RAMOS PLUS

RACK MONITORING SYSTEM

INTRODUCTION MANUAL

EN

CONTEG

Table of Contents

Introduction

In this manual, we'll cover the main features and basic configuration of the RAMOS PLUS and the setup of notifications and the explanation of events will be in another manual.

What is the RAMOS PLUS and Rack sensor ST3H

The RAMOS PLUS is a high speed, accurate, intelligent monitoring device, featuring a completely embedded host and operating system. We've combined the low cost and simplicity of use of the RAMOS OPTIMA, along with many advanced features of our RAMOS ULTRA platform.

The Rack sensor ST3H combines 4 sensors into one sensor port on the RAMOS PLUS, specially designed to monitor the air entering and leaving a computer rack. The Thermal Rack Map is performed from the CONTEG Pro Server using the Rack sensor ST3H connected to the RAMOS PLUS. The Rack sensor ST3H monitor the temperature and humidity at different points of the rack.

RAMOS PLUS Features:

- IP based, including SNMPv3 and HTTPS
- Send encrypted SNMP Trap and Email Notifications
- Supports 4 Intelligent Sensors
- Optional cellular modem with external antenna
- Notification Wizards
- Support Daisy Chained Temperature sensors and expander D8-8

Port assignment information for RAMOS PLUS units

Port numbering starts from the power connector on the unit: the closest port to the power connector is Port 1 and closest to the Ethernet interface is Port 4.

You may connect Conteg intelligent sensors to any available ports.

LED information for RAMOS Plus units

Power/Ethernet Link - Sensor 1 - Sensor 2 - Sensor 3 - Sensor 4

The Power/Ethernet LED will become red if there's no network connection, and blinking green (according to LAN activity) when the connection is normal.

For sensor LEDs (green):
Off = offline
On = online and normal
Slow blinking = Warning status
Fast blinking = Critical and Error status

Reset button functions for RAMOS Plus units

There are specific commands you can send to the unit by holding the Reset button for a specified amount of time.
You'll have to use something sharp, such as a straightened paperclip to be able to press Reset.

Time to hold	Action
3..7 sec	Reboot
7..12 sec	Web UI password reset
12..17 sec	Serial flash erase (DB erase without factory reset, the system configuration is kept)
17..25 sec	Reset to factory defaults (serial flash erase + config erase)

Setting up the unit's IP address

Very Important Note: The unit's ship with the passwords **enabled**. The default log in for the web interface is Username: admin Password: public
Every unit is shipped with the default IP address of 192.168.0.100
First we will go through the process of changing this IP address to fit your own network configuration.

Note: In some cases, your computer might not be able to connect to this default IP address. In this situation you either need to:
a) add this IP your computers routing table or
b) add a secondary IP address to the LAN card to allow access to the unit.
See below how to setup these.
Ensure the following items are available to you before starting:
- RJ45 CAT5 crossover cable with RJ45 male connection
- A PC with Ethernet card or LAN socket, logged in with Administrator rights

1) Connect the unit via the Ethernet port of the unit to your computers LAN or Ethernet port with a CAT5 crossover cable.
2) Open a web browser and type the default IP address, hit enter.

You'll be presented by the **Summary** page.
Go to the **System/Network** page to change the network settings (see below in this manual).
Once you have assigned the new IP address use the "ping" command to test the unit's reply.

How to add a manual route to the computer's routing table?

Open an Administrator Command Prompt (CMD) window and type:

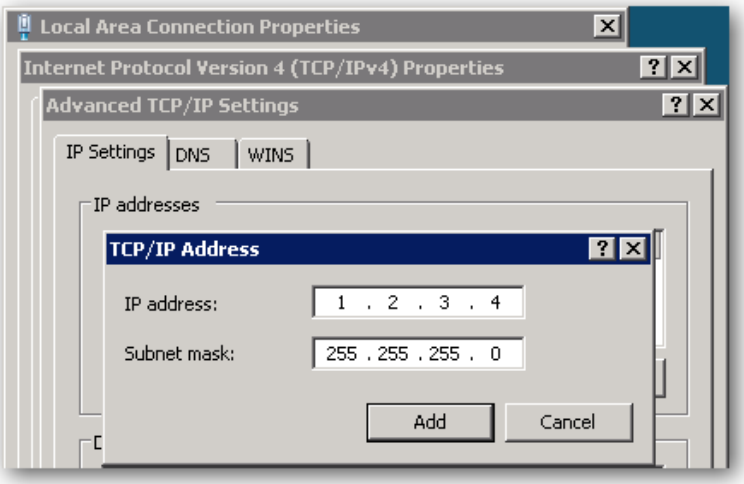
```
route add 192.168.0.100 10.1.1.20
```

Where 10.1.1.20 is the IP address of the Ethernet interface on the PC that the unit is plugged into with the crossover cable.

Note: If you do not receive an 'OK!' message then a parameter was wrong or missing.
The route is not persistent (removed upon rebooting), but you can also delete it with the `route delete 192.168.0.100 command.`

How to add a secondary IP address to the computer's LAN card?

You can do this via the GUI by opening the LAN connection's properties:



Or open an Administrator Command Prompt (CMD) window and type:

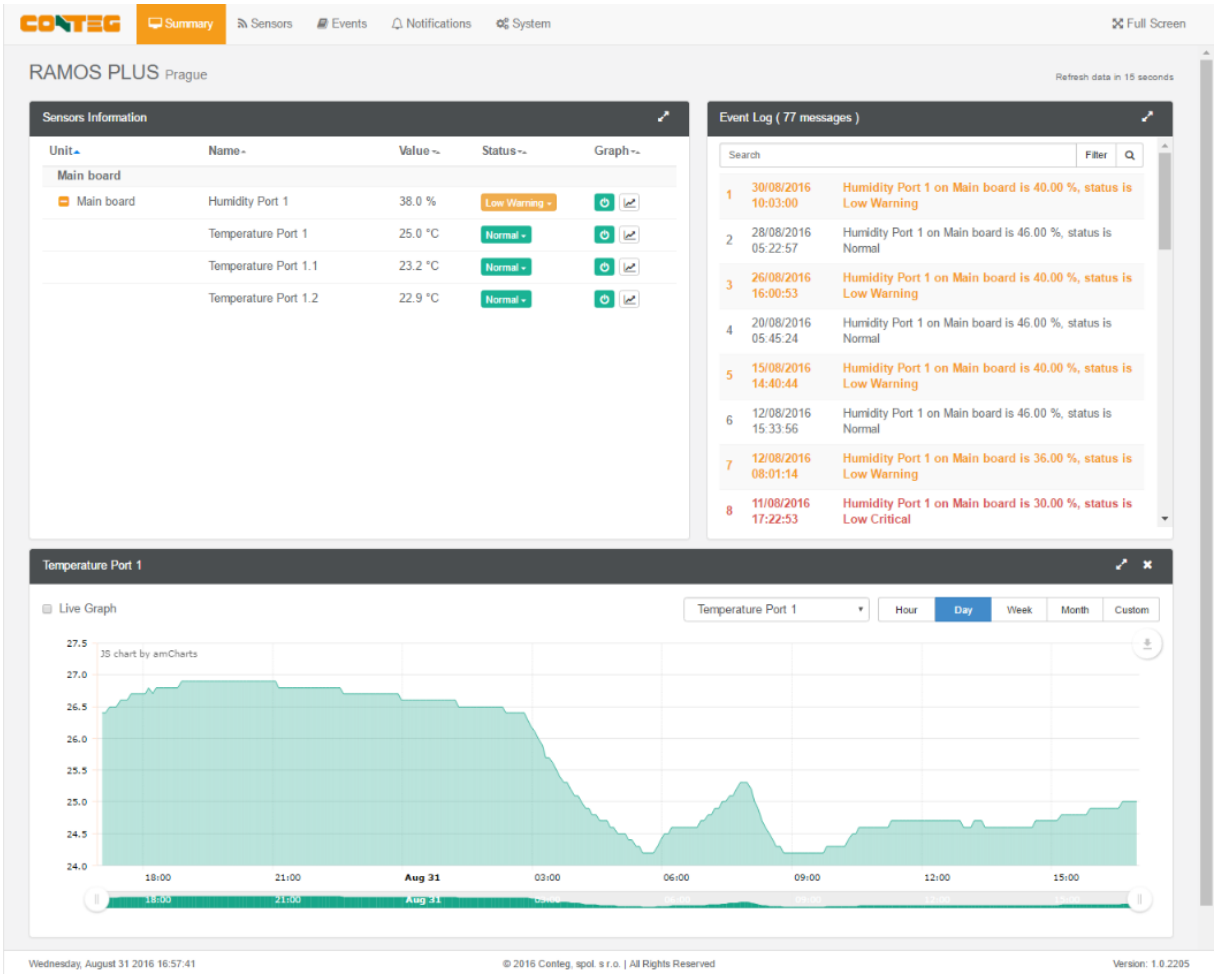
```
netsh interface ipv4 add address "Local Area Connection" 192.168.0.2
255.255.255.0
```

The above command adds the IP Address 192.168.0.2 (with Subnet Mask 255.255.255.0) to the connection titled "Local Area Connection".
You will then be able to connect to the unit with its default IP.

Note: The secondary IP address is permanent for the LAN connection; don't use it if you only need it once. Instead use the routing table method above.

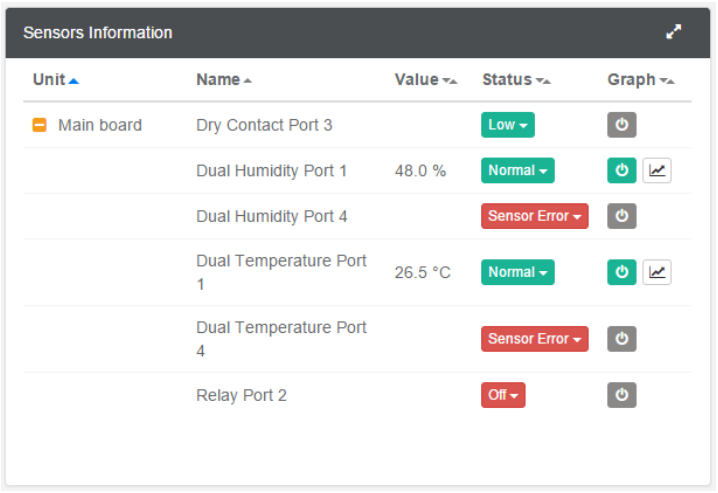
RAMOS PLUS Web UI Walkthrough

Summary page

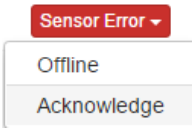


This is the Summary page with Sensor Status and the Event Log, with the Sensor Graph enabled.

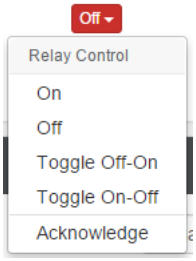
The Event Log contains all entries from the “All Events” category. We’ll explain the different categories in the Notifications manual. The last 30 entries are shown, but if you’re scrolling down the list, more events (30 more) will be loaded automatically. You can view the full log if you keep scrolling down.



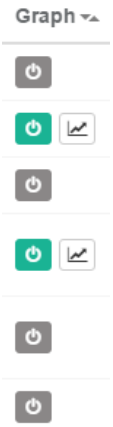
In the Summary Page's Sensors Information window you can do the following:



Directly acknowledge a sensor's status, and put the sensor offline



Control the relay-type sensors



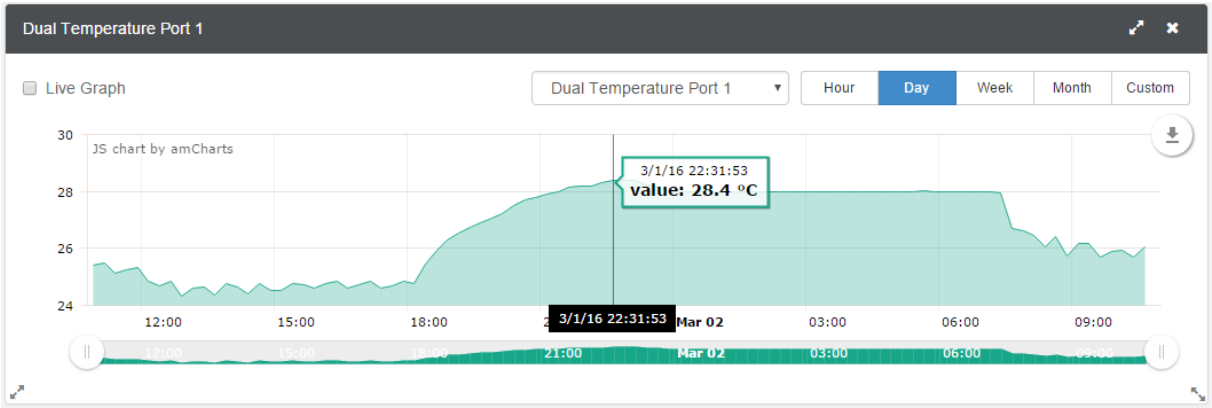
Enable/disable graph data collection per sensor, and display the graph display window for the Summary page

We'll explain the Graph feature in more detail below.

Graph feature

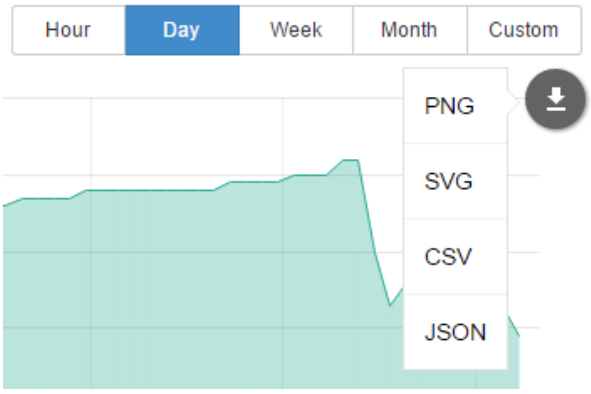
After you've enabled the data collection for a sensor, you can choose to display specific time intervals of the stored data: hourly/daily/weekly/monthly and custom display interval.

You can also export the recorded data in multiple formats.



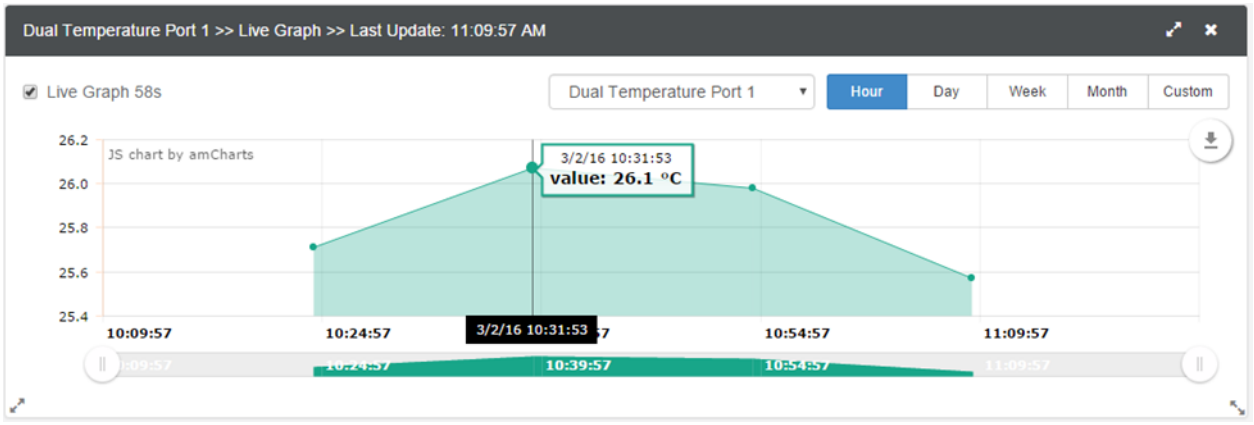
In this example picture, we've chosen to display the temperature sensor's daily maximum.

You could also resize the graph window (including full screen) and move the scale to display more or less data.

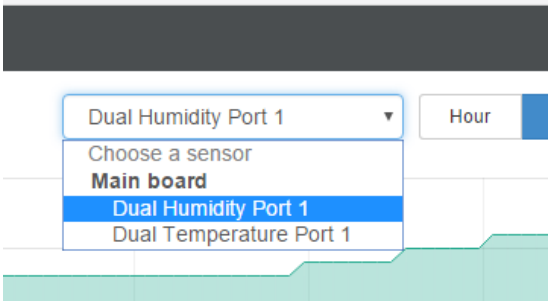


You can choose to export the graph data in selected formats by clicking on the icon on the right.

The file will be downloaded automatically and assigned a file name that will contain the sensor's name, IP address of the unit, and the date and time.



By choosing the Live Graph option, you can get continuous update of the graph data (by default every 60 seconds). If you don't use this option, the graph data needs to be refreshed manually.

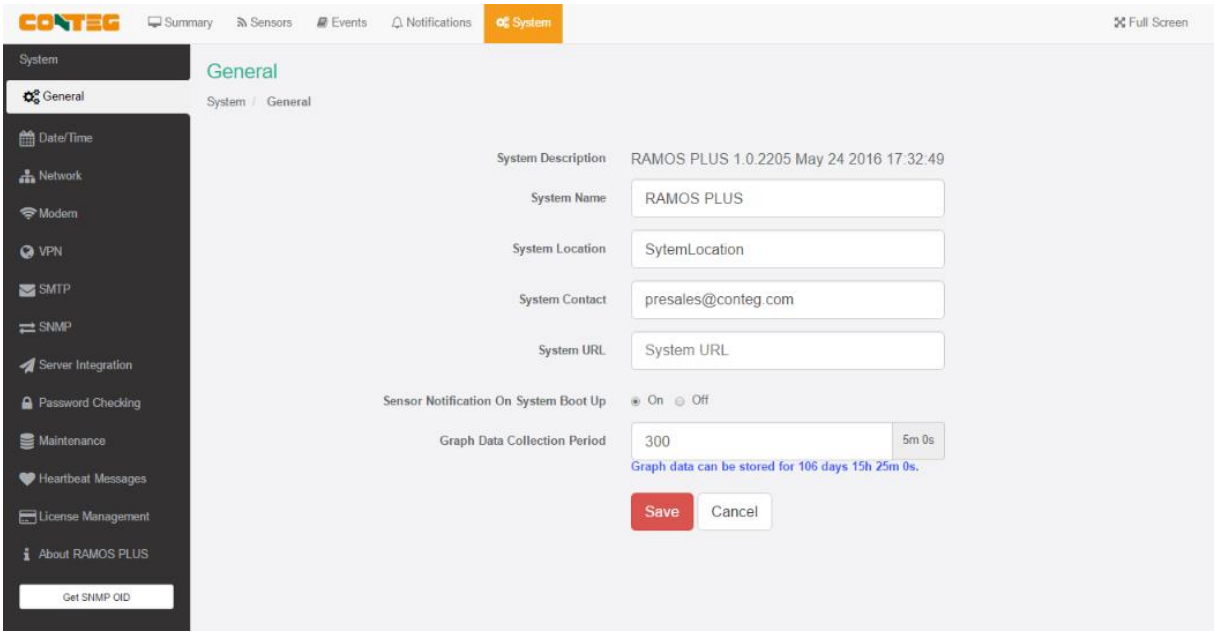


To change to a different sensor's graph, choose it from the drop-down menu.

Note that you could only choose a sensor here that you've already enabled the graph data collection for.

System page

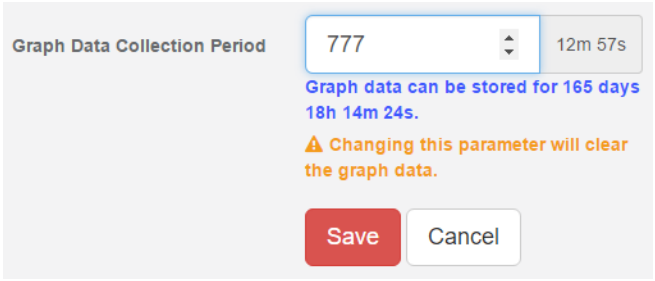
General



Here you can change general settings for the device.

The unit's firmware version is shown in the Description field, and the System Name/Location/Contact options are user configurable.

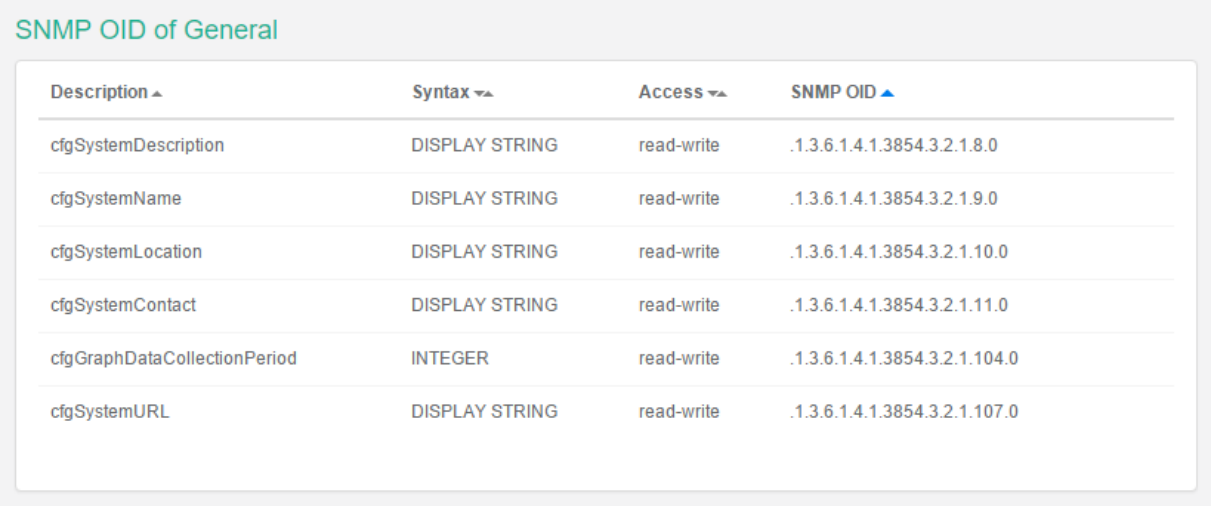
You could also specify the System URL option, for quick access of a custom part of the Web UI for example, but you can specify any URL.



By changing the **Graph Data Collection Period**, you can choose how frequently the data is sampled. Note that if you had stored graph data previously, changing this setting will clear the data.

Note: a Low Power Mode is selectable from Conteg Pro Server, on the Web UI this option is not shown.

On each System subpage you can see a **Get SNMP OID** button (where applicable):

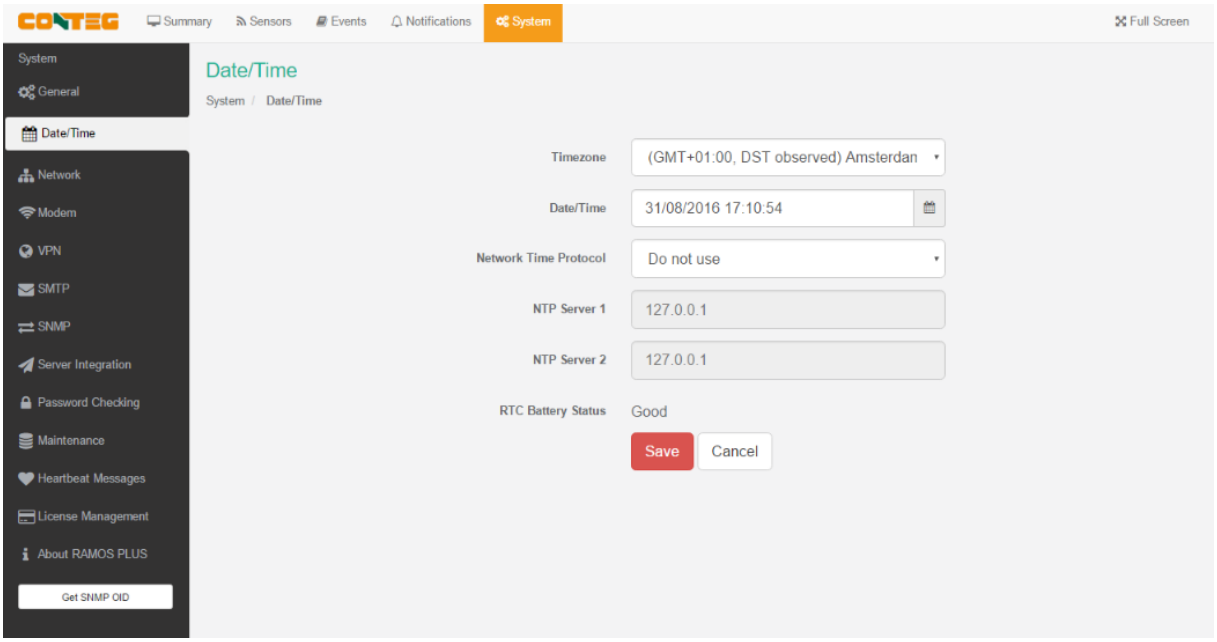


This will give you a popup window with all relevant OIDs for the actual page (here the General page is shown).

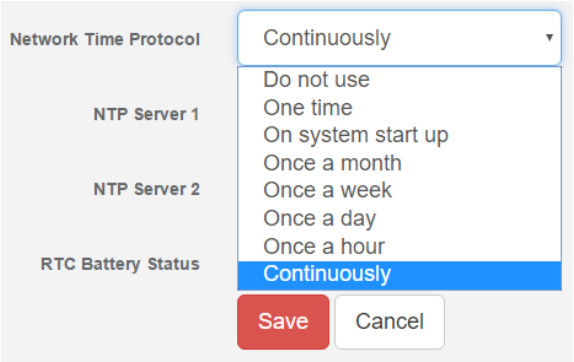
You can use OIDs for SNMP calls and in custom scripts, or for setting up the unit for monitoring by a third party NMS software such as WhatsUpGold or Paessler.

This button is also accessible on the Sensors page.

Date/Time

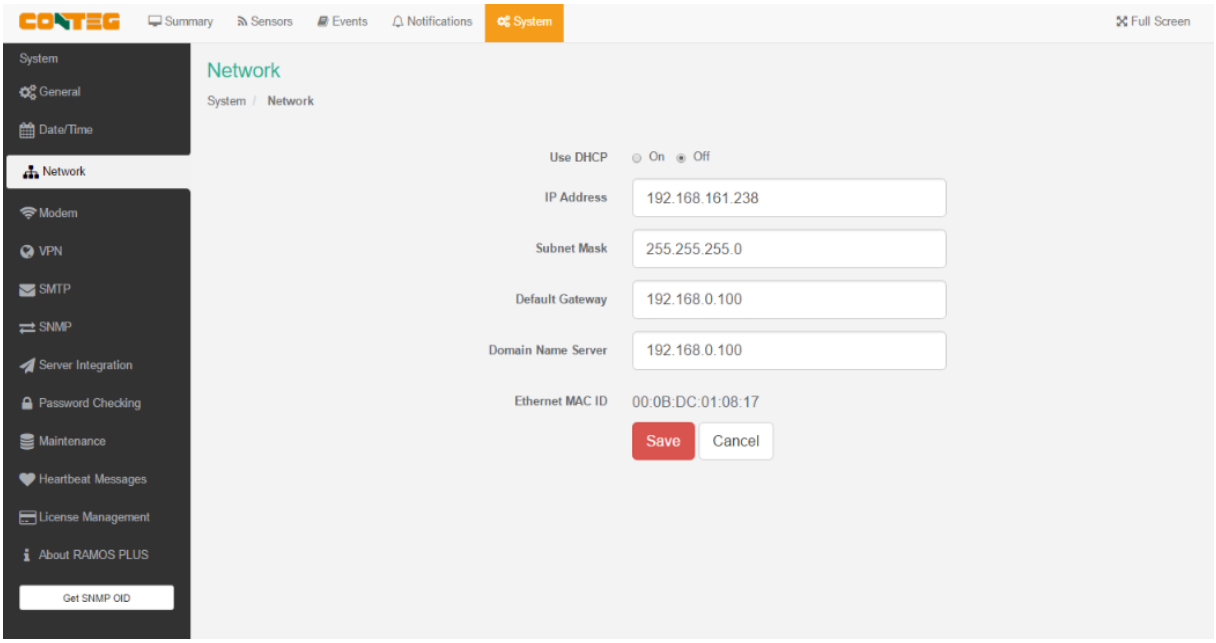


The system date and time with time zone is user configurable, with NTP server synchronization (if the unit is connected to CPS (CONTEG Pro Server), then it will sync with the APS NTP service), also displayed the status of the RTC battery (good/bad).



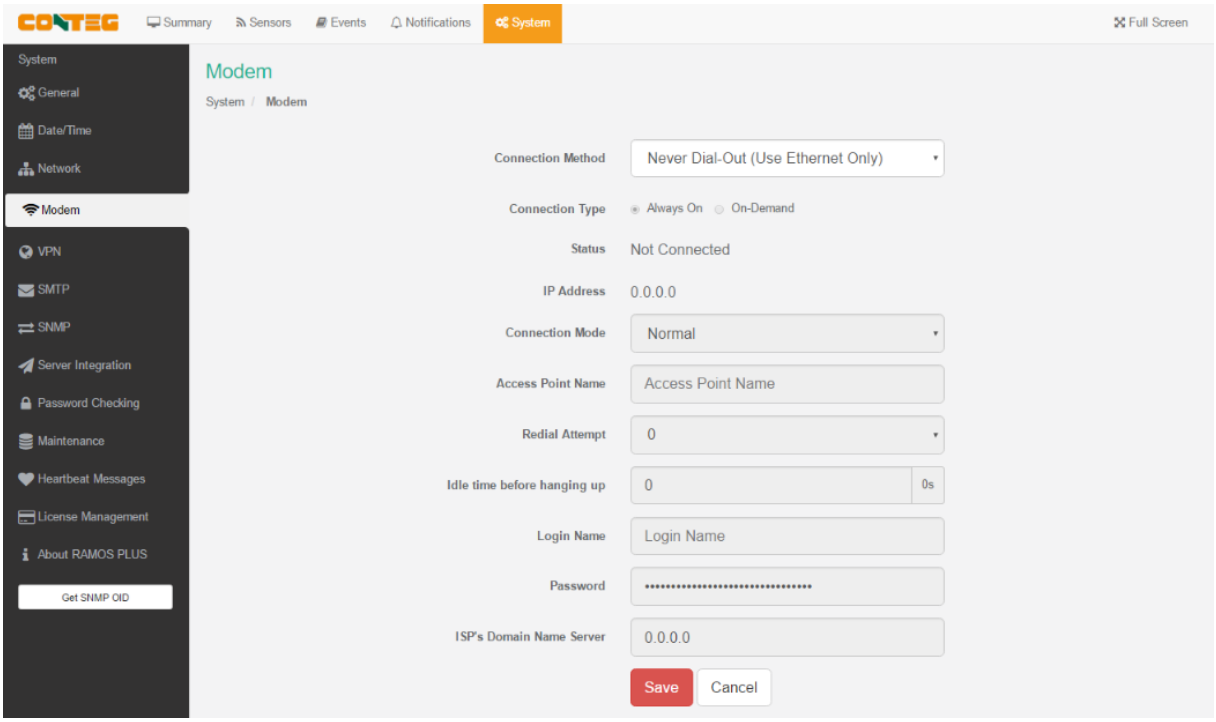
You can also select the frequency of NTP synchronization with the drop-down menu.

Network



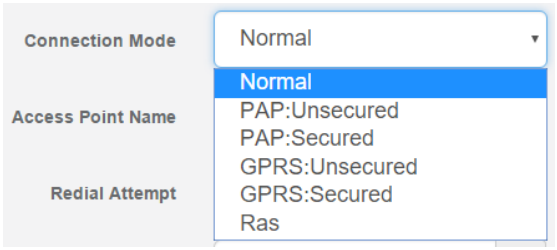
The unit's MAC ID is displayed here, and all user configurable options for IPv4 with fixed IP or DHCP client mode.

Modem

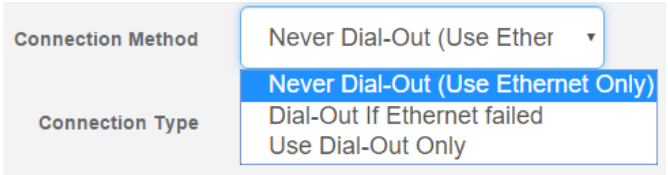


If the unit is equipped with the internal modem module, then the modem's **Dial-Out configuration** can be set up here for data connections. Contact your service provider for the correct settings.

You can also view the state of the connection and the assigned IP address when the connection is established.



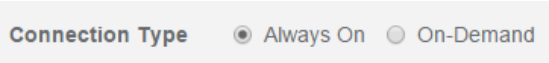
You may select a different *Connection Mode* (PAP/GPRS/RAS).
The most commonly used is *GPRS Unsecured*.



You may change the *Connection Method* as follows:

- *Never Dial Out (Use Ethernet only)*: the unit will never try to use the modem for sending out notifications. If you don't have Ethernet connection, you should change this setting; otherwise you won't get any notifications.

- *Dial-Out if Ethernet failed*: the unit will only use the modem for sending out notifications, if the Ethernet connection fails.
- *Use Dial-Out Only*: the unit will only use the modem to send out the notifications, regardless of the state of the Ethernet connection.



Also you may change the Connection Type:

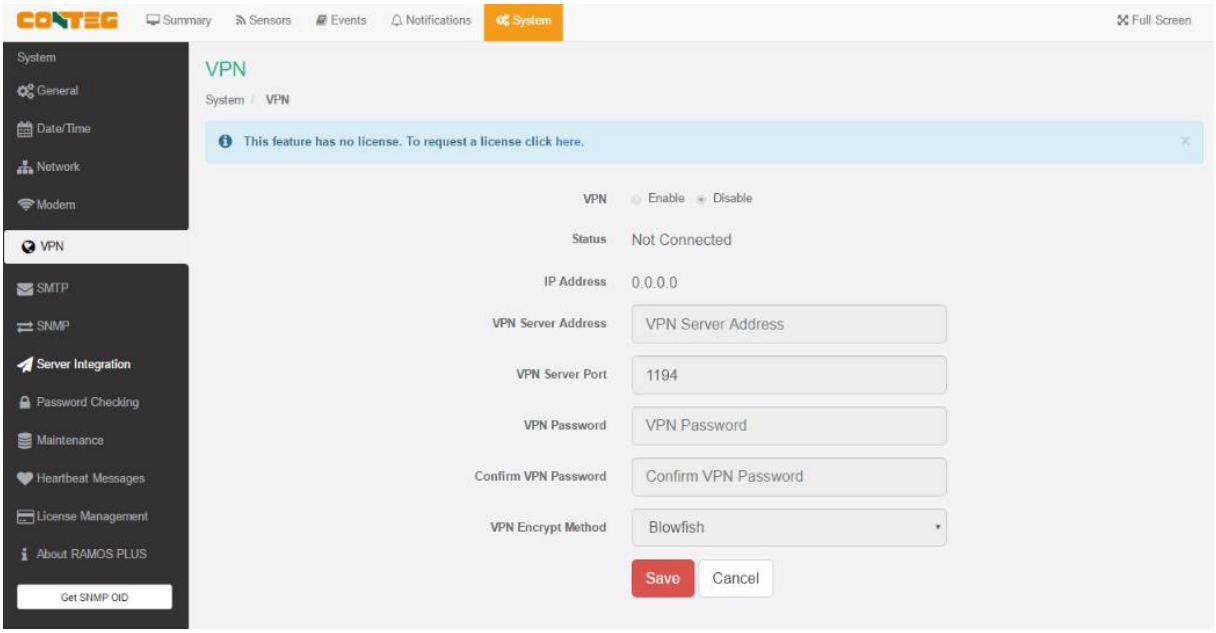
- On-Demand: the unit will initiate a connection only when it's necessary for sending out the notifications.
- Always On: the unit will keep the connection up, even when there is nothing to send.

Note 1: There's no auto-detection feature for the internal modem module, the configuration is always shown even if your unit is not equipped with the module.

Note 2: Only insert and remove the SIM card when the unit is turned off. Otherwise you can damage the SIM and the modem.

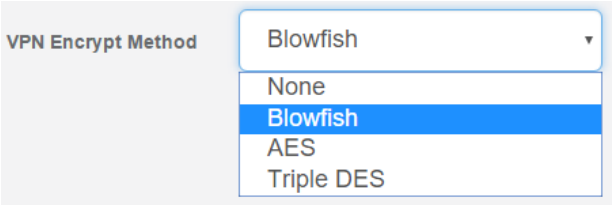
Note 3: The PIN code for the SIM card needs to be removed; otherwise the modem can't use it.

VPN



This feature requires a separate license. You can read more details about the licensing later in this manual.

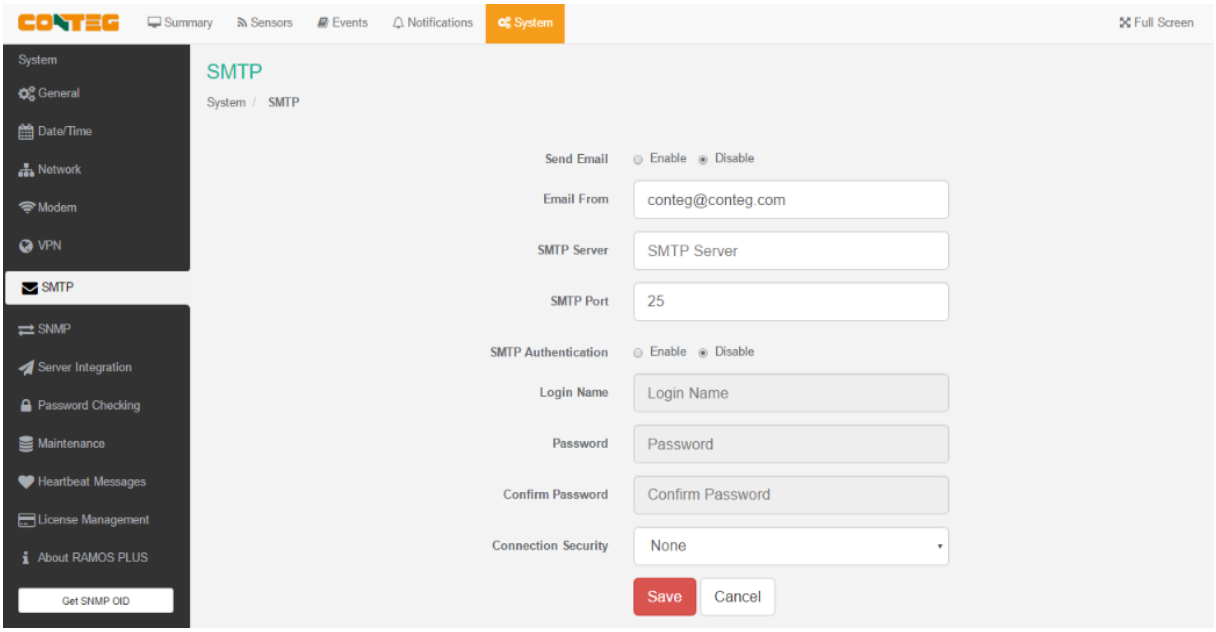
This feature is used by connecting the RAMOS PLUS with the CPS VPN server. After the license has been activated and the CPS VPN server is set up, you'll need to fill out the same options here to be able to use the VPN connection.



Note 1: You can also configure these settings from the APS console for the unit.

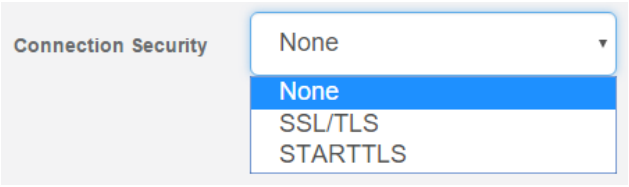
Note 2: If you use the VPN option, the maximum number of sensors that can be used by the unit will be reduced to 50.

SMTP



The SMTP server configuration options are shown here, it's required to be set up for the Email actions.

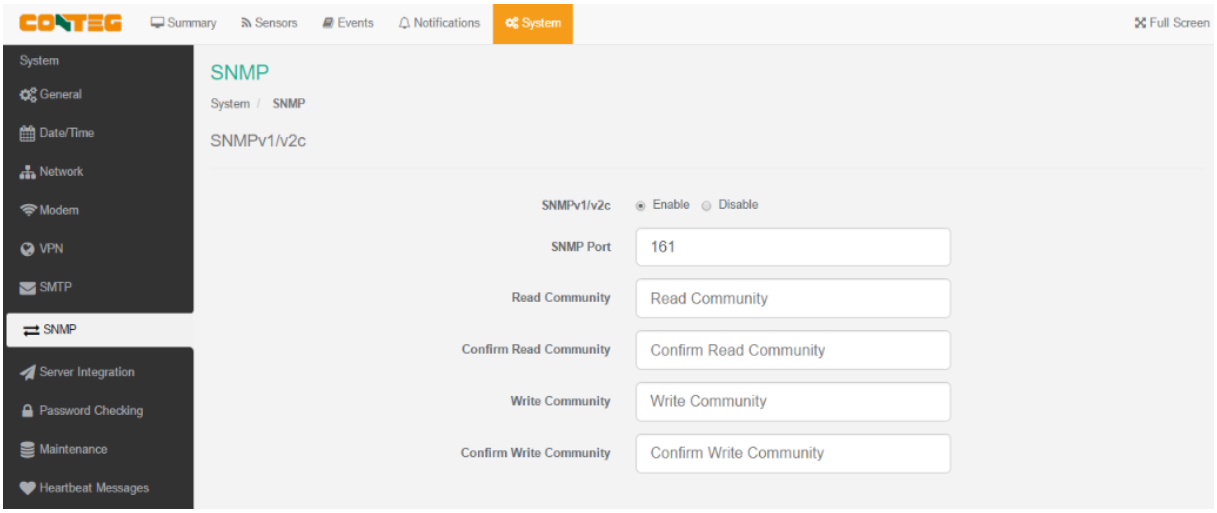
Fill out all parameters; the address in the *Email From* parameter will be used by the Email actions by default, but you could change it if your mail server supports it (when it's not required to match the SMTP user for example).



SSL/TLS and STARTTLS are supported for the connection security.

You could also turn off any email sending from the unit by disabling the *Send Email* option.

SNMP

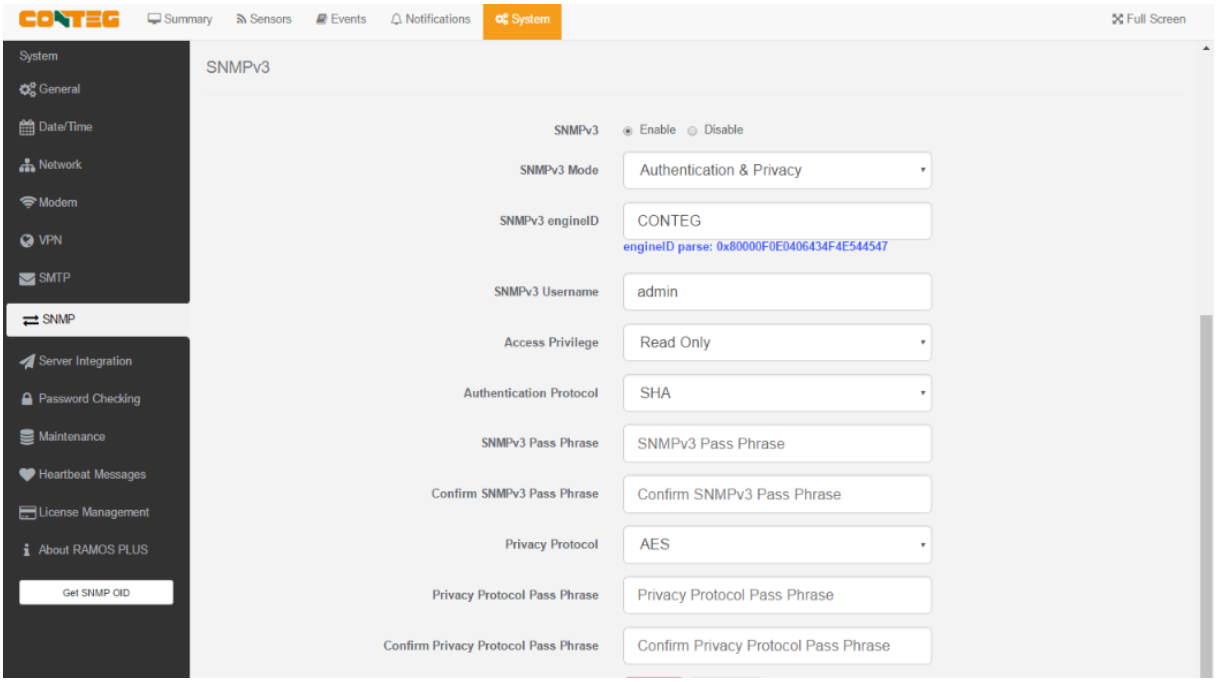


The SNMP service configuration options are shown here, it is required for SNMP operations.

SNMPv1 is enabled by default, with community password "**public**".

Scroll down for SNMPv3 options.

SNMPv3



The SNMPv3 options can be found by scrolling down on the SNMP page.

This feature requires a separate license. You can read more details about the licensing below in this manual.

Below we'll give a quick description of each setting:

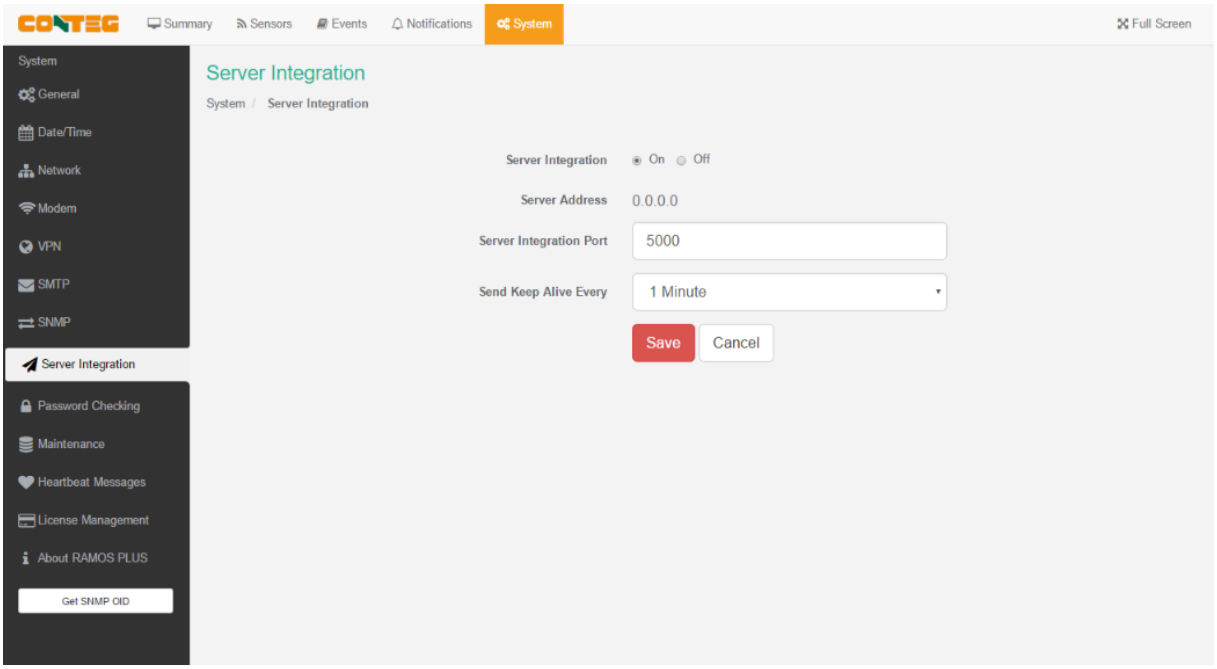
Level	Authentication	Encryption	Description
No Authentication	Username	No	Match Username (same as SNMP v1/v2c)
Authentication Only	MD5 or SHA	No	Auth Based on Algorithms (check password)
Auth&Privacy	MD5 or SHA	Yes - DES	Auth Algorithms and Encryption

Basically if you select **No Authentication** then the setup will be the same as with SNMP v1 and v2c versions: authentication is only checked by unencrypted username.

Authentication Only will provide password protection but no encryption.

Authentication&Privacy provides encrypted username and password protection.

Server Integration

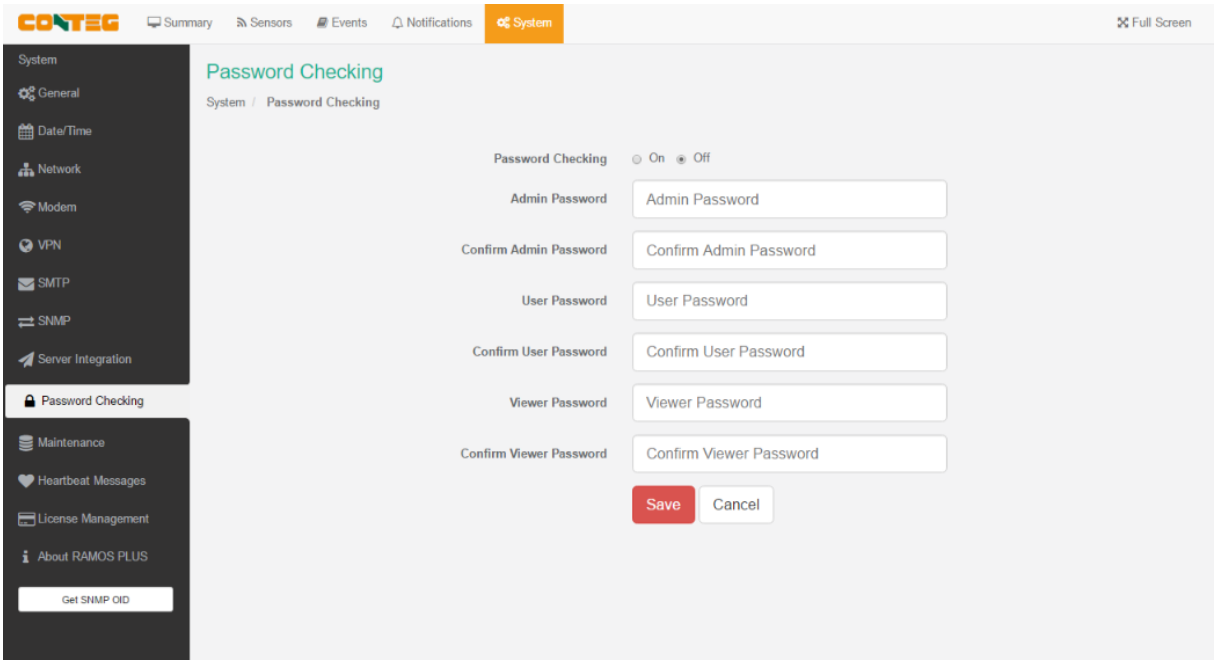


If the unit has been added to the CONTEG Pro Server console, the server's IP address will be displayed here. User configurable options are the CPS port and keep-alive period.

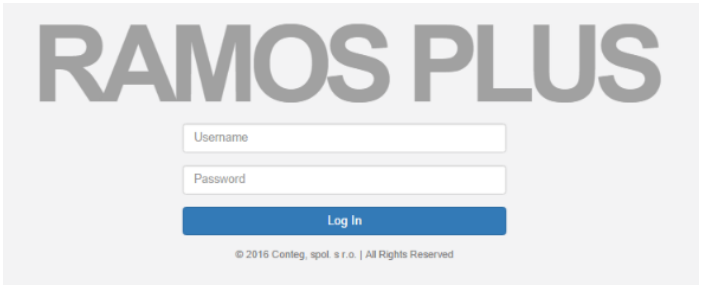
You can change the CPS port from the Web UI when the server's port changes.

Alternatively you can re-initialize your unit from the CPS console to re-establish communication.

Password Checking



Password checking for the Web UI can be turned on/off here, along with the option for specifying the password for the different user access levels.



After you enable the password checking, you'll need to re-login.

If you don't remember the admin password, you can hold the unit's reset button for 7-12 seconds to be able to log in to the Web UI without a password.

User access levels:

Admin - full access to all settings, system and notification configurations (default is public)

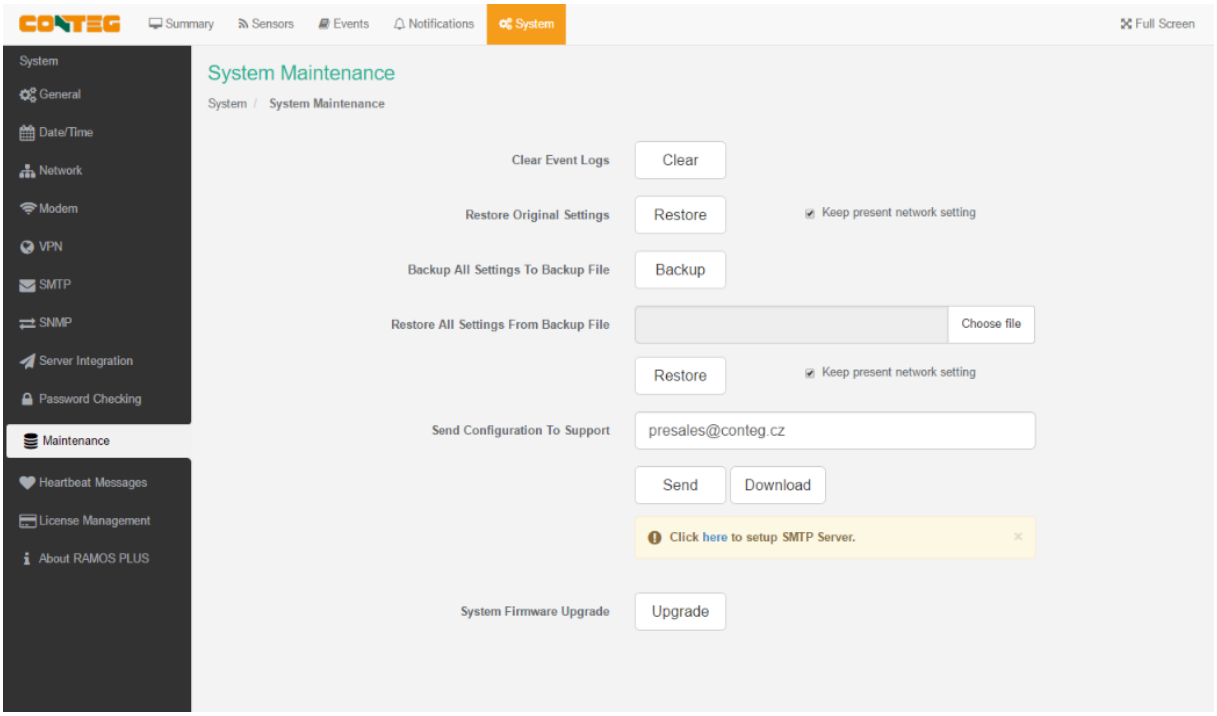
User - full access to all settings except for those which are the system-related such as network

Viewer - read-only guest access for every page

Note 1: The passwords can only be set from the unit's Web UI; this option is not available from APS.

Note 2: The default password is "public" for all access levels.

Maintenance



On this page the following options are available:

Clear Event Logs: clears all logged events.

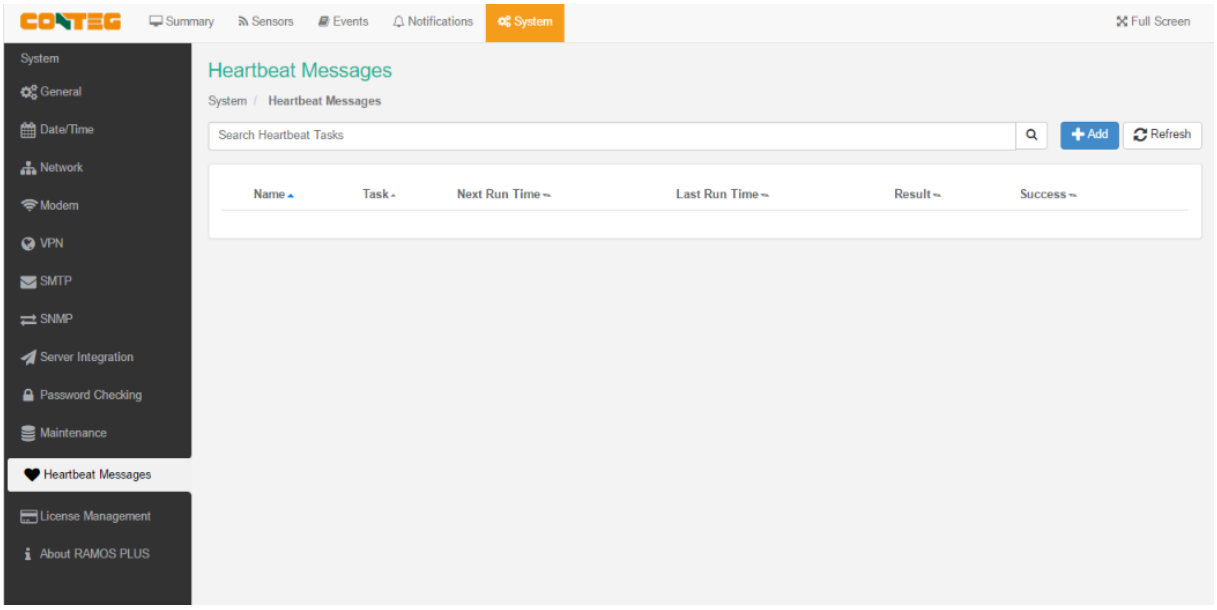
Restore Original Settings: removes all customized settings and returns the unit to factory defaults - you can also choose to keep the network configuration intact.

Backup/Restore All Settings: the unit's configuration can be backed up to a file and restored quickly and easily. You can choose to keep the present network settings, if the backup file is from another unit. The backup file contains all settings and notifications for the unit.

Send Configuration To Support: when asked by Support, this sends the unit's backup file to us.

System Firmware Upgrade: allows you to upgrade to the latest firmware of the unit - alternatively you could upgrade from CPS. We'll show you the process of the Web UI firmware upgrade below in another section.

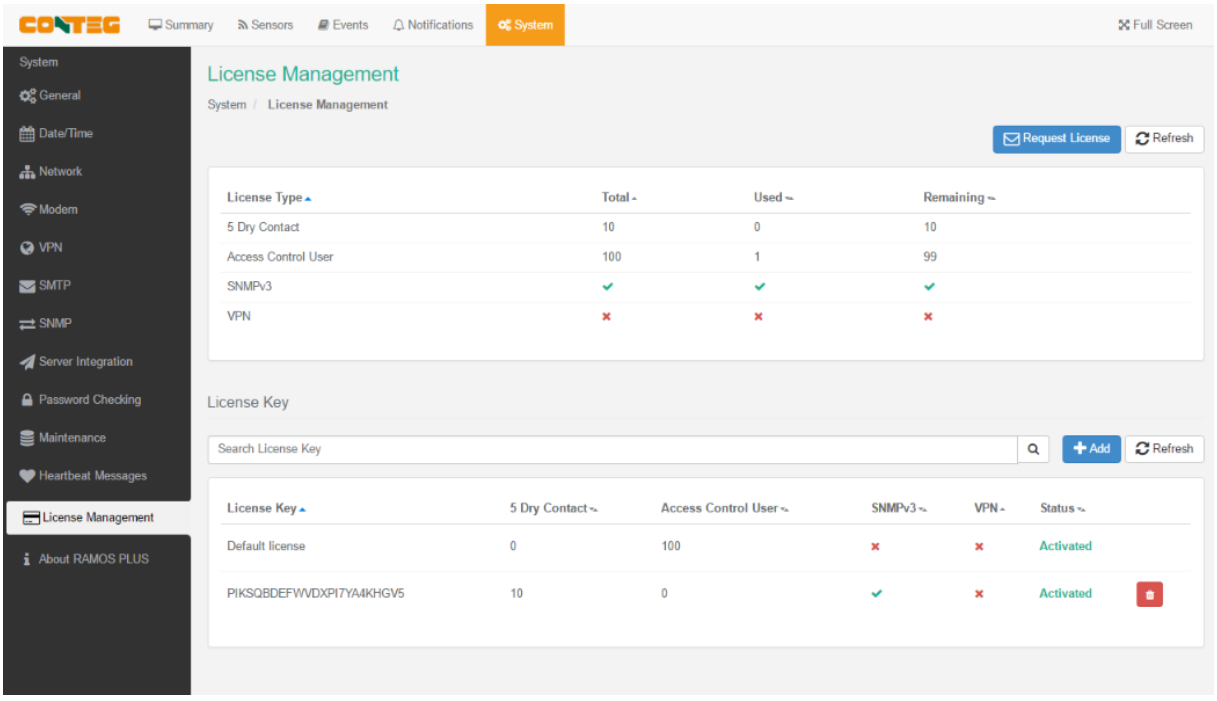
Heartbeat Messages



This feature allows you to set up periodical “keep alive” notifications task by email, SMS or SNMP Trap to indicate the unit is still working properly.

We’ll show you how to set up these in another manual with the other notifications and actions.

License Management



Here you can manage the purchased licenses for specific features on the unit.

For example you can request VPN license by clicking on the **Request License** button.

This will send an email to our Sales team with your unit’s MAC ID. You can then add the purchased license key with the **Add** button and activate this feature on the unit.

License keys can be backed up/restored with the backup file.

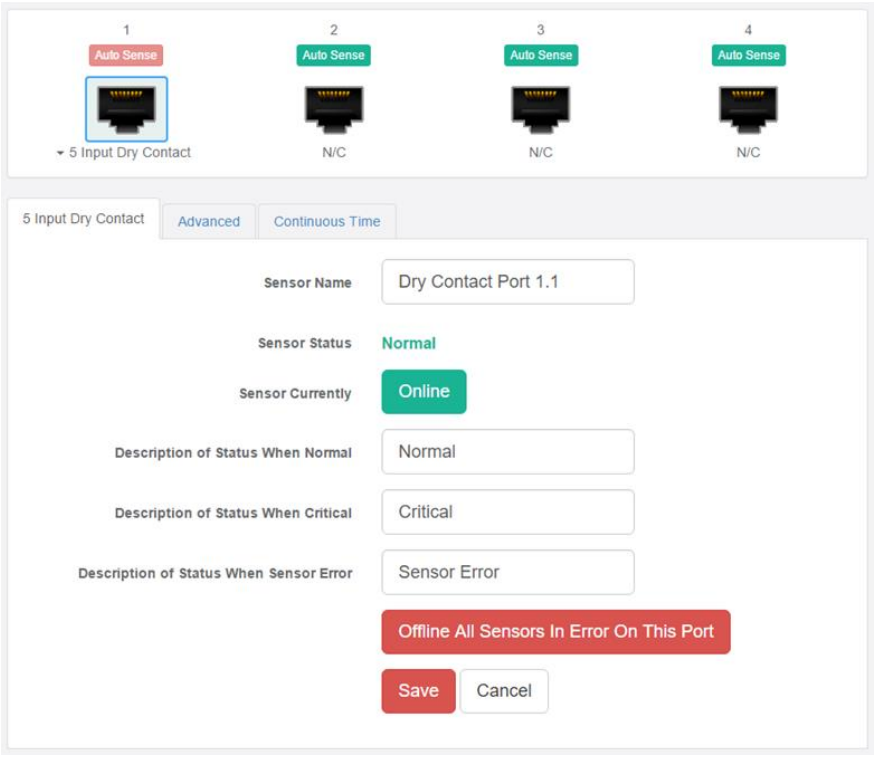
All keys are unique per device and per feature.

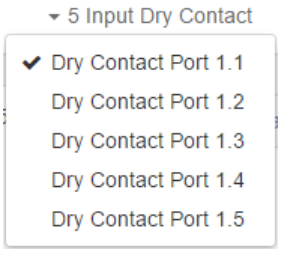
Features that needs separate licensing:

- **5 Dry Contact option**: Allows you to connect 5 dry contacts (input only) per sensor ports. See below for more information.
- **Access Control User licenses over 100**: The first 100 user licenses are free (1 is always used for the Admin user), and you can get more licensed users in blocks of 100; the limit is 1000.
- **SNMPv3 feature**: Allows you to use and configure secure, authenticated SNMP trap messages. (**Included in default**)
- **VPN feature**: Currently the CPS VPN integration is supported, to use a secure VPN channel between the unit and CPS. Please note that when using this option, the number of maximum sensors that can be used by the unit will be reduced to 50.

About Dry Contact Inputs

The dry contact inputs can be configured as **inputs only up to 5 Volts**.

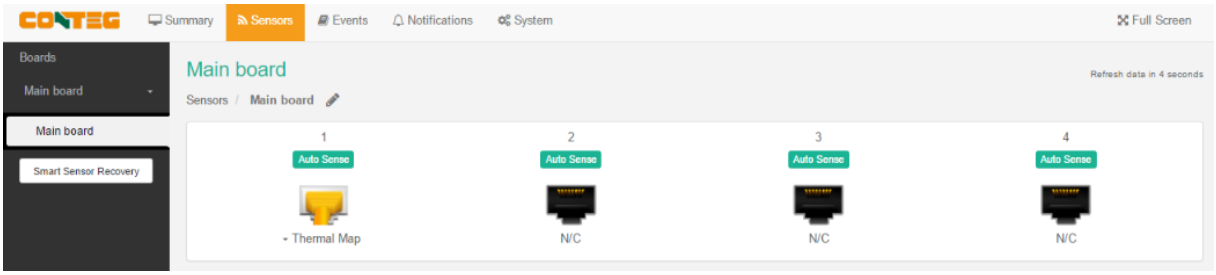




Practical applications:

The dry contact inputs can be used to monitor many types of equipment, for example, you can run the connection from warning lights on alarm panels to the dry contact inputs, so that when the warning light on the alarm panel is activated, the dry contact is triggered, thus allowing you to send notifications via emails or SNMP traps.

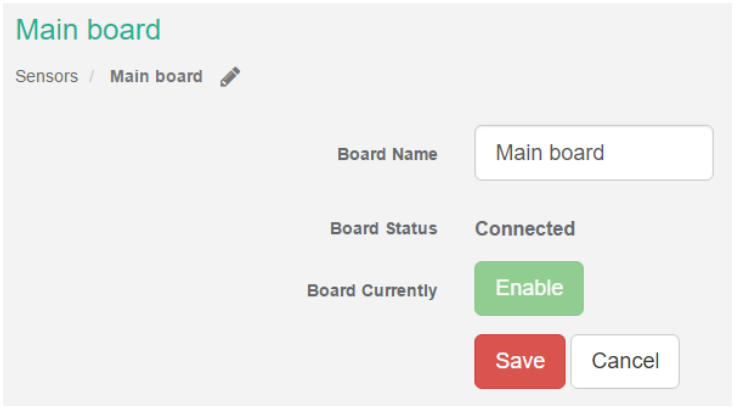
Sensors page



On this page you can view all sensors connected to the unit per port.

Non-connected sensors will be also displayed, until you re-attach or manually remove them from the configuration.

Data is refreshed automatically in 15 seconds.



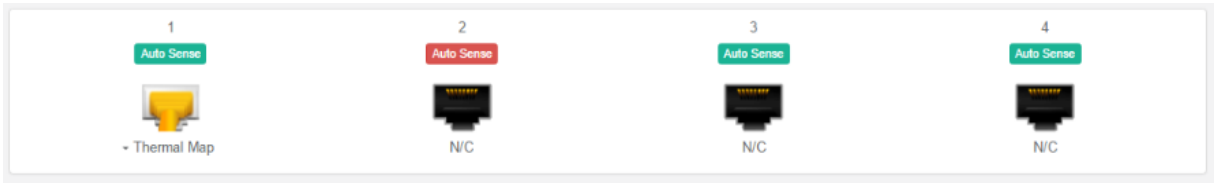
You could also rename the unit's Main board.

General options for all sensors

You can change the following general options for all sensors:

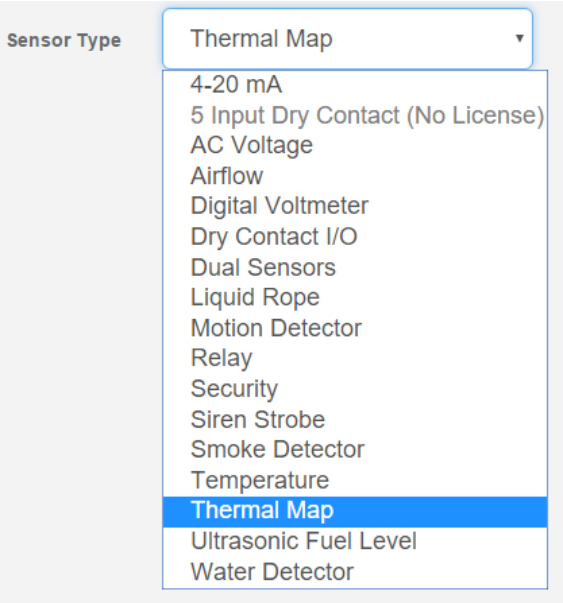
Disable Auto Sense

Click on the **Auto Sense** button to turn off the automatic sensor detection for a port.



This feature is useful if you want to simulate a sensor (this works for Relay type sensors) or to prevent a sensor from going offline state. Note however that the sensor will be in "sensor error" state if the unit can't get any reading from the sensor.

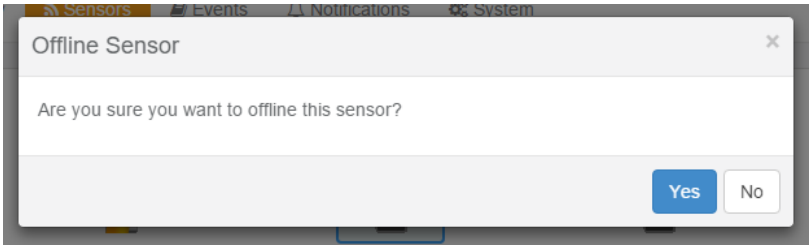
Choose Sensor Type



You can pre-configure a specific sensor type if needed, for example if you put the sensor offline before.

Offline a sensor

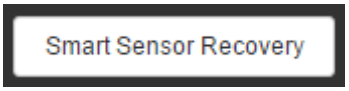
You can manually offline any sensor by clicking on the green **Online** button on the sensor's configuration page.



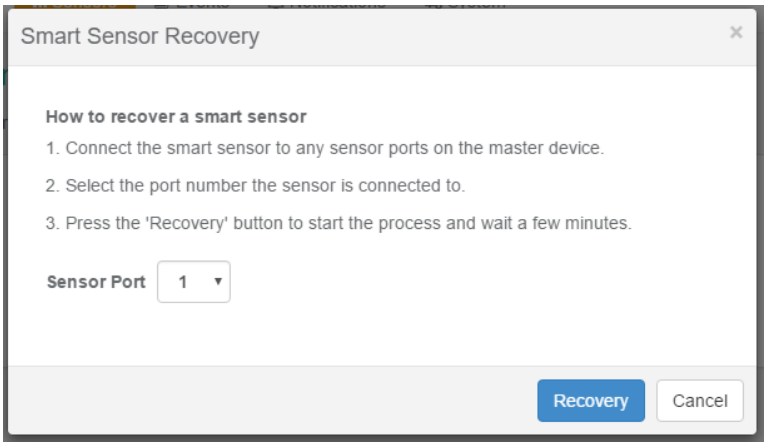
You'll be asked for confirmation in a popup window.

Note: if you change a sensor to "offline" it will no longer be displayed on the web interface. In order to reactivate it, you have to toggle it back to "online".

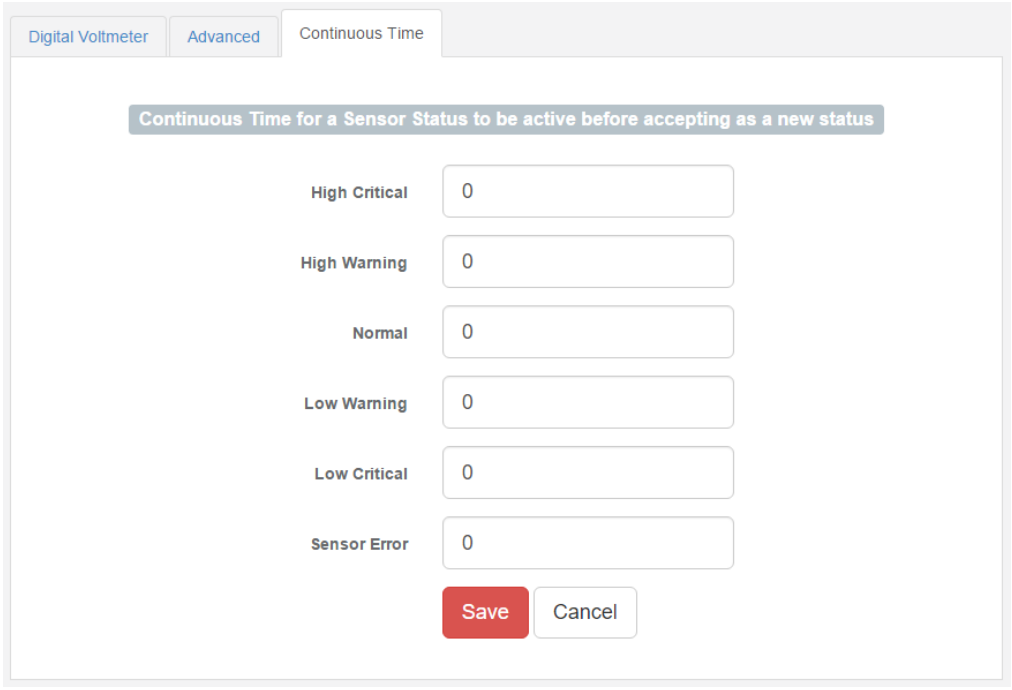
Smart Sensor Recovery



This feature will be used **only** for the new **Smart Sensor** type. The firmware can be updated on these sensors automatically, and if the upgrade has failed for some reason and the sensor becomes unresponsive, with this option you can recover them to the default firmware. It's not used by other sensor types.



Change Continuous Time



The following advanced functions are for setting the time frame in which the system should delay a notification being triggered when a sensor gives a reading that exceeds the thresholds (high warning, normal, etc).

Continuous Time to Report High Critical: This helps to eliminate unnecessary messages during minor fluctuations. You can set the amount of time to delay a notification of a status change from high warning to high critical. Enter the time in seconds and press the “Save” button. The amount of time that can be entered is between 0 and 65535 seconds which equals approximately 18 hours.

Continuous Time to Report High Warning: As above but delays notification for “High Warning”.

Continuous Time to Report for Normal: As above but delays notification for return to “Normal” state.

Continuous Time to Report for Low Warning: As above, but delays notification for “Low Warning” state.

Continuous Time to Report for Low Critical: As above but delays notification for “Low Critical” state.

Continuous Time to Report for Sensor Error: As above, but delays notification being sent for sensor going into an error state.

Example: An airflow sensor or humidity sensor may have temporary drops in readings which are normal operating characteristics; a logical time limit is set to show abnormal conditions.

Example sensor configuration

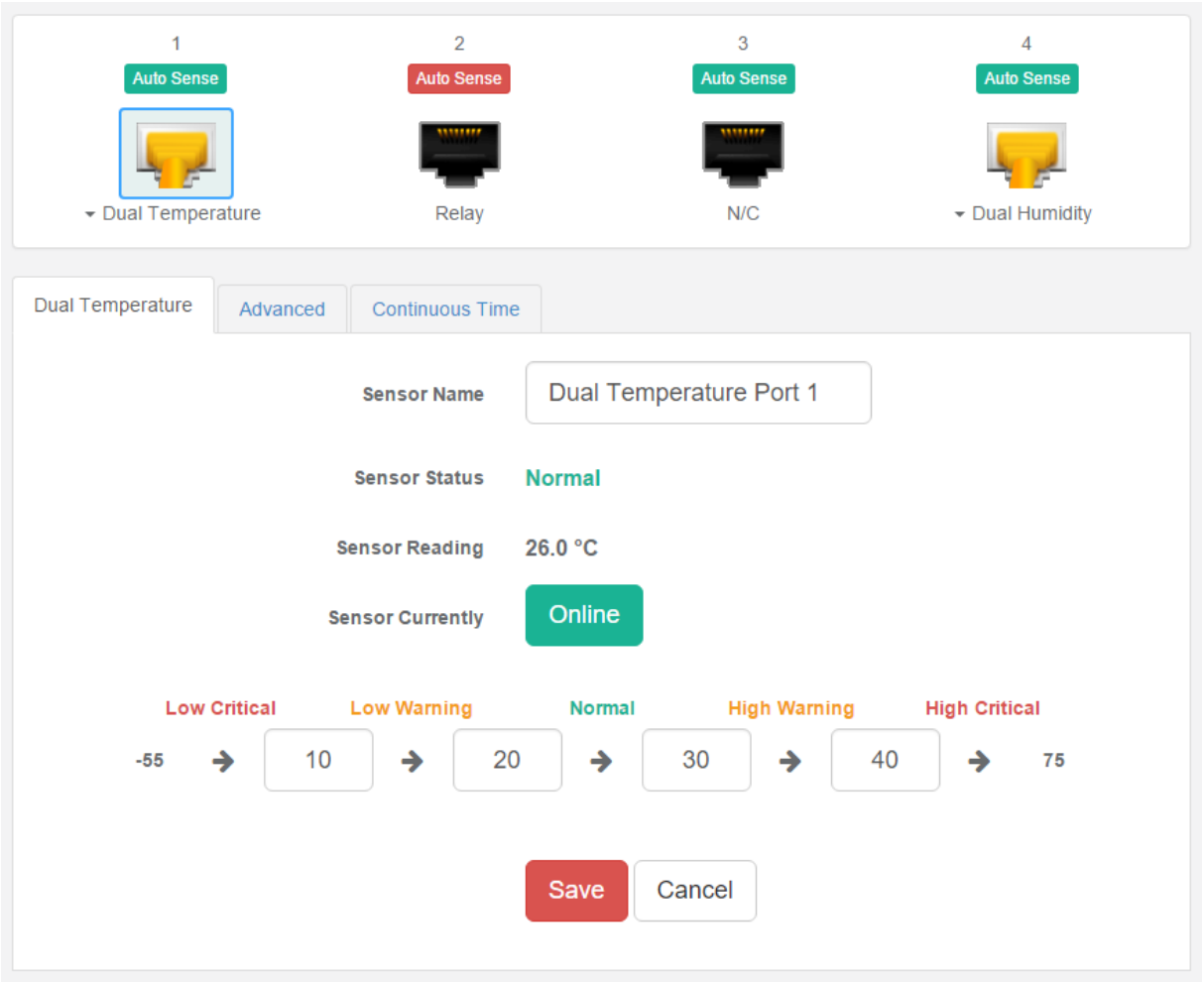
Below we’ll show the configuration of 2 sensor types: The Temperature/Humidity and a Relay sensor.

The configuration of these 2 types of sensors covers most settings that can be configured for other sensor types.

Temperature/Humidity Sensor

Click on the sensor port where the sensor is connected to open the sensor’s configuration.

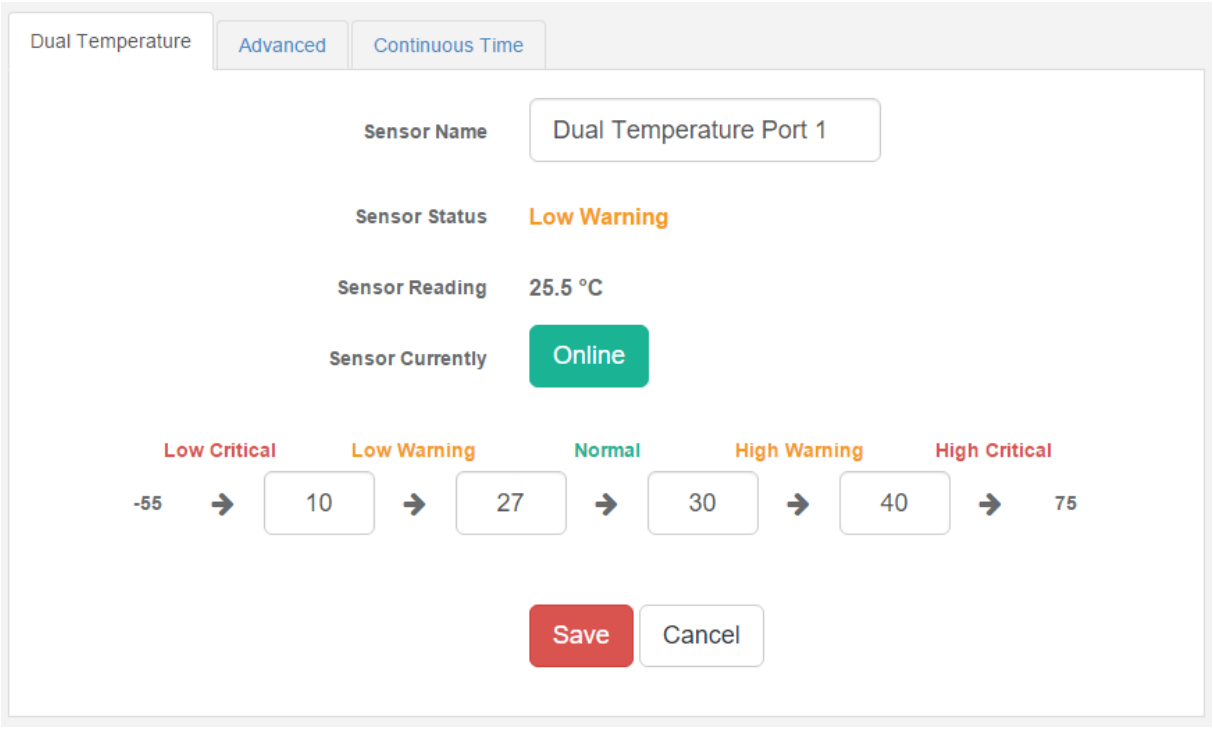
Note: another way of accessing this page is to click on the sensor from the Summary page.



From this page you can carry out various operations. You can view the current status (normal, low critical, high critical etc), rename the sensor, put it offline and change the thresholds. In the screen

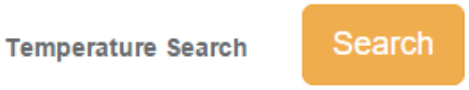
shot above you can see the sensor is indicating a temperature of 26 degrees °C, and a status of Normal.

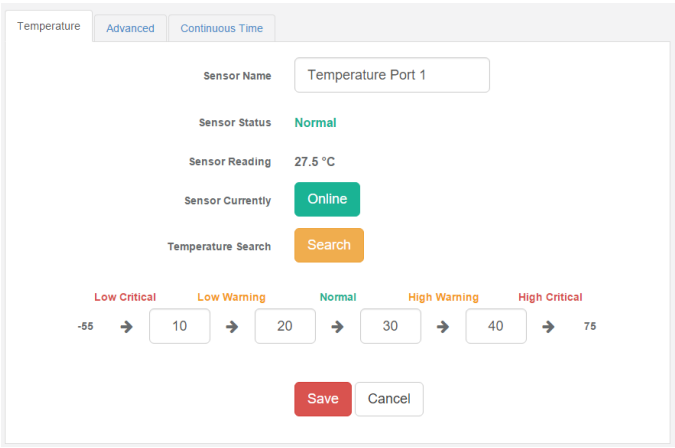
You can re-configure the thresholds for each sensor state. After changing a threshold value, click "**Save**". In the next screen shot you can see that a threshold has been changed to 27 make a new "low warning" state, and along with it the sensor status has changed:



Note: The Humidity sensor has the same configuration options as the Temperature sensor.

You might see a **Temperature Search** option for the connected Temperature sensors:

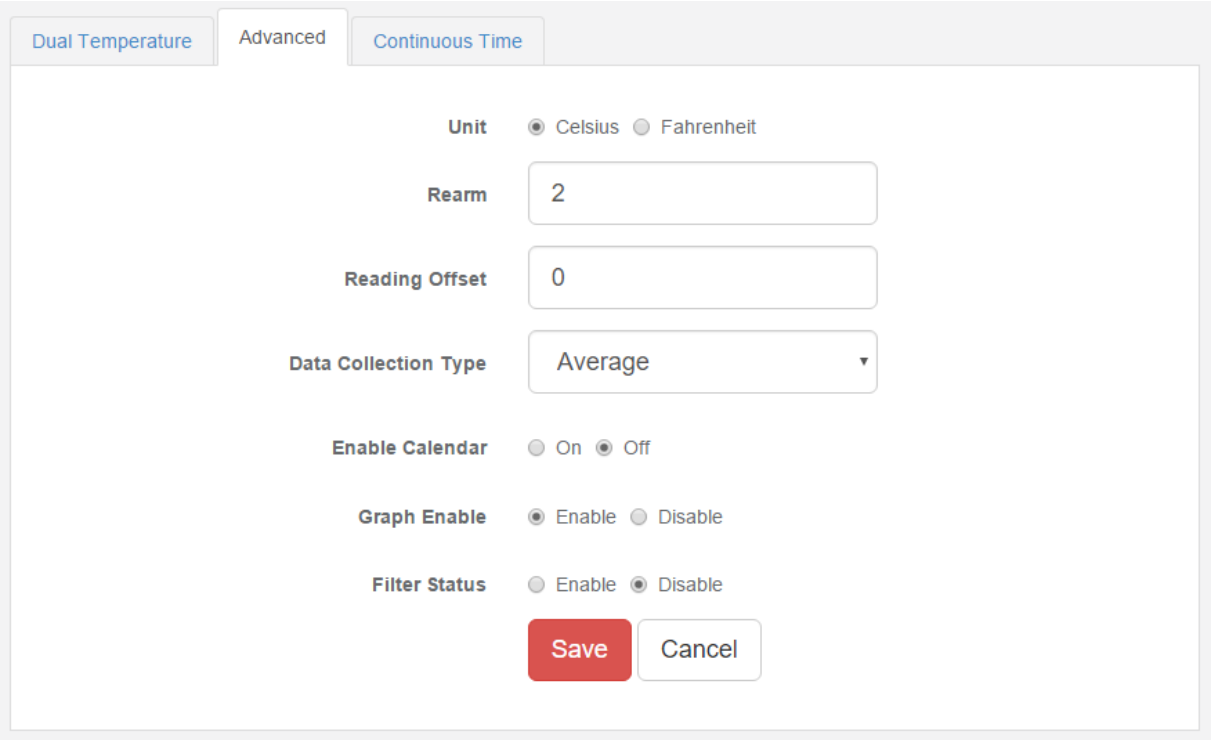




What this button does is to search for new temperature sensors in a chain, if you've connected more than 1 sensor in a Daisy-Chain Temperature (RMS-U-DST) sensor chain.

It is not available for Thermal Map Sensors (RMS-P-ST3H).

Advanced sensor configuration for Temperature/Humidity sensors

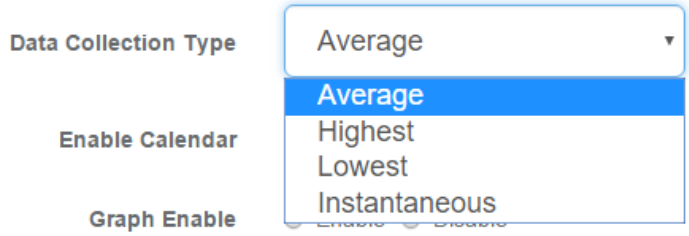


Units: changes units from °C to °F or vice versa.

Rearm: The Rearm parameter is useful for sensors whose values can vary such as the temperature and humidity sensors.

It is used to prevent the sensor from rapidly changing between two states. For example if the **Warning High** threshold for the temperature sensor is set to 80 degrees and the sensor were to vary between 79 and 80 you could be faced with a very large number of emails, traps, and events logged. The Rearm parameter prevents this by forcing the temperature to drop by the Rearm value before changing the state back to normal. In this example, if Rearm is set to 2 then the sensor would have to drop from 80 down to 77 before the status would change from **Warning High** back to normal.

Reading Offset: The Reading Offset feature is a calibration tool. If you wish to calibrate the temperature sensor, for example, you could enter an offset value of 5. This would mean if the sensor reads 20 degrees then it would record as 25 degrees. This figure can also be a minus figure (e.g. -5 would show 15 degrees instead of 20).



Data Collection Type: This refers to the data collection from the sensor and how the data is then displayed on the graphs.

There are four options for the collection of data: Average, Highest, Lowest and Instantaneous. The default setting is “Average”.

When the data collection type is set to “Average” the averaged value between 2 graph intervals is stored and output graphs for the daily, monthly, and yearly all have the same size on the screen. For the daily graph, each data point on the graph is one data point collected from the sensor. But for the monthly and yearly graph, in order to display more data into the same size as the daily graph, some consolidation on the data is needed. One data point on the monthly and yearly graph is an average of the sensor data in a range.

The maximum and minimum values showing on the monthly and yearly graphs are the value of this consolidated data and not the raw data over that period of that time.

The When the Data Collection Type is set to the Highest setting then you will get the graphing output displaying the sensors highest average readings during sampling. This is the same for the Lowest setting (lowest average).

With the Instantaneous setting you can store the actual value of the sensor at the sampling interval without averaging.

Graph Enable: In order to save the data from the sensors on the unit you will need to enable the Graphing feature on the unit. You need to change the Enable Graph to the On position and click on the Save button to enable the graphing. Note that you could also enable the graphing from the Summary page.

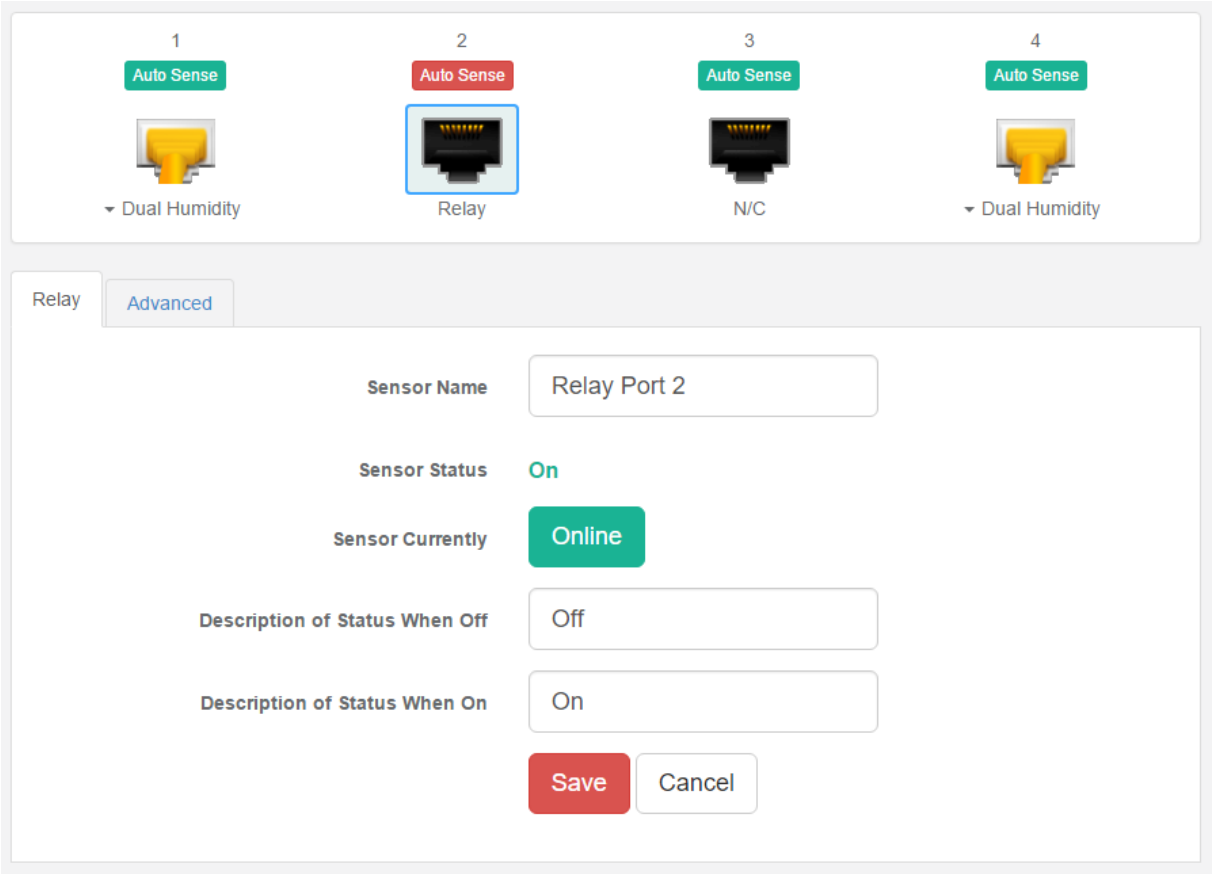
Filter Status: The Sensor Filter Status is a feature that you can Enable or Disable and when enabled will check the sensor status. If the status of the sensor changes very rapidly, then it will report how many times the sensor status changed, instead of having multiple separate entries in the syslog.

When enabled, this will report the changes and status of a sensor only once.

Relay Sensor

Click on the sensor port where the sensor is connected to open the sensor’s configuration.

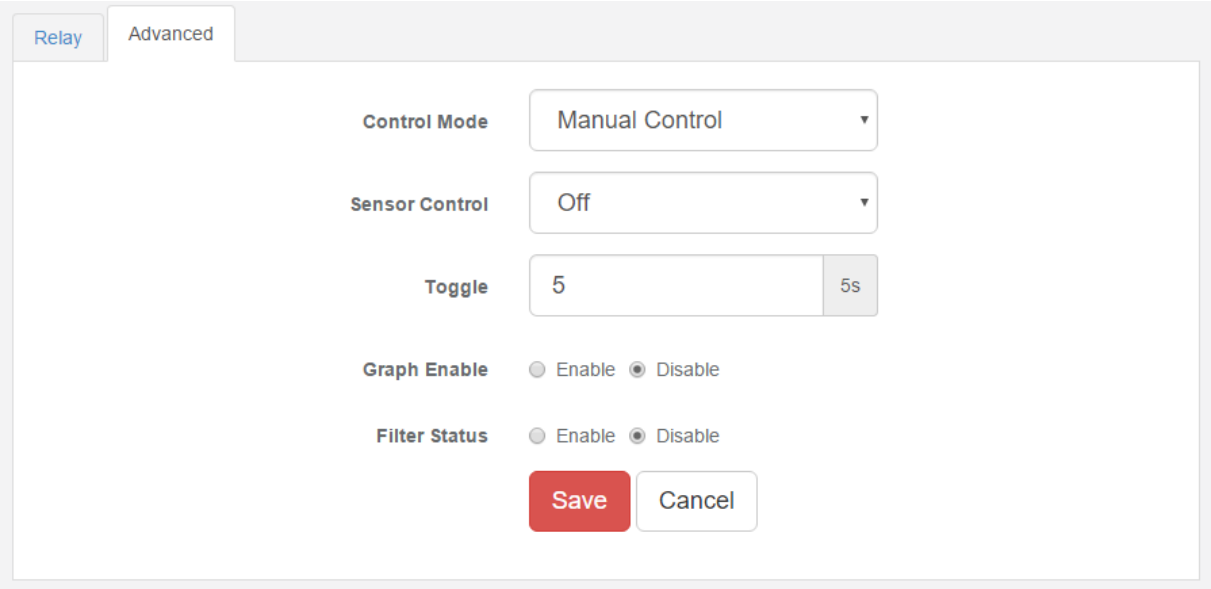
Note: another way of accessing this page is to click on the sensor from the Summary page.



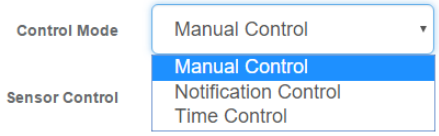
Description of Status When Relay Off: This field is the custom description, which will be displayed in the Relay Status field when the relay state is off. The same text is listed as one of the relay actions used to turn off the relay. Examples for this field are Close Door, Turn Pump Off, Turn Light Off, etc.

Description of Status When Relay On: This field is the custom description, which will be displayed in the Relay Status field when the relay state is on. The same text is listed as one of the relay actions used to turn on the relay. Examples for this field are Open Door, Turn Pump On, Turn Light On, etc.

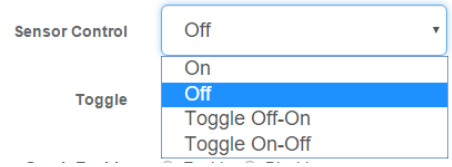
Advanced sensor configuration for Relay sensors



Control Mode:

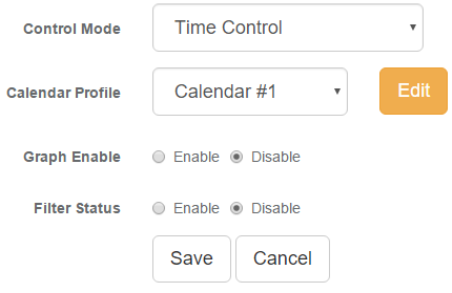


Manual Control allows you to manually control the relay using the "Sensor Control" option by controlling the cycle of the relay in an on-off-on or an off-on-off cycle. You can also set the "Toggle" (Cycle Time) here in seconds.

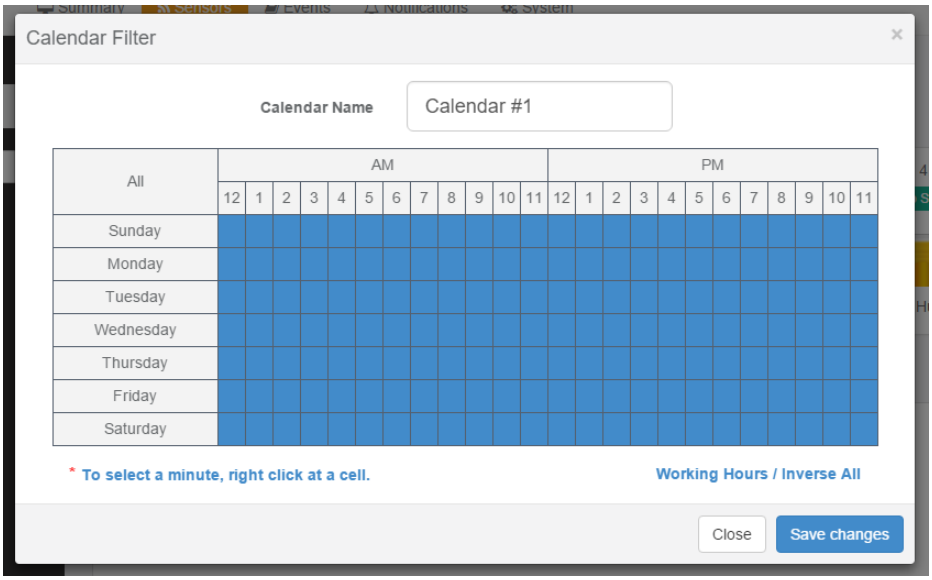


Notification Control allows you to link the relay to an action. The following actions can be chosen in an action: Turn on until sensor normal, turn off until sensor normal, cycle the relay, turn on until acknowledged, and turn off until acknowledged. You can also turn the "Sensor Normal Relay State" to on or off. We'll explain more about this option in the Notifications manual.

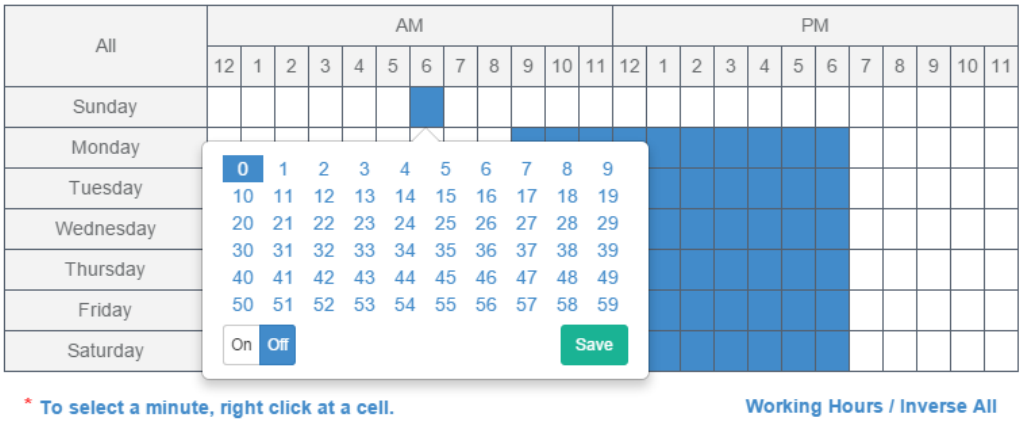
Time Control allows you to setup a Calendar Profile for what days and times you want or do not want the relay to be active.



Click on the **Edit** button next to a selected calendar to modify it.



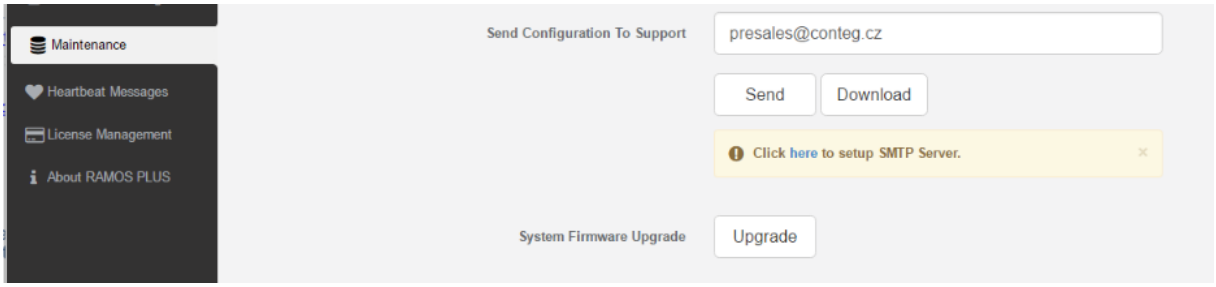
Blue cells mean that the notification is on, white cells means it's off.



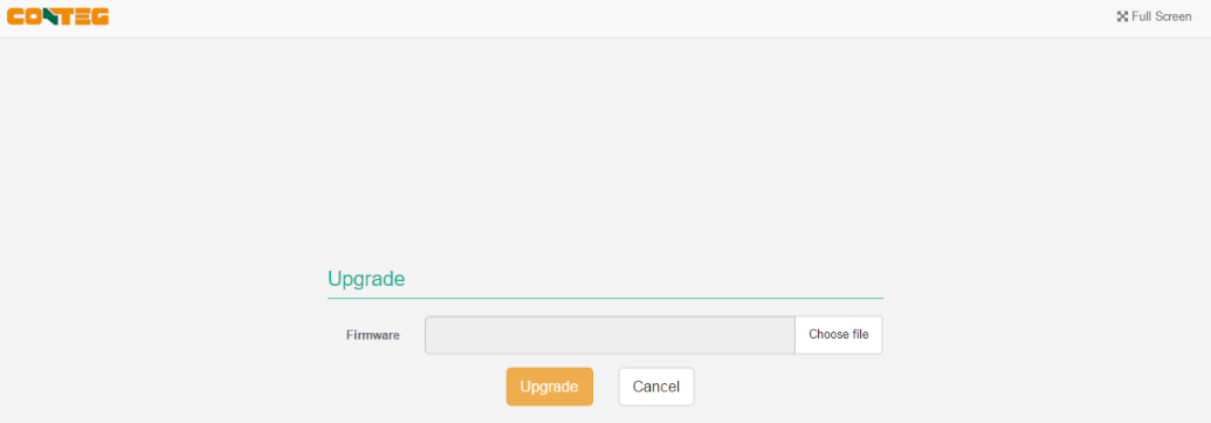
You can quickly select the Working Hours only, and specify a custom schedule down to minutes by right clicking on a cell.

Firmware upgrade through the Web UI

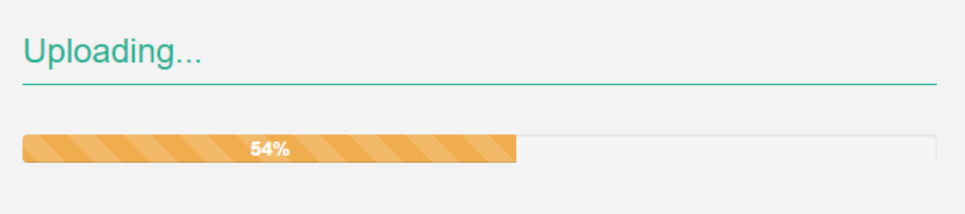
The firmware upgrade process is very simple and straight-forward.



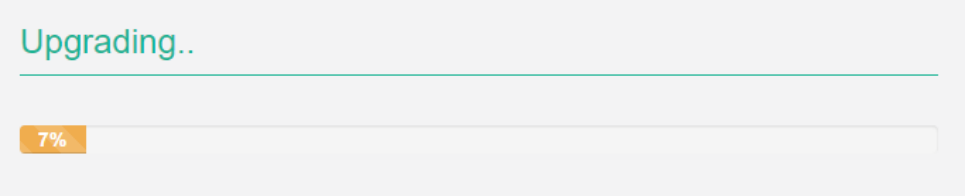
Open the **System/Maintenance** page and click on the **Upgrade** button at the System Firmware Upgrade section.



This will start the Upgrade page. Choose the firmware file from your PC and click on **Upgrade** to start the process.

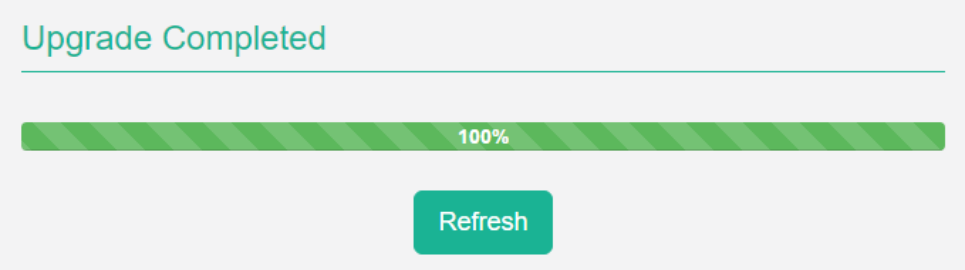


First the file will be uploaded to the unit…



…then the upgrade process will run. The whole process can be done in a few minutes.

The Power/Ethernet LED will be red during the upgrade.



The unit will reboot at the end of the upgrade. Click on the Refresh button to reload the Web UI.

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