MacroAir
engineers of air™

Operation Manual

Controller 4

Table of Contents

Introduction

Caution & Safety, Electrical Guidelines 2
Hazard of Electrical Shock, Installation and Service,
Fan Network Ordering 4
Touchpad Remote Dimensions 5

Network Installation

Network Wiring Requirements, Daisy Chain 6
Network Wiring Configurations 7
Network Excess Cable 8
Fan Wiring Instructions 9
Mixed Network Wiring Instructions,
Emergency Stop for Fire Alarm 10

Sensor Installation

Temp/Humidity Sensor Installation (Optional) 11
T-Splice Connection Method 12

Configuration and Operation

Controller 4 Screen Setup 14
Screen Flow 15
Home Screen 16
Temperature/Humidity Setpoint Screen 17
Fan Select Screen 18
Fan Address Screen 19
Motor Calibration Screen 20
Fan Diameter Screen 21
Mkey Screen (Certain Fan Models) 22

Information

Warranty 23
Technical Support 24

Introduction

Caution and Safety

This appliance can be used by children aged from eight (8) years and above and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

⚠ **ATTENTION: Safety. READ AND SAVE THE ENTIRE MANUAL BEFORE OPERATING THE FAN.** Ensure that all safety procedures and instructions are followed during the installation, operation, and servicing of the fan. Failure to apply these safety practices could result in death or serious injury. If you do not understand the instructions, please call our technical department for guidance.

⚠ **CAUTION: Non-Compliance.** The fan installation should follow the recommendations outlined in this manual. MacroAir is not responsible for any injury or damage to persons or property because of 'not complying' with the recommendations outlined in the manual.

Electrical Guidelines

⚠ **WARNING: Electrical Damage.** Improper electrical installation can cause damage to the fan and interfere with other electronic equipment. In addition to standard electrical safety considerations, please observe the following:

- **MacroAir Cables.** The wiring from the control panel to the fan MUST be MacroAir supplied shielded cable. CAT5e to be MacroAir supplied twisted, stranded, and shielded or greater.
- **Electrical Interference.** Separate incoming power and motor control cables by a minimum of six (6) inches.
- **Individual Fan Wiring.** Run wiring for each fan separately.
- **Multiple Fans.** Do not attempt to control multiple fans from one (1) fan control panel.
- **ALWAYS GROUND PROPERLY.** Connect the supplied cable glands to each end of the motor cable and tighten them securely at both the fan motor and control panel ends. Connect the ground bar in the control panel to ground at the main breaker and test.
- **Read.** Please refer to the installation instructions for more information.

⚠ **ATTENTION: Qualified Technicians.** All fan controls should only be installed by qualified technicians familiar with the requirements of the National Electrical Code (NEC) and local codes. Refer to appropriate portions of this manual for other important requirements. Failure to follow these guidelines will void the manufacturer's warranty.

Introduction

Electrical Guidelines cont.

⚠ **ATTENTION: Factory Configured.** All electrical controls are configured at the factory and are ready to use. No user adjustments are available. Follow the included wiring schematics and installation instructions when installing this device to ensure proper operation. Do not make any changes to any part of the motor control panel without first consulting MacroAir.

⚠ **ATTENTION: Code Compliance.** Installation is to be in accordance with the NEC, ANDSI/NFPA 70-1999 and local codes.

Hazard of Electrical Shock, Explosion, or Arc Flash:

⚠ **ATTENTION: Read.** Read and understand this manual before installing or operating a fan unit. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.

⚠ **ATTENTION: Code Compliance.** The user is responsible for compliance with all international and National Electrical Code requirements with respect to grounding of all equipment.

⚠ **WARNING: Do Not Touch.** Many of the parts of this unit operate at line voltage. DO NOT TOUCH.

⚠ **WARNING: Covers.** Install all covers before applying power or starting and stopping the unit.

Installation and Service

⚠ **WARNING: Damage.** Do not operate or install any fans or fan accessories that appear to be damaged.

⚠ **WARNING: Death and Injury.** Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ **WARNING: Disconnect Power.** If the fan does not operate properly using the procedures in this manual, BE CERTAIN TO REMOVE ALL POWER TO THE UNIT and contact our Technical Department for further assistance.

⚠ **CAUTION: Moving Parts.** Keep all body parts clear of moving parts at all times.

⚠ **ATTENTION: Qualified Technicians.** All electrical troubleshooting and repair must be done by a qualified technician and meet all applicable codes.

Fan Network Ordering

Type of controller: Controller 4, which can network up to 4 fans.

MacroAir customizes fans to operate in a network by:

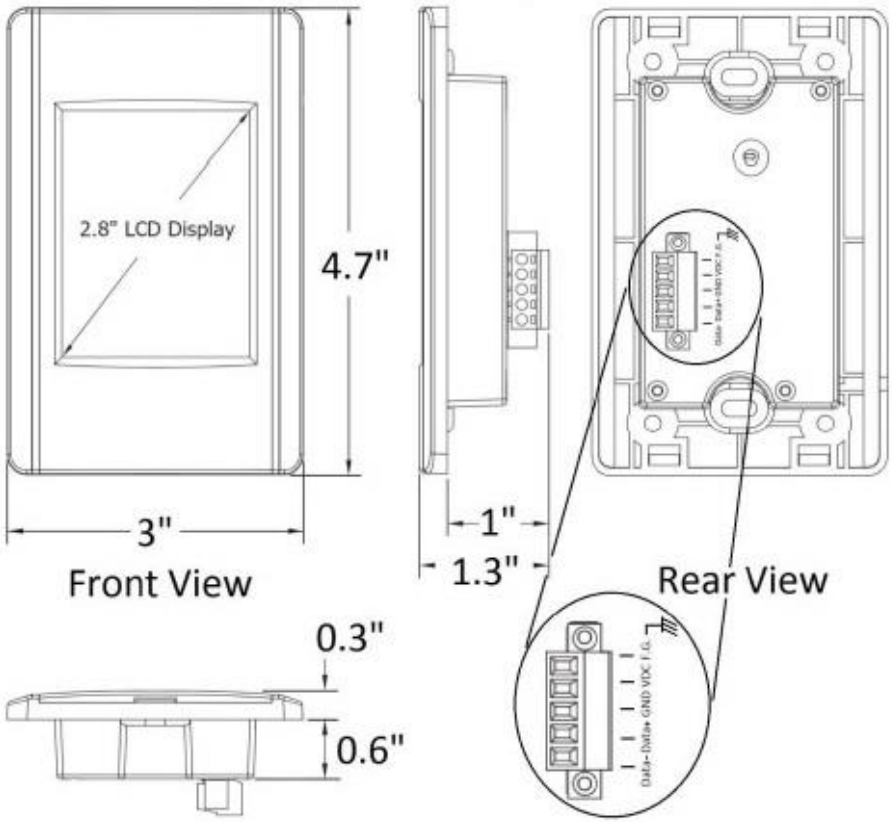
- Addressing the fans.
- Modifying the panel enclosure.
- Modifying the wiring on the VFD.

Note: If you did not order your fans for a network, please contact Technical Support for assistance with networking your fans. Also, when installing new fans in an existing mixed network, contact Technical Support.

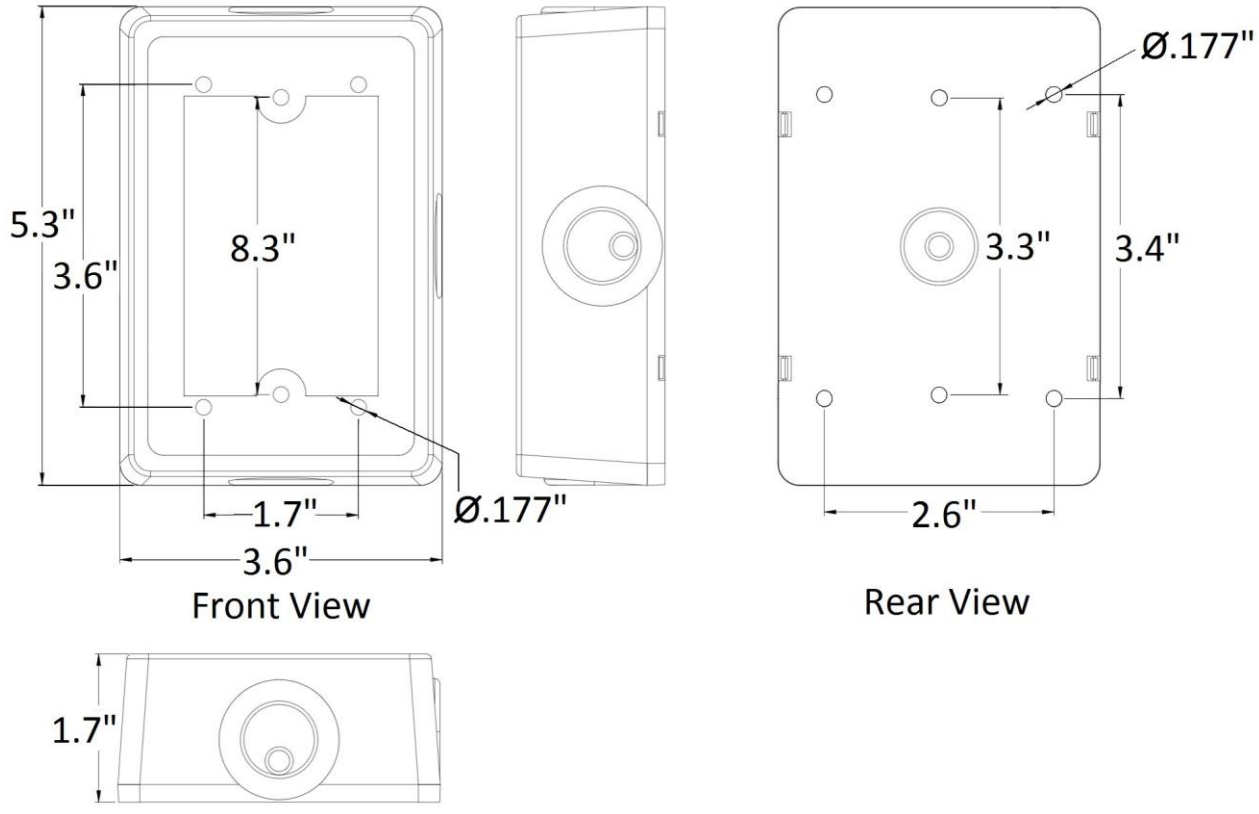
Introduction

Touchpad Remote Dimensions

LCD Display



Enclosure



Network Installation

Network Wiring Requirements:

- Use stranded CAT5e or higher shielded cable.
- Minimum 24AWH (0.5mm) cross section.
- Ground the shielding and drain wire at only one point of the cable run.
- Route wires as far away as possible from high voltage AC cables, fluorescent lights, arc welders, and other equipment that transmits EMI (electromagnetic interference).
- Do not run CAT5e in conduit with high voltage AC cables.
- Do not exceed 400ft [122m] of CAT5e between each fan in the network.
- RJ-45 to use CAT5-B pinout (see image below).

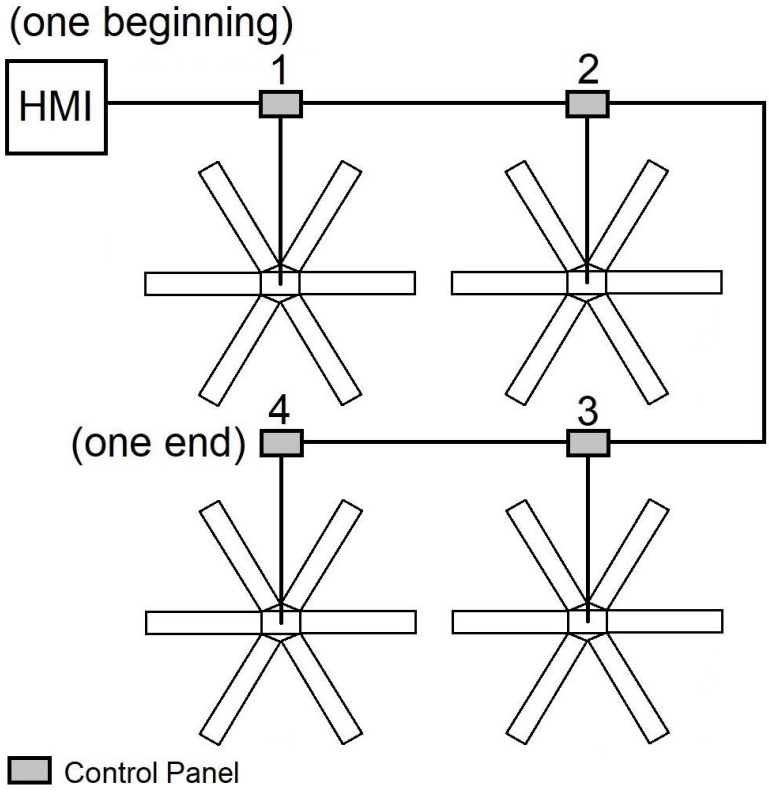
CAT5B pinout

Daisy Chain

Network MacroAir fans must be connected in one single line, referred to in this document as a "daisy chain". The characteristics of a proper daisy chain are: one beginning (Controller 4) and one end (last fan or control panel).

If the fans are not connected in one line/chain, there will be a degradation of the communication signal and the network may not function as intended (fans in the network may not operate).

Each fan has a unique address, which is noted on a sticker on the control panel. It is important to mount the fans in the correct order.

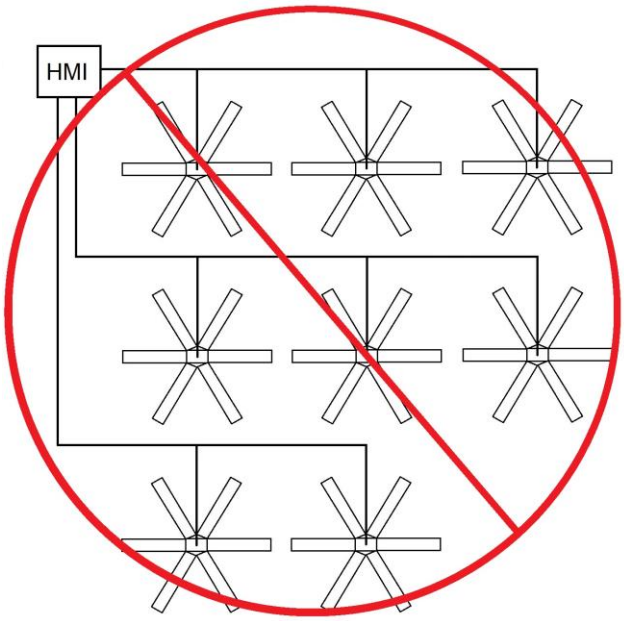


Network Installation

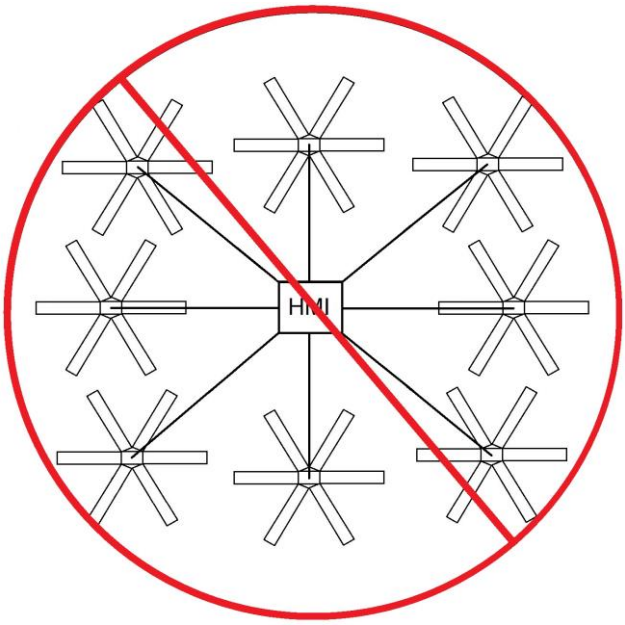
Network Wiring Configurations

Improper Wiring Configuration

End of Line x3

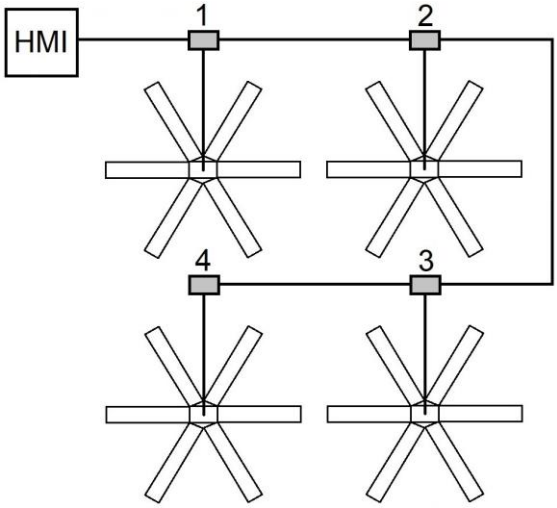


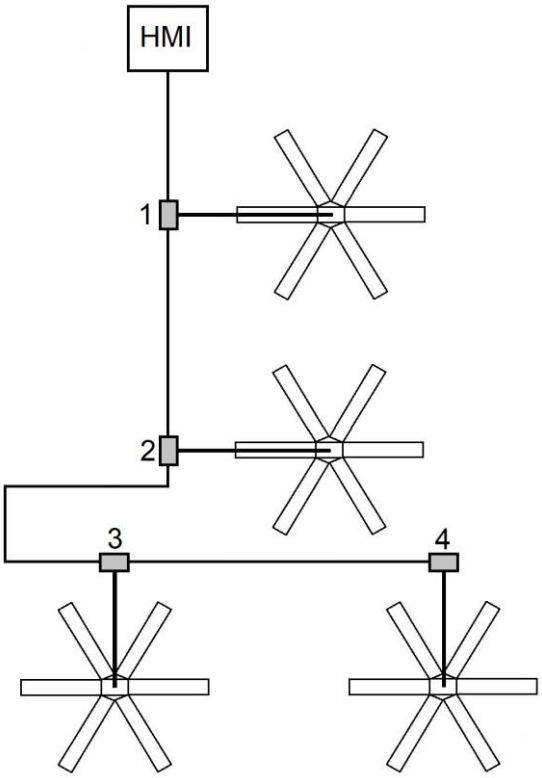
End of Line x8



Proper Wiring Configuration

ONE End of Line





Network Installation

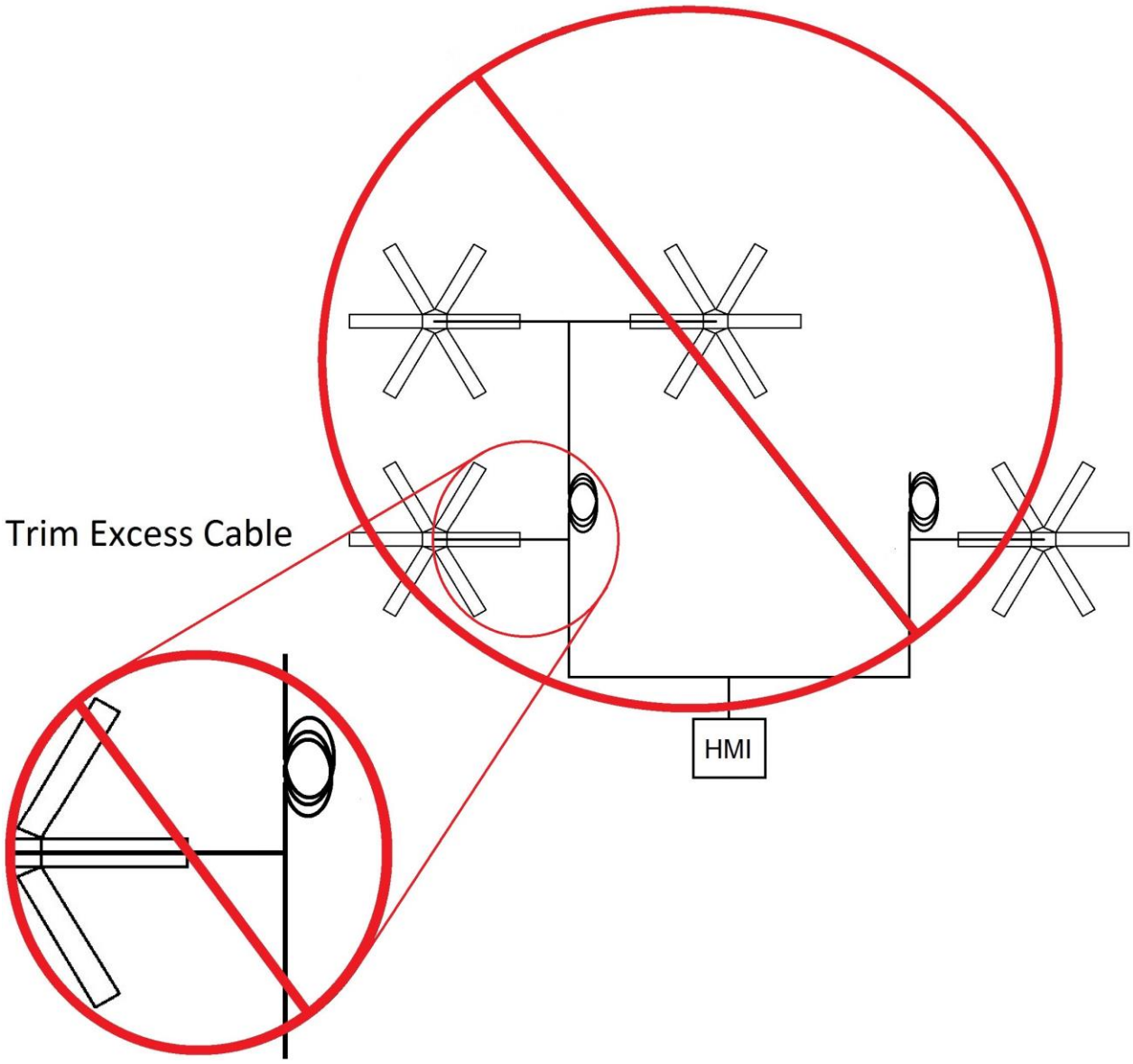
Network Wiring Configurations cont.

Excess Cable at Connection Point

With noise being emitted throughout a typical industrial/commercial environment, **extra cable should not be coiled up** as the coil itself will create noise/interference in the communication signal. There should be no more than 2ft [0.6m] of excess cable at each connection point.

If more than 2ft [0.6m] of cable is needed for future relocation of the fan, run the cable up toward the ceiling and back down in a horseshoe shape.

ALWAYS AVOID SHARP BENDS OF THE CABLE.

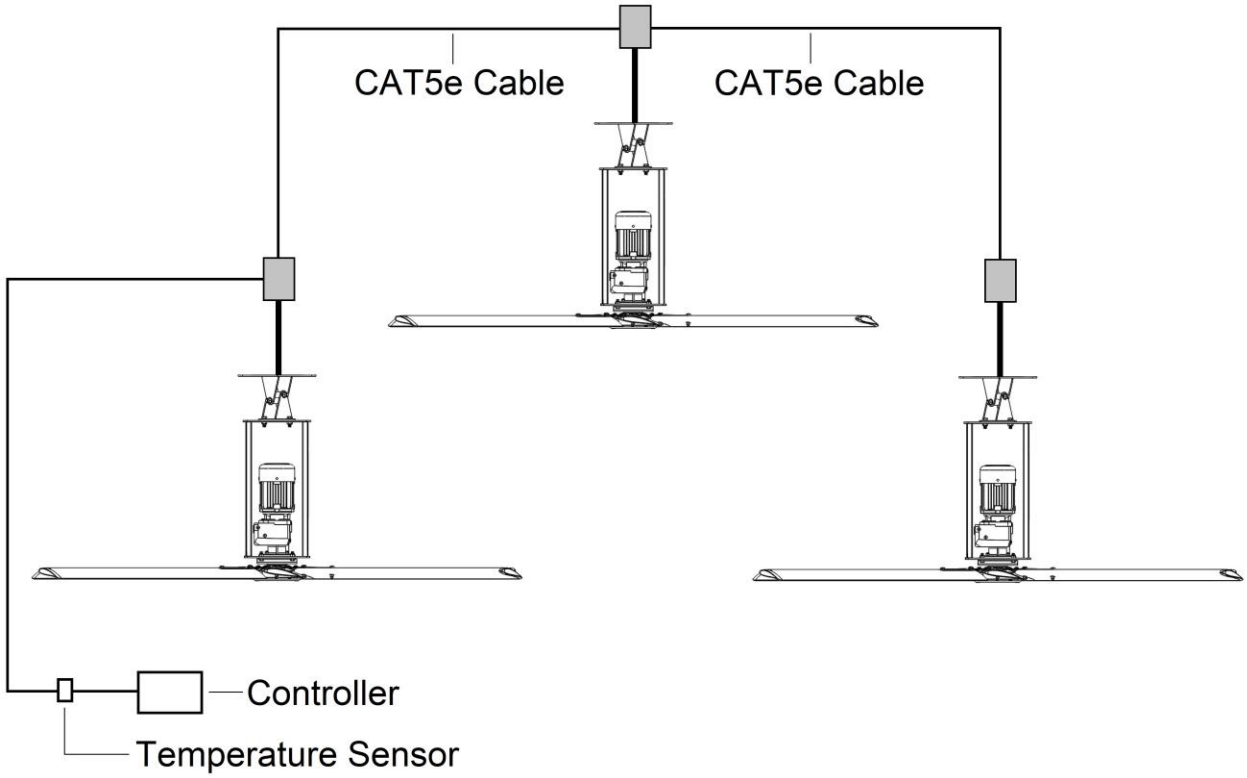


Network Installation

Fan Wiring Instructions

MacroAir fans are wired in a daisy chain with one CAT5e from the touchscreen/previous fan into an RJ45 port on the control panel, and one CAT5e going to the next fan from the second RJ45 port on the panel. The internal panel wiring does not need to be modified for communications.

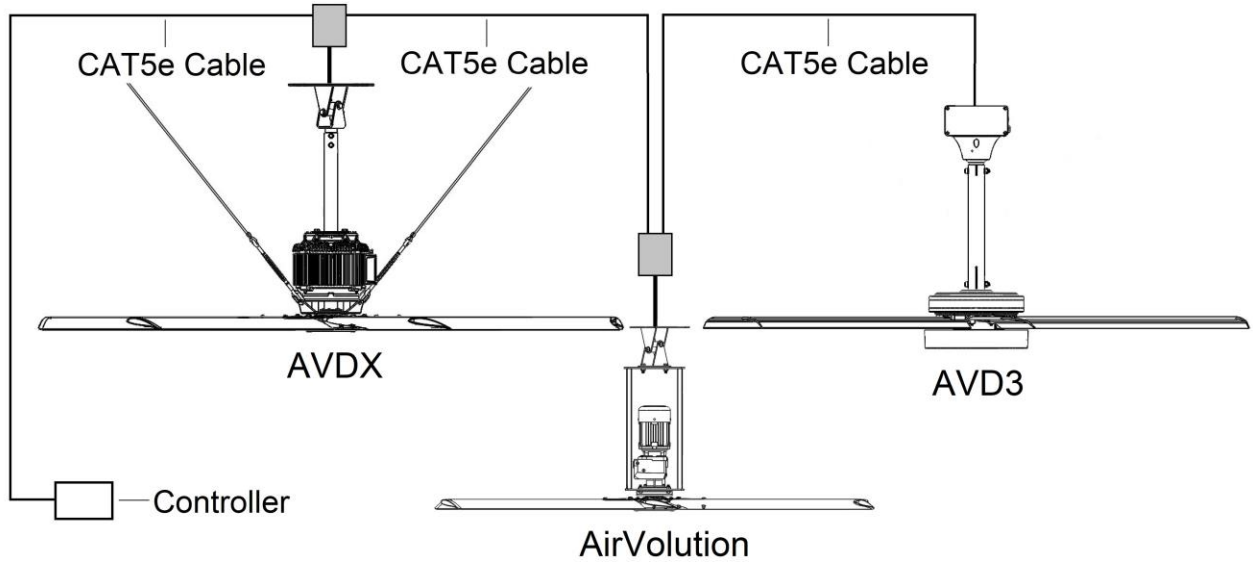
A properly wired daisy chain network will have the CAT5e network ran per the below illustration.



Network Installation

Mixed Network Wiring Instructions

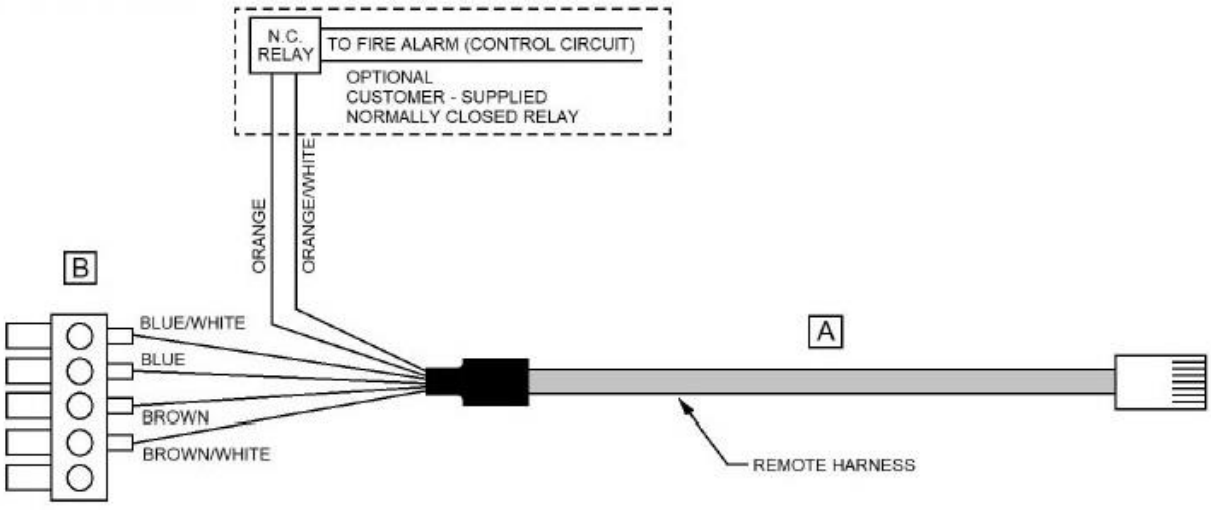
Networks utilizing different MacroAir fans, will wire each fan according to the preceding wiring instructions in the manual (ref page 9). Below is an example of wiring for a mixed network:



Note: When installing new fans in an existing mixed network, contact Technical Support for assistance with networking your fans.

Emergency Stop for Fire Alarm

Touchpad Remote Wiring: Use the schematic below to connect the fan(s) to an emergency stop (i.e., Fire Alarm System)



COMPONENTS:

A – REMOTE HARNESS (FOUND IN FAN REMOTE ENCLOSURE)

B – TERMINAL BLOCK CONNECTOR

Reference Terminal Block: Touchpad Remote Dimensions, LCD Display, Rear View, page 5

Sensor Installation

Temperature/Humidity Sensor Installation (Optional)

PINOUT:

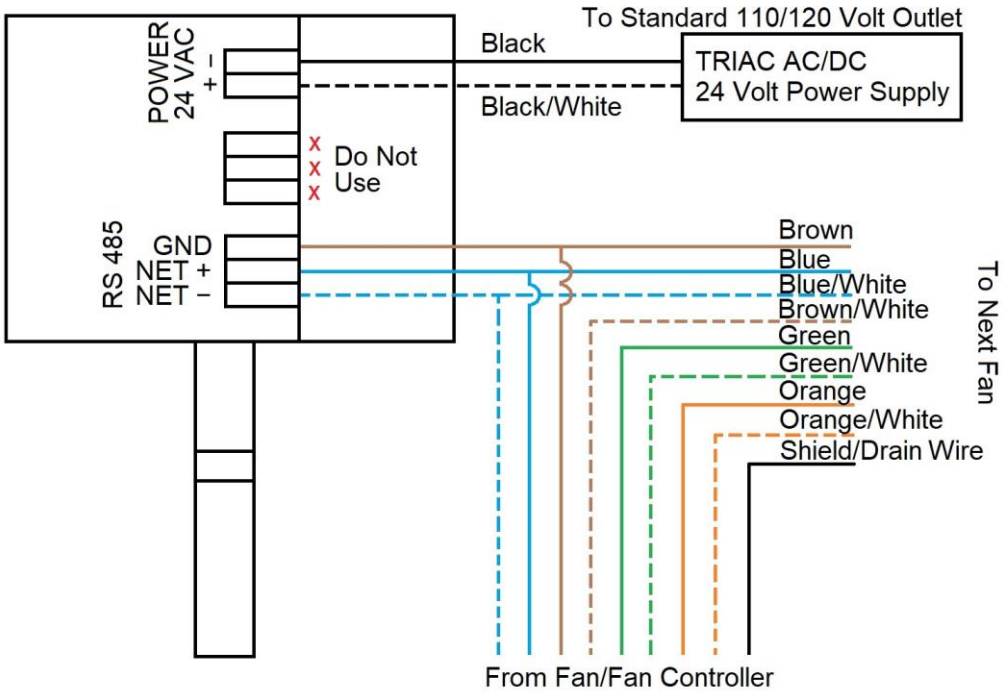
Black (From Power Supply)..... Common
Black/White (From Power Supply) ..... 24VDC+
Blue (From Cat5E) ..... Net+
Blue/White (From Cat5E)..... Net-

Mounting: Ceiling or Floor Mounting

1. When mounting the temperature/humidity sensor at the ceiling, mount at least 1ft [0.3 m] below the ceiling in the same room where the fan/fans are placed. When mounting the temperature/humidity sensor at the floor, mount the sensor within 6ft [1.8m] of the ground in the room where the fan/fans are placed. Use caution when placing the sensor making sure not to place it where there is any contact with direct sunlight. Each sensor has small mounting holes for attachment with screws.

2. Once the sensor has been placed it can be wired into the network. Use the provided 110/120V power supply to power the temperature/humidity sensor and the blue, blue/white, and brown wires from the CAT5e cable for communication. If there is enough slack in the cable you can run the wiring directly in and out at the same point on the sensor.

3. Please refer to the wiring diagram. See pages 12-13 of this manual (T-Splice Connection Method) for proper stripping and bean crimping of wires.



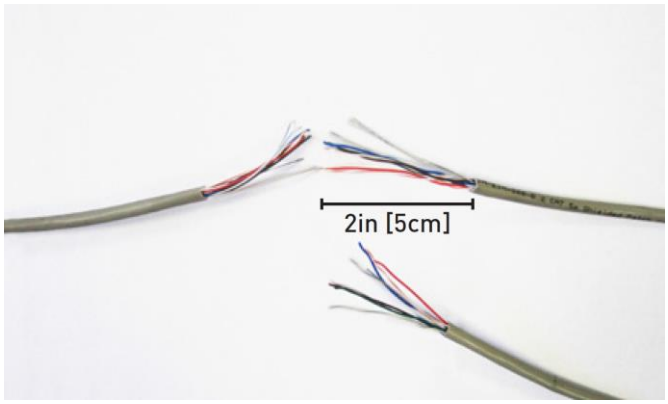
Sensor Installation

T-Splice Connection Method

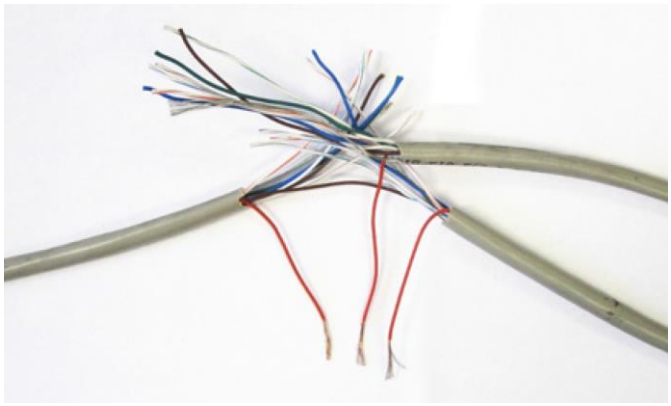
1. Take the incoming CAT5e from the network, the 15ft [4.57m] CAT5e whip from the fan, and the CAT5e going to the rest of the network. Give some slack (no more than 2ft / 0.6m) on each CAT5e to strip the wires and splice them together. Run the slack up towards the ceiling and back down in a horseshoe shape.

DO NOT roll the excess slack into a circle or coil because this creates a place for the network to pick up noise on the lines.

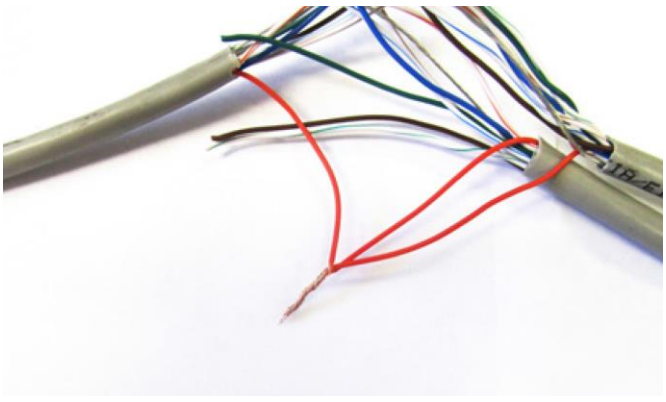
2. Strip jacketing off the three CAT5e cables and separate each color wire leaving approximately 2in [5cm] of each wire exposed including the drain/shield wire.



3. Strip approximately 1/2in [1.3 cm] off each color wire leaving the bare copper exposed.



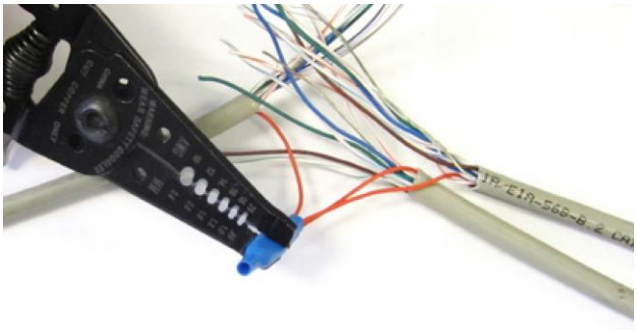
4. Twist the 3 wires of same color from each CAT5e together.



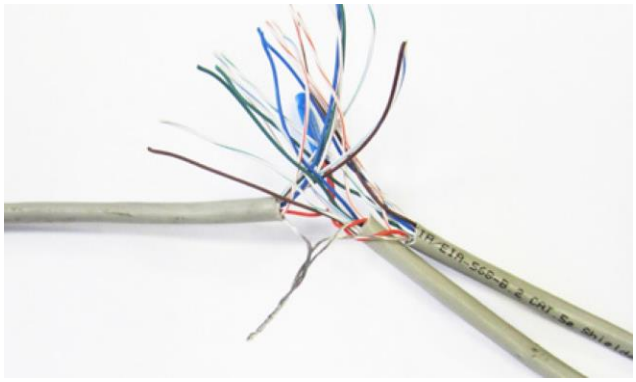
Sensor Installation

T-Splice Connection Method cont.

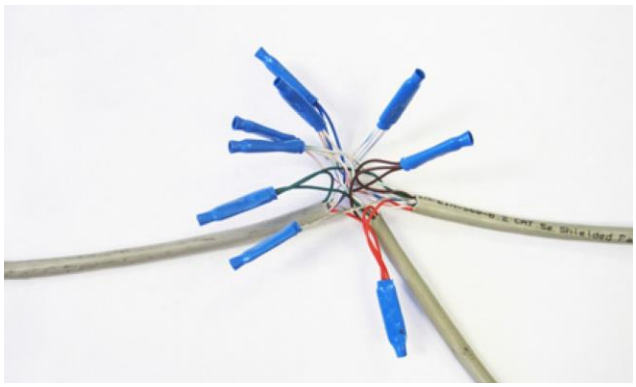
5. Place a gel filled bean crimp onto the end of the 3 wires and use a small crimper or pliers to crimp the bean tight on the wires.



6. Double check that the 3 drain wire/bare wires are also crimped together as this is what continues the shielding throughout the network. The shielding and drain wire MUST be connected to Earth Ground at **only one point** of the cable run.



7. Repeat steps 3-5 for all the wires EXCEPT the Brown/White wire. **The Brown/White wire is only needed for wiring in a repeater.**



8. Once all the wires are crimped, carefully twist the wires up. Then fold them back and tape them up with electrical tape to clean up your wiring.

Controller 4 Screen Setup

The touchscreen may require additional setup before operating the fans. Please refer to the steps below to properly configure your controller.

1. Power on the fans. The screen will illuminate as soon as power is supplied.

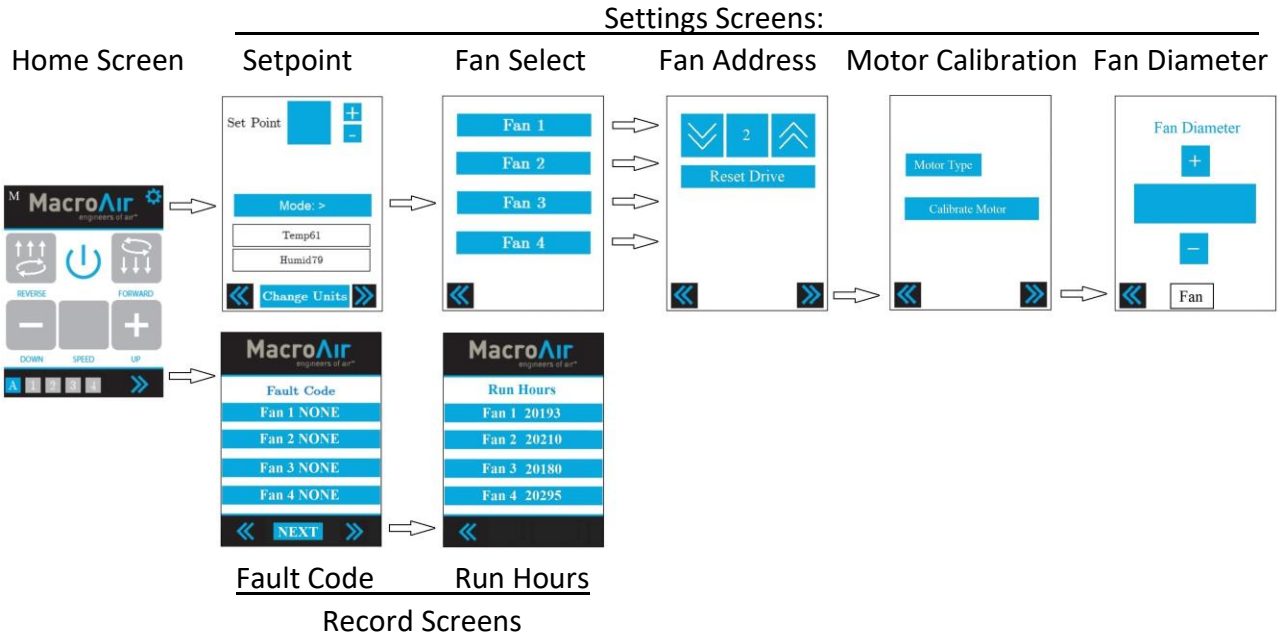
2. The screen will search for fans and take you to the home screen once the scan is complete.

3. AirVolution fans do not require further setup. If you have this fan on the network, set a speed and direction using the buttons on the home screen. AirVolution fans will operate normally.

4. AVD370, AVD3, 550, 780, and AVDX fans REQUIRE the blade size to be programmed in order to function correctly. The fan diameter is set via the “Fan Diameter” screen. Once the diameter is programmed into every AVD3 and AVD370 fan on the network, the fans can be operated normally. 550, 780, and AVDX fans need to be calibrated.

Configuration and Operation

Screen Flow



Home Screen .....Page 16

Temp/Humidity Setpoint .....Page 17

Fan Select .....Page 18

Fan Address .....Page 19

Motor Calibration .....Page 20

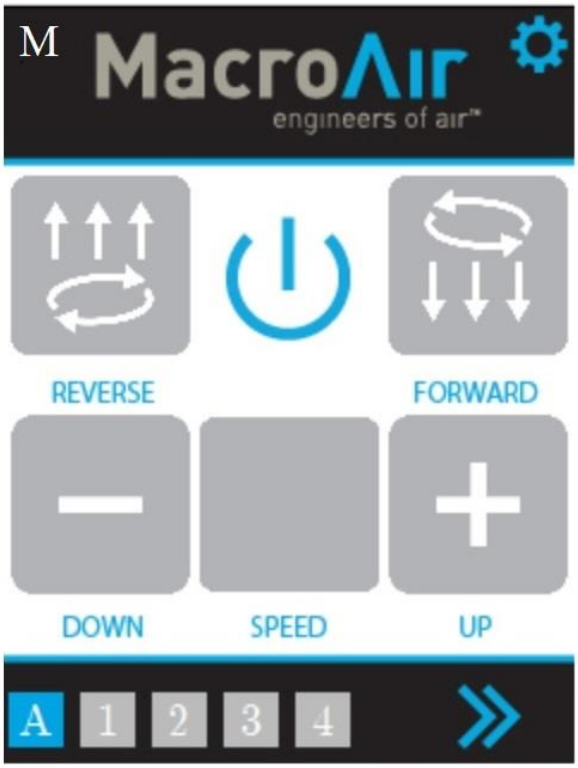
Fan Diameter .....Page 21

Mkey .....Page 22

Configuration and Operation

Home Screen

The home screen allows control of all connected fans. Selecting a speed and direction will run the selected fan(s). The fans will not run unless speed AND direction commands are given.



Mode (M or A icon): "M" indicates Manual mode; "A" indicates Auto mode (which only displays when the Temperature/Humidity sensor is present in the network).

Settings (gear icon): Accesses the Fan Select page, from which the settings page can then be accessed.

A, 1, 2, 3, 4: Clicking this button will toggle between "A" and the individually numbered fans. "A" indicates control of all the fans on the network. Numbers 1, 2, 3, 4 … etc. indicates individual control of the fan selected.

Reverse: Issues a reverse command to all fans or the individual fan selected.

Power: Turns off the selected fan(s).

Forward: Issues a forward command to all fans or the individual fan selected.

Down (minus): Adjusts the fan speed down by 5%.

Speed: Displays the current setting of the last commanded speed (displayed as a percentage).

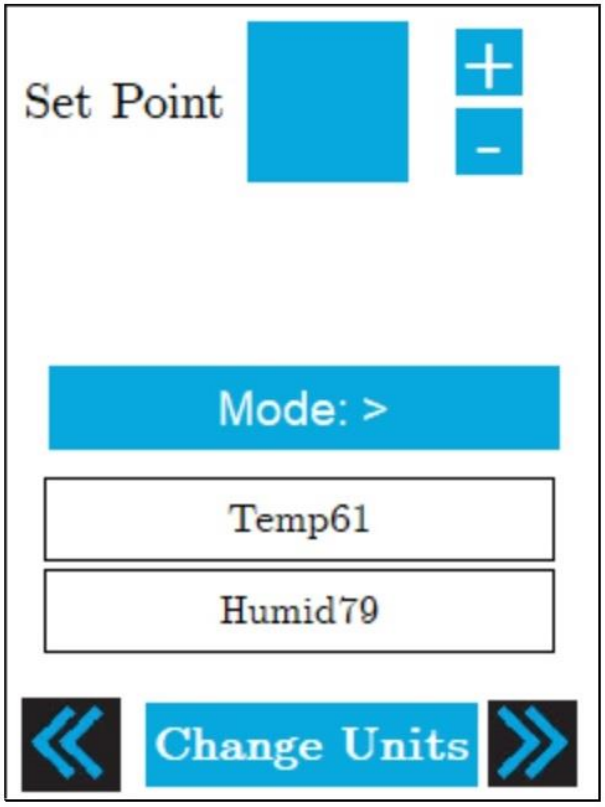
Up (plus): Adjusts the fan speed up by 5%.

Right Arrow: Navigates to the fault code screen.

Configuration and Operation

Temperature/Humidity Setpoint

Only if ordered with the Temperature/Humidity Sensor:
The Setpoint screen allows you to select the method of control for your fans, as well as the desired temperature or humidity setpoint if the optional sensor is installed.



Set Point: Displays the temperature or humidity threshold. The plus adjusts the threshold higher; the minus adjusts the threshold lower.

Mode Selection: Allows you to choose between manual mode, temperature mode and humidity mode. Manual mode allows you to control the fan from the home screen. Temperature mode runs the fan according to the speed and direction set on the home screen once the measured temperature is greater or less than the set point temperature (depending on mode selected). Humidity mode runs the fan according to the speed and direction set on the home screen once the measured humidity is greater than the set point.

Temperature Reading: Displays the ambient temperature. Will read “BAD TEMP READING” if there is no sensor connected.

Humidity Reading: Displays the ambient humidity. Will read “BAD HUMID READING” if there is no sensor connected.

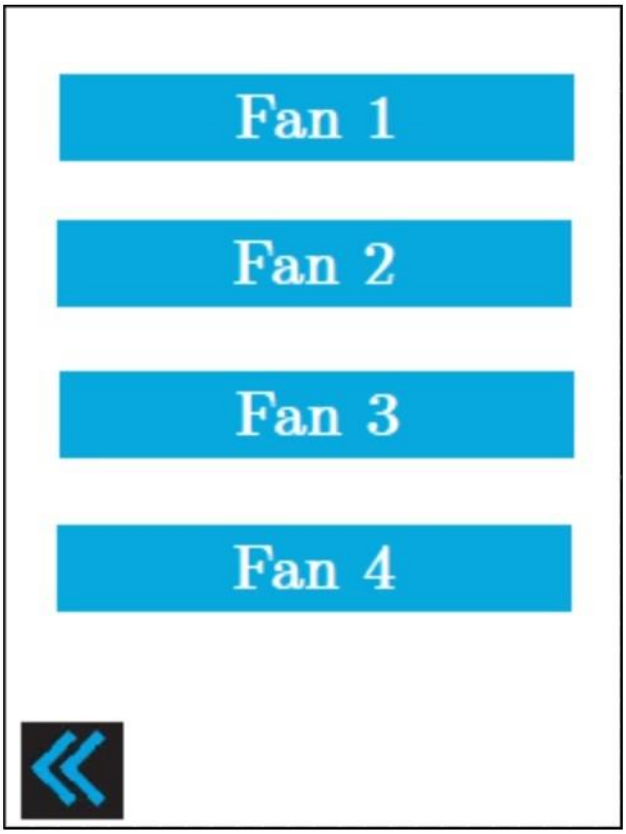
Left Arrow: Navigates to the Home Screen.

Change Units: Changes the Temperature Reading and Set Point between Fahrenheit and Celsius.

Right Arrow: Navigates to the Fan Select screen.

Fan Select

The Fan Select page displays a button for every fan connected to the controller*. Pressing the button for the desired fan will take you to that fan's Address page. Pressing the left arrow will take you back to the Setpoint page.



* If fans are connected, but not displayed on the Fan Select screen, check your CAT5 connections. Call technical support if you require further assistance.

Fan Address

The address page allows you to change the Modbus address of the fan. This is useful for programming fans for the controller that were not originally shipped with the controller. Please note that each fan must have a unique address, so be careful when making any changes to ensure that there are no address conflicts. Only one fan can be connected when changing address.

Up/Down Arrows: Adjusts the address number shown on the screen. Ensure that this number is unique for every connected fan.

Reset Drive: Resets the drive. Address changes do not take effect until the drive is reset.

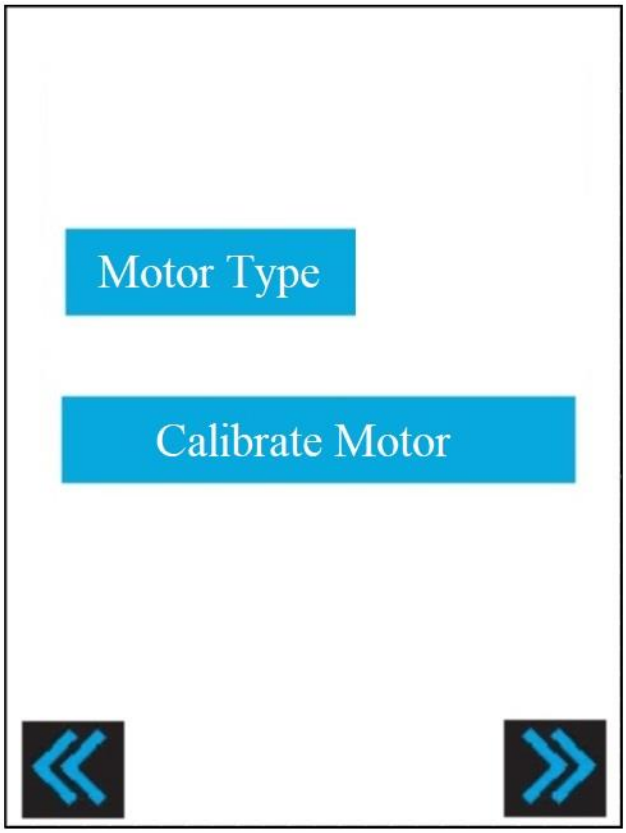
Left Arrow: Takes you to Fan Select screen.

Right Arrow: Takes you to Motor Calibration screen.

Motor Calibration

Press the Motor Calibrate button. The screen will display a warning. If the motor is cold, press the Calibrate Motor button again.

The screen will ask if the motor has run recently. If it has, press the Yes button. Calibration will not occur, and you must wait until the motor is cold to perform the calibration. If the motor has not run recently, press the No button. The fan will perform a calibration of the motor. The motor will make a loud noise while calibrating; this is normal. If the motor calibration fails, log into the technical support website and file a case, you will receive a call from Technical Support. The Technical Support address is: https://MacroAirFans.com/Techsupport



Once motor calibration is done, press the lower left arrow to get to the address screen. Change to the desired address and press the Reset button. If you do not need to change the address, press the arrow in the lower left until you are at the fan control screen. You may now operate your fan as desired.

Motor Type: Displays motor type.

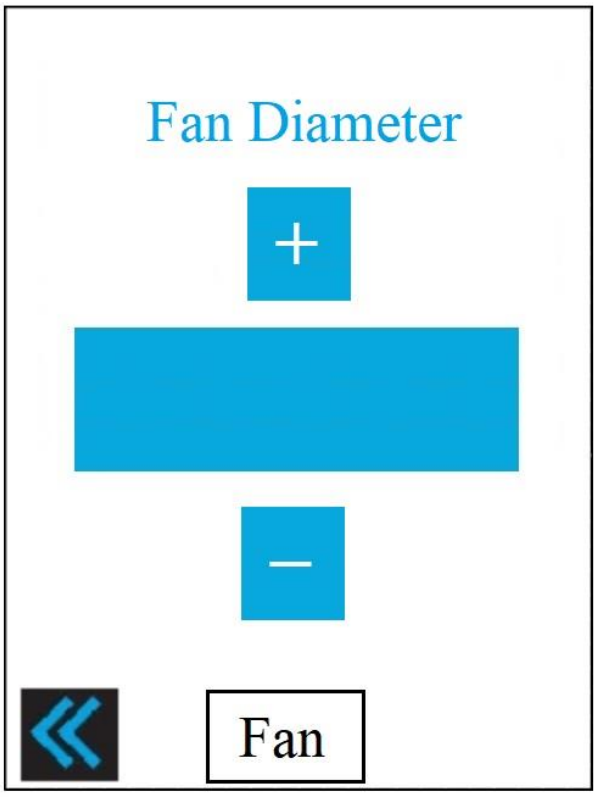
Calibrate Motor: Calibrates the fan (not applicable to the AVD3 or AVD 370).

Left Arrow: Takes you to the Address screen.

Right Arrow: Takes you to the Fan Diameter screen.

Fan Diameter

The Fan diameter page allows you to set the diameter on AVD3, AVD370, 550, 780, and AVDX fans. **These fans will not run properly if the diameter is not set correctly.**



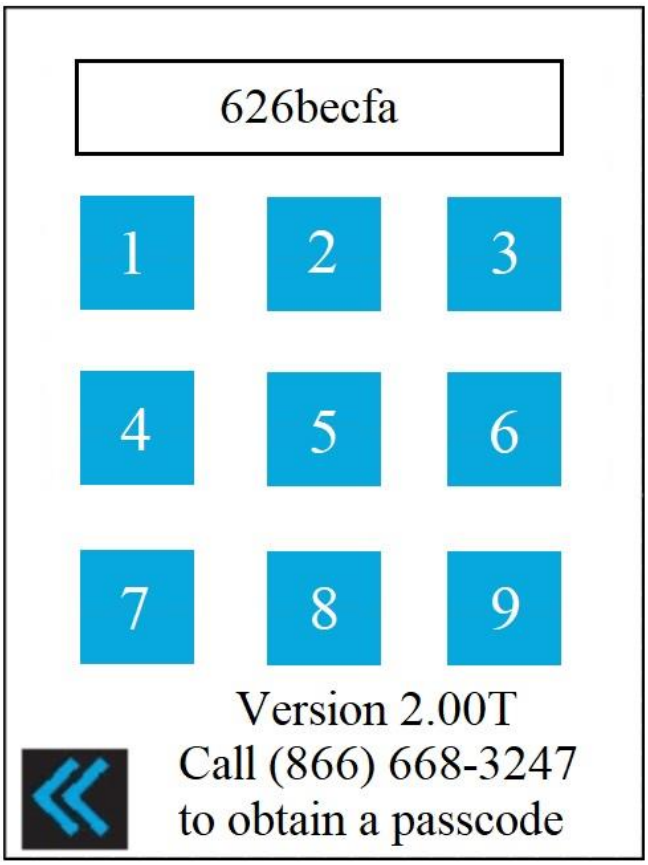
Plus/Minus: Adjust the diameter up and down. For AVD3 fans, adjust the diameter past 24 to access 3-blade fan settings.

Left Arrow: Takes you to the Motor Calibration screen.

Configuration and Operation

Mkey (present for certain fan models)

The Mkey page prevents unauthorized users from accessing advanced settings on the fan that could potentially cause damage if misused. For access to advanced settings, please call Technical Support at 866-668-3247.



Mkey: Displays a code that needs to be relayed to technical Support for a password. This code is constantly changing, so you must be in front of the screen when on the phone with MacroAir.

Number pad: Technical support will issue you with a 4-digit number once you provide the Mkey. The 4-digit code can be typed in using the number pad.

Left Arrow: Takes you to the Address page.

Warranty

MacroAir warrants the Products listed in the table below will be free from defects in materials and workmanship under normal use and maintenance for the applicable Warranty Period. Other than the Warranty set forth in this document, no other written or oral warranties apply, and no employee, agent, dealer, or other person is authorized to give any other warranties on behalf of MacroAir.

START DATE OF WARRANTY COVERAGE

Warranty Period begins fifteen (15) days following shipment of the Product, or on the date the Product is installed (not to exceed sixty (60) days Customer receives the Product), whichever date is later. Customer should retain necessary documentation to verify the date of receipt and installation of the Product. Customer will be required to produce this documentation in order to obtain Warranty services from MacroAir. The Warranty specified herein applies only to Products purchased on or after April 15, 2021.

PRODUCTS AND SYSTEMS COVERED BY THIS WARRANTY AND APPLICABLE WARRANTY PERIODS:

Fan Type	Mechanical: Blades, Hub & Frame	Standard Electrical[1]: Motor, Electrical Controls, Remote	Labor
AVDX	15 Years	10 Years	1 Year
AirVolution	15 Years	7 Years	1 Year
AirLegacy	15 Years	5 Years	1 Year
AVD3	10 Years	5 Years	1 Year
AVD 370	10 Years	5 Years	1 Year

WARRANTY COVERAGE:

Subject to the exclusions herein, the MacroAir Warranty covers any defects in workmanship or materials of the covered Products under normal operation and prescribed maintenance when those defects adversely affect the ability of the Product to operate properly.[2] The Warranty only covers Products which have been installed in compliance with MacroAir's written installation instructions by a state-qualified or licensed electrical contractor and operated and maintained by the Customer in conformity with MacroAir's written instructions, and when the Product is purchased directly from MacroAir or a MacroAir Authorized Dealer.

This Warranty is subject to all provisions, conditions, limitations, and exclusions explained in this Warranty document.

*Scan QR code or visit macroairfans.com/warranty for full warranty information.

1 "Standard Electrical" means any common electrical component that is utilized across more than one fan line will assume the higher warranty period.
2 "Operate properly" applies only to mechanical, electrical, and structural systems of the Product.

Information

Technical Support

For installation assistance, application questions, technical support & any other inquiries, please contact our Technical Support team at (866) 668-3247 option 2.

Let's Stay Connected!

Social

Website

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