

ROOSTERTM **MONITOR200** *Airflow Alarm*

User Manual

High Performance, BACnet® MS/TP Capable Airflow Monitor
with Full-Color Touch Screen Display

Version 1.07.03

Complete Kit includes:

- o Alarm Module
- o Sensor
- o Power Supply



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Product Overview

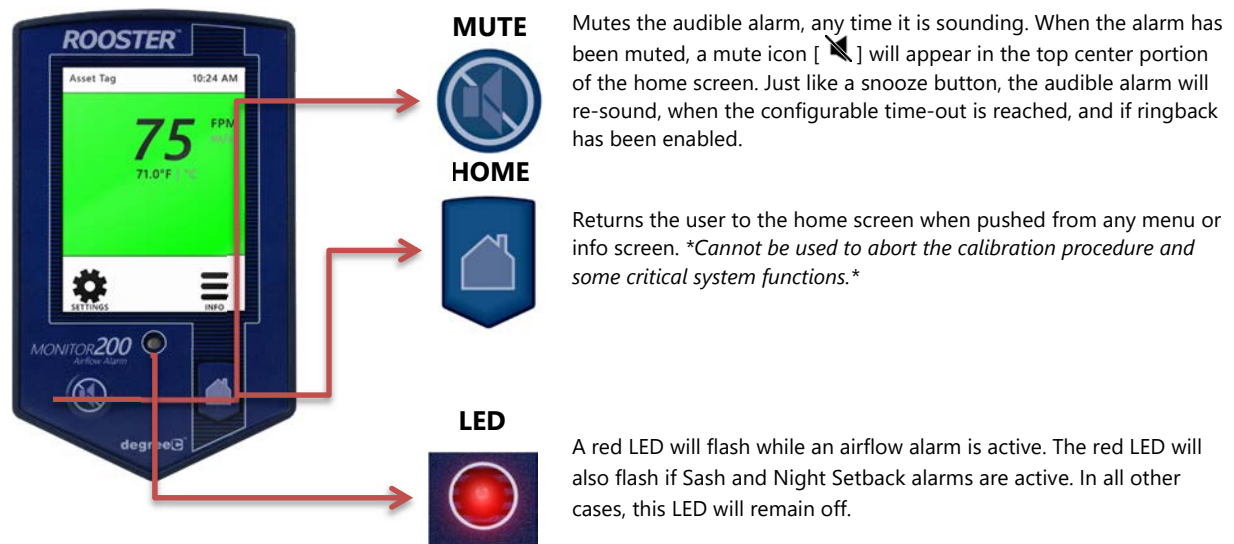
Congratulations on your purchase of the BACnet® MS/TP capable Rooster Monitor200 from Degree Controls. The Rooster Monitor200 with BACnet® MS/TP capability represents a new generation of airflow monitoring and alarming. The Monitor200 is our full-featured, highly flexible, alarming and monitoring system with increased functionality for advanced users. It is designed for chemical fume hoods, biosafety cabinets, and a wide range of critical containment applications where airflow is to be monitored, alarmed, and communicated to building and laboratory management systems. The Monitor200 with BACnet® capability allows for ease of integration into building automation and control systems, supporting reduced energy costs and maximized building efficiency.

A brief overview of the Rooster Monitor200's many features, including but not limited to:

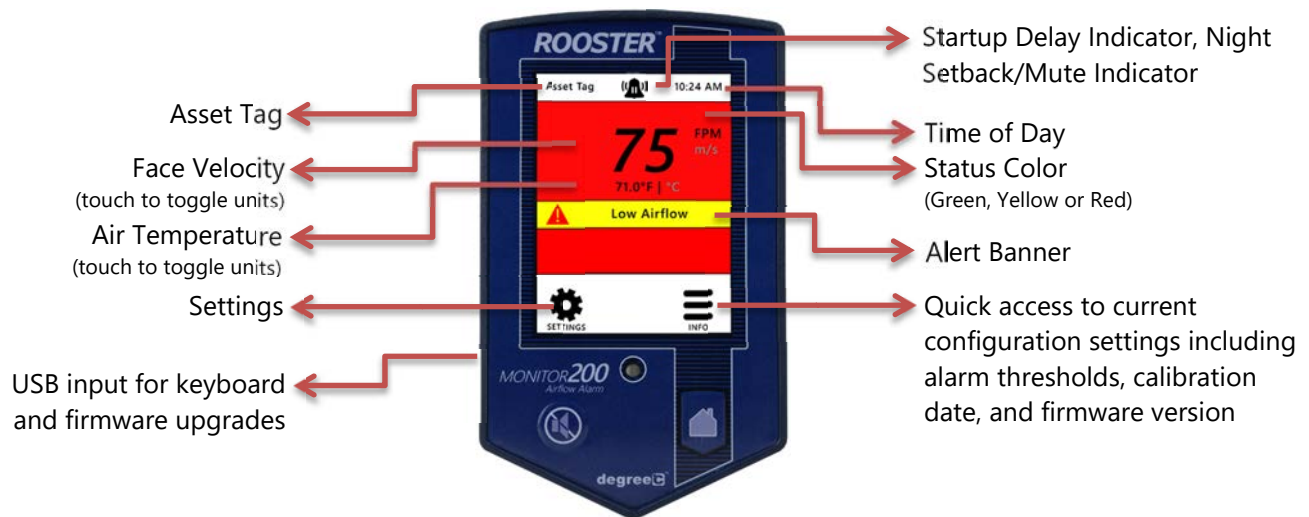
- Glove-friendly touchscreen.
- Best in class air velocity sensing.
- Probe for BSC canopies and duct installations. Side-wall style sensor for negative pressure cabinets such as chemical fume hoods.
- Quick, 2-step airflow calibration process.
- Bright backlit display.
- Password protected access tiers limit access to critical functions for authorized users.
- BACnet® MS/TP capability for easy integration into BMS.
- Event logging for your airflow safety compliance needs.
- Import/export configuration file to save setup time and ensure operational consistency among all Rooster Monitors in your facility.
- Night setback airflow settings to manage laboratory air exchange.
- Configurable relay outputs.
- Scalable analog output to change the position of a damper or control fan speed.
- Sophisticated controls including sash position sensing and PI control to regulate fans or dampers.

This manual will guide you through installation, calibration procedures, firmware upgrades, alarm control settings, and the full range of features for the Rooster Monitor200.

Hard Button Overview



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 chemical fume hood, or company asset, or laboratory. A 12-digit numeric asset tag can be set with the provided on-screen keypad, OR plug in a USB interface keyboard to enter a 12-character alphanumeric tag. Users can enable or disable display of the Asset 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>Date & Time>Date & Time Settings

KEYPAD AND BUTTON SOUNDS

Users may toggle keypad and button beep sounds on and off.

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

DEVICE VOLUME

Users can toggle through low, medium, or high alarm volumes. If logged in as 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's safety requirements. Audible alarms may be turned off using "Alarm Tone Settings".

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

ON-SCREEN ALERT BANNERS

A yellow banner will appear beneath on-screen velocity readings to alert users regarding various scenarios such as low airflow or power failure.

Home

TOGGLE VELOCITY UNIT TYPE

Instantly toggle displayed velocity units from m/s to fpm, or vice versa, by pressing on the displayed velocity reading on the home screen. A third touch toggle of CFM is accessible if volumetric flow is enabled, or ACH if air changes per hour is enabled.

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 UPGRADES AND DATA IMPORT/EXPORT

Firmware upgrades can be installed on-site via USB flash drive. See the USB Field Upgrade section for more information. Users may also import/export Rooster settings and export the event log through the USB interface.

CUSTOMIZABLE BOOT SCREEN

The Rooster may be configured with a custom image to display on bootup using the Upload Start-Up Image option of the Import/Export menu. The acceptable file format is .bmp, 240 x 320 pixels.

Home>Settings>System>Advanced>Import/Export

NIGHT SETBACK

EH&S or Certifier users can configure 3 convenient modes (Audible, Muted, or Off) of operation. The Rooster Monitor200 is a normally open device. To trigger audible or muted night setback, the dry contact relay must be closed. See the Alarm Threshold Configuration section 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 a 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. Optionally, the audible alarm can be turned off completely.

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.

Home>Settings>System>Airflow Settings>Airflow Resolution

TWO POINT CALIBRATION

For greater accuracy and performance, the Rooster Monitor200 uses a two-point calibration procedure to collect both a high velocity and low velocity reference point. (Note: For a probe sensor calibration, the low velocity reference point is collected by leaving the sensor cover in place while performing the low velocity calibration step). See the Calibration section of this manual for additional information.

Home>Settings>Calibration>Calibrate>Airflow Sensor Calibration

Rear Panel Layout for Advanced Connections

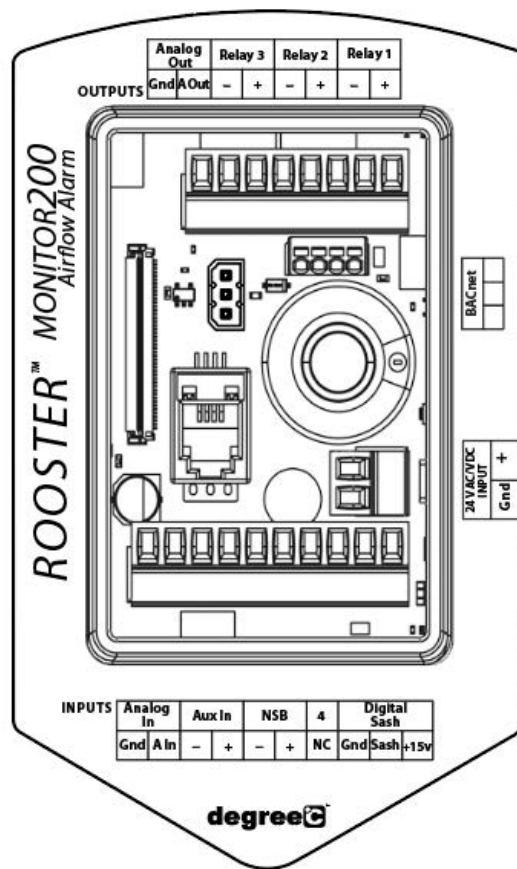


Figure 1 Connections

See connector details below.

Connection Description	Connector Type	Mating Connector
Power Entry	2-Pin, polarized, Phoenix Contact	Included and attached to AC/DC power supply
Sensor Connection	RJ10	Included as part of sensor assembly
BACnet® Connection	3-pin, push-in spring connection	Not included 3-position orderable Part Number: Phoenix Contact 1778845
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 Connection	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

Table 1 Connections - Rear Panel of Display Module

Optional Sash Switch Kit, Degree Controls Part#: 62310AS004 includes a 10-postion Phoenix Contact connector. This is for digital sash sensor mode.

Optional Sash Position Sensor Kit, Degree Controls Part#: 62310AS008 includes a 10-postion Phoenix Contact connector. This is for analog sash sensor mode.

Technical Specifications

Alarm Module Size	82mm x 135mm x 19mm (3.2" x 5.3" x 0.7") (without back plate)
LCD Display Area	57mm x 70mm (2.3" x 2.7")
Airflow Velocity Range	0.15- 20.0 m/s (30-4,000 fpm)
Response Time	< 1 second
Supply Voltage Current Consumption	24VAC/VDC or Supplied Wall Adapter < 0.5A for 24VAC/VDC
Sash Switch Input	Pin 1 = +15V Power (For Proximity SW) Pin 2 = SASH (Contact or Proximity) Pin 3 = GND (Contact or Proximity)
Night-Set Back Input	Dry Contact Closure Pins 5-6
Auxiliary Input (BACnet® Monitored)	Dry Contact Closure Pins 7-8
Analog Input	0 – 10V Analog Pin 9 = A IN Pin 10 = GND

<i>Relay Outputs</i>	Qty. (3), 1A, 24VAC/VDC Pins 1-2 Relay1 Pins 3-4 Relay2 Pins 5-6 Relay3
<i>Analog Output</i>	0 – 5V, 0 – 10V, 0 – 20mA, 4 – 20mA Analog Pin 7 = A OUT Pin 8 = GND
<i>Power Adapter</i>	90-250V
<i>Red LED indicator</i>	160° viewing angle
<i>Alarm Volume</i>	0 - 85dB (adjustable)
<i>Relative Humidity</i>	(non-condensing) 5 - 95%
<i>Operating Temperature</i>	5 to 60°C (40 to 140°F)
<i>Storage Temperature</i>	-40 to 85°C (-40 to 185°F)
<i>Weight</i>	<170g (<6oz)
<i>Compliance Standards</i>	CE, RoHS

Connection and Wiring Information

Degree Controls recommends 18-24 AWG wire for all wiring connections to the input and output connectors. The sensor and power entry connections have been prepared for you, and merely need to be pulled through the openings and connected to the display module. If the Sash Switch option (digital sash operation) is purchased, this is pre-connectorized for you as well.

The Rooster Monitor200 has additional input and output capabilities for night setback and application specific controls. These cable harnesses should be prepared by the client, using the orderable mating connectors listed above.

Sash Input

The Rooster Monitor200 provides you with the ability to select one of two sash input settings:

1. Digital sash sensor or
2. Analog sash sensor

The default value is Digital, and users can toggle between a digital or analog sash sensor input by navigating to:

Home>Settings>Sash Settings

Digital Sash

The default I/O polarity of the digital sash position input is normally open. The design intent is as follows:

The sash setting is set to *Digital*.

When the sash is in a safe position, the proximity sensor should not detect a metallic object/strip.

Sash position input logic may be reversed using the I/O configuration menu on the Monitor200 to achieve a different result, and any proximity sensor may be implemented.

Degree Controls can provide you with an optional Sash Switch comprised of (1) inductive proximity sensor and (1) 10-position connector which mates to the input connection of the display module. This inductive

proximity sensor switches state when it contacts metal surfaces. This sash sensor is a normally open device, meaning it closes upon sensing metallic objects.

The DegreeC Sash Switch (Part# 62310AS004), comes with three stripped and tinned wire leads:

Brown = +15V

Black = Sash

Blue = GND

Wire these in their respective positions 1, 2, and 3 on the input connection block.

Analog Sash

With the sash input configured as *Analog*, the Monitor200 monitors the sash position as detected from the 0-10V analog signal on the analog input.

The design intent is as follows:

The sash setting is set to *Analog*.

The Monitor200 monitors sash position as detected from a 0-10V analog signal on the analog input.

The sash height calibration routine records the sash sensor's resistance in the Open, Normal and Closed positions.

If the sash reading is within 1% of full scale of the recorded closed position, the sash is considered to be in the closed position.

If the sash reading is 1% of full scale greater than the normal position, the sash is considered to be in the open position.

If sash readings are between the closed and open positions, the sash is considered to be in the normal position.

The Monitor200 will alarm for unsafe sash position whenever the sash is in the open position.

The DegreeC Sash Position Sensor Kit (Part# 62310AS008) uses pin 1 for 15V and analog input pins 9 and 10 on the input connector marked as Analog In:

Pin 1 = +15V

Pin 9 = A IN

Pin 10 = GND

See the sash height calibration section for additional calibration detail. See the I/O configuration section to configure a relay output for Sash Alarm.

Note: For implementation support, or for users preferring to use a micro-switch for sash alarm activation, please contact Degree Controls.

Night Setback Input

The Rooster Monitor200 allows the user to connect to the digital input (0V, dry contact) on the input connector, positions 5-6, for night setback. The purpose of the Night Setback input is to provide the user with the ability to send a remote signal to all Rooster Monitor200s, simultaneously, to change 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. After setting an NSB threshold, three NSB states can be selected. If no threshold is set (all threshold values are zero), then only the Disable and Enable options are available.

Audible: In this state, when the night setback signal is asserted, the Monitor200 will audibly alarm when airflow drops below the NSB trip threshold.

Note: NSB threshold is independently set.

Muted: In this state, when the night setback signal is asserted, the Monitor200 will alarm (screen will display a red background, and the LED will flash) when airflow drops below the NSB trip threshold, but the alarm will be muted.

Disabled (default): If the night setback signal is asserted in this state, the Monitor200 will ignore it.

Auxiliary Input

The Rooster Monitor200 provides a BACnet® MS/TP monitored auxiliary input for specialized applications. For example, a human presence sensor may be connected to the auxiliary input and monitored via BACnet® communication in order to shut off room lights or reduce the number of air changes per hour when no persons are detected. The auxiliary input is a digital input, dry contact closure with default I/O polarity of normally open. See the BACnet® section for auxiliary input object information.

Outputs

Relay Outputs

Three relay outputs are available on the output connector of the Rooster Monitor200 alarm module. Default I/O polarity is normally open, and output polarity logic may be changed via the Output Configuration menu of the Rooster Monitor200.

The Rooster Monitor200 alarms for airflow and sash position and allows users to enable on-screen buttons for accessory lamp and accessory fan. Relay outputs are configurable and linked to alarms and accessory buttons from the output configuration grid. See the I/O Configuration section for additional detail.

Analog Output

Analog output can be enabled to produce an analog control signal on the analog output pins in order to maintain the desired face velocity or to indicate the flow. Analog output pins are 7 and 8 on the output connector and marked as Analog Out:

Pin 7 = A OUT

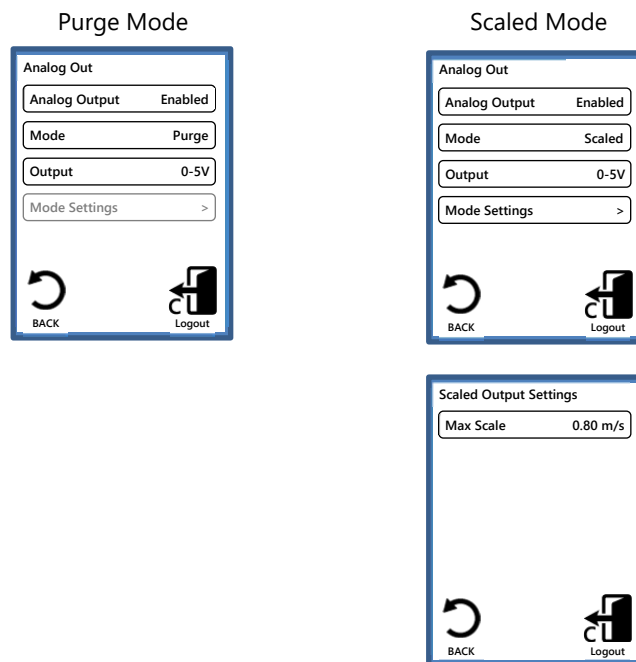
Pin 8 = GND

Users can enable/disable the analog output, toggle between Purge, Scaled, and Control modes, and select the analog output signal.

Home>Settings>System>Advanced>Analog Out

Settings	Parameters
Analog Output	Disabled Enabled
Mode	Purge Scaled Control
Output	0-5V 0-10V 0-20mA 4-20mA
Mode Settings	Mode settings are available for Scaled and Control modes. See details below.

Screen examples:



Purge Output

When Purge is activated, the analog output is set to its highest level to fully open a valve or set a fan to maximum speed. The intention is to evacuate air from a hood in the event of a spill or an emergency condition.

The Purge button appears on the main screen if Analog Output is enabled with Purge mode selected. Press the button to activate purge.

- Purge overrides any other control, whether the Monitor200 is in normal operating mode or a night setback condition.
- When Purge is active, the airflow monitor is in the alarm state.
 - o The screen background is red with a PURGE IN PROGRESS alert banner.
 - o The audible alarm sounds.
 - o The mute button behaves normally.
 - o Purge suppresses any other airflow alarm. All other alarms are deactivated while Purge is in progress.

- When Purge is in progress, pressing the Purge button deactivates Purge; the airflow monitor reverts to standard behavior.

The purge button appears differently in on/off states.



Figure 2 Purge Inactive



Figure 3 Purge Active

Scaled Output

Scaled Output provides a control signal proportional to velocity. Scaled Output is typically used to change the position of a damper in a VAV (variable air volume) system or control fan speed. With Analog Output enabled and Scaled mode selected, the user needs to select the output and enter Max Scale, the upper limit of the scaled analog output range.

For example, with:

- Output set to 0-5 V,
- Max Scale set to 0.80 m/s, and
- flow in the cabinet set such that 0.40 m/s is displayed on the Rooster

the analog out voltage will be 2.5 volts.

Control Output

Control Output implements a proportional and integral control loop to maintain a specified velocity setpoint. A control signal is calculated using the error, or difference, between current face velocity or volumetric flow and the setpoint. The Control Output is typically used to regulate a fan or damper.

With Analog Output enabled and Control mode selected, the user needs to choose the output and then select Mode Settings and enter the setpoint. Proportional and integral terms are also available for the user to tune the output control loop. The proportional gain, P term, determines the ratio of the output response to the error signal. The user can adjust this value based on stability of the airflow. Proportional gain can be any decimal value between 0 and 9999, and the default value for P term is 0.50.

The primary purpose of the integral term is to eliminate the small steady-state error between process flow and the setpoint. It produces a correction based on the error over time. The integral term can be any decimal value between 0 and 9999, and the default value for I term is 0.20.

Mechanical Information

Alarm Module

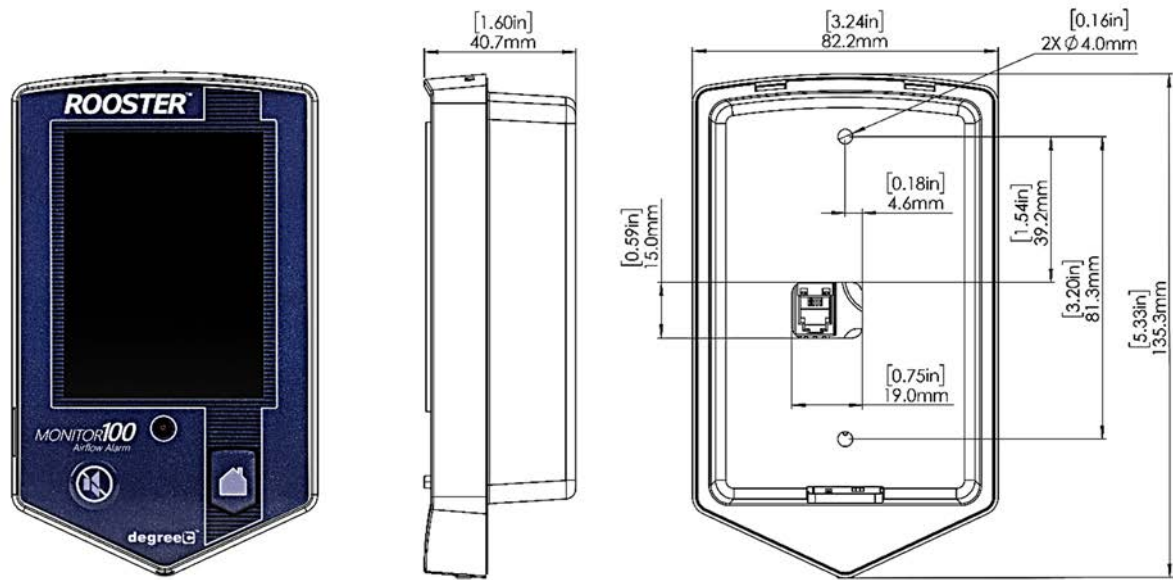


Figure 4 Alarm Module with Wall-Mount Back Plate

Probe Sensor

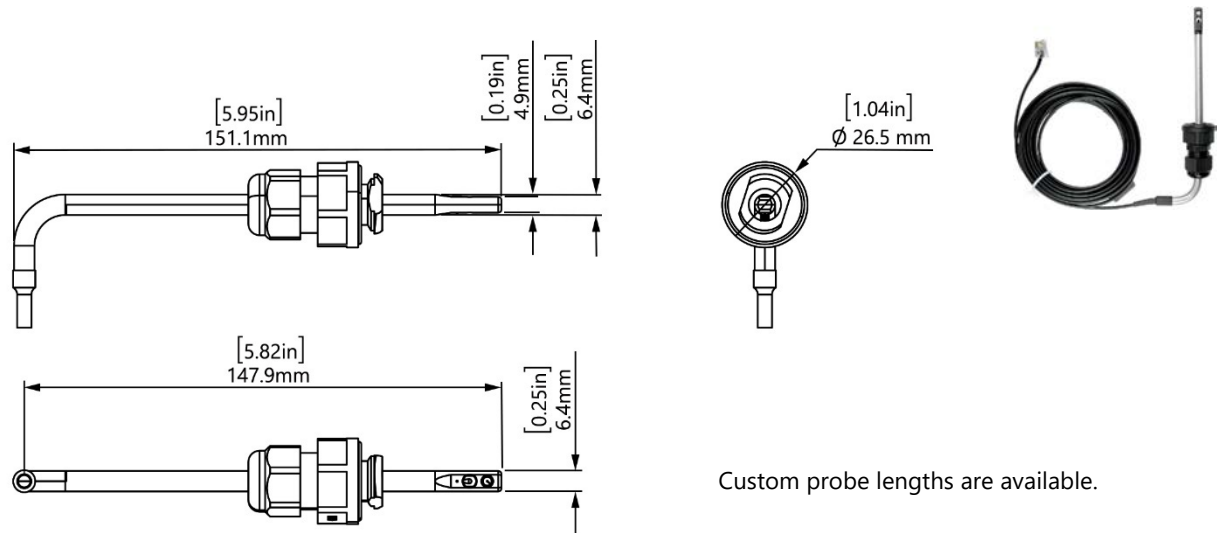


Figure 5 Probe Sensor

Sidewall Sensor

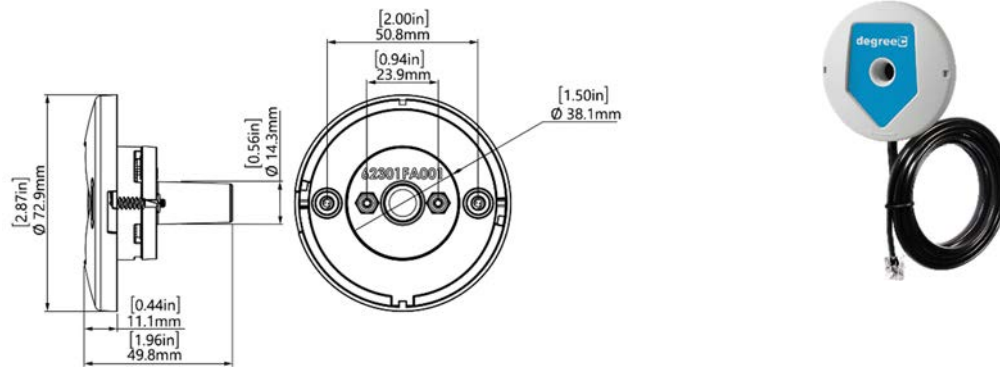


Figure 6 Sidewall Sensor

Inline Sensor

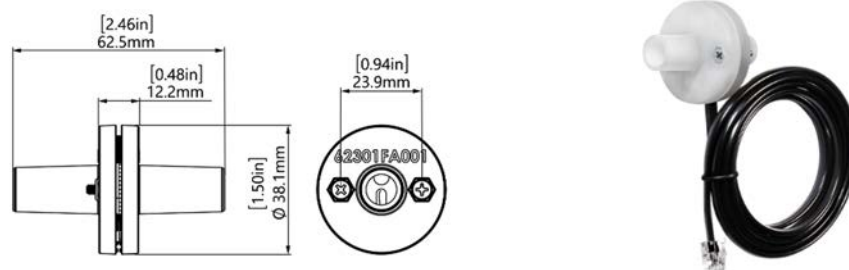


Figure 7 Inline Sensor

Installation

Installation of the Rooster Monitor200 involves selecting and preparing appropriate locations for the alarm module and sensor, wiring, connecting the unit, and then mounting both the alarm module and sensor securely.

Back Plate Mounting Options - Alarm Module

The Rooster Monitor200 is easily mounted to a cabinet or wall panel. First, secure the back plate, and then align the alarm module to the back plate and tighten the bottom captive screw. Two back plate versions are available:

1. **Wall Mount:** This back plate (Part# 62310FA006) sits directly on the wall or cabinet surface, and is secured by self-tapping screws, or industrial Velcro. Sensor and control wiring access is at the back, while access for power in from the wall mount power supply is at the bottom of the back plate.
2. **Semi-Flush:** This back plate (Part# 62310FA008) sits partially inside a standard electrical gang box, allowing the Rooster to be recessed and sit approximately 15mm [0.6"] proud of the mounting surface. Self-tapping screws secure it, and there is open back access to accept building power, sensor, and control wiring.

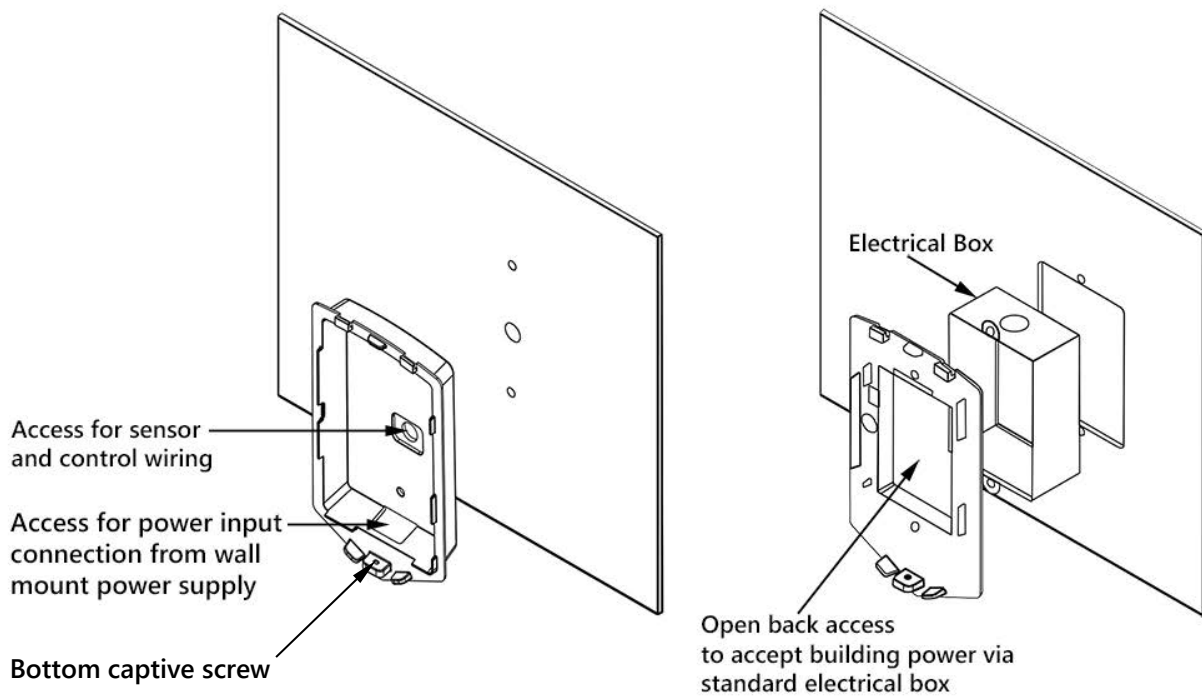


Figure 8 Wall Mount (left), Semi-Flush Mount (right) - for Alarm Module

Installation Procedure

1. Determine mounting locations for the Rooster Monitor200 alarm module and sensor.
2. Mark the surface where the Rooster Monitor200 alarm module will be located and make the necessary drills/cutout according to the mounting option you selected when you placed your order: Wall Mount or Semi-Flush Mount.
3. Secure the back plate.
4. Mount the sensor. See below for sensor installation guidelines.
5. Feed power and sensor wire harnesses through the opening(s) and make connections to the Rooster Monitor200 alarm module. Make any other optional connections to the alarm module.
6. Align top of alarm module with tabs on back plate, and secure in place with captive screw at bottom of alarm module.

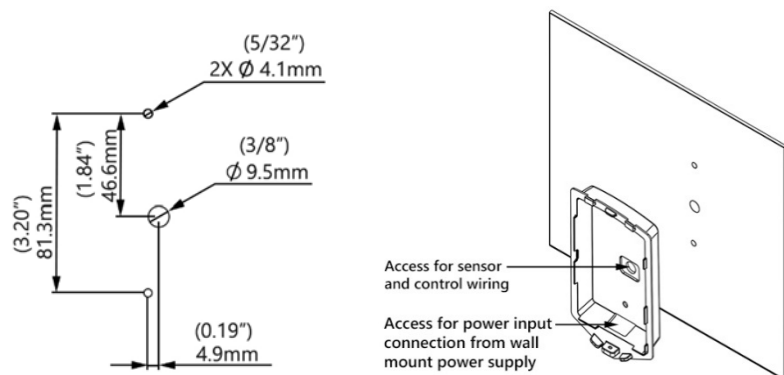


Figure 9 Wall Mount Back Plate Mounting

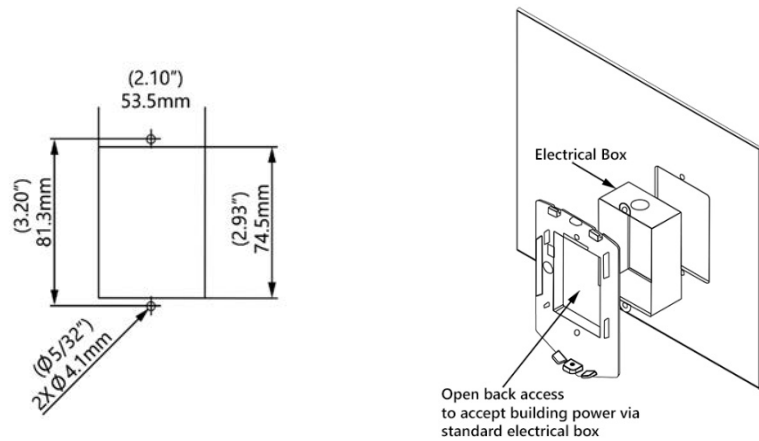


Figure 10 Semi-Flush Back Plate Mounting

Probe Sensor

The Probe sensor should be located in the duct system in the best laminar (stable) flow possible. The sensor should be placed at least two duct diameters away from duct elbows and constrictions and follow ASHRAE best practices.

Probe sensor installation steps:

1. Drill 16mm [5/8"] hole.
2. Adjust insertion depth and tighten (A) gland nut onto sensor probe.
3. Insert into duct hole, with wider flange first, and then rotate into position.
4. Tighten mounting nut (B) in left-hand direction.
5. Make sure the sensor head faces airflow by positioning the probe elbow in the flow direction.

A gland fitting is included with the Probe sensor. (Gland Fitting, Degree Controls Part#: HA1203)

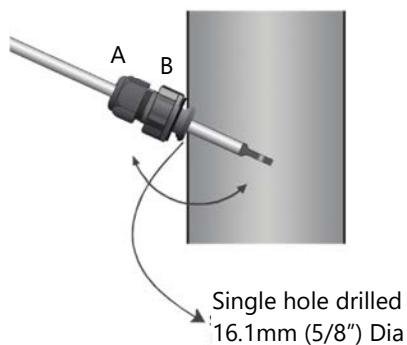


Figure 11 Probe Sensor Installation

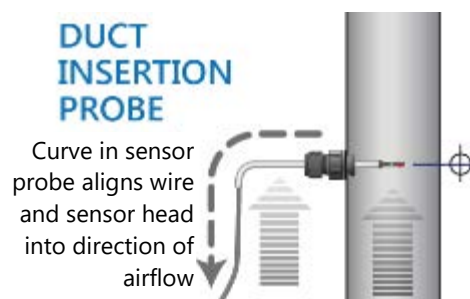


Figure 12 Align Sensor Head Into Direction of Airflow



Sidewall Sensor

When determining the face velocity of a negatively pressurized cabinet, the Sidewall sensor is often the best choice, as it measures clean, temperature-controlled, laboratory air. This is preferable to measuring potentially heated, dirty air in the exhaust duct. The Sidewall sensor has a removable air screen, which is washable and provides the sensor with a level of protection against tampering.

The Sidewall sensor should be located away from a sash opening or air moving device to avoid turbulence. Positioning the sensor opening above the sash and in the back 1/3rd of the cabinet is recommended.



Single Walled Cabinet

When an airflow channel only needs to pass through a single sheet metal panel, the "single wall" installation method is suitable. This is most typical when the Sidewall sensor is mounted on the side of a cabinet, and airflow simply travels through the sensor body with no need for additional ducting. In this case, the user will not need to use the PVC flex tubing, nor the end cap, which is included in the Sidewall sensor assembly.

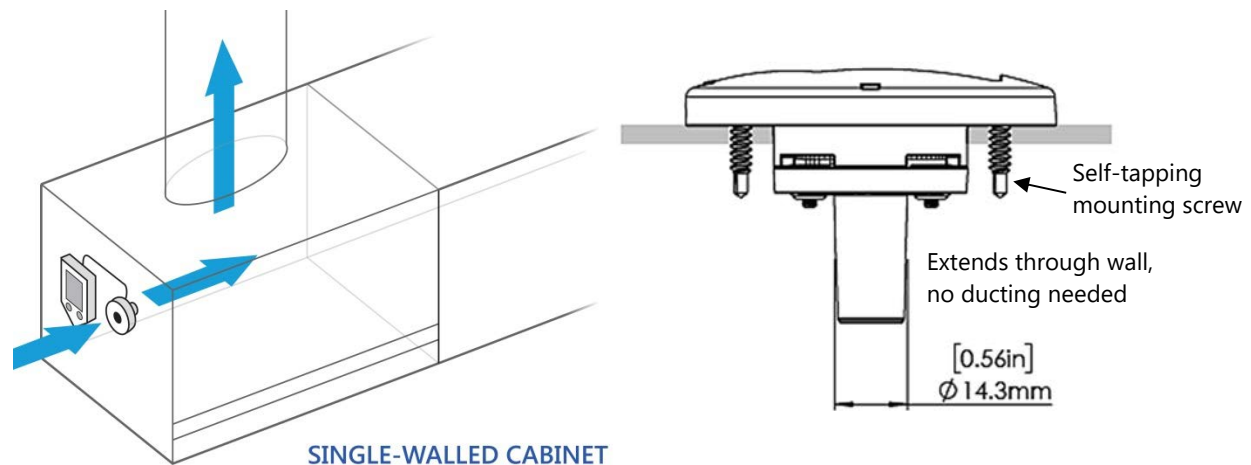


Figure 13 Sidewall Sensor on Single Walled Cabinet

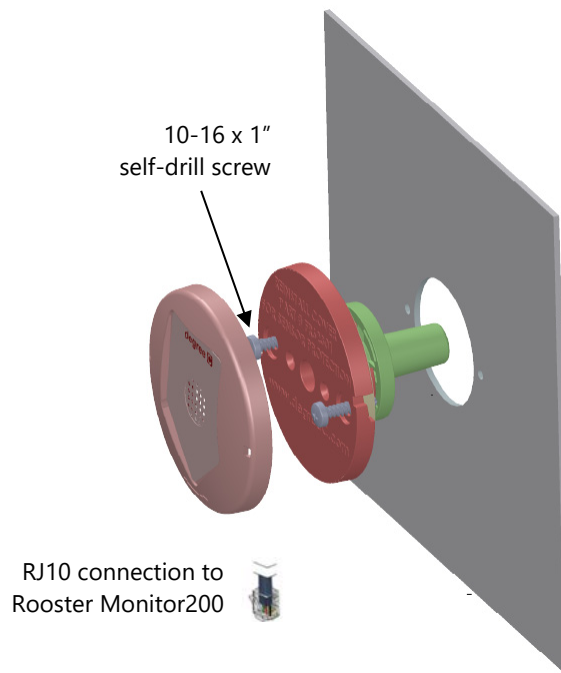


Figure 14 Sidewall Sensor Mounting - Single Walled Cabinet

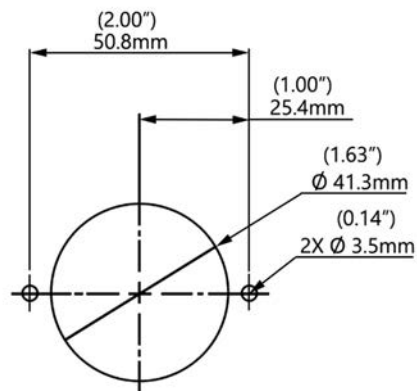


Figure 15 Sidewall Sensor Mounting Dimensions

Dual Walled Cabinet

For those installations where the Sidewall sensor will be on the front face of the fume hood, and a duct is needed to create an airflow path from the front face to the inside face of the cabinet, the "dual walled" installation method is required. This method is also required for installations where the Sidewall sensor is mounted on the side, but there are two sheet metal walls for the airflow to travel through. In both scenarios, the Sidewall sensor will need to be installed according to the "dual walled" method depicted in the diagram below. The dual walled solution simply involves the use of the supplied PVC tubing and end cap.

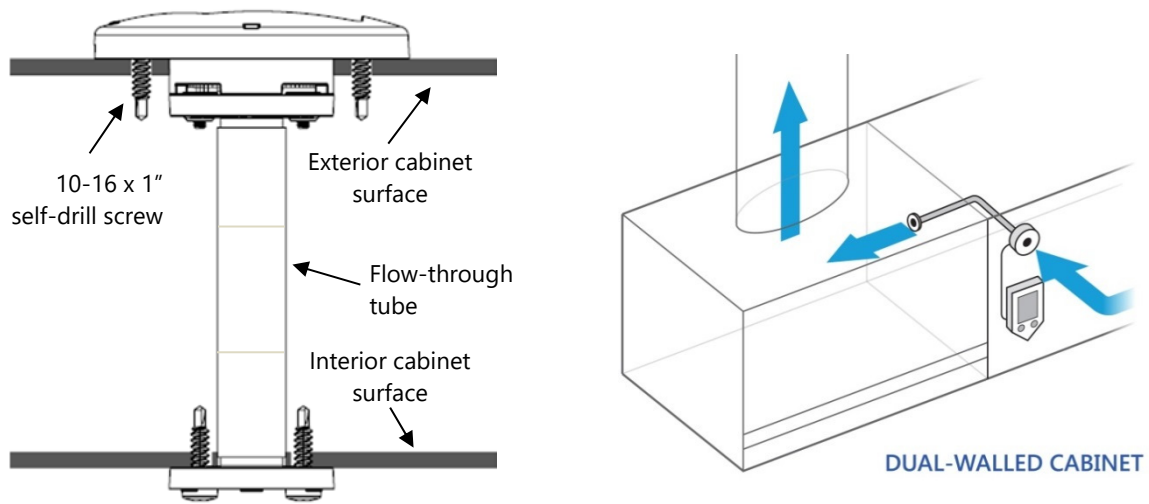


Figure 16 Sidewall Sensor on Dual Walled Cabinet

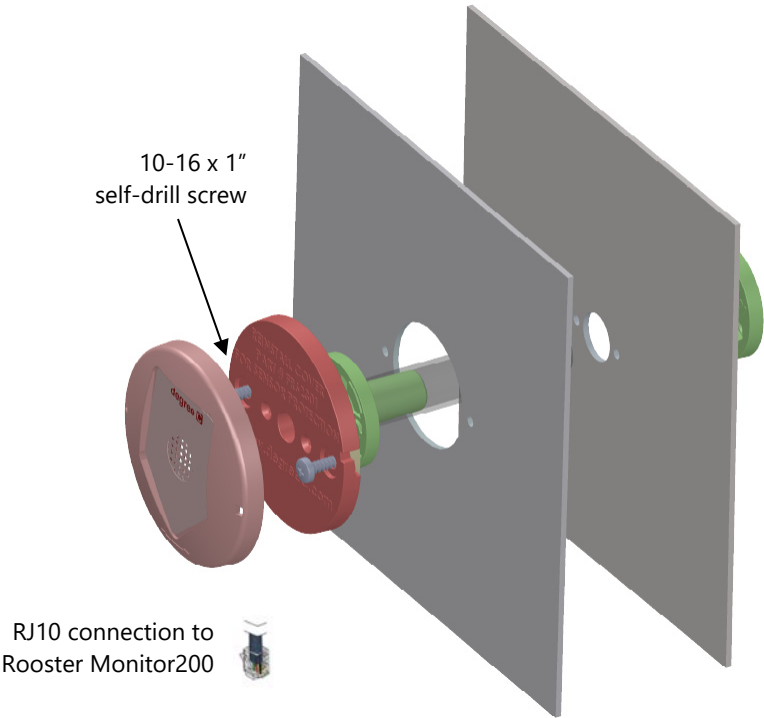
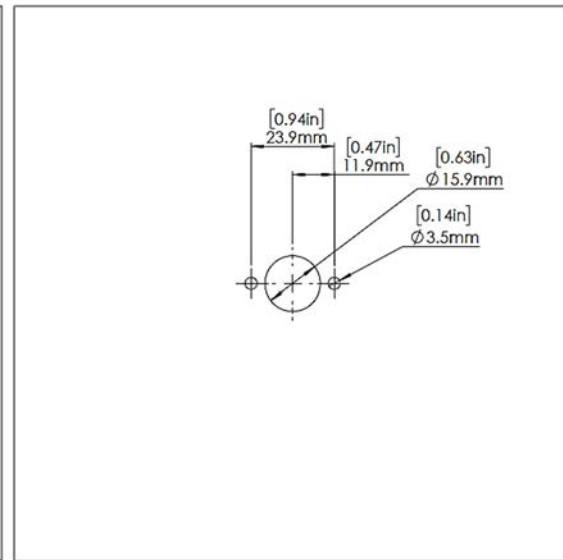
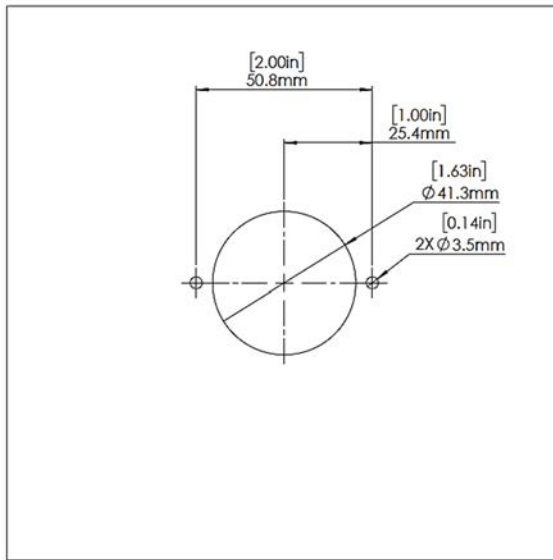


Figure 17 Sidewall Sensor Mounting - Dual Walled Cabinet



Inline Sensor

We recognize that certain airflow monitors, already installed in cabinets, may have failed in the field, or do not meet the level of safety required in recent years. In addition, for some installations, the equipment manager may require a sensor installation where tampering is prevented, by moving the sensor assembly out of sight and away from any tool access. For this reason, the Rooster can be ordered with an inline sensor which is quickly connected by splicing into the existing 1/2" flow tube being used by another monitor. The suggested installation procedure is depicted below. **Inline sensor includes sensor and tubing only. Call Degree Controls for pricing on additional installation components.*

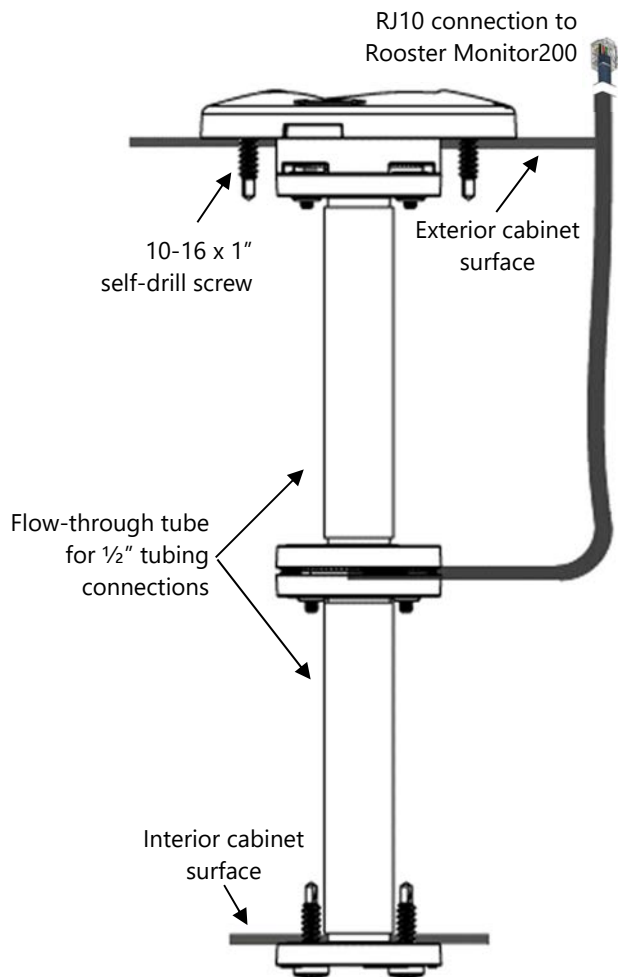


Figure 21 Suggested Inline Sensor Installation



Figure 20 Inline Sensor Includes Sensor with Cable and Tubing Only

Boot Up Procedure

The Rooster does not have a power-on switch and will become energized as soon as it is plugged in. The Rooster boots to the Degree Controls startup screen, with a slot for a custom logo or image file in .bmp format, 240 x 320 pixels (Navigate to the Import/Export menu to upload a new start-up image.). Once the start-up procedure has completed, the Home screen will appear with two system buttons and an "Uncalibrated" message on the yellow status banner across the screen. Before performing a first-time calibration of your unit, you will need to set up password-protected access tiers for advanced system functions (Calibration requires a Certifier passcode). This is explained in the "Access Tier Privileges" section below.



The Rooster Monitor can be rebooted 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 Rooster: 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
Set Minimum Alarm Volume Threshold	EH&S, Certifier
Alarm Ringback Setting	EH&S, Certifier
Alarm Delay Setting	EH&S, Certifier
Startup Delay Setting	EH&S, Certifier
Alarm Latching Setting	EH&S, Certifier
Alarm Tones Settings	EH&S, Certifier
Mute Live Alarm	None
Perform Calibration	Certifier
Set Asset Tag	EH&S
Set Time / Clock Format	EH&S, Certifier
Import / Export	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 (if Alarm Latching is set to Password)	EH&S

Set/Change Passwords

To change or set a password, follow this GUI (graphical user interface) 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 have authorization 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.

Calibration

Calibration – Airflow Sensor

Once you have installed and booted up your Rooster Monitor200, you must perform a first-time calibration to set the alarm threshold and establish both low velocity and normal operational velocity set points. You may choose from two calibration routines:

- Two-point calibration with *manual entry of face velocity* for low flow and normal operating conditions. Nominal face velocity is measured via your handheld °C Point anemometer.
- Two-point calibration with *automated entry of face velocity* for low flow and normal operating conditions. Face velocity is measured via a UAS1000 reference sensor connected to the built-in USB port on Rooster. Rooster automatically calculates average face velocity from measurements taken at multiple grid points in the plane of the hood sash. Note: UAS1000 sensor calibration is valid for Rooster with a Sidewall or Inline sensor installation. It is not available for a Probe sensor installation.

Notes:

1. The Rooster can also be calibrated using a °C Point anemometer and a Bluetooth dongle for automated entry of face velocities. Contact sales@degrec.com for more information.
2. Calibration with automated entry of face velocity is only valid for Sidewall or Inline sensor installation. It is not available for a Probe sensor installation.

Follow the appropriate steps below to get your unit calibrated. Steps 1 through 5 are the same for both calibration routines. If you choose to calibrate with automated entry, connect the UAS1000 reference sensor to the USB port on the left side of Rooster before beginning calibration.

1. You must first make sure that the system date and clock are accurate, because the Rooster saves the date and time of calibration for quick referencing. Follow the path below and set an accurate date and time (you may choose to set the clock in 12 or 24-hour format).

Home>Settings>System>Date & Time>Date & Time Settings

2. Navigate to the Calibration screen by following this path:

Home>Settings>Calibration

3. Push the grey "Calibrate" button to enter the Calibration menu screen.

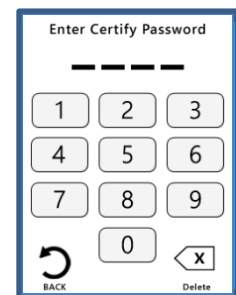
Home>Settings>Calibration>Calibrate

4. In order to proceed, you will need to enter your "Certify" password. If you have not set a custom password, the factory default is "6425".

Home>Settings>Calibration>Calibrate

5. For your initial calibration, keeping the default "Normal" value for "Allowed Turbulence" is recommended. Setting the "Allowed Turbulence" to "High" will help you overcome cabinet-level airflow instability issues. In most cases, changing this setting to "High" is not necessary. It should be reserved for rare circumstances where there is difficulty achieving stable, laminar airflow.

Home>Settings>Calibration>Calibrate>Allowed Turbulence



For two-point calibration with manual entry of velocity

(Skip to the next section for automated entry.)

- Before beginning the calibration process, select the Sensor Type to be calibrated. The choices are Probe, Sidewall, or Inline. There are a few key differences in the setup process for both Probe and Sidewall/Inline — these steps are outlined below:

Home>Settings>Calibration>Calibrate>Sensor Type

Setup for Probe:

- Plug the sensor into Rooster (ensure cap is on).
 - Press the red "Calibrate" button and follow steps 7 through 8.
- Wait until the Airflow Stability indicator is constant and then select "Continue" to initiate calibration and collect the low airflow calibration point. When the progress bar has filled up completely, you will be prompted to collect the high airflow calibration point.
 - Remove the cap and install the probe sensor. With air velocity at normal operating levels, wait until the Airflow Stability Indicator is constant, and then select "Continue" to collect the high airflow calibration point. When the progress bar has filled up completely, you will be prompted to enter your nominal face velocity (measured via your handheld anemometer). To toggle between m/s and fpm units, press the m/s or fpm button on the top right corner of the keypad. Press "Enter" to proceed and complete calibration.

Calibration Setup

Allowed Turbulence Normal

Sensor Type Probe

Calibrate

BACK EFCU Logout

Step 1 of 2: Collect low airflow calibration point. Ensure that cap is on probe sensor before continuing.

Continue Cancel

Airflow Stability Indicator

Full Scale Airflow

Step 2 of 2: Collect high airflow calibration point. Remove cap, install sensor, assert normal airflow and then continue.

Continue Cancel

Airflow Stability Indicator

Full Scale Airflow

Setup for Sidewall/Inline:

- Plug the sensor into the Rooster and install the sensor where calibration will take place.
**Note – If applicable, the sash will need to be in upright position prior to beginning the calibration process.*
 - Press the red "Calibrate" button and follow the steps below.
**Note – If applicable, the sash may be returned to its normal position once the low velocity point is entered (and desired units are chosen (fpm or m/s)).*
- Wait until the Airflow Stability Indicator is constant and then select "Continue" to initiate calibration and collect the low airflow calibration point. When the progress bar has filled up completely, you will be prompted to enter the current low airflow velocity (measured via your handheld anemometer). Press "Enter" to proceed.
 - With air velocity at normal operating levels, wait until the Airflow Stability Indicator is constant, and then select "Continue" to collect the normal velocity calibration point. When the progress bar has filled up completely, you will be prompted to enter the current nominal velocity.

Step 1 of 2: Set sash to high position for first calibration point.

Continue Cancel

Airflow Stability Indicator

Full Scale Airflow

Step 2 of 2: Set sash to safe operating position for final calibration point.

Continue Cancel

Airflow Stability Indicator

Full Scale Airflow

After valid set points have been defined, the user has the option to define a recalibration due date and enter Certifier information. Once the set points have been saved, the calibration sequence will end with a "Calibration Successful!" message. If a "Calibration

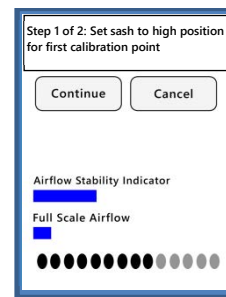
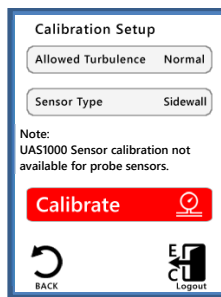
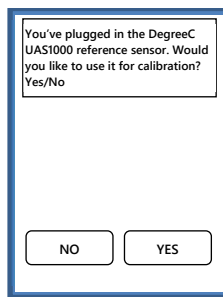
Failure" message is received instead, proceed to the troubleshooting section, or repeat the calibration procedure.

For two-point calibration with automated entry of velocity

6. Rooster automatically detects a UAS1000 sensor connection. Select "YES" to proceed with calibration using the UAS1000 reference sensor.
7. Select the Sensor Type to be calibrated. The choices are Sidewall or Inline.
Home>Settings>Calibration>Calibrate>Sensor Type

Setup for Sidewall or Inline:

- a) Plug the sensor into Rooster and install the sensor where calibration will take place
**Note – If applicable, the sash will need to be in the upright position prior to beginning the calibration process.*
- b) Press the red "Calibrate" button and follow the steps below.
**Note – If applicable, the sash may be returned to its normal position once average face velocity is calculated for the sash high position.*
8. Wait until the Airflow Stability indicator is constant, then select "Continue" to initiate the calibration.



9. Use the up arrows to the right of horizontal and vertical grid points to enter the number of measurement points for determining average face velocity using the UAS1000 reference sensor. Up to 12 may be entered for the horizontal axis, and 4 for the vertical. Then select "Continue".
10. Position the UAS1000 sensor in the sash plane and at the active measurement point of the grid array. Rooster represents this with the operator symbol, ⊗. When Airflow Stability is constant, select "Start Reading" to collect UAS1000 air velocity measurements.
11. Repeat the prior step for remaining grid points. You may select "Redo Last Point" if you believe there was a faulty reading.

Enter the number of grid points to determine average face velocity using UAS1000 reference.

Continue Cancel

Horizontal 3 ^

Vertical 2 ^

Sash High Average: Point 1 of 6

Start Reading Cancel

UAS1000 Airflow: 51 FPM

Airflow Stability Indicator

Full Scale Airflow

Sash High Average: Point 2 of 6

Start Reading Cancel

UAS1000 Airflow: 46 FPM

Airflow Stability Indicator

Full Scale Airflow

Redo Last Point

Sash High Average: Point 6 of 6

Start Reading Cancel

UAS1000 Airflow: 41 FPM

Airflow Stability Indicator

Full Scale Airflow

Redo Last Point

Sash High Position Average Face Velocity: 44FPM

Continue Cancel

Redo Final Point

12. Rooster will use all measurement points to calculate and then display average face velocity for the sash high position, establishing the low velocity set point. Select "Continue" and follow the on-screen prompts to establish the normal operational velocity set point.

Step 2 of 2: Set sash to safe operating position for final calibration point.

Continue Cancel

UAS1000 Airflow: 128 FPM

Airflow Stability Indicator

Full Scale Airflow

Enter the number of grid points to determine average face velocity using UAS1000 reference.

Continue Cancel

Horizontal 3 ^

Vertical 1 ^

Sash Safe Average: Point 1 of 3

Start Reading Cancel

UAS1000 Airflow: 130 FPM

Airflow Stability Indicator

Full Scale Airflow

Sash Safe Position Average Face Velocity: 129 FPM

Continue Cancel

Redo Final Point

Once valid set points have been defined, the calibration sequence will end with a "Calibration Successful!" message. If a "Calibration Failure" message is received instead, proceed to the troubleshooting section, or repeat the calibration procedure.

Troubleshooting – Airflow Sensor Calibration

If you receive a "Calibration Failure" message, you may be experiencing one of the following common issues:

1. **Velocity positions are too close [Zero velocity vs. Normal velocity].** To calculate an accurate calibration curve, the Rooster Monitor200 requires a minimum of 20% difference between sensor readings for low velocity and normal velocity to successfully calibrate. *There may not be enough of a difference between the sensor readings you have used during the calibration procedure.* You may need to increase system velocity to a higher than normal level to ensure there is a minimum of 20% difference in velocities.
2. **Velocity input values are problematic.** As in 1, above, the Rooster Monitor200 requires a minimum difference of 20% between nominal values for both low and high velocity settings. First, consider the possibility of a typographical error, and try to perform the sequence again. Verify that the correct values have been entered, and that there is a minimum 20% difference between them.
3. **Turbulence.** The Rooster Monitor200 has an "Allowed Turbulence" setting available to users who are having difficulty finding a sensor location with stable airflow. Although uncommon, this can be an issue in some systems due to the mechanical or environmental design of the cabinet or

laboratory. The default setting is "Normal", and should only be changed if calibration is unsuccessful, due to unstable airflow. Before changing this setting, ensure that you are following the calibration procedure properly.

Home> Settings>Calibration>Calibrate>Allowed Turbulence

Airflow Obstruction. Verify that your workspace is free of any obstructions in the plenum or internal blockages in the HVAC system that could lead to faulty airflow readings. You may also need to validate that your sensor is placed and installed properly. See the Installation section for instructions.

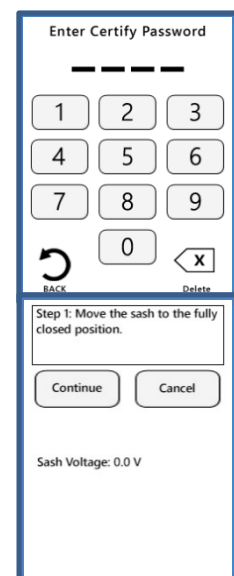
4. **Incorrect Units.** Ensure that the correct units are selected. Units can be changed by tapping them on the home screen.

If you have tried the common fixes above, please contact our customer service team at sales@degrec.com or call in to our toll-free line at (877) 334-7332.

Calibration – Sash Height

The sash height calibration routine calibrates sash position, to scale, to a given input voltage. Sash height calibration is available for analog sash operation and describes sash position as Closed, Normal, or High. The sash height calibration steps are as follows:

1. Navigate to the Calibration screen by following this path:
Home> Settings>Calibration
2. Push the grey "Calibrate" button to enter the Calibration Selection menu screen.
Home> Settings>Calibration>Calibrate
3. In order to proceed, you will need to enter your "Certify" password. If you have not set a custom password, the factory default is "6425".
Home> Settings>Calibration>Calibrate
4. Push the "Calibrate Sash Position" button to enter the Sash Calibration Setup menu screen.
Home> Settings>Calibration>Calibrate>Calibrate Sash Position
5. Press the red "Calibrate" button.
6. Move the sash to the fully closed position, then select "Continue" to initiate the calibration.
Note: The Monitor200 displays the actual sash input voltage level as you step through the calibration routine. Voltage levels should change as you move the sash position from Closed to High to Normal.
7. Move the sash to the fully open position, then select "Continue".
8. Move the sash to the normal operating position, then select "Continue".



- Once the Closed, High, and Normal sash positions are defined, sash position is calibrated to scale, and the calibration sequence will end with a "Calibration Successful!" message with the sash calibration date.

Note: The sash height position routine records position.

Sash Readings

- If the sash reading is within 1% of full scale of the recorded closed position, the sash is considered to be in the closed position.
- If the sash reading is 1% of full scale greater than the normal position, the sash is considered to be in the open position.
- If sash readings are between the closed and normal positions, the sash is considered to be in the normal position.
- The Monitor200 will alarm for unsafe sash position whenever the sash is in the open position.

Alarm Threshold Configuration

- To set your alarm threshold, follow the menu path below:
Home> Settings>Thresholds>Adjust Normal Thresholds
- Select "Low Threshold" to set low threshold alarm trip and clear points. Select "High Threshold" to set high threshold alarm trip and clear points. Use of low threshold alarm trip and clear points is most common.

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.

- By default, no values are set for the NSB (Night Setback) mode of operation. Depending on your application or setup, an active alarm during Night Setback may not be required. 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. Once thresholds are assigned for Night Setback, the alarm may be set as "Audible" or "Muted" in the alarm controls menu.

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

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

Adjust Normal Thresholds

Alarm Trip: 80 FPM
Alarm Clear: 85 FPM

Low Threshold

No High Threshold Set

High Threshold

BACK Logout

Enter Low Trip Threshold

80 fpm

1 2 3
4 5 6
7 8 9
. 0 Enter

Enter Low Clear Threshold

85 fpm

1 2 3
4 5 6
7 8 9
. 0 Enter

Alarm Troubleshooting

If an alarm is failing to sound or clear as intended, first verify that the alarm threshold values are valid. 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 Monitor200 offers an array of customization options for alarm behaviors. The following section provides a detailed overview on how to customize alarm behavior to meet individual 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 Monitor200 allows authorized users (Certifier & EH&S) to set night setback, ringback, alarm delay, startup delay, latching, alarm tone and airflow resolution preferences.

Night SetBack

The Rooster Monitor200 supports Night Setback (NSB) for energy savings and greater HVAC system integration in building automation systems. Users can toggle between three modes of operation detailed below:

The 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

Note: The definitions in the table below are with the I/O Polarity of the NSB input set as normally open.

Night Setback Modes	Definition
Audible	Enters Night Setback mode whenever relay is closed and audibly triggers an alarm when airflow drops below the NSB trip point. To adjust Night Setback alarm thresholds, navigate to: Home> Settings>Thresholds>Adjust Thresholds
Muted	Enters Night Setback mode whenever relay is closed and triggers a muted alarm when airflow drops below the NSB trip point. (LED will still flash during an alarm event). This is the default setting. To adjust Night Setback alarm thresholds, you must go to the Calibration menu and select "Adjust Thresholds".
Disabled	Disables Night Setback mode. Device 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 several ringback durations available:

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

Setting	Definition
Off	Turns off ringback. If an alarm is muted with ringback turned off, the alarm sound turns on immediately (approximately 1 sec delay) if the unit is still in an active alarm state.
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.
Disable	Disables ringback. If an alarm is muted, the alarm remains muted for the entire duration of the alarm event.

Alarm Delay

To account for hysteresis and prevent nuisance alarms or premature recoveries, users can define the amount of time that the Rooster has to achieve continuous safe velocity readings before the alarm state clears, 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 are fully powered up and operational.

Startup Delay	Definition
5s	Alarm is paused for 5 seconds on power up.
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.

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. When latching is set to "Password", 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 Tone Settings

The user can configure alarms with different tones. Alarm tone settings are available for Low Flow, Sensor, and Sash Alarms. At the time of tone selection, the tone plays for approximately 2 seconds to provide an understanding of tone type and volume level. Default alarm tone settings are:

- Airflow alarm - Tone 1
- Sensor alarm - Off
- Sash alarm - Tone 2

Alarm Tone settings supersede Minimum Volume settings.

Alarm Type	Definition
Off	The audible alarm is off.
Tone 1	Alarm plays Tone 1.
Tone 2	Alarm plays Tone 2.

Examples:

1. If the sensor becomes disconnected, and Sensor Alarm is set to Tone 1, the audible alarm will play Tone 1, and the on-screen alert banner will indicate Sensor Fault.
2. If the sensor becomes disconnected, and Sensor Alarm is set to Off, there will be no audible alarm, and the on-screen alert banner will indicate Sensor Fault.

Splash Screen

During startup, the Monitor200 displays the splash screen first and then the home screen. The user has the ability to display the splash screen throughout the entire startup delay period by changing Splash Screen from "Normal" to "Startup Delay".

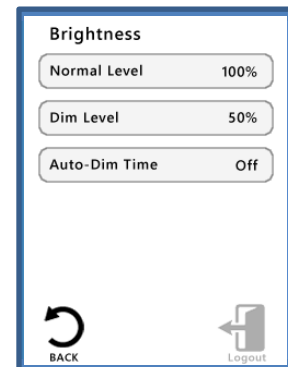
Home > Settings > System > Alarms/Sound > Alarm Controls > Splash Screen

Backlight Dimming

Brightness is adjusted via the left and right arrows. Actual screen brightness adjusts immediately as the setting is changed. Pressing the Enter button will save the brightness setting, and Cancel will leave the setting unchanged.

A timer is reset each time the screen is pressed. If that timer reaches the "Auto-Dim Time" value, the screen will dim. When the screen is pressed again, the screen will return to its original brightness setting. The lowest dimness setting will not allow the screen to turn completely dark, instead, it will be just bright enough to still be readable. Dim times are 1, 5, 10, and 60 minutes, with an "Off" setting, and a default time of 10 minutes initially.

Home > Settings > System > Brightness



Airflow Settings

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	Increases filtering providing smoother readings, but slower response.
Med	Default setting. Provides a balance between smooth readings and reasonable response times.
High	Decreases filtering resulting in greater fluctuation of readings with faster response.

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 at different settings up to 5 fpm or .05 m/s.

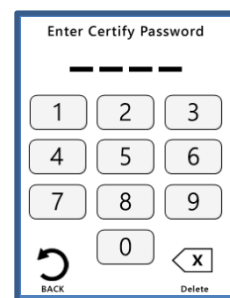
Home > Settings > System > Airflow Settings > Airflow Resolution

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.

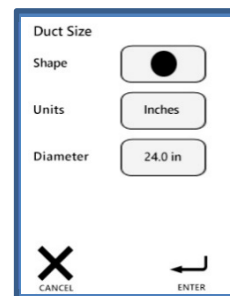
Volumetric Flow Settings

The Monitor200 displays velocity flow by default. Display of volumetric flow is available for applications using probe style sensors in ducted flows. Volumetric flow can be displayed by first navigating to the Airflow Settings menu to enable volumetric flow, and then entering the required duct information. The steps are as follows:

1. Navigate to the System screen by following this path:
Home>Settings>System
2. Push the "Airflow Settings" button to enter the Airflow Settings menu screen.
Home> Settings>System>Airflow Settings
3. In order to proceed, you will need to enter your "Certify" password. If you have not set a custom password, the factory default is **"6425"**
4. Push the "Volumetric Flow Settings" button to enter the Volumetric Flow menu screen.
Home> Settings>System>Airflow Settings>Volumetric Flow Settings
5. Push the "Volumetric Flow" button until it says Enabled.
Home> Settings>System>Airflow Settings>Volumetric Flow Settings>Volumetric Flow



6. Push the "Duct Size" button to enter the Duct Size screen.
Home> Settings>System>Airflow Settings>Volumetric Flow Settings>Volumetric Flow>Duct Size
7. Press the "Shape" button until the appropriate duct shape is displayed, circular or rectangular.
8. Press the "Units" button to display your choice of cm or inch units for entry of duct dimension(s).
9. Enter the dimension(s) of the duct, diameter for circular shape or height and width for rectangular shape.



A third units touch toggle of CFM is accessible on the main screen with volumetric flow enabled.

Air Changes Per Hour

The Monitor200 displays velocity flow by default. Airflow changes per hour (ACH) is available to measure the air volume added to, or removed from, a space. ACH can be displayed by navigating to the Airflow Settings menu:

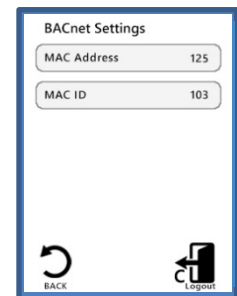
1. Enable Airflow Changes/Hr.
2. Enable volumetric flow.
3. Enter duct information.
4. Enter room volume.

To view the ACH on the main screen, press the units area a third time, after enabling ACH in the settings area.

BACnet® MS/TP

The Rooster Monitor200 uses the BACnet® Master Slave Token Passing (MS/TP) protocol. Data is transmitted via the BACnet® connection on the rear panel of the alarm module. Prior to a BACnet® device discovery, the MAC Address and MAC ID of the Rooster must be set at the alarm module, and the Rooster power cycled for 5 seconds. A BACnet® Settings menu screen is provided to change the MAC Address and MAC ID for network configuration:

Home> Settings>BACnet Settings



Familiarize yourself with all functions and behaviors invoked by Rooster inputs and soft buttons before beginning BACnet® communication to the device. If conflicting object values are established, device behavior may not be as intended. If your Rooster is not working as expected, and you have exhausted all normal troubleshooting steps, follow the factory reset procedure to restore default settings and passwords.

BACnet® Protocol Network Settings

The MAC Address sets the main hardware address of the Rooster Monitor200. Each device on the network must have a unique hardware address. Default values for MAC Address and MAC ID are included in the BACnet® MS/TP Objects table below.

Baud rate for BACnet® MS/TP communication protocol is 38400 baud.

BACnet® MS/TP Objects

The Rooster BACnet® MS/TP interface allows users to extensively configure and monitor the device. See the objects table below for details.

BACnet® MS/TP Objects Table

Feature	Object Type	Device Instance	Units	Range	Read/Write	Definition	Default Value	Notes
MAC Address	Analog Value	0	-	1 - 127	R/W	MAC Address	125	MAC Address must match alarm module to establish initial communication
MAC ID	Analog Value	1	-	1 - 254	R/W	MAC ID	103	MAC Address must match alarm module to establish initial communication
Room Volume	Analog Value	2	ft3	0-100000	R/W	Room volume	0	
Low Alarm Trip	Analog Value	3	m/s	0 to 40.99	R/W	Low air velocity value that will trigger an alarm	80	
Low Alarm Clear	Analog Value	4	m/s	0 to 40.99	R/W	Low air velocity value that will clear an alarm	85	
High Alarm Trip	Analog Value	5	m/s	0 to 40.99	R/W	High air velocity value that will trigger an alarm	No value set	
High Alarm Clear	Analog Value	6	m/s	0 to 40.99	R/W	High air velocity value that will clear an alarm	No value set	
NSB Low Alarm Trip	Analog Value	7	m/s	0 to 40.99	R/W	Low air velocity value that will trigger an alarm	No value set	Valid in Night Setback mode of operation
NSB Low Alarm Clear	Analog Value	8	m/s	0 to 40.99	R/W	Low air velocity value that will clear an alarm	No value set	Valid in Night Setback mode of operation
NSB High Alarm Trip	Analog Value	9	m/s	0 to 40.99	R/W	High air velocity value that will trigger an alarm	No value set	Valid in Night Setback mode of operation

Feature	Object Type	Device Instance	Units	Range	Read/ Write	Definition	Default Value	Notes
NSB High Alarm Clear	Analog Value	10	m/s	0 to 40.99	R/W	High air velocity value that will clear an alarm	No value set	Valid in Night Setback mode of operation
Backlight Dim Pct	Analog Value	11	%	5 to 100	R/W	Touch screen dim level as a percentage of highest brightness level	50	
Backlight Normal Pct	Analog Value	12	%	5 to 100	R	Touch screen brightness level as a percentage	100	
Duct Height	Analog Value	13	cm	0 to 122	R/W	Airflow duct area height	0	Valid if the selected duct area is rectangle
Duct Width	Analog Value	14	cm	0 to 183	R/W	Airflow duct area width	0	Valid if the selected duct area is rectangle
Duct Dia	Analog Value	15	cm	0 to 183	R/W	Airflow duct area diameter	0	Valid if the selected duct area is circle
Face Velocity	Analog Input	0	m/s	0 to 5	R	Real time face velocity with sash in any position	No value set	
Air Temperature	Analog Input	1	C	0- 150	R	Air temperature	F	
Airflow Changes Per Hour	Analog Input	2	NA	-	R	Number of times the air in a system has been completely refreshed in an hour	No value set	Valid if Airflow Changes/Hr is enabled and room volume is entered
Sash Close Voltage	Analog Input	3	V	0 – 10 V	R	Calibrated sash voltage with the sash closed		Valid if Sash Type is analog
Sash Open Voltage	Analog Input	4	V	0 – 10 V	R	Calibrated sash voltage with the sash in the high position		Valid if Sash Type is analog
Sash Normal Voltage	Analog Input	5	V	0 – 10 V	R	Calibrated sash voltage with the sash in the normal operating position		Valid if Sash Type is analog

Feature	Object Type	Device Instance	Units	Range	Read/Write	Definition	Default Value	Notes
Calibration Status	Binary Input	0	0: Uncalibrated 1: Calibrated	0, 1	R	Calibration status	Uncalibrated	
Low Flow Alarm	Binary Input	1	0: Inactive 1: Active	0, 1	R	Low Flow Alarm becomes active if low flow alarm setpoint is reached		
High Flow Alarm	Binary Input	2	0: Inactive 1: Active	0, 1	R	High Flow Alarm becomes active if high flow alarm setpoint is reached		
Allowed Turbulence	Binary Input	3	0: Normal 1: High	0, 1	R	Allowed turbulence level during calibration	Normal	Setting Allowed Turbulence to High will help you overcome cabinet-level airflow instability issues. It should be reserved for rare circumstances where there is difficulty achieving stable, laminar airflow.
Sash Calibration Status	Binary Input	4	0: Uncalibrated 1: Calibrated	0, 1	R	Sash calibration status	Uncalibrated	Sash calibration is associated with Sash Type analog
Relay1 Status	Binary Input	5	0: OFF 1: ON	0,1	R	Current output status of Relay 1	-	
Relay2 Status	Binary Input	6	0: OFF 1: ON	0,1	R	Current output status of Relay 2	-	
Relay3 Status	Binary Input	7	0: OFF 1: ON	0,1	R	Current output status of Relay 3	-	
Sash In Status	Binary Input	8	0: OFF 1: ON	0,1	R	Sash input status		
NSB In Status	Binary Input	9	0: OFF 1: ON	0,1	R	NSB input status		
Aux In Status	Binary Input	10	0: OFF 1: ON	0,1	R	Aux input status		

Feature	Object Type	Device Instance	Units	Range	Read/Write	Definition	Default Value	Notes
NSB Mode	Binary Value	0	0: Disabled 1: Enabled	0, 1	R/W	Enable or disable Night Setback mode of operation	NSB Disabled	
NSB Mute	Binary Value	1	0: Audible 1: Muted	0, 1	R/W	Configure the Night Setback mode of operation as audible or muted	Muted	Valid if NSB Mode is enabled
Key Beep	Binary Value	2	0: Audible 1: Muted	0, 1	R/W	Toggle key beep and button beep sounds on and off	Audible	
Volumetric Flow	Binary Value	3	0: Disabled 1: Enabled	0, 1	R/W	Enable or disable the display of volumetric flow on the Rooster	Disabled	A non-zero value for volumetric flow can be displayed on the Rooster provided duct information is entered.
Duct Shape	Binary Value	5	0 : Circle 1 : Rectangle	0,1	R/W	Shape of airflow duct	Circle	
Sash Digital Input Polarity	Multi-State Value	0	1: Normally Open 2: Normally Closed 3: Disabled	1, 2, 3	R/W	Sash digital input polarity	Normally Open	
NSB Digital Input Polarity	Multi-State Value	1	1: Normally Open 2: Normally Closed 3: Disabled	1, 2, 3	R/W	NSB digital input polarity	Normally Open	
AUX Digital Input Polarity	Multi-State Value	2	1: Normally Open 2: Normally Closed 3: Disabled	1, 2, 3	R/W	AUX digital input polarity	Normally Open	
Alarm Latch	Multi-State Value	3	1: Disabled 2: Password 3: Enabled	1, 2, 3	R/W	Alarm latch status	Disabled	

Feature	Object Type	Device Instance	Units	Range	Read/Write	Definition	Default Value	Notes
Device Volume	Multi-State Value	4	1. High 2. Medium 3. Low	1, 2, 3	R/W	Device volume control	High	
Relay1 Polarity	Multi-State Value	5	1: Normally Open 2: Normally Closed 3: Disabled	1, 2, 3	R/W	Relay out polarity status when not active	Normally Open	
Relay2 Polarity	Multi-State Value	6	1: Normally Open 2: Normally Closed 3: Disabled	1, 2, 3	R/W	Relay out polarity status when not active	Normally Open	
Relay3 Polarity	Multi-State Value	7	1: Normally Open 2: Normally Closed 3: Disabled	1, 2, 3	R/W	Relay out polarity status when not active	Normally Open	
Relay1 Functionality	Multi-State Value	8	1: Sash Alarm 2: Flow Alarm 3: Light 4: Fan 5: Null	1, 2, 3, 4, 5	R/W	Relay functionality	Flow Alarm	
Relay2 Functionality	Multi-State Value	9	1: Sash Alarm 2: Flow Alarm 3: Light 4: Fan 5: Null	1, 2, 3, 4, 5	R/W	Relay functionality	Sash Alarm	
Relay3 Functionality	Multi-State Value	10	1: Sash Alarm 2: Flow Alarm 3: Light 4: Fan 5: Null	1, 2, 3, 4, 5	R/W	Relay functionality	Null	
Ringback Delay	Multi-State Value	11	1: Off 2: 10 s 3: 30 s	1, 2, 3, 4, 5, 6	R/W	Time delay before audible alarm returns, after pressing the mute button	10 sec	

Feature	Object Type	Device Instance	Units	Range	Read/Write	Definition	Default Value	Notes
			4: 1 min 5: 5 min 6: 10 min					
Backlight Dim Time	Multi-State Value	12	1: 1 min 2: 5 min 3: 10 min 4: 60 min 5: Off	1, 2, 3, 4, 5	R/W	Time delay before screen brightness goes to dim level	Off	
Sash Type	Multi-State Value	13	1: Analog 2: Digital	1, 2	R/W	Sash type	Digital	
Startup Delay	Multi-State Value	14	1: 5 sec 2: 30 sec 3: 1 min 4: 2 min 5: 5 min	1, 2, 3, 4, 5	R/W	Amount of time alarm is paused on startup	30 sec	
Probe Type	Multi-State Value	15	1: Probe 2: Sidewall 3: Inline	1, 2, 3	R/W	Sensor type to be calibrated	Sidewall	
Alarm Delay	Multi-State Value	16	1: 1 sec 2: 2 sec 3: 5 sec 4: 10 sec	1, 2, 3, 4	R/W	Amount of time that the Rooster has to achieve continuous safe velocity readings <i>before the alarm state clears</i> and continuous unsafe velocity readings <i>before an alarm is triggered</i>	2 sec	
Asset Tag	Character String Value	0	-	12-digit, alphanumeric	R/W	Asset Tag	Asset Tag	Rooster information, asset tag
Rooster-FwRev	Character String Value	1	-	NA	R	Current revision of Rooster firmware	Current revision	Rooster information, firmware revision

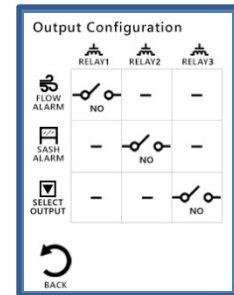
Feature	Object Type	Device Instance	Units	Range	Read/Write	Definition	Default Value	Notes
SerialNumber	Character String Value	2	-	Standard serial number format	R	Serial number of Rooster		Rooster information, ID Data
Rooster Caldate	Character String Value	3	-	Standard date format	R	Calibration date	NA	Rooster information, airflow sensor calibration date
Sash Caldate	Character String Value	4	-	Standard date format	R	Sash calibration date	NA	Rooster information, Analog Sash calibration date

I/O Configuration

Relay Outputs

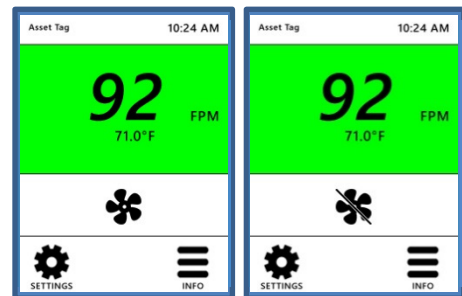
Flow Alarm and Sash Alarm link to relay outputs 1 and 2 by default. Relay outputs are configurable, however, and can be linked to both alarms and on-screen accessory buttons. The output options are:

1. Flow Alarm
2. Sash Alarm
3. Light (accessory button)
4. Fan (accessory button)



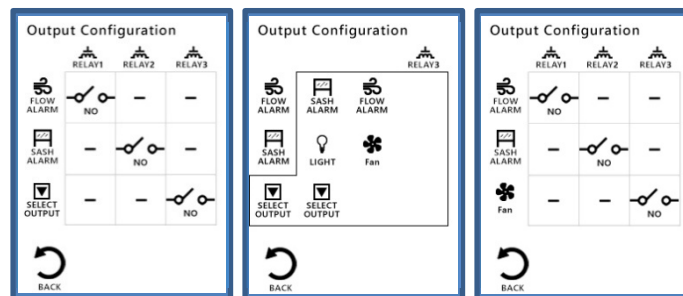
Accessory Buttons

"Light" is an on-screen accessory button which can be used to turn a lamp on or off. "Fan" is a separate on-screen accessory button which can be used to turn a fan on or off. Once the user links an accessory button to a relay output from the grid, the button is enabled and displayed on the main screen of the Monitor200. Accessory buttons reflect the on/off status of the connected devices. Press the button to toggle the connected device on or off.



Links to Relay Outputs

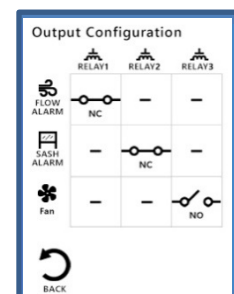
Relay outputs are linked from the Output Configuration grid. For the relay you want to change, press the output on the left-most side of the grid to show the output options. Then press the output you want to link to the selected relay. If the relay is unassigned, "Select Output" appears.



I/O Polarity

For advanced users, it may be helpful to toggle relay and input nodes from normally open to normally closed. In the default state, a closed relay output denotes an alarm. If the alarm state is required to be an open relay, then toggle the output on the Monitor200.

For example: The Flow Alarm and Sash Alarm are configured by default to alarm when the relay is closed. If these are toggled to Normally Closed, then this logic is



reversed.

Home>Settings>System>Advanced>I/O Configuration>Output Configuration

Import/Export

EEPROM

The user can save all current Rooster settings to a USB thumb drive for future use. Importing the EEPROM configuration file to other Roosters in your facility ensures operational consistency and saves valuable setup time. Plug a USB thumb drive into the Rooster and navigate to the Import/Export menu to access the Import EEPROM or Export EEPROM function.

Home>Settings>System>Advanced>Import/Export

Event Log

Rooster logs the date and time of alarms and alarm recovery as well as system boot time to its internal SD card. Users can export the event log in .csv format to a USB thumb drive. Simply plug a USB thumb driving into the Rooster and select Export Event Log from the Advanced menu. Users also have a selection to delete the event log.

Home>Settings>System>Advanced>Import/Export

	A	B	C	D	E
1	Date	Time	Event Type		
2	7/30/2019	17:40:56	System Boot		
3	7/30/2019	17:43:30	Low Flow Alarm		
4	7/30/2019	17:43:54	Low Flow Alarm Clear		
5	7/30/2019	20:49:43	Sash Alarm		
6	7/30/2019	20:49:44	Sash Alarm Clear		
7					
8					

Figure 22 Event Log in .CSV Format

Users can also view the event log on screen by navigating to the Info screen and then pressing "Event Log" to view.

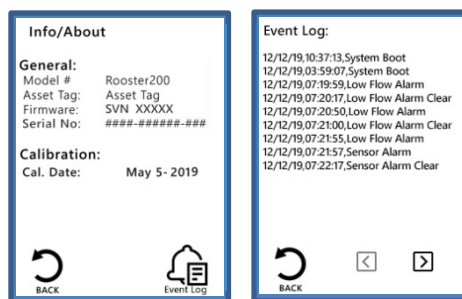


Figure 23 Event Log Viewable On Screen

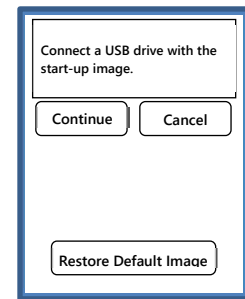
Upload Start-Up Image

Upload Start-Up Image allows users to change the start-up image via USB upload. The acceptable file format is .bmp, 240 x 320 pixels. Once the image is successfully uploaded, Rooster will display "Success! The start-up image will show on the next boot up.

The default image may be restored at any time.

Export Calibration Data

The Certifier can export the calibration certificate with information about the Rooster's calibration. Plug a USB thumb drive into the Rooster and then select Export Calibration Data to export the document in .csv file format.



Model:	Monitor200
Asset Tag:	Asset Tag
Rooster Serial No:	####-#####-###
Sensor Type:	Probe
Cal Date:	Jan 5- 2024
Cal Due Date:	Jan 5- 2025
Certifier :	
Certifier Mail:	
Calibrated by:	Manual
[AF_CAL_DATA]	
AverageFacevelocityHigh	0.03
AverageFacevelocitySafe	0.65

USB Field Upgrade Procedure

Caution: A Rooster with firmware preceding version 1.06 may be upgraded to version 1.06 using the bootloader, however, existing calibration data will be lost, and all settings will be reset to factory defaults. Thus, this update should only be done during annual certification, where the certifier would be recalibrating anyway, OR, if the client approves forcing a recalibration.

Degree Controls is continually improving Rooster products. The latest in Rooster technology offers users a convenient soft reboot procedure for upgrading the operating system while maintaining existing *calibration data* and *user settings*. This is available for a Rooster having firmware version 1.06 and later.

A Rooster with firmware preceding version 1.06 may be upgraded, however, existing calibration data will be lost, and all settings may be reset to factory defaults. Thus, the update should only be done during annual certification, where the certifier would be recalibrating anyway, OR, if the client approves forcing a recalibration.

The first step of the firmware upgrade process is to identify the current version of Rooster firmware. Next, use the table below to evaluate the effects of an upgrade, and determine the best time to update your Rooster.

Upgrade From Firmware Version	Upgrade Procedure	Calibration Maintained?	User Settings Maintained?
V1.06.xx	Soft Reboot from Info Screen	Yes	Yes
V1.05.xx	Power Cycle Procedure	No	Yes, if the Export EEPROM function is used to save Rooster settings before upgrading firmware, <i>and</i> the Import EEPROM function is used to restore user settings post upgrade.

You will need:

1. USB thumb drive with new firmware "RM200_BT.bin"
2. Rooster Monitor200

Review the firmware update procedure carefully before you begin. The firmware update procedure must be allowed to complete without interruption. If the update procedure is interrupted by user interference, a power failure, or some other circumstance, the existing firmware may be corrupted, and the device may become nonfunctional. Contact Degree Controls if your Rooster is inoperative as a result of an interruption during the firmware update procedure.

Soft Reboot from Info Screen

Procedure:

1. Insert the USB thumb drive into the left side of Rooster.
2. Navigate to the Info [] screen and press the Upgrade [] button at the bottom of the screen. Rooster will prompt you to confirm you wish to backup current settings and upgrade the firmware.
3. Select "Yes". Rooster will restart to read the USB thumb drive, and the Alarm LED turns on. Once the upgrade process is complete, Rooster will automatically restart.
4. Navigate to the Info screen to validate that the new firmware version was properly installed. The firmware release information – listed next to "firmware" – should have changed to the most current build. If this is not the case, repeat the upgrade procedure.

Power Cycle Procedure

Procedure:

1. Remove power from the Rooster.
2. Insert USB thumb drive into left side of the Rooster.
3. Depress and hold the "Home" button, while reapplying power to your unit. (Hard Home button must be depressed while Rooster powers up in order to enter the firmware update sequence.)
4. After approximately 3 seconds, release the Home button. After approximately 10 seconds, the LED on the front of the Rooster will light, and the unit will boot up with the new firmware.
5. When the field upgrade procedure is complete, navigate to the Info [] screen to validate that the new firmware version was properly installed. The firmware release information – listed next to "firmware" – should have changed to the most current build. If this is not the case, repeat the upgrade procedure.

Factory Reset Procedure

The Factory Reset will return the Rooster Monitor200 to its default alarm & input/output settings. Time and date will be preserved. The factory reset procedure can be done at any time upon system reset to restore default settings and passwords.

Note: Calibration settings, contact information, asset tag designations, and prior event log history will be lost upon successful factory reset.

1. When the startup screen displays, press the "Mute" button four times.

2. The "Enter Certify Password" screen will display. The factory default Certifier password is "6425". This can be changed by accessing the Advanced menu.
3. The Factory Menu will be displayed. Select "Reset to Factory Defaults"
4. The unit now requires recalibration. Follow this menu path to perform a new calibration:
Settings>Calibration>Calibrate

GUI Map



Warranty

For a period of one (1) year following the date of delivery, and subject to the other provisions of this Warranty Section, DegreeC warrants that all new products that are both (a) manufactured by DegreeC and (b) purchased directly from DegreeC (or an authorized distributor of DegreeC) shall be free of material defects in materials and workmanship. Buyer's sole and exclusive remedy, and DegreeC's sole and exclusive obligation, in the event of any product defect shall be for DegreeC to, at its option, repair or replace such products free of charge. In no event shall DegreeC be liable for ordinary wear and tear. In order to get the benefit of the foregoing warranty, Buyer must examine the delivered products immediately upon receipt thereof and report to DegreeC, in writing, any visible defects within ten (10) working days of such receipt. Buyer's failure to report defects within the foregoing time period will be deemed an unqualified waiver of any and all of Buyer's rights to warranty claims. DegreeC does not provide any warranty for third party parts, components, or products that are not manufactured by DegreeC. Such parts, components, or products may be warranted by third parties on a "pass through" basis. The foregoing remedies shall not apply to any product failure caused in whole or in part by (i) Buyer's failure to operate, maintain, or service the products in accordance with DegreeC's documentation, (ii) any alteration, modification, or repair made to the products other than by DegreeC, or (iii) use of the products for a purpose other than that for which it is intended. THE FOREGOING EXPRESS WARRANTY extends only to the original customer of DegreeC or DegreeC's authorized distributor, as the case may be. THE CORRECTION OF ANY DEFECT IN, OR FAILURE OF, PRODUCTS BY REPAIR OR REPLACEMENT IN ACCORDANCE WITH DEGREEC'S POLICIES DESCRIBED HEREIN SHALL BE DEGREEC'S SOLE AND EXCLUSIVE OBLIGATION AND THE SOLE AND EXCLUSIVE REMEDY OF BUYER FOR ANY AND ALL LOSSES, DELAYS OR DAMAGES RESULTING FROM THE PURCHASE OR USE OF DEGREEC'S PRODUCTS. OTHER THAN THE LIMITED WARRANTY SPECIFICALLY STATED HEREIN, DEGREEC SPECIFICALLY DISCLAIMS ANY AND ALL OTHER WARRANTIES WITH RESPECT TO DEGREEC'S PRODUCTS, INCLUDING THE PERFORMANCE THEREOF AND ANY SERVICES PROVIDED TO BUYER, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY ARISING FROM A COURSE OF DEALING OR USAGE OF TRADE, NON-INFRINGEMENT AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR USE.

