

# RAM GEN II Single Room Pressure Monitor

## Installation Manual

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### Application

These installation instructions guide the installer through the installation of the RAM GEN II Room Pressure Monitor. Please read these instructions thoroughly before beginning installation.

### North American Emissions Compliance

#### *United States*

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case users will be required to correct the interference at their own expense.

#### *Canada*

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### Installation

#### **NOTICE**

##### **Risk of Property Damage.**

Ensure that the power source conforms to the requirements of the equipment. Failure to use a correct power source may result in permanent damage to the equipment.

#### **NOTICE**

##### **Risque de dégâts matériels.**

S'assurer que la source d'alimentation électrique est conforme aux spécifications de l'équipement. L'utilisation d'une source d'alimentation électrique inappropriée risque d'endommager irrémédiablement l'équipement.

**IMPORTANT:** The RAM GEN II Room Pressure Monitor must be wired to 24 VAC only. Wiring the unit to 110 VAC will cause serious damage and void the warranty.

Use of the software that is in (or constitutes) this product or access to the cloud or hosted services applicable to this product, if any, is subject to applicable terms set forth at [www.johnsoncontrols.com/techterms](http://www.johnsoncontrols.com/techterms). Your use of this product constitutes an agreement to such terms. If you do not agree to be bound by such terms, you may return the unused product to your place of purchase.

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## MONITOR SETTINGS

### RAM GEN II Room Pressure Monitor Settings

*This form should be completed during the initial configuration for each room pressure monitor. Be sure to configure the unit for either Positive, Negative, or both using the Isolation Mode Configuration setup procedure.*

**Room Name / Number** \_\_\_\_\_

**Unit Model Number and Serial Number (ESN)** \_\_\_\_\_

**Analog Output**

Operating Mode (Direct or PID) \_\_\_\_\_

Analog Output Range (zero based or offset) \_\_\_\_\_

Analog Output Upper Limit (0-100%) \_\_\_\_\_

Analog Output Lower Limit (0-100%) \_\_\_\_\_

Analog Output Action (Direct or Reverse) \_\_\_\_\_

**PID Constants**

Proportional Constant (0.5-100%) \_\_\_\_\_

Integral Constant (0.0-100%) \_\_\_\_\_

Derivative Constant (0.0-100%) \_\_\_\_\_

**Alarm Limits**

Positive Isolation High Alarm Setpoint \_\_\_\_\_

Positive Isolation High Warning Setpoint \_\_\_\_\_

Positive Isolation Low Warning Setpoint \_\_\_\_\_

Positive Isolation Low Alarm Setpoint \_\_\_\_\_

Negative Isolation High Alarm Setpoint \_\_\_\_\_

Negative Isolation High Warning Setpoint \_\_\_\_\_

Negative Isolation Low Warning Setpoint \_\_\_\_\_

Negative Isolation Low Alarm Setpoint \_\_\_\_\_

**Audible Alert**

Operating Mode (audible or silent) \_\_\_\_\_

Delay Time Base (seconds or minutes) \_\_\_\_\_

Delay Setting (0-60) \_\_\_\_\_

Alarm Quiet Period Starting Hour (0-23) \_\_\_\_\_

Alarm Quiet Period Ending Hour (0-23) \_\_\_\_\_

**Engineering Units**

Inches of Water or Pascals \_\_\_\_\_

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## GENERAL

### Specifications

#### Electrical

Pressure Range .....	$\pm 0.2500$ "WC
Accuracy of Measurement .....	$\pm 0.5\%$ FS
	*NIST Traceable / Individual certification available as option
Power Supply .....	Class 2, 24VAC $\pm 10\%$ , 30VA universal 120/240 to 24 VAC, 60/50 Hz, step-down isolation transformer provided Optional 24VAC .75A universal 100/240VAC, 60/50Hz wall adapter
Recommended Cable Type .....	Belden 1325A

#### Communications

BACnet® MS/TP Network .....	Two-wire twisted pair, RS-485 signaling
Recommend Cable Type .....	Belden 3107A

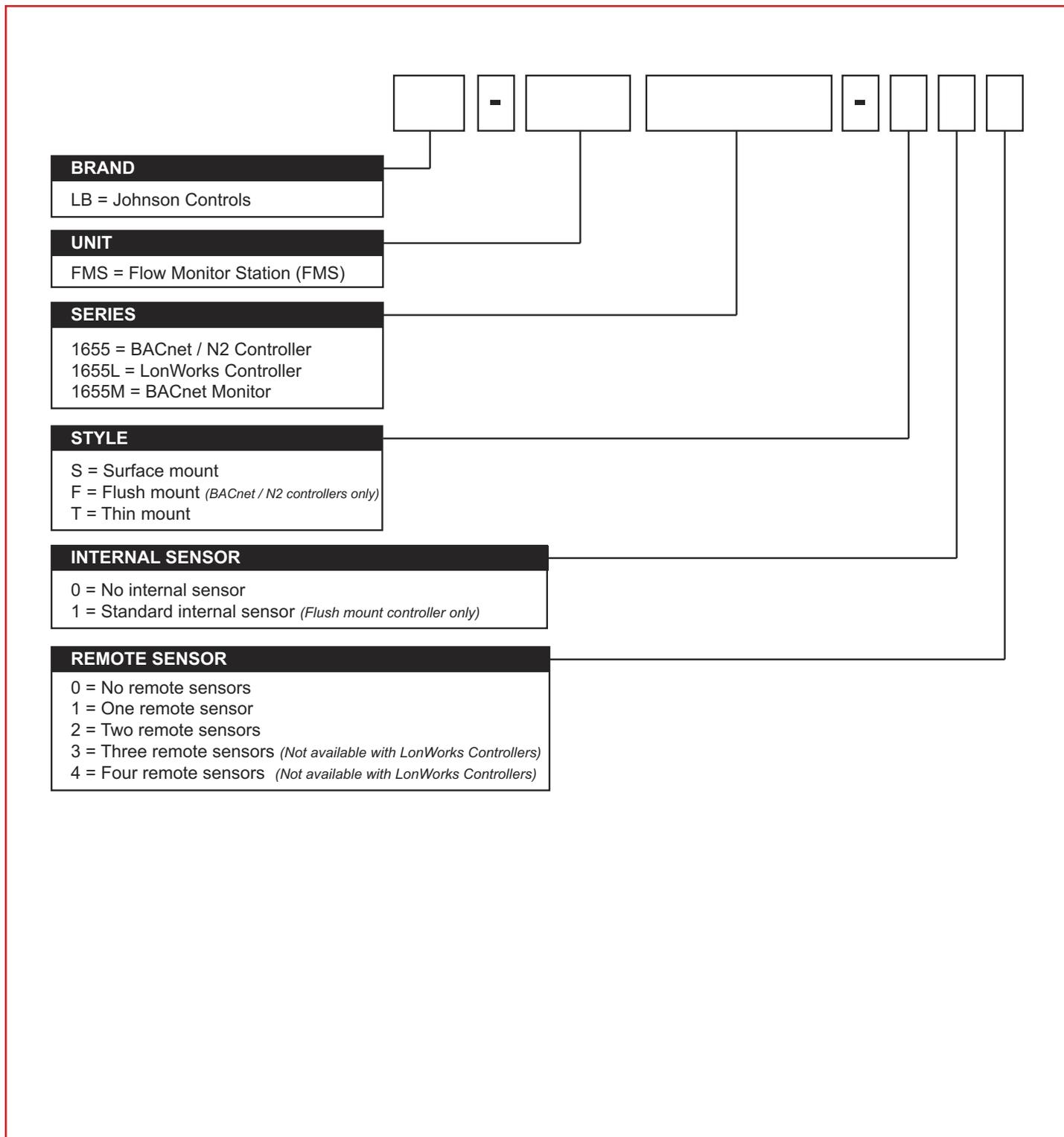
#### Touchscreen User Interface

LCD Size .....	3.2" diagonal
LCD Type .....	Transmissive
Resolution .....	240 x 320 portrait
Viewing Area .....	50.60 mm x 66.80 mm
Color Depth .....	18-bit or 262K colors
Backlight Color .....	White
Luminous Intensity .....	min 2500 cd/m <sup>2</sup>
RAM GEN II Monitor Surface Mount Enclosure .....	3"W x 5"H x 1.13"D
External Remote Sensor Housing .....	2.3"W x 4"H x 2.7"D
Stainless Steel Cover Plate for Flow Tube .....	2.7"W x 4.5"H x 0.2"D
Stainless Steel Cover Plate for Remote Sensor .....	.7"W x 4.5"H x 0.2"D
RAM GEN II Monitor with Flow Tube Cover Plate .....	approx. 3.5 lb.
RAM GEN II Monitor with Optional External Remote Sensor .....	approx. 4.0 lb.
RAM GEN II Monitor Mounting Options .....	Surface
Flow Tube Cover Plate Mounting .....	Flush
Remote Pressure Sensor Mounting .....	Flush

#### Environmental

Operating Temperature .....	32° to 125° F Operating
Operating Humidity .....	10% - 95% RH, Non-condensing

Part Number Guide



**BRAND**  
LB = Johnson Controls

**UNIT**  
FMS = Flow Monitor Station (FMS)

**SERIES**  
1655 = BACnet / N2 Controller  
1655L = LonWorks Controller  
1655M = BACnet Monitor

**STYLE**  
S = Surface mount  
F = Flush mount (*BACnet / N2 controllers only*)  
T = Thin mount

**INTERNAL SENSOR**  
0 = No internal sensor  
1 = Standard internal sensor (*Flush mount controller only*)

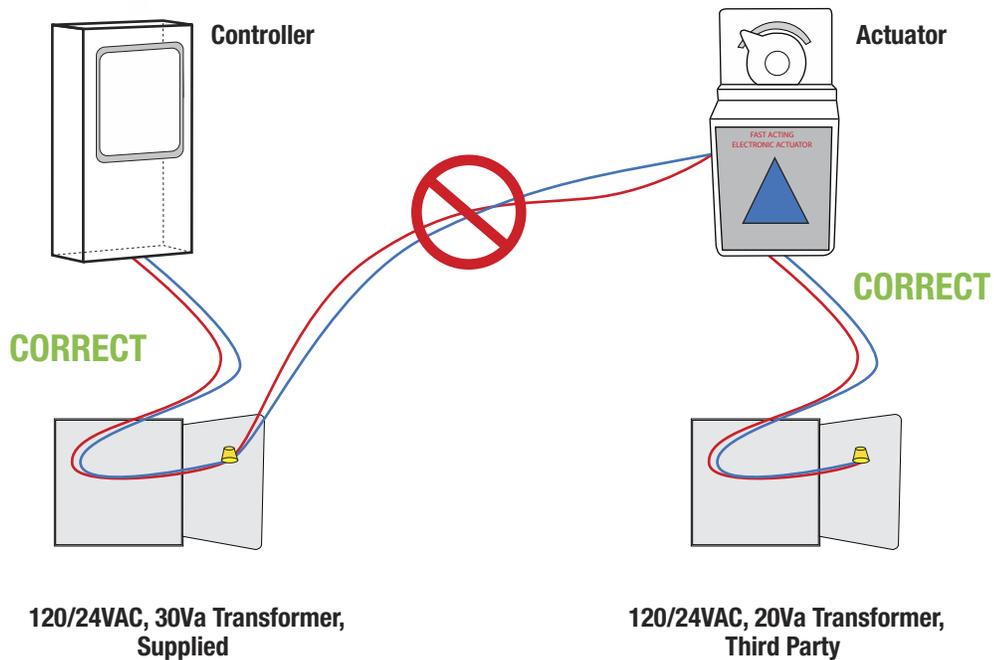
**REMOTE SENSOR**  
0 = No remote sensors  
1 = One remote sensor  
2 = Two remote sensors  
3 = Three remote sensors (*Not available with LonWorks Controllers*)  
4 = Four remote sensors (*Not available with LonWorks Controllers*)

System Precautions

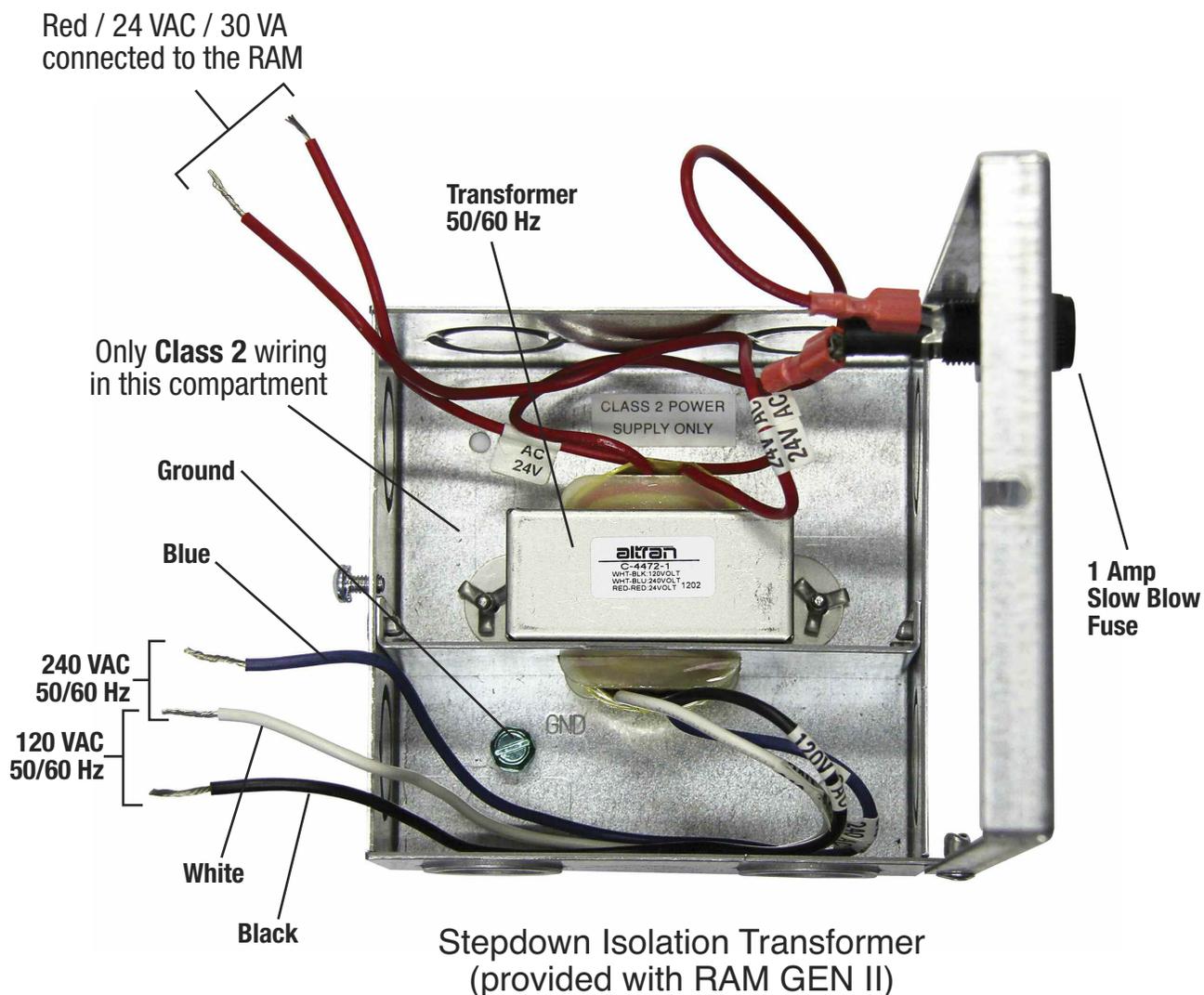


# Warning

Failure to follow the wiring diagrams could result in damage to your equipment and could void your warranty. Under no circumstances should a single transformer be split between actuator and controller. Doing so will damage the actuator, the transformer, the controller or all units. A single 120/24V 30Va transformer is required for the controller and a separate 120/24V 20Va transformer is required for the actuator. This equipment contains electrostatic sensitive components. To prevent possible damage, take precautions to prevent electrostatic discharge when handling or servicing this equipment by wearing an approved ESD grounding wrist strap connected to an earth ground source.



System Precautions



\*Note:

This product should be installed with the manufacturer provided isolated power supply and connected to an electrical circuit protected by a minimum 20A circuit breaker. This circuit breaker should be mounted in an approved electrical enclosure located separately, but in close proximity to this product.

## GENERAL

### Overview

The RAM GEN II Room Pressure Monitor is an ultra-sensitive instrument used to monitor differential pressure in hospital rooms, isolation rooms, surgical suites, laboratories, and clean rooms. This unit is capable of measuring and displaying differential air pressures as low as 0.0001" WC (0.0249 Pa).

Key features of the RAM GEN II Monitor include:

- Full-color touchscreen display with programmable display options and adjustable backlight
- Safety Halo™ edge lighting
- Intuitive user interface that simplifies setup and configuration of unit
- Graphical display that indicates room status
- Audible and visual alarms
- Multi-level password protection
- Zero calibration feature allows in-field recalibration of zero pressure reading
- 2 factory-calibrated analog outputs, one for PID control and one for remote monitoring room DP
- BACnet® BMS network comms port

The RAM GEN II Monitor is equipped with a 3.2" full-color touchscreen display in portrait orientation (240 pixels by 320 pixels). The password-protected menu tree is intuitive and simplifies the setup and configuration of the unit. The menus incorporate touch-based interfaces such as sliders, radio buttons, and dialog pop-ups to facilitate the ease-of-use of the RAM GEN II Monitor.

The display has a bright background color that changes to indicate the three different room statuses. The background colors indicate "**Normal**" when pressure is within defined limits, "**Warning**" when pressure is nearing an out-of-limits condition, and "**Alarm**"

when pressure is outside defined acceptable limits. The pressure ranges for these conditions are easily set by the user for the specific installation. The background color changes provide an at-a-glance conditions of the monitored room.

Alarm conditions may be defined by the user, in terms of desired differential pressure settings for the room being monitored. When an alarm condition occurs, it may be annunciated in three user-definable ways:

1. On the display
2. With an audible alarm
3. Safety Halo™ edge lighting
4. Over the BMS network

The alarm will automatically reset when the unit has sensed that the room differential pressure has returned to proper limits. The user may easily mute the audible alarm by touching the **Alarm Audible** button at the bottom of the touchscreen display.

The RAM GEN II Monitor provides a single digital input that may be used for monitoring a door switch. The configuration of the door switch input is configured for normally-closed operation, and is active-high triggered. A SPDT magnetic door switch type is recommended for use with function.

The user may set up multiple multi-level passwords to prevent unauthorized or casual access to the RAM GEN II Monitor configuration settings. Up to ten passwords of up to eight digits may be programmed, with each having one of four associated access levels. Administrators and facility management personnel may have unrestricted access, while general staff may be assigned restricted access passwords which limit

the functionality of the user menus.

Room pressure selection of **Positive**, **Negative**, or **Neutral Isolation** may be protected using limited access passwords, thereby eliminating the need for keylock switches and keys. In some locales, it is prohibitive to allow an isolation room controller to switch between positive and negative modes of isolation. To accommodate this situation, the RAM GEN II Monitor may be configured at the factory for either Positive- and Neutral-isolation modes only or Negative- and Neutral-isolation modes only.

The RAM GEN II Monitor isolation monitor is powered by a supplied universal 120/240 VAC to 24 VAC isolation power supply that is fused at the secondary with a 1-amp slow blow fuse. This powers both the touchscreen display along with the connected differential pressure sensor module.

A 10 ft. length of 4-conductor cable is provided with the RAM GEN II Monitor to interface the two modules. If the distance between the display and remote sensor modules exceeds 10 ft, then this cable may be substituted with the required length of 4 conductor, dual twisted pair, shield cable (Belden part no. 1325A).

The RAM GEN II Monitor includes a remotely mounted sensor for measuring the differential pressure of the monitored room or space. This remote sensor must be installed in the wall between the monitored isolation room and the adjoining corridor or anteroom. The front port (P1) must be oriented towards the isolation room and the rear port (P2) towards the corridor or anteroom. Please see the illustration on pages 8-9 for more details.

## Installation

The RAM GEN II Monitor incorporates a PID output signal that may be used to control a damper actuator. The factory-calibrated analog signal is available as either a voltage between 0-10VDC or 2-10VDC at the remote sensor connector. Refer to page 8 and 9 for more information.

**Remote Sensor Mounting Procedure**

1. Cut an opening in the wall of the isolation room to receive the supplied single-gang "old work" low voltage mounting bracket (Figure 1) for the remote sensor module. Nominal dimensions for the cutout are 3.65" H x 2.15" W. Drill a 7/16" hole through the opposite wall for the flow tube.
2. Install the single-gang low voltage mounting bracket in the cutout. Route a length of supplied flow tube through the mounting bracket and through the 7/16" hole in the opposite wall.

Separate the backplate from the touchscreen display enclosure by turning the set screw at the bottom of the display enclosure fully clockwise to release the backplate. Pull the backplate bottom out slightly to clear the bottom edge of the display enclosure and slide the backplate down away from the tabs at the top of the enclosure. Disconnect either end of the gray harness between the backplate and display module by pushing down on the locking tab, and then sliding the connector out. Disconnect the interface cable from the display module by removing the terminal block from the 4 pin connector CN3 on the display module PC board.

3. Confirm that the 4-conductor interface cable between the remote sensor module and the touchscreen display module has its red and black conductors securely attached to the +V and GND terminals, respectively. Route the end of the interface cable with the 3 and 4 pin connector down the wall to the anticipated location of the touchscreen display module.
4. Using a suitable length of 2 conductor 20 AWG cable, connect the output of the universal isolated power supply module to the power input at the remote sensor module. The output of this power supply module is non-polarized, so the two red wire may be wired to power input terminals in either orientation. Refer to page 8 for AC power wiring detail. If the RAM GEN II Monitor was shipped with a pluggable DC wall adapter power supply, then the positive lead (striped) must be connected to the +Vin terminal and the negative lead (solid) must be connected to the -Vin at the remote sensor's 9 pin connector. Refer to page 9 for DC power wiring detail.
5. The RAM GEN II Monitor has a factory-calibrated analog output and is available as voltage at the Vo terminal. The designated output (Vo) can be used to control a damper actuator to maintain a user set pressure setpoint when the RAM GEN II Monitor is used in a controller application.
6. Attach the pluggable connector to the mating header on the remote sensor module. Attach the end of the flow tube to the barbed fitting at back of sensor, and then secure the remote sensor module to the

mounting bracket with two supplied 6-32 x 3/4" screws.

7. Install the louvered cover plate onto the installed sensor module using two supplied machine screws. On the opposite side of the wall (corridor side), attach the end of the flow tube to the barbed fitting of the flow tube mounting plate.
8. Press the mounting plate into place, allowing the excess tube length to go into the wall space. Secure the mounting plate with the supplied screws and wall anchors.
9. Install a louvered cover plate onto the mounting plate using two supplied machine screws.

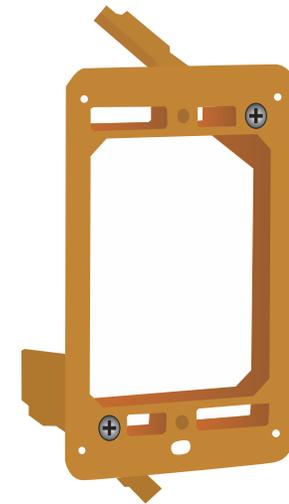


Fig 1. Single-gang, low-voltage mounting bracket.

## MOUNTING/WIRING

### Installation

#### Display Mounting Procedure (surface mount)

1. Cut an opening in the wall adjacent to the door of the isolation room for installing the supplied single-gang “old work” low voltage mounting bracket (Figure 1) for the touch-screen display module. Nominal dimensions for the cutout are 3.65” H x 2.15” W.
2. Install the single-gang low voltage mounting bracket in the cutout.
3. Pull the loose end of the interface cable from the remote sensor module through the cutout in the drywall, and then through the hole in the center of the display enclosure backplate (Figure 2).
4. Attach the backplate to the mounting bracket with two 6-32 x 3/4” screws, carefully aligning it using the two mounting slots on the backplate before tightening.
5. Connect the loose end of the interface cable (4 pin) to the corresponding header at the top of the display module circuit board (see Figure 3). Confirm all 4 conductors of the interface cable are securely attached at the terminal plugs. Reconnect gray harness between backplate and display module.
6. Reconnect the gray harness to the backplate circuit board and attach the display enclosure to the backplate by inserting the tabs at the top of the display into the corresponding slots at the top of the backplate. Secure the display enclosure to the backplate by turning the slotted setscrew at the bottom of

the enclosure counterclockwise until it is flush with the enclosure bottom.

7. Finally, apply power to the monitoring system by applying line power to the power supply module. If the unit was shipped with the 24VDC wall adapter power supply, power up the system by plugging it into an available electrical receptacle, preferably located at a location above the ceiling tile directly above the surface mounted display.



Fig 2. Route interface cable through center hold at display enclosure backplate.



Fig 3. Interface connected to 4-pin header at top of display module.

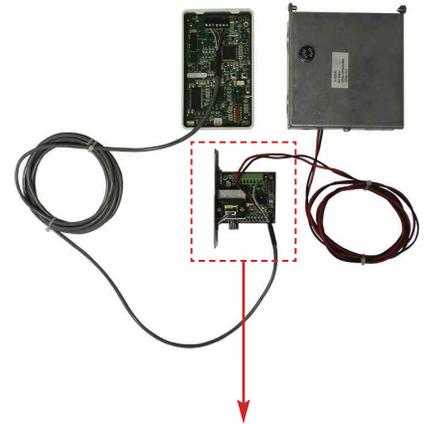
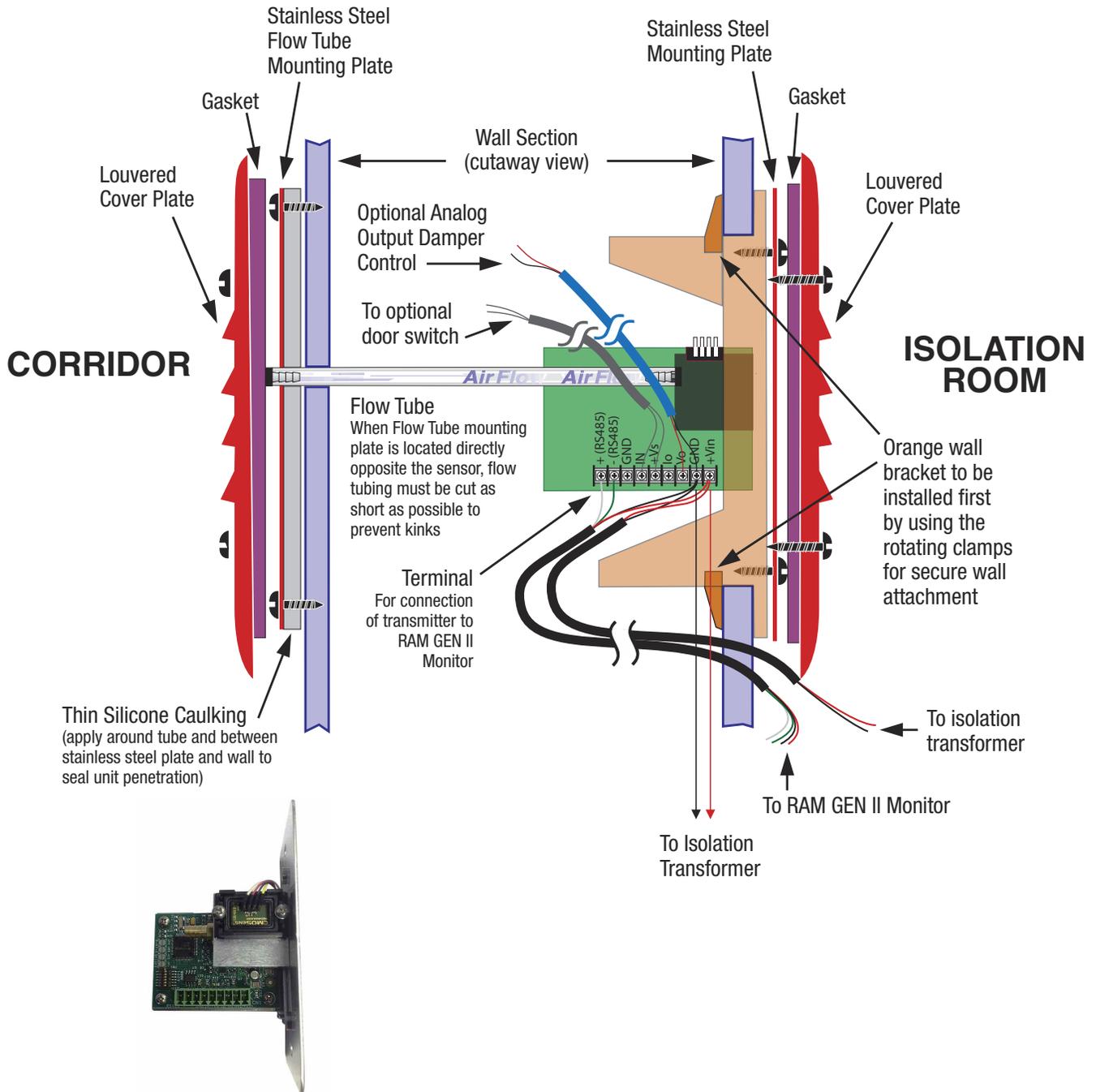


Fig 3a. Basic Assembly with close up of wall sensor connections.

Installation

**Remote Sensor Installation Detail (Side View)**  
*(with standard 24 VAC power supply)*

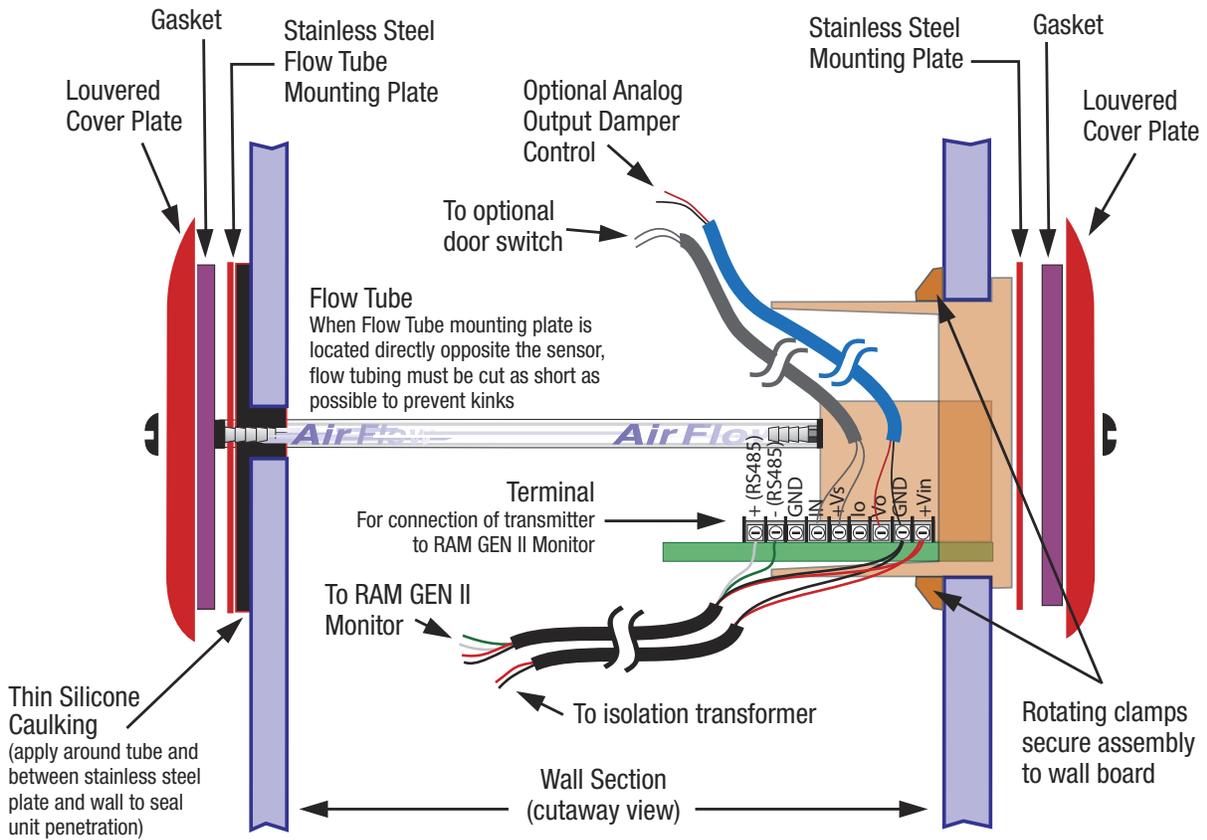


Installation

Remote Sensor Installation Detail (Bottom View)

CORRIDOR

ISOLATION ROOM



RAM GEN II Monitor Basic Programming

**RAM GEN II Monitor Basic Programming**

After the RAM GEN II Monitor unit has been properly installed, apply power to the unit. Upon power up, the Safety Halo™ status indication bezel will cycle through seven colors (red, green, blue, yellow, magenta, cyan, and white), followed by three action icons (normal, caution, alarm), and finally, the JCI splash screen indicating serial numbers, firmware version numbers, and sensor calibration date. This splash screen remains displayed for approximately 10 seconds and disappears to reveal the main display screen. This splash screen can be redisplayed using the **About this FMS** option in the **Diagnostics Menu**.

**Main Display Screen**

All RAM GEN II Monitor units come shipped from the factory in the neutral isolation mode. The neutral isolation mode will be represented on a blue background (Figure 4). Information displayed on the main screen includes the following:

- Name of monitored room (up to 25 characters)
- Current isolation mode (positive, negative, or neutral)
- Current differential pressure reading in selected engineering units (default is “WC)
- Time and date

While in neutral isolation mode, the background color of the main display screen is blue. However, while in either positive or negative isolation modes, the background color actively represents that current status of the monitor. A green background indicates that the current differential pressure is within allowable limits of the desired setpoint.

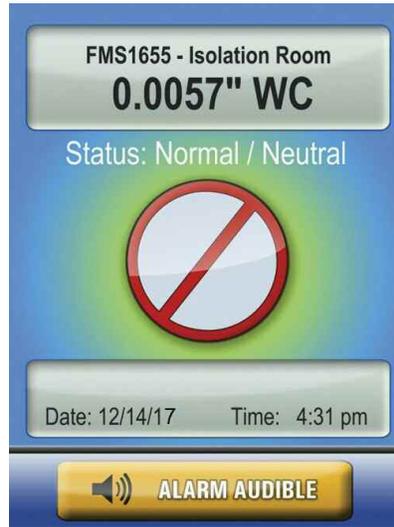


Fig 4. Main display shows isolation mode, room status and differential pressure.

A yellow background indicates one of two conditions: 1) door to monitored space is open (if door switch is enabled), or 2) current differential pressure has drifted outside of the allowable limits of the desired setpoint and are in the caution range.

A red background indicates that the current differential pressure has reached a critical condition and is outside of the allowable limits of the desired setpoint.

The RAM GEN II Monitor incorporates a full-color touchscreen and includes an extensive easy-to-use menu system that allows the user to quickly setup the monitor for immediate use. Also integrated into the RAM GEN II Monitor display are several hotspots that provide quick access to various settings. Refer to page 13 for details on using these

hotspots as display settings shortcuts. Touching the screen anywhere other than one of the reserved hotspots invokes the menu system, unless one or more security passwords have been entered.

**Configuring Room Pressure Monitor**

Configuring the RAM GEN II Monitor settings is extremely easy using the intuitive user menus integrated in the touchscreen display. Within minutes, the RAM GEN II Monitor may be configured to start displaying the real-time differential pressure of the isolation room being monitored.

**Setting Up Alarm Limits**

To determine the various setpoints at which the unit status changes from normal to warning, and from warning to alarm, the alarm limits must be configured accordingly.

**Alarm limits are only in effect while the unit is in either positive or negative isolation mode, as the alarms are disabled while neutral isolation mode is active.**

In order to specify the alarm limits for positive or negative isolation mode, set the isolation mode accordingly by selecting the **Room Setup** option from the **Unit Setup** menu, and then select the **Isolation Mode** option from the **Set Isolation Mode** menu. Select the desired isolation mode from the resulting configuration popup window and press “OK.”

### RAM GEN II Monitor Basic Programming

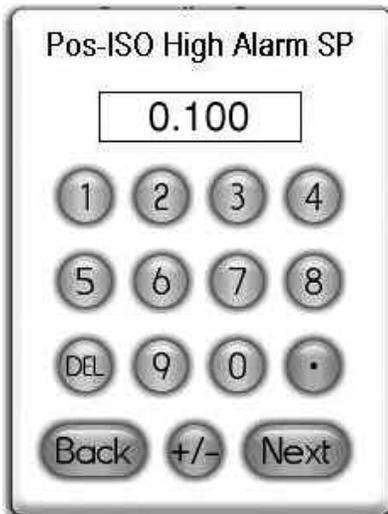


Fig 5. Enter high alarm setpoint for positive isolation mode using keyboard popup.

To begin specifying the alarm and warning setpoints, select the **Alarm Limits** option from the **System Setup** menu. The user is prompted to sequentially enter the high alarm and warning limits, followed by the low warning and alarm limits, in that order. For example, if positive isolation mode was selected above, then the configuration popup shown in Figure 5 will be displayed, prompting the user to enter the positive isolation high alarm setpoint using the keypad.

These limits should be specified to identify the differential pressure range which is considered normal, as well as the range which indicates a warning condition, and the range which is considered critical and indicates an alarm condition.

The figure on page 14 shows the relationship of these four alarm setpoints and how they relate to the normal operating differential pressure of the monitored isolation room.

#### Configuring Alarm Buzzer

The RAM GEN II Monitor alarm resources provide support for both visual and audible alerts. The audible alert option on the **System Setup** menu allows the alarm buzzer settings to be easily configured. Selecting this option invokes the configuration screen shown in Figure 6.

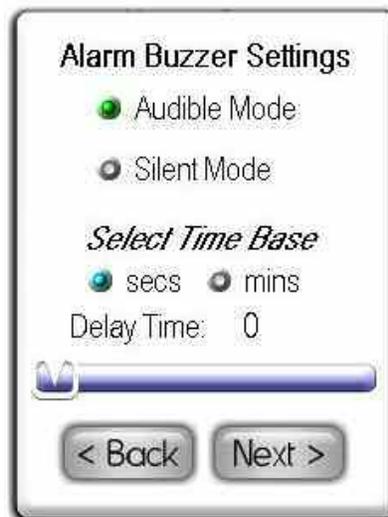


Fig 6. Alarm buzzer may be configured for audible or silent mode.

The alarm buzzer may be selected for one of two modes of operation: audible or silent mode. If audible mode is selected, a delay may be specified in seconds or minutes. If silent mode is selected, then the alarm buzzer will not sound whenever the unit encounters an alarm condition. If audible mode is selected, the user may specify an alarm quiet period. This feature allows the audible alerts to be suppressed between the specified hours every day, thereby eliminating the potential for nuisance alarms. Hospitals may take advantage

of this feature to minimize nuisance alarms during non-visiting hours in patient rooms.

#### Selecting Displayed Units

The RAM GEN II Monitor displays differential pressure readings in one of two units: inches of water column (in WC) or Pascals (Pa). Touching the differential pressure reading in the upper LCD window of the display will invoke the **Select Engineering Units** selection screen. If the engineering units selection is changed, the corresponding alarm setpoints are automatically converted to the newly selected units.

#### Configuring Display Options

The **Display Setup** menu provides support for configuring all of the display settings on the RAM GEN II Monitor. Options are available for configuring the main display, setting the system time and date, adjusting the display brightness, and setting the Safety Halo™ function. The **Display Options** menu item allows the main display to be configured as required by the specific application. If desired, the user may individually enable or disable the display of the isolation mode, room status, and the time/date at the bottom of the screen.

The Safety Halo™ option on the **Display Setup Menu** allows the user to disable or enable this function as well as setting the intensity of the Safety Halo™ brightness. A nightly auto-dim feature can be set to dim the Safety Halo™ brightness to a user-set level at specified hours every day.

**RAM GEN II Monitor Basic Programming**

The set time and date option on the **Display Setup** menu allows the user to specify the current time and date that may be displayed at the bottom of the main display. The RAM GEN II Monitor will maintain the time and date as long as the unit is not powered down.

The set brightness option on the **Display Setup** menu allows the intensity of the display backlighting to be adjusted from very dim to very bright. The brightness settings are saved in nonvolatile memory and remain in effect through a power cycle.

**Adding Password Security**

Access to the RAM GEN II Monitor menu system can be protected from unauthorized tampering through the multi-level security passwords. Up to ten individual passwords may be entered in the system, each with a specific access level. A password entry may be created by selecting the **Passwords Setup** option from the **System Setup** menu, and then selecting add password. The user is prompted to enter a minimum of four and up to eight numeric digits.

Once a password has been specified, the user is prompted to specify one of four access levels: Unrestricted, Standard, Basic, and Restricted. All password entries are saved to non-volatile memory, and remain in effect through a power failure. In the event that a password has been forgotten, there is a factory-default “back door” password that will provide unrestricted access to the user menu system. Please consult with the factory for more information regarding this password.

**Note: An unrestricted password must be created first before any restricted**

**passwords can be set. Resetting Sensor Zero Offset**

The RAM GEN II Monitor’s remote sensor can have its zero offset reset to the factory calibrated default in the event the monitored pressure does not approach zero when the door to the monitored room is opened. Select the **Reset Zero Offset** option on the **Diagnostics** menu to begin the procedure. Once the reading stabilizes, click the OK button to proceed. Exit to the main display and verify that the reading goes to zero. If not, repeat the above procedure.

**Remote Monitoring the RAM GEN II Monitor**

The RAM GEN II Monitor provides native support for BACnet® MS/TP protocol over a RS-485 serial port located on the RAM GEN II Monitor user interface display at CN7, a 3 pin pluggable terminal block at back of display (see page 19). The RAM GEN II Monitor is able to communicate 11 points of information to the building management system. See page 18 for list of BACnet® points. The network settings are easily configured by selecting the **Network Setup** option from the **Unit Setup** menu. As an alternate means of remote monitoring, a 4-20mA signal representing the room DP is available for connecting to a third party controller on the BMS. It is located at the green terminal block on the remote sensor and labeled as “Io.”

**PID Output Setup**

The RAM GEN II Monitor has an analog output which can be used to control a damper actuator for closed loop control of the room differential pressure. This analog output is present at the 9 pin connector on remote sensor and can be

configured for a 0-10Vdc or 2-10Vdc output through the touchscreen display menu. Go to **PID Output** option in **Room Setup** of **Unit Setup** menu. Select PID Output Setup, set operating mode, and output range.

Touch Finish to save settings and exit back to PID Output Setup menu. If necessary the PID loop parameters can be changed by selecting the PID Loop Setup option where the Proportional, Integral, & Derivative values can be tuned for the optimum control loop response. For most typical applications, PID factory settings work well.

**Editing Setpoints**

When the RAM GEN II Monitor is used as a controller, the target differential pressure setpoints can be set by selecting the Room Setup option in the Unit Setup menu. There the Edit Setpoint option can be selected and the setpoints for Positive, Negative, and Neutral isolation can be set as well as a dead band.

**Diagnostic Menu**

The RAM GEN II monitor incorporates several troubleshooting tools. The Override PID Output option allows the analog output to be overridden and locked while test and balance makes adjustments to the Supply and Exhaust dampers. While in the overridden state, the analog output is “disconnected” from the PID control loop, if enabled. The Real-Time View option allows the user to see in real time the actual values for the Pressure, Setpoint, PID Output, and Door Status. A software reset can be invoked through the Reset Monitor option. It is recommended to perform this function after installation to insure that all user settings are properly stored to nonvolatile memory.

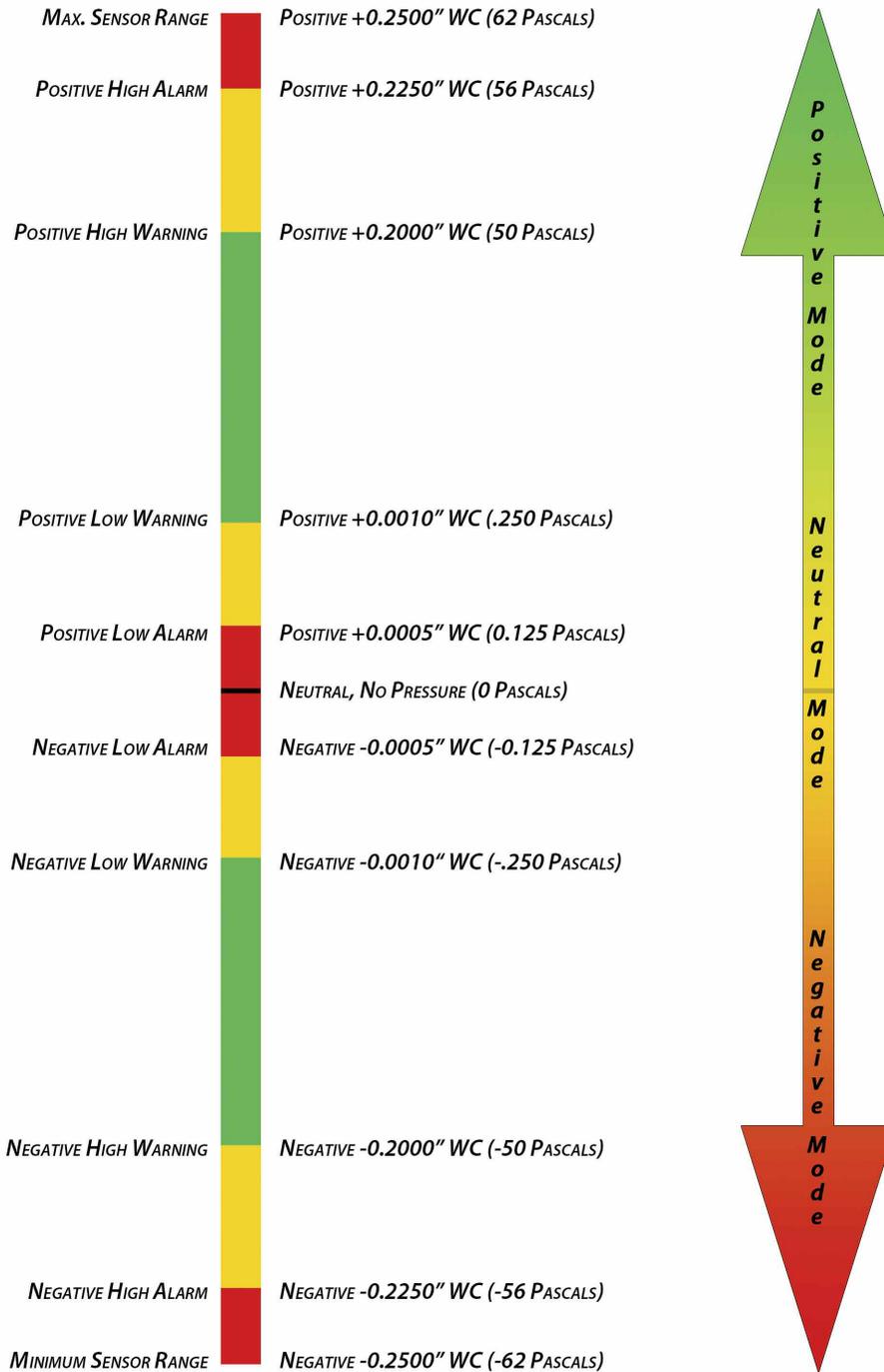
## CLEANING THE DISPLAY

### Cleaning the RAM GEN II Monitor Display

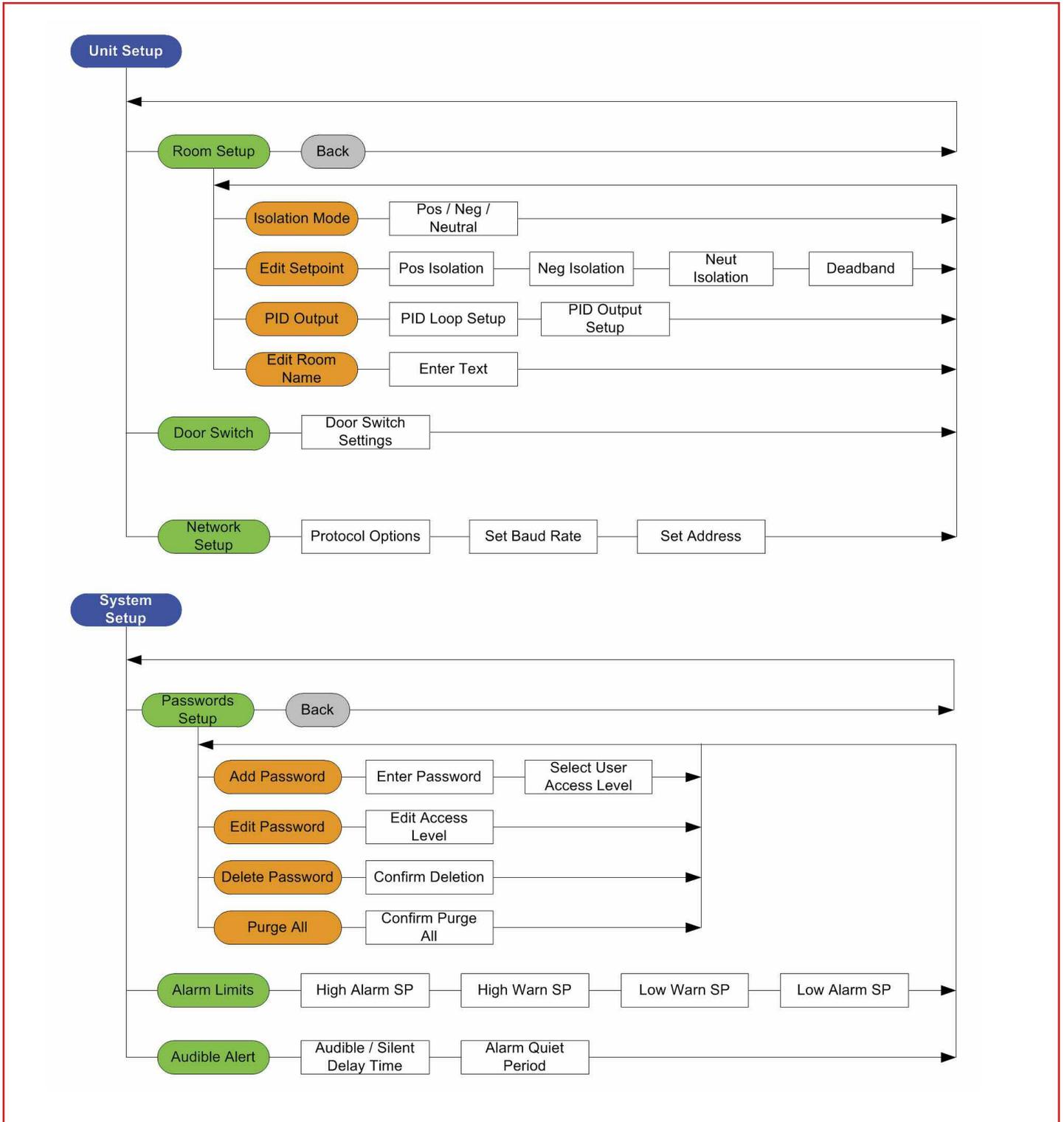
- The cloth may be used dry, or lightly dampened with a mild cleaner or ethanol.
- Be sure the cloth is only lightly dampened, not wet. Never apply cleaner directly to touch panel surface; if cleaner is spilled onto touch panel, soak it up immediately with absorbent cloth.
- Cleaner must be neither acid nor alkali (neutral pH).
- Wipe the surface gently; if there is a directional surface texture, wipe in the same direction as the texture.
- Never use acidic or alkaline cleaners, or organic chemicals such as: paint thinner, acetone, toluene, xylene, propyl or isopropyl alcohol, or kerosene.



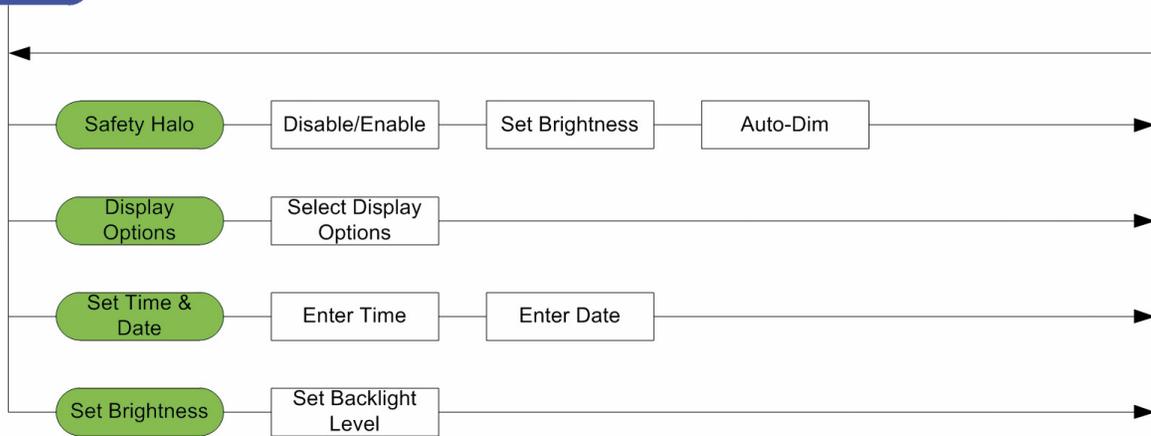
**Alarm Setpoints**



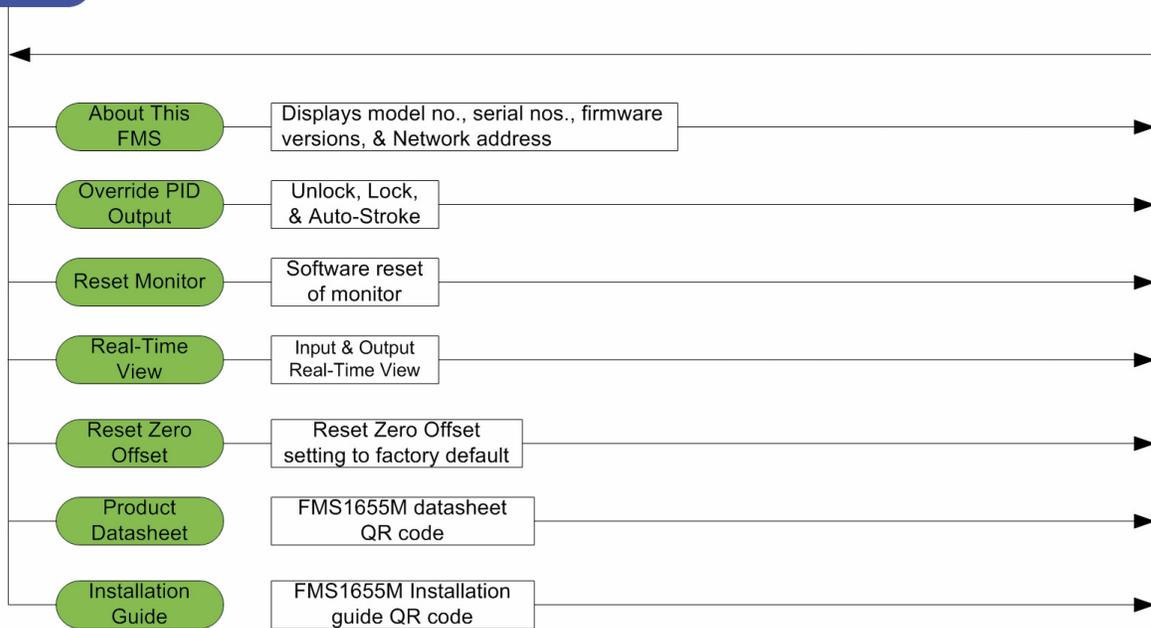
## SETUP MENU TREE



Display Setup



Diagnostics



## MODULE SETTINGS

### Options Dipswitch (S1) – internal use only

1.	Graphics Chip Mode Selection	OFF = Programming Mode	ON = Run Mode
2.	Touch Screen Calibration Mode	OFF = Force calibration	ON = Auto calibration
3.	Reserved		
4.	Reserved		

### Options Dipswitch (S2) – mode configuration 1

1.	Product Type	OFF = FMS/HMS	ON = CMS-1655
2.	EMERGENCY PURGE Buttom	OFF = Disabled	ON = Enabled
3.	Mode Select	OFF = FMS-1655 / CMS-1655	ON = HMS-1655
4.	Operational Mode:	OFF = Demo Mode	ON = Run Mode

Pushbutton Switch (SW1):	Reset Button	
Pushbutton Switch (SW2):	Reserved	

**BACnet® Objects**

The following table itemizes the list of points available for integration in a BMS. This table contains the objects for open BACnet® integration.

Object	Functional Description	Read or Write	Analog Values		
<b>Analog Inputs</b>			AV - 1	Setpoint (Differential Pressure Setpoint)	Read/Write
AI - 1	Analog Input 1 (default: Isolation Pressure)	Read-Only	AV - 2	Low Pressue Alarm Setpoint	Read/Write
<b>Binary Inputs</b>			AV - 3	Low Pressure Warning Setpoint	Read/Write
BI - 1	Digital Input 1 (default: Door Switch)	Read-Only	AV - 4	High Pressure Warning Setpoint	Read/Write
<b>Analog Outputs</b>			AV - 5	High Pressure Alarm Setpoint	Read/Write
AO - 1	Analog Output (Damper Position)	Read-Only	AV - 6	Pressure Deadband	Read/Write
			<b>Multistate Objects</b>		
			MSO-1	Isolation Mode: 1-positive, 2-negative, 3-neutral	Read/Write
			MSO-2	Alarm Status: 1-normal, 2-warning, 3-alarm	Read-Only

# RAM GEN II MONITOR WIRING GUIDE

NOTE: For optimum network communications, the reference signal (REF) must be connected to the COM terminal on the NAE gateway's FC Bus terminal block

