



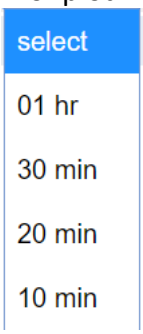
4.7 PLOTTING

View graph of logging enabled points.

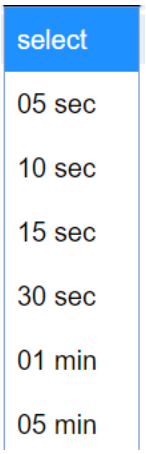
Navigation: **Home → Plotting**



- Channel : Select Channel.
- Start Time : Pick time from which graph need to be plotted.
- Duration : Select duration of plot.



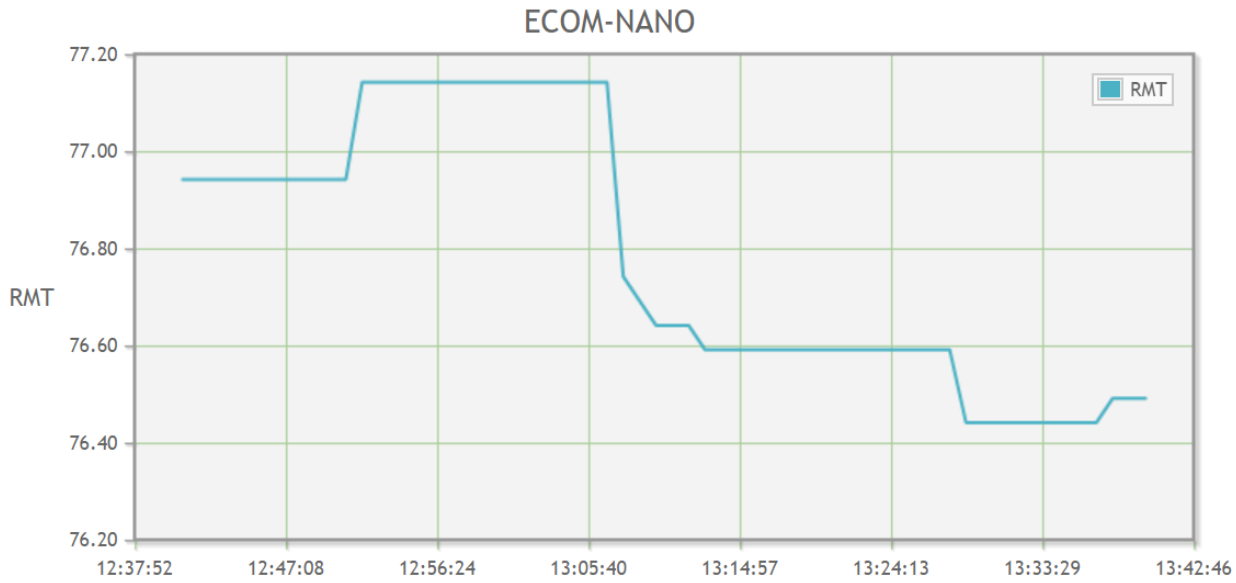
- Interval : Select data interval.



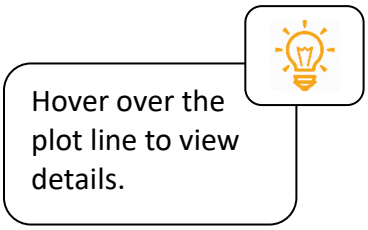
Click 

ECOM-NANO - Plotting

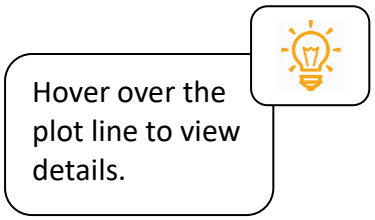
Channel:	RMT
Start Time :	10 Jul 2018 12:40:45 Duration 01 hr Interval 01 min
	Plot



Sample graph - Analog point.

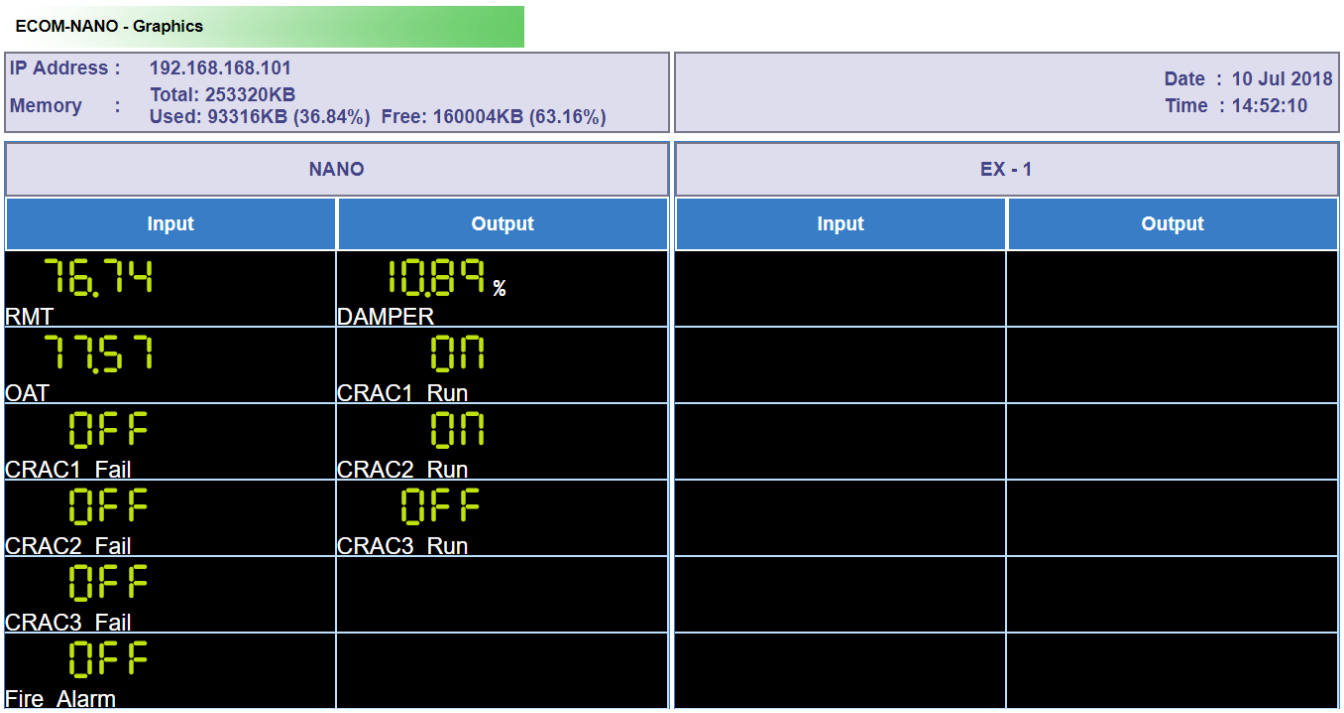


Sample graph - Digital point.



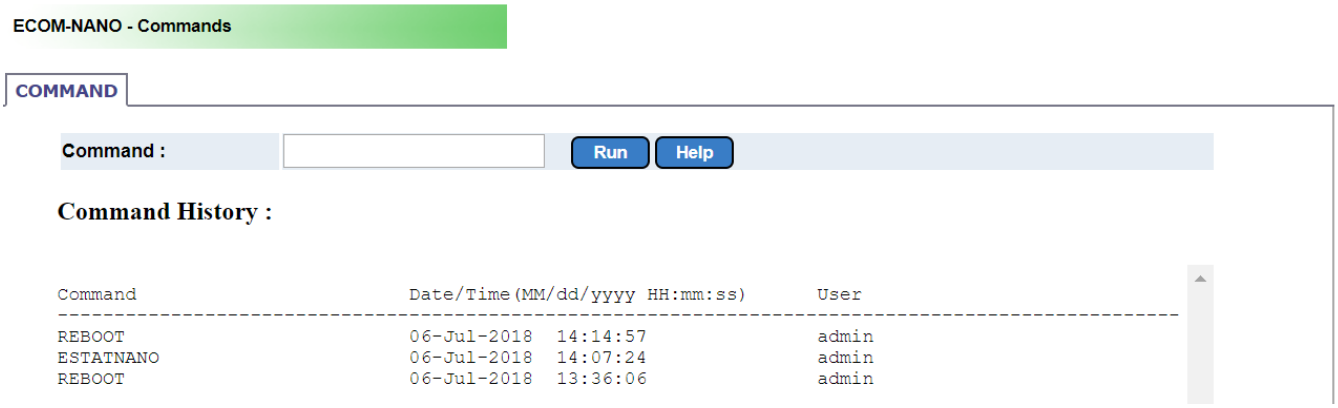
4.8 GRAPHICS

Display Input/Output status.
Navigation: **Home → Graphics**



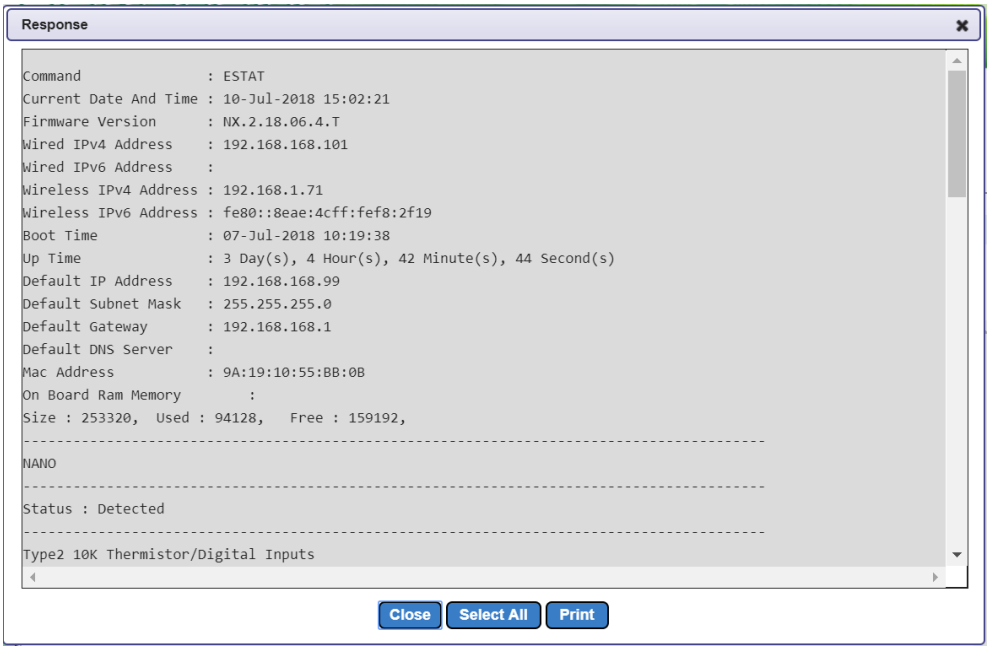
4.9 COMMANDS

Execute Commands.
Navigation: **Home → Commands**



Command : Enter Command.

Click Run to execute the command. The output of the command will be shown in a popup window.

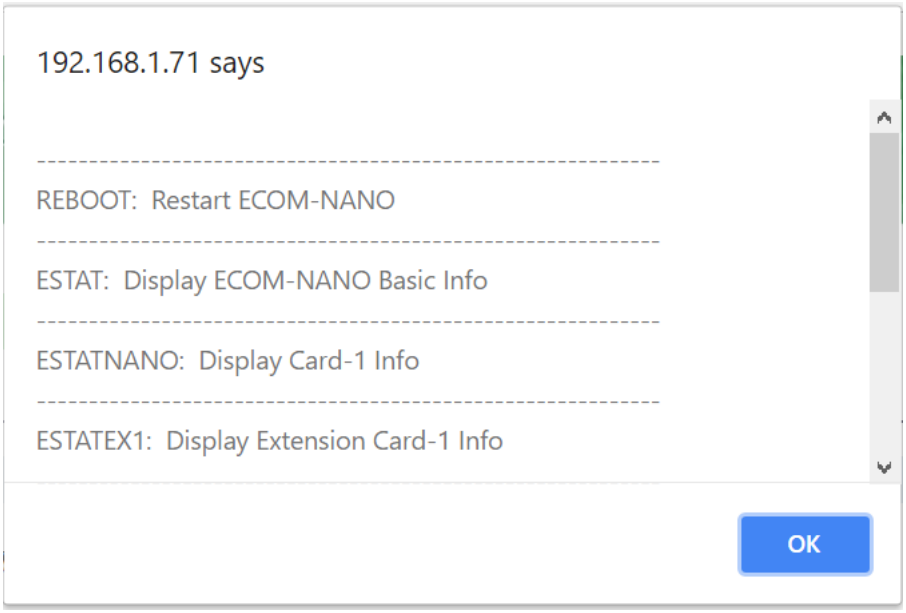


Click Close to close the popup.

Click Select All to select the result.

Click Print to print the result.

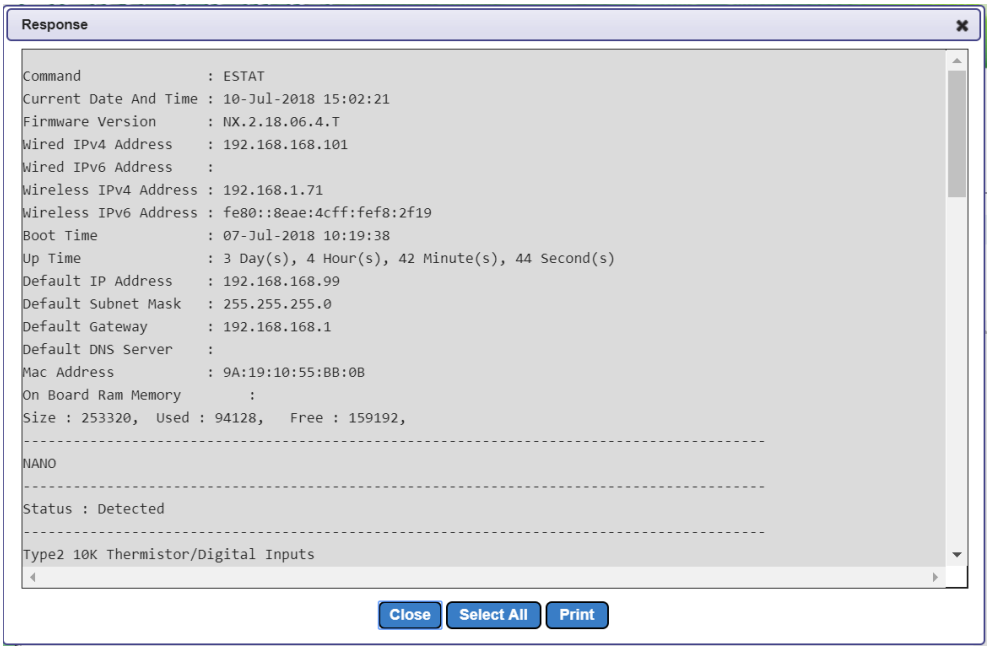
Click Help to view the list and commands.



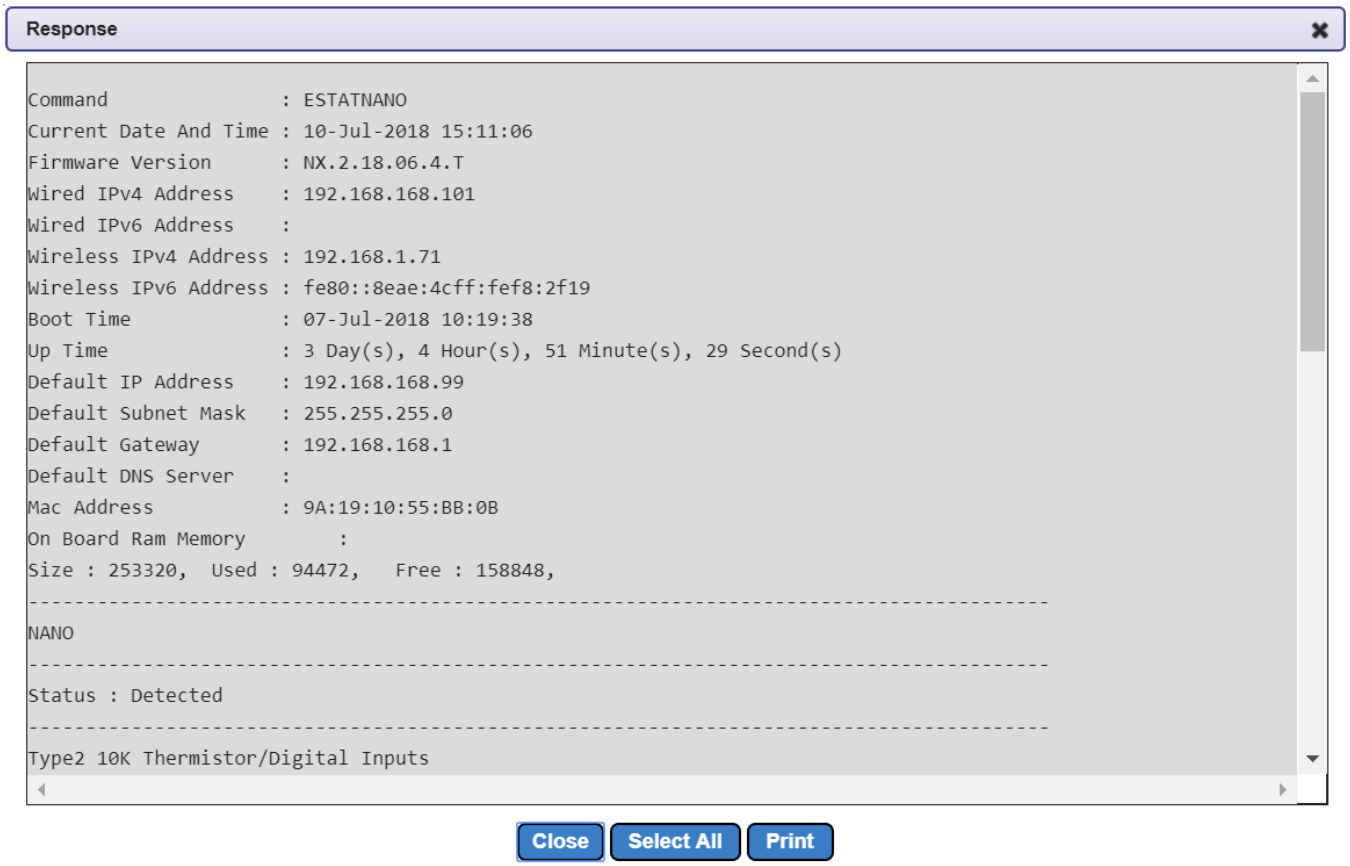
Commands

REBOOT - Restart ECOM NANO
ESTAT - Display ECOM NANO Basic Info

ESTAT command is used to display the details of all expansion cards connected to the ECOM-Nano. ESTAT command will provide an output in a popup window as shown below.

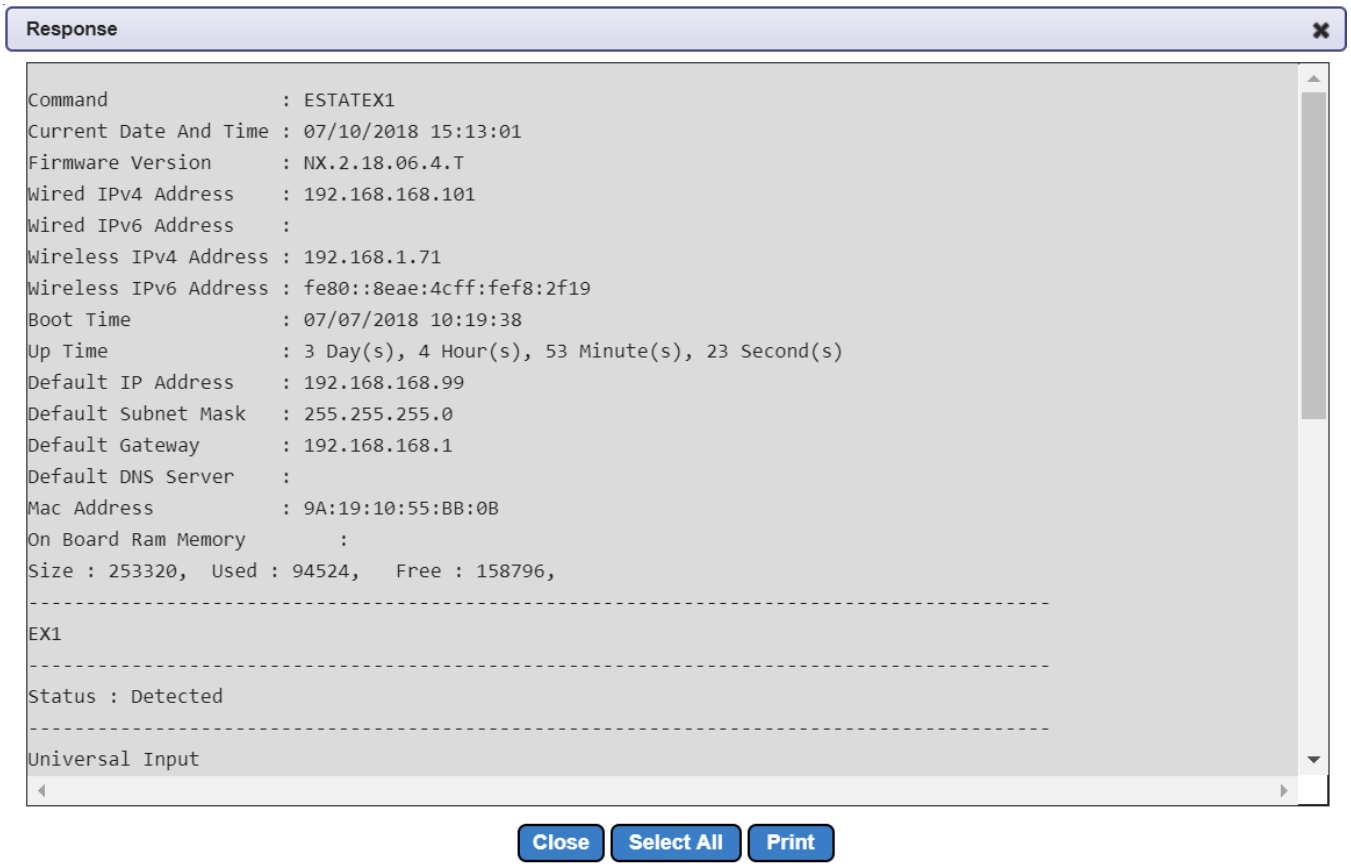


ESTATNANO - Display Card-1 Info



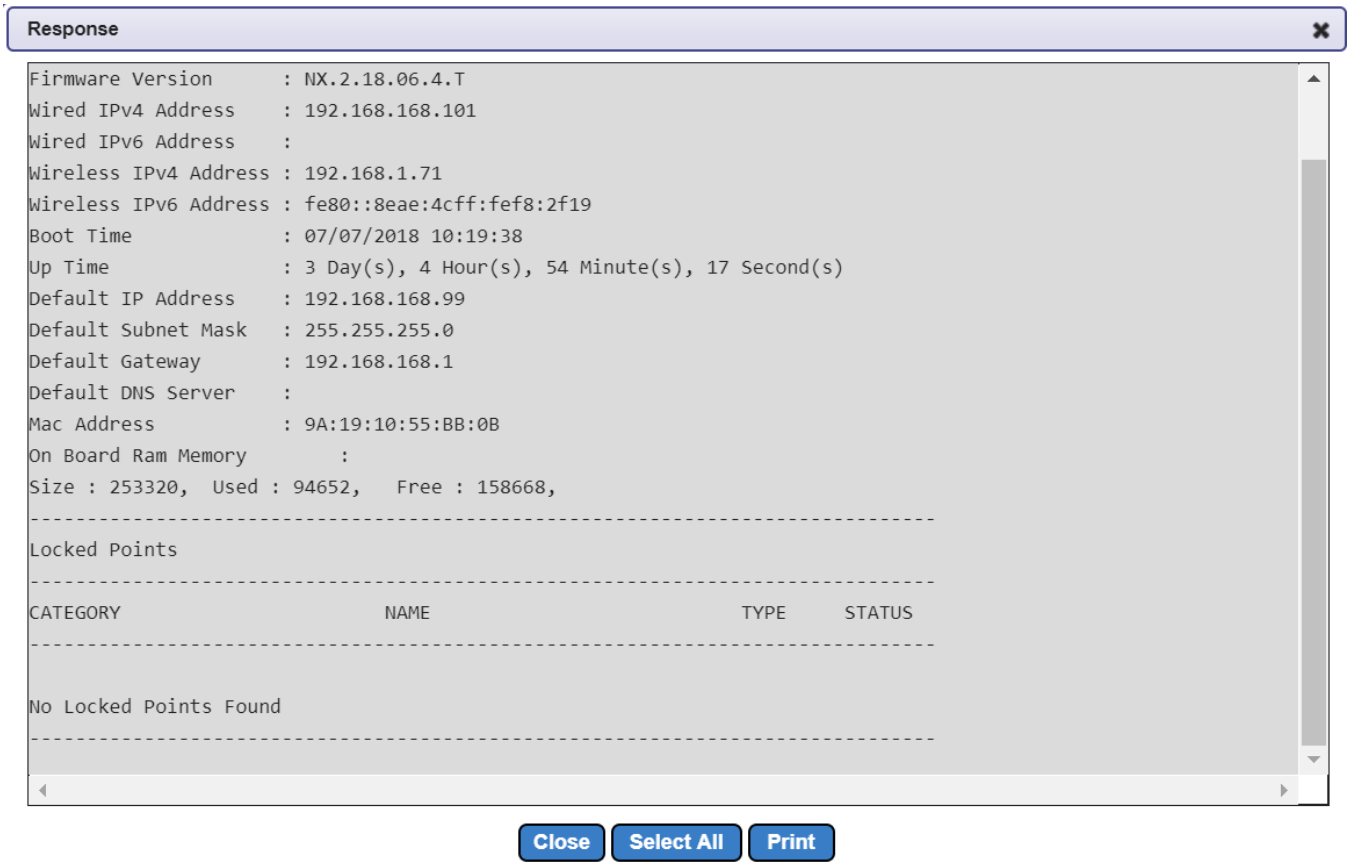
ESTATEX1 - Display Extension Card-1 Info

ESTATEX1 command is used to get input and output details of specific expansion card/IO card (EX1). While execution, details will be displayed as follows.



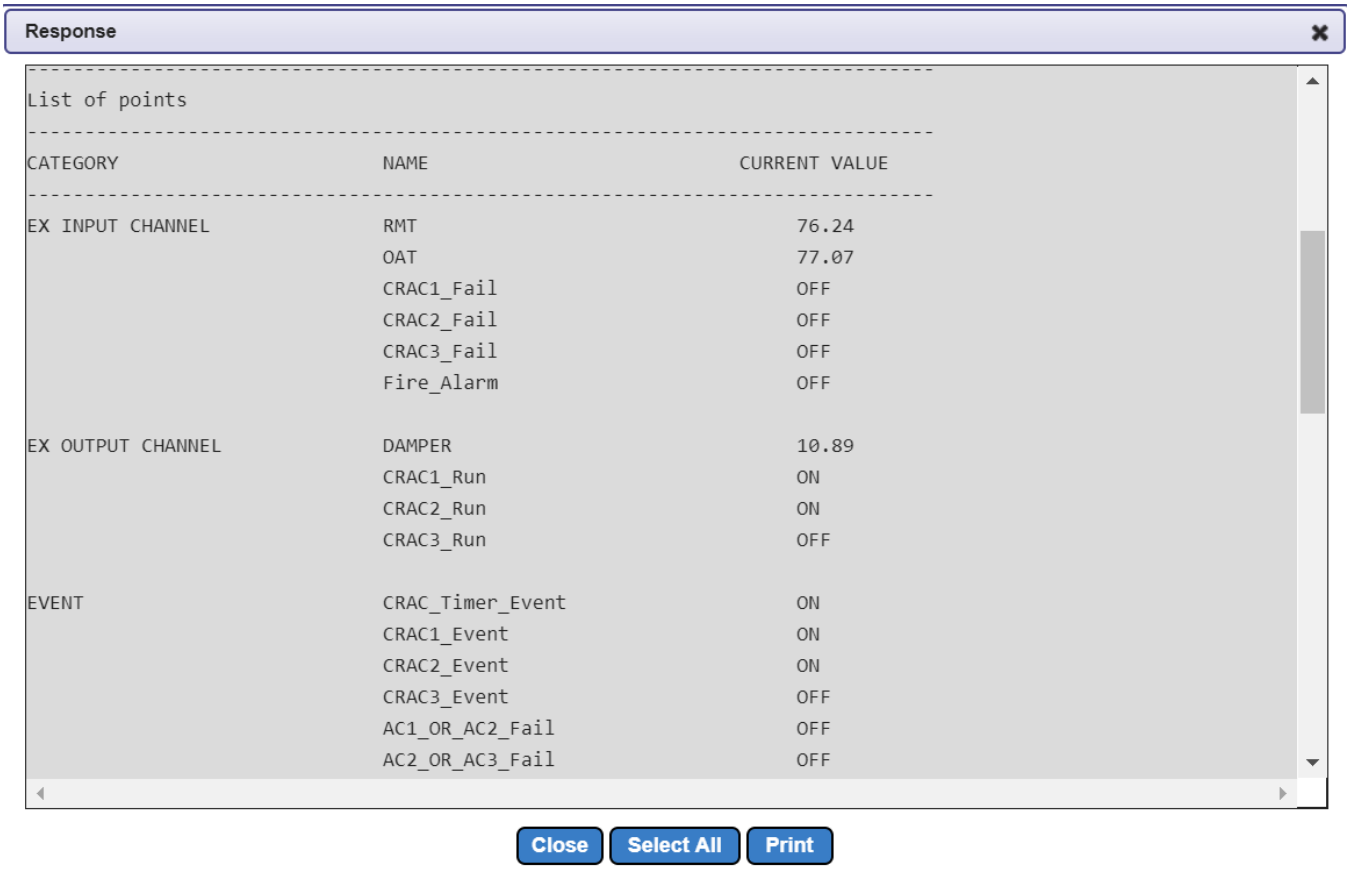
LOCKED - Display Used Output Channels

Locked command is used to get information about channels that are in manually controlled mode (locked points). Details will be displayed in a popup window as shown below.



LISTALL - List All Control Channels

Listall command is used to get a list of all channels configured on ECOM-Nano with it's category name and current value. The output will be displayed in a popup window as follows.



LISTTABLES - List All Switching Tables

This command can be used to list details of all switching tables configured on ECOM-Nano. When executed the command, result will be displayed in a popup window as shown below.

Response

```
Command               : LISTTABLES
Current Date And Time : 07/10/2018 15:18:27
Firmware Version      : NX.2.18.06.4.T
Wired IPv4 Address    : 192.168.168.101
Wired IPv6 Address    :
Wireless IPv4 Address : 192.168.1.71
Wireless IPv6 Address : fe80::8eae:4cff:fef8:2f19
Boot Time             : 07/07/2018 10:19:38
Up Time               : 3 Day(s), 4 Hour(s), 58 Minute(s), 49 Second(s)
Default IP Address    : 192.168.168.99
Default Subnet Mask   : 255.255.255.0
Default Gateway       : 192.168.168.1
Default DNS Server    :
Mac Address           : 9A:19:10:55:BB:0B
On Board Ram Memory       :
Size : 253320,  Used : 95256,   Free : 158064,
------------------------------------------------------------------------------------------------------
Switching Tables
------------------------------------------------------------------------------------------------------
Name                          Channel            Value to set   Latch     OntimeDelay   OffTimeDelay
------------------------------------------------------------------------------------------------------
CRAC1-Event-ON-ST             CRAC1_Event        ON             Disabled  00:00:00      00:00:00
```

Close Select All Print

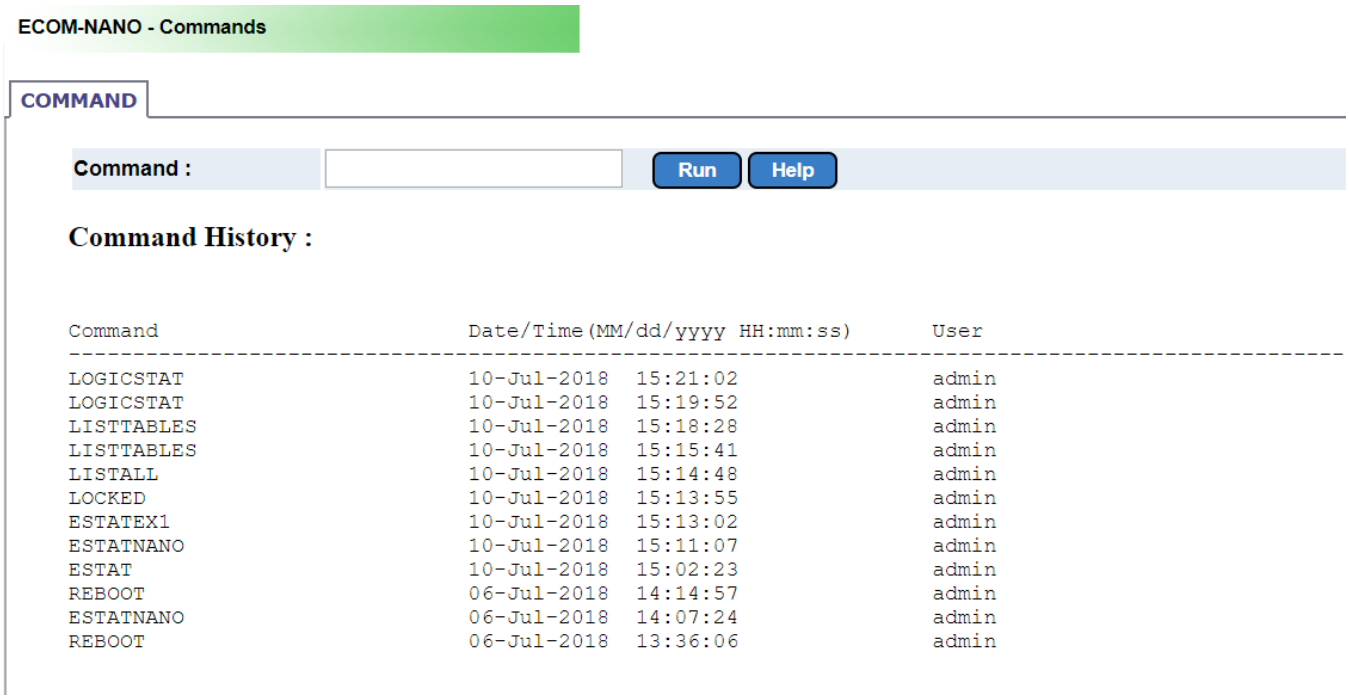
LOGICSTAT - Display All Control Channel Status

Response

```
On Board Ram Memory       :
Size : 253320,  Used : 95292,   Free : 158028,
+-----------------------------------------------------------------------------------------+
|Counter 1                                                                                |
+---+-----------------------------+----------+---------------+------------------+----------+
|  #|                         Name|     Value|      Condition|       Reset After|   DataLog|
+---+-----------------------------+----------+---------------+------------------+----------+
|  1|                          CT1|     28346|           TRUE|               N/A|        NO|
+---+-----------------------------+----------+---------------+------------------+----------+
+-----------------------------------------------------------------------------------------------------------------------------------
|Counter 2
+---+-----------------------------+----------+---------------+----------+---------------+----------+----------
|   |                             |          |                CONDITION|                AUTORESET|
+---+-----------------------------+----------+---------------+----------+---------------+----------+----------
|  #|                         Name|     Value|      Condition|  Schedule|    Reset After|  Schedule|  Data Log
+---+-----------------------------+----------+---------------+----------+---------------+----------+----------
|  1|                CRAC1_COUNTER|        31|           TRUE|       N/A|            N/A|       N/A|        NO
+---+-----------------------------+----------+---------------+----------+---------------+----------+----------
|  2|                CRAC2_COUNTER|        32|           TRUE|       N/A|            N/A|       N/A|        NO
+---+-----------------------------+----------+---------------+----------+---------------+----------+----------
|  3|                CRAC3_COUNTER|        30|          FALSE|       N/A|            N/A|       N/A|        NO
+---+-----------------------------+----------+---------------+----------+---------------+----------+----------
+-----------------------------------------------------------------------------------------+
```

Close Select All Print

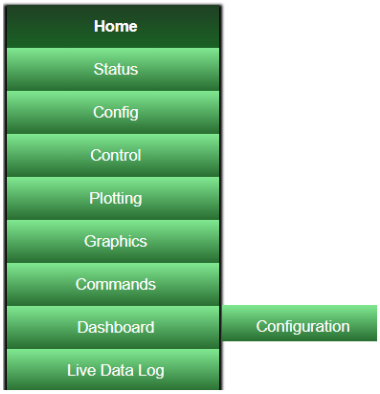
Command History



Include in info
Command history displays up to last 40 successfully executed commands, Date/Time and the User.
Only admin can execute commands and see the output.
Commands are not case sensitive.

4.10 DASHBOARD

Configure and view up to 4 Dashboards.
Navigation: **Home → Dashboard**



Click on Configuration menu.

: Create new dashboard

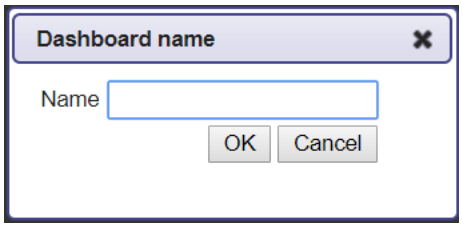
: Save dashboard.

: Edit selected dashboard

: Delete selected dashboard

Creating a dashboard

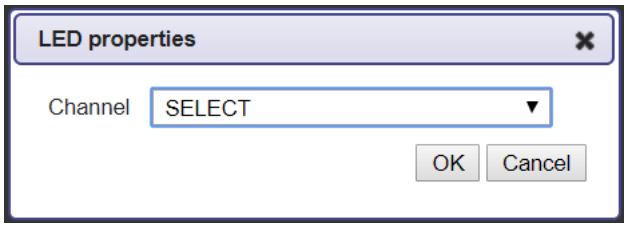
Click  to create a dashboard.



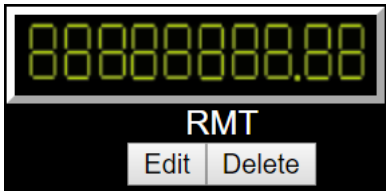
Name : Enter dashboad name.
Click OK to create the dashboard.
Click Cancel to cancel.

Adding graphics to the dashboard

: LED.
Click on LED, select Channel. Channel can be analog or digital.

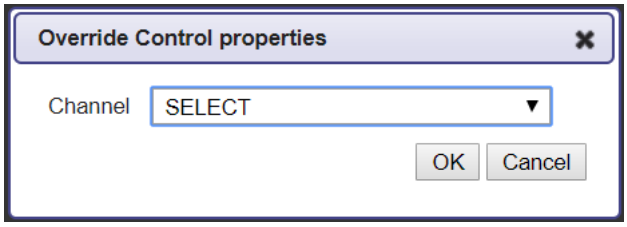


Click OK to add LED to the Dashboard.
Click Cancel to cancel.



Click Edit to edit the LED.
Click Delete to delete the LED. It will ask for a confirmation.

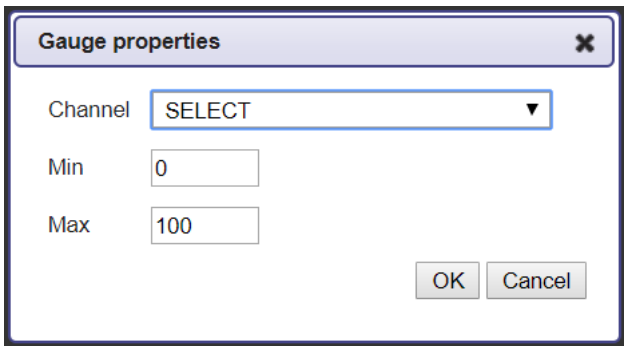
: Override Control.
Click on Override Control, select Channel. Override Control works only with Digital points.



Click OK to add Override Control to the Dashboard.
Click Cancel to cancel.

Click Edit to edit the Override Control.
Click Delete to delete the Override Control. It will ask for a confirmation.

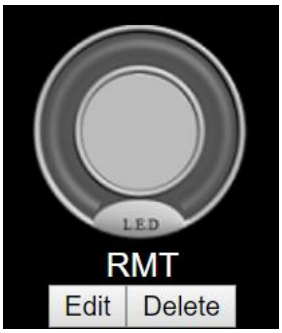
: Gauge.
Click on Gauge, select Channel. Gauge works only with Analog points.



Select Analog channel.
Enter minimum value.
Enter maximum value.

Click OK to add Gauge to the Dashboard.

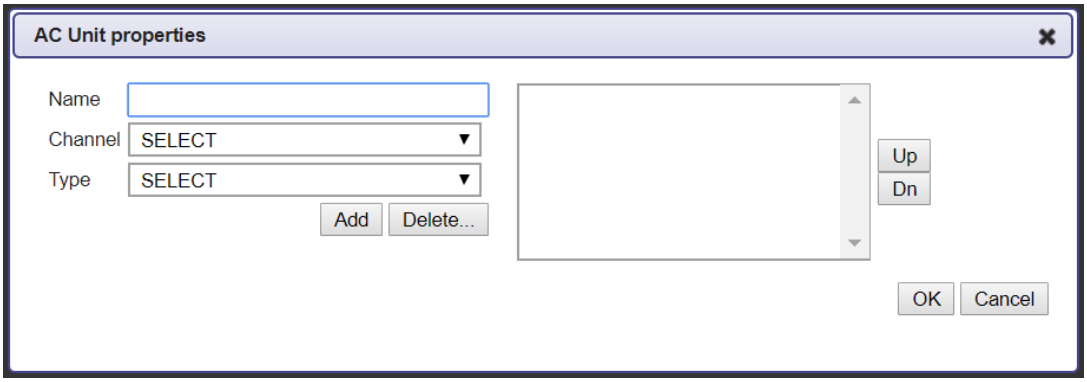
Click Cancel to cancel.



Click Edit to edit the Gauge.

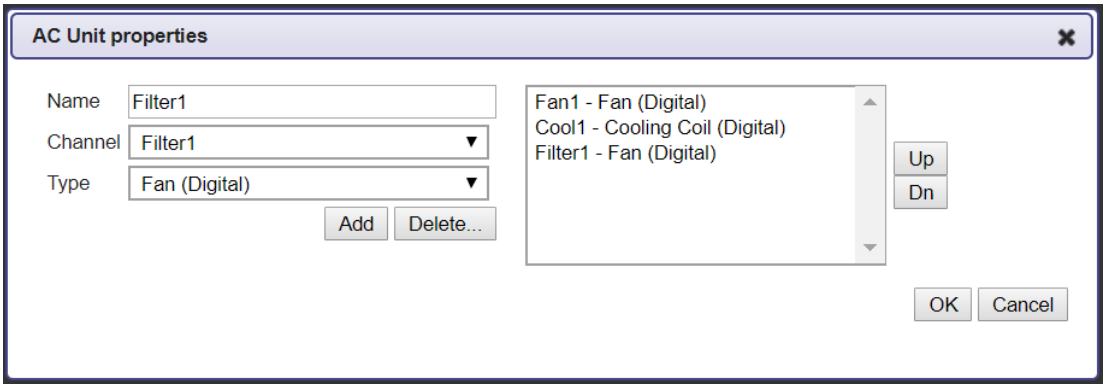
Click Delete to delete the Gauge. It will ask for a confirmation.

: AC Unit
Click on AC Unit.



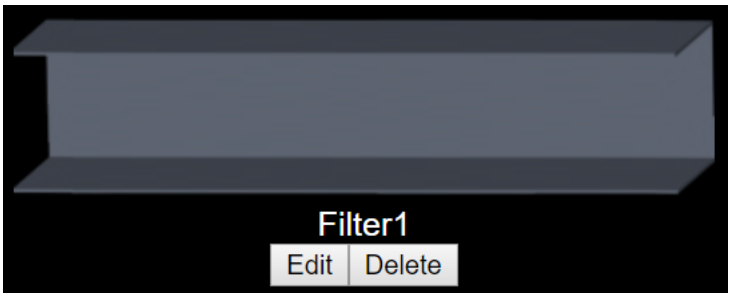
Name : Enter Name for AC Unit.
Channel : Select Channel.
Type : Select Type. Available Types are Filter (Digital), Filter (Analog), Fan (Digital), Cooling Coil (Digital), Heating Coil (Digital)

Click Add.



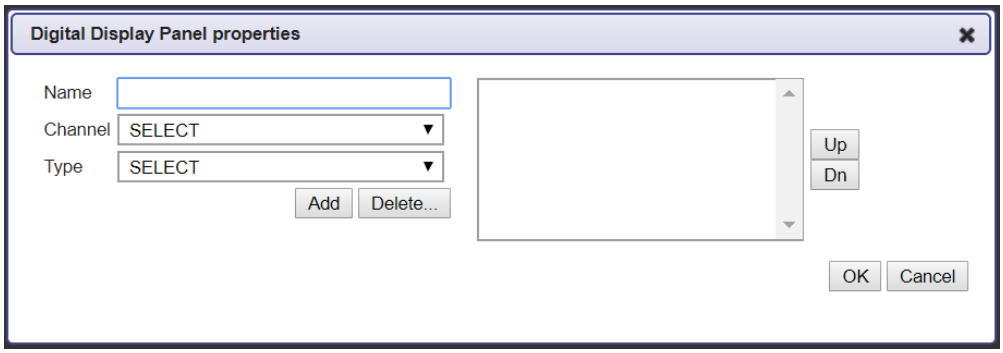
To remove an added graphic, select and click Delete... .

Click Up / Dn keys to rearrange the order of the graphics.

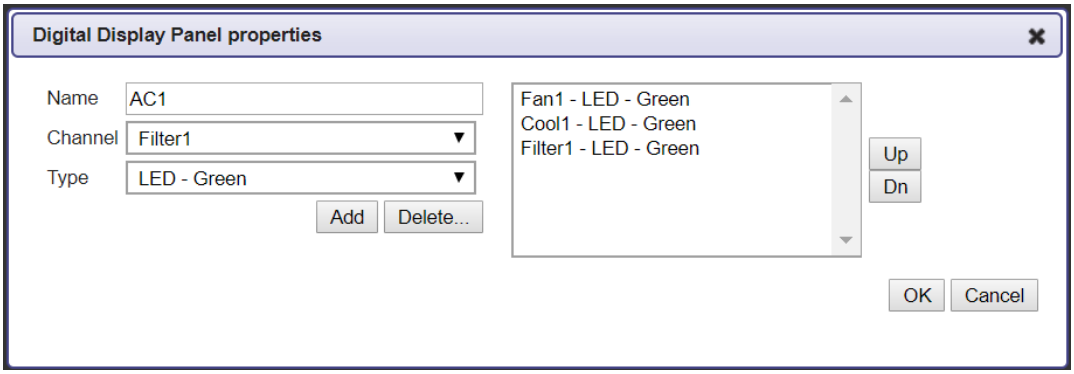


Click Edit to edit the AC Unit.
Click Delete to delete the AC Unit. It will ask for a confirmation.

: Digital display panel.
Click on Digital display panel.

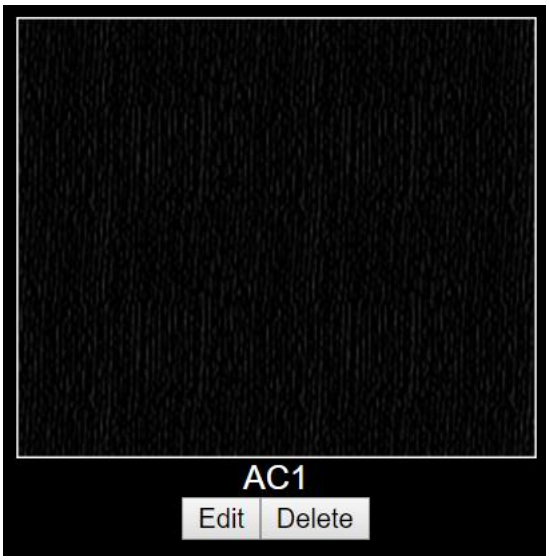


Name : Enter Name for Digital display panel.
Channel : Select Channel. Only Digital channels are supported.
Type : Select Type. Available Types are LED – Red, LED – Green.
Click Add.



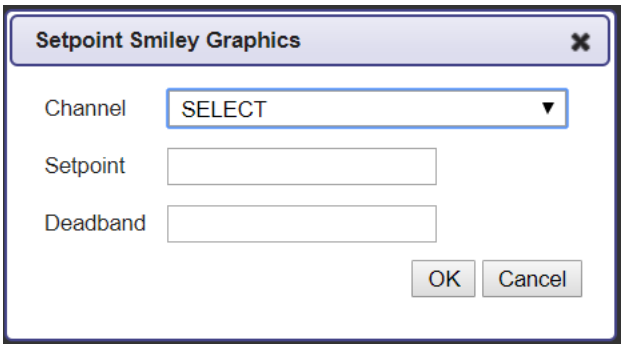
To remove an added graphic, select and click Delete....

Click Up / Dn keys to rearrange the order of the graphics.

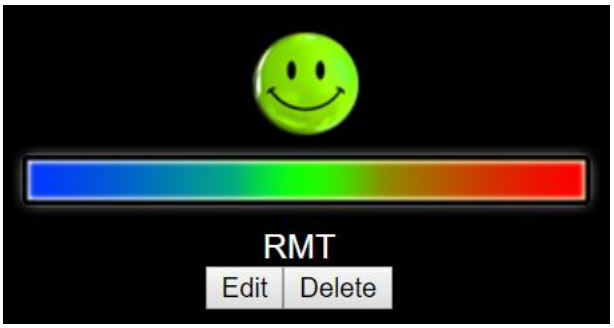


Click Edit to edit the Digital display panel.
Click Delete to delete the Digital display panel. It will ask for a confirmation.

 : Setpoint smiley.
Click on Setpoint smiley.



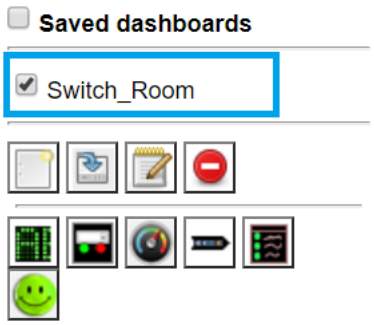
Channel : Select Channel. Only Analog channels are supported.
Setpoint : Enter Setpoint.
Deadband : Enter Deadband.
Click OK.



Click Edit to edit the Setpoint smiley.
Click Delete to delete the Setpoint smiley. It will ask for a confirmation.

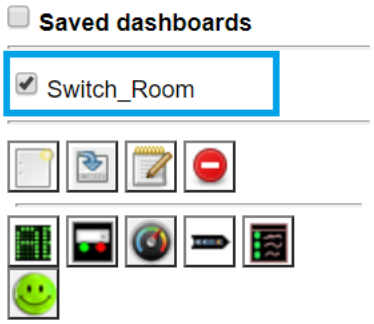
Click  to save the dashboard.

Editing a dashboard



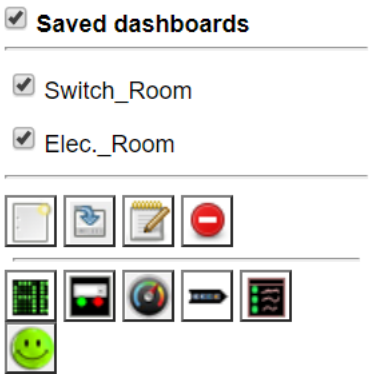
Select the dashboard to be edited and click  .

Deleting a dashboard



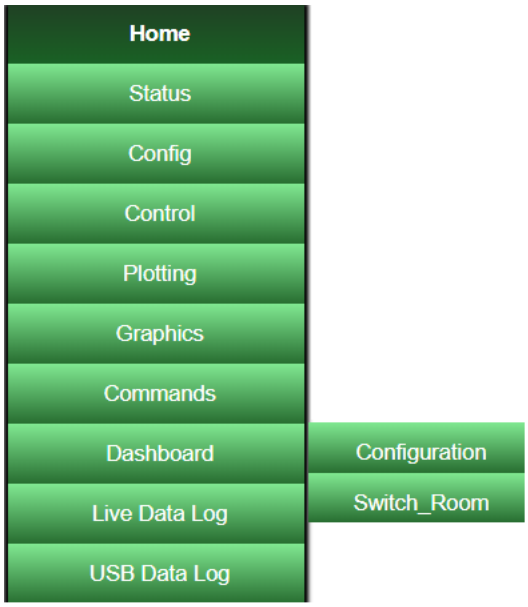
Select the dashboard to be edited and click  .

To delete all dashboards, select Saved dashboard and click  .

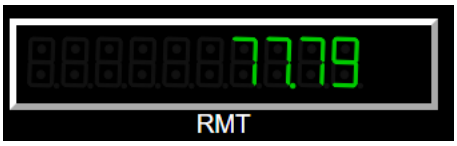


View Dashboard

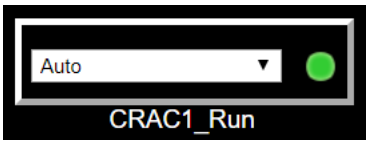
Click on the Dashboard menu and select the newly created Dashboard.



LED :

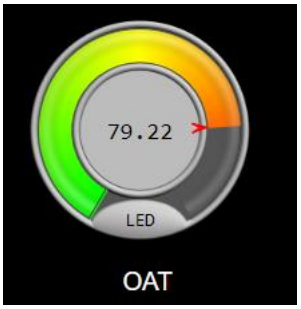


Override Control :

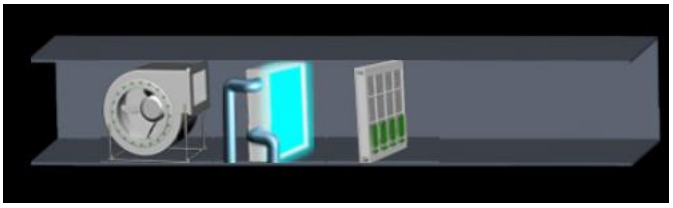


Select Auto, ON or OFF.

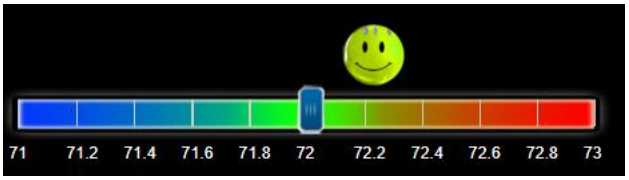
Gauge :



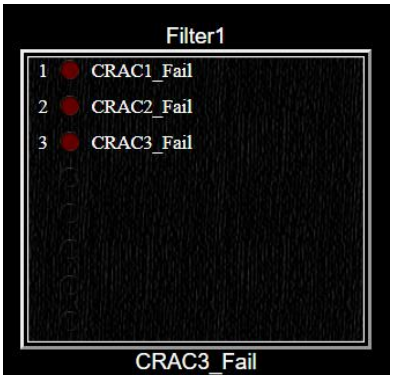
AC Unit :



Setpoint Smiley :



Digital display panel :



4.11 LIVE DATA LOG

Displays live data log for up to 8 channels.
Navigation: **Home → Live Data Log**

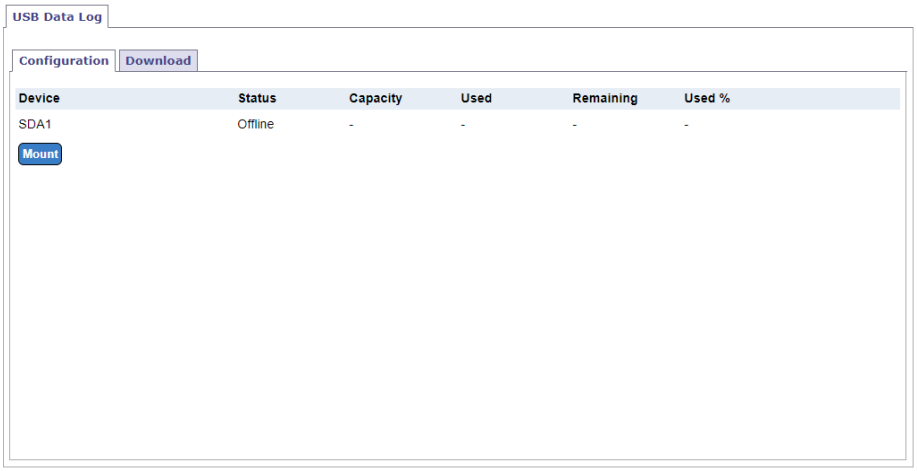
Refresh Rate 01 sec ▼

DATE (dd-MM-yyyy)	TIME (HH:mm:ss)	CHANNEL NAME							
		RMT ▼	OAT ▼	CRAC1 ▼	CRAC2 ▼	CRAC1 ▼	CRAC2 ▼	CRAC3 ▼	select ▼
11-Jul-2018	10:55:13	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:12	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:11	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:10	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:09	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:08	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:07	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:06	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:05	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:04	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:03	78.39	79.77	OFF	ON	OFF	OFF	OFF	
11-Jul-2018	10:55:02	78.39	79.77	OFF	ON	OFF	OFF	OFF	

Select Refresh Rate – 01 sec, 05 sec, 10 sec, 1 min, 30 min, 1 hr.
Select Channels.
Click Print Data to print the Live Data Log.

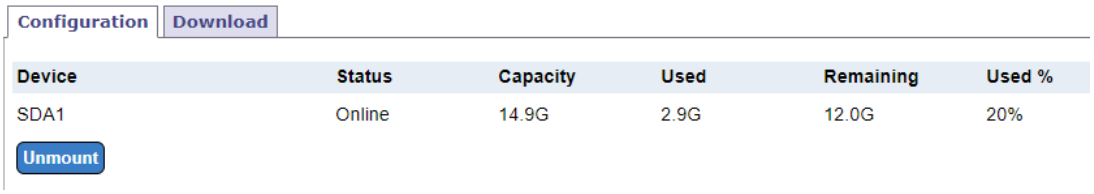
4.12 USB DATA LOG

Download data log to USB.
Navigation: **Home → Live Data Log**



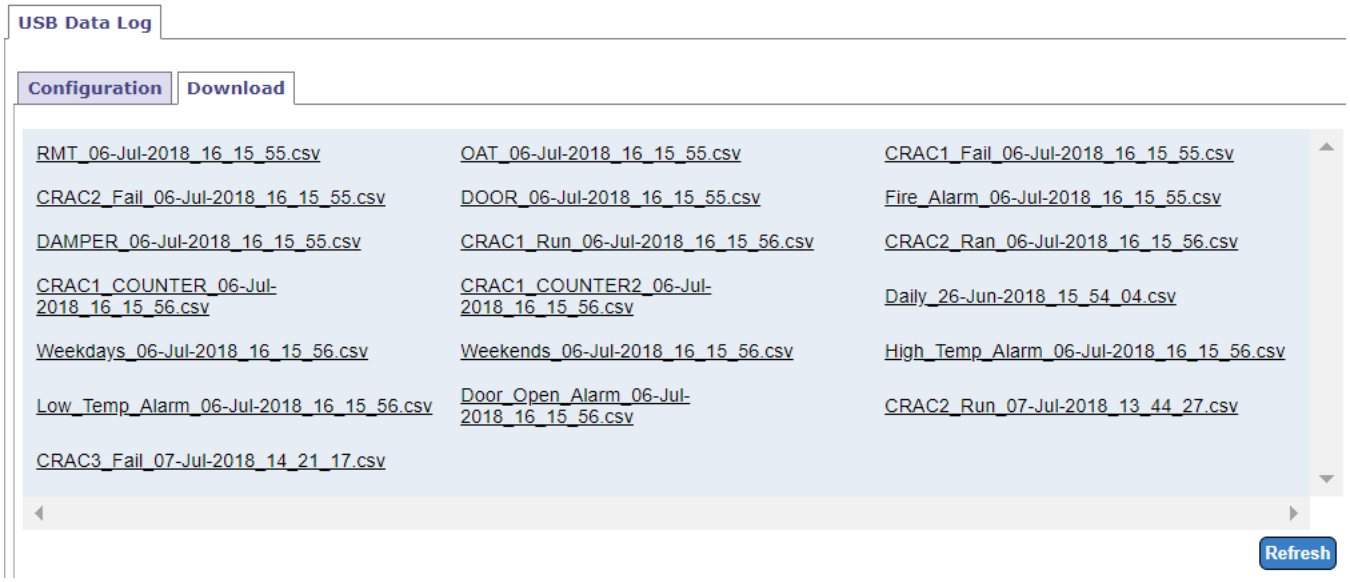
Mounting USD drive

Connect USB to ECOM-Nano and click Mount.



Once mounted, select the download tab to initiate download to USB.

Click Unmount to unmount the USB.

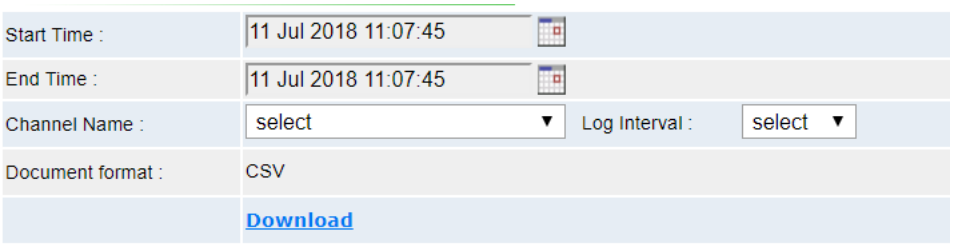


Click on the filename to download the CSV file. The file is downloaded to the Downloads folder of the logged in user.

Click Refresh to refresh the page.

4.13 HISTORICAL DATA LOG

Download historical data log.
Navigation: **Home → Historical Data Log**

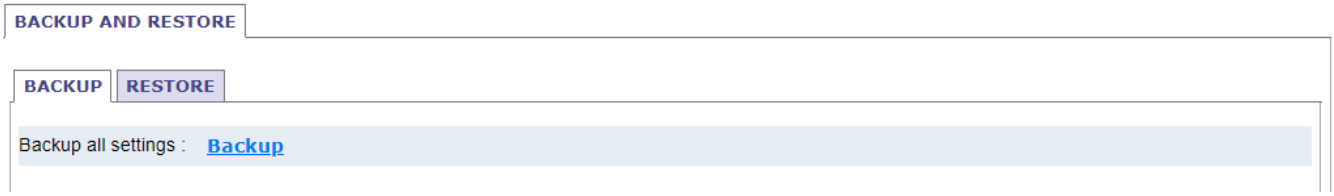


Start Time : Select start date and time.
End Time : Select end date and time.
Channel Name : Select Channel.
Log Interval : Select Log Interval – 05 sec, 10 sec, 15 sec, 30 sec, 1 min, 10 min, 30 min, 1 hr.
Document format : CSV.

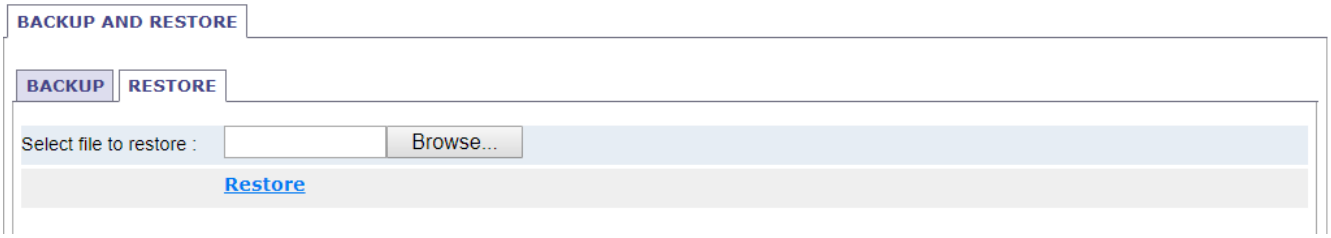
Click Download to download the CSV file. The file is downloaded to the Downloads folder of the logged in user.

4.14 BACK UP & RESTORE

Backup/Restore controller settings.
Navigation: **Home → Backup and Restore**



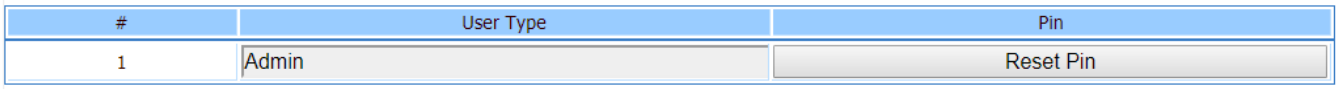
Click Backup to backup controller settings. The backup file is downloaded to the Downloads folder of the logged in user. The extension of the file is .bak.



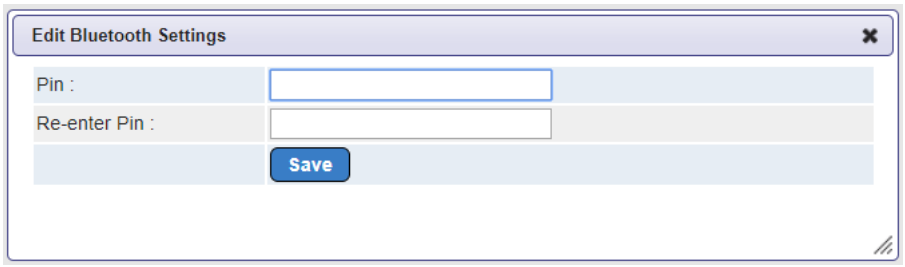
Click Browse... to select the backup file.
Click Restore to restore the controller settings from an earlier backup. Restore takes few seconds to few minutes depending on the settings of the controller. Once successful it shows the following message. Reboot the board to apply the new settings.

4.15 BLUETOOTH

Configure Bluetooth pin.
Navigation: **Home → Bluetooth**



Click Reset Pin to change the Bluetooth pin. Default pin is 1234.



Pin : Enter Bluetooth pin. Supports only four digits (0 – 9)
Re-enter Pin : Re-enter Bluetooth pin.
Click Save.

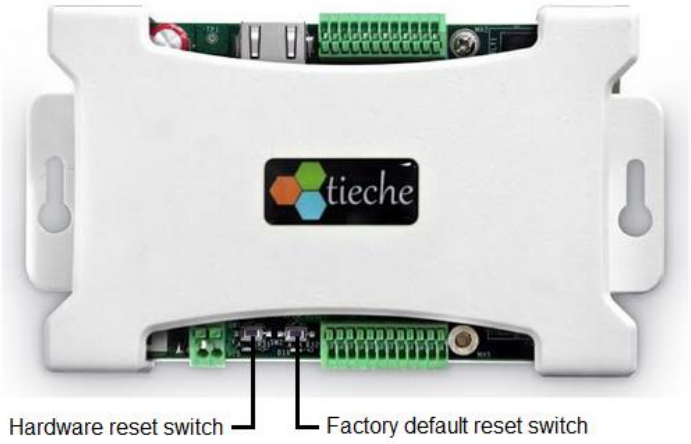
Only admin users have access to Bluetooth.

4.16 HELP

The Help file provides a list of the maximum number of points/controllers supported by the ECOM Nano.

4.17 HARDWARE INFO

APPENDIX A - RESET FUNCTION



Take a picture and blow up to show switches.

Show the blow up to the right and draw lines from the below detail 1 and 2 to the image

- Hardware reset switch : Reboot the controller.
- Factory default reset switch : Used for the following functions.

1. Network & Password Reset
   Press and hold the factory default reset switch for 10 seconds. After 10 seconds the heart beat LED starts blinking continuously in very short intervals. At this point release the switch and restart the controller.
   This action resets user name, password and network configuration to default. All other configurations and data log are retained.

2. Factory Default Reset
   Press and hold the factory default reset switch for 20 seconds. After 10 seconds the heart beat LED starts blinking continuously in very short intervals. Continue to press and hold the switch. After 20 seconds the heart beat LED turns OFF. At this point release the switch and restart the controller.
   This action resets all the configurations to factory default state and clears all data logs.

Factory Default Settings:

User Name : admin
Password : default@Ec0M$
IP Address : 192.168.168.99

APPENDIX B - XML DATA

Data exchange links and formats.

XML data includes details for inputs, outputs, alarms and schedules.

IPv4 xml link : ***http://192.168.168.99/cgi-bin/ECOM.xml***
IPv6 xml link : http://[IPv6 address]/cgi-bin/ECOM.xml

XML format

```
<NodeID/>
<CurrentTime>12:38:01</CurrentTime>
<CurrentDate>Oct 26, 2017</CurrentDate>
- <Sensor id="0" Channel="1000">
    <SensorName>Input_1</SensorName>
    <SensorValue>5.00</SensorValue>
    <SensorUnits>V1</SensorUnits>
    <SensorAlert>None</SensorAlert>
    <SensorRelay>00.00</SensorRelay>
    <SensorLTValue>00.00</SensorLTValue>
    <SensorGTValue>00.00</SensorGTValue>
  </Sensor>
- <Sensor id="1" Channel="1001">
    <SensorName>Input_2</SensorName>
    <SensorValue>10.00</SensorValue>
    <SensorUnits>V2</SensorUnits>
    <SensorAlert>None</SensorAlert>
    <SensorRelay>00.00</SensorRelay>
    <SensorLTValue>00.00</SensorLTValue>
    <SensorGTValue>00.00</SensorGTValue>
  </Sensor>
- <Sensor id="2" Channel="1002">
    <SensorName>Input_3</SensorName>
    <SensorValue>15.02</SensorValue>
    <SensorUnits>V3</SensorUnits>
    <SensorAlert>None</SensorAlert>
    <SensorRelay>00.00</SensorRelay>
```

Change screenshot with new xml

APPENDIX C – EMAIL SAMPLES

Test email

ECOM MICRO: ECOM MICRO- FLOOR 1 :Test Mail Inbox ×

secoweb@tiechesystems.com
to me

Controller name: ECOM MICRO- FLOOR 1
Wired IPv4 address: 192.168.1.51
Wired IPv6 address: fe80:0:0:0:5610:ecff:fec8:1041

Date and Time: 29 JUN 2018 FRI 09:11:26

Change screenshot

Boot up email

ECOM-MICRO : ECOM MICRO- FLOOR 1 : Turned ON Inbox ×

secoweb@tiechesystems.com
to me

Controller name: ECOM MICRO- FLOOR 1
Wired IPv4 address:192.168.1.51
Wired IPv6 address:fe80:0:0:0:5610:ecff:fec8:1041

Date and Time: 29 JUN 2018 FRI 09:40:51

Active Alarms

Alarm Name: RMT-HIGH-ALARM
Level: Critical
Date and Time: 29-Jun-2018 09:37:07

Alarm Name: OAT-HIGH-ALARM
Level: High
Date and Time: 29-Jun-2018 09:39:03

Alarm Name: SAT-HIGH-ALARM
Level: Medium
Date and Time: 29-Jun-2018 09:37:30

Alarm Name: RMT-1-HIGH-ALARM
Level: Low
Date and Time: 29-Jun-2018 09:39:28

Email when alarm is generated

ECOM MICRO : ECOM MICRO- FLOOR 1 : RMT-1-HIGH-ALARM : Low : Alarm Generated Inbox ×

secoweb@tiechesystems.com Fri, Jun 29, 10:08 PM
to me

Controller Name: ECOM MICRO- FLOOR 1
Alarm Name: RMT-1-HIGH-ALARM
Status: Alarm
Level: Low
Date and Time: 29-Jun-2018 09:37:37
Comments: Testing Alarm -4

Email when alarm returns to normal

ECOM MICRO : ECOM MICRO- FLOOR 1 : RMT-1-HIGH-ALARM : Low : Alarm Returned to Normal Inbox ×

secoweb@tiechesystems.com Fri, Jun 29, 10:06 PM
to me

Controller Name: ECOM MICRO- FLOOR 1
Alarm Name: RMT-1-HIGH-ALARM
Status: Normal
Level: Low
Date and Time: 29-Jun-2018 09:35:33
Comments: Testing Alarm -4

APPENDIX D – LCD DISPLAY INFO

APPENDIX E – SMS COMMAND

APPENDIX F – SMS MESSAGES

APPENDIX G – ECOM NANO - TECHNICAL SPECIFICATIONS

Processor	**Expansion Capability**
536 MHz, High Performance, 32 bit embedded microcontroller	Supports up to 32 inputs and 36 outputs through ECOM NANO-X expansion modules
Memory	**Real Time Clock**
256 MB Operating RAM 256 MB NAND Flash Operating system and controller configuration	+/-1 minute per month
	Memory Back up
	10 years for NAND flash memory
Supply Voltage	**Wiring Terminals**
Rated: 12 VDC +/-5%, 2.0 Amps	**Power**
Communications	Stranded copper wire 18 to 22 (AWG) 0.75 to 0.34 (mm^2)
IEEE 802.3 Ethernet 10/100 BaseT 2 EIA-485, 250kbps 3 USB 2.0 ports IEEE 802.15.1 Bluetooth 2.0 802.11b/g/n Wi-Fi GSM-Quad-Band-850/900/1800/1900 MHz	**Input /Output/RS-485**
	Stranded copper wire 20 to 24 (AWG) 0.5 to 0.25 (mm^2)
Inputs	**User Interfaces**
4 selectable binary/thermistor inputs	User friendly web interface Android application Monitor and control via SMS Email alerts 4 X 20 character LCD display Power on LED Heart beat LED Digital output LED
12 bit A/D converter Binary: Dry Contact 10K, thermistor (Type-II)	
4 selectable voltage /binary inputs	
12 bit A/D converter Impedance: 6.2k ohm 0 - 5/10 VDC Analog 10V Digital input 10V over voltage protection	
Outputs	
4 Analog voltage outputs	
0-10 VDC +/-5% Output Power: 50mA @ 10 VDC 16 bit D/A converter	
8 Digital outputs	
0/10 VDC Output Power: 50 mA @ 10 VDC	

APPENDIX G – ECOM NANO-X - TECHNICAL SPECIFICATIONS

