MacroAir
engineers of air™

Operation Manual

Controller 30

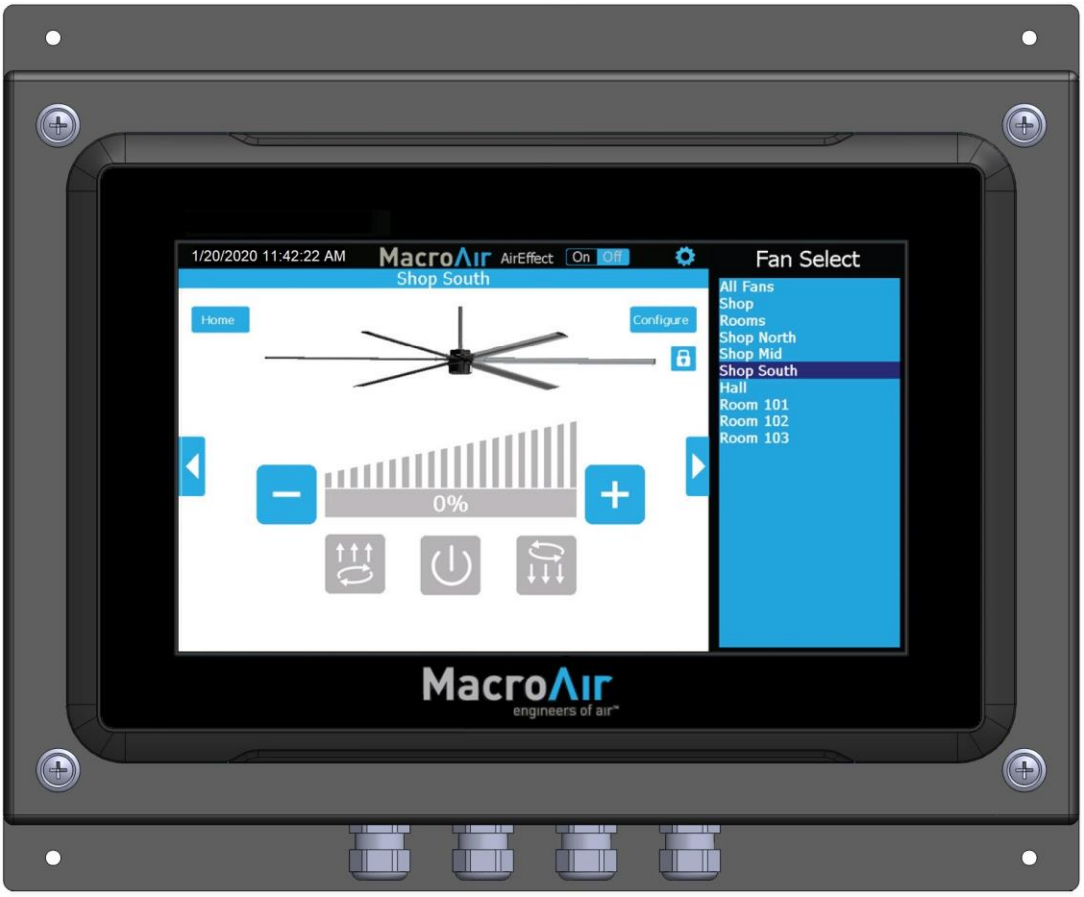


Table of Contents

Introduction

Caution & Safety, Electrical Guidelines 2
Hazard of Electrical Shock, Installation and Service, Key Safety Systems, Electrical Guidelines 3
Mounting Guidelines 4
Clearance Guidelines, Fan Placement and Spacing, Fan Network Ordering 5
Controller Dimensions 6
Controller Components 7

Network Installation

Network Wiring Requirements 8
Network Wiring Configurations 9
Network Excess Cable 10
Controller Wiring Instructions 11
Fan Wiring Instructions 12
Mixed Network Wiring Instructions 13
AirEffect Sensor 14

Configuration and Operation

Controller Setup 15
Controller Home Screen 16
Fan Control Screen 17
Fan Configure Screen 18
Settings Screen 19
Advanced Settings Screen 20
Groups Screen 21
Schedules Screen 22
Fine Tune Screen 23
Remote Operation 24

Information

Technical Support 25

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.

Key Safety Systems

⚠ **ATTENTION: Safety.** MacroAir fans are engineered with key safety features to prevent pieces of the fan from falling in the unlikely event of a catastrophic failure. Used together, these systems and devices provide comprehensive protection to people, equipment, and property.

Introduction

Key Safety Systems, cont.

⚠ **WARNING: Safety Cable and Guy Wires.** Install safety cable on EVERY fan. Install guy wires on every fan, unless otherwise specified. Properly installing the guy wires will keep the fan stable in case of earthquake or in “outdoor” installations where high wind conditions may occur. The safety cable, if installed per MacroAir specifications, will prevent the fan from falling in the unlikely event that the mounting system should fail.

⚠ **WARNING: Safety Cable.** A MacroAir fan should never be run without a properly installed safety cable, which is supplied with every fan along with all required hardware. You must install a safety cable for the warranty to be in effect.

⚠ **WARNING: Blade Safety Links.** Install the complete set of extended blade safety links, which connect each blade to the adjacent blades and reinforce the area between the mounting holes. This is an important precautionary measure that will help prevent a blade from falling should one break off at the hub for any reason.

⚠ **ATTENTION: Mark the Floor to Alert Personnel.** When mounting a fan in an area where materials may be elevated into its path, MacroAir recommends marking or painting the floor with a large, crosshatched circle to alert personnel of the overhead location of the fans.

Mounting Guidelines

⚠ **WARNING: Weight Considerations.** We recommend that a building structure be capable of holding approximately twice the stated hanging weight of the fan. If there is some doubt of this, a professional contractor or architect should perform a thorough evaluation of the building prior to purchasing the fans. MacroAir provides guidelines for mounting fans, however it is the sole responsibility of the building owner and installer to ensure the safety of the mounting system, that the building structure is sound, and that the installation complies with all federal, state, and local codes.

⚠ **WARNING: Torque.** The maximum torque (twisting force) that must be handled by the mounting system, including the building structure, occurs at fan startup. For a 24-foot fan, the maximum potential starting torque is 137 Ft-Lbs. When standard electrical controls are installed, the fan will never begin to approach this maximum because the standard variable-speed control system uses the soft-start fail, or when a fan is installed as a single-speed model without the variable speed control system (rare), full torque might be applied to the mounting system, so it is important that it be adequate to withstand 137 Ft-Lbs. torque.

⚠ **ATTENTION: Check Federal, State, and Local Codes.** Check all relevant codes to make sure that all product certifications, product listings, and building regulations are met. Code compliance is the responsibility of the installer.

⚠ **WARNING: Welding.** DO NOT attach the fan or fan mounting components to the building structure by welding that component to the structure. DO NOT cement the fan to the structure.

Introduction

Clearance Guidelines

⚠ **ATTENTION: Sprinkler Systems and Fan Placement.** In any installation where fire sprinklers are in place, do not interfere with their correct operation. Fans should be located no less than three (3) feet below a sprinkler and placed central to each sprinkler quadrant.

⚠ **ATTENTION: Sprinkler Systems and Code Compliance.** Prior to installing fans, review all codes applicable to sprinkler systems and fans to ensure code compliance. Refer to the wiring diagrams packaged inside the control panel for proper installation. If further advice is needed, you may contact our support staff, however it is your sole responsibility to see that the installation is completed to code and correct.

General Information on Fan Placement and Spacing

⚠ **ATTENTION: Strobe and Performance.** If possible, avoid mounting fans directly below lights or skylights to avoid any strobe effect caused by moving blades. A large fan, 20-24 feet in diameter, performs best at 20 to 30 feet above the floor, but acceptable performance has been demonstrated as low as 10 feet and as high as 50 feet.

⚠ **WARNING: Mezzanine Placement.** If the building has a mezzanine, fans should be mounted so a person cannot reach a fan in any way from the upper level/deck. Make certain that fans are positioned so that blade tips are at least three (3) feet away from any area where a person may be able to extend outward to reach them.

⚠ **WARNING: Oscillating Movement.** If unusual oscillating movement is observed, immediately stop using the ceiling fan and contact the manufacturer, its service agent, or suitably qualified persons.

REFER TO FAN INSTALLATION MANUAL(S) FOR FURTHER MAINTENANCE INFORMATION.

Fan Network Ordering

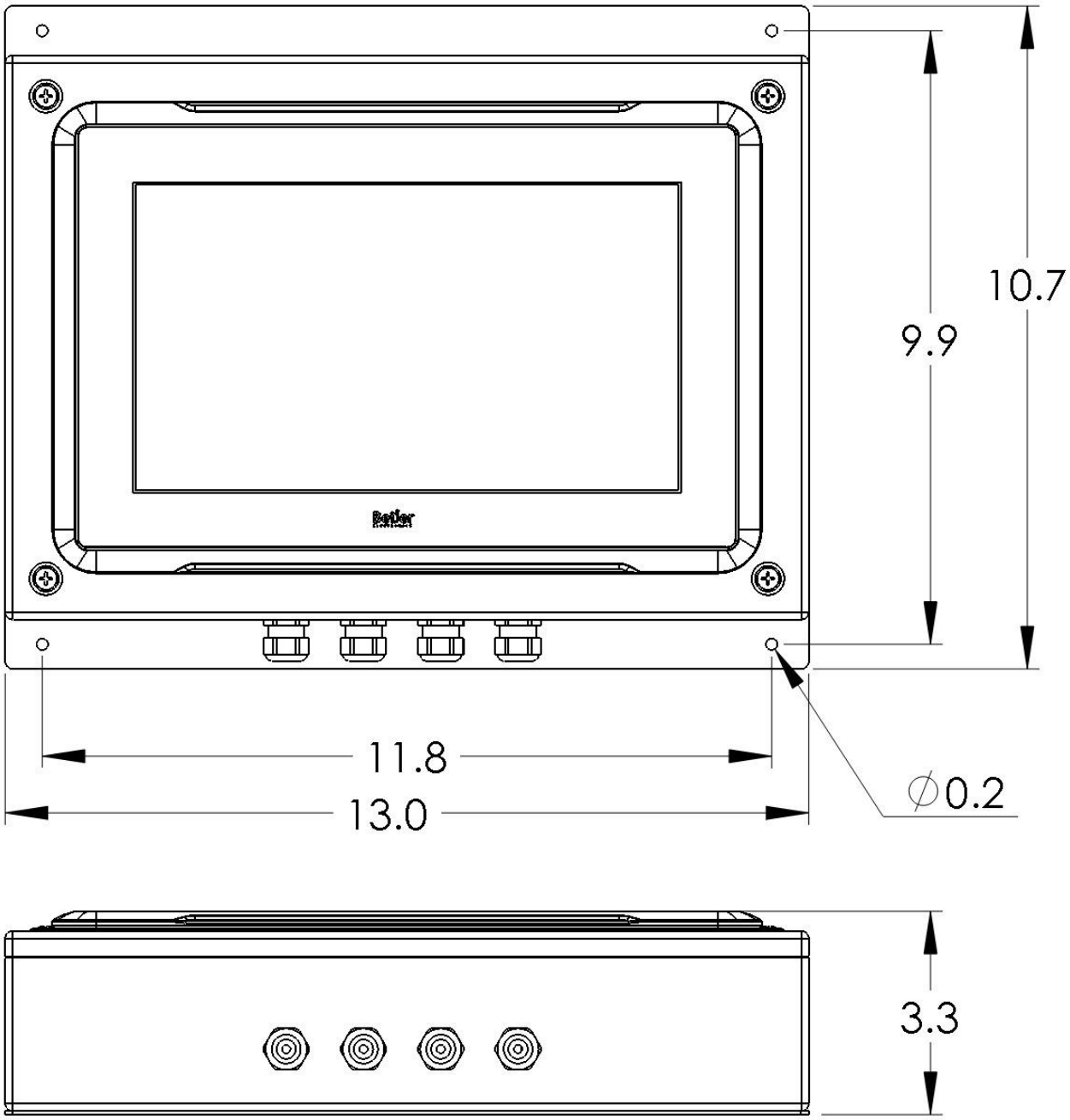
Type of controller: **Controller 30** (which can network up to 30 fans)

MacroAir customizes fans to operate in a network by: Addressing the fans.

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.

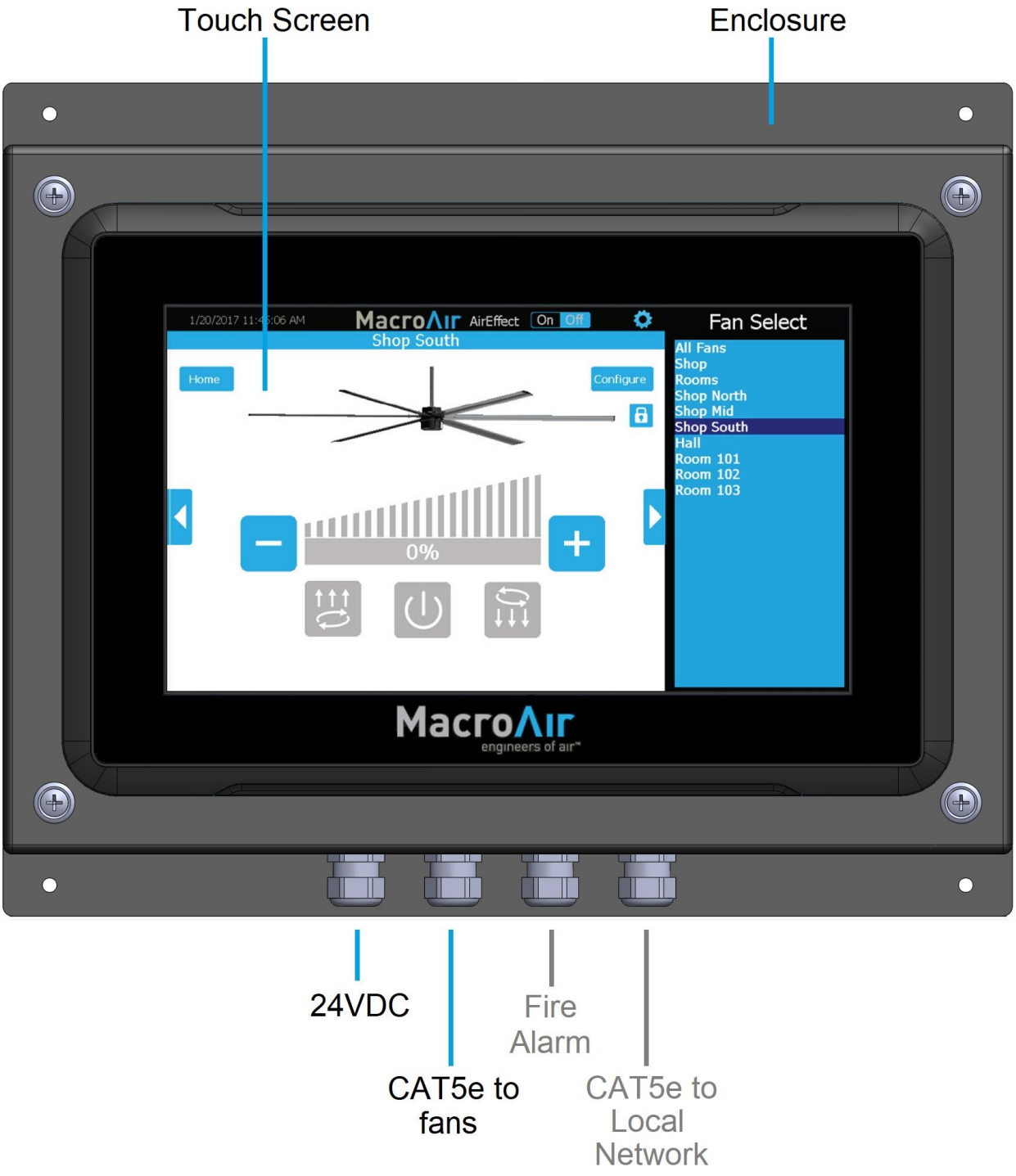
Introduction

Controller Dimensions



Introduction

Controller Components



Note: The glands for the fire alarm and CAT5e to local network are plugged from the factory in order to maintain the screen's IP 66 rating when not used. If you are utilizing the fire alarm option and/or remote operation, remove the plugs from any gland you will be using.

Network Installation

Network Wiring Requirements:

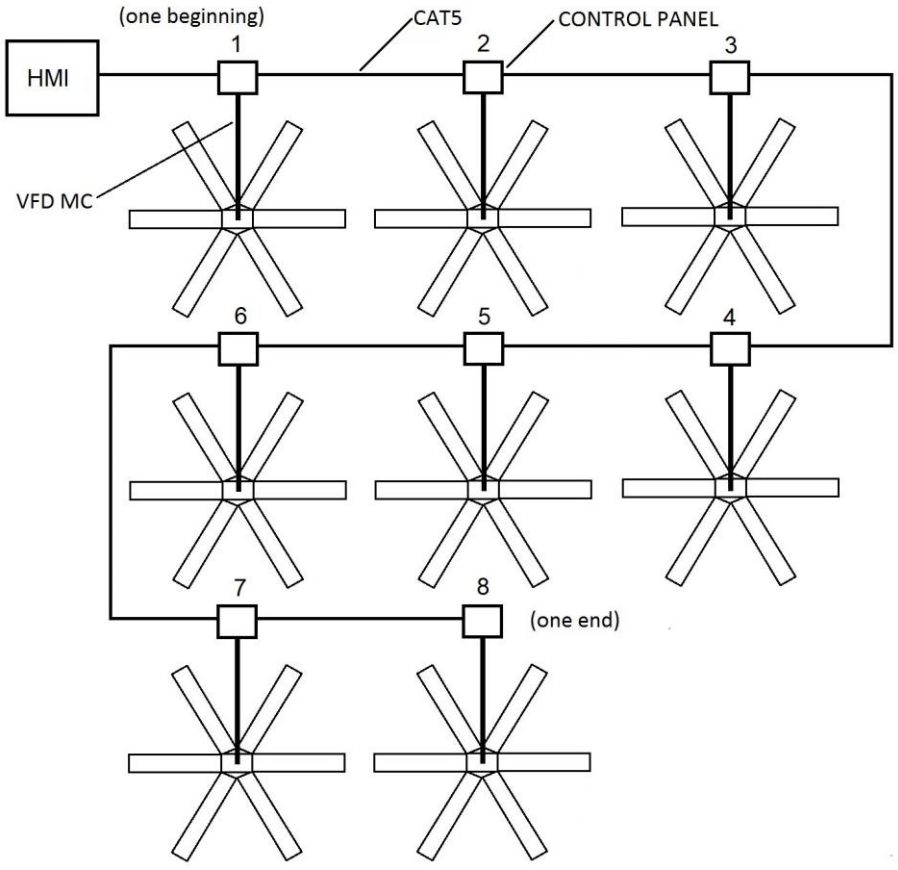
- Use stranded CAT5e or higher shielded cable.
- Minimum 24AWH (0.5mm) cross section.
- Ground the shielding and drain wire at only one point of the cable run.
- Route wires as far away as possible from high voltage AC cables, fluorescent lights, arc welders, and other equipment that transmits EMI (electromagnetic interference).
- Do not run CAT5e in conduit with high voltage AC cables.
- Do not exceed 4000ft [1219m] of CAT5e between the screen and the last fan in the network.

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 30) 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.

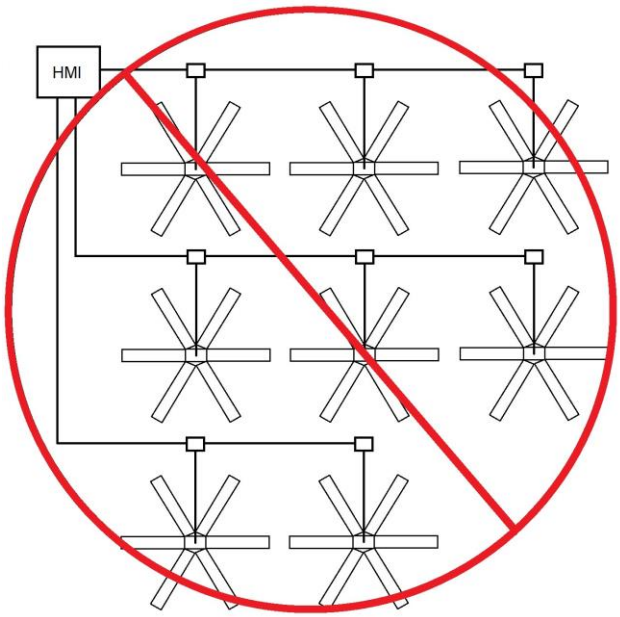


Network Installation

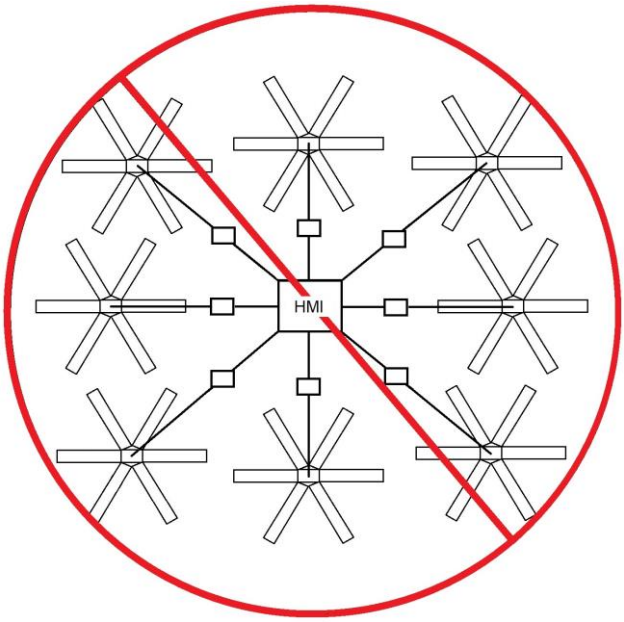
Network Wiring Configurations

Improper Wiring Configuration

End of Line x3

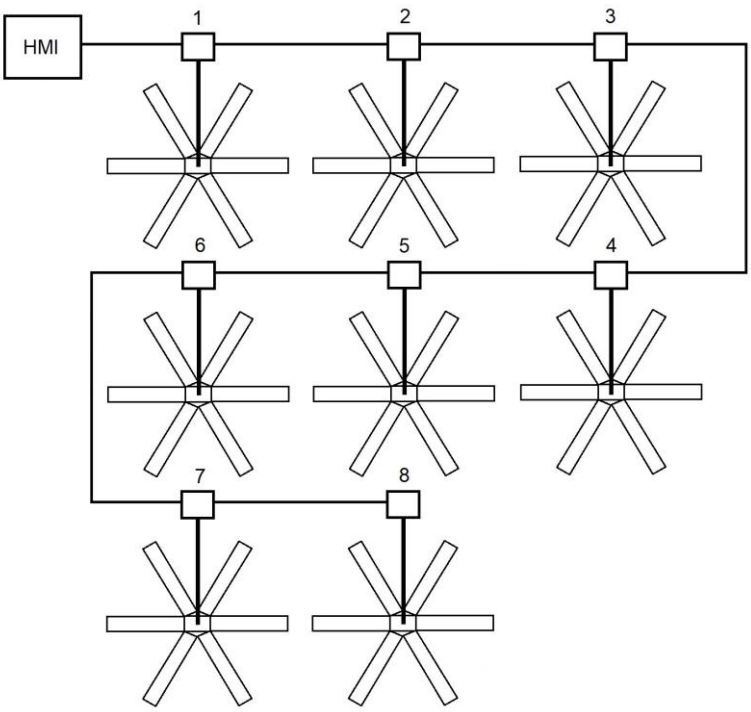


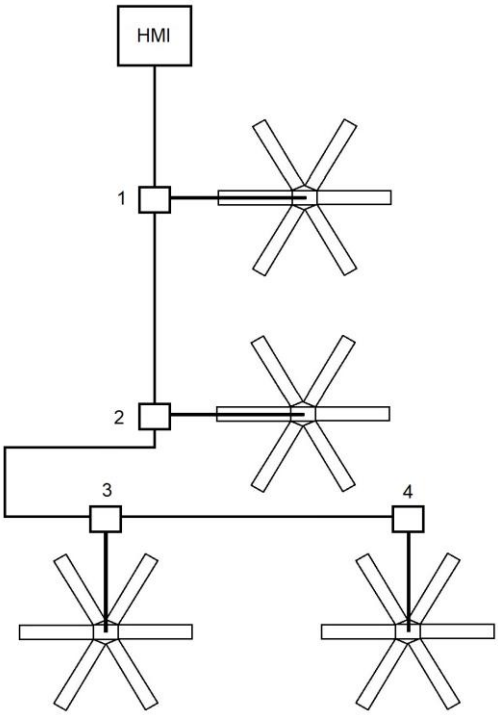
End of Line x8



Proper Wiring Configuration

ONE End of Line





Network Installation

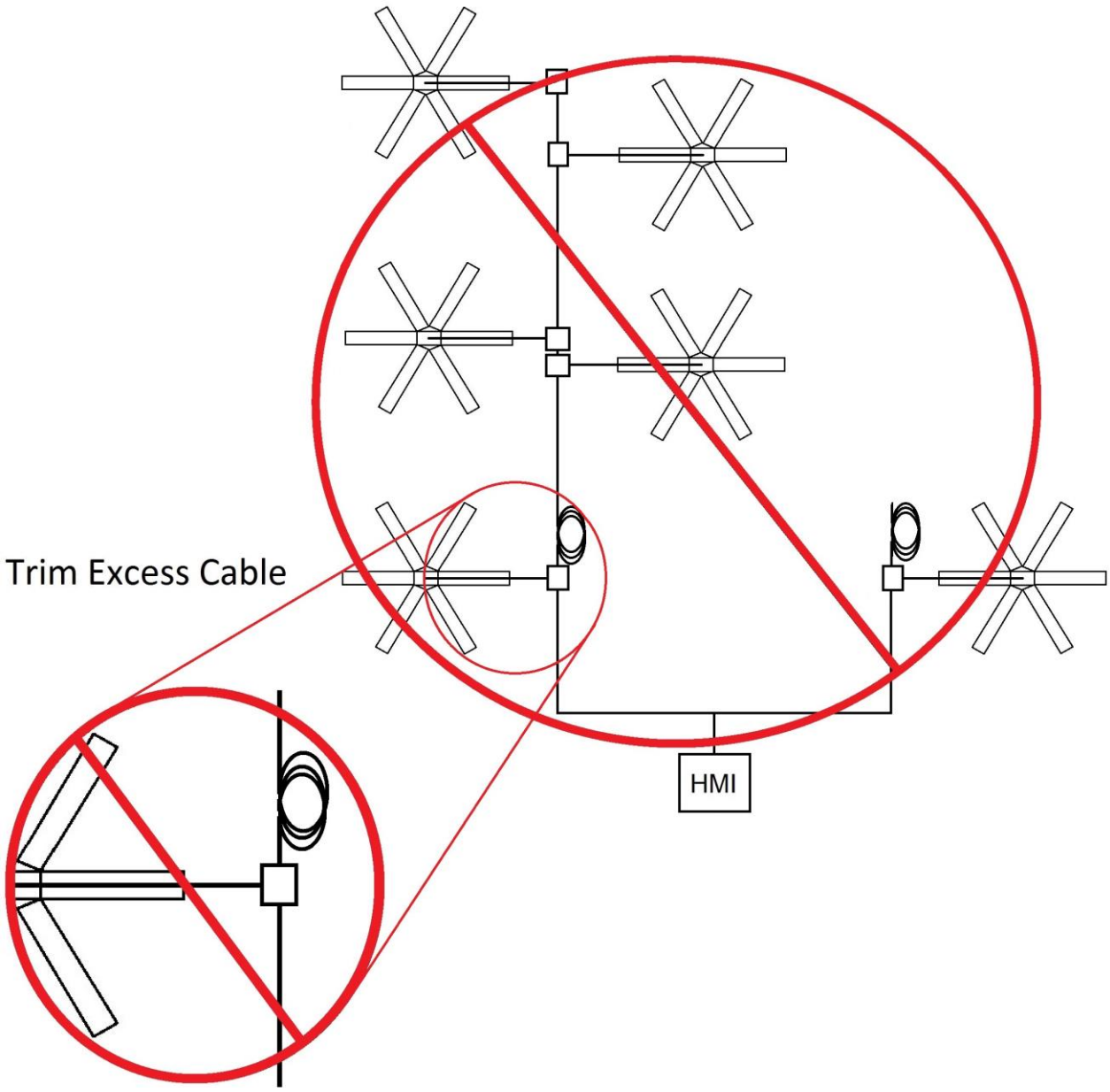
Network Wiring Configurations cont.

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

Controller Wiring Instructions

⚠ **WARNING: Power to be off.** Prior to following the steps below, ensure all power to the touchscreen is off.

1. Run the included power supply cable through the gland on the bottom of the network controller and plug the terminal block in per the below diagram.

2.

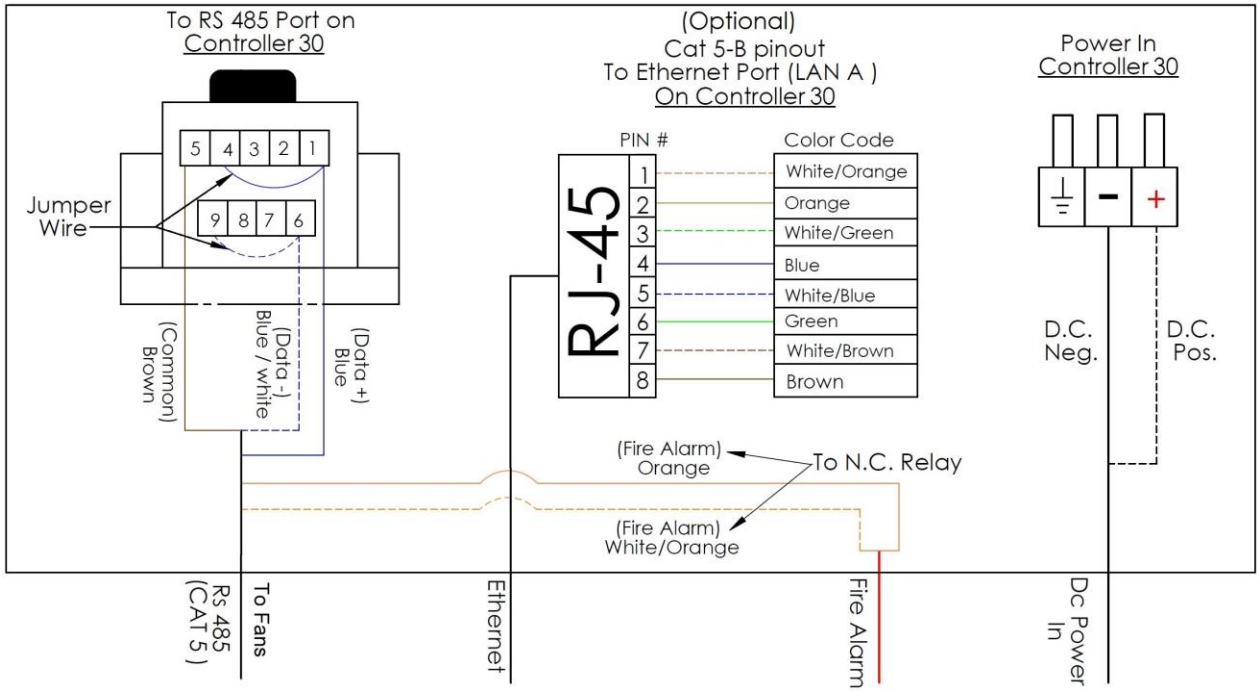
3. Run one end of CAT5e through the gland on the bottom of the network controller and wire the blue and blue/white wires to the touchscreen per the diagram below. Do not remove any factory wiring.

4.

5. If a fire alarm is being used, a normally closed relay can be tied into the orange and orange/ white wire coming from the fans. If a fire alarm is not being used, the orange pair needs to be twisted together.

6. If you are utilizing the optional remote operation feature (pg. 24), run a separate CAT5e from your router to the LAN A port on the back of the screen. The CAT5e will need an RJ45 male end terminated per the pinout below.

Touchscreen Wiring Diagram



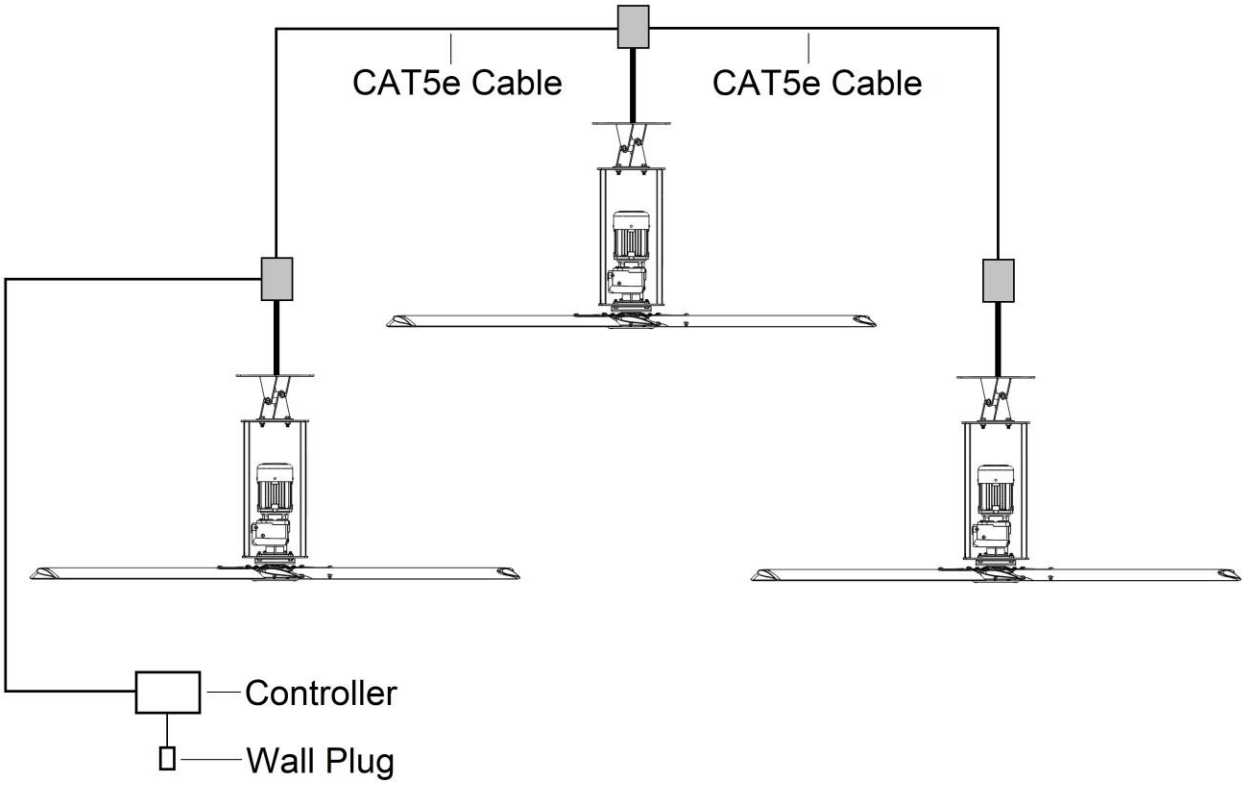
- For fan wiring instructions, refer to page (pg 12).

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.

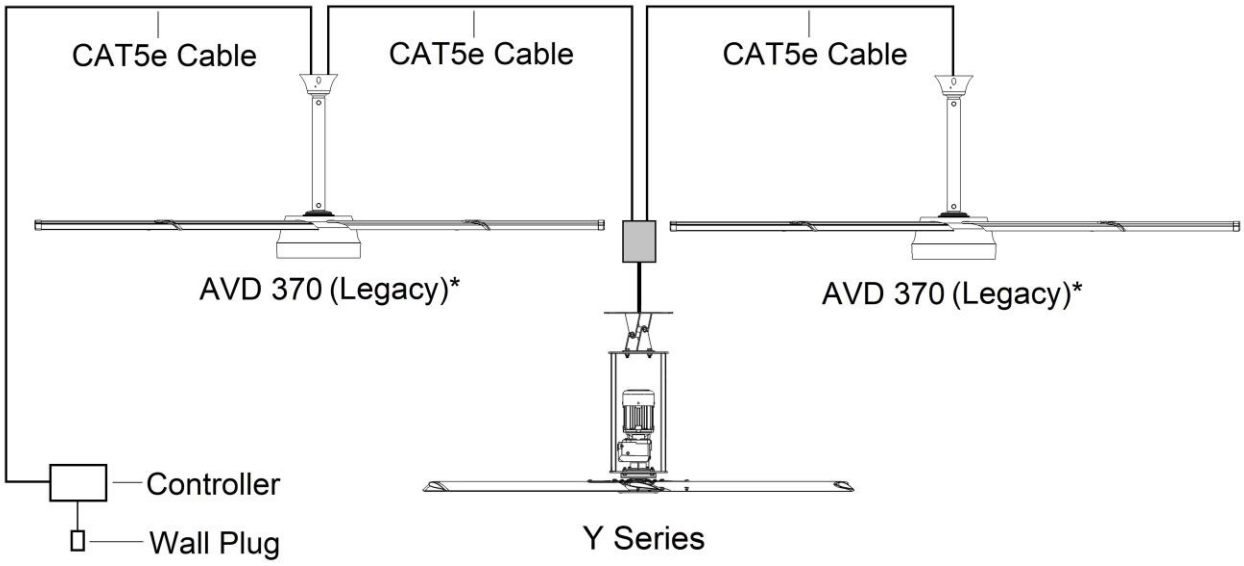


Control Panel Schematic: Refer to documentation included in the Fan Installation Manual.

Network Installation

Mixed Network Wiring Instructions

Networks utilizing different types of connections, will require Technical Support for assistance with networking your fans*. 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.**

Network Installation

AirEffect Sensor

⚠ **ATTENTION: AirEffect Option.** If you ordered the optional AirEffect feature, refer to the Operation Manual (MacroAir #90-30017-00) accompanying the AirEffect Sensor.

Configuration and Operation

Controller Setup

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

2. Power on the screen. The program will load automatically and take you directly to the Home Screen (pg. 16).

3. All fans connected to the network will be displayed on the screen. If no fans are detected, or if any fans are missing, check the CAT5e and ensure that the fans are powered on, then rescan the network using the tool on the Settings Screen (pg. 19). Occasionally a fault code will be present on one or more fans; this is normal. Faults can be reset from the Fan Control Screen (pg. 17). If a fault does not reset, refer to the fan manual for fault code descriptions and contact technical support if you require further assistance.

4. Use the Fan Configure Screen (pg. 18) to input all available data for the fan. Blade sizes must be set manually on all MacroAir fans (except Y Series).

5. Grouping allows you to create a button for multiple fans to run after being given one direction and speed command, rather than turning them all on individually. To create a group, refer to the Groups Screen (pg. 21).

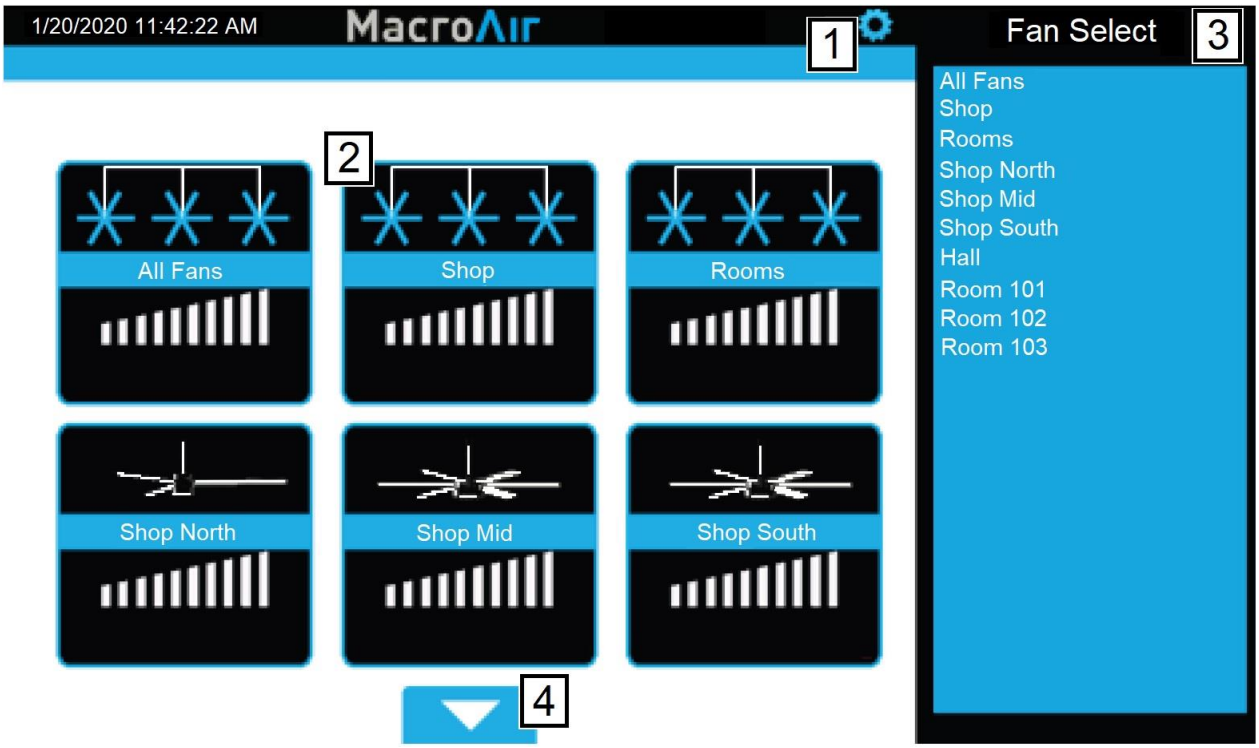
6. Scheduling allows you to set up time periods for the fans to turn on and off automatically, requiring no manual input. You can set up schedules for individual fans, all fans, or groups of fans. To create a schedule, refer to the Schedules Screen (pg. 22).

7. AirEffect is an optional control system that senses and automatically maintains a desired room temperature range by calculating the fans' ideal operating speeds and direction and automatically runs the fans accordingly. AirEffect can be enabled to be always on or turned on and off via scheduling. To set up AirEffect, refer to the Operation manual accompanying the AirEffect Sensor.

Configuration and Operation

Controller Home Screen

The home screen will display all the available fans that are on the network, as well as any groups you have created.



1 **Gear** - Takes you to the settings screen.

2 **Fan Status Box** - Displays the status of the fan. Pressing this button takes you to that fan's control screen.

3 **Fan Select** - Allows you to select any fan, even ones not currently displayed on the page.

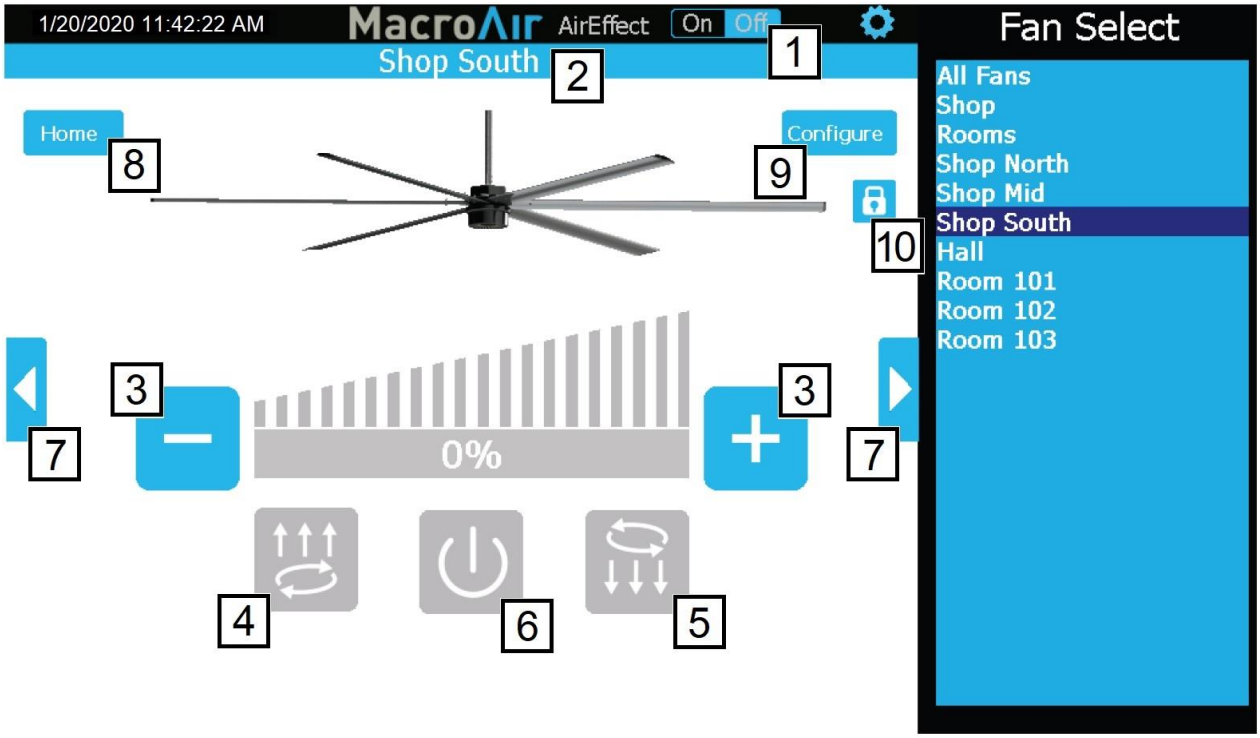
4 **Up/Down Arrow** - Takes you to the next set of fans.

If the installation has been verified, but no fans have been detected contact Technical Support (pg. 25).

Configuration and Operation

Fan Control Screen

Tapping on a fan status box on the home screen will take you to the fan control screen. This screen allows you to configure and control the fans individually or issue a command to multiple fans if you clicked the "All Fans" button or a group button. Please ensure that the fans are configured correctly before attempting to run them (see Fan Configure, pg. 18).



1 **AirEffect On/Off** – (If AirEffect was ordered with your network) If AirEffect is enabled on C30, toggles AirEffect on or off for the selected fan or group, allowing manual control.

2 **Fan/Group Name** - Displays the name of the fan or group.

3 **Decrease/Increase Speed** - Increase or decrease the speed between 0-100% by 5% using "-" and "+" buttons.

4 **Reverse Button** - Runs the fan clockwise to pull air up. This setting is useful to achieve destratification without creating a discernable breeze.

5 **Forward Button** - Runs the fan counter-clockwise to blow air down. This is the main setting used for cooling.

6 **Power Button** - Stops the fan if it is running.

7 **Right/left Arrows** - Takes you to the next fan/group.

8 **Home** - Takes you to the home screen.

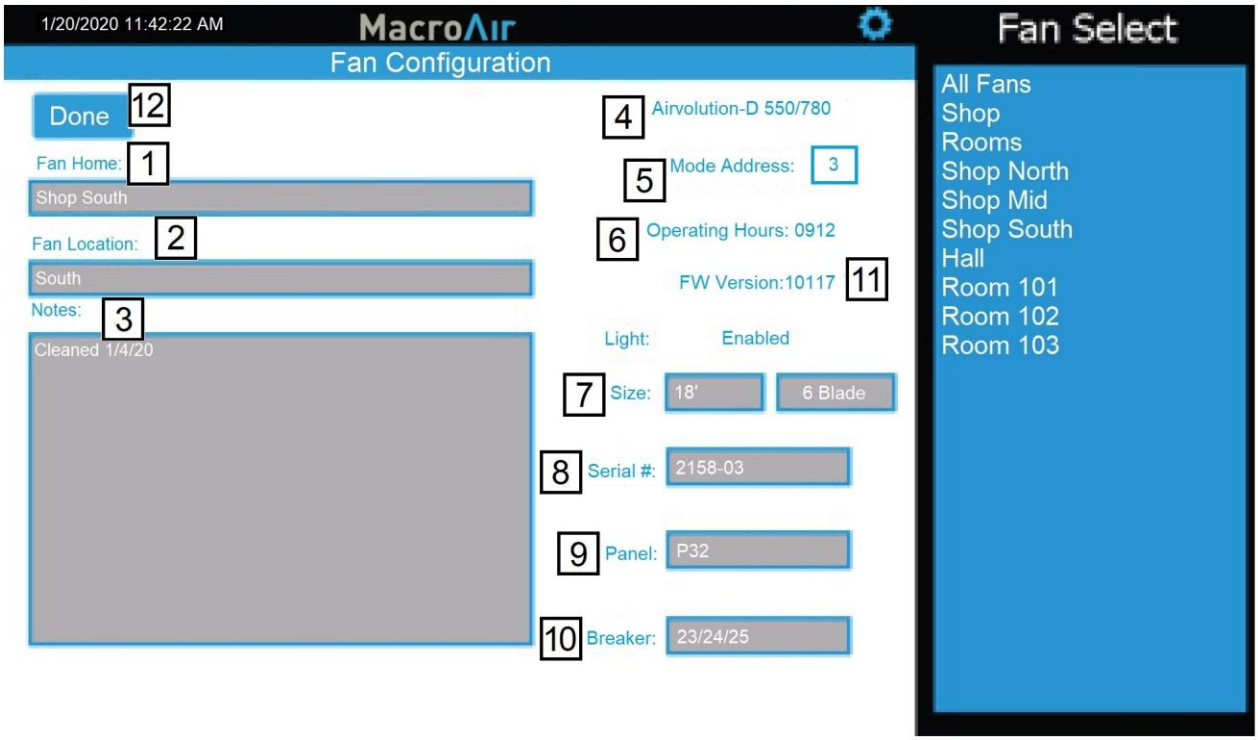
9 **Configure** - Takes you to the fan's configure screen.

10 **Lock** - Locks and unlocks control of fan and functions (requires admin login, refer to Settings Screen, pg. 19).

Configuration and Operation

Fan Configure Screen

Tapping the Configure button on the fan control screen will bring you to the fan configure screen. This screen displays basic information on the fan. This screen also provides fields to input information that may prove useful for reference or troubleshooting.



Note: Entry on the screen for items 1, 2, 3, 8, 9 ,and 10 are done on a pop-up keyboard.

1 **Fan Name** - Changes the name that is displayed for the fan.

2 **Fan Location** - Allows you to input a location (for example “Loading Dock”) which can help identify the fan.

3 **Notes** - Any additional notes on the fan you would like to include.

4 **Type** - Displays the fan model.

5 **Node Address** - Displays the network address of the fan.

6 **Operating Hours/Voltage** - Displays the operating hours for AVD fans/Displays incoming voltage rating of the VFD for AirVolution Legacy fans.

7 **Size** - Allows you to set the fan size. **Required** for MacroAir fans.

8 **Serial** - Allows you to input the serial number of the fan for easy reference.

9 **Panel** - Allows you to specify the electrical panel the breaker is in for easy reference.

10 **Breaker** - Allows you to specify the breaker number the fan is on for easy reference.

11 **FW** - All fans display a Status Code (except Y Series fans).

12 **Done** - Returns to the Fan Screen.

Configuration and Operation

Settings Screen

Tapping the Settings button will bring you to the settings screen. This screen contains information on the touchscreen and configuration options for the network.

1 **Exit** - Goes back to the Home screen.

2 **Software Version** - Indicates the software version of the touch screen.

3 **Date** - Displays the revision date of the screen software.

4 **Current Date** - Displays current date. To setup AirEffect and fan scheduling you will need to set the date (pg 20).

5 **Mkey** - Displays the code to grant access to Comm settings for MacroAir Tech Support.

6 **Language** - Allows selection of alternate languages (English, Spanish, French, Malay).

7 **Re-scan Network on Exit** - When selected, rescans the network to detect any changes. Used after adding/removing fans or changing addresses.

8 **AirEffect (Optional)** - Provides access to AirEffect options. This will only be available if AirEffect was ordered with your network (pg 14).

9 **Groups** - Provides access to the Groups page (pg 21).

10 **Schedule** - Provides access to the Schedules page (pg 22).

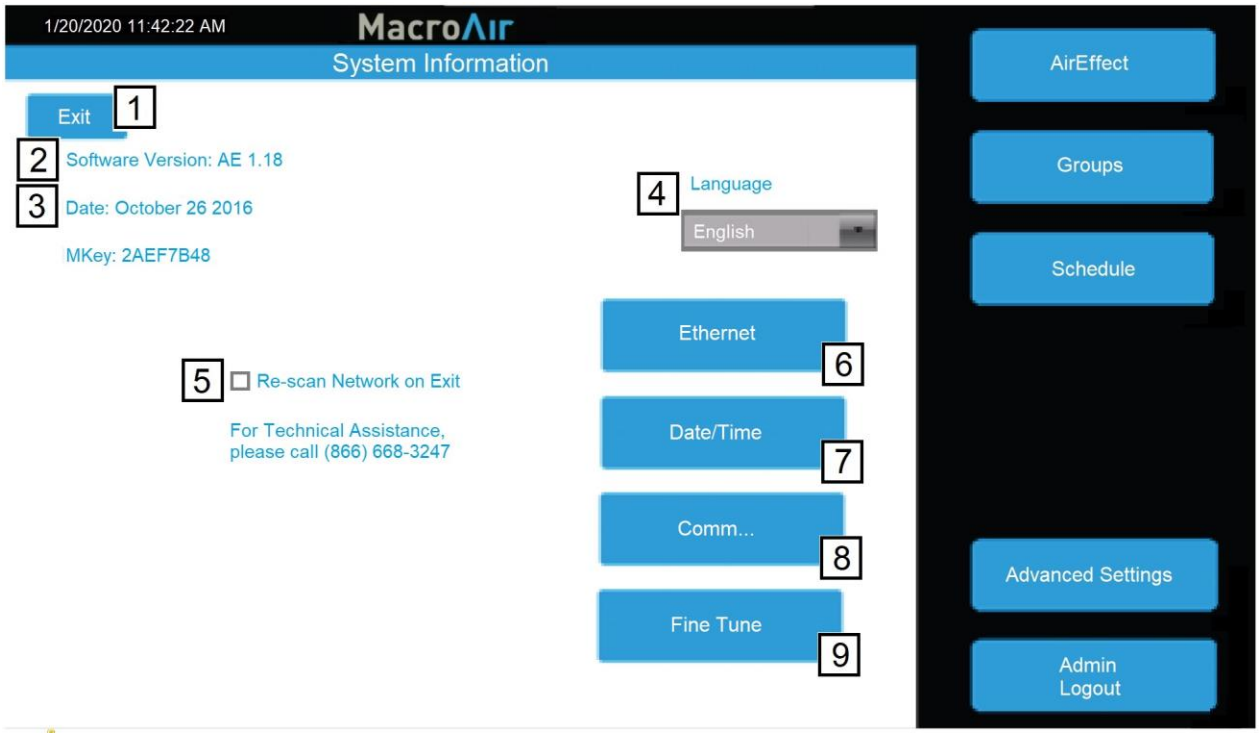
11 **Advanced Settings** - Displays the Advance Settings page (pg 20).

12 **Admin Login** - Brings up the Admin Login page. You will need to be logged in under admin to access most of the other pages on the Settings screen. The default username AND password is "admin".

Configuration and Operation

Advanced Settings Screen

Tapping on the "Advanced Settings" button will bring you to the Advanced Settings screen. This screen is very similar to the Settings screen, but contains 4 additional advanced options (Ethernet, Date/Time, Comm and Fine Tune).



1 **Home** - Goes back to the Home screen.

2 **Software Version** - Indicates the software version of the touch screen.

3 **Date** - Displays the revision date of the screen software.

4 **Language** - Allows selection of alternate languages.

5 **Re-scan Network on Exit** - When selected, rescans the network to detect any changes. Used after adding/removing fans or changing addresses.

6 **Ethernet** - This page displays the Ethernet information for the screen. This information is used to remotely control the screen with a program such as VNC viewer. More information is available in the Remote Operation section of the manual (pg. 24).

7 **Date/Time** - This screen allows you to set the date/time. This is very important for scheduling, as the screen will run schedules according to the programmed date/time.

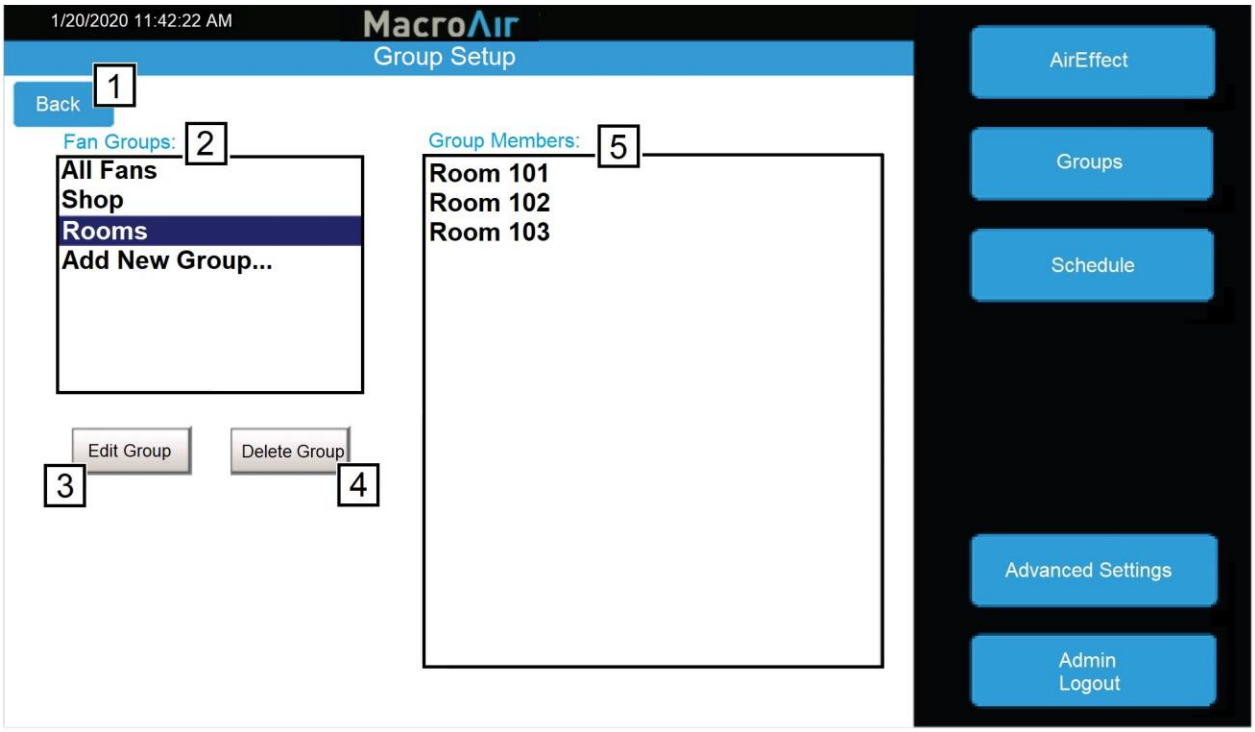
8 **Comm** - This screen provides access to the Modbus communications page. This is a password-protected page and is only accessible with MacroAir technical support on the phone. If you need access to this page, please call us at (866) 668-3247.

9 **Fine Tune** - This screen allows you to adjust the maximum speed of each fan. More information on the Fine Tune page (pg. 23).

Configuration and Operation

Groups Screen

Tapping on the “Groups” button will bring you to the Groups screen. This screen allows you to create groups and assign fans to them, easily allowing control of multiple fans at the same time.



1 **Back** - Takes you back to the previous screen.

2 **Fan Groups** - Displays fan groups you have created. Click “Add New Group” to add a new group.

3 **Edit Group** - Allows you to change the group name or group members of the selected group. Having a group name is required to save changes.

4 **Delete group** - Deletes the selected group.

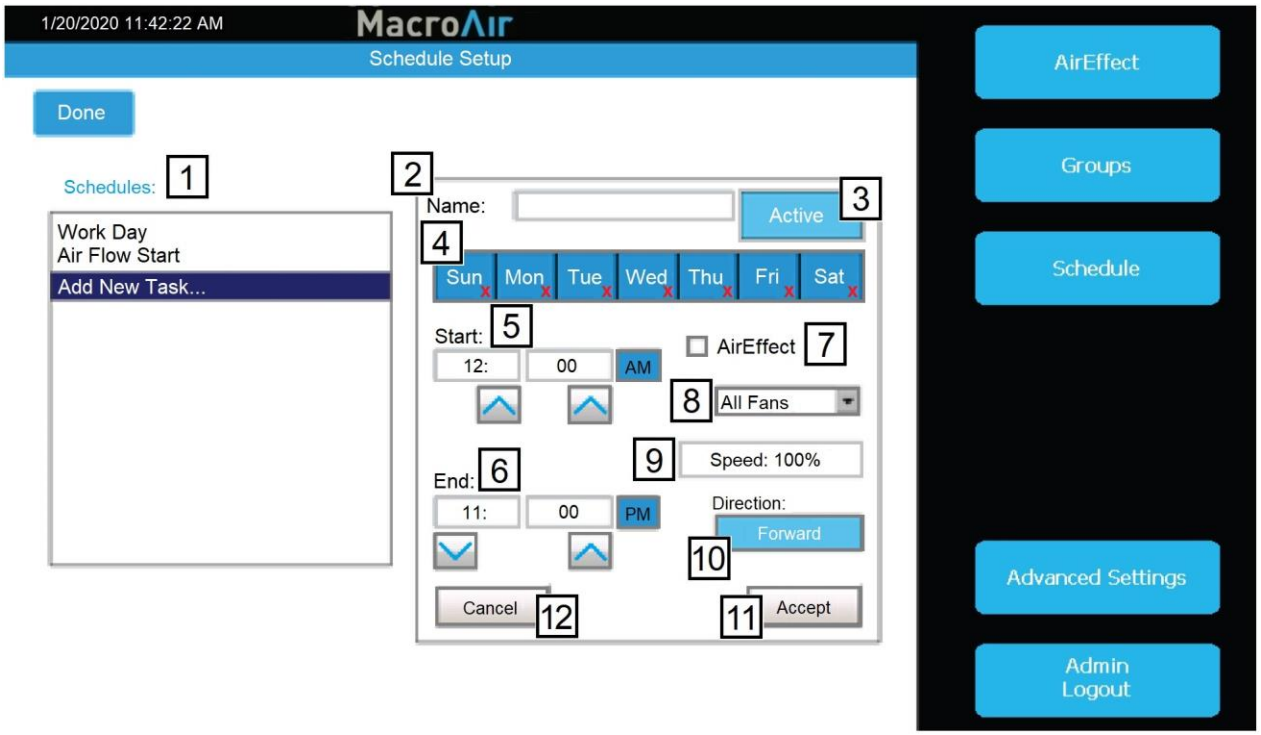
5 **Group Members** - Displays all fans with checkboxes to indicate which fans are part of the group. Check boxes to add fans to the group, remove checks to remove fans from the group.

Edit Group Name - Allows you to edit the group name. Press “Accept” to save changes or “Cancel” to cancel any changes made. (Only visible when “Edit Group” is pressed.)

Configuration and Operation

Schedules Screen

Tapping the Schedules button will bring you to the schedules screen. This screen allows you to set a schedule for fans or groups to run and stop automatically.



1 **Schedules** - Allows you to select an existing schedule or create a new schedule when "Add New Task" is selected.

2 **Name** - Names the schedule (required).

3 **Active/Inactive** - Enables or disables the schedule.

4 **Sun-Sat** - Selects which days to run the schedule. Red X's indicate days where the schedule is not in effect .

5 **Start** - Specifies time of day when the fans will run.

6 **End** - Specifies time of day when the fans will stop running.

7 **AirEffect (Optional)** - Runs fans according to AirEffect during the schedule.

8 **Drop Menu** - Allows you to select a fan or group. If AirEffect is selected, zones are displayed instead.

9 **Speed** - Specifies the speed the fans will run. If AirEffect is selected, this field is ignored.

10 **Direction** - Specifies the direction the fans will run. If AirEffect is selected, this field is ignored.

11 **Accept** - Save Changes.

12 **Cancel** - Cancel Changes.

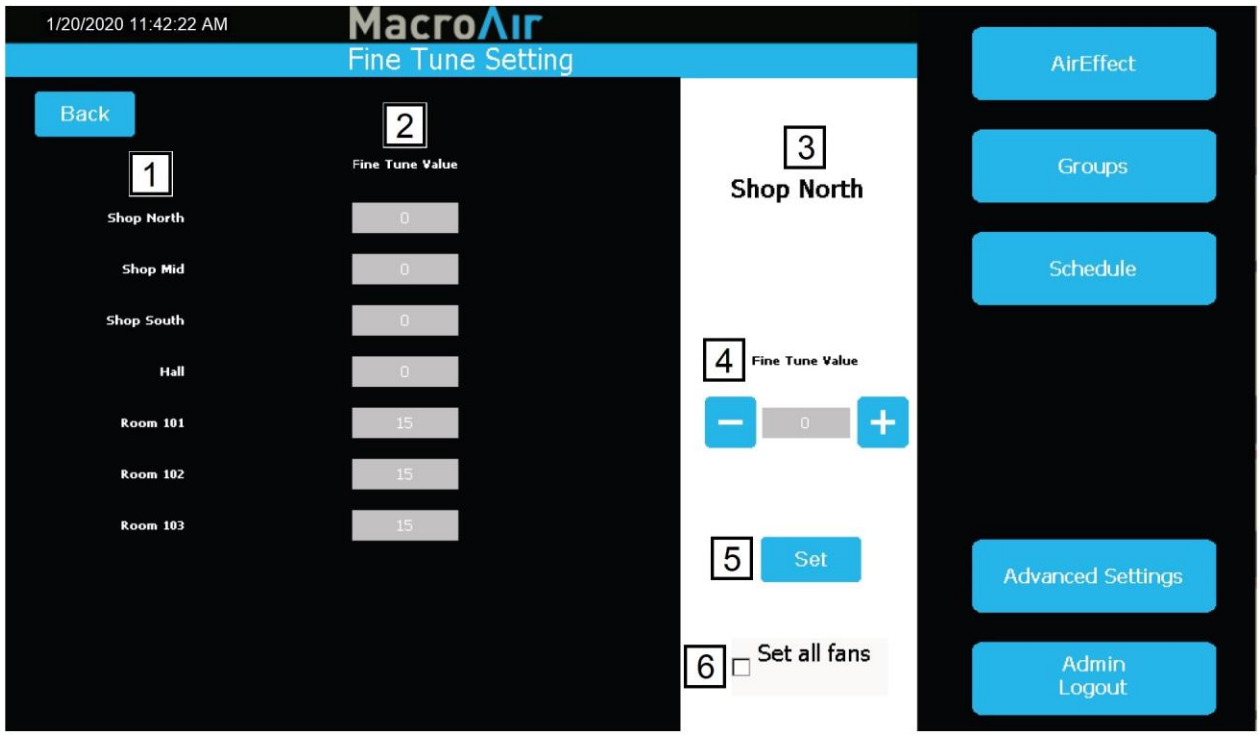
Edit Schedule - Allows you to edit a selected existing schedule (visible when a schedule is selected).

Delete Schedule - Allows you to delete a selected existing schedule (visible when a schedule is selected).

Configuration and Operation

Fine Tune Screen

Tapping the Fine Tune button will bring you to the Fine Tune screen. This screen allows you to adjust the maximum speed for every fan, which is useful in applications where speed needs to be limited.



1 **Fan Names** - Displays the names of all network fans.

2 **Fine Tune Value** - Displays the percentage of maximum speed by which a fan is limited (e.g., a value of 10 will limit the fan to 90% of maximum speed)

3 **Selected Fan Name** - Displays the name of the selected fan.

4 **Decrease/Increase Fine Tune Value** - Use the "-" and "+" buttons to decrease or increase the fine tune value of the selected fan, respectively.

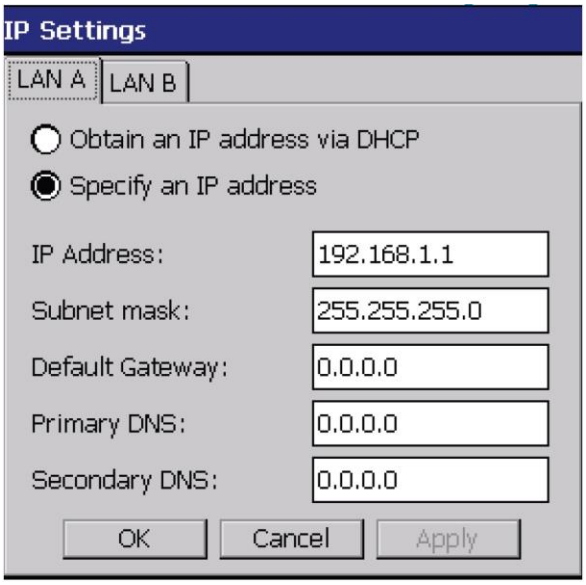
5 **Set** - Saves changes made to the fine tune value of the selected fan.

6 **Set All Fans** - Applies the fine tune value of the selected fan to all fans on the network.

Remote Operation

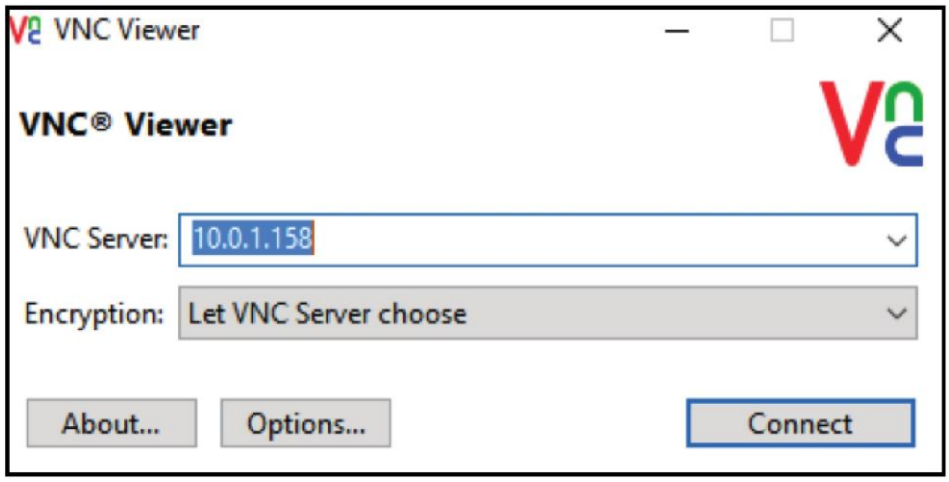
MacroAir Controllers are capable of being controlled remotely, allowing access from any computer or smart device on the same local network. Please follow the steps below to properly set up remote operation:

1. Plug your controller into your internet network via the Ethernet port on the back of the screen.
2. In the settings screen of the controller click on “Ethernet” to check the IP address.



You can let it obtain an IP address or specify one.

3. You will need a computer or device that is on the same network as the Controller with a VNC viewer installed (“VNC-Viewer” used below).



4. Open the VNC and input the IP address of the controller.
5. Select connect and the controller screen should show up.

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.

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