



INSTALLATION GUIDE

BAFWorks® 3.0



For help, call 1-877-BIG-FANS
or visit www.bigassfans.com



IMPORTANT SAFETY INSTRUCTIONS READ AND SAVE THESE INSTRUCTIONS

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

WARNING: The BAFWorks® Admin Lock feature is not a suitable replacement for proper lockout/tagout procedures as prescribed in OSHA standard 29 CFR 1910.147. Before servicing equipment connected to the BAFWorks system, ensure proper procedures have been taken to isolate equipment to be serviced. These procedures **MUST** be followed even if the Admin Lock feature is enabled for a device in the BAFWorks application.

CAUTION: This guide is intended to provide instructions for installing BAFWorks and using it to control fans and other devices. Consult the installation guide included with the fan or device for additional installation, operation, and safety instructions.

WARNING: Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards.

CAUTION: Installation must be in accordance with the requirements specified in this installation manual and with any additional requirements set forth by the National Electrical Code (NEC), ANSI/NFPA 70, and all local codes. Code compliance is ultimately **YOUR** responsibility! Failure to comply with these codes could result in personal injury or property damage.

WARNING: The fan controllers contain high voltage capacitors which take time to discharge after removal of mains supply. Before servicing the fan controller, ensure isolation of mains supply from line inputs at the controller's disconnect. Wait three minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Note: Darkened display LEDs are not an indication of safe voltage levels.

WARNING: When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

CAUTION: When service or replacement of a component in the fan requires the removal or disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.

WARNING: Power must be disconnected before installation and servicing, cleaning, and other user-maintenance. Failure to disconnect power creates risk of fire, electric shock, and serious bodily injury.

CAUTION: Exercise caution and common sense when powering BAFWorks, fans, and other devices. Do not connect BAFWorks, fans, or other devices to a damaged power source. Do not attempt to resolve electrical malfunctions or failures on your own.

CAUTION: The Big Ass Fans product warranty will not cover equipment damage or failure that is caused by improper installation.

ANY OF THE FOLLOWING ACTIONS BY THE CUSTOMER OR ANY AGENT OF THE CUSTOMER WILL CONSTITUTE A BREACH OF AND WILL VOID ALL WARRANTIES:

- Failure to follow the required installation procedures specified in the Big Ass Fans-supplied installation guide and in all other documentation supplied with the fans and related equipment, including documentation provided by the manufacturers of the individual fan and control components;
- Failure to follow all relevant codes and ordinances, including, but not limited to the National Electrical Code and state and local building codes;
- Failure to follow electrical engineering industry standards regarding the approved method of installing solid-state electrical equipment having the characteristics of the fans, the fan controls, and their related components, even if such standards are not specifically referenced in any instructions or literature supplied by Big Ass Fans or provided by manufacturers of the fan and control components; and/or
- Failure to use all installation and mounting hardware supplied by Big Ass Fans.

CAUTION: The following information is merely a guide for proper installation. Big Ass Fans cannot assume responsibility for the compliance or the non-compliance to any code, national, local, or otherwise for the proper installation of the fan controllers, fans, or associated equipment. A hazard of personal injury and/or equipment damage exists if codes are ignored during installation.

Leave this installation guide with the owner of the BAFWorks control system after installation.

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Introduction

BAFWorks® enables you to network and control all of the fans, lights, and ventilation systems in your facility from a secure, centralized location. The system's intuitive wall-mounted interface is simple to learn and makes controlling and automating your devices easier than ever. This translates into year-round energy control and savings, as well as real-time operational information about your devices, right at your fingertips.

Big Ass Fans recommends reading this Installation Guide in its entirety before installing the control system so that a plan of action can be made for system implementation.



Installation Guide:
Rev. Q
11/18/2020

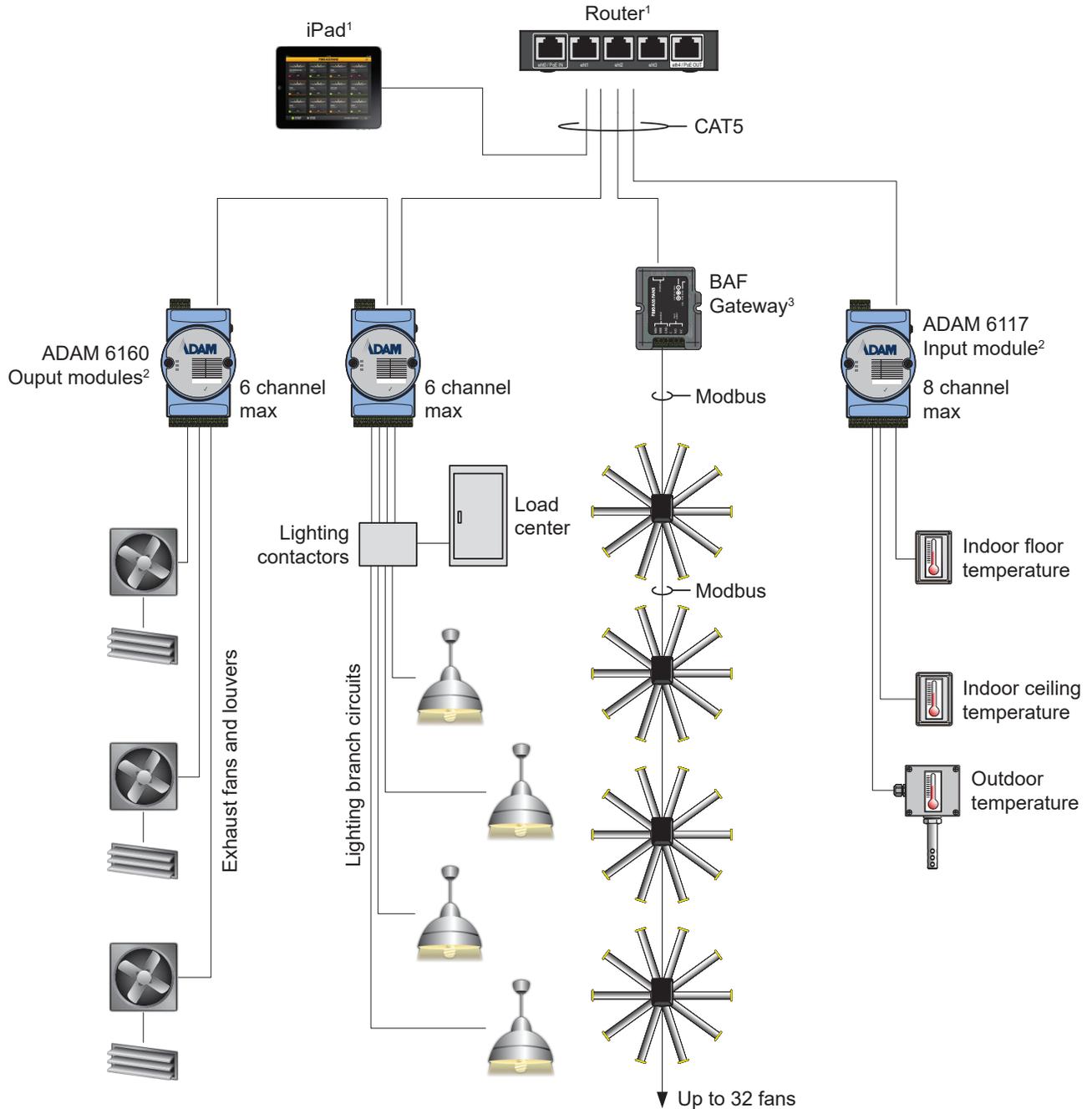
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BAFWorks® system diagram

The diagram below shows a typical BAFWorks® installation with fans, lights, exhaust fans and louvers, and temperature sensors.

After BAFWorks is installed, the iPad® mobile digital device (and fan remote operator station[s], if installed) will be your only means of fan control. You will not be able to use the wall-mounted controllers included with the fans. Before installing BAFWorks, install the fan system and wall controllers according to the instructions in the fan Installation Guide. This will give you a backup means of fan control in case a problem occurs with the BAFWorks system or if you need to make parameter changes.

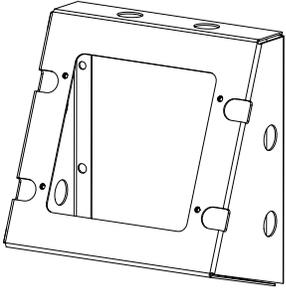
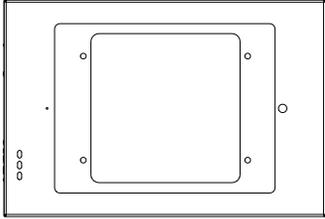
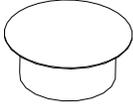
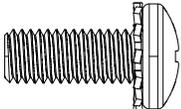
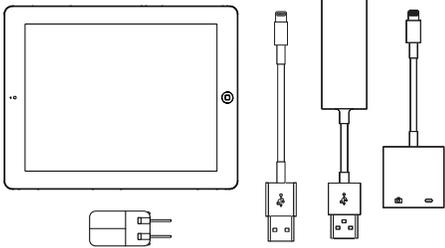
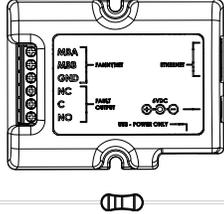
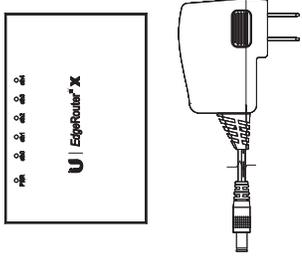
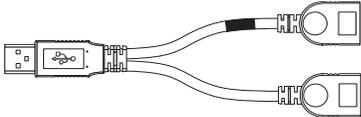
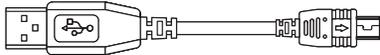
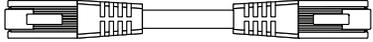
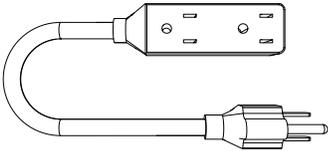
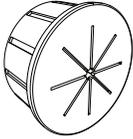
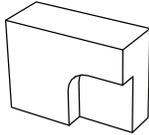


1. The iPad and router are located inside the provided wall mounting bracket.
2. ADAM modules can be daisy chained.
3. The BAF gateway is connected locally to the router. If the gateway is remotely mounted, a customer-supplied 5 VDC, 100 mA power supply must be used. See page 21 for connection details for the wall-mounted components.

Parts and hardware

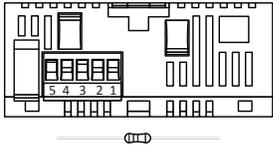
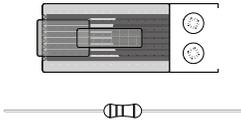
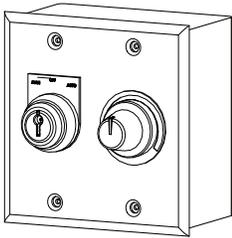
Note: The exact parts and hardware included will vary depending on the components (fans, lighting, ventilation, temperature sensors) you are connecting to BAFWorks®. The drawings below and on the following page are not to scale.

Wall-mounted parts and hardware

		 <p>(6) Mounting Bracket Knockout</p> 
<p>Mounting Bracket</p>	<p>iPad® Enclosure¹</p>	<p>(4) 10-32 x 1/2" Pan Head Screw²</p>
		
<p>iPad, 36" (914 mm) Data/Charging Cord, USB to Ethernet Adapter, Lightning to USB Camera Adapter, & 2 A USB Charger</p>	<p>BAF Gateway & (4) Resistor³</p>	<p>Router & AC Power Adapter⁴</p>
		
<p>USB Splitter⁵</p>	<p>12" (305 mm) USB Cord⁶</p>	<p>12" (305 mm) CAT5 Ethernet Patch Cable</p>
		
<p>9 ft (2.7 m) Power Cord</p>	<p>Bushing Plug</p>	<p>Foam Bumper</p>

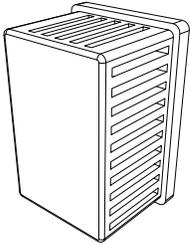
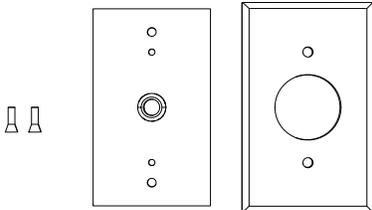
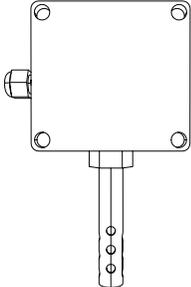
1. The iPad enclosure includes a key (not shown) for securing access to the iPad.
2. Included with the iPad enclosure
3. Includes two (2) 120 Ω 1/4 W resistors for end of line termination (Brown, Red, Brown, Gold) and two (2) 680 Ω 1/4 W resistors for proper line biasing where required (Blue, Gray, Brown, Gold. **Required for Lenze SMVector VFDs ONLY.**)
4. 100–240 VAC 50/60 Hz, 12 VDC @ 0.5 A
5. Type A Male to Type A Female (with data), Type A Female (power only for BAF gateway). The “power only” side for the gateway is marked with a red band.
6. Type A Male to Mini B Male

Fan parts and hardware

		
<p>Modbus Communication Card & 120 Ω 1/4 W Resistor¹</p>	<p>RJ45 to Modbus Connector & 120 Ω 1/4 W Resistor²</p>	<p>Remote Operator Station³</p>

1. One (1) Modbus communication card is required for each fan in the BAFWorks® system with a Lenze SMVector VFD.
2. One (1) RJ45 to Modbus connector is required for each fan in the BAFWorks system with a Delta E or M series VFD, or an Allen-Bradley® PowerFlex® 4, 4M, or 40 VFD.
3. Included only if the remote operator station option is ordered. One remote operator station is required for each fan you plan to control locally. Four (4) cover screws and two (2) keys for turning the mode selection knob are provided with each remote operator station. See page 35 for remote operator station installation, operation, and wiring instructions.

Temperature sensor parts and hardware

		
<p>Indoor Temperature Sensor</p>	<p>Indoor Sensor Mounting Hardware</p>	<p>Outdoor Temperature Sensor</p>

Lighting, ventilation, and automation parts and hardware

The parts, hardware, and wiring required for connecting lights, ventilation, and temperature sensors to the BAFWorks system are shipped in pre-assembled lighting, input, and output panels. The specific parts included on the panels (input modules, output modules, etc.) depend on the types of devices you are connecting to the system. See pages 8–15 for panel diagrams and wiring details.

Pre-installation requirements

Read and complete all of the following steps prior to BAFWorks® installation!

1. Identify network to use for BAFWorks®

Choose one of the following:

a. Use the provided Ubiquiti® ER-X EdgeRouter™ X router.

If the provided router is used, CAT5 cable must be routed between the router and all ADAM modules (star or daisy chain topology). Keep in mind that the router includes only four (4) LAN ports; therefore, the maximum number of home runs is limited to three (3).

b. Use the existing wired or wireless network.

Use this setup in locations where third-party networks are not approved. Adhere to the following requirements:

- **Use of the existing network requires close cooperation and planning with the facility's network administrator.**
- CAT5 cable must be routed between the ADAM modules and the nearest LAN port (star or daisy chain topology).
- CAT5 cable must be routed between the BAF gateway and the nearest LAN port.
- The attached devices (iPad, gateway, ADAM modules, etc.) must be part of the same subnet or VPN.
- Firewalls must not block the ports required by the system. Refer to the table below.

UDP/TCP ports used by ADAM modules (initial mode)

Function	Protocol	Port
UDP ASCII communication	UDP	1025
Datastream	UDP	5168
GCL IO message	UDP	5168
P2P message	UDP	1025
Search engine	UDP	5048
TCP ASCII/Modbus communication	TCP	502
Download	TCP	5450
Download Adam6024	TCP	7000

When the ADAM modules are in normal mode, they follow the standard of Ethernet/IP. TCP port number 44818 is used for explicit messaging and UDP port number 2222 is used for implicit messaging.

2. Identify hardware requirements

Identify the hardware required to interface with the facility's equipment. Adhere to the following:

- a. The lighting panel includes six (6) 4-pole, 20-amp lighting contactors and can control twenty-four (24) 20-amp lighting circuits in six groups of four. The contactors are 120 VAC coil, but can be ordered with optional coil voltages if needed.
- b. The 6 channel relay output panel includes one (1) ADAM 6160 module and can control six (6) loads independently (relay contacts are limited to 5 A @ 250 VAC each). This panel should be used for interfacing with exhaust fan motor starters, louvers, and lighting circuits, which are already controlled by lighting contactors.
- c. The 12-channel relay output panel includes two (2) ADAM 6160 modules.
- d. The 8 channel analog input panel includes one (1) ADAM 6117 module. It supports both voltage (± 1 , ± 5 , ± 10) and current (± 20 mA, 0–20 mA, 4–20 mA). Big Ass Fans recommends and pre-configures the modules for 4–20mA operation.
 - i. One controlled fan zone requires two (2) channels (floor temperature sensor and ceiling temperature sensor).
 - ii. One controlled ventilation zone requires two (2) channels (floor temperature sensor and outdoor temperature sensor).
 - iii. The floor temperature sensor can be shared by fan automation and ventilation automation (i and ii).
 - iv. Additional controlled zones (if it is desired to control by temperature independently) will require additional channels and sensors.
- e. All panels (a, b, c, and d) include a 30 W, 24 VDC power supply. AC input: 100–277 VAC, 50/60 Hz.

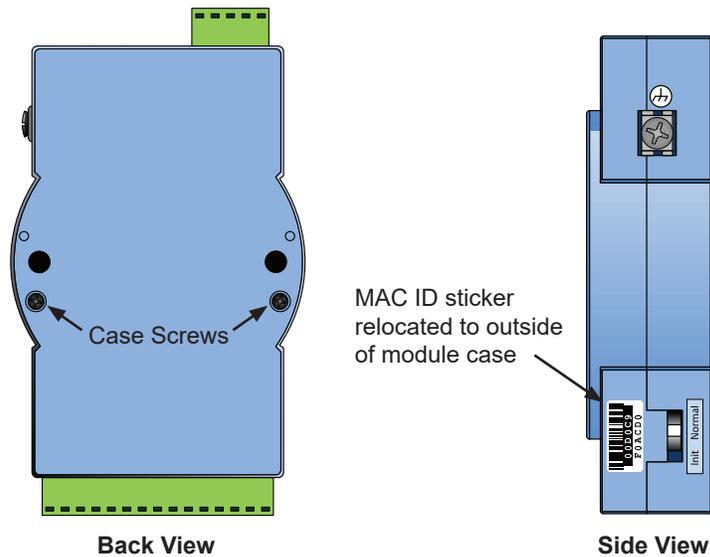
Pre-installation requirements (cont.)

3. Obtain ADAM module MAC ID numbers

If multiple ADAM modules of the same module number will be used on the same network, Big Ass Fans recommends obtaining and recording each module's MAC ID number. The MAC ID numbers will be helpful during ADAM module configuration.

To obtain an ADAM module's MAC ID number:

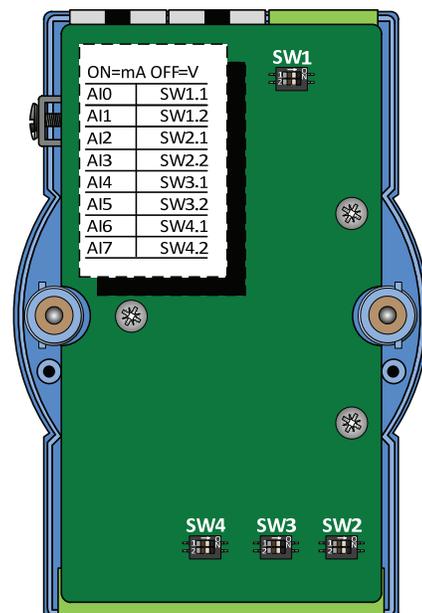
1. Remove the two (2) small Phillips head screws from the back of the module and separate the case halves. Refer to the illustration below.
2. Locate the module's MAC ID sticker on the PC board.
3. Record the MAC ID number on page 54 of this manual. You can also carefully peel the sticker off of the PC board and relocate it to the outside of the module case for future reference. Refer to the illustration below.



4. Configure signal input type (ADAM 6117 analog input modules only)

The ADAM 6117 module signal input type must be configured for 4–20 mA or 0–10 V. Big Ass Fans recommends 4–20 mA. With the case halves separated (see step 3 above), locate the input mode selection switches and set them to 4–20 mA. Refer to the illustration below.

Set ONLY the input mode selection switches to 4–20 mA. DO NOT toggle any of the other switches inside the module. These switches are critical to module operation. Toggling these switches may ruin the module.



Installation overview

Complete all steps in “Pre-Installation Requirements” on page 5 before proceeding.

To install BAFWorks, complete the following steps. See the chapters, sections, and pages referenced below for detailed installation instructions.

1. Install network-enabled hardware

Install, wire, and configure all ADAM modules, lighting/input/output panels, temperature sensors, and other network hardware as described in “Electrical Installation: Lights, Ventilation, & Automation” on pages 8–18.

2. Install wall-mounted components

Mount the router, BAF gateway, and iPad® to the wall and connect the wall-mounted components as described in “Mounting the BAFWorks Control System” on pages 19–22.

3. Install Modbus wiring and configure fans

Install the fan Modbus wiring and complete all fan configuration and wiring as described in “Electrical Installation: Fans” on pages 23–34. If you are installing the remote operator station option, complete all installation and wiring steps in “Fan Remote Operator Station (Optional)” on pages 35–38.

4. Configure ADAM modules

Download the configuration utility and configure the ADAM modules as described in “Configuring ADAM Modules” on pages 39–41.

5. Add ADAM modules and temperature sensors to BAFWorks

Add and configure the ADAM modules and temperature sensors as described in “Adding Output and Input Modules” on pages 42–43.

6. Configure fan automation settings

Configure the fan group automation settings as described in “Setting Up Fan Group Automation” on page 44.

7. Configure ventilation automation settings

Configure the ventilation group automation settings as described in “Setting Up Ventilation Group Automation” on page 45.

8. Add fans, lights, and ventilation

Add fans, lights, and louvers/vents to the BAFWorks system as described on pages 46–51 of the “Setting Up the BAFWorks Application” chapter.

8 Electrical Installation: Lights, Ventilation, & Automation



WARNING: To reduce the risk of electric shock, wiring should be performed by a qualified electrician! Incorrect assembly can cause electric shock or electrical component damage! Hazard of electrical shock!

WARNING: Installation must be in accordance with the requirements specified in this installation manual and with any additional requirements set forth by the National Electrical Code (NEC), ANSI/NFPA 70, and all local codes. Code compliance is ultimately YOUR responsibility! Failure to comply with these codes could result in personal injury or property damage.

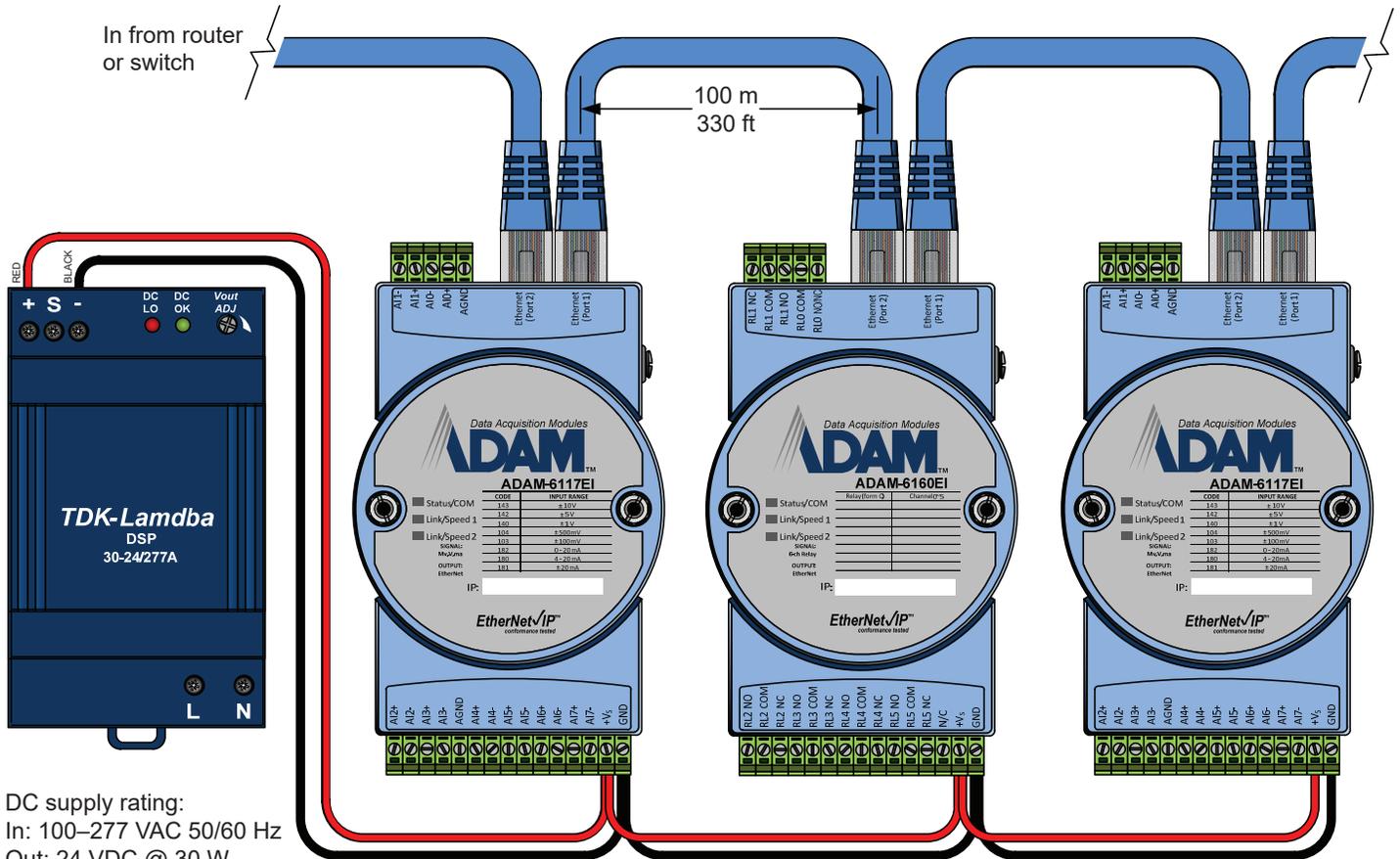
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Complete all steps in "Pre-Installation Requirements" on page 5 and ensure that you have read "Installation Overview" on page 7 before proceeding.

ADAM module basic power and data wiring

The maximum cable distance allowed between any two devices is 100 m (330 ft).

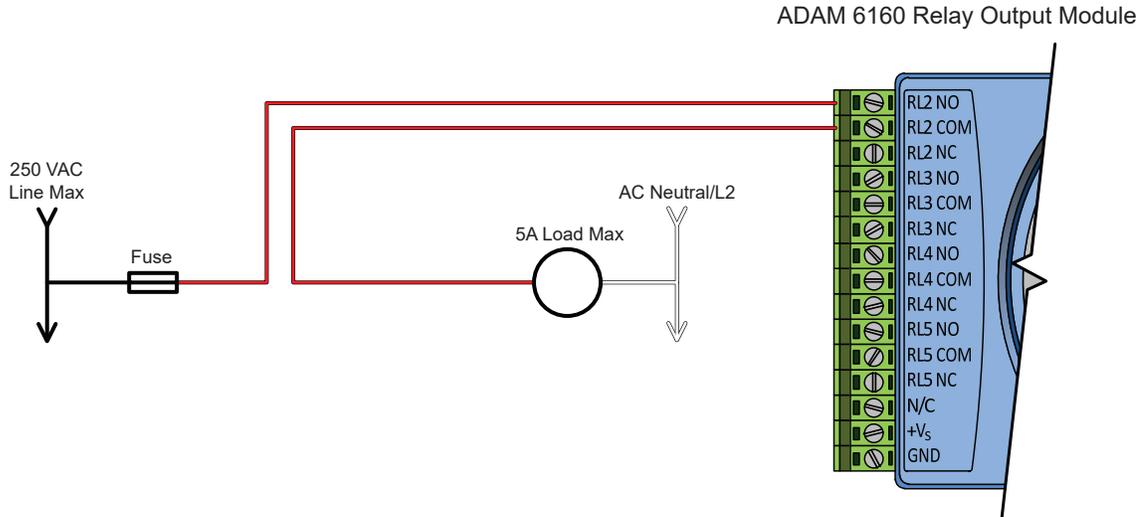


ADAM module power consumption: 10–30 VDC, 3.5 W each
ADAM module environmental ratings: 14°F–158°F (-10°C–70°C), 20–95% RH non-condensing

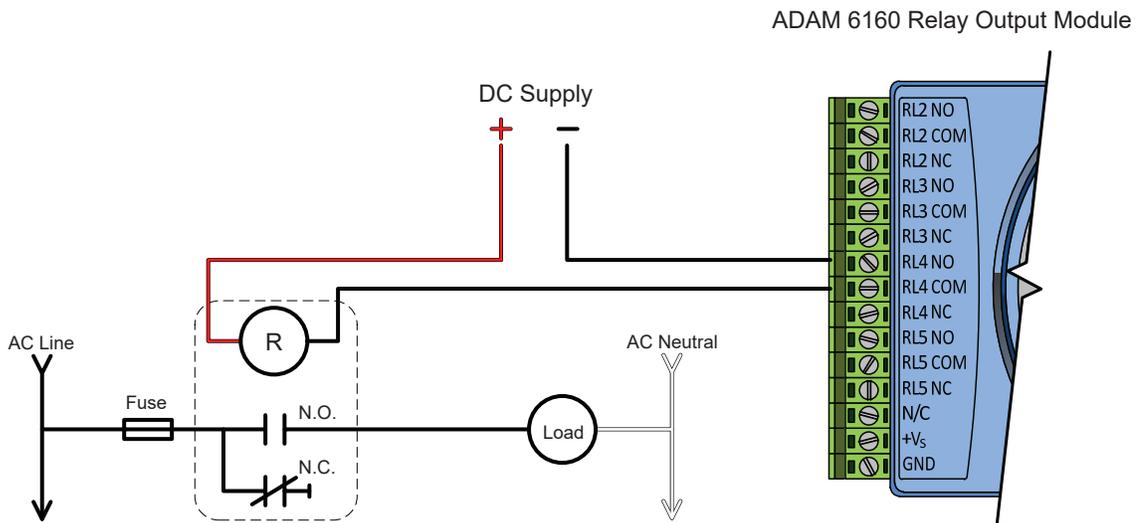
Basic relay output wiring

The ADAM 6160 relay output module includes six (6) form C relays. These relays are rated for up to 5 A @ 250 VAC and can be used to directly drive smaller loads, such as lighting contactors or motor starters. For loads that exceed the 5 A rating, the relay outputs can be used to drive pilot or isolation relays to achieve higher current capacity. Some typical wiring examples are shown below.

Controlling a load directly

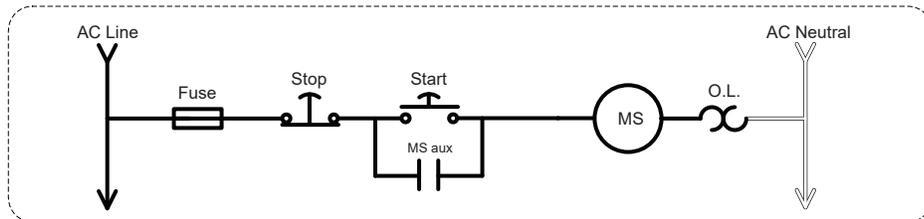


Using a low voltage pilot/isolation relay



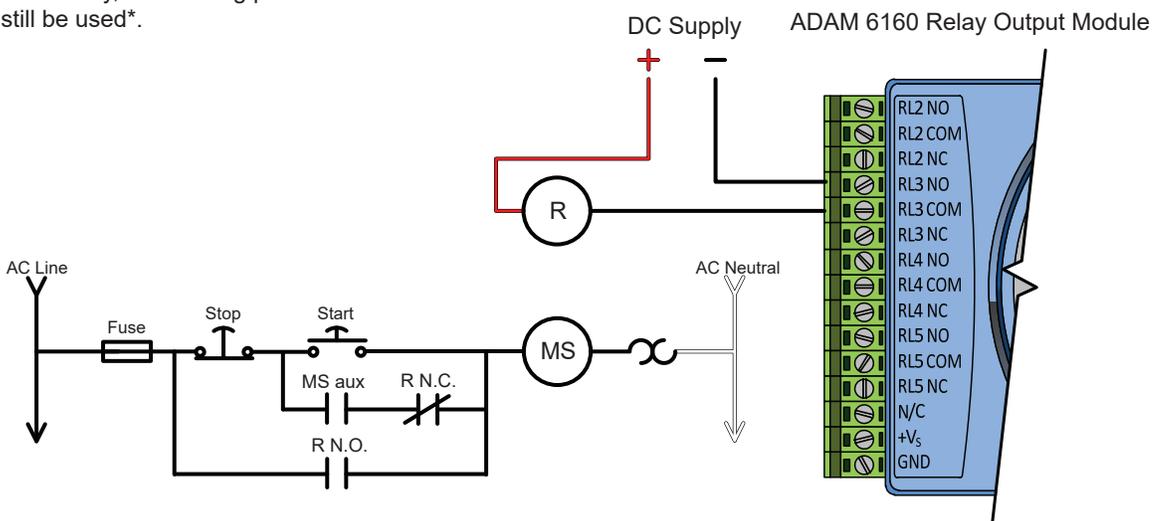
Basic relay output wiring (cont.)

Typical 3-wire combination motor starter control wiring (single station)

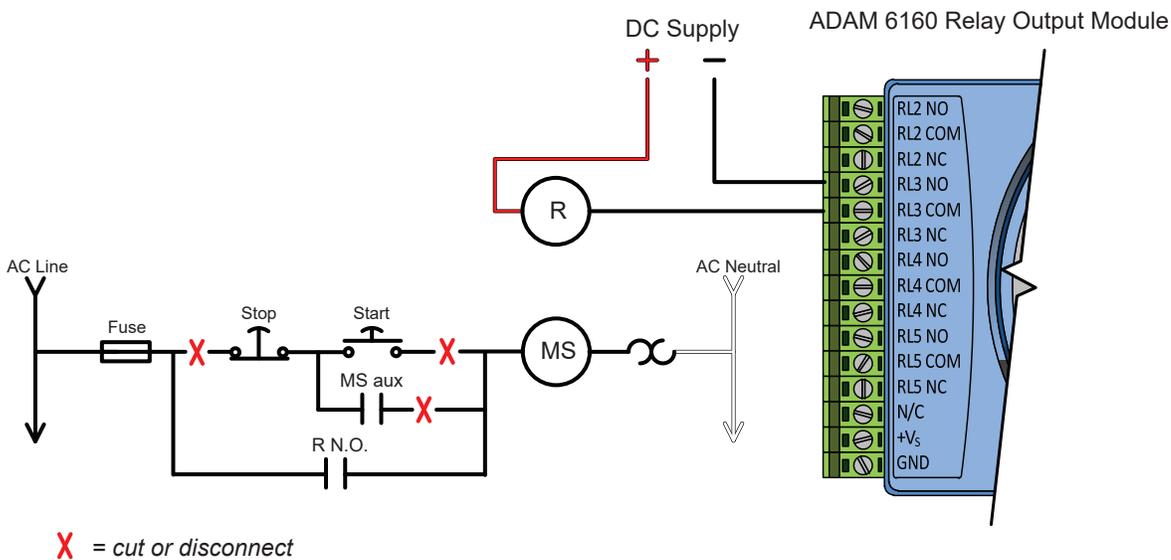


Interfacing with 3-wire start/stop circuits

With a low voltage SPDT relay, the existing push button controls can still be used*.



*The addition of an SPDT pilot relay as shown above allows the use of both iPad® start/stop and the existing start/stop push buttons. However, relay contact flight time is critical. If the pilot relay's N.C. contact re-closes too quickly upon an iPad stop command relative to the motor starter's auxiliary contact opening, the motor starter may fail to de-energize if the iPad was used to energize the starter. If this occurs, the existing start/stop push buttons must be disconnected from the circuit, and the motor starter must be controlled from the iPad only as shown below.

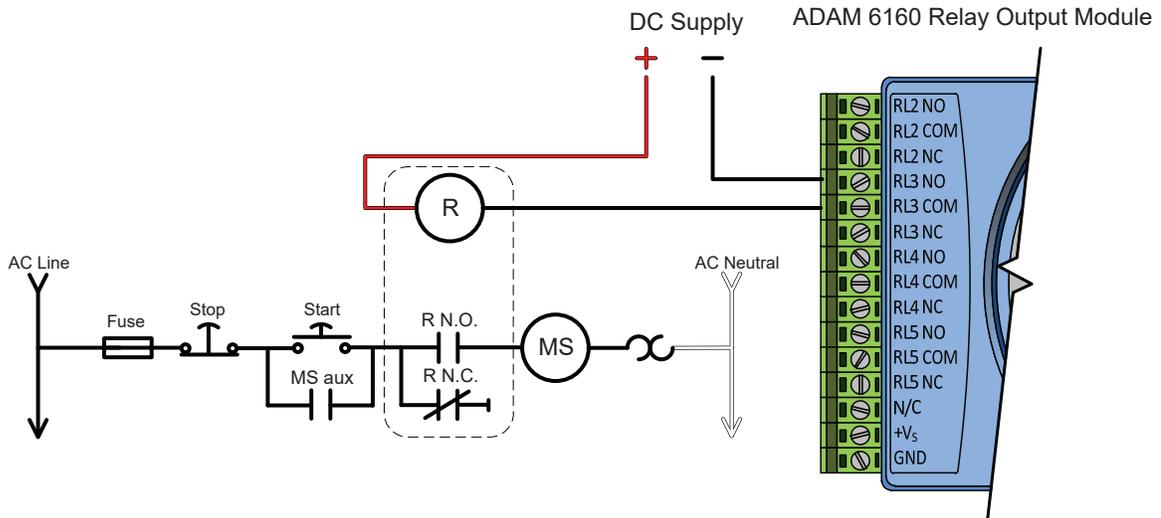


X = cut or disconnect

Basic relay output wiring (cont.)

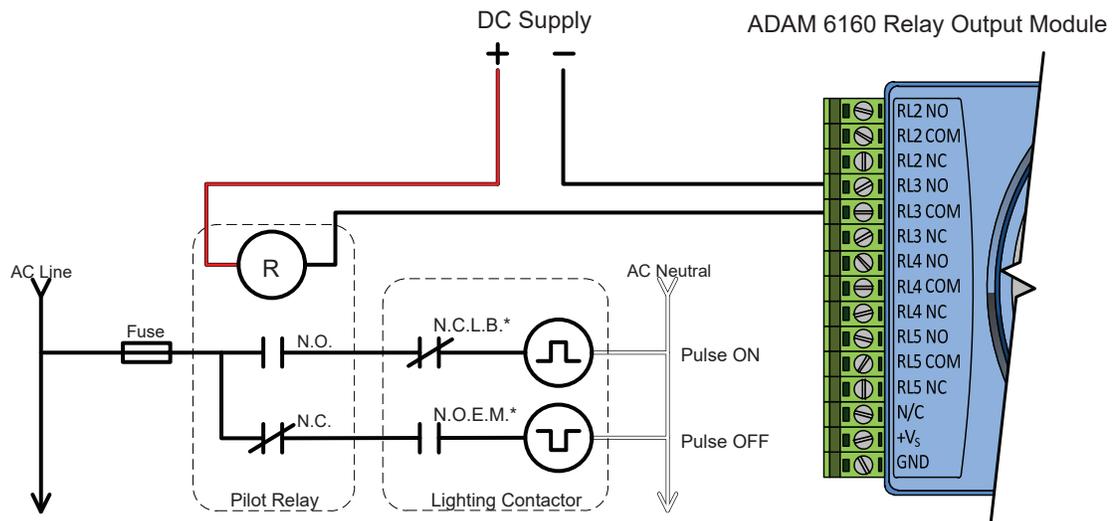
Using the ADAM module and/or pilot relay as a circuit enabler

Shown with low voltage SPDT relay



Interfacing with mechanically held lighting contactors

With a low voltage SPDT pilot relay



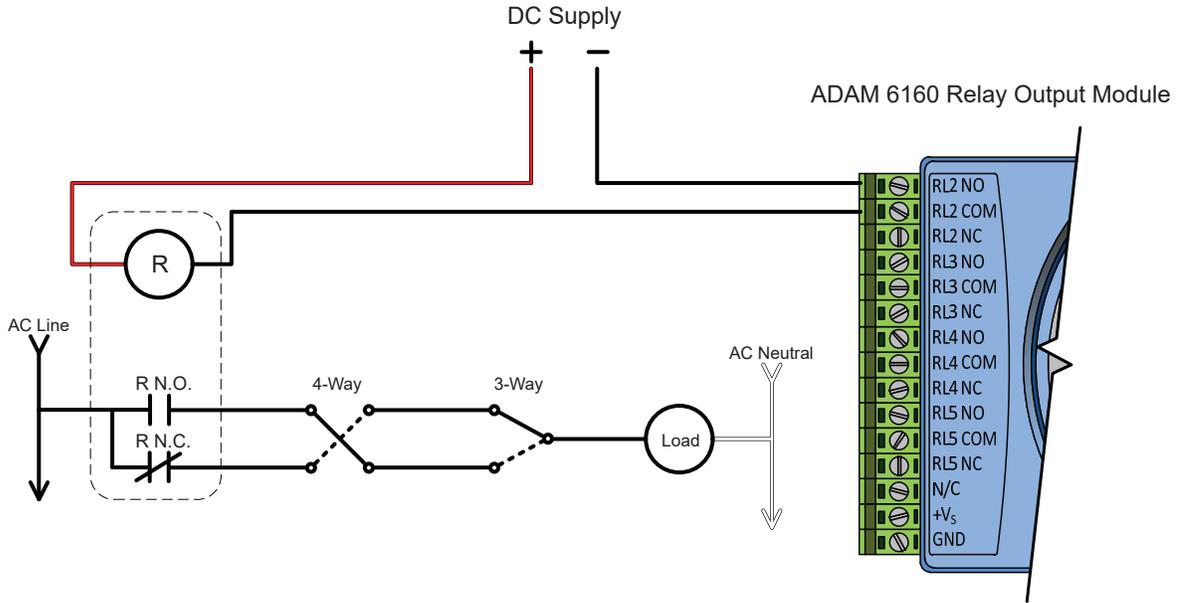
There are many different topologies for mechanically held contactors. This diagram serves as a generic representation of the contactor's coil lead functions. The pilot relay's N.O. and N.C. contact are used to alternate the contactor's on and off coil leads. This diagram can also be used as a basic guide for modifying an electrically held contactor to operate as a mechanically held contactor. Auxiliary contact flight time is critical in these applications. Normally Closed Late Break and/or Normally Open Early Make auxiliary contacts may be necessary for proper operation.

Contact the lighting contactor manufacturer if additional details are needed.

Basic relay output wiring (cont.)

Using the ADAM module with 3-way or multi-way lighting circuits

Shown with 3-way light switch, 4-way light switch, and low voltage SPDT pilot relay

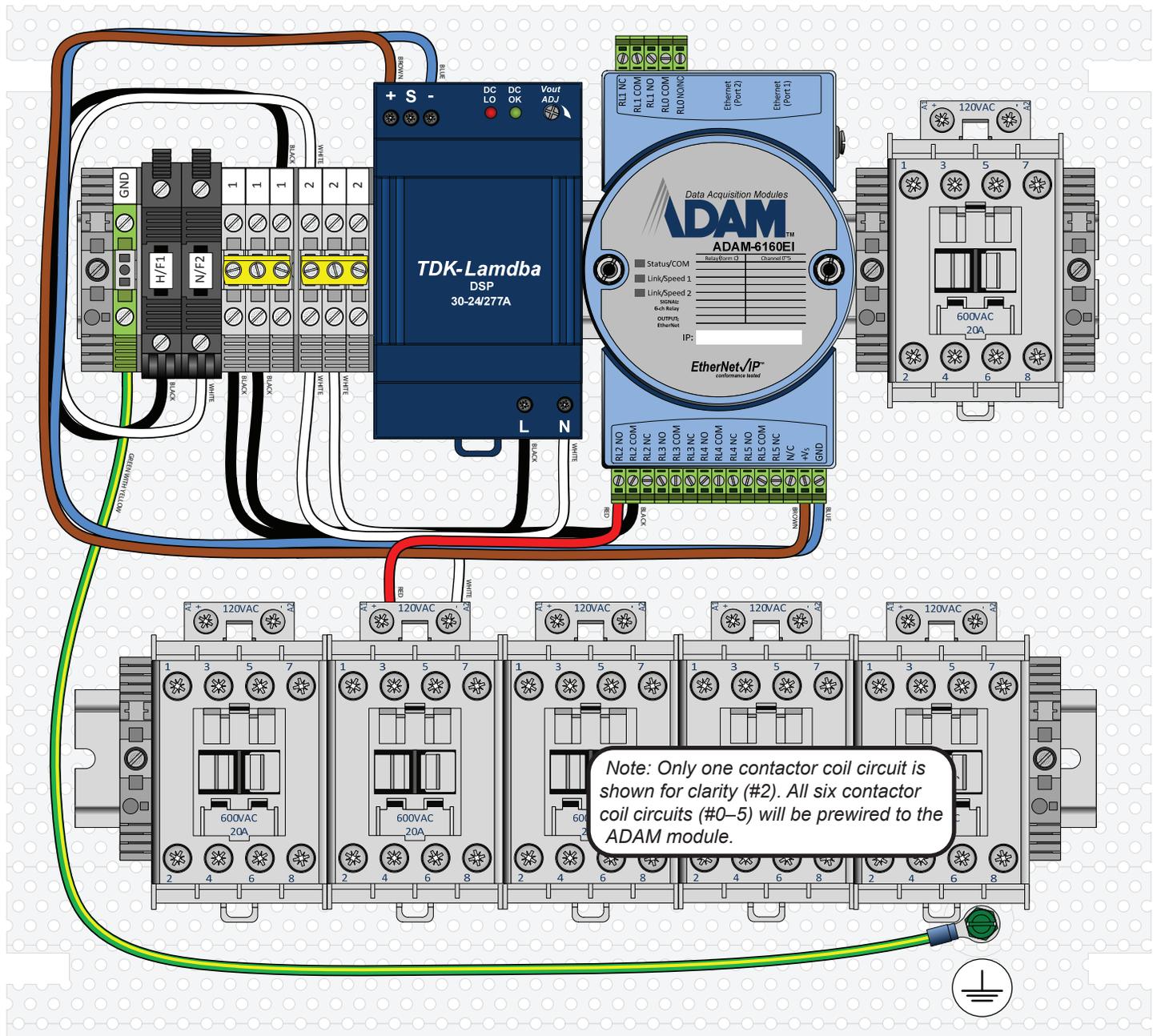


Note: ADAM 6160 relay module contacts are rated for 5 A max @ 250 VAC. The relay module contacts can be used to pilot smaller loads, but use of a pilot relay with a suitable contact rating for the connected load and branch circuit is recommended. When connected in this fashion, the On/Off status displayed on the iPad® may not represent the actual load state.

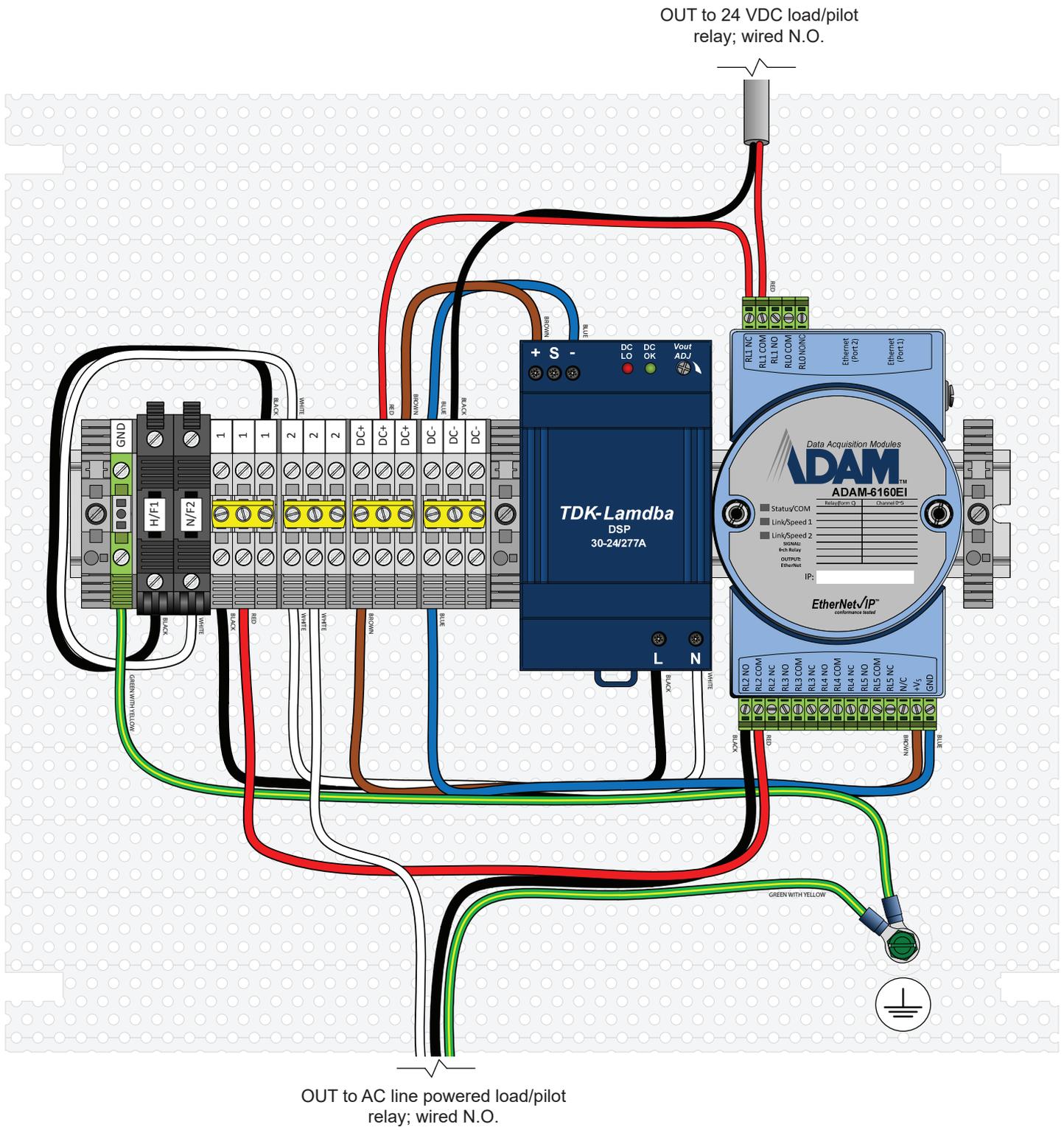
Wiring: 12 x 12 x 4 lighting panel, 6-channel

The standard lighting control panel shown below includes six (6) 4-pole, 20 A contactors with 120 VAC coils. This allows switching of up to twenty-four (24) 20 A lighting circuits in six (6) groups of four (4) circuits each.

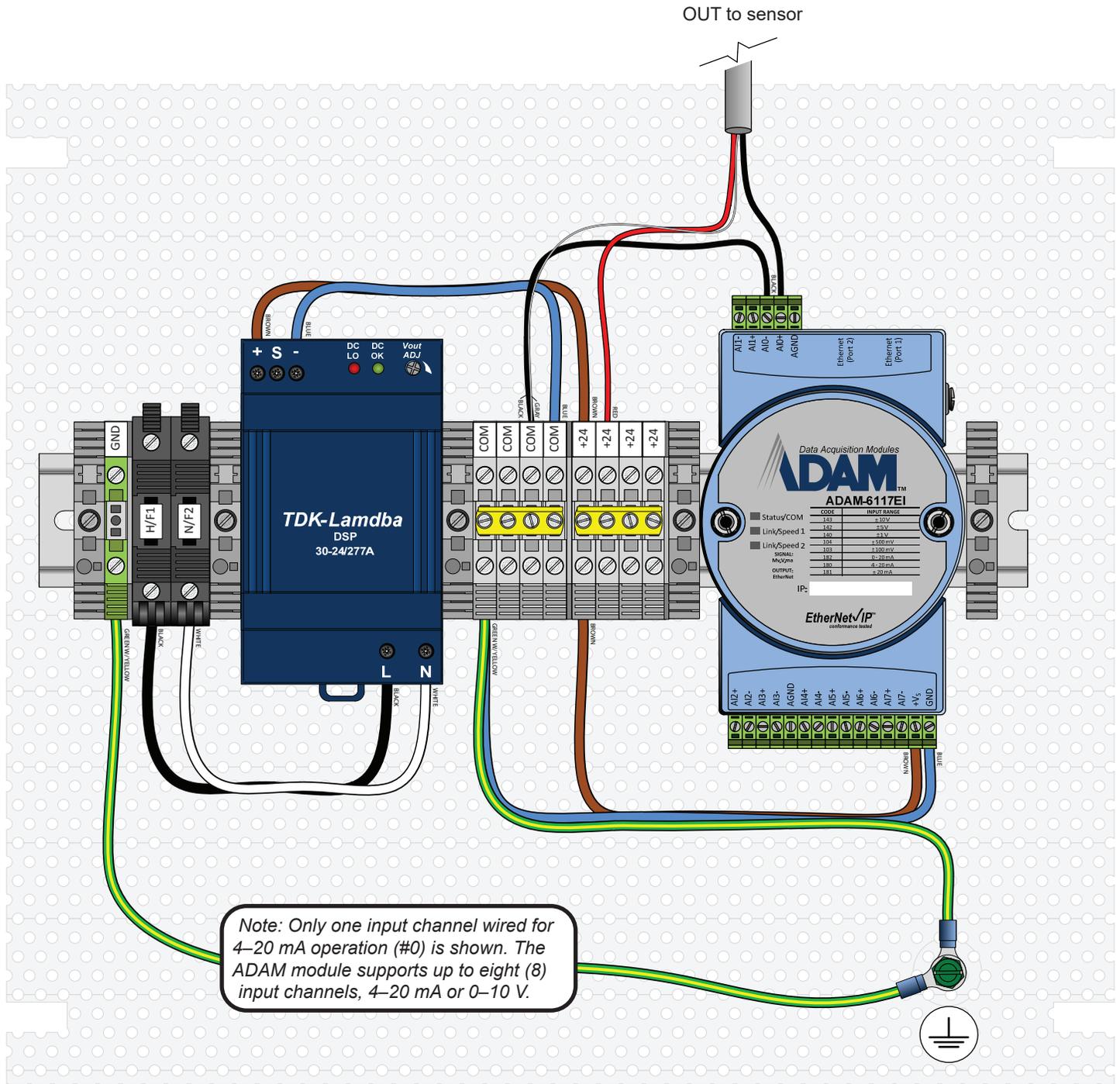
Note: Alternate contactors and coil voltages can be supplied upon request (12–277 V AC/DC).



Wiring: 12 x 12 x 4 output panel

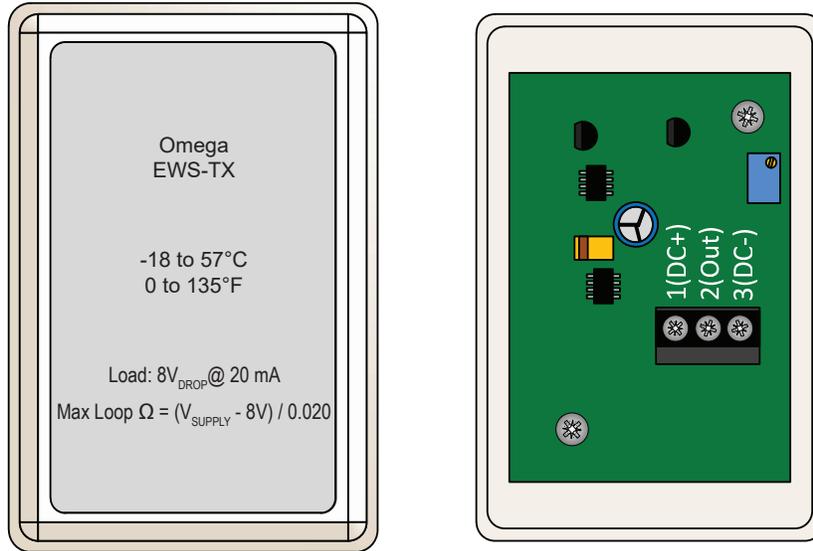


Wiring: 12 x 12 x 4 analog input panel, 8 channel

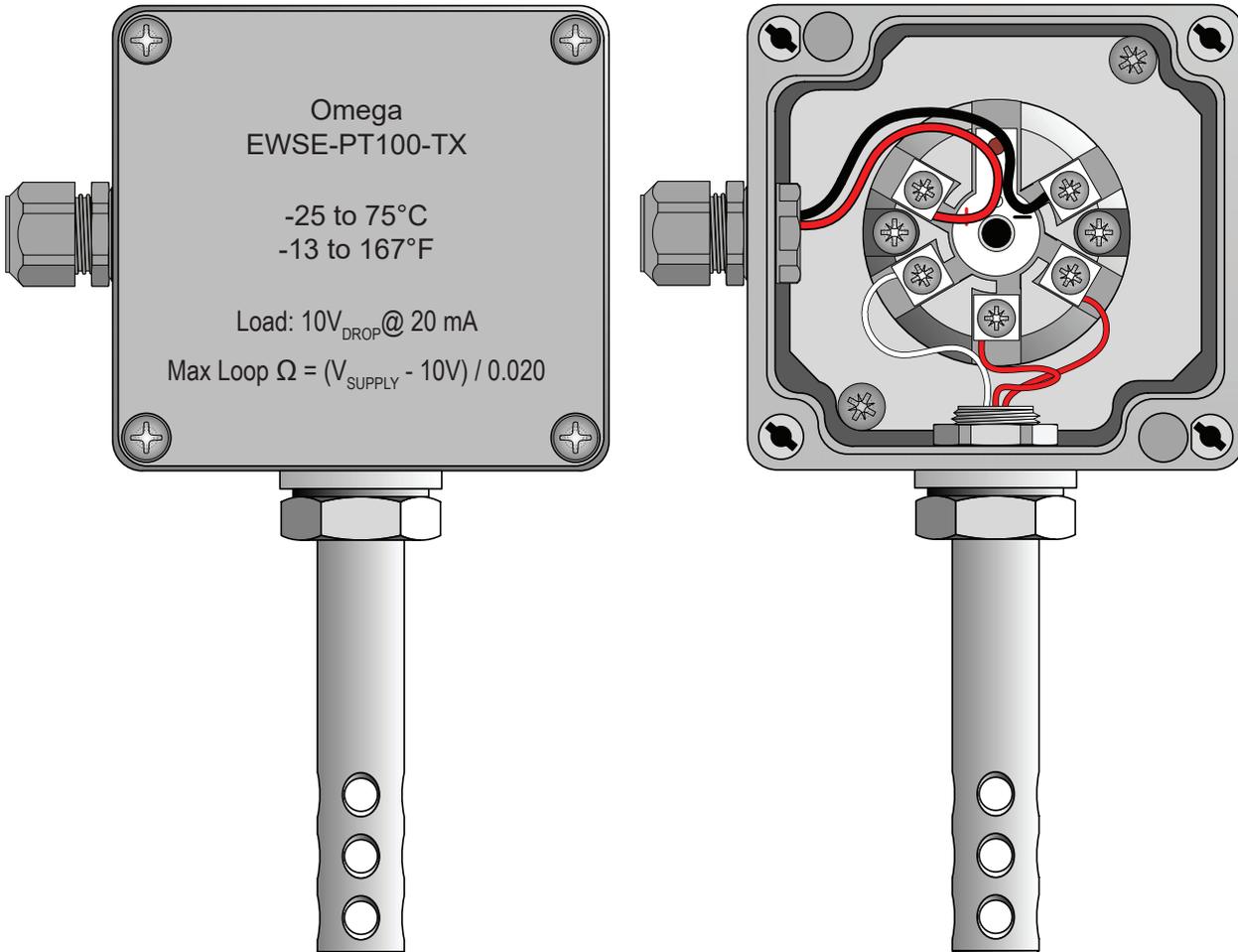


Temperature sensor specifications

Indoor sensor



Outdoor sensor



Mounting temperature sensors

Indoor sensor

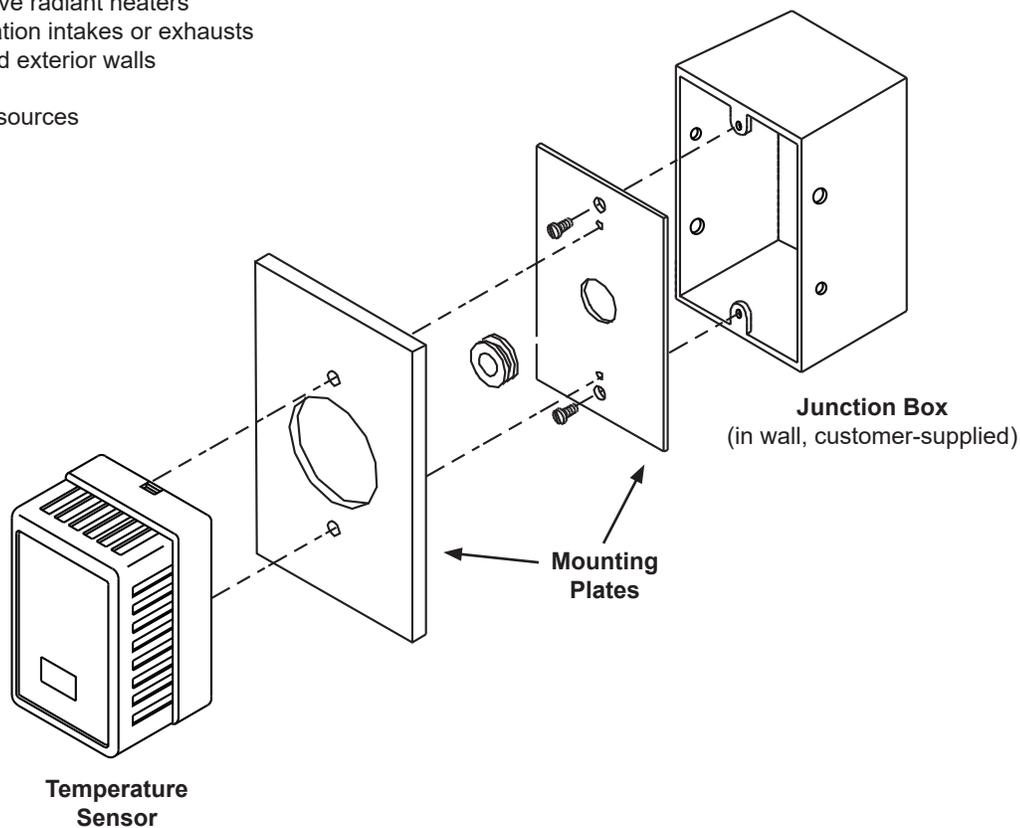
Mount the sensor to a standard 2" x 4" (51 mm x 102 mm) junction box using the provided hardware as shown below. *Note: A junction box is not supplied.*

Mounting guidelines

- Mount sensors on flat surfaces that are free from vibration and where there is adequate distance from foreign objects or moving equipment.
- Mount sensors in a location where they are exposed adequately to circulated air.
- Mount floor-level sensors at the same height from the floor as a typical fan wall controller.
- Mount ceiling-level sensors 3–4 ft (0.9–1.2 m) from the ceiling.

Do not mount sensors in the following locations:

- Adjacent to or above radiant heaters
- Near HVAC ventilation intakes or exhausts
- On poorly insulated exterior walls
- In roof decking
- Near radiant heat sources



Outdoor sensor

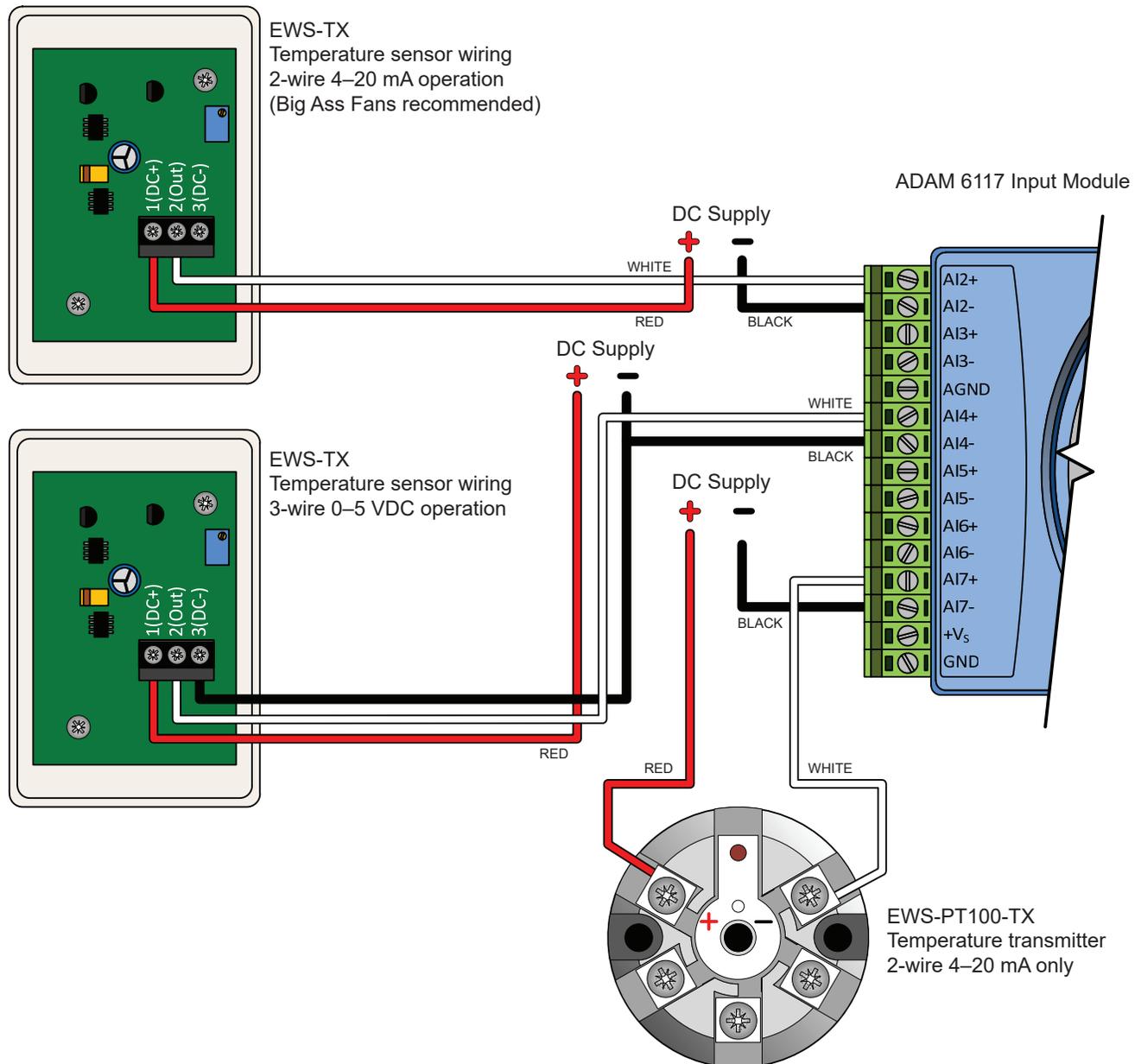
Mounting guidelines

- Mount sensors on flat surfaces that are free from vibration and where there is adequate distance from foreign objects or moving equipment.
- Do NOT mount sensors in direct sunlight.

Basic temperature sensor wiring

The ADAM 6117 analog input module supports up to eight (8) channels and several signal types and levels. Big Ass Fans recommends using temperature sensors that include 4–20 mA loop transmitters, as current loops are much less susceptible to induced interference over long distances. As long as the wiring is at least 22 AWG, there are no practical wiring distance limitations for these sensors. Excess of 5,000 ft (1,524 m) is possible. If 4–20 mA loop transmitters are not available or preferred, voltage transmitters can also be used.

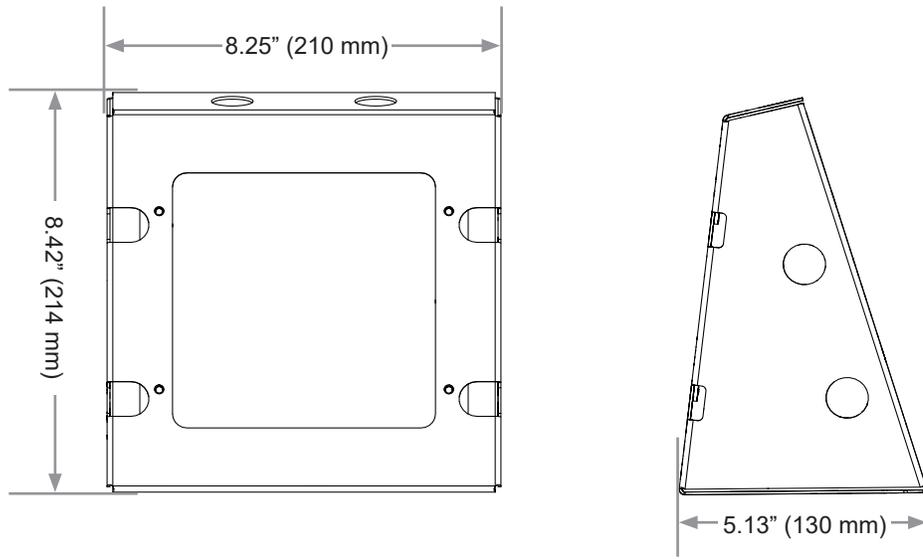
The ADAM 6117 module **must be configured** prior to use. For module hardware configuration and configuration utility instructions, see page 39. Sensor wiring examples are shown below. Shielded instrument cable with drain lead is recommended.



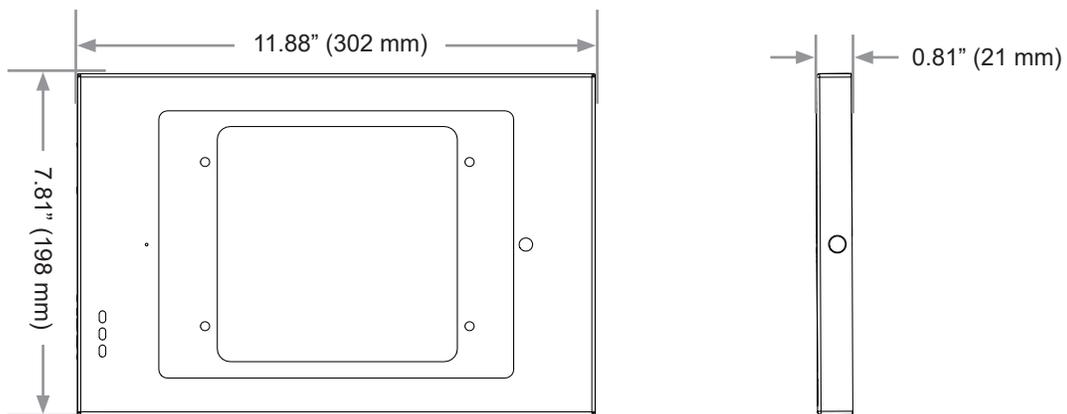
Complete all steps in "Pre-Installation Requirements" on page 5 and "Electrical Installation: Lights, Ventilation, & Automation" on page 8 before proceeding.

Dimensions

Mounting Bracket



iPad® Enclosure



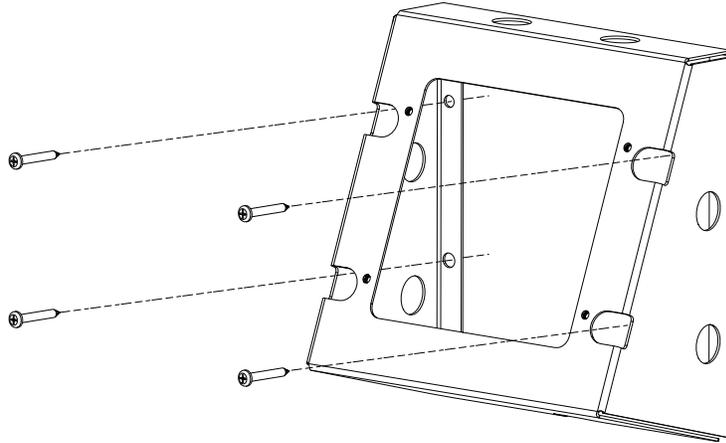
Mounting the control system

1. Install mounting bracket

Select a flat mounting location that is readily accessible, free from vibration, and where there is adequate distance from foreign objects or moving equipment. Attach the mounting bracket using four (4) suitable 1/4" mounting screws as shown.

Mounting Hardware (Customer-Supplied):

(4) 1/4" Mounting Screw

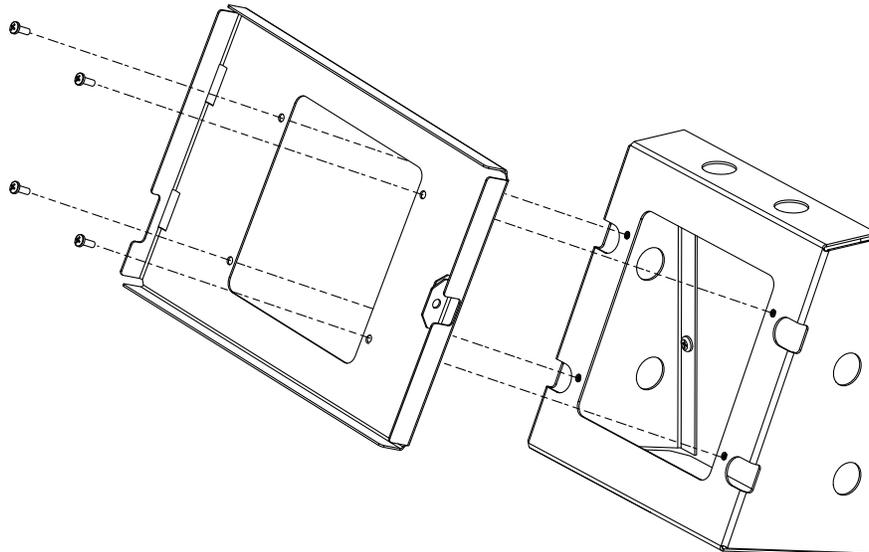


2. Attach backplate

Attach the backplate of the iPad® enclosure to the mounting bracket as shown. Orient the plate so that the key lock is on the right. Insert the four (4) provided screws into the four holes on the plate.

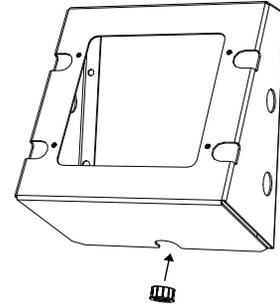
iPad Enclosure Hardware (BAF-Supplied):

(4) 10-32 x 1/2" Pan Head Screw



3. Attach bushing plug

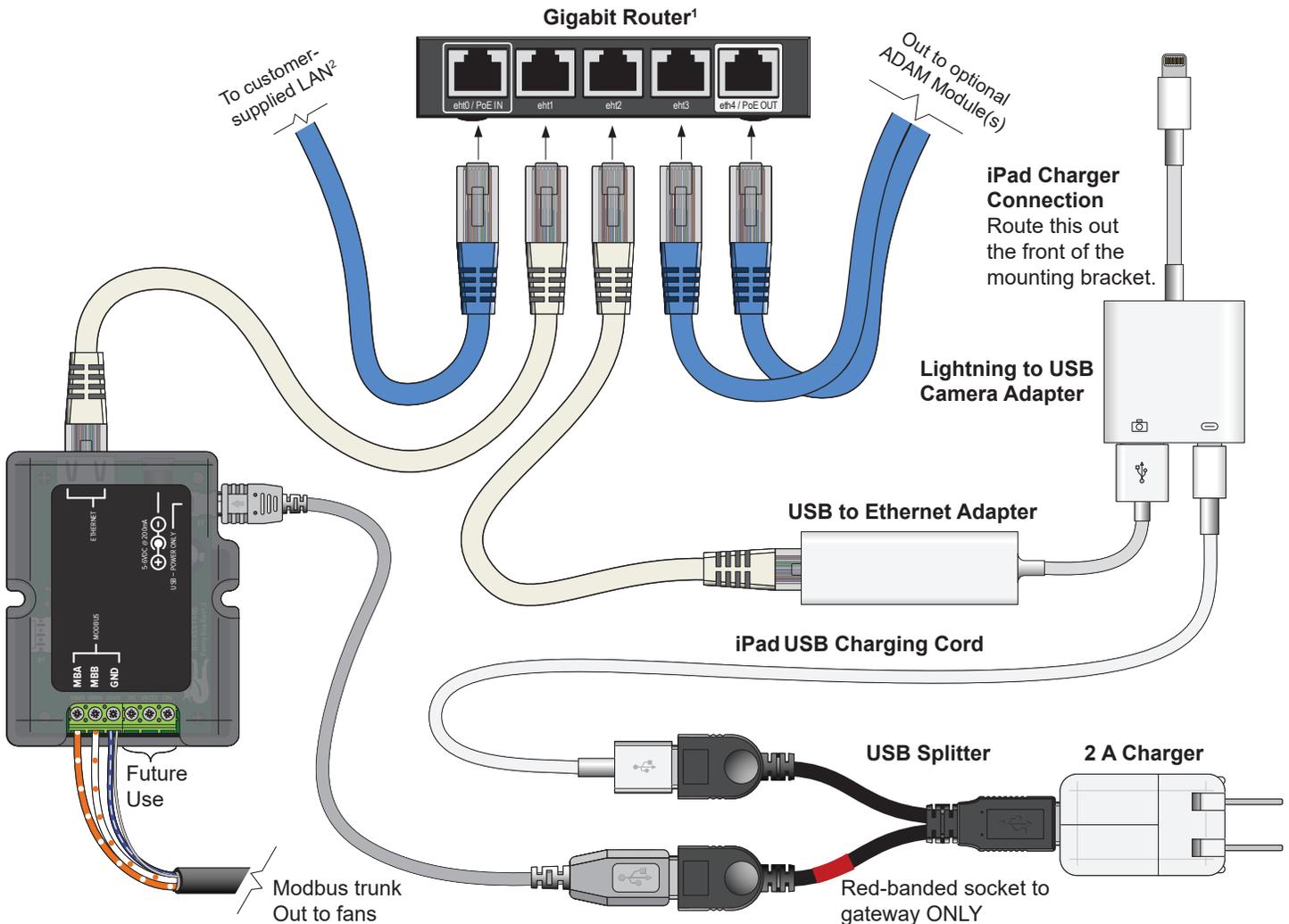
Insert the bushing plug into the hole on the bottom of the mounting bracket as shown.



4. Connect components

Place the BAF gateway and the router inside the mounting bracket and make the connections shown below. Route the power cord through the bushing plug at the bottom of the mounting bracket, and route the iPad® charger connection out the front of the mounting bracket as shown.

WARNING: The gateway has two power supply options: USB (provided) or a 5–6 VDC 200 mA supply (not provided). **DO NOT** connect both at the same time.



See page 25 for Modbus gateway connection details.

1. The router's AC adapter and three-socket extension cord are included but not shown.
2. An Internet connection is required for iPad clock sync (needed for schedule-enabled operation). Consult the end-user IT personnel at the installation location before configuring Internet settings. If you do not intend to use the scheduling feature, permanent Internet connectivity is not required.

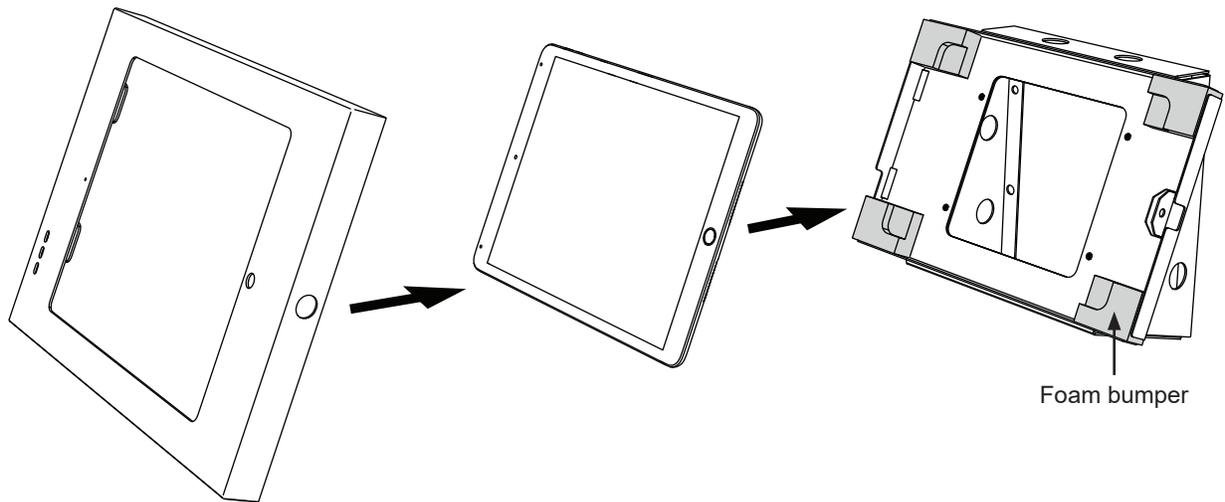
5. Complete electrical installation

Complete all necessary steps in the “Electrical Installation: Lights, Ventilation, & Automation” and “Electrical Installation: Fans” sections before proceeding to step 6.

6. Attach iPad® and front cover

Secure the peel-and-stick foam bumpers inside the backplate of the iPad® enclosure. Plug the lightning to USB camera adapter into the iPad, and then rest the iPad in the enclosure so that the Home button is on the right. Secure the front cover of the iPad enclosure onto the backplate. Make sure the front cover is oriented as shown. If necessary for security, lock the iPad enclosure using the provided key.

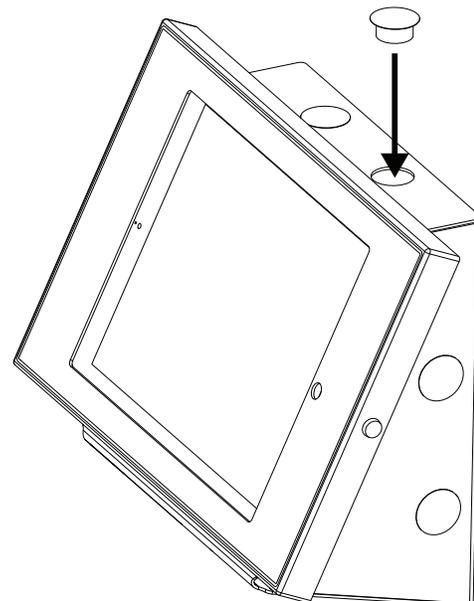
Note: Wiring, internal components, and the power cord are not shown in the illustration below.



7. Attach knockouts

Insert the six (6) provided knockouts into the holes in the mounting bracket that are not being used for wiring or the power cord.

Note: Wiring and the power cord are not shown in the illustration on the right.





WARNING: To reduce the risk of electric shock, wiring should be performed by a qualified electrician! Incorrect assembly can cause electric shock or damage the motor and the controller! Hazard of electrical shock!

WARNING: Installation must be in accordance with the requirements specified in this installation manual and with any additional requirements set forth by the National Electrical Code (NEC), ANSI/NFPA 70, and all local codes. Code compliance is ultimately YOUR responsibility! Failure to comply with these codes could result in personal injury or property damage.

WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication of safe voltage levels.

CAUTION: The Big Ass Fans product warranty will not cover equipment damage or failure that is caused by improper installation.

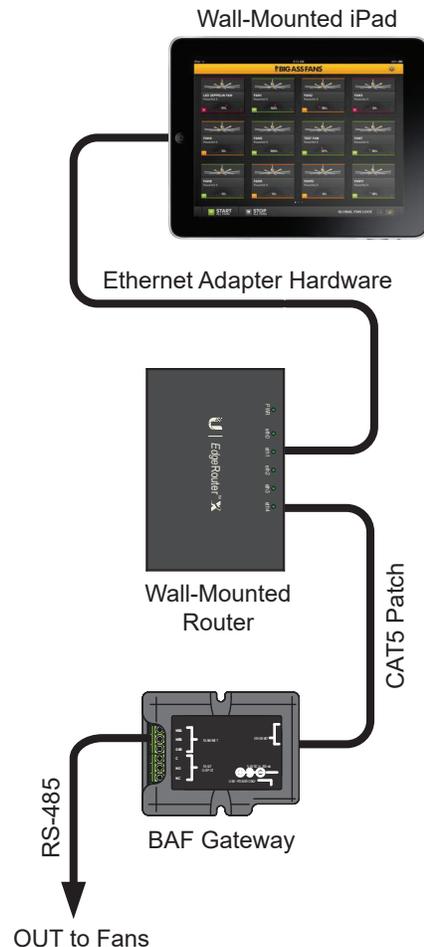
Installation overview

The BAFWorks® control system uses the Modbus RTU protocol to communicate to fans over a two-wire RS-485 network. Each fan is controlled by the BAFWorks iPad® application and the BAF Modbus gateway.

After BAFWorks is installed, the iPad (and remote operator station[s], if installed) will be your only means of fan control. You will not be able to use the wall-mounted controllers included with the fans. Before installing BAFWorks, install the fan system and wall controllers according to the instructions in the fan Installation Guide. This will give you a backup means of fan control in case a problem occurs with the BAFWorks system or if you need to make parameter changes.

The iPad and the provided router are located inside the wall mounting bracket. The gateway is connected locally to the router. If this gateway is remotely mounted, a customer-supplied 5 VDC, 100 mA power supply must be used. See page 21 for connection details for the wall-mounted components.

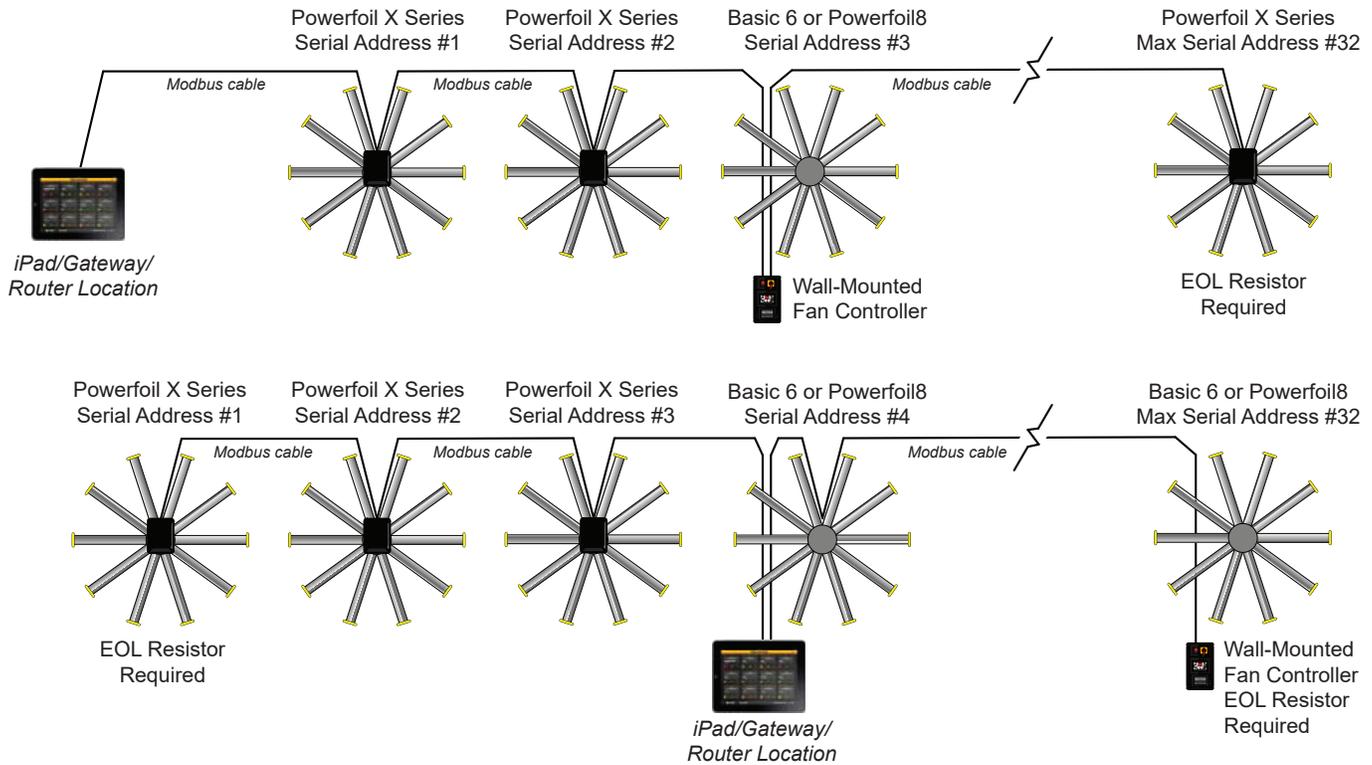
Closing the BAFWorks application will leave you without a means of fan control unless the remote operator station option is installed.



Modbus wiring overview

Do not assign the same address to two (2) fans.

The BAFWorks® control system utilizes the Modbus RTU protocol to communicate to fans over a two-wire RS-485 network. Each fan or device requires a unique serial address for the BAFWorks application and Modbus gateway to function properly. The following pages detail the setup and connections unique to each supported type of fan. Two basic wiring layouts are shown below. The first illustrates multiple daisy chained drops with the iPad® and gateway located on one end of the Modbus loop. The second illustrates the same fan drop arrangement with the iPad and gateway in a central location. Either scenario will handle up to 32 unique serial addresses.



Cable types and distances

The maximum total distance for a Modbus loop is 4,000 cable feet (1,219.2 m); however, this may not always be practical. The cable impedance, load impedance, foreign signal presence, serial baud rate, and number of attached devices will decrease this imum distance limit. Testing has shown that the control system has a solid signal strength on a 1,000-ft (304.8 m) loop; however, there is no way to determine the maximum length for a particular application due to the number of variables.

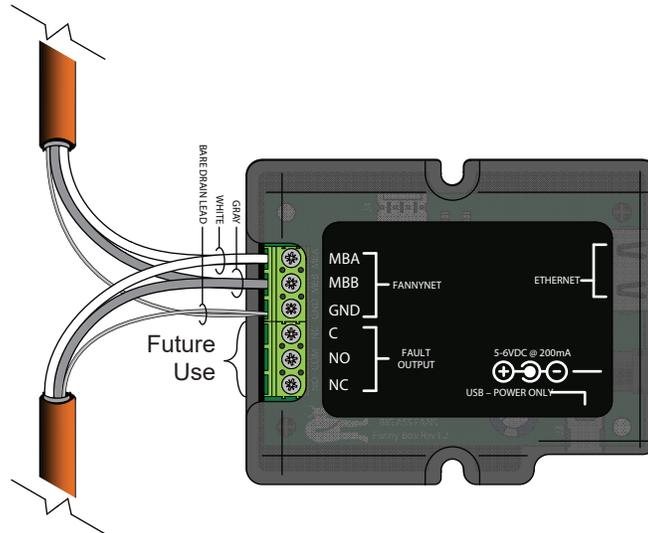
There are a number of acceptable cable types that can be used for installation. On the following pages, Windy City Wire Modbus cable is used for all examples. **It is absolutely critical that the cable used meets TIA/EIA-485 standards for use on RS-485 networks.** Manufacturers that make acceptable cable include Carol®, Alpha Wire, Tyco/Raychem®, and Belden.

Terminating or EOL resistors

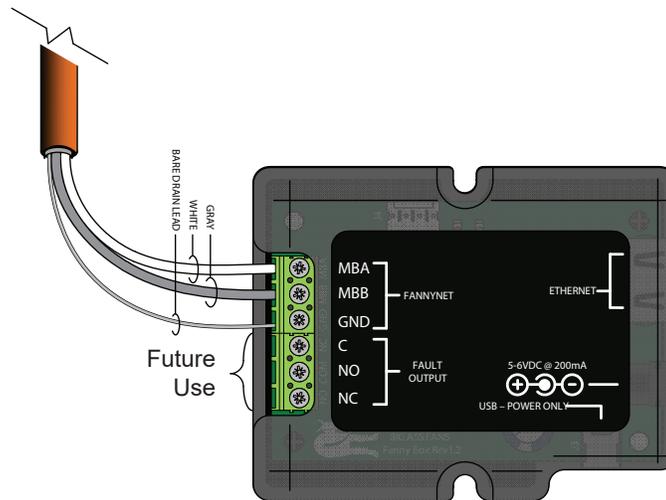
A number of 1/4W, 120-ohm resistors are included in the provided hardware. As illustrated on the following pages, an EOL resistor must be placed across the MBA and MBB terminals at the last device in a Modbus cable run, even if it is only a single run between the gateway and a single fan.

Terminations at the Modbus gateway

Located in-line with a daisy chained Modbus loop



Located at the end of a daisy chained Modbus loop



Note: The gateway includes an internal EOL resistor. The addition of an external resistor is not necessary.

Setup and wiring: 200–240 V & 400–480 V Delta E Series VFDs (Powerfoil®X Series fans)

⚠ WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication of safe voltage levels.

To enable the fan to connect to BAFWorks®:

1. Remove the VFD enclosure cover. Connect the BAFCon controller (provided with the fan) to the VFD by plugging the controller cable into the VFD's CAT5 power tap. Apply power to the fan.
2. Check the fan's Modbus address. Each fan is programmed with a random address between 1–247. On the BAFCon Home screen, tap the menu icon, and then tap **FAN MANAGEMENT** > Fan Name > **Fan Settings**. The Modbus address is displayed at the bottom of the screen. Tap **CHANGE** if you want to change the address, and then follow the instructions on the screen.
3. Record the Modbus address in the Setup Notes section of this installation guide. You will need to enter the address when adding the fan in the BAFWorks application.
4. Disconnect AC mains power from the fan via the twist-lock plug or other means.
5. Install the Modbus cable into the VFD enclosure with the appropriate fitting, such as a cord grip connector or EMT connector.
6. Disconnect the controller cable from the CAT5 power tap, and then disconnect the power tap from the VFD's RJ45 port and low voltage terminals. Refer to the illustration on the right.
7. Connect the data cable as shown on the following page. Pay special attention to the polarity for MBA, MBB. *Note: It is helpful to plug the data port screw terminal block into the drive prior to termination. BE MINDFUL of the tightening torque. The VFD's data port can be damaged by excessive force applied on the screw heads. The cable shield's drain lead and reference line (if present) connect to the VFD's Analog Common terminal (ACM).*
8. Reinstall the VFD enclosure cover and reapply power to the fan. The BAFWorks application will now be able to connect to this fan on the network.

Note: The following actions will result in a communications loss and subsequent fan shutdown:

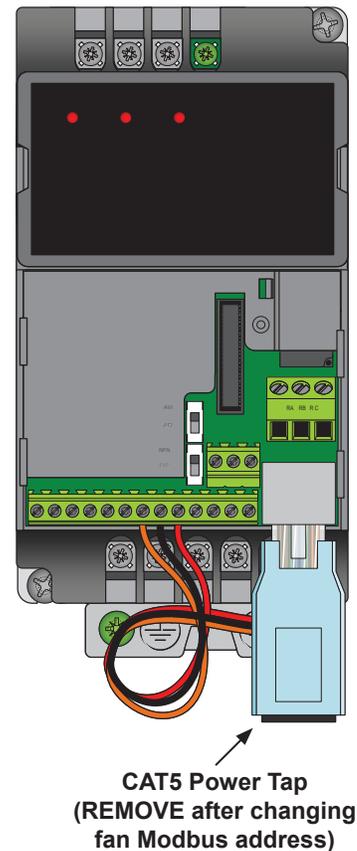
- Closing the BAFWorks application
- iPad®, gateway, or router power loss
- Modbus data loop wire break
- iPad disconnection from router

Alternatively, the remote operator station can be installed.

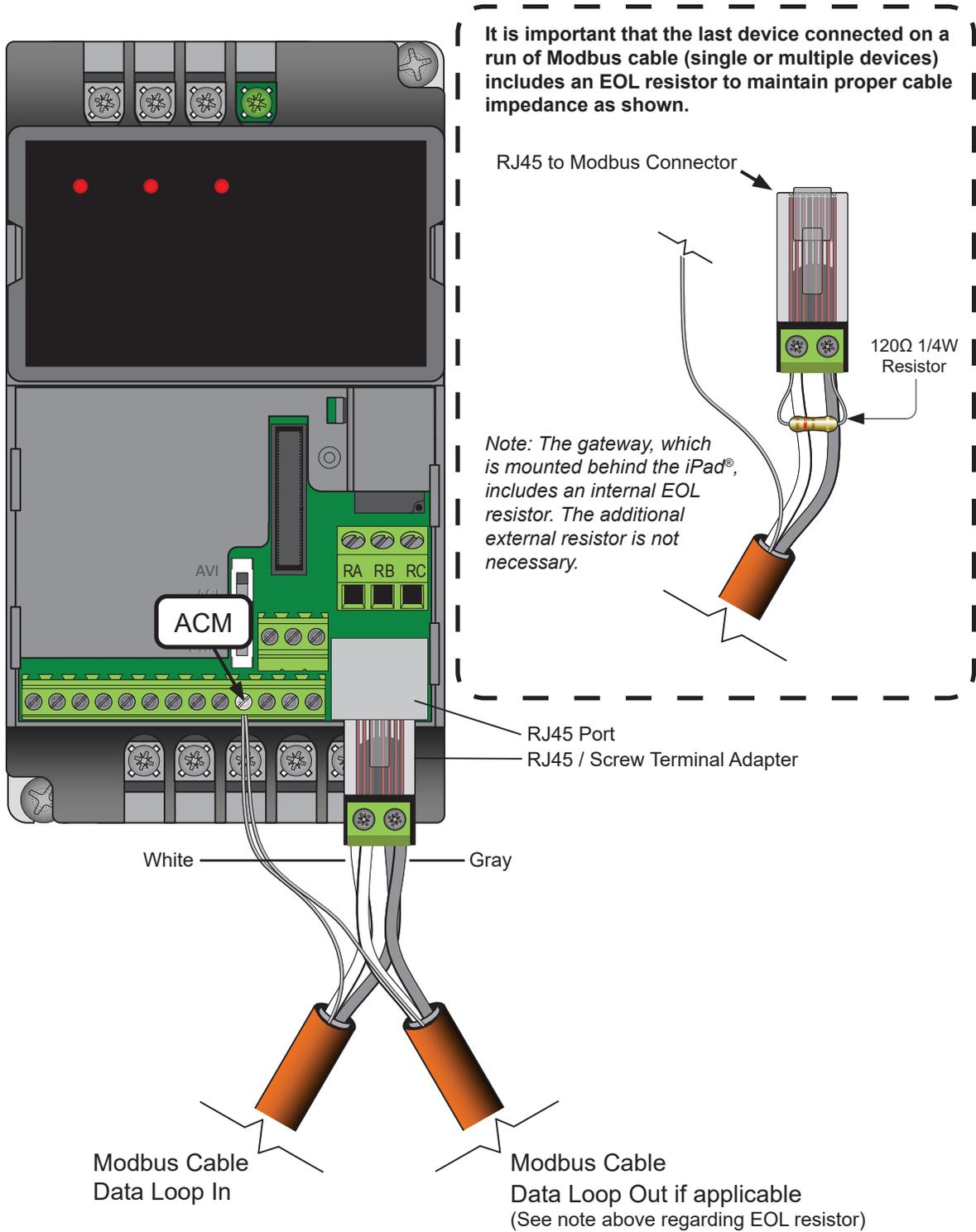
Fan parameters

All parameters for using Delta E Series VFDs with BAFWorks are programmed at the factory except for fan addresses. If you want to view or modify fan parameters, you will need to reconnect the BAFCon controller and contact Customer Service. Big Ass Fans recommends storing the BAFCon controller, CAT5 power tap, and controller cable near the fan in case you need to reconnect them.

To view or modify fan parameters, tap the menu icon on the BAFCon Home screen, and then tap **FAN MANAGEMENT** > Fan Name > **Diagnostics** > **VFD Parameters**. Follow the instructions on the screen for contacting Customer Service.



Setup and wiring: 200–240 V & 400–480 V Delta E Series VFDs (Powerfoil®X Series fans) (cont.)



Note: The wire colors shown above are applicable to Windy City Wire Modbus cable only. Other cable types may differ. Take note of color/polarity if using a different model of cable.

Setup and wiring: 575–600 V Delta M Series VFDs (Powerfoil®X Series fans)

⚠ WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication of safe voltage levels.

The following parameter changes are required prior to disconnection of the wall-mounted fan controller:

Parameter	Default setting	Change to
Pr.00: First Start/Stop Reference, USB/RS485	1	3
Pr.01: First Speed Reference, USB/RS485	1	3
Pr.88: Communication Address	1	1–32 (must be unique to fan)
Pr.90: Transmission Fault Treatment; Warn and ramp to stop	3	1
Pr.91: Timeout Detection	0.0 sec (disable)	90.0 sec
Pr.92: Modbus RTU (8,E,1)	0	4

Make these parameter changes before disconnecting the wall controller cable from the VFD and proceeding with fan power down and Modbus loop termination. If necessary, Big Ass Fans recommends leaving the wall controller installed as a redundant means of control. Alternatively, the remote operator station can be installed (see page 35).

⚠ WARNING: Before making parameter changes, ensure that the fan is stopped, the "RUN" LED is off, and the "STOP" LED is illuminated on the wall controller.

To change fan parameters:

1. Press **PROG/DATA** on the wall controller to enter programming mode.
2. Press **▲** or **▼** if necessary to display parameter P 00.
3. Press **PROG/DATA** to view the current setting.
4. Press **▲** or **▼** to change the setting to 3.
5. Press **PROG/DATA** to save the change.
6. Press **▲** or **▼** to move to another parameter within group 02, or press **Mode** to exit programming mode.

Repeat the steps above to navigate to and change the remaining required parameters. When you are finished, press **Mode** to exit programming mode and return to the normal operational screens.

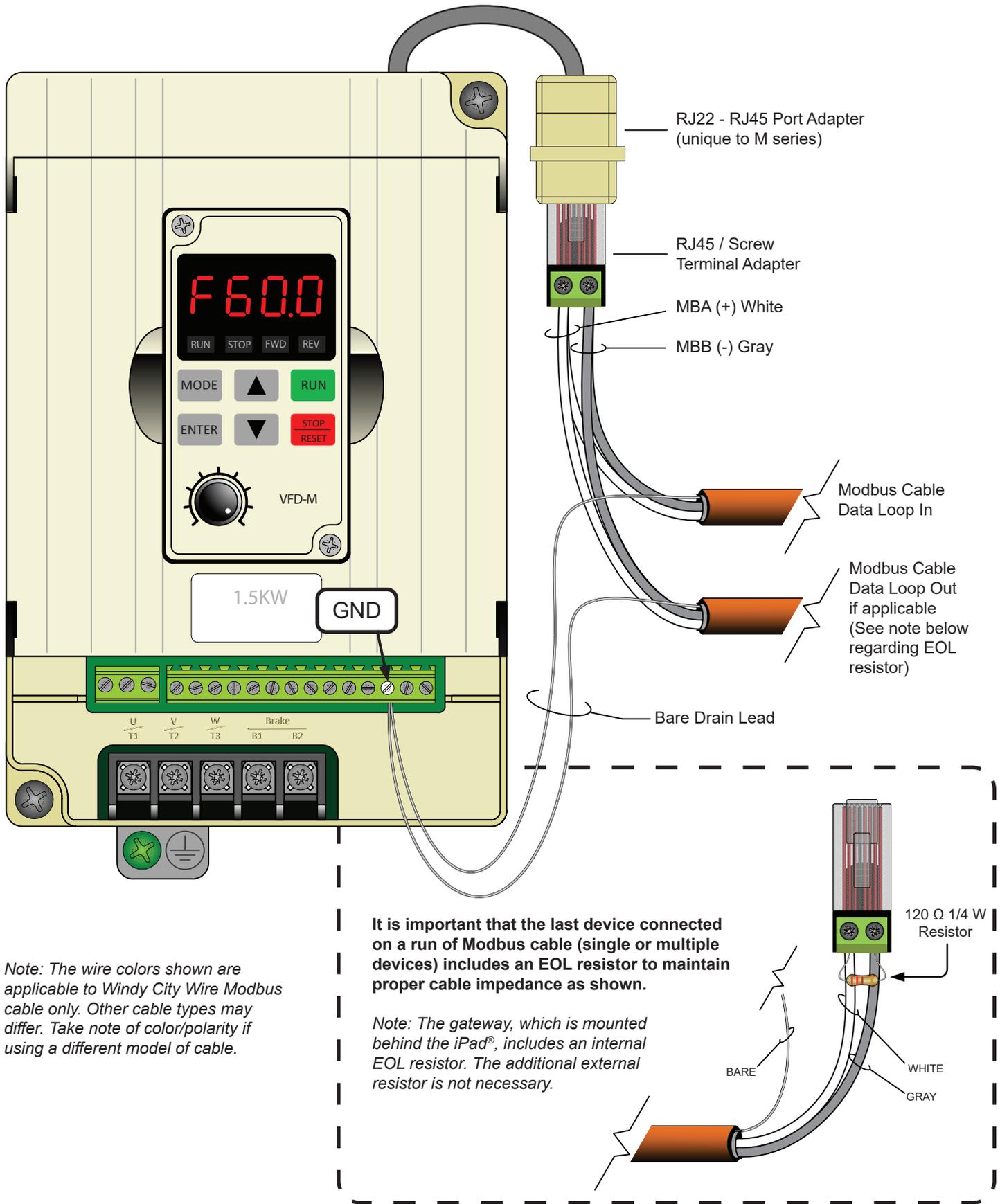
Final connections

1. Disconnect AC mains power from the fan via the twist-lock plug or other means, and then wait for a darkened LED display on the wall controller.
2. Remove the cover of the VFD enclosure and install the Modbus cable into the enclosure with the appropriate fitting, e.g. cord grip connector or EMT connector.
3. Disconnect the existing wall controller cable from the VFD's RJ22 to RJ45 port adapter. Leave the adapter in place.
4. Connect the data cable as shown on the following page. Pay special attention to the polarity for MBA, MBB. The cable shield's drain lead and reference line (if present) connect to the VFD's low voltage ground terminal (GND).
5. Reinstall the VFD enclosure cover and reapply power to the fan. The BAFWorks® application will now be able to connect to this fan on the network.

Note: The following actions will result in a communications loss and subsequent fan shutdown:

- Closing the BAFWorks application
- iPad®, gateway, or router power loss
- Modbus data loop wire break
- iPad disconnection from router

Setup and wiring: 575–600 V Delta M Series VFDs (Powerfoil®X Series fans) (cont.)



Setup and wiring: Lenze SMVector VFDs (Powerfoil®8 and Basic 6® fans)

⚠ WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Darkened display LEDs are not an indication of safe voltage levels.

⚠ WARNING: Before making parameter changes, ensure fan is stopped and jumper wires are removed.

Parameter	Default setting	Action
P100: Start Stop Control	3	Confirm set to 3
P101: Speed Reference	0	Confirm set to 0
P116: Remote Speed Reference	6	Confirm set to 6
P122: Terminal 13B Function	9	Confirm set to 9
P199: Program Selection	0	Confirm set to 0
P400: Communication Protocol	2	Confirm set to 2
P410: Modbus Address	1	Set to 1–32 (must be unique to fan)
P411: Baud Rate	2	Confirm set to 2
P412: Communication Format	2	Confirm set to 2
P422: Network Stop	2	Confirm set to 2
P425: Communication Timeout	30.0 sec	Confirm set to 30.0 sec
P426: Timeout Action	4	Confirm set to 4

To confirm or change fan parameters:

1. Press  on the wall controller to enter programming mode.
2. Press  or  until the desired parameter is displayed.
3. Press  to view the current setting.
4. Press  or  to change the setting (if necessary).
5. Press  to save the change.

Repeat the steps above to confirm or change parameters. When the last change is completed, the controller will return to the normal operational screen.

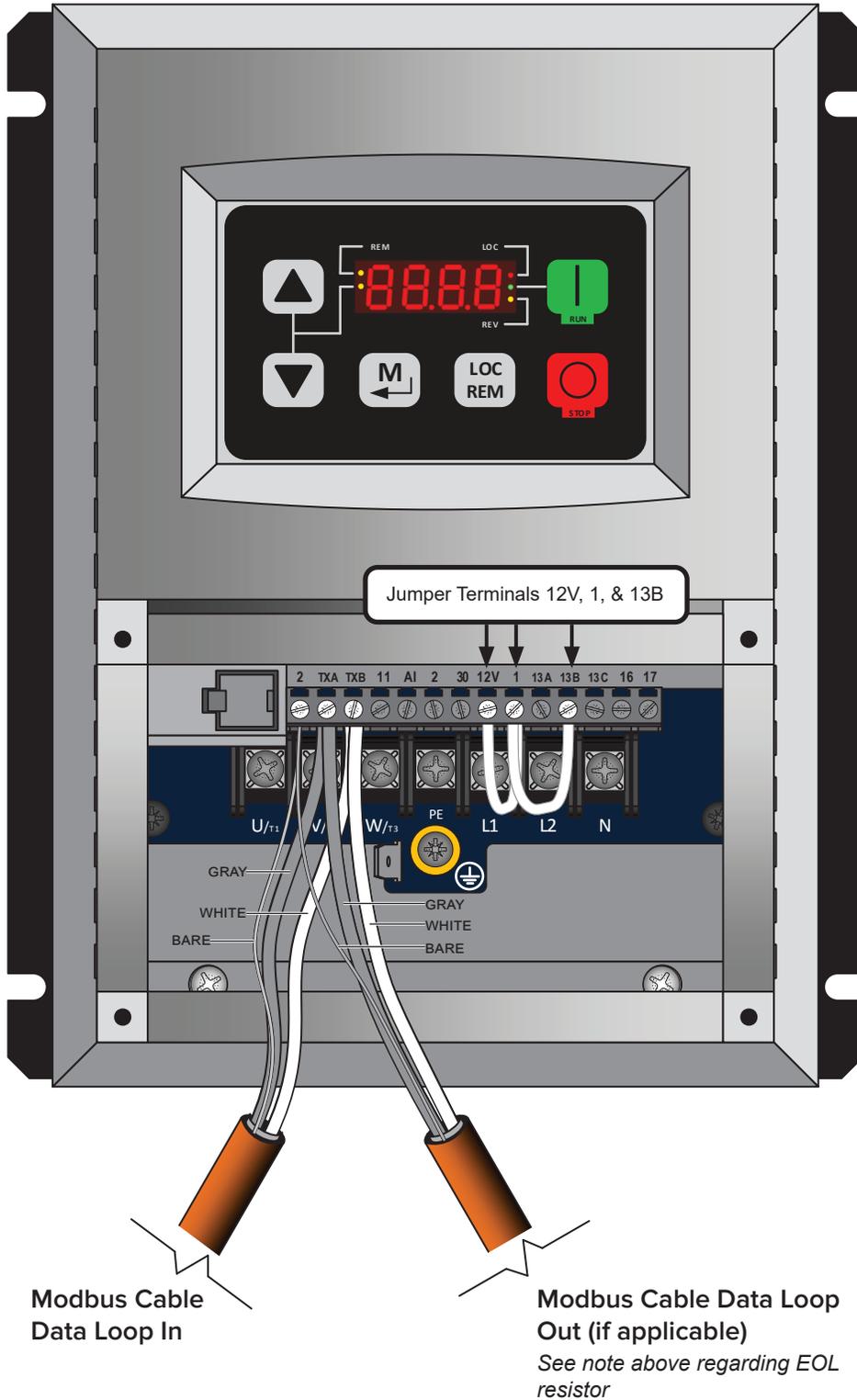
Final connections

1. Disconnect AC mains power from the fan via the included rotary disconnect or other means, and then wait for a darkened LED display on the fan controller.
2. Remove the lower VFD cover and install the Modbus cable into the main drive housing with the appropriate fitting, e.g., cord grip connector or EMT connector.
3. Install jumpers between terminals 12, 1, and 13B.
4. Connect the data cable as shown on the following page. Pay special attention to the polarity for Data(+) and Data(-). The cable's shield and drain line (if present) land on terminal 2 (DC Common) on the VFD.
5. Reinstall the VFD's lower cover while being mindful of the bare drain leads slack (if present). *Incidental contact between the drain lead and the VFD's input/output leads can result in catastrophic damage to all other devices on the Modbus loop!*
6. Reapply power to the fan. The BAFWorks® application will now be able to connect to this fan on the network.

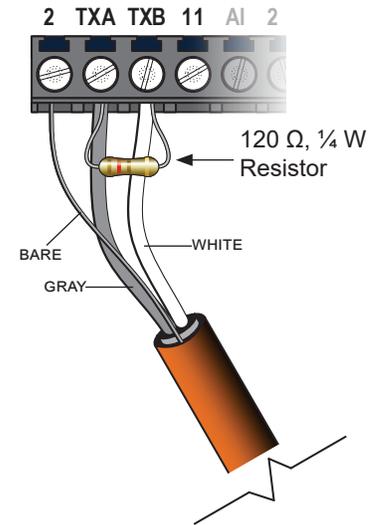
Note: The following actions will result in a communications loss and subsequent fan shutdown:

- Closing the BAFWorks application
- iPad®, gateway, or router power loss
- Modbus data loop wire break
- iPad disconnection from router

Setup and wiring: Lenze SMVector VFDs (Powerfoil®8 & Basic 6® fans) (cont.)



It is important that the last fan connected on a run of Modbus cable (regardless of fan quantity) includes an EOL resistor to maintain proper cable impedance as shown.



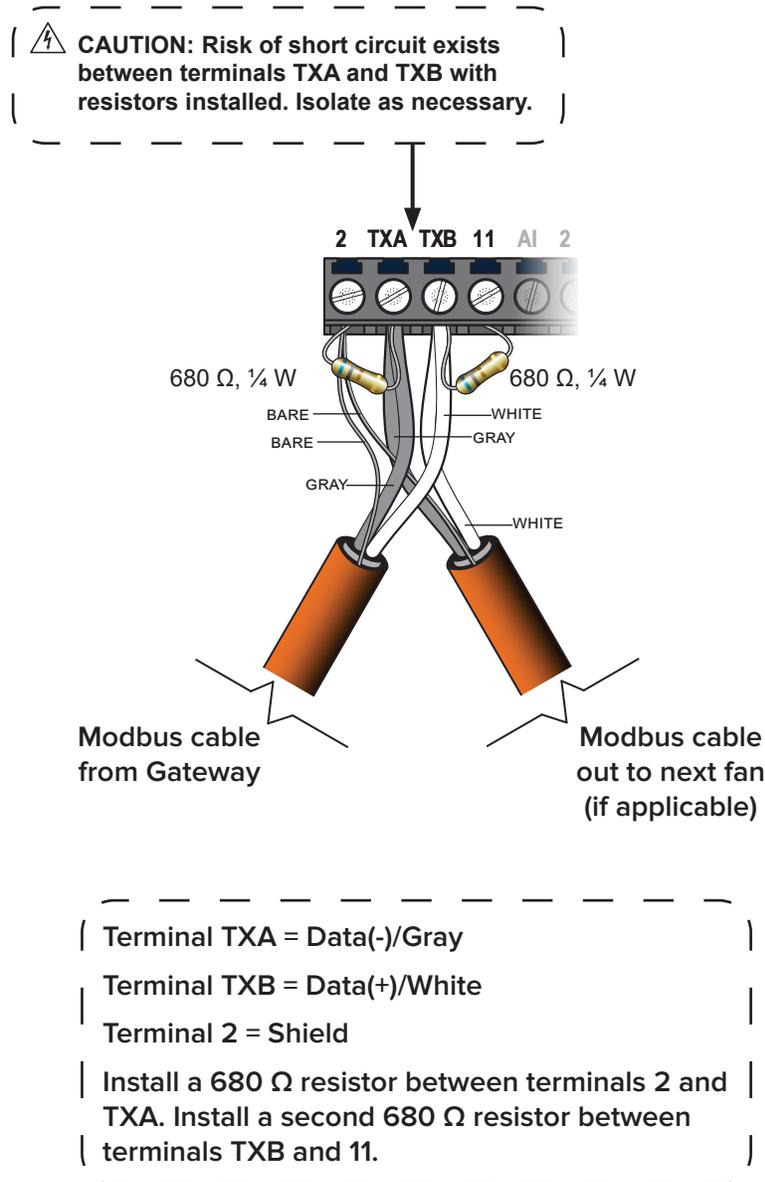
Note: The gateway, which is mounted behind the iPad®, includes an internal EOL resistor. The additional external resistor is not necessary.

- Terminal TXA = Data(-)/Gray
- Terminal TXB = Data(+)/White
- Terminal 2 = Shield

Note: The wire colors shown above are applicable to Windy City Wire Modbus cable only. Other cable types may differ. Take note of color/polarity if using a different model of cable.

RS-485 Network Biasing: Lenze SMVector VFDs (Powerfoil®8 & Basic 6® fans)

Depending on the design of the RS-485 transmitters and receivers, biasing resistors may be required for proper data transmission. The biasing resistors keep the data lines on the system at a fixed level while the transmitters are in an idle state. Without these resistors, data corruption or data packet loss can occur. The SMVector drives fall within these requirements; therefore, **a pair of 680 Ω, ¼ W resistors must be installed on either the first or last SMVector drive in the network series.** Due to the presence of a 120 Ω resistor at the end of the line, Big Ass Fans recommends installing the 680 Ω resistors at the first fan location to prevent clutter on the terminal strip.

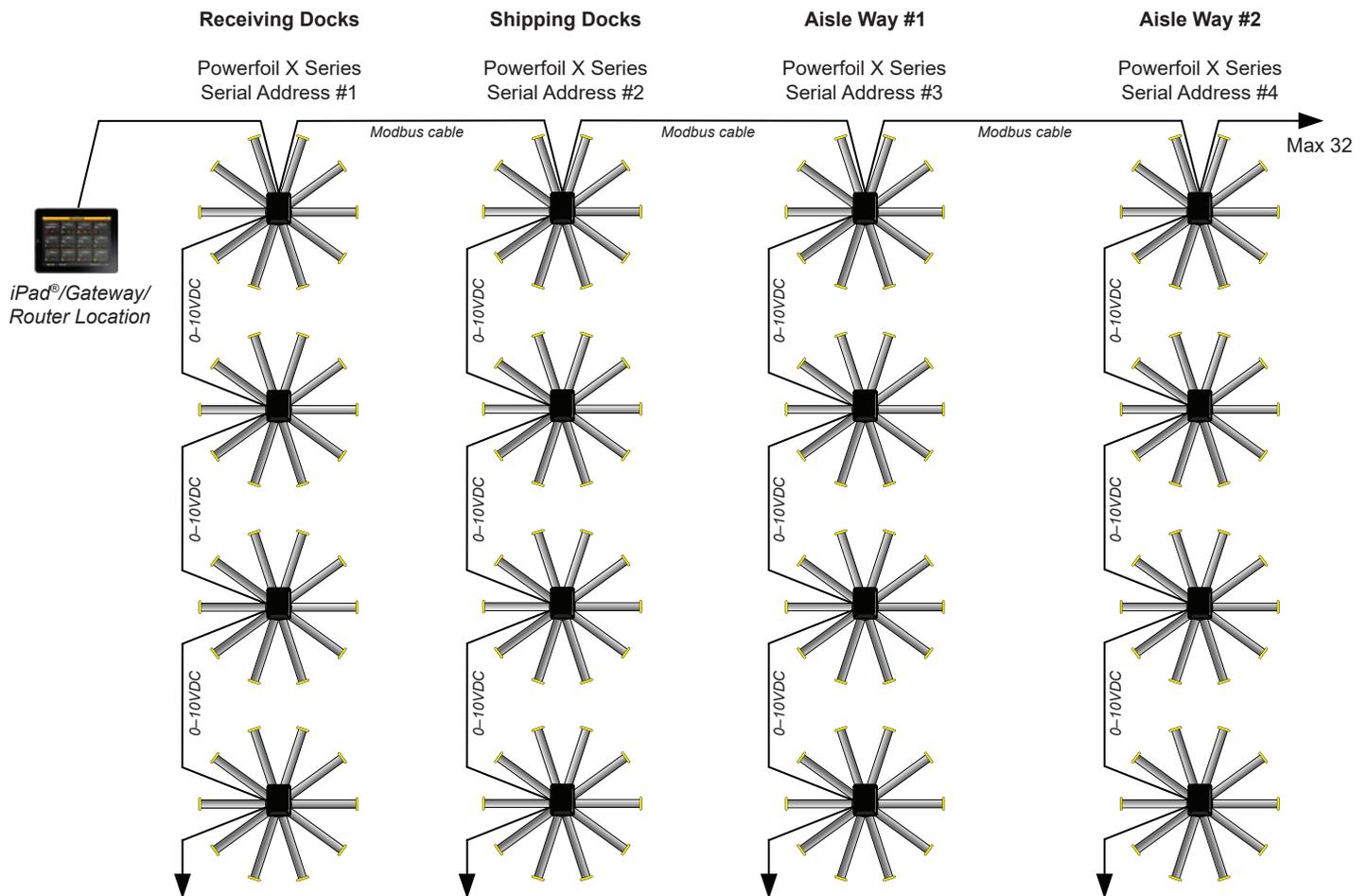


Note: The wire colors shown are applicable to Windy City Wire Modbus cable only. Other cable types may differ. Take note of color/polarity if using a different model of cable.

Connecting more than 32 fans (daisy chaining)

The BAFWorks® application and gateway are capable of communicating with only 32 unique serial addresses; however, **it is possible to connect more than 32 fans on a single gateway installation utilizing each fan controller's 0–10VDC daisy chaining setup as illustrated below.** Each fan controller contains a single 0–10 VDC analog input for speed reference, as well as a 0–10 VDC analog output; therefore, there is no signal loss from fan to fan, as each fan controller acts as a 0–10 VDC repeater.

In this arrangement, a “fan” on the BAFWorks application represents a group of fans, which are connected by the 0–10 VDC analog loop. All fans on the 0–10 VDC loop will behave identically. This is known as a master/slave setup or daisy chain, with the master being the first fan in the chain on the Modbus loop. You will reach a practical fan quantity limit based on square footage of your facility and/or for safety reasons before you find a physical hardware limitation. For 0–10 VDC analog signals, an 18–20 AWG, two-conductor shielded cable is recommended for distances up to 100 ft (30.5 m). See the fan's Installation Guide for connection details.

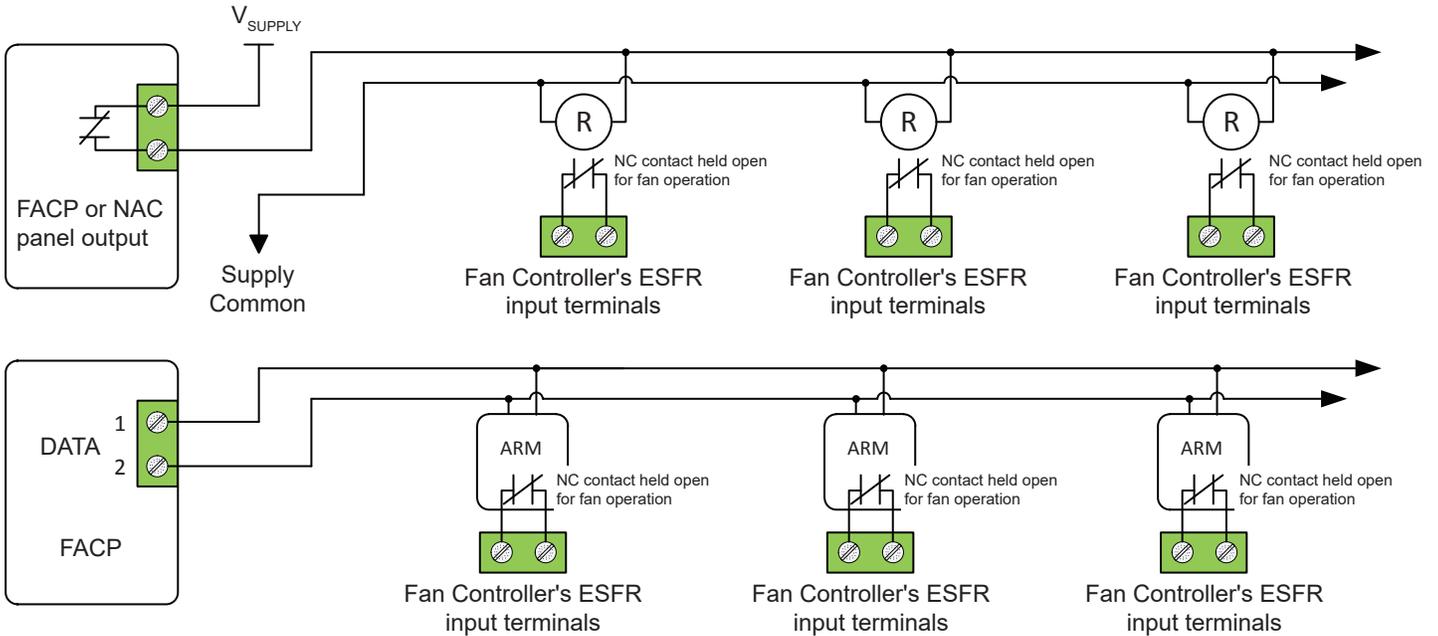


Daisy chain-capable fans and controllers

- Powerfoil®X Series fans with Delta E Series VFDs or Delta M Series VFDs
- Powerfoil®8 and Basic 6® fans with Lenze SMVector VFDs
- Any other fan system using VFDs that include both an analog input and analog output
- Additional fans can be added to the RS-485 trunk by way of a repeater (Big Ass Fans part number 005045 and 005045-WD).

Fire alarm interface methods

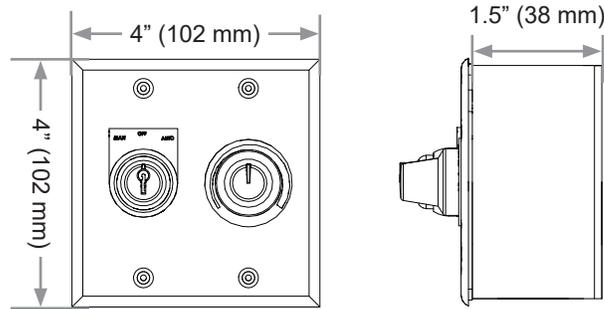
The most common method for interfacing fans with a fire alarm system is to provide a dry relay contact to each fan. In this scenario, the relay coil is controlled by the Fire Alarm Control Panel (FACP) or a Notification Appliance Circuit (NAC). On newer systems, the relay is replaced by an addressable Alarm Release Module (ARM). In all of these scenarios, the fan sees a dry contact inserted across a run enable input to the fan controller. When the fan is turned on, it will enter an External Fault Trip (EF Fault). This is considered a “fail safe” scenario, especially when the FACP, NAC, or ARM relay coil remains energized at all times to enable fan operation. Any circuit power failure or alarm condition will result in a fan shutdown, which will be reported on the BAFWorks® user interface. The typical circuit layout is shown below.



⚠ WARNING: Ensure power is disconnected from the fan(s) prior to installing the remote operator station(s).

The remote operator station lets you switch between BAFWorks® fan control and local fan control. One remote operator station is required for each fan you plan to control locally. Each remote operator station must be wired to the fan it will control and can be mounted up to 100 ft (30.5 m) from the fan's VFD. The following pages describe how to mount and operate the remote operator station and how to wire it to each supported type of VFD. *Note: The required 6-conductor (20 AWG minimum) cable is not provided. Big Ass Fans recommends Belden 5504UE or similarly rated cable.*

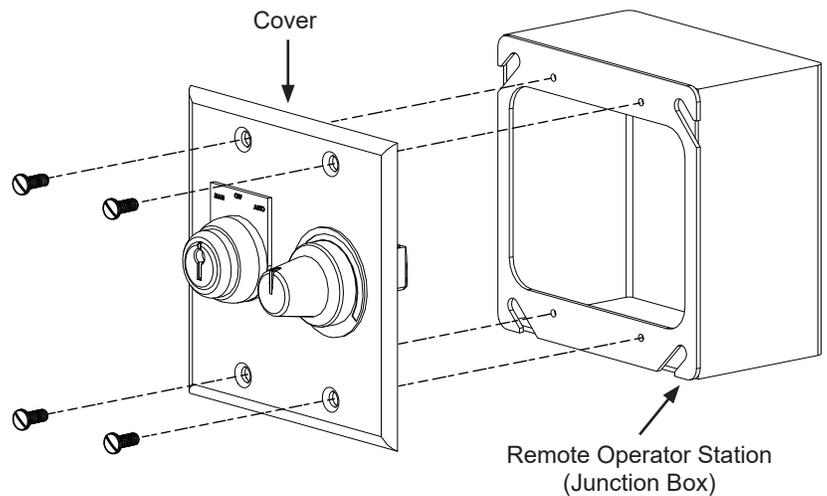
Dimensions



Installation

To mount the remote operator station:

1. Select a flat mounting location from which the fan is visible and that is 100 ft (30.5 m) or less from the fan's VFD. The mounting location should also be readily accessible, free from vibration, and at an adequate distance from foreign objects or moving equipment.
2. Remove the cover and four (4) screws and set them aside in a safe location.
3. Route power to the mounting location and mount the back of the remote operator station (junction box) to the wall using suitable customer-supplied mounting screws.
4. Wire the remote operator station to the fan's VFD. Refer to the following pages for wiring diagrams.
5. Reattach the cover using the four (4) screws as shown on the right.



Operation

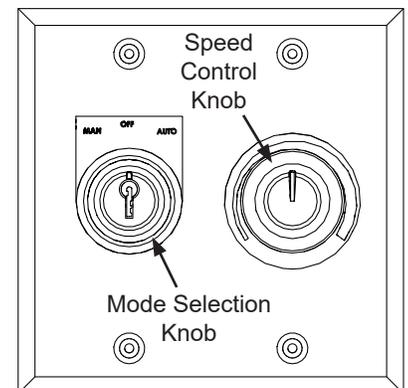
The remote operator station consists of a mode selection knob and a speed control knob. Use the provided key to turn the mode selection knob. **To prevent unauthorized access to the remote operator station, do not leave the key in the mode selection knob!**

To control the fan using the BAFWorks application, turn the mode selection knob to the AUTO position.

To start the fan locally, turn the mode selection knob to the MANUAL position.
To stop the fan locally and lock it out, turn the mode selection knob to the OFF position.

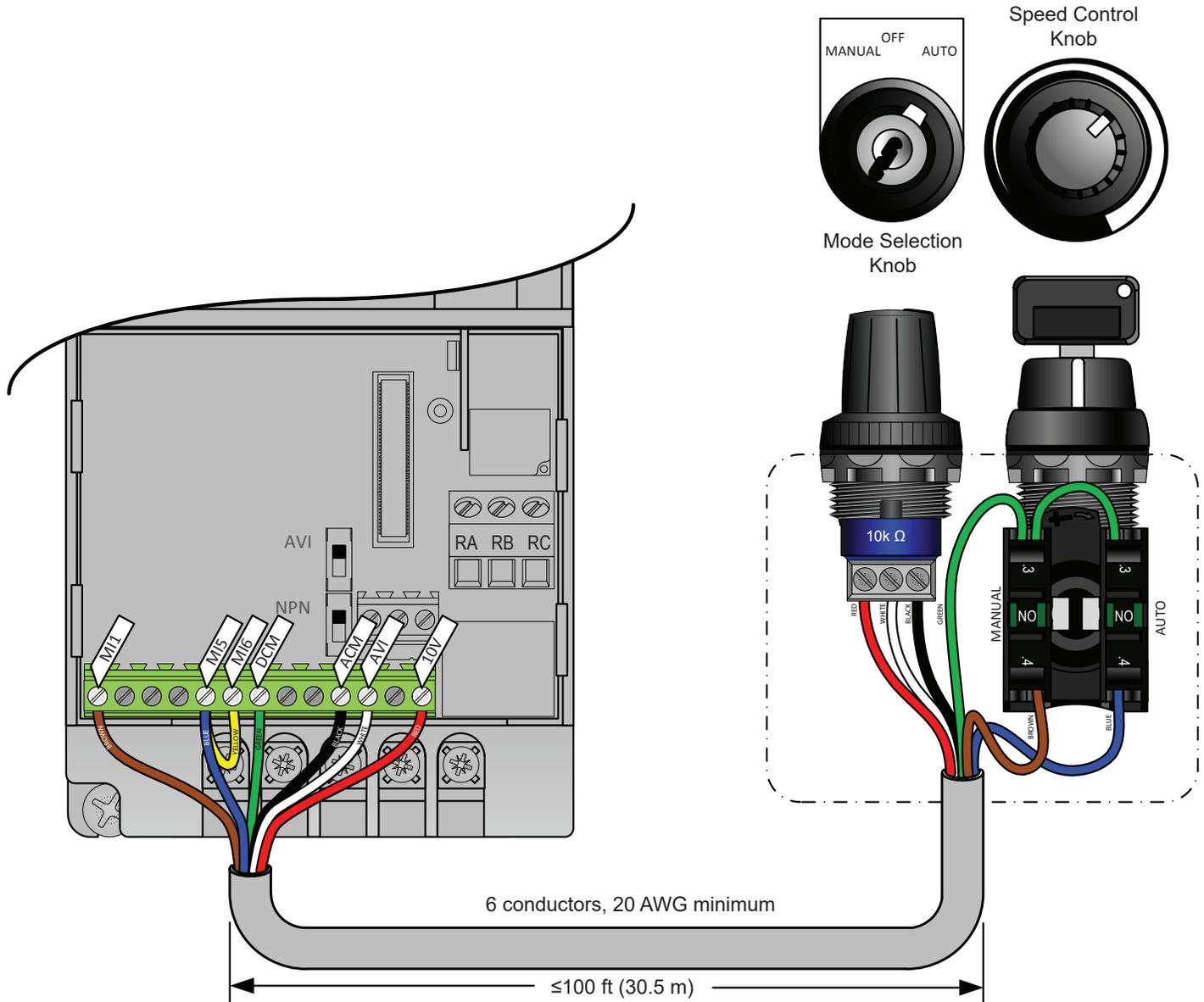
To adjust fan speed locally, make sure the mode selection knob is turned to the MANUAL position, and then rotate the speed control knob to the desired speed setting.

When the mode selection knob is turned to MANUAL or OFF, "local control" appears on the fan's BAFWorks icon and you will not be able to control the fan using BAFWorks.



Remote operator station wiring: 200–240 V & 400–480 V Delta E Series VFDs (Powerfoil® X Series fans)

WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication of safe voltage levels.



The following parameter changes are required for proper operation. To modify these parameters, you will need to reconnect the BAFCon controller (provided with the fan) and contact Customer Service. Tap the menu icon on the BAFCon Home screen, and then tap **FAN MANAGEMENT** > Fan Name > **Diagnostics** > **VFD Parameters**. Follow the instructions on the screen for contacting Customer Service.

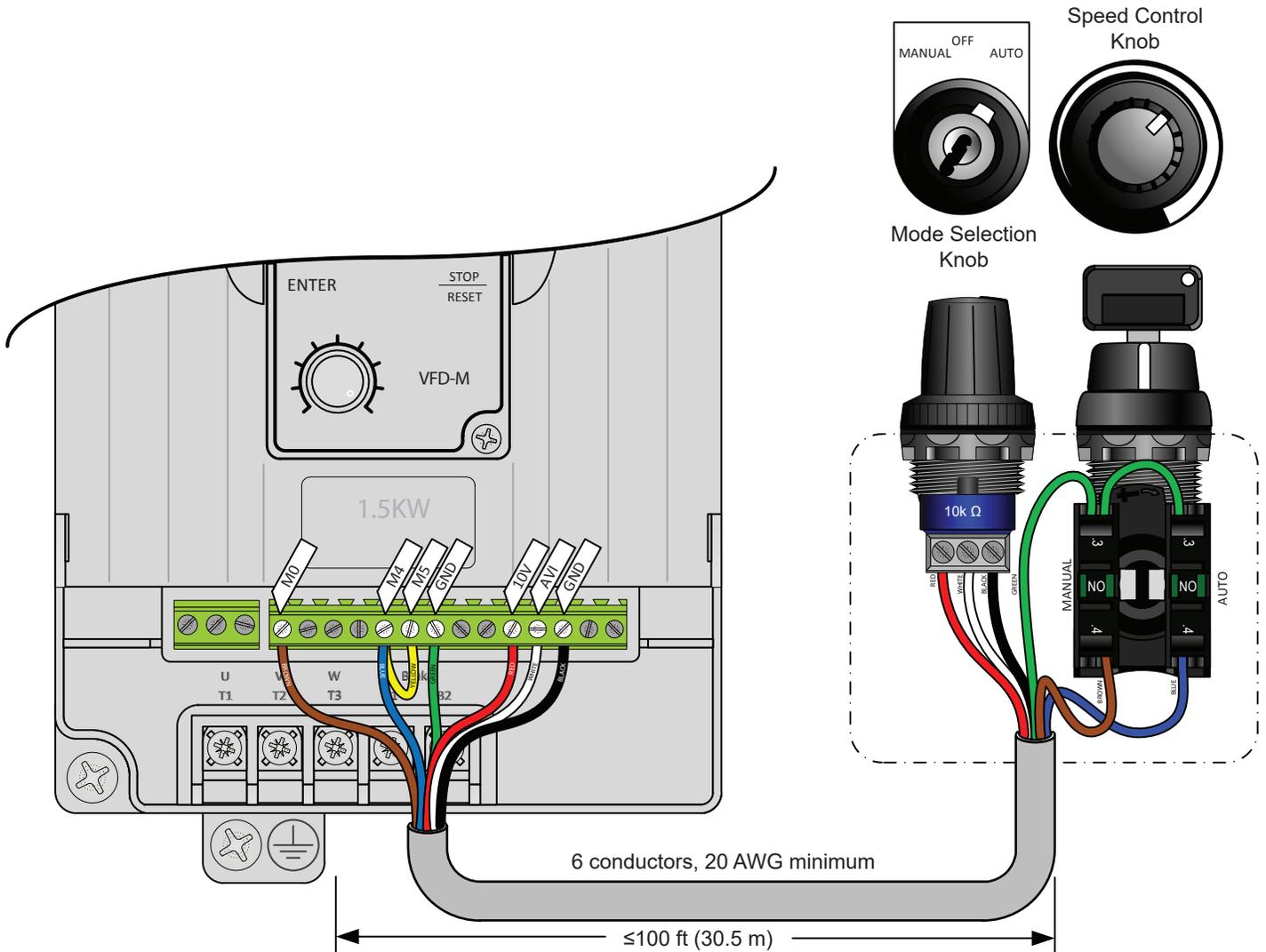
Parameter	Change to
02-00: First Master Frequency Command	"1" 0 to +10 V from AVI Terminal
02-01: First Operation Command	"1" External Terminals
04-07: Multifunction Input Terminal 5	"20" Communication Command Enable

Jumper wire installation (yellow)

Big Ass Fans recommends making the parameter changes listed above prior to remote wiring or jumper wire installation. A new jumper should be installed between terminals MI5 and MI6.

Remote operator station wiring: 575–600 V Delta M Series VFDs (Powerfoil®X Series fans)

⚠ WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication of safe voltage levels.



The following additional parameter changes are required for proper operation:

Parameter	Change to
Pr.00: First Start/Stop Reference	"1" Master Freq. from 0 to +10 V
Pr.01: First Speed Reference	"1" Master Start/Stop from Ext. Terminals
Pr.41: Multifunction Input Terminal 4	"24" Control Source = Communication
Pr.42: Multifunction Input Terminal 5	"28" 2nd Source for Frequency Command

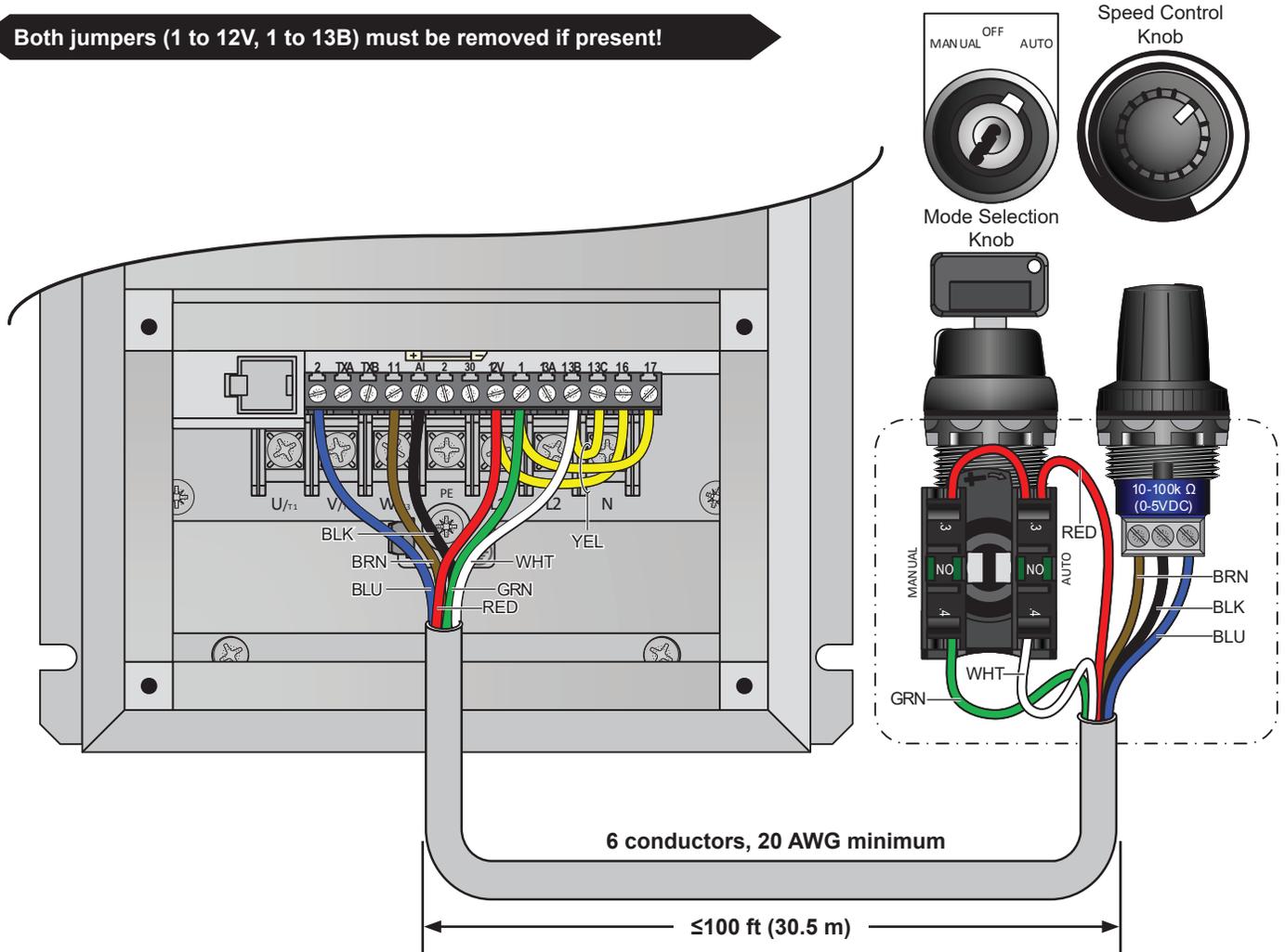
Jumper wire installation (shown above in yellow)

Big Ass Fans recommends making the parameter changes listed above prior to remote wiring or jumper wire installation. A new jumper should be installed between terminals M4 and M5.

Remote operator station wiring: Lenze SMVector VFDs (Powerfoil®8 & Basic 6® fans)

⚠ WARNING: The fan controllers contain high voltage capacitors that take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect if installed. Wait three (3) minutes for capacitors to discharge to safe voltage levels. Darkened display LEDs are not an indication of safe voltage levels.

Both jumpers (1 to 12V, 1 to 13B) must be removed if present!



The following parameter changes are required for proper operation:

Parameter	Default setting	Change to
P100: Start Stop Control	3	1
P116: Remote Speed Reference	6	1
P123: TB13C Function	0	7
P140: Relay Function	3	16
P156: Analog In Config	0	1

Jumper wire installation (yellow)

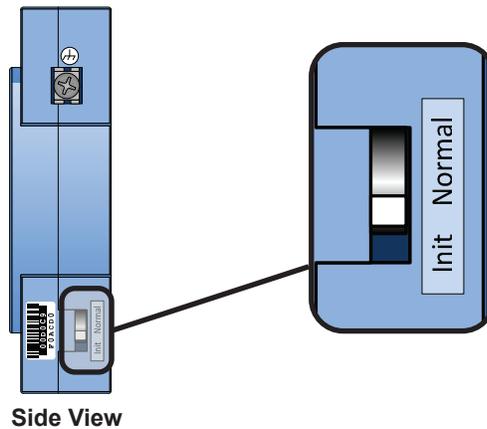
Big Ass Fans recommends making the parameter changes listed above prior to remote wiring or jumper wire installation. Jumpers should be installed between terminals 1 and 17, terminals 13B and 13C, and terminals 12V and 16. If an ESFR pilot relay is already installed on terminals 12V and 13A, remove the N.O. relay common lead from terminal 12V and relocate to terminal 16. This will prevent three wires from being landed under a single terminal. In this control arrangement, terminals 12V and 16 are both +12 VDC for digital supply.

Complete all necessary installation, wiring, and setup steps in all previous chapters before proceeding.

Pre-configuration requirements

Before downloading and using the ADAM module configuration utility, ensure that:

- You have obtained each ADAM module's MAC ID number (see pre-installation step 3 on page 6).
- You have configured each ADAM 6117 input module's signal input type (see pre-installation step 4 on page 6).
- The PC on which you plan to download the utility for module configuration is on the same network/VPN as the BAFWorks® system and the ADAM modules you will be configuring. An additional CAT5 cable will be required to connect the PC to the BAFWorks router if a customer VPN or subnet with wireless is not being used.
- The ADAM modules are connected to power and to the network. The Status/Com LED on the front of each module should be flashing green and the Link/Speed LED should be solid green/solid yellow.
- The ADAM modules are set to Initialize mode. The white switch on the side of each module should be set to "Init." Refer to the illustration below.



Downloading the configuration utility

To download and install the APAX configuration utility on a compatible PC:

1. Open a Web browser and type "www.advantech.com" into the address bar.
2. Search the Web site for "adam/apax."
3. In the **Support Results** column, click **Adam/APAX. Net Utility for ADAM/APAX series**.
4. Download and install the utility. Several versions of the utility are available. Ensure you select the version that is compatible with your operating system. If you cannot locate the utility, use the Web site to contact Advantech Support.

Configuring the modules

To configure an ADAM module using the APAX utility:

1. Open the APAX utility on your PC. *Note: Make sure the PC you are using for module configuration is on the same network/VPN as the BAFWorks system.*
2. In the tree on the left side of the screen, right-click **Ethernet**, and then click **Search Device** (Figure 1). The available ADAM modules appear in the tree below your PC's IP address (Figure 2).

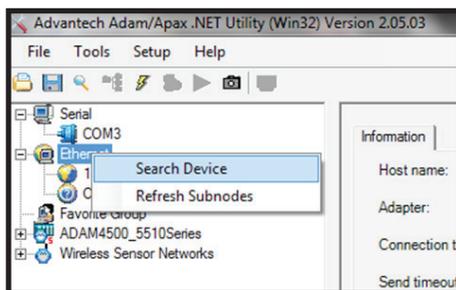


Figure 1–Search Device

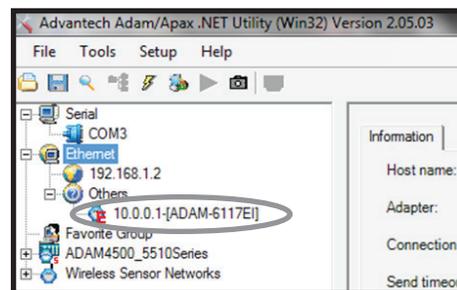


Figure 2–Module listed below PC IP address

Configuring the modules (cont.)

3. Click the module you want to configure. The **Setting** tab for the module appears in the module information pane. This tab includes the module's MAC ID and Ethernet configuration settings (Figure 3).

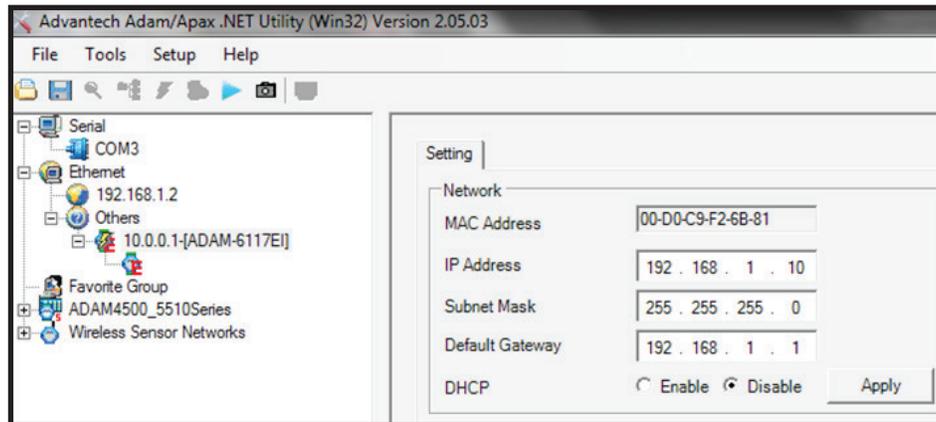


Figure 3—Module Setting tab

Configure the settings:

- **IP Address.** Enter a unique IP address for the module. Refer to your PC IP address for the available address range. For example, if your PC IP address is 192.168.1.2 as shown above, set the module IP address to 192.168.1.3 or higher. In the illustration above, the IP address 192.168.1.10 is used for the module.
 - **Subnet Mask.** Enter “255.255.255.0”.
 - **Default Gateway.** Enter the router's IP address.
 - **DHCP.** Big Ass Fans recommends leaving DHCP disabled. If the router or switch being used reassigns IP addresses to connected devices, the BAFWorks® application will lose communication with the devices. **Alternatively, DHCP can be enabled.** This allows the router to assign an IP address to each module, but requires you to set up IP address reservations during router configuration. Regardless of other connected device states, this will apply the same IP address to the module. This is based on the module's MAC ID, which must be known for this procedure to be completed properly.
4. Click **Apply**. The module will reboot and a “Network change success!” message will appear. Click **OK**. Note that the module's new IP address now appears in the tree below the PC IP address, and the name of the module appears below its IP address (Figure 4).

If you are configuring an ADAM 6117 input module, proceed to step 5. If you are configuring an ADAM 6160 relay output module, proceed to step 6.

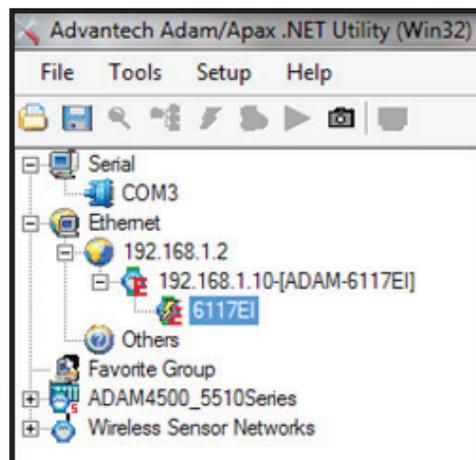


Figure 4—Module IP address and name

Configuring the modules (cont.)

5. On ADAM 6117 input modules ONLY, select the input channel range for each channel on the module (Figure 5).
 - a. In the tree on the left side of the screen, click the module you want to configure.
 - b. In the module information pane, click the **AI** tab next to the **Module Information** tab.
 - c. In the **Range** drop-down list under **Selected Items**, select the type of sensor signal being used. Big Ass Fans recommends 4–20mA for all field sensors.
 - d. Select the **Apply to All Channels** check box, and then click **Apply**.

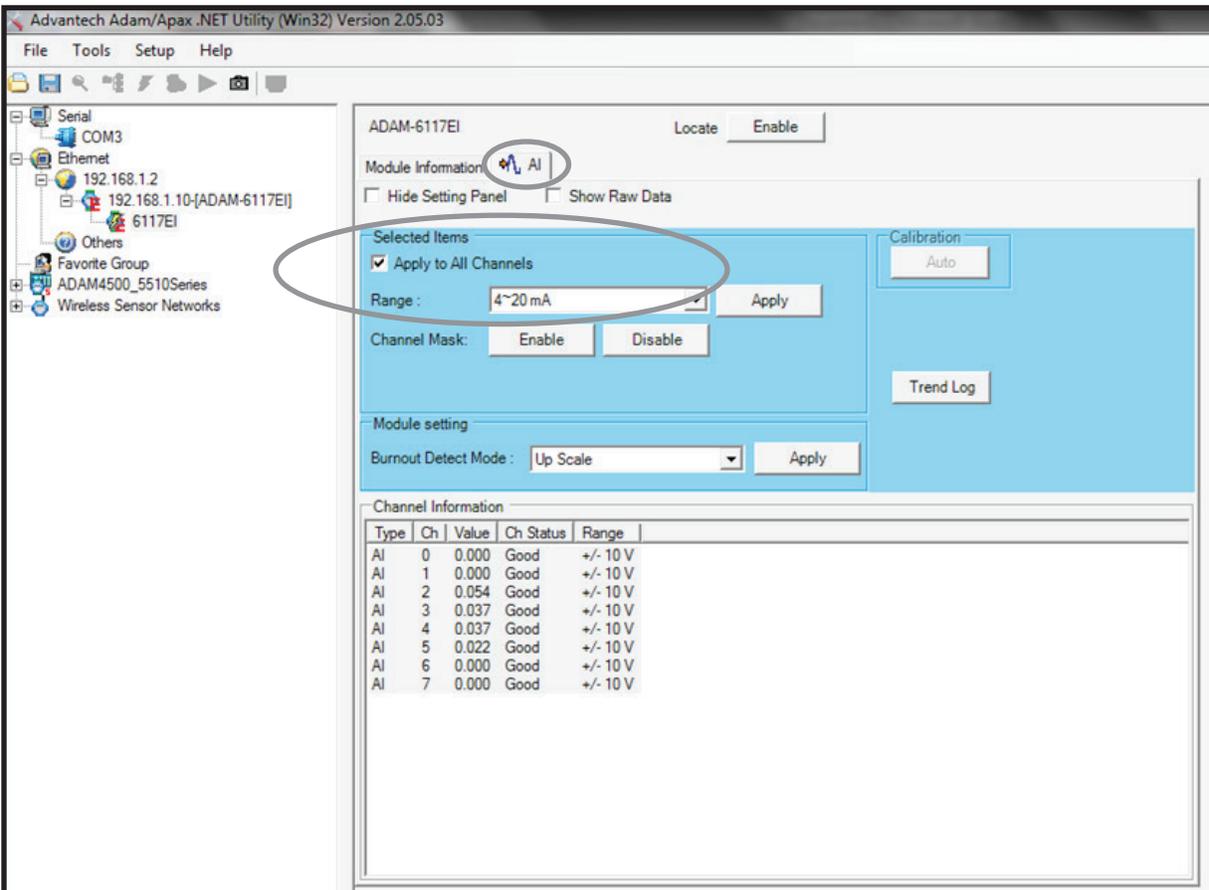


Figure 5—Selecting the input channel range

6. Remove power from the module, and then move the mode selection switch on the side of the module from “Init” to “Normal.”
7. Reapply power to the module.
8. Repeat steps 3–7 for all connected ADAM modules. After all modules have been configured, shut down the PC.

Note: The APAX utility is useful for troubleshooting data errors encountered within the BAFWorks® application, such as erroneous temperatures and module communication loss. An active channel reports the current signal values within the APAX utility. For the ADAM 6160 relay output module, individual output channels can be forced on and off to verify device functionality if the iPad® is not yet available for testing or setup (set true, set false).

Recording module information

After you are finished configuring the ADAM modules, record the following information on page 54 of this manual:

- The IP address of each module
- The ADAM 6117 channels being used and their functions (indoor floor, indoor ceiling, outdoor)
- The ADAM 6160 channels being used and their functions (light, vent/exhaust fan, louver)

42 Setting Up the BAFWorks® Application

Complete all necessary installation, wiring, setup, and configuration steps in all previous chapters before proceeding.

WARNING: The BAFWorks® Admin Lock feature is not a suitable replacement for proper lockout/tagout procedures as prescribed in OSHA standard 29 CFR 1910.147. Before servicing equipment connected to the BAFWorks system, ensure proper procedures have been taken to isolate equipment to be serviced. These procedures **MUST** be followed even if the Admin Lock feature is enabled for a device in the BAFWorks application.

Adding output and input modules

To add and configure an ADAM 6160 output module:

1. If necessary, open BAFWorks.
2. In the top left corner of any screen of the BAFWorks application, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. In the top left corner of the screen, touch **Modules** (Figure 1). The All Modules page appears (Figure 2).
5. If necessary, touch **Add Modules** at the bottom of the All Modules page (Figure 2).
6. Enter a name for the module, select the module type (**ADAM 6160**), and enter the module's IP address (Figure 2). Ensure all module IP addresses are recorded on page 54 of this manual.
7. Touch **Save** under the output module's settings.
8. If you want to make changes to the module, touch **Edit** under the module's settings. Touch **Delete** to delete the module.
9. Touch **Done** at the bottom of the All Modules page, and then touch **Exit** in the top left corner of the screen.



Figure 1—Modules button

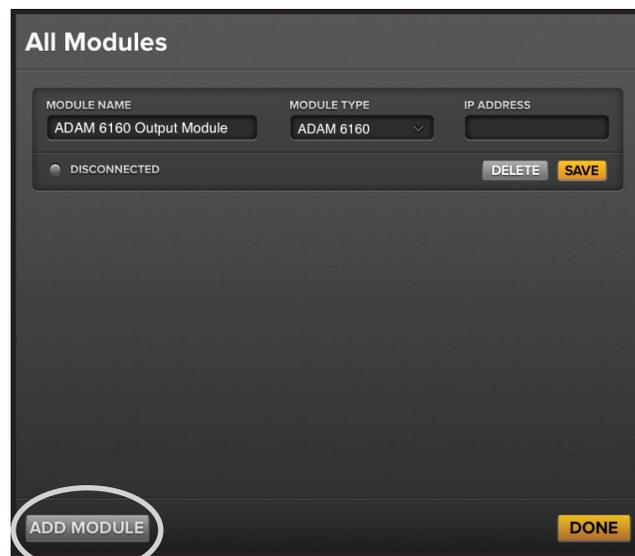


Figure 2—All Modules page

To add and configure an ADAM 6117 input module:

1. If necessary, open BAFWorks®.
2. In the top left corner of any screen of the BAFWorks application, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. In the top left corner of the screen, touch **Modules** (Figure 1 on the previous page). The All Modules page appears (Figure 3).
5. If necessary, touch **Add Module** at the bottom of the All Modules page (Figure 3).
6. Enter a name for the module, select the module type (**ADAM 6117**), and enter the module's IP address (Figure 3). Ensure all module IP addresses are recorded on page 54 of this manual.
7. Touch **Save** under the module name, and then touch **Edit > Add Sensors**. The Add Sensors page appears (Figure 4).
8. If necessary, touch **Add Sensor** at the bottom of the Add Sensors page (Figure 4).
9. Enter the temperature sensor's port number, and then fill in the Min Reading and Max Reading fields (Figure 4) according to the table below. Ensure all port numbers and signal types are recorded on page 54 of this manual.

Signal type	Min reading	Max reading
0–10V	32768	65533
0–5V	32768	49152
4–20mA	0	65533

10. Fill in the Min Value and Max Value fields (Figure 4) according to the table below. Ensure all sensor types are recorded on page 54 of this manual. *Note: The values shown below will vary if you are using customer-supplied sensors instead of the sensors provided by Big Ass Fans. Consult the literature provided with the customer-supplied sensors for the min and max values.*

Sensor type	Min value	Max value
Indoor (floor/ceiling)	0°F	135°F
Outdoor	-13°F	167°F

11. Touch **Save** under the sensor's settings.
12. If necessary, touch **Add Sensor** at the bottom of the Add Sensors page to add more temperature sensors. Configure the settings as described in steps 9 and 10 above.
13. Touch **Save** under each sensor's settings.
14. If you want to make changes to a sensor, touch **Edit** under the sensor's settings. Touch **Delete** to delete the sensor. When you are finished, touch **Done** at the bottom of the Add Sensors page.
15. On the All Modules page, touch **Save** under the input module's settings.
16. If you want to make changes to the module, touch **Edit** under the module's settings. Touch **Delete** to delete the module.
17. Touch **Done** at the bottom of the All Modules page, and then touch **Exit** in the top left corner of the screen.

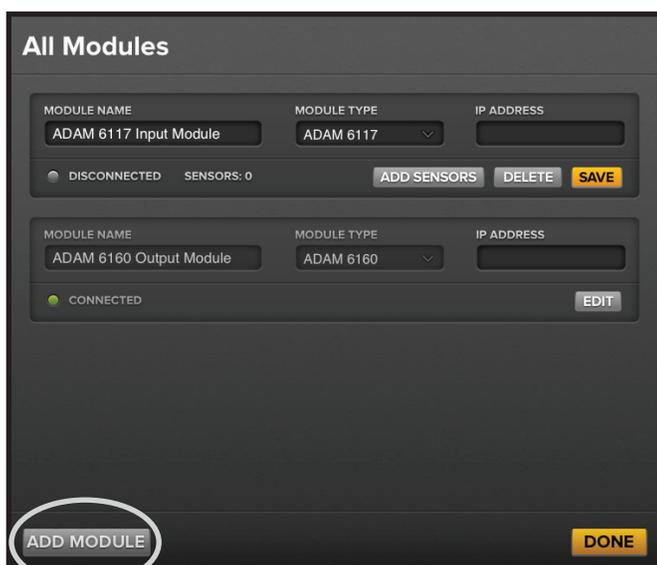


Figure 3—All Modules page

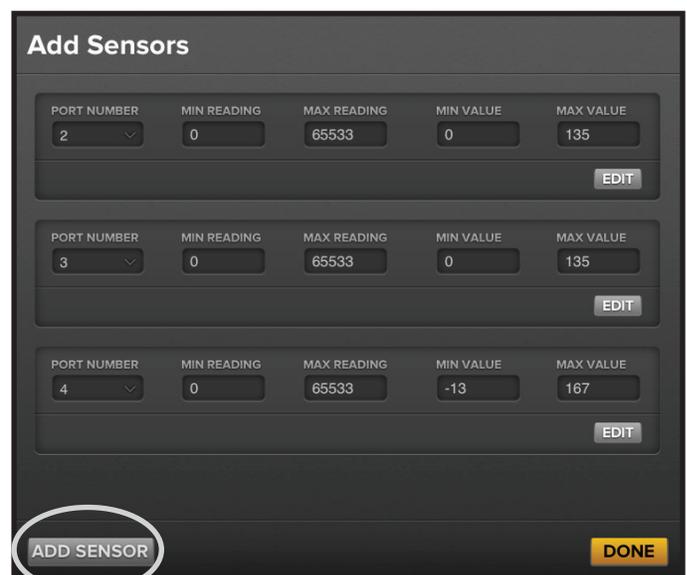


Figure 4—Add Sensors page

Setting up fan group automation

The fan group automation feature lets users automatically maintain optimal fan speed and temperature based on whether it is the cooling season or the heating season. Automation uses the temperature sensors connected to BAFWorks® to monitor the temperature at the floor and ceiling levels. Based on the temperature readings, the fan group speed is automatically adjusted to maintain the specified temperature settings.

To set up fan group automation:

1. If necessary, open BAFWorks.
2. On the BAFWorks home screen, touch **Fans**.
3. Locate the fan group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears.
Note: The application starts with a default group called "Fans." See page 46 for instructions on adding and deleting groups.
4. Under **Automation**, select an automation mode:
 - **Manual.** Lets users manually change the speed of the fans to suit their temperature needs. The fans will not adjust speed automatically.
 - **Summer.** During the cooling season, monitors the temperature at the floor level and adjusts the fan speed according to the specified temperature and speed settings.
 - **Winter.** During the heating season, monitors the difference in temperatures at the floor and ceiling levels and automatically adjusts the fan speed to maintain a uniform temperature between the floor and ceiling while using the lowest fan speed possible.
 - **Auto.** Combines the features of Summer and Winter modes and monitors the difference between the floor temperature and the Winter maximum temperature setting. If the floor temperature is less than the Winter maximum temperature, Winter Mode is used. If the floor temperature is greater than the Winter maximum temperature, Summer Mode is used.
5. Next to Automation Changes, touch **Edit**. The Fans Automation page appears (Figure 5).
6. Configure the settings, and then touch **Done**. See Figure 5 below for settings details.
7. Use the scheduling feature to specify when you want each automation mode to start. See page 59 for information on scheduling.
8. When you are finished, touch **Done** on the group details page.

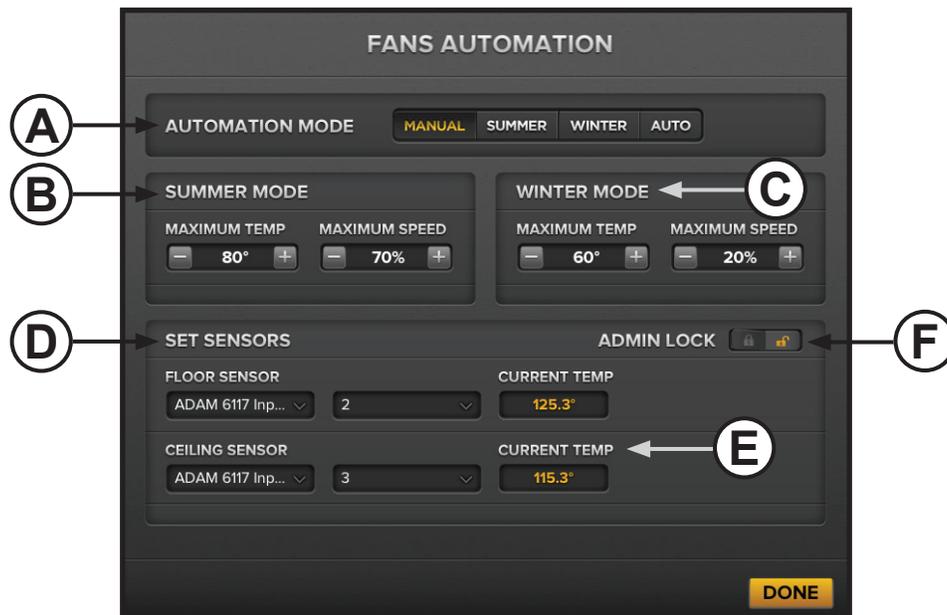


Figure 5—Fans Automation page

- A. Automation Mode.** Select the automation mode. See step 4 above for details.
- B. Summer Mode.** Set the maximum temperature (the temperature in °F at which the fan will reach full speed) and the maximum fan speed for the cooling season.
- C. Winter Mode.** Set the maximum temperature (the temperature in °F at which the fan will reach full speed) and the maximum fan speed for the heating season.
- D. Set Sensors.** Select the input module and port number of the floor temperature sensor and the ceiling temperature sensor. Ensure this information is recorded on page 54 of this manual.
- E. Current Temp.** Indicates the current temperature at the ceiling and floor levels as reported by the temperature sensors.
- F. Admin Lock.** Lock or unlock access to the automation settings. This setting requires administrator password entry. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*

Setting up ventilation group automation

The IntelliVent® automation feature lets users specify a maximum indoor winter temperature and automatically starts ventilation when this setpoint is exceeded and shuts down ventilation when the setpoint is reached. IntelliVent also lets users specify a minimum outdoor temperature and will not run ventilation if the outdoor temperature is below this value. IntelliVent uses the temperature sensors connected to BAFWorks® to monitor the outdoor temperature and the indoor floor level temperature. Based on the temperature readings, the louvers or vents in the group automatically open and close or start and stop to maintain the specified temperature settings.

To set up ventilation group automation:

1. If necessary, open BAFWorks.
2. On the BAFWorks home screen, touch **Ventilation**.
3. Locate the louver or vent group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears. *Note: The application starts with default groups called "Louvers" and "Ventilation." If vent exhaust fans and louvers are controlled independently, leave both default groups in place. If louvers are piloted off of the existing exhaust fan motor starters, you can delete the default Louvers group. See page 50 for instructions on adding and deleting groups.*
4. Next to IntelliVent Changes, touch **Edit**. The Louvers IntelliVent Settings or Ventilation IntelliVent Settings page appears (Figure 6). *Note: The Ventilation IntelliVent Settings page is shown in Figure 6. The settings are the same for louvers.*
5. Configure the settings, and then touch **Done**. See Figure 6 below for settings details.
6. On the group details page, touch the **On** button next to IntelliVent to enable automation, or use the scheduling feature to schedule automation to start and stop at programmed times. See page 66 for information on scheduling.
7. When you are finished, touch **Done** on the group details page.

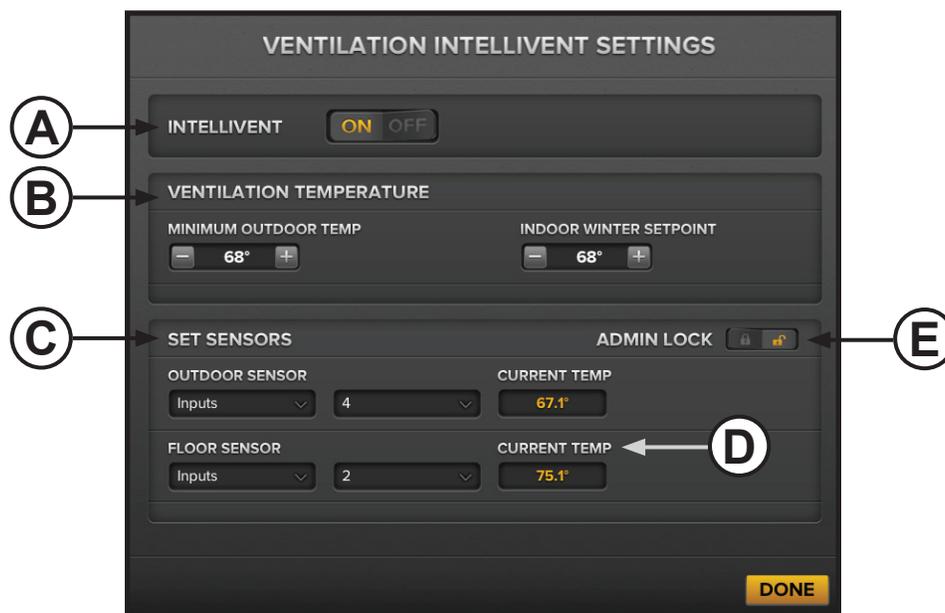


Figure 6—Ventilation IntelliVent Settings page

- A. IntelliVent.** Turn ventilation automation on or off.
- B. Ventilation Temperature.** Set the minimum outdoor temperature and the indoor winter setpoint (°F).
- **Minimum Outdoor Temp.** Set the minimum outdoor temperature at which ventilation will run. If the outdoor temperature is below this value, ventilation will not run, even if the indoor temperature exceeds the Indoor Winter Setpoint value.
 - **Indoor Winter Setpoint.** Set the maximum indoor winter temperature. If the indoor temperature exceeds this value and the outdoor temperature is at least two (2) degrees cooler than the indoor temperature, ventilation will run. If the indoor temperature is below this value or the outdoor temperature is below the Minimum Outdoor Temp value, ventilation will not run.
- C. Set Sensors.** Select the input module and port number of the outdoor temperature sensor and the indoor floor temperature sensor. Ensure this information is recorded on page 54 of this manual. *Note: The floor sensor can be the same sensor used for fan group automation.*
- D. Current Temp.** Indicates the current outdoor temperature and the indoor floor level temperature as reported by the temperature sensors in the system.
- E. Admin Lock.** Lock or unlock access to the IntelliVent settings. This setting requires administrator password entry. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*

Adding and deleting fans and fan groups

Each fan in the BAFWorks® system must belong to a group. The application starts with a default group called “Fans.” You can add fans to this group or create new groups.

To add a fan to a group:

1. If necessary, open BAFWorks.
2. On the BAFWorks home screen, touch **Fans**.
3. Touch the name of the fan group to which you want to add the fan.
4. In the top left corner of the screen, touch **Edit**.
5. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
6. At the top of the screen, touch **Add**.
7. In the Identify Device dialog box (Figure 7), enter the fan’s Modbus address and select the fan’s drive type. Ensure all fan addresses and drive types are recorded on page 53 of this manual.
8. Touch **Verify**.
9. In the Your Fan Is Verified dialog box (Figure 8), enter a name for the fan, select the fan model, and specify the fan group. If you want to create a new group, select **Create Group** from the **Select Group** drop-down list, and then enter a group name, select the group type (**Fans**), and touch **Save**.
10. Touch **Add**, and then touch **Exit** in the top left corner of the screen. The new fan appears on the fan group screen.

See below for instructions on deleting fans. See the following page for instructions on adding and deleting fan groups.



Figure 7—Identify Device dialog box

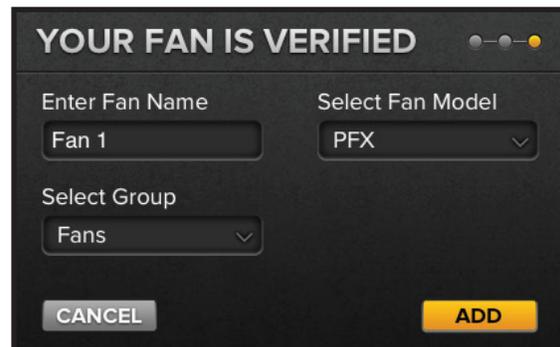


Figure 8—Your Fan is Verified dialog box

Deleting fans

To delete a fan:

1. On the BAFWorks home screen, touch **Fans**.
2. Touch the name of the fan group containing the fan you want to delete.
3. In the top left corner of the screen, touch **Edit**.
4. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
5. Touch the **X** icon(s) next to the fan(s) you want to delete (Figure 9).
6. In the top left corner of the screen, touch **Exit**.



Figure 9—Deleting fans

Adding and deleting fan groups

You can only delete empty fan groups. You must delete all fans from a group or move the fans to a different group before you can delete the group. To move a fan to a different group, select the fan, and then choose a group from the drop-down header at the top of the fan settings page (see page 57). For instructions on deleting fans, see the previous page.

To add a fan group:

1. On the BAFWorks® home screen, touch **Fans**.
2. In the top left corner of the screen, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. At the top of the screen, touch **Add** (Figure 10).
5. In the Create New Group dialog box, enter a name for the new group, and then select **Fans** for the group type.
6. Touch **Save**. The new group appears on the fan groups screen.
7. In the top left corner of the screen, touch **Exit**.

To delete a fan group:

1. On the BAFWorks home screen, touch **Fans**.
2. In the top left corner of the screen, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. Touch the **X** icon(s) next to the fan group(s) you want to delete (Figure 10).
5. In the top left corner of the screen, touch **Exit**.



Figure 10—Adding and deleting fan groups

Adding and deleting lights and light groups

Each light in the BAFWorks® system must belong to a group. The application starts with a default group called “Lights.” You can add lights to this group or create new groups.

To add a light to a group:

1. If necessary, open BAFWorks.
2. On the BAFWorks home screen, touch **Lights**.
3. Touch the name of the light group to which you want to add the light.
4. In the top left corner of the screen, touch **Edit**.
5. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
6. At the top of the screen, touch **Add**.
7. In the Add Light dialog box (Figure 11), enter a name for the light, and then select the output module and port number that the light is connected to. Ensure all output module and port number information is recorded on page 54 of this manual.
8. Touch **Save**, and then touch **Exit** in the top left corner of the screen. The new light appears on the light group screen.

See below for instructions on deleting lights. See the following page for instructions on adding and deleting light groups.

Figure 11–Add Light dialog box

Deleting lights

To delete a light:

1. On the BAFWorks home screen, touch **Lights**.
2. Touch the name of the light group containing the light you want to delete.
3. In the top left corner of the screen, touch **Edit**.
4. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
5. Touch the **X** icon(s) next to the light(s) you want to delete (Figure 12).
6. In the top left corner of the screen, touch **Exit**.



Figure 12–Deleting lights

Adding and deleting light groups

You can only delete empty light groups. You must delete all lights from a group or move the lights to a different group before you can delete the group. To move a light to a different group, select the light, and then choose a group from the drop-down header at the top of the light settings page (see page 61). For instructions on deleting lights, see the previous page.

To add a light group:

1. On the BAFWorks® home screen, touch **Lights**.
2. In the top left corner of the screen, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. At the top of the screen, touch **Add** (Figure 13).
5. In the Create New Group dialog box, enter a name for the new group, and then select **Lights** for the group type.
6. Touch **Save**. The new group appears on the light groups screen.
7. In the top left corner of the screen, touch **Exit**.

To delete a light group:

1. On the BAFWorks home screen, touch **Lights**.
2. In the top left corner of the screen, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. Touch the **X** icon(s) next to the light group(s) you want to delete (Figure 13).
5. In the top left corner of the screen, touch **Exit**.



Figure 13—Adding and deleting light groups

Adding and deleting louvers/vents and louver/vent groups

Each louver and vent in the BAFWorks® system must belong to a group. The application starts with default groups called “Louvers” and “Ventilation.” You can add louvers and vents to these groups or create new groups.

To add a louver or vent to a group:

1. If necessary, open BAFWorks.
2. On the BAFWorks home screen, touch **Ventilation**.
3. Touch the name of the louver or ventilation group to which you want to add the louver or vent.
4. In the top left corner of the screen, touch **Edit**.
5. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
6. At the top of the screen, touch **Add**.
7. In the Add Louver or Add Ventilation dialog box (Figure 14), enter a name for the louver or vent, and then select the output module and port number that the louver/vent is connected to. Ensure all output module and port number information is recorded on page 54 of this manual.
8. Touch **Save**, and then touch **Exit** in the top left corner of the screen. The new louver or vent appears on the louver or ventilation group screen.

See below for instructions on deleting louvers and vents. See the following page for instructions on adding and deleting louver/vent groups.

Figure 14–Add Louver and Add Ventilation dialog boxes

Deleting louvers and vents

To delete a louver or vent:

1. On the BAFWorks home screen, touch **Ventilation**.
2. Touch the name of the group containing the louver or vent you want to delete.
3. In the top left corner of the screen, touch **Edit**.
4. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
5. Touch the **X** icon(s) next to the louver(s) or vent(s) you want to delete (Figures 15 and 16).
6. In the top left corner of the screen, touch **Exit**.



Figure 15–Deleting louvers



Figure 16–Deleting vents

Adding and deleting louver/vent groups

You can only delete empty louver/vent groups. You must delete all louvers or vents from a group or move them to a different group before you can delete the group. To move a louver or vent to a different group, select the louver or vent, and then choose a group from the drop-down header at the top of the louver/vent settings page (see page 64). For instructions on deleting louvers and vents, see the previous page.

To add a louver or vent group:

1. On the BAFWorks® home screen, touch **Ventilation**.
2. In the top left corner of the screen, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. At the top of the screen, touch **Add** (Figure 17).
5. In the Create New Group dialog box, enter a name for the new group, and then select **Louvers** or **Ventilation** for the group type.
6. Touch **Save**. The new group appears on the ventilation groups screen.
7. In the top left corner of the screen, touch **Exit**.

To delete a louver or vent group:

1. On the BAFWorks home screen, touch **Ventilation**.
2. In the top left corner of the screen, touch **Edit**.
3. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See page 52 for instructions on changing the password.*
4. Touch the **X** icon(s) next to the louver/vent group(s) you want to delete (Figure 17).
5. In the top left corner of the screen, touch **Exit**.



Figure 17—Adding and deleting louver/vent groups

Configuring general settings

To configure the general settings for BAFWorks®:

1. In the top right corner of any screen of the BAFWorks application, touch .
2. Enter the admin lock password, and then touch **OK**. *Note: The default admin lock password is 1271. See below for instructions on changing the password.*
3. Configure the settings as needed. See below for details.
4. Touch **Done**.

BAFWorks® general settings

- **Lock Password.** Change the admin lock password used to access administrative functions within BAFWorks.
- **Screensaver.** Enable or disable the BAFWorks screensaver.
- **IP Address.** View or edit the IP address of the BAF gateway.
- **Manuals.** Access a BAFWorks tutorial and online fan manuals. *Note: Internet access is required to view the online fan manuals.*
- **Smart Algorithms.** Adjust how often (in seconds) the temperature sensors in the system read the temperature. *Note: Decreasing the default time values in these fields may result in undesirable fan operation; for example, the fans may turn on and off too often.*
 - **Auto.** Adjust how often the temperature is read when fan groups are in Auto mode.
 - **Winter.** Adjust how often the temperature is read when fan groups are in Winter mode.
 - **Summer.** Adjust how often the temperature is read when fan groups are in Summer mode.
 - **Automation.** Adjust how often the temperature is read for louver and vent groups.

BAFWorks® Setup Notes

iPad® Unlock Password: _____

BAF Gateway Address: _____

Apple® User ID: _____

Apple® Password: _____

Router Login: 192.168.1.1 _____

Router Login User ID: bafworks _____

Router Login Password: _____
(default = bafworks)

BAFWorks® Admin Password: _____
(default = 1271)

Fan Modbus address	Fan name	Fan location	Fan drive type
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
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21			
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27			
28			
29			
30			
31			
32			

Complete all necessary installation, wiring, setup, and configuration steps in all previous chapters before proceeding.

WARNING: The BAFWorks® Admin Lock feature is not a suitable replacement for proper lockout/tagout procedures as prescribed in OSHA standard 29 CFR 1910.147. Before servicing equipment connected to the BAFWorks system, ensure proper procedures have been taken to isolate equipment to be serviced. These procedures **MUST** be followed even if the Admin Lock feature is enabled for a device in the BAFWorks application.

Understanding the home screen

From the BAFWorks home screen, you can easily access each of the fan groups, light groups, and ventilation groups in the system. See Figure 1 below for details on navigating the home screen. See the following sections for details on working with fans, lights, and ventilation.

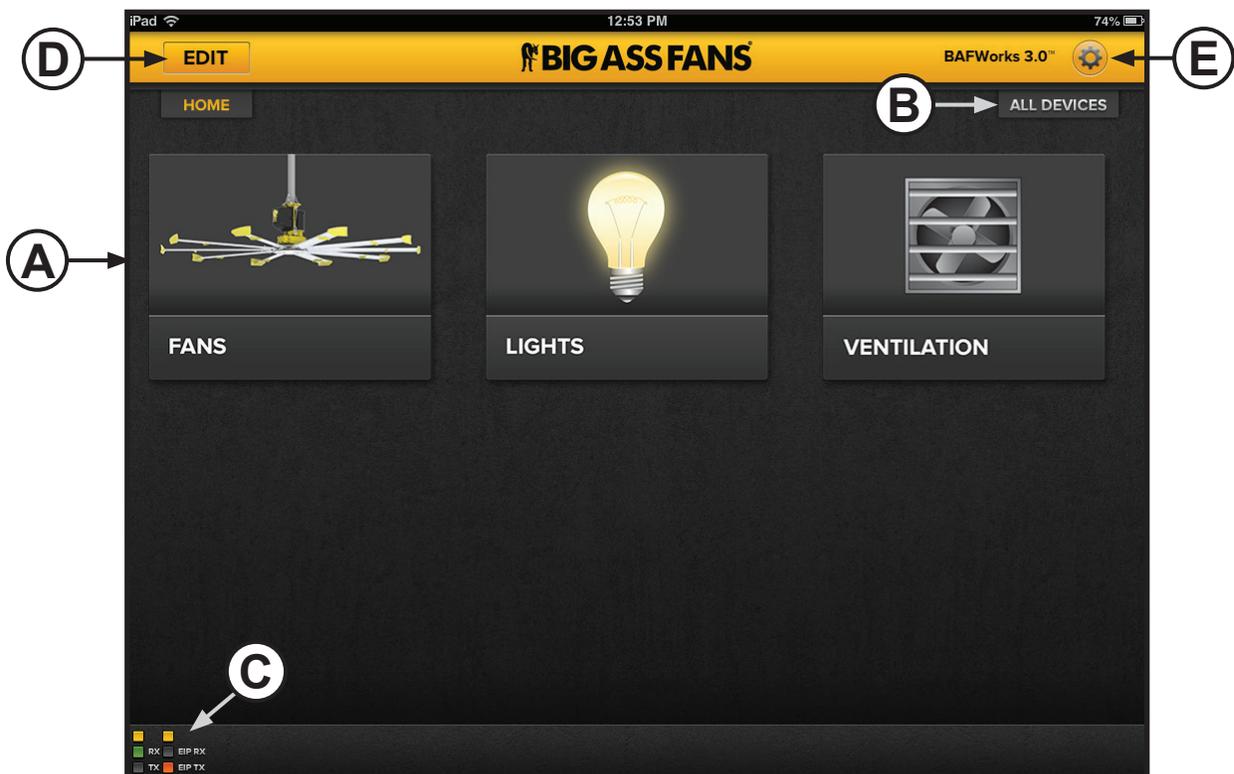


Figure 1–BAFWorks home screen

- A. Device Categories.** Touch a category to view fan groups, light groups, or ventilation groups.
- B. All Devices Button.** Touch this button to view all of the devices in the system. This button is available on any screen of the application. See the following page for details on working with all devices.
- C. Network Activity Indicator.** Provides a quick visual indication of network activity. Yellow indicates that the application is connected to the BAF gateway. RX (green) indicates that the application is receiving data from connected devices. TX (orange) indicates that the application is transmitting data to connected devices. This indicator is visible on all screens of the application.
- D. Edit Button.** Touch this button to access administrative functions, such as adding and deleting devices. This setting requires administrator password entry.
- E. Settings Icon.** Touch this icon to access general settings, such as administrator password and screen saver. This icon is available on any screen of the application. General settings require administrator password entry.

Working with all devices

To view and interact with all of the devices in the BAFWorks® system, touch the **All Devices** button in the top right corner of any screen of the application. The All Devices screen provides you with real-time information about all of the devices in the system, as well as options for managing them. See Figure 2 below for details. See the following sections for information on working with individual devices and device groups.



Figure 2—All Devices screen

- A. Home Button.** Touch the Home button to return to the BAFWorks home screen.
- B. Start/Stop All Devices.** Start or stop all devices in the system.
- C. Screen Navigation Bar.** Swipe your finger back and forth across the circles to view the devices on each screen. Up to six (6) devices can be displayed on one screen.
- D. Global Admin Lock.** Lock or unlock the operational status of all devices in the system. This setting requires administrator password entry.
- E. Group Header.** Indicates the group to which the device belongs
- F. Animated Device Icon.** Provides a quick visual indication of device type and status. For fans, the device icon includes a speed indicator showing the fan's current running speed. Touch a device icon to view the settings for that device. See the following sections for more information on device settings.
- G. Device Status Icon.** Indicates the device's operational status. See the following sections for descriptions of each status icon.

Configuring individual fan settings

To adjust the settings for a fan in the BAFWorks® system:

1. On the BAFWorks home screen, touch **Fans** or **All Devices**.
2. If you touched **Fans**, touch the name of the fan group containing the fan you want to work with.
3. Select the fan. The fan settings page appears (Figure 3).
4. Adjust the settings as necessary, and then touch **Done**. See Figure 3 below for details.

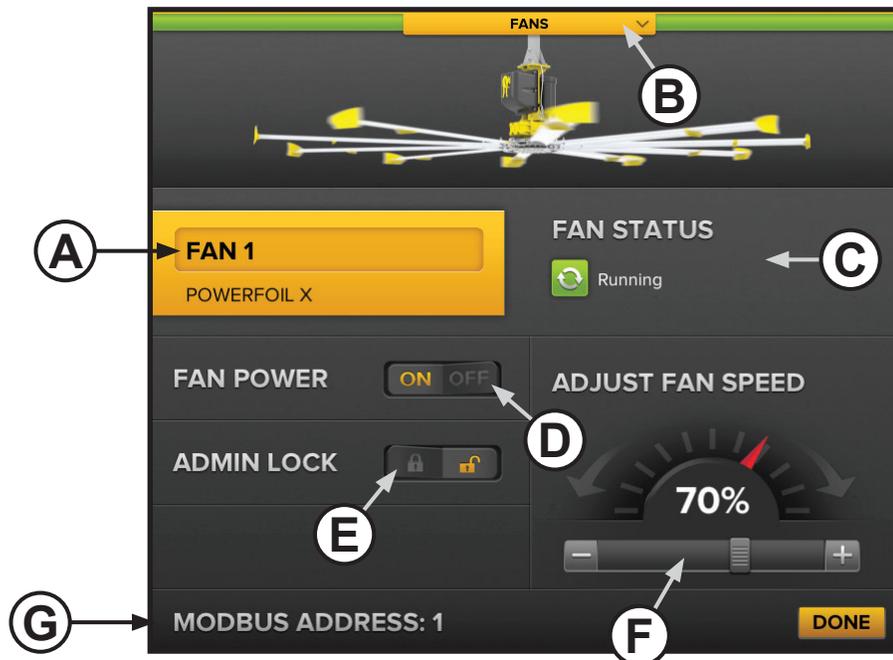


Figure 3–Fan settings page

- A. Fan Name.** Touch here to edit the fan name.
- B. Group Header.** Indicates the group to which the fan belongs. Touch the group header to assign the fan to a different group.
- C. Fan Status.** Indicates the fan's operational status. See the table below for descriptions of each status icon.
- D. Fan Power.** Start or stop the fan.
- E. Admin Lock.** Lock or unlock the fan's operational status. This setting requires administrator password entry.
- F. Adjust Fan Speed.** Drag the needle or the slider for coarse speed adjustments. Touch the plus (+) and minus (-) buttons for more finite control.
- G. Modbus Address.** Indicates the fan's Modbus address in the system (1–32).

Fan status icons

Icon	Description
	Fan running, communication OK
	Fan stopped, communication OK
	Fan faulted, communication OK. See the fan Installation Guide for details on fan fault messages.
	Communication loss, fan status unknown

Starting and stopping fan groups

To start or stop a group of fans in the BAFWorks® system:

1. On the BAFWorks home screen, touch **Fans**.
2. Touch the name of the fan group you want to work with.
3. At the bottom of the screen, touch **Start Fans** or **Stop Fans** (Figure 4).

Note: You can also lock or unlock the operational status of the fans in the group by touching the lock/unlock icons in the bottom right corner of the screen (Figure 4). This setting requires administrator password entry.



Figure 4—Starting, stopping, and locking/unlocking fan groups

Configuring fan group settings

To adjust the settings for a group of fans in the BAFWorks system:

1. On the BAFWorks home screen, touch **Fans**.
2. Locate the fan group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears (Figure 5).
3. Adjust the settings as necessary, and then touch **Done**. See Figure 5 below and the following page for details.

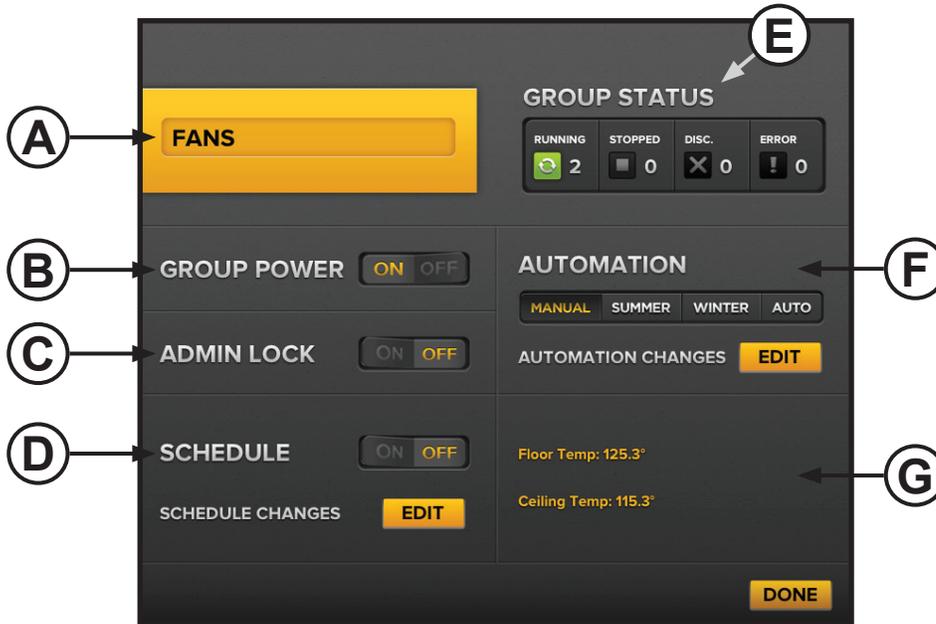


Figure 5—Fan group details page

- A. Group Name.** Touch here to edit the group name.
- B. Group Power.** Start or stop all fans in the group.
- C. Admin Lock.** Lock or unlock the operational status of all fans in the group. This setting requires administrator password entry.
- D. Schedule.** Touch **Edit** to schedule start, stop, speed change, and automation events for the group. Touch **On/Off** to enable or disable scheduled events. See the following page for more information on scheduling.
- E. Group Status.** Indicates the operational status of each fan in the group. See the previous page for descriptions of each status icon.
- F. Automation.** Select Manual, Summer, Winter, or Auto mode. Touch **Edit** to configure temperature and sensor settings. See page 44 for more information on automation.
- G. Temperature.** Indicates the current temperature at the floor and ceiling levels as reported by the temperature sensors in the system.

Scheduling fan group events

The scheduling feature lets you schedule groups of fans to start, stop, change speed, or change automation modes at programmed times. See page 44 for more information on automation.

To schedule a fan group event:

1. On the BAFWorks® home screen, touch **Fans**.
2. Locate the fan group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears.
3. Next to Schedule Changes, touch **Edit**. The scheduling page appears (Figure 6).
4. If necessary, at the bottom of the scheduling page, touch **Add New Event** (Figure 6).
5. Set the day(s) of the week on which the event will occur, the start time for the event, and the event action. If you selected **Set Fan Speed** as the action, use the plus (+) and minus (-) buttons to set the desired fan speed (Figure 6).
6. Touch **Save** under the event's settings.
7. If necessary, touch **Add New Event** at the bottom of the scheduling page to add more events. Configure the settings as described in step 5 above.
8. Touch **Save** under each event's settings.
9. If you want to make changes to an event, touch **Edit** under the event's settings. Touch **Delete** to delete the event. When you are finished, touch **Done** at the bottom of the scheduling page.
10. On the group details page, touch the **On** button next to **Schedule** to enable the scheduled event(s).
11. Touch **Done** at the bottom of the group details page.
12. Observe the fan group icon on the fan groups screen. Note that a calendar icon appears in the top right corner of the group icon, indicating that scheduling is enabled for the group (Figure 7).

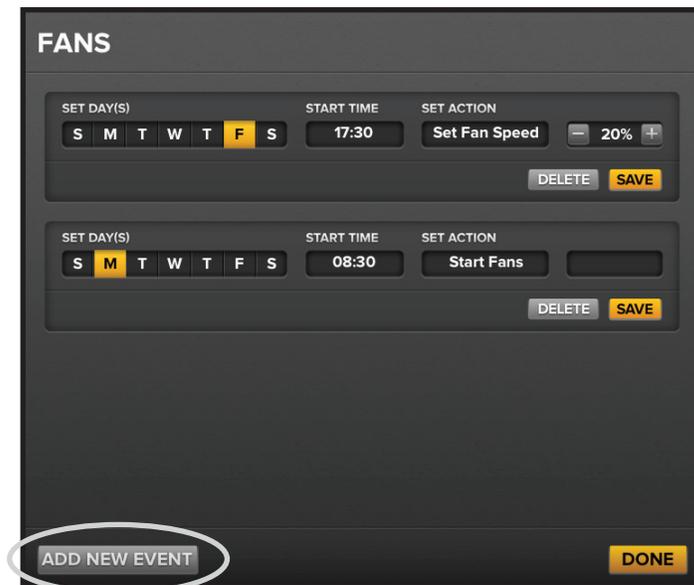


Figure 6–Fan scheduling page



Figure 7–Calendar icon on the fan group icon

Viewing fan diagnostic information

To view a fan's diagnostic information, swipe your finger downward over a fan icon. Detailed diagnostics information is displayed on top of the fan icon (Figure 8). You can scroll up and down through the information with your finger.

Press and hold your finger on the diagnostics text to select all of the text and copy it. The information can then be pasted into Notepad or into an e-mail for diagnostics assistance. *Note: Sending e-mail from the iPad® requires an Internet connection and an active e-mail account.*

When you are finished, touch **Done** in the bottom right corner of the fan icon.



Figure 8–Fan diagnostics information

Understanding fire alarm trip system behavior

If the fans have been properly interfaced with a fire alarm system (as described on page 34 of this manual and in the fan's Installation Guide), a fire alarm trip, known as an External Fault, will shut down all of the fans. The first fan to initiate an ALL STOP command will be registered on the BAFWorks® screen as shown on the right (Figure 9).

Before the fans can be returned to operation, the fire alarm relay contact must be opened. You can then touch **Clear** as shown on the right and restart the fans. If you touch **Clear** before resetting the alarm contacts, the system will immediately return to fire alarm trip mode after a fan address scan.



Figure 9–Fire stop error

Configuring individual light settings

To adjust the settings for a light in the BAFWorks® system:

1. On the BAFWorks home screen, touch **Lights** or **All Devices**.
2. If you touched **Lights**, touch the name of the light group containing the light you want to work with.
3. Select the light. The light settings page appears (Figure 10).
4. Adjust the settings as necessary, and then touch **Done**. See Figure 10 below for details.

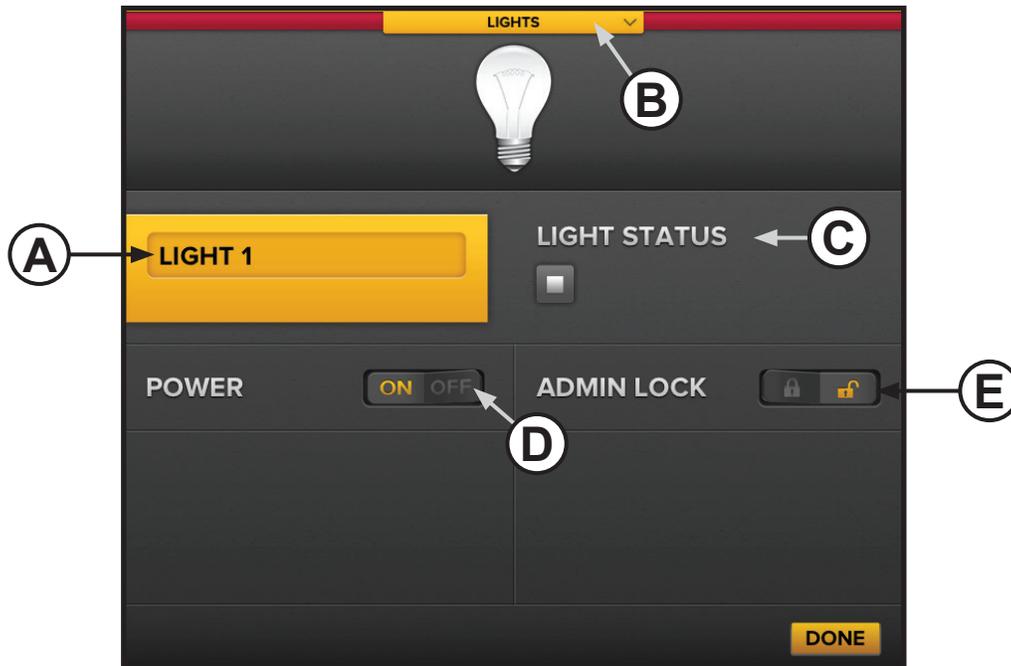


Figure 10–Light settings page

- A. Light Name.** Touch here to edit the light name.
- B. Group Header.** Indicates the group to which the light belongs. Touch the group header to assign the light to a different group.
- C. Light Status.** Indicates the light's operational status. See the table below for descriptions of each status icon.
- D. Power.** Turn the light on or off.
- E. Admin Lock.** Lock or unlock the light's operational status. This setting requires administrator password entry.

Light status icons

Icon	Description
	Light on, communication OK
	Light off, communication OK
	Communication loss, light status unknown

Turning light groups on and off

To turn a group of lights in the BAFWorks® system on or off:

1. On the BAFWorks home screen, touch **Lights**.
2. Touch the name of the light group you want to work with.
3. At the bottom of the screen, touch **Turn On Lights** or **Turn Off Lights** (Figure 11).

Note: You can also lock or unlock the operational status of the lights in the group by touching the lock/unlock icons in the bottom right corner of the screen (Figure 11). This setting requires administrator password entry.



Figure 11—Turning on/off and locking/unlocking light groups

Configuring light group settings

To adjust the settings for a group of lights in the BAFWorks system:

1. On the BAFWorks home screen, touch **Lights**.
2. Locate the light group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears (Figure 12).
3. Adjust the settings as necessary, and then touch **Done**. See Figure 12 below and the following page for details.

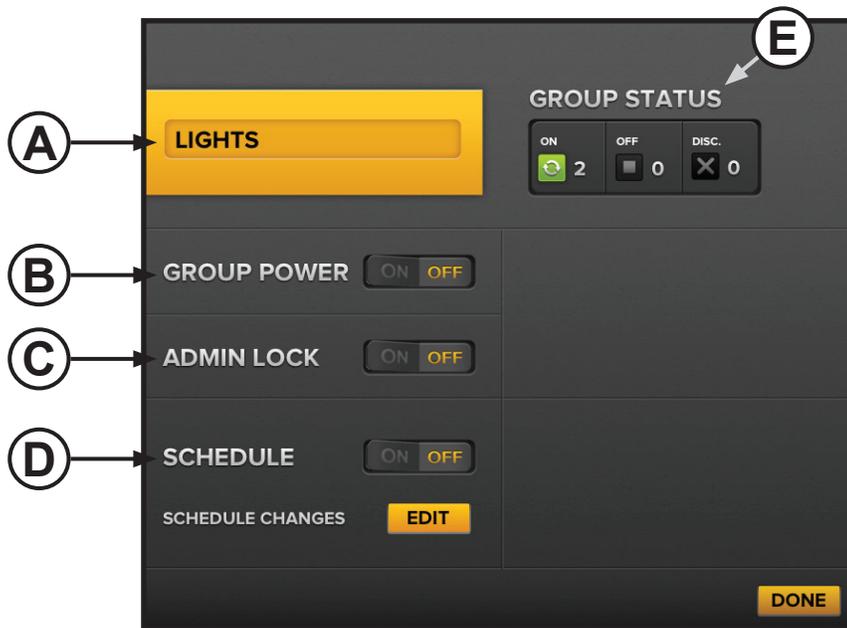


Figure 12—Light group details page

- A. Group Name.** Touch here to edit the group name.
- B. Group Power.** Turn all lights in the group on or off.
- C. Admin Lock.** Lock or unlock the operational status of all lights in the group. This setting requires administrator password entry.
- D. Schedule.** Touch **Edit** to schedule the lights in the group to turn on or off at programmed times. Touch **On/Off** to enable or disable scheduled events. See the following page for more information on scheduling.
- E. Group Status.** Indicates the operational status of each light in the group. See the previous page for descriptions of each status icon.

Scheduling light group events

The scheduling feature lets you schedule groups of lights to turn on or off at programmed times.

To schedule a light group event:

1. On the BAFWorks® home screen, touch **Lights**.
2. Locate the light group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears.
3. Next to Schedule Changes, touch **Edit**. The scheduling page appears (Figure 13).
4. If necessary, at the bottom of the scheduling page, touch **Add New Event** (Figure 13).
5. Set the day(s) of the week on which the event will occur, the start time for the event, and the event action (**Turn On Lights** or **Turn Off Lights**) (Figure 13).
6. Touch **Save** under the event's settings.
7. If necessary, touch **Add New Event** at the bottom of the scheduling page to add more events. Configure the settings as described in step 5 above.
8. Touch **Save** under each event's settings.
9. If you want to make changes to an event, touch **Edit** under the event's settings. Touch **Delete** to delete the event. When you are finished, touch **Done** at the bottom of the scheduling page.
10. On the group details page, touch the **On** button next to **Schedule** to enable the scheduled event(s).
11. Touch **Done** at the bottom of the group details page.
12. Observe the light group icon on the light groups screen. Note that a calendar icon appears in the top right corner of the group icon, indicating that scheduling is enabled for the group (Figure 14).

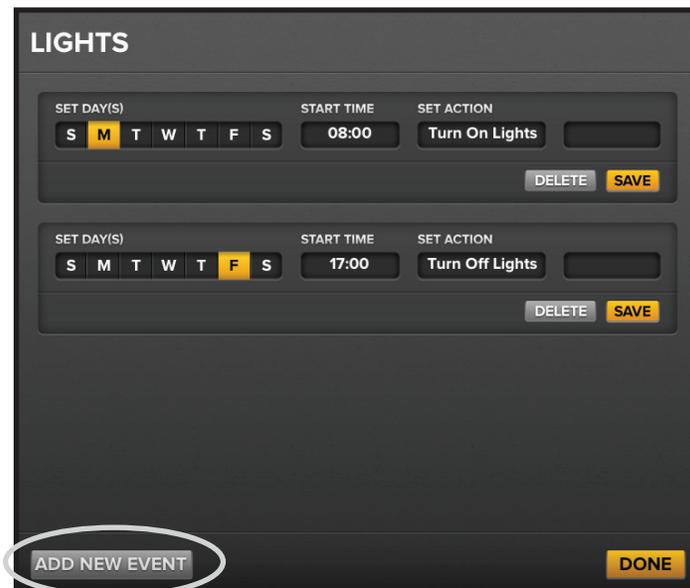


Figure 13–Lights scheduling page



Figure 14–Calendar icon on the light group icon

Configuring individual louver and vent settings

To adjust the settings for a louver or vent in the BAFWorks® system:

1. On the BAFWorks home screen, touch **Ventilation** or **All Devices**.
2. If you touched **Ventilation**, touch the name of the group containing the louver or vent you want to work with.
3. Select the louver or vent. The louver or vent settings page appears (Figure 15).
4. Adjust the settings as necessary, and then touch **Done**. See Figure 15 below for details.

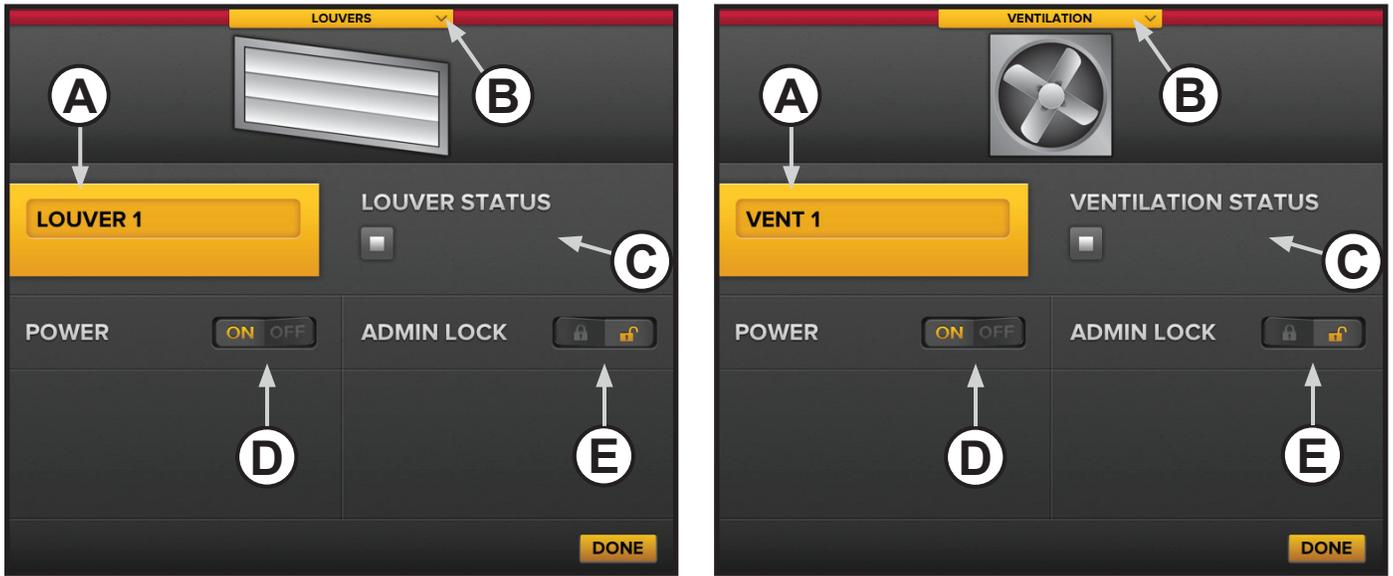


Figure 15–Louver and vent settings pages

- A. Name.** Touch here to edit the louver or vent name.
- B. Group Header.** Indicates the group to which the louver or vent belongs. Touch the group header to assign the louver or vent to a different group.
- C. Status.** Indicates the louver or vent’s operational status. See the table below for descriptions of each status icon.
- D. Power.** Open or close the louver, or turn the vent on or off.
- E. Admin Lock.** Lock or unlock the louver or vent’s operational status. This setting requires administrator password entry.

Louver and vent status icons

Icon	Description
	Louver open/vent running, communication OK
	Louver closed/vent stopped, communication OK
	Communication loss, louver/vent status unknown

Starting and stopping louver and vent groups

To start or stop a group of louvers or vents in the BAFWorks® system:

1. On the BAFWorks home screen, touch **Ventilation**.
2. Touch the name of the louver or vent group you want to work with.
3. At the bottom of the screen, touch **Open Louvers**, **Close Louvers**, **Turn On Ventilation**, or **Turn Off Ventilation** (Figure 16).

Note: You can also lock or unlock the operational status of the louvers/vents in the group by touching the lock/unlock icons in the bottom right corner of the screen (Figure 16). This setting requires administrator password entry.

Note: A vent group is shown on the right. For a louver group, the open/close and lock/unlock settings are in the same locations shown on the right.



Figure 16—Starting, stopping, and locking/unlocking vent groups

Configuring louver and vent group settings

To adjust the settings for a group of louvers or vents in the BAFWorks system:

1. On the BAFWorks home screen, touch **Ventilation**.
2. Locate the louver or vent group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears (Figure 17).
3. Adjust the settings as necessary, and then touch **Done**. See Figure 17 below and the following page for details.

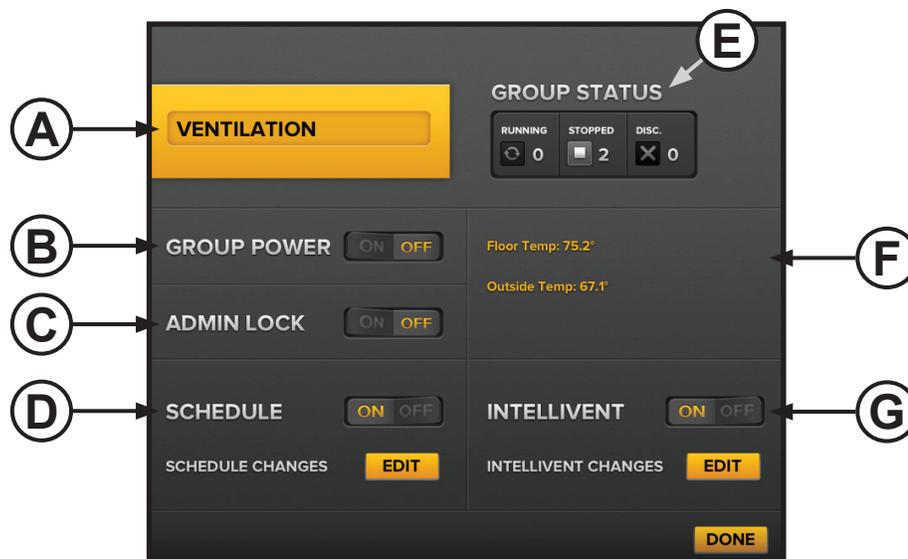


Figure 17—Louver/vent group details page

- A. Group Name.** Touch here to edit the group name.
- B. Group Power.** Open or close all louvers in the group, or turn all vents in the group on or off.
- C. Admin Lock.** Lock or unlock the operational status of all louvers or vents in the group. This setting requires administrator password entry.
- D. Schedule.** Touch **Edit** to schedule open/close, start/stop, and automation events for the group. Touch **On/Off** to enable or disable scheduled events. See the following page for more information on scheduling.
- E. Group Status.** Indicates the operational status of each louver or vent in the group. See the previous page for descriptions of each status icon.
- F. Temperature.** Indicates the current indoor floor level temperature and the outdoor temperature as reported by the temperature sensors in the system.
- G. IntelliVent®.** Touch **Edit** to configure ventilation automation settings. Touch **On/Off** to enable or disable automation. See page 45 for more information on automation.

Scheduling louver and vent group events

The scheduling feature lets you schedule groups of louvers or vents to open/close, start/stop, or begin/end automation at programmed times. See page 45 for more information on automation.

To schedule a louver or vent group event:

1. On the BAFWorks® home screen, touch **Ventilation**.
2. Locate the louver or vent group you want to work with, and then touch the **Detail Page** button for the group. The group details page appears.
3. Next to Schedule Changes, touch **Edit**. The scheduling page appears (Figure 18).
4. If necessary, at the bottom of the scheduling page, touch **Add New Event** (Figure 18).
5. Set the day(s) of the week on which the event will occur, the start time for the event, and the event action.
6. Touch **Save** under the event's settings.
7. If necessary, touch **Add New Event** at the bottom of the scheduling page to add more events. Configure the settings as described in step 5 above.
8. Touch **Save** under each event's settings.
9. If you want to make changes to an event, touch **Edit** under the event's settings. Touch **Delete** to delete the event. When you are finished, touch **Done** at the bottom of the scheduling page.
10. On the group details page, touch the **On** button next to **Schedule** to enable the scheduled event(s).
11. Touch **Done** at the bottom of the group details page.
12. Observe the louver or vent group icon on the ventilation groups screen. Note that a calendar icon appears in the top right corner of the group icon, indicating that scheduling is enabled for the group (Figure 19).

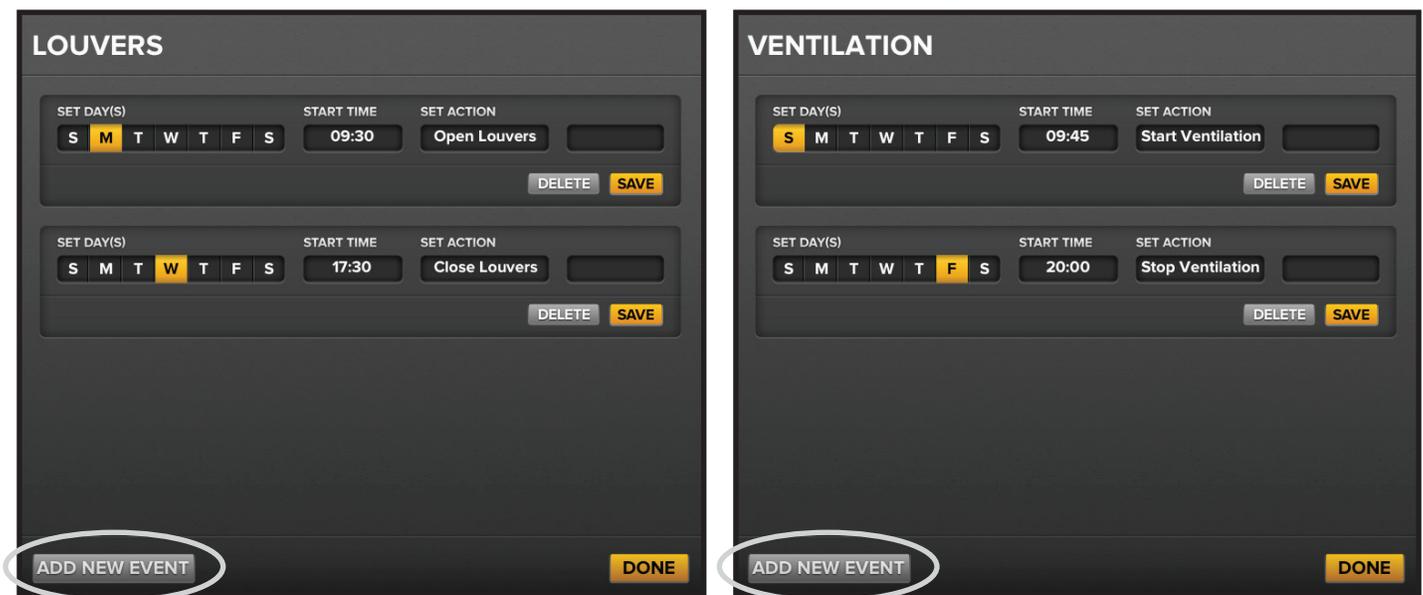


Figure 18—Louver and vent scheduling pages



Figure 19—Calendar icons on the louver and vent group icons

Some issues can be resolved before requesting service. Review the below troubleshooting tips before contacting Customer Service for support.

Symptom	Possible solution(s)
<p><i>Intermittent or permanent communication losses with fans (RS-485)</i></p> <p>The RX and TX network activity indicators in the bottom left corner of the BAFWorks® application screen (see item C on page 55) are cyclic under normal circumstances. If you do not observe a normal rhythm of RX (green) and TX (orange), data packet loss or corruption within the Modbus data loop may have occurred.</p>	<p>Verify the following:</p> <ul style="list-style-type: none"> • All components are plugged in • The fan controllers are programmed properly (address, protocol, etc.) • Terminating resistors are installed only where required • All cable and communications card connections have been tug tested • The Modbus cables are generally isolated or shielded from AC power circuits. A quality shielded cable should be used. Per standard installation, the cable shield is landed in parallel with the cable's reference line. If all shields are tied together, Big Ass Fans recommends bonding the cable shield to Earth/PE/Ground. Do this in one spot only! If bonded in multiple locations, a ground loop will result. • The cable does not exceed distance limitations. This is a dynamic situation. There is no definitive way to know the control system's limitations for certain. If everything else has been ruled out, contact Big Ass Fans Customer Service about the use of a wireless or wired RS-485 repeater. This will replace a long run of cable, but it requires setup and a suitable low voltage DC supply at each radio module. Installation challenges may exist.
<p><i>Communication loss between the iPad® and the BAF gateway/router</i></p> <p>The yellow network activity indicators in the bottom left corner of the BAFWorks application screen (see item C on page 55) confirm the connection between the iPad and the BAF gateway and/or ADAM modules. If the top two indicators are not yellow, communication has been lost between the iPad and those devices.</p>	<p>Verify the following:</p> <ul style="list-style-type: none"> • The iPad is being directed to your router/gateway combination. This can be verified on the iPad under Settings > Ethernet > Apple USB to Ethernet Adapter. If Ethernet does not appear under Settings, there is a poor connection between the iPad, lightning to USB camera adapter, USB to ethernet adapter, or ethernet to router cable connections. • The router settings and iPad Ethernet configuration are correct.

Ports used by ADAM modules on corporate networks

If you are running BAFWorks using a corporate network instead of the provided router, the network firewall or other network component may block UDP/TCP traffic. If this occurs, the ADAM modules will not be able to communicate with the BAFWorks system. When troubleshooting communications issues on a corporate network, note the following ports used by the ADAM modules for UDP/TCP communication.

UDP/TCP ports used by ADAM modules (initial mode)

Function	Protocol	Port
UDP ASCII communication	UDP	1025
Datastream	UDP	5168
GCL IO message	UDP	5168
P2P message	UDP	1025
Search engine	UDP	5048
TCP ASCII/Modbus communication	TCP	502
Download	TCP	5450
Download Adam6024	TCP	7000

When the ADAM modules are in normal mode, they follow the standard of Ethernet/IP. TCP port number 44818 is used for explicit messaging and UDP port number 2222 is used for implicit messaging.

CONTACT US

Talk to a Big Ass Fan Expert. Call us at one of the numbers below or visit www.bigassfans.com



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Manufacturing and Warranty

You are responsible for providing and paying for shipping when returning a product to Big Ass Fans for the purpose of recycling under the WEEE directive.

Manufacturer



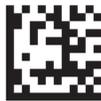
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