

High Performance Air Velocity and Temperature Sensor with Full-Color Touch Screen Display

Complete Kit includes:

- Sensor Display Panel
- Sensor probe and mounting clamp
- Power Supply



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Product Overview

Congratulations on your purchase of the RoosterTM Sensor100, the next-generation air velocity and temperature sensor, for monitoring and alarm system for critical HVAC and process control applications where airflow is required to be viewed, monitored, alarmed, and even communicated to building and laboratory systems.

Degree Controls Inc. designed the Rooster[™] Sensor100 to meet the demand for high performance air velocity and temperature sensing applications and uses an intuitive, glove-friendly, color touchscreen interface, and best-in-class air velocity sensing. This product is design with a probe style sensor to reach into ducted flows in building, process, datacenter and HVAC applications. An instrumentation class sensor is used to eliminate trouble alarms and provide best accuracy across wide temperature ranges. The Rooster[™] Sensor100 comes calibrated with NIST certificate, from 0.15 – 20.0 m/s [30 – 4000 fpm]. Different calibration ranges can be ordered, for more information, contact Degree Controls, Inc.

The Rooster[™] Sensor100 uses a bright, backlit display and contains many simple-to-use features, and configuration capabilities, built into an intuitive user interface that requires little to no training to learn. Password-protected access tiers ensure greater safety in a range of environments by limiting access to critical functions and system settings for specific, authorized users.

The Rooster[™] Sensor100 is the first airflow sensor with USB-based plug and play firmware upgrades, to keep your product current and operating to the latest standards. Register with us to receive these product updates at http://www.degreec.com/en/support/register.html

This manual will guide you through installation, firmware upgrades, alarm control settings, and the full range of features for the Rooster™ Sensor100.

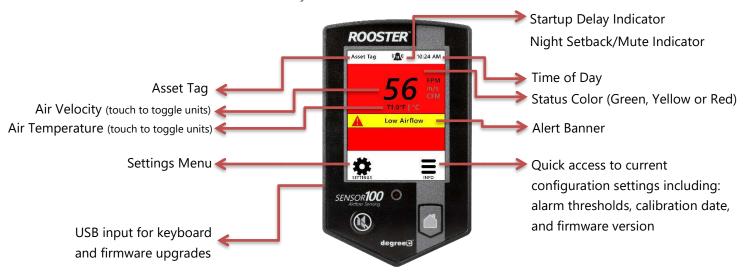
Hard Button Overview



Returns the user to the home screen when pushed from any menu or info screen. * Cannot be used to abort ome critical system functions.*

This red LED will flash while an airflow alarm is active. The red LED will also flash if Night Setback alarm is active. In all other cases, this LED will remain off.

Soft Buttons and Home Screen Layout



FEATURE OVERVIEW

Custom Asset Tag

Users logged in as EH&S can change default "Asset Tag" to a custom tag. This is useful for naming the sensor in larger distributed systems, or to denote a company asset number. The user may set a 12-digit numeric asset tag with the provided on-screen keypad OR plug in a USB interface keyboard to enter a 12 character alphanumeric tag.

Home> Settings>System>Advanced>Configure Asset Tag

Clock

Users logged in as EH&S or Certifier can set time, date and change clock to display in 12 or 24 hour format.

Home> Settings>System>Time>Date and Time Settings

Keypad Sounds

Users may toggle keypad beep sounds on and off.

Home> Settings>System>Alarms/Sound>Key Beep

Alarm Volume

Users can toggle through low, medium or high alarm volumes. If logged in as an EH&S or Certifier, a global minimum volume threshold can be set. This restricts a standard User from setting an alarm volume too low for particular facility safety requirements.

Home> Settings>System>Alarms/Sound>Device Volume

On-Screen Alert Banners

A yellow banner will appear beneath on-screen velocity readings to alert users of the following scenarios: 1) Uncalibrated Sensor 2) Sensor Failure 3) Low Airflow. Alarm latched status will also display here.

>Home

Toggle Velocity Unit Type

Instantly toggle displayed velocity units between m/s, fpm, or cfm by pressing on the displayed velocity reading on the home screen.

>Home

Toggle Temperature Type

Instantly toggle displayed temperature units from Fahrenheit to Celsius or vice versa by pressing on the displayed temperature reading on the home screen.

>Home

Password-Protected Access Tiers: Certifier & EH&S

Password protected access tiers enable advanced configuration options and features.

Home> Settings>System>Advanced>Change Passwords

USB Interface for Field Upgrade Procedure

Firmware upgrades can be installed on-site via USB flash drive.

Customizable Boot Screen

Our engineers can configure your unit with a custom image or logo file (240x320) in portable network graphic (.png) format to display on bootup. Contact our sales team to get started: sales@degreec.com

Night Setback

EH&S or Certifier users can configure 3 convenient modes (Audible, Muted, or Off) of operation. The RoosterTM Sensor100 is a N/O device, to trigger audible or muted night setback, the dry contact relay must be closed. See Page 10 for instructions on how to setup night setback alarm thresholds.

Home> Settings>System>Alarms/Sound>Alarm Controls>Night Setback

Alarm Latching

EH&S or Certifier users can setup latched alarms to indicate that a low airflow state has occurred in the "Alarm Controls" menu. User must then enter EH&S or Certifier passcode to unlatch an alarm.

Home> Settings>System>Alarms/Sound>Alarm Controls>Latch Alarm

Alarm Ringback

EH&S or Certifier users can configure the amount of snooze time before an alarm rings again after being muted in the "Alarm Controls" menu.

Home>Settings>System>Alarms/Sound>Alarm Controls>Ringback

Backlight Dimming

Users can toggle the brightness setting, as well as the brightness of the screen when set to "dim".

A "time before dim" option is available that sets the screen to dim after a predetermined amount of time has expired.

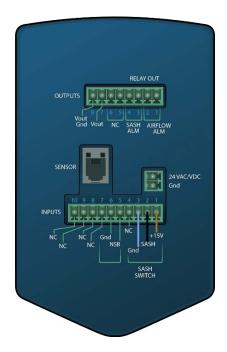
Home> Settings>System>Brightness

Airflow Resolution

EH&S or Certifier users can select the resolution of air velocity units displayed in m/s, fpm, or cfm **Note**: cfm can only be displayed once duct diameter information has been entered; see page 13 of this manual for more information.

Home>Settings>System>Advanced>Airflow Resolution

Rear Panel Layout for Advanced Connections



Rear Panel View of RoosterTM Sensor100

| Connection Description | Connector Type | Mating Connector |
|------------------------|---|--|
| Power Entry | 2-Pin, polarized, Phoenix Contact | Included and attached to AC/DC power supply |
| Sensor Connection | RJ-11 | Included as part of sensor assembly |
| Output Connection | 8-pin, polarized, Phoenix Contact *2-position connectors will fit | Not included. 8-position orderable Part Number: Phoenix Contact 1803633 2-position orderable Part Number: Phoenix Contact 1803578 |
| Input Connections | 10-pin, polarized, Phoenix Contact *2-position connectors will fit | Not included. 10-position orderable Part Number: Phoenix Contact 1803659 2-position orderable Part Number: Phoenix Contact 1803578 |

Degree Controls recommends 18-24 AWG wires to be used with screw terminal connections.

Technical Specifications

| Alarm Module Size | 3.2" x 5.25" x 0.75" (78mm x 134mm x 19mm) |
|------------------------|--|
| LCD Display Area | 2.25"x 2.73" (57mm x 70mm) |
| Airflow Velocity Range | 30-4,000 fpm (0.15- 20.0 m/s) **custom velocity ranges available upon request. |
| Air velocity Accuracy | ±(4% of reading + 0.10 m/s [20 fpm]) |
| Response Time | < 1 second |
| Supply Voltage | 24VAC/VDC |
| Night-Set Back | Dry Contact Closure (0V) |
| Relay Outputs | Qty. (1), 1A, 24VDC [Pins 1-2 Air Velocity Alarm] |
| Power Adapter | 90-250V |
| Red LED indicator | 160° viewing angle |
| Alarm Volume | 0 - 85dB (adjustable) |
| Relative Humidity | (non-condensing) 5 - 95% |
| Operating temperature | 40°F - 140°F (5°C - 60°C) |
| Storage temperature | -40°F - 185°F (-40°C - 85°C) |
| Weight | <6oz (<170g) |
| Compliance Standards | CE, RoHS |

Installation

Mounting the RoosterTM Sensor100

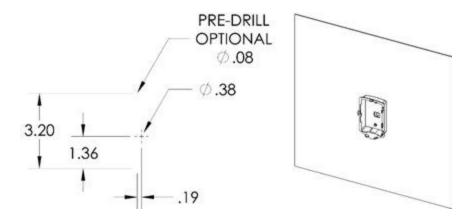
After configuring your wires, the Rooster Sensor100 is mountable to a cabinet or physical wall panel by first securing the back plate, and, once this is complete, the Rooster will snap right onto the backplate. Two backplate versions are available.

- 1) Wall mount: This backplate sits directly on the wall or cabinet surface, and secured by self-tapping screws, or industrial Velcro.
- 2) Semi-Flush: This back plate sits partially inside a standard electrical gang box, allowing the Rooster to be recessed and sit approximately 0.6" [15mm] proud of the mounting surface.

1) Wall-mount backplate:

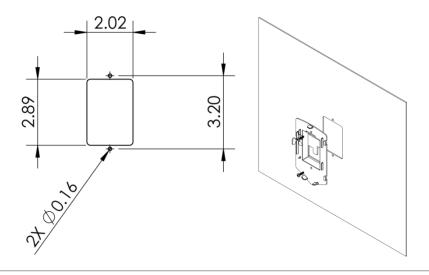
For installations where the Rooster Sensor100 is mounted directly to a flat surface, the Wall-mount backplate is used. The installation consists of a hole for the sensor and power wires to access the unit, and 2 pre-drill holes for self-tapping fasteners included in your kit.

Alternatively, the base may be mounted with industrial Velcro fasteners.



2) Semi-flush backplate:

For installations where the Rooster Sensor100 should be semi-flush, and the user is capable of cutting a rectangular hole, as shown below, the Rooster Sensor100 may be mounted in semi-flush manner, where the backplate is recessed into a standard electrical gang box. In this method, the Rooster Sensor100 only protrudes 0.6" (15mm) from the wall panel.



Wiring the RoosterTM Sensor100

Using the backplate label as a reference, the next step is to prepare the wiring harness for the Rooster[™] Sensor100. Once the wire harnesses are pulled through the opening and attached to the Rooster, then the front touch panel assembly can be snapped into place.

Degree Controls recommends 18-24 AWG for all wiring connections to the input and output connectors. Both the Sensor and power supply connections have been prepared for you, and merely need to be pulled through the sheetmetal cutout and connected to the Rooster as pictured above.

The RoosterTM Sensor100 has additional input and output capabilities for night setback and alarm output relay.

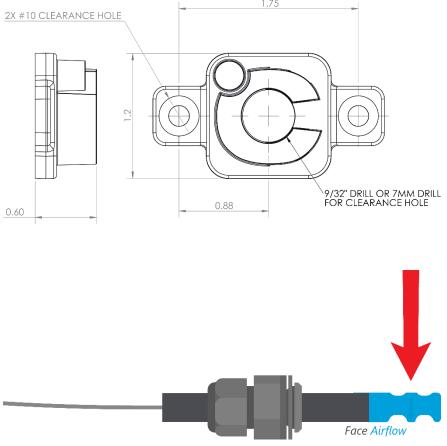
The IO connectors present on the Rooster[™] Sensor100 have some pins deactivated as these are reserved for future Rooster TM models designed for more advanced control functionality:

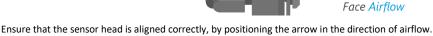
- Output Connectors, Pins 5-6
- o Input Connectors, Pins 7-10

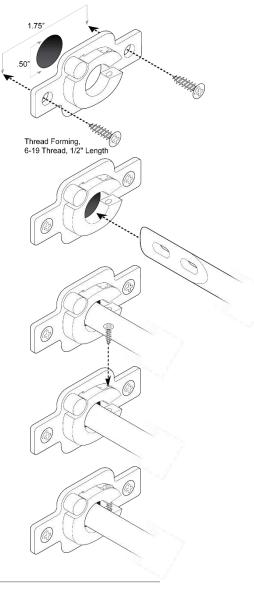
These pins should be non-connected.

Probe Sensor

The probe sensor should be located in your duct system in the best laminar (stable) flow possible. Good sensor placement practices should be followed. Sensor should be placed at least two duct diameters away from duct elbows and constrictions. Please see below and to the right for °C Clamp specifications and installation instructions.







Night Setback Input

The Rooster Sensor100 allows the user to connect to the digital input (0V, dry contact), on Input Connector, positions 5 & 6. The purpose of the Night Setback input is to allow the user the ability to send a remote signal to all Rooster Sensor100's, simultaneously, which changes their behavior during low flow conditions. This signal is normally initiated by a Laboratory or Building Management System (BMS).

Once the wiring connections are made, the User can assert and remove the night Setback signal from the BMS, and three Sensor100 states can be selected.

- o **On:** This state can be enabled to trigger NSB mode of operation when no NSB trip threshold is configured.
- o **Audible:** In this state, when a night setback signal is asserted, the Sensor100 will still audibly alarm when airflow drops below the NSB trip threshold.
- Muted: In this state, when the night Setback signal is asserted, the Sensor100 will alarm when airflow drops below the NSB trip threshold, but the alarm will be muted.
- o **Off (default):** In this state, when the night Setback signal is asserted, the Sensor100 will ignore it.

Boot Up Procedure

The RoosterTM does not have a power-on switch and will become energized as soon as you plug it in. The RoosterTM boots to the screen depicted on the right, with a slot for a custom logo. The boot screen is designed to support a custom image or logo file in portable network graphic (.png) format with (240x320) dimensions. This feature must be requested and is not setup for manual configuration.

Once the start procedure has completed, the Home screen will appear with two system buttons and you will need to setup password-protected access tiers for advanced system functions. This is explained in the "Access Tier Privileges" section below.



You can reboot your Rooster[™] Sensor100 at any time by pushing the hard "Home" and "Mute" Buttons simultaneously until the Boot Screen reappears.

Access Tier Privileges: USER, EH&S & CERTIFIER

Users have the ability to customize their containment cabinets within a defined set of options for each authorization level. There are three levels of access to the RoosterTM: User, EH&S/Facility Manager and Certifier. These are managed by logging in with a 4-digit numerical passcode. The User access level does not require a passcode.

Manufacturer default passcodes:

EH&S = 8377

Certifier = **6425**

Access Privileges Defined

| Function | Passcode Required |
|-------------------------|-------------------|
| Adjust Alarm Volume | None |
| Alarm Latching Settings | EH&S, Certifier |
| Alarm Ringback Settings | EH&S, Certifier |
| Mute Live Alarm | None |
| Set Asset Tag | EH&S |

| Set Minimum Alarm Volume Threshold | EH&S, Certifier |
|--|-----------------|
| Set Time / Clock Format | EH&S, Certifier |
| Toggle between Fahrenheit or Centigrade Temperature Units on Home Screen | None |
| Toggle between Metric or Imperial Air Velocity Units on Home Screen None | |
| Toggle ON/OFF Keypad Sounds | None |
| Unlatch Alarm | EH&S |

Set/Change Passwords

To change or set a password, follow this GUI path to trigger the password change sequence:

Home> Settings>System>Advanced>Change Passwords

You will have to enter an EH&S or Certifier passcode to get access to the "Advanced" menu. To change either the EH&S or Certifier passcode, you must first re-enter the old passcode. Please note that if you are authorized to perform both EH&S and Certifier functions, you may set an identical passcode for both access tiers to make logging in and accessing key functions easier.

Alarm Threshold Configuration

- 1) To set your alarm threshold, follow the menu path below:
 - Home> Settings>Thresholds>Adjust Thresholds
- 2) To set alarm thresholds, you will first have to define an alarm trip point and an alarm clear point. The alarm trip point is the air velocity value that will trigger an alarm. The alarm clear point is the air velocity value that will clear an alarm state. Once you have defined these values, the alarm will trip and clear based on your settings. You may return to this menu at any time to adjust these values as needed.

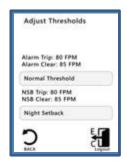


3) By default, no value is set to NSB (Night Setback) mode of operation. Depending on your application or setup, you may not need to have an active alarm during night setback mode. You may choose, however, to set a specific alarm trip and clear point for Night setback mode. You will first have to define an alarm trip point and an alarm clear point. The alarm trip point is the air velocity value that will trigger an alarm. The alarm clear point is the air velocity value that will clear an alarm state. Once thresholds are assigned for night setback, you may choose to set your alarm as "audible" or "muted" in the alarm controls menu below.:



To quickly glance at threshold settings, follow this menu path below:
 Home> Settings> Thresholds>Threshold Info





Alarm Troubleshooting

Is your alarm failing to sound or clear how you intended? You may need to verify that you have entered **valid threshold values**. For both normal and NSB modes of operation, the "Alarm Trip" or "NSB Trip" point must be a lower value than the "Alarm Clear" or "NSB Clear" point to properly trigger and clear an alarm.

The Rooster[™] Sensor100 offers an array of customization options for alarm behaviors. In the following section, we will provide a detailed overview on how to customize your alarm behavior to meet your particular needs and preferences.

Alarm Controls

To provide our users with full customization of the alarm behaviors that are best suited for their facilities and unique conditions, the Rooster[™] Sensor100 allows authorized users (Certifier & EH&S) to set latching, ringback, night setback, alarm delay and airflow resolution preferences.

Night SetBack

The Rooster[™] Sensor100 supports Night Setback for energy savings and greater HVAC system integration in building automation systems. Users can toggle between 3 modes of operation detailed below:

This crescent moon icon [] will appear on the top portion of the home screen when Night Setback is active

Home> Settings>System>Alarms/Sound>Alarm Controls>Night Setback

| Night SetBack Modes | Definition |
|---------------------|---|
| Audible | Enters Night Setback mode whenever relay is closed and audibly triggers an alarm when airflow drops below NSB trip point. To adjust Night Setback alarm thresholds, you must go to the Threshold menu and select "Adjust Thresholds". |
| Muted | Enters Night Setback mode whenever relay is closed and triggers a muted alarm when airflow drops below NSB trip point. (LED will still flash during an alarm event). To adjust Night Setback alarm thresholds, you must go to the Threshold menu and select "Adjust Thresholds". This is the default setting. |
| Off | Disables Night Setback mode. Alarm does not enter Night Setback mode when relay is closed. |

Alarm Ringback

When an active alarm state is muted, ringback is a useful safety feature to remind the user that the muted alarm is still active. Whenever there is an active alarm state, the red LED will flash for the entire duration of the alarm. There are 7 ringback modes available:

Home> Settings>System>Alarms/Sound>Alarm Controls>Ringback

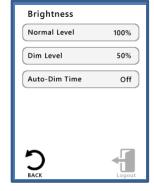
| Settings | Definition |
|----------|---|
| Off | Disables ringback. If an alarm is muted, the alarm remains muted for the entire duration of the alarm event. |
| 10s | A muted alarm will ringback audibly after 10 seconds if the unit is still in an active alarm state. This is the default setting.* |
| 30s | A muted alarm will ringback audibly after 30 seconds if the unit is still in an active alarm state. |
| 1min | A muted alarm will ringback audibly after 60 seconds if the unit is still in an active alarm state. |
| 5min | A muted alarm will ringback audibly after 5 minutes if the unit is still in an active alarm state. |
| 10min | A muted alarm will ringback audibly after 10 minutes if the unit is still in an active alarm state. |
| 60min | A muted alarm will ringback audibly after 60 minutes if the unit is still in an active alarm state. |

Backlight Dimming

Brightness is adjusted via the left and right arrows. Actual screen brightness adjusts immediately as

the setting is changed. The Enter button will save the brightness setting, and cancel will leave the setting unchanged.

Auto-Dim Time resets a timer each time that the screen is pressed. Once that particular amount of time has expired, the screen will dim. When the screen is pressed again, the screen will return to its original brightness setting. The dimmest setting will not allow the screen to turn completely dark, instead just enough to still be readable. Dim times are [1, 2, 5, 10, 60] minutes, with an "Off" setting, and a default time of 10 minutes initially.



Home> Settings>System>Brightness

Latch Alarm

Alarm latching is a useful feature to indicate that an alarm state was triggered even if the device is no longer in an active alarm state. This could occur, for example, when a user has stepped away from the workstation. When latching is activated "ON", a yellow banner will display beneath the velocity and temperature readings on the home screen to indicate that a low airflow event has occurred. If the latch alarm setting is set to "Password" mode, an EH&S passcode must be entered to unlatch this alarm. If the Latch alarm setting is set to "ON", simply tap the banner to disable the alarm. Switching the latch state to "OFF" disables this feature entirely.

Home> Settings>System>Alarms/Sound>Alarm Controls>Latch Alarm

Alarm Delay

To account for hysteresis, users can define the amount of time that the RoosterTM Sensor100 has to achieve continuous safe velocity readings before the alarm state is cleared and continuous unsafe velocity readings before an alarm is triggered. This is called Alarm Delay.

| Alarm Delay | Definition |
|-------------|--|
| 1s | Alarm is cleared after 1 second if velocity readings are above the alarm clear threshold. Alarm is triggered after 1 second if velocity readings are below the alarm trip threshold. This is the default setting. |
| 2s | Alarm is cleared after 2 seconds if velocity readings are above the alarm clear threshold. |
| | Alarm is triggered after 2 seconds if velocity readings are below the alarm trip threshold. |
| 5s | Alarm is cleared after 5 seconds if velocity readings are above the alarm clear threshold. |
| | Alarm is triggered after 5 seconds if velocity readings are below the alarm trip threshold. |
| 10s | Alarm is cleared after 10 seconds if velocity readings are above the alarm clear threshold. |
| | Alarm is triggered after 10 seconds if velocity readings are below the alarm trip threshold. |

Startup Delay

The startup delay prevents an alarm from triggering until the workstation and ventilation systems have fully powered up and are operational. Refer to chart on next page for further definitions.

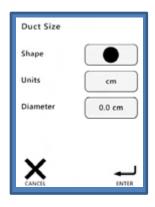
| Alarm Delay | Definition |
|-------------|---|
| 30s | Alarm is paused for 30 seconds on power up. |
| 1 min | Alarm is paused for 1 minute on power up. |
| 2 min | Alarm is paused for 2 minutes on power up. |
| 5 min | Alarm is paused for 5 minutes on power up. |

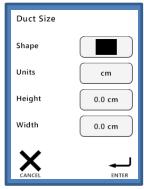
Duct Size

Volumetric flow can be displayed on the home screen for the RoosterTM Sensor100. In order to set this up, enter the duct diameter screen from the settings menu. Select the shape of the duct, and the diameter (in cm).

Once the duct diameter is entered, the user is then able to cycle between fpm, m/s, and cfm on the home screen.

Home>Settings>Duct Size





Airflow Resolution

For advanced users, displayed velocity units can be configured to display in an alternate resolution. The default resolution for units is 1 fpm and .01 m/s respectively, however, for users who prefer a more uniform readout, this can be configured up to 5 fpm or .05 m/s.

Home>Settings>System>Airflow Settings>Airflow Resolution

| Airflow Resolution | Definition |
|--------------------|---|
| 1 fpm | Displayed units in FPM are rounded to 1 fpm. This is the default setting. |
| 2 fpm | Displayed units in FPM are rounded to 2 fpm. |
| 5 fpm | Displayed units in FPM are rounded to 5 fpm. |
| .01 m/s | Displayed units in m/s are rounded to .01 m/s. This is the default setting. |
| .02 m/s | Displayed units in m/s are rounded to .02 m/s. |
| .05 m/s | Displayed units in m/s are rounded to .05 m/s. |

Airflow Sensitivity

This setting smooths airflow readings by applying a filter that determines "sensitivity" of readings.

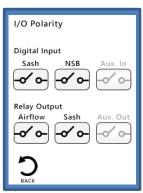
Home>Settings>System>Airflow Settings>Sensitivity

| Sensitivity | Definition |
|-------------|--|
| Low | Decreases filtration effect, resulting in greater fluctuation of readings. |
| Med | Default setting. Filtration effect stabilizes readings. |
| High | Increases filtration effect, providing smoother readings. |

I/O Polarity

For advanced users, it may be helpful to toggle relay and input nodes from N/C to N/O. Consult diagram below for further information.

Home>Settings>System>Advanced>I/O Polarity



DAC Output

The Rooster[™] Sensor100 has DAC Output enabled, with correspondence to air velocity.

There are four user selectable ranges to choose from, which the user will connect to pins 7 & 8 on the rear panel's 8-position "Outputs" Connector:

- o 0-5 VDC
- o 0-10 VDC
- 0-20 mA (not implemented yet)
- 4-20 mA (not implemented yet)

Home>Settings>System>Advanced>Analog Out

USB Field Upgrade Procedure

Procedure to field upgrade Rooster[™] Sensor100 Operating System

You will need: USB thumb drive with new firmware "Rooster.bin" Rooster™ Sensor100

Procedure:

- 1. Remove power from the RoosterTM Sensor100 by unplugging power supply.
- 2. Insert USB thumb drive into left side of RoosterTM Sensor100.
- 3. Depress and hold "Home" button, then re-apply power to your unit. (Hard Home button must be depressed while RoosterTM powers up to enter the firmware update sequence)
- 4. After ~3 seconds, release Home button. After 10 seconds, the LED on the front of the Rooster[™] will light and the unit will boot up with new Firmware.
- 5. When you have completed the Factory Reset Procedure, navigate to the info [] screen from home to validate that your new firmware version was properly installed. The date of the firmware release listed next to "firmware" should have changed to the most current build. If this is not the case, repeat steps 1-6 again.

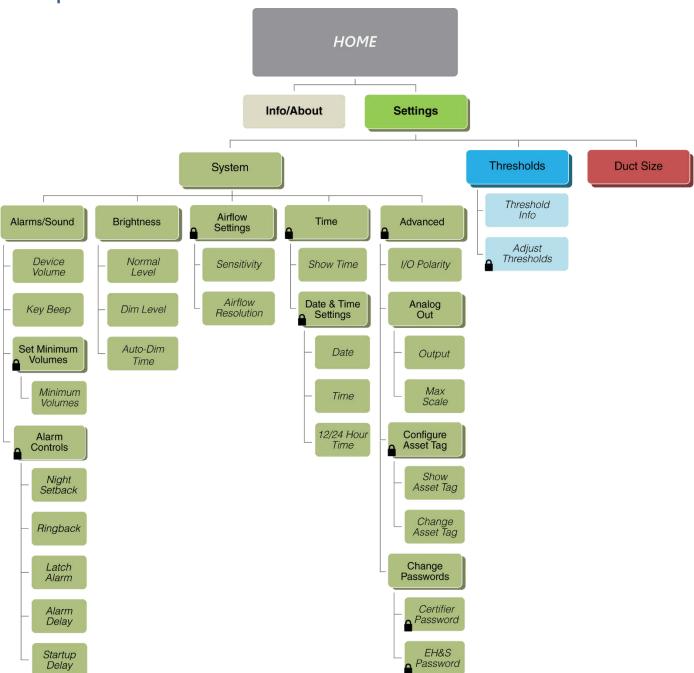
Factory Reset Procedure

The Master Reset will return the Rooster Sensor100 to its default alarm & input/output settings. Time and date will be preserved during a factory reset. The following Factory Reset Procedure can be done at any time upon system reset to restore default settings and passwords.

- 1. After following the above steps, when the 1st information screen displays, momentarily press the "Mute" key.
- 2. The "Enter Factory Password" screen will display. Factory Password is "5878" and cannot be changed.
- 3. Factory Menu will display. Depress "Reset to Factory Defaults"

Factory-default certify password is "6425"

GUI Map



WARRANTY

The Rooster[™] Sensor100 is warranted to be free from defects in workmanship and materials for a period of one (1) year from receipt. Degree Controls will at its option replace or repair defective parts within the warranty period. Damage resulting from misuse, wear and tear, and tampering is not covered by the warranty.

