# Control Air M and M+

For Commercial Water to Water DDC Applications

BOSCH

Installation & Operation Manual

BTC 469503103 A (2019/02) US

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# 1 Key to Symbols and Safety Instructions

## 1.1 Key to Symbols

### Warnings

Warnings in this document are identified by a warning triangle printed against a grey background.

Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

- **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.
- **NOTICE** is used to address practices not related to personal injury.

### Important information

This symbol indicates important information where there is no risk to people or property.

## 1.2 Safety Warnings

**WARNING: ELECTRIC SHOCK HAZARD**

- Installation and servicing of this equipment can be hazardous due to the electrical components. Only trained and qualified personnel should install, repair, or service the equipment.

**WARNING: ELECTRIC SHOCK HAZARD**

- Before performing service or maintenance operations on the system, turn off main power to the unit. Electrical shock could cause personal injury or death.

**WARNING: FIRE, INJURY HAZARD**

- When working on equipment, always observe precautions described in the literature, tags, and labels attached to the unit. Follow all safety codes. Wear safety glasses and work gloves. Use a quenching cloth for brazing, and place a fire extinguisher close to the work area.

**WARNING: ELECTRIC SHOCK HAZARD**

- To Reduce the risk of Fire or Electric Shock, Do not interconnect the outputs of different class 2 circuits.

**WARNING:**

- This product can expose you to chemicals including Lead and Lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

# 2 Introduction

## 2.1 The Control Air M/M+ Interfaces

The Control Air M and M+ (M=Manager) is a Human-Machine Interface (HMI) that interfaces with the BOSCH DDC Control Air 5600, enabling the user to view and change property values, and/or control parameters, to match a corresponding application whether it is a Water to Air or Water to Water Heat Pump. It also provides a means of accessing and modifying the controller's schedule and real time clock in applications where a system server or Building Automation System (BAS) is not available. The Control Air M is designed for applications where there is one (1) WSHP. The Control Air M+ is designed for applications where there is up to fifty (50) WSHP's (existing networks only).

The software is normally configured at the factory to match the unit configuration, however, there are cases where additional on-site changes need to be made and this screen will allow the qualified technical or commissioning agent to incorporate such changes (without having to download a different software application) via the commissioning tool. The interface is offered in two forms: as a wall mount or unit mounted Control Air M/M+module or in the form of an APP called the Equipment Touch (OEM), which can be found in the Google Play Store (Android Only).

## 2.2 The Control Air M/M+ Module

The Control Air M/M+ module (Figure 1) is a touchscreen device with a 4.3" color LCD display that you connect to a Control Air 5600 to view or change its property values, schedule units, view trends and alarms, and more. The unit connects to the controller via the onboard serial port. The module can be purchased by the following part numbers:

- Control Air M (8733951042)
- Control Air M+ (8733951043)
- Connecting Cable (Virtual Control Air M/M+ only) (8733908163)

The module is only compatible with the Control Air 5600 controller.

*Figure 1*

## 2.3 Virtual Control Air M/M+ (Equipment Touch (OEM) APP)

Virtual Control Air M/M+ (see Figure #2) provides the end-user an interface to a controller by way of a Android Tablet and a purchased USB-L cable (8733-927-403). The adapter; USB to micro USB (not provided by BOSCH) may be needed if USB port is not available on Android device. This adapter, not provided by Bosch, needs to be a female USB to male micro USB. Once the cables are purchased, the corresponding driver will need to be downloaded and installed before using the application. The USB or micro USB end of the cable is connected to the Android device, and the serial end is connected to the DDC controller. The Control Air M/M+ cable driver, and instruction manual are all available for free download at the Bosch Thermotechnology website.

**WARNING: FIRE, INJURY HAZARD**

- When working on equipment, always observe precautions described in the literature, tags, and labels attached to the unit. Follow all safety codes. Wear safety glasses and work gloves. Use a quenching cloth for brazing, and place a fire extinguisher close to the work area.

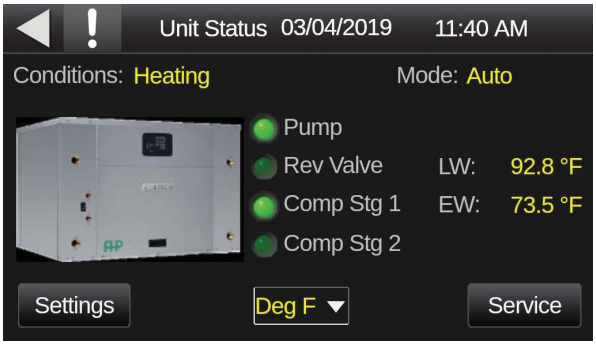


*Figure 2*

## 3 Specifications

| Description | Value |
|---|---|
| Power | 24 Vac (+/-15%), 5 VA, 50-60 Hz, Class 2 |
| Backlit LCD display | 4.3" resistive touchscreen color LCD discplay with backlighting WQVGA 480x272 px |
| Cable | 6 ft. (1.8 m) cable to connect to controller's Local Access port. |
| Communication | Rnet: 2-wire EIA-485 port for connection to the Rnet sensor network (115 kbps) |
| Memory | — 16 MB Flash memory to store screen file.<br>— 1.5 MB RAM to store variable data and LCD data.<br>— 4 KB Serial EEPROM to store non-volatile configuration data. |
| Operating Range | -4° to 140°F (-20°C to 60°C), 10%-90% RH noncondensing |
| Overall dimensions | — Width: 5-7/16 in. (138mm)<br>— Height: 4-1/16 in. (116mm)<br>— Depth: 1-3/8 in. (30mm) |
| Weight | 0.54 lbs (0.24 kg) |
| Listed by | UL-916 (PAZX), CE, FCC Part 15-Subpart B-Class A |
| Temperature Sensor | — Range @ 95% RH: -4°F to 140°F (-20°C to 60°C)<br>— Range @ 20% RH: -4°F to 194°F (-20°C to 90°C)<br>— Accuracy @ 25°C: ±0.4°C<br>— Accuracy over 20°C to 30°C: ±0.5°C<br>— Accuracy over 10°C to 45°C: ±1.0°C<br>— Accuracy over full range: ±2.5°C<br>— Resolution: 0.01°C |
| Humidity Sensor | — Range: 0 to 100% RH<br>— Accuracy over 20 to 80% RH: ±3.0% RH<br>— Accuracy over full range: ±5.0% RH<br>— Resolution: 0.05 RH |

*Table 1 Specifications*

## 4 Physical Dimensions

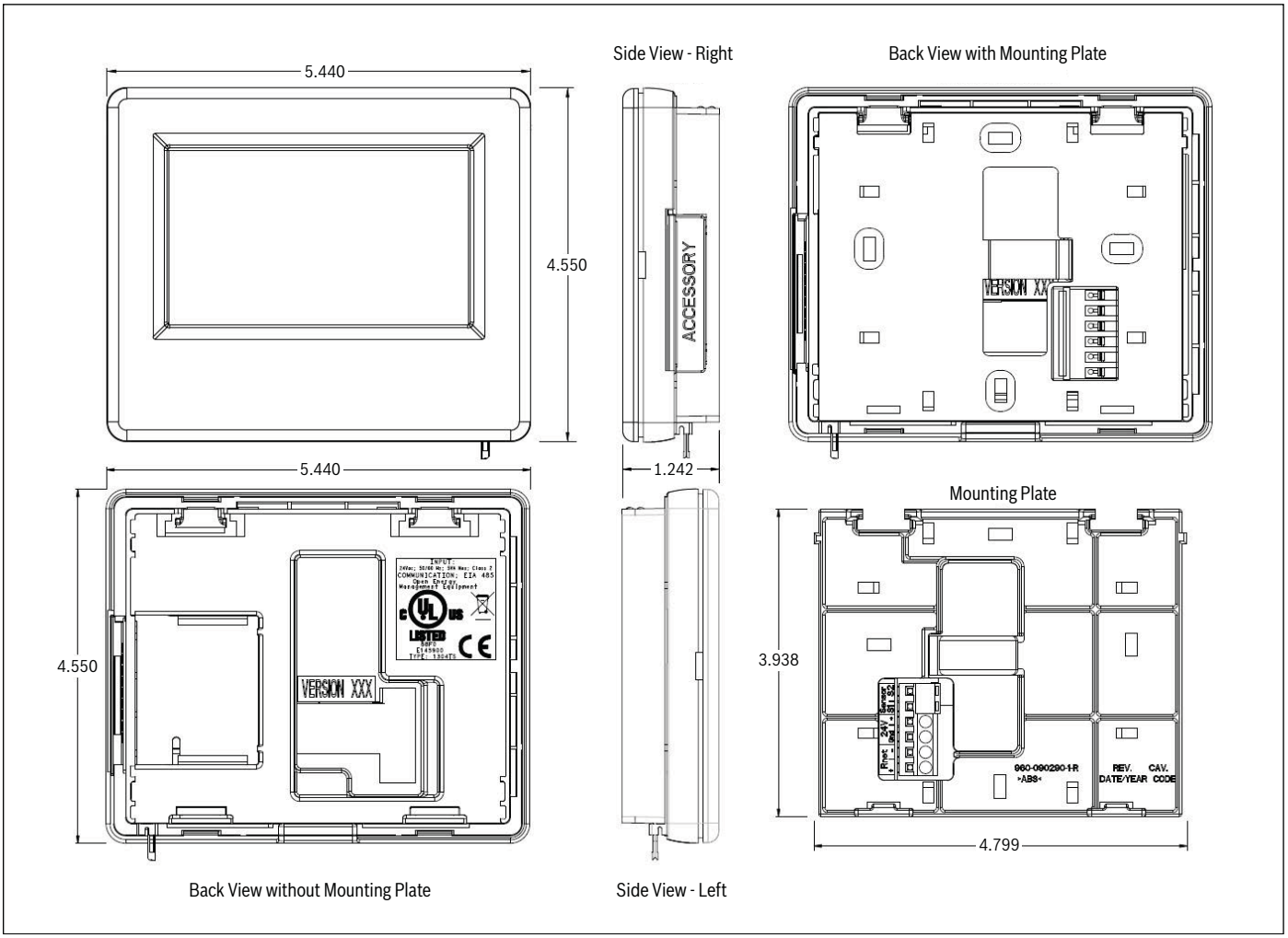


*Figure 3*

### Control Air M/M+ Module Termination Details

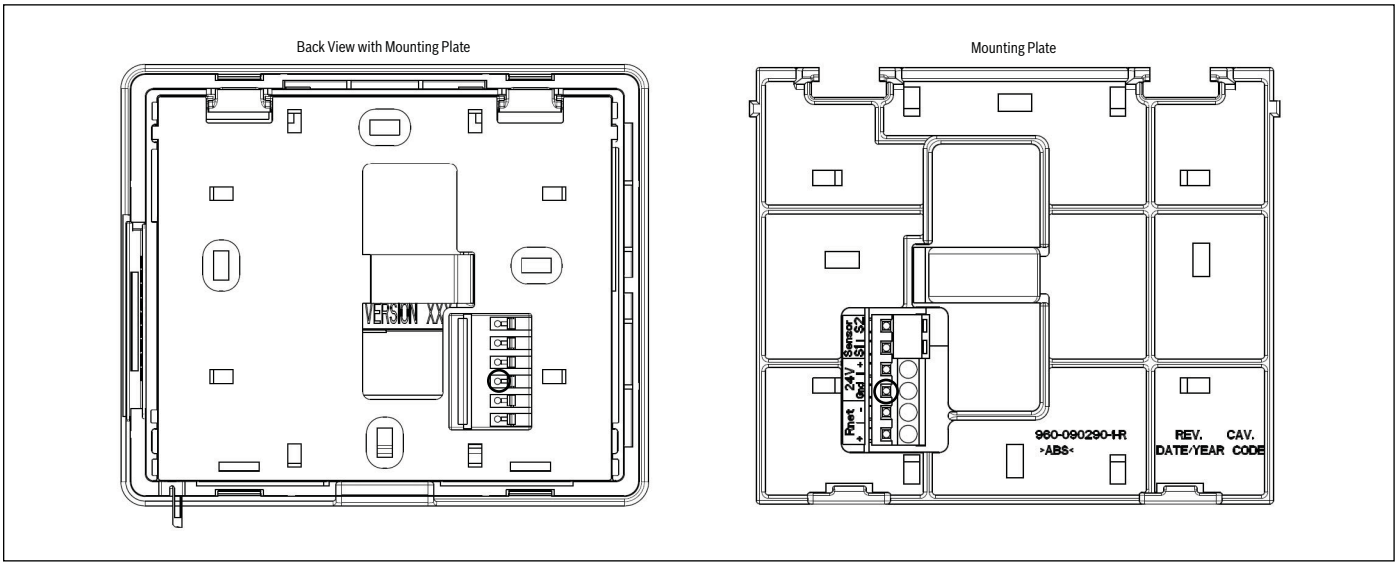


*Figure 4*

# 5 Wiring

The Control Air M communicates through a Rnet connection. The Control Air M is intended for use with a single WSHP. It can be wired using the instructions in section 6. The Control Air M+ communicates through a BACnet MS/TP connection. The Control Air M+ is intended for use with up to 50 WSHP's on an exisiting network.

## 5.1 Recommended Wiring Scheme

| Connect this wire: | To this terminal on the Control Air M: |
|---|---|
| Red | 24 VAC (R) |
| Black | 24 VAC (C) |
| White | Rnet+ |
| Blue | Rnet- |

*Table 2 Power Wiring*

2-conductor wire 18 AWG for distances up to 100 feet. All transformer secondaries must be grounded. Wiring connections must be in accordance with NEC and local codes. All wiring and mounting screws must be field supplied.

## 5.2 Rnet Wiring Specifications

**NOTICE:**

- Use the specified type of wire and cable for maximum signal integrity.

| Description | Value |
|---|---|
| Cable | 4 conductor, unshielded, or unshielded CMP, plenum rated cable |
| Conductor | 22 AWG (7x0096) bare copper |
| Maximum length | 500 feet (152 meters) |
| Recommended coloring | Jacket: White |
| UL temperature | 32–167°F (0–75°C) |
| Voltage Limited Listing | 300 VAC, power UL: NEC CL2P, or better |
| Insulation | Low-smoke PVC (or equivalent) |
| Color Code | Black, white, green, red |
| Shielding | If shielded, Aluminum/Mylar shield (100% coverage) with TC drain wire |

*Table 3*

# 6 Connection

## 6.1 Communicate Using a Tablet Through Virtual Control Air M and M+

In lieu of using the module to interface with the controller, a connection may be established at the local access port of the controller to perform test and balance operations or to make changes to any device on the network.

## 6.2 To Wire and Mount the Control Air M/M+

1. Remove the backplate from the Control Air M/M+
   a. Hold the Control Air M/M+ as shown in the picture below.
   b. While firmly pressing the 2 tabs on top of the Control Air M/M+, pull on the backplate with your index finger until the backplate releases from the Control Air M/M+.

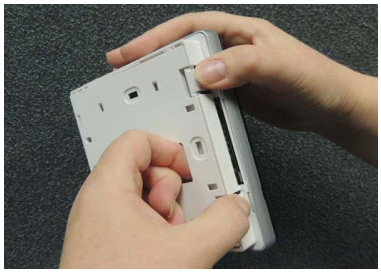

*Figure 5*

2. Pull the communication cable, power cable, and external thermistor wiring (if applicable) through the large hole in the center of the backplate.
3. Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the individual wire insulation.
4. If wiring 1 cable to the Control Air M/M+, cut the shield wire off at the outer jacket, then wrap the cable with tape at the outer jacket to cover the end of the shield wire. If wiring 2 cables in a daisy-chain configuration, twist together the shield wires, then wrap the shield wires with tape.
5. Strip about 0.25 inch (0.6 cm) insulation from the end of each wire.
6. Connect wiring to the Control Air M/M+ as shown in Figure 6.

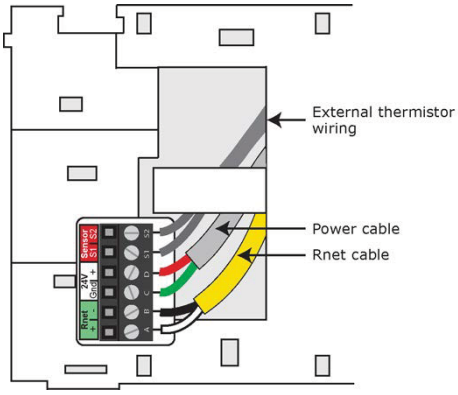


*Figure 6*

**CAUTION: ELECTRIC SHOCK HAZARD**

- Allow no more than 0.06 inch (1.5 mm) bare communication wire to protrude. If bare communication wire contacts the cable's foil shield, shield wire, or a metal surface other than the terminal block, the device may not communicate correctly.

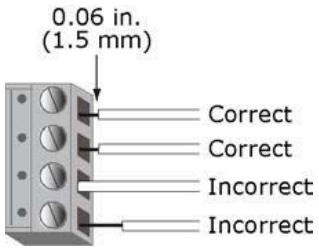


*Figure 7*

7. Attach the backplate to the wall or panel. If mounting in or on a panel:
   a. Drill two 3/16 inch (4.8 mm) pilot holes in the panel.
   b. Attach backplate using pan head 6-32 x 3/8" to l/2" long machine screws. Do not overtighten screws to prevent damage to plastic housing.

It is recommended to use Loctite 220 on screw threads if the Control Air M/M+ will be subject to vibration.

8. Attach the Control Air M/M+ to the backplate:
   a. Place the bottom of the Control Air M/M+ onto the backplate by aligning the 2 slots on the Control Air M/M+ with the tabs on the backplate.
   b. Push the Control Air M/M+ onto the backplate until the tabs at the top of the Control Air M/M+ snap onto the backplate.
9. Turn off the controller's power.
10. Connect the other end of the Rnet wiring to the controller's Rnet port or to a zone sensor.

- Insert the shield wire with the ground wire into the controller's GND terminal.
- Use the same polarity throughout the Rnet or MS/TP.

11. Connect power wiring to a 24 Vac power supply.
12. Turn on the controller's power.

## 6.3 Additional Information on Connecting Control Air M/M+ to a Controller

Connect the Control Air M/M+ module (or Android tablet if using Virtual Control Air M/M+) to the serial port on the DDC controller as indicated below.

**CAUTION: ELECTRIC SHOCK, INJURY HAZARD**

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

**Mounting**

The Control Air M/M+ must be mounted within the building interior. You can mount the Control Air M/M+:

- In a panel with the controller or on the panel door
- On a wall up to 500 feet from the controller

**Wiring**

The Control Air M/M+ requires a 24 Vac power supply. It is not powered by the Rnet.

**CAUTION: ELECTRIC SHOCK HAZARD**

- The Control Air M/M+ can share a power supply with the DDC controller as long as you:
  1. Maintain the same polarity.
  2. User the power supply only for DDC controllers.

You can also wire an external 10 kOhm, Type II thermistor to the Control Air M/M+. See External sensor resistance requirements (Table 6, page 13).

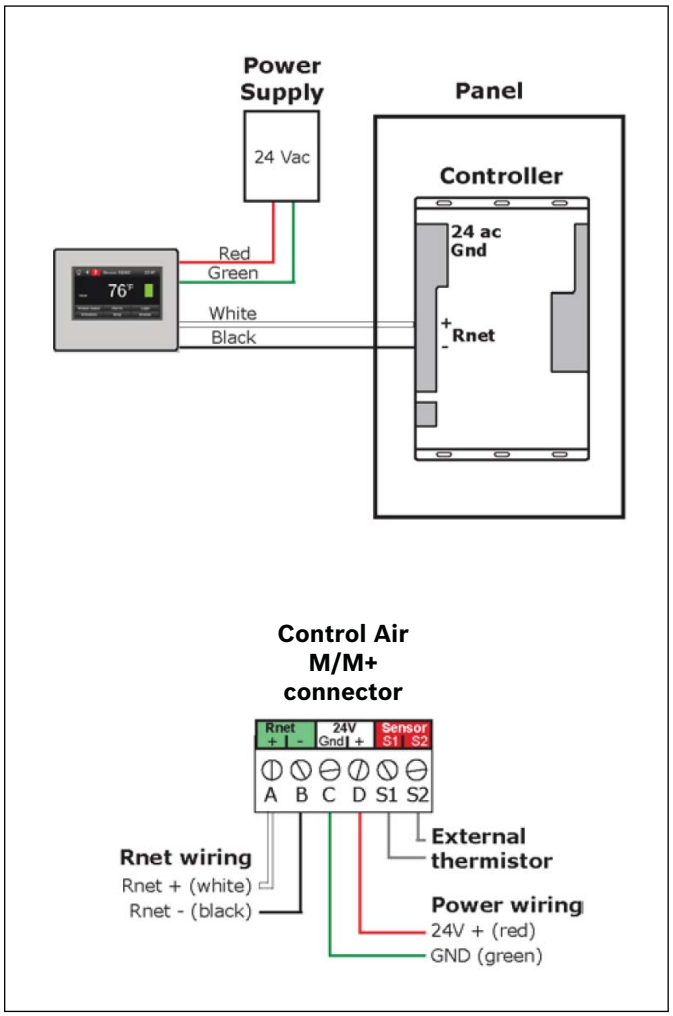


*Figure 8*

**Establishing Communication**

Plug the USB-L cable to the USB (Bosch part number 8733-927-403) to USB micro adapter (field supplied) and then to the Android tablet and controller before launching Virtual Control Air M/M+ (Equipment Touch (OEM) app). The DDC controller must be connected to a 24 VAC source and powered on.

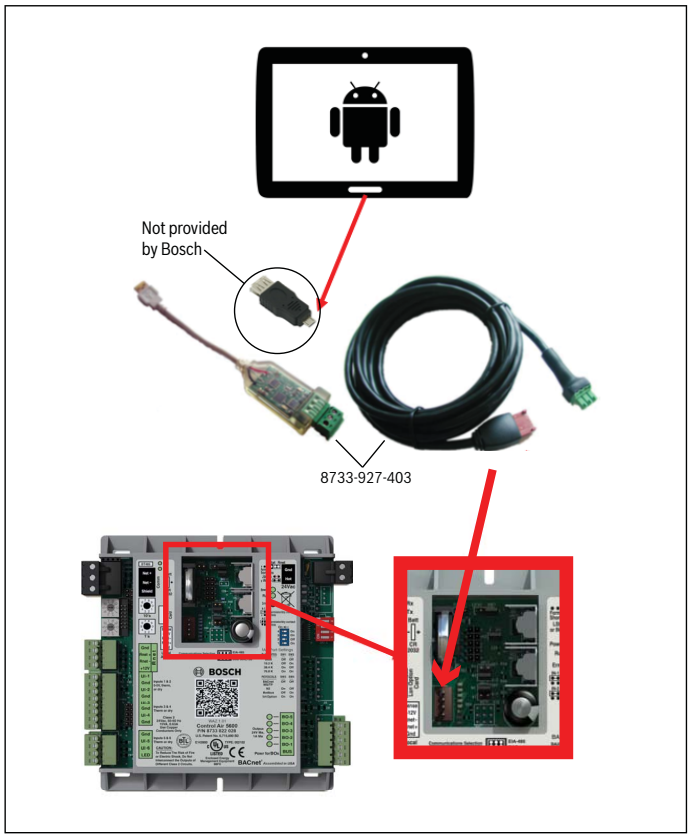


*Figure 9*

# 7 How to Navigate Screens in Control Air M/M+

## 7.1 Login

The following displays if the screen you selected requires a password. Enter your password, then touch **Done.**

*Figure 10*

Each screen is programmed with one of the following password levels:

| A screen having this password level... | Can be accessed by... |
|---|---|
| User | A user logged in with the User, Admin, or Factory password |
| Admin | A user logged in with the Admin or Factory password |
| Factory | A user logged in with the Factory password |
| No password | Anyone |

*Table 4*

The default password for a new Control Air M/M+ is 0000.

You can change passwords on the Control Air M/M+ by going to Touchscreen Setup > Passwords screen.

You log out on the Setup screen.

## 7.2 Alarms

The Alarm screen allows the user to view up to 100 events starting with the most recent. It also allows user to see which points have gone into alarm and retuned to normal as well as the ones that have been manually cleared.

*Figure 11*

## 7.3 Trends

*Figure 12*

This screen can be accessed from the Help Screen on the Service page (Home -> Service -> Help -> Trends). It allows the end user to view trends for points that have trending enabled.

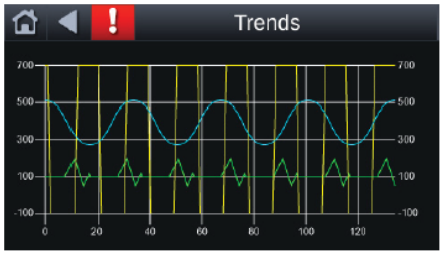


*Figure 13*

## 8 To Update the Control Air M/M+'s Firmware

The Control Air M/M+ has a USB port at the bottom that allows you to update the device's firmware from a USB flash drive.

### 8.1 Prerequisite

The USB flash drive must be formatted as FAT, FAT16, or FAT32. To verify, right-click the flash drive in Windows Explorer, then select **Properties**. **File system** should show **FATxx**. If **File system** shows NTFS or anything else, you must reformat the drive. Right-click the flash drive, then select **Format**. In the **File system** field, select **FAT (Default)**, then click **Start**.

**NOTICE:**

- Follow the steps below in order. If you select **Reload Firmware** (step 3) on the display before you insert the USB drive (step 2), the touchscreen will become inoperable.

### 8.2 To Update the Firmware

1. Create a folder on the flash drive called Touch, then put the ETxxxxxx.hex file in the folder.
2. Plug the flash drive into the Control Air M/M+'s USB port.
3. From the System screen, touch **Setup > Touchscreen Setup > Reload Firmware**.
4. A warning message appears. Touch **Yes** to continue.
5. The following series of messages appear:
   - **Verifying Firmware Image**
   - **Reading Firmware Image from USB**
   - **Installing Application**
   - **Verifying Firmware Image.**
6. When the Home screen displays, remove the flash drive.

### 8.3 Resetting the Control Air M/M+

You can create a reset.dat file and put it on a USB flash drive to reset some of the Control Air M/M+'s functionality.

**Prerequisite**
The USB flash drive must be formatted as FAT, FAT16, or FAT32. To verify, right-click the flash drive in Windows Explorer, then select **Properties. File system** should show **FATxx**. If **File system** shows NTFS or anything else, you must reformat the drive. Right-click the flash drive, then select **Format**. In the **File system** field, select FAT **(Default)**, then click **Start**.

1. Insert the USB flash drive into your computer.
2. Create a folder on the flash drive named Touch.
3. In a text editor such as Notepad, start a new file.
4. In the file, type a function number from the table below.
5. Save the file to the flash drive's Touch folder with the name reset.dat.
6. For function 01 or 02, copy any updated firmware .hex file or .stv file in the Touch folder.
7. Insert the flash drive into the USB port at the bottom of the Control Air M/M+.
8. Cycle power to the Control Air M/M+.

| If... | Then you should... | Function number |
|---|---|---|
| You cannot get to the Touchscreen | Reload the firmware | 01 |
| You need to quickly update the firmware on several Control Air M/M+ devices | Reload the firmware - Put the new firmware in the Touch folder with the reset.dat file | 01 |
| You want to carry your Control Air M/M+ from site to site.<br>Your Control Air M/M+ has a unrecoverable error from site to site | Reset factory defaults | 04 |
| The Control Air M/M+ does not respond correctly to the location where you touched the screen | Calibrate the touchscreen | 08 |

*Table 5*

## 8.4 Compliance

**FCC Compliance**

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

**NOTICE: HARMFUL INTERFERENCE HAZARD**

- Changes or modifications not expressly approved by the responsible party for compliance could void the user's authority to operate the equipment.

**CE Compliance**

**NOTICE: HARMFUL INTERFERENCE HAZARD**

- This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

**External sensor resistance requirements**

| Temp (°C) | Temp (°F) | Resistance (Ohms) |
|---|---|---|
| -40 | -40 | 335,651 |
| -35 | -31 | 242,195 |
| -30 | -22 | 176,683 |
| -25 | -13 | 130,243 |
| -20 | -4 | 96,974 |
| -15 | 5 | 72,895 |
| -10 | 14 | 55,298 |
| -5 | 23 | 42,315 |
| 0 | 32 | 32,651 |
| 5 | 41 | 25,395 |
| 10 | 50 | 19,903 |
| 15 | 59 | 15,714 |
| 20 | 68 | 12,494 |
| 25 | 77 | 10,000 |
| 30 | 86 | 8,056 |
| 35 | 95 | 6,530 |
| 40 | 104 | 5,325 |
| 45 | 113 | 4,367 |
| 50 | 122 | 3,601 |
| 55 | 131 | 2,985 |
| 60 | 140 | 2,487 |
| 65 | 149 | 2,082 |
| 70 | 158 | 1,752 |

*Table 6*

# 9 The Control Air M and M+ Screens

## 9.1 Units Status Screen/Home Page

The Unit Status screen (Figure 14) is the home page for the Control Air M, and shows the main menus/categories of the software the user can interface with on the devices.

- **Settings** – For an installer, these settings allow for changes to the device, as well as unit configuration at start-up.
- **Service** – For a service technician, this menu allows a user to diagnose or troubleshoot the unit.

The screen provides valuable unit diagnostic data - entering and leaving water temperatures, states of the compressors, Reversing valve, Pump. It gives the user the ability to change the temperature units between Fahrenheit and Celsius. The header of the screen is common to most screens.

*Figure 14*

## 9.2 Settings Screen

The Settings page allows the user to access one of the following pages:

- Unit Settings
- Device Settings
- Alarm Settings
- *Pumps
- Temperature
- Schedule
- Setpoints
- *Lead/Lag

* If configured in Unit Settings.

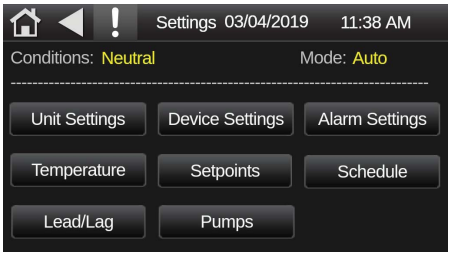


*Figure 15*

### 9.2.1 Unit Settings Screen

This screen can be accessed from the Settings menu. This menu allows the commissioning agent to setup or modify operational parameters of the unit.

Once all operational parameters are configured, these settings may be saved and archived to flash memory by selecting the Save Settings check-box.

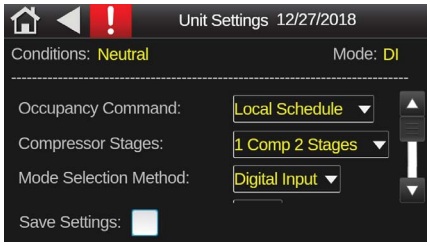


*Figure 16*

**Occupancy Command**

Under the Unit Settings screen, this parameter is used to select the control source that will provide the occupancy command to the unit. The options for this variable are the following:

- Digital Input
- Local Schedule
- BAS Command
- Manual Override

Throughout the setup process, by selecting different boxes, this is how you advance to the next setup screen if available, while the back arrow is used to backtrack to previous screens.

**Digital Input:** The Digital Input option may be selected if the unit occupancy is required to be controlled remotely via a switch (dry contact) or other binary input. The connection (typically from a room occupancy sensor) should be made in IN-1 of the controller. Choosing this setting allows the unit to be placed in occupied mode once the input is shorted to ground, and in unoccupied mode once the input is opened.

**Local Schedule:** Schedule runs the unit on a local, modifiable schedule, which cannot be accessed over a network. The occupancy schedule for heating or cooling can be set according to the morning, daytime, and night time settings for each day of the week. The option will allow the unit to run on an 8:00 AM to 5:00 PM default schedule everyday if the unit is to be started up during the construction phase of the project. See the Schedule Screen for more information.

**BAS Command:** The unit factory default for the Occupancy Command parameter is set to BAS Command. A qualified technical agent may change the parameter to be BAS Command, if different from the default setting. This option will enable the unit to be commanded from the BAS Server. The unit is ready for BAS integration once this parameter is set up, and it can then be commanded to occupied or unoccupied via the BAS by writing to the Occupancy Status integration point (refer to Integration Points List document).

**Manual Override:** If the unit is intended to run all the time it can be set to Manual Override, which will override the schedule and set the unit into occupied mode indefinitely, until the Manual Override option is deselected.

### Compressor Stages

This parameter allows the user to choose the number of compressors and stages for the application. This parameter is typically set up from the factory to match the unit configuration and should only be changed by a qualified technician.

Ensure the compressor configuration is set accurately as this selection will determine the code structure for reporting compressor safety alarms from the Unit Protection Module (UPM) to the controller. The fault codes for a 1 compressor 1 stage unit are different from that for a 2 compressor 2 stage unit.

**2 Compressor 2 Stages:** This value is selected when unit has 2 compressors and each compressor will operate as an independent stage.

**1 Compressor 2 Stages:** This value is selected when unit has 1 compressor that has two independent stages. This is the default setting from the factory.

**1 Compressor 1 Stage:** This value is selected when unit has 1 compressor with only 1 stage of operation.

### Mode Selection Method

This setting is similar to a thermostat mode select feature, which gives the user the option of setting the unit mode. The options are: Heat, Cool, Off, Auto and Digital input. When operating on Digital Input mode the unit will change from heat to cool by using the state of the digital input (IN6) on controller as follows:

- Off = Heat
- On = Cool

This feature is typically used when the unit is not configured into a BAS network. However, if there is a BAS network, it is recommended to operate the unit using the integration points.

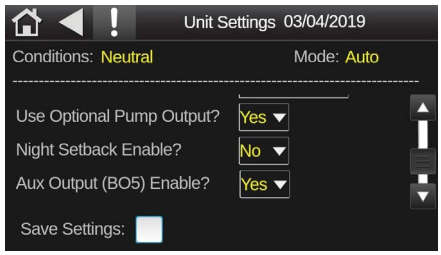


*Figure 17*

**Night Setback Enable:**
This parameter allows users to enable or disable night setback feature. Enabling Night setback will operate the unit under the following setpoints when it enters the unoccupied state.

- 74°F (adj.) Cooling setpoint.
- 85°F (adj.) Heating setpoint.

Disabling it puts the unit in an OFF state and the unit will not try to meet any setpoints.

**Aux Output Enable**
This parameter can be used to energize the Auxiliary output (DO-5). This is a manual setting and DO-5 is not configured to support any device in particular. Its a simple On/Off function for DO-5 and is Off by default.

**Use Optional Pump Output**
When this parameter is set to Yes, BO-1 can be used for pump output. Selecting Yes also enables the "Pump" configuration page on the Settings screen.

### 9.2.2 Device Settings Screen

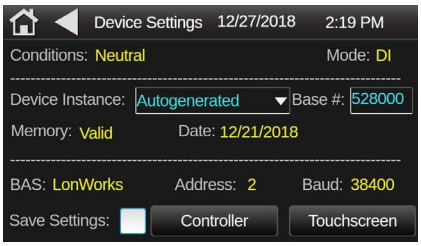


*Figure 18*

The Device Settings menu allows the user to adjust or reset any settings on the actual Control Air M/M+ module.

On this screen the BACnet® ID will be displayed. This value can be changed, however, it is not recommend to change this parameter arbitrarily as it may cause network problems.

Always consult with Network Administrator (Front End company) before changing the controllers BACnet® ID as it may interfere with other devices in the network.

Two main sub menus are available on this screen:

- Controller
- Touchscreen

#### 9.2.2.1 Controller Screen

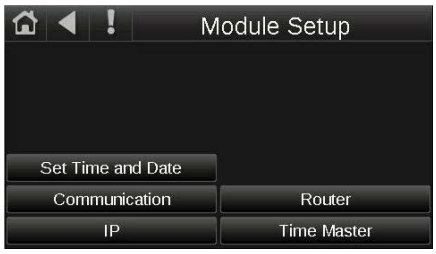


*Figure 19*

This screen provides access to the device Module Setup menu, that provides the end-user the ability to set the time/date, update device communication information, and access to the Time Master page.

##### 9.2.2.1.1 Set Time and Date

Touch the time or date field to edit it.

*Figure 20*

##### 9.2.2.1.2 Communication

This screen lets you edit the information below for the controller.

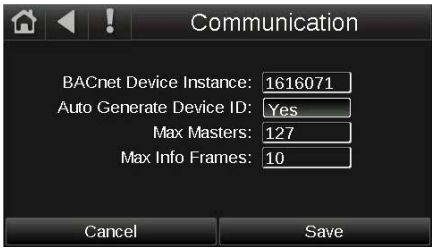


*Figure 21*

Touch a field to tap in new information.

- **BACnet Device Instance** – number
- **Auto Generate Device ID** – Enter No or Yes

You can edit the following fields that pertain to the controller's MS/TP network:

- **Max Masters** - Set this to the highest MAC address (up to 127) on the MS/TP network. If you later add a device with a higher address, you must change this field to that new address.
- **Max Info Frames** - Specifies the maximum number of information messages a controller may transmit before it must pass the token to the next controller. CAUTION Increasing this number allows the controller to transmit more messages while it has the token, but it also increases the overall time it takes for the token to pass through the network.

- For a router, set this value to a high number such as 200
- In non-router controllers, use the following formula to calculate this value: [2 - (devices * (.002 + (80/baud))] / [(600/baud) * devices] = Max Info Frames

  For example, if the network has 15 devices at 19200 baud, Max Info Frames would be 4.

You may need to increase the result of the formula for controllers that need to communicate many values to other devices.

#### 9.2.2.1.3 Router

Lets you view or edit the router's ARC156, MS/TP, or Ethernet network number.

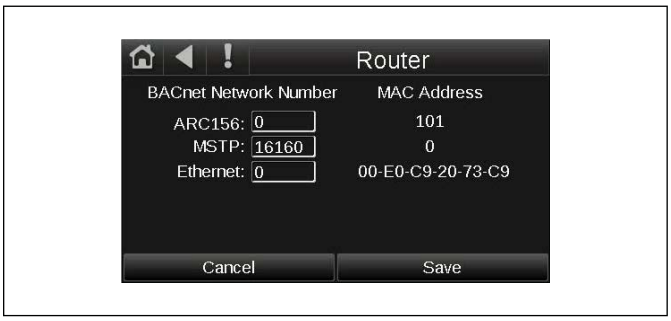


*Figure 22*

Touch a field to tap in the new number on the keypad.

#### 9.2.2.1.4 IP

Lets you view or edit network addresses and the UDP Port.

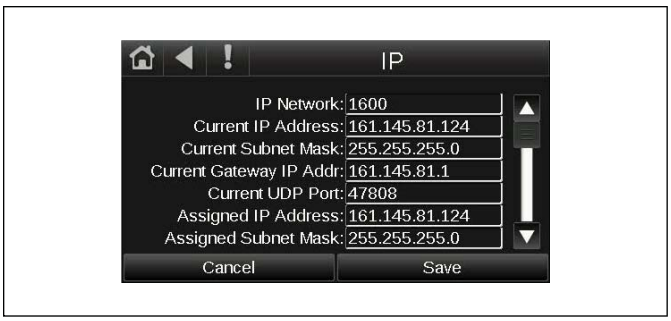


*Figure 23*

Touch a field to tap in the new number on the keypad.

#### 9.2.2.1.5 Time Master

If the controller can be a BACnet Time Master, this screen lets you configure how it sends time synchronization broadcasts.

*Figure 24*

**Time Sync Mode** - Tap in the number below that represents your selection:

- 0 = No Broadcast - The controller will not act as Time Master.
- 1 = Local Broadcast - If it doesn't already exist, a BACnet address with network number and MAC address length both set to zero is added to the controller's Time Synchronization Recipients list found on the driver's Device page in WebCTRL®. The controller will then send time broadcasts only to controllers on its ARCnet or MS/TP network.
- 2 = Global Broadcast - If it doesn't already exist, a global address with network number set to 65535 and MAC address length set to zero is added to the controller's Time Synchronization Recipients list found on the driver's Device page in WebCTRL®. The controller will then send time broadcasts to all its connected networks.

**Time Sync Interval** - Enter how often local or global time broadcast should be sent (1-9999 minutes). If Time Sync Interval is set to zero, no time sync messages are sent.

If the controller looks through its Time Synchronization Recipient List and finds an entry with MAC address length set to zero and network number set to 65535, the controller's BACnet Time Master mode is set for Global Broadcast. If there is no global broadcast entry in the recipient list, the controller then looks for a local broadcast address (MAC address length set to zero and network number set to zero or to the same network number as the module's). If such an entry is found, the BACnet Time Master mode is set for Local Broadcast. Otherwise, the mode defaults to Disabled/None.

#### 9.2.2.2 Touchscreen Screen

*Figure 25*

This screen provides the end-user the ability to edit and modify the touchscreen settings.

Touch a button to go to one of these screens:

| Screen | Description |
|---|---|
| About | Displays information about the touchscreen firmware |
| Inactivity Timeout | Lets you define how long the Control Air M can have no activity before returning to the Standby screen and logging out the user. Set to 0 to deactivate this feature |
| Sensor Setup | Lets you set up the Control Air M temperature and humidity sensors. See Using Control Air M's temperature and humidity sensors to control equipment |
| Clean Screen | Displays a one-minute count-down timer so that you can clean fingerprints from the display window without touching something that would affect equipment operation. |
| Key Click Off/On | Touch Key Click Off to turn off the sound when you touch a field or button. Touch Key Click On to turn on the sound |
| Alarm Sound Off/On | Touch Alarm Sound Off to turn off the alarm notification sound or touch Alarm Sound On to turn on the sound. An alarm will generate a sound only if it is set up by Bosch |
| Reload Firmware | Erases the current firmware so that you can load new firmware through the USB port. See To update the Control Air M/M+'s firmware |
| Passwords | Let you change the User or Admin password, if allowed. |
| Calibrate Touch Panel | Lets you recalibrate the Control Air M/M+ by touching targets. The device is calibrated in the factory, but time, temperature, or handling could affect the calibration. Recalibrate the screen if you touch it in one location and it responds as if you touched it in another. |

*Table 7*

#### 9.2.3 Alarms Settings Screen

The Alarm Settings screen can be accessed from the home page through the Settings menu. This screen allows the user to adjust heat pump unit alarm settings, including:

- Set values for alarm trip limits on leaving water temperature.
- Set values for entering water temperature differentials
- Set Pump and compressor(s) runtime trip values.

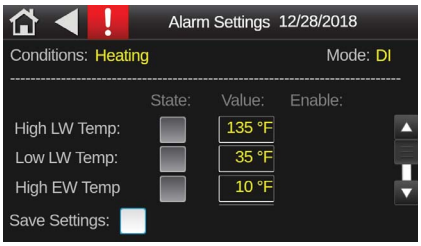


*Figure 26*

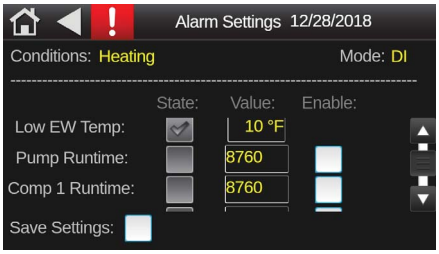


*Figure 27*

### 9.2.4 Pumps

This screen can be accessed from the Home page through the Setting Menu. This screen Allows the user to view and/or adjust the following parameters:

- Run Continuously in Occupied mode:This parameter when set to "Yes" runs the pump continuously in the occupied mode and if set to "No", cycles with the compressor
- Pump Output: This parameter does not indicate is the pump output is actually energised, instead indicates if there is a pump call.
- Pump Start Counter (total): This value indicates how many times in total the pump was started after its corresponding reset.
- Pump Start Counter (Last hr): This value indicates how many times in the last hour the pump was started.

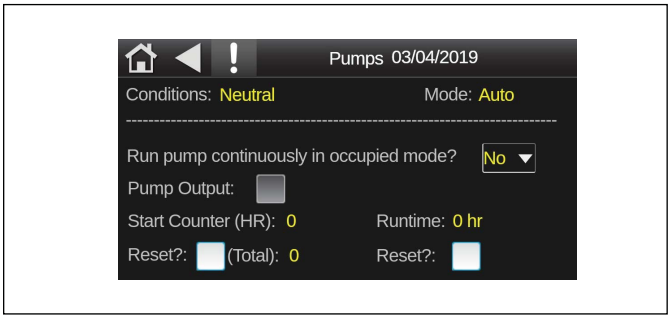


*Figure 28*

### 9.2.5 Temperature

The Temperature Screen can be accessed from the home page through the Settings menu. This screen allows the user to view the following temperatures and temperature setpoints.

- Entering water temperature
- Leaving water temperature
- Auto changeover temperature
- Effective cooling setpoint
- Effective heating setpoint.

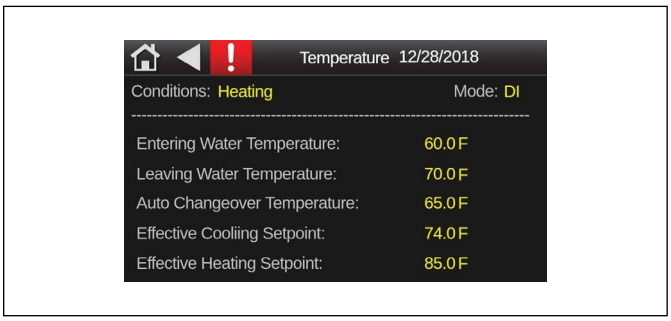


*Figure 29*

### 9.2.6 Setpoints

This screen can be accessed from the Settings screen. It allows the user to adjust the following setpoints and differentials

- Occupied heating and cooling setpoints
- Unoccupied heating and cooling setpoints
- Heat/Cool Setpoint differential
- Heat/Cool Stage 2 setpoint differential
- Auto Changeover setpoint and deadband

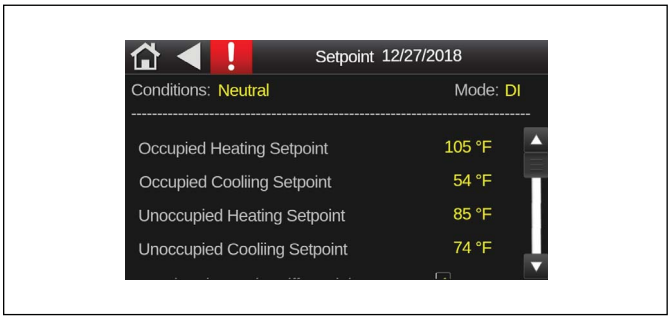


*Figure 30*

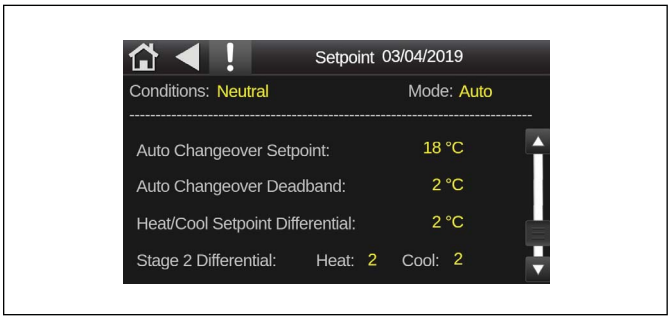


*Figure 31*

### 9.2.7 Schedule Screen

The Schedule menu can be accessed from the home page through the Settings menu. This screen allows the user to view, add, edit, or delete BACnet schedules in the controller.

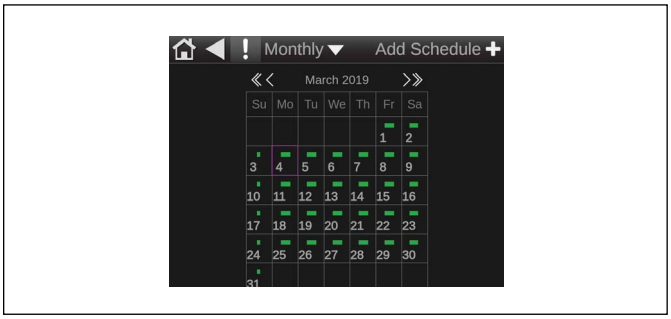


*Figure 32*

The controller comes with the following default schedule:

| Day of Week | Time | Mode |
|---|---|---|
| MON-FRI | 8:00AM - 5:00PM | Occupied Mode |
| SAT | 7:00AM - 3:00PM | Occupied Mode |
| SUN | 10:00AM - 1:00PM | Occupied Mode |

*Table 8*

#### Viewing Schedules

- Month View (default)

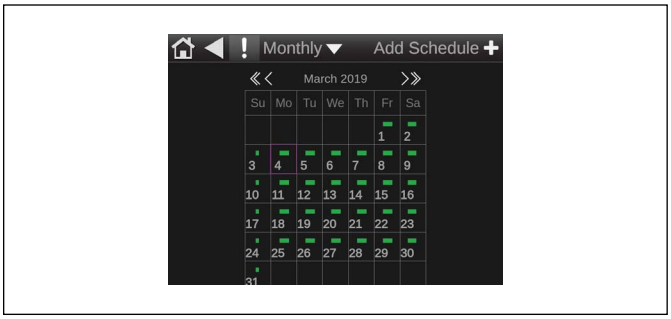


*Figure 33*

The schedule screen is configured to display the monthly view by default. To change to weekly view, click drop down option and change accordingly.

- Week View

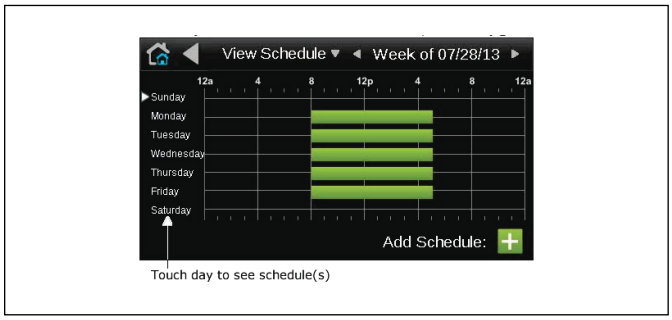


*Figure 34*

Which days of the week shown have schedules (indicated by green bars).

If you see Schedule editing disabled at the bottom of the screen instead of Add Schedule, scheduling is being done through another application and is disabled for the Control Air M+.

Touch a day to see the schedule(s) for that day. In the screen below, touch a schedule's name or green bar (not the Effective Schedule bar) to edit or delete the schedule.

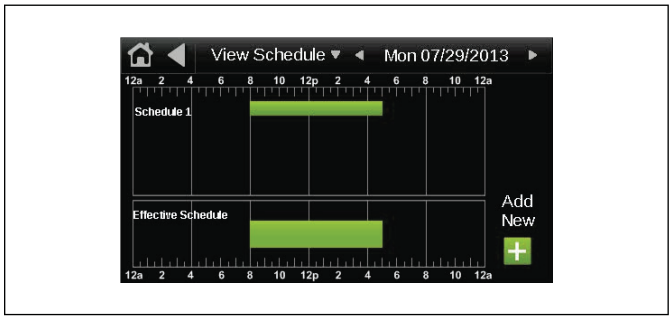


*Figure 35*

The Effective Schedule is the combined result of the day's schedule(s).

You cannot edit a schedule's Type (Dated, Weekly, Continuous), its Priority (Normal or Override), or whether the schedule is an ON Schedule or Off Schedule. If you need to change any of these settings, delete the schedule, and then make a new one.

**Creating Schedule**

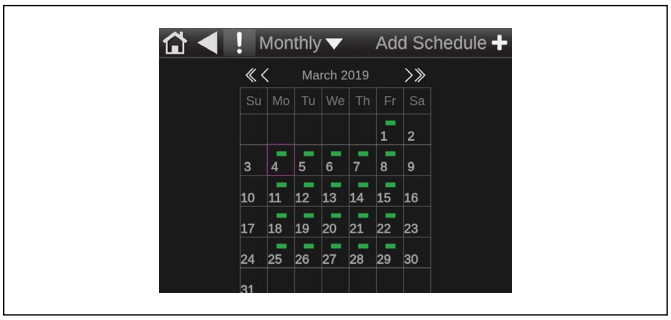


*Figure 36*

In the above image there is no schedule for the weekend (Sat/Sun). To create a schedule for every Saturday (Occupied from 7 AM to 3 PM), click Add schedule.

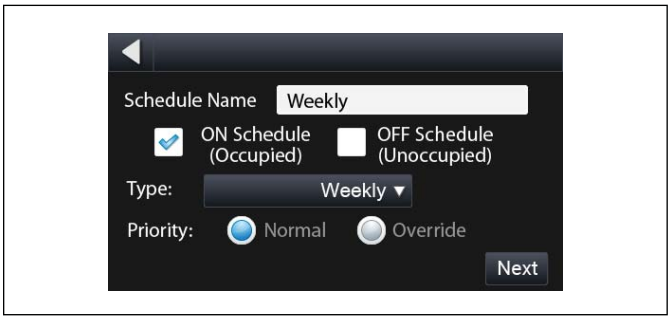


*Figure 37*

Touch the Schedule Name field, and enter a unique name (for Example: Saturdays). Select one (ON for this example) of the following:

- **ON** Schedule for an occupied period
- **OFF** Schedule for an unoccupied period that is to override an ON schedule. For example, a holiday schedule that is to override a weekly schedule.

Touch the Type field, then select one (weekly for this example) of the following:

| Select... | To use the schedule... |
|---|---|
| Dated | For a specified period of time between a start and end date. For example, 7:00 am to 7:00 pm every day between July 1st and July 22. |
| Weekly | Every week on the specified days. For example, every Monday through Friday, 8:00 am to 5:00 pm. |
| Continuous | Continuously between 2 specified dates/times, For example, a non-stop schedule that starts June 1st at 12:00 am and ends August 31st at 11:50 pm. |

*Table 9*

ON Schedule only–Select one (normal for this example) of the following:

- Normal for a typical occupied period
- Override for a occupied period that is to override an OFF schedule.

Touch Next to define the criteria for the type of schedule you selected earlier in the scheduling process.

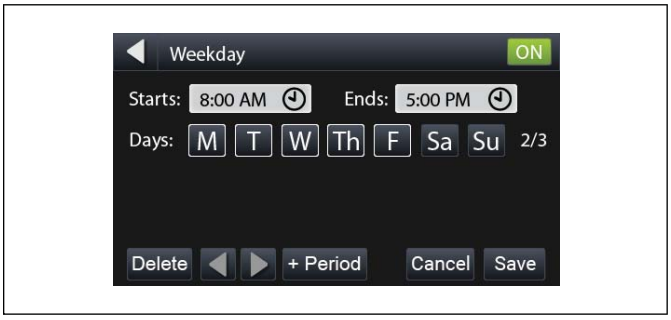


*Figure 38*

If you have a date range configure accordingly. Touch Save when finished.

**Editing/Deleting Schedules**

Open the schedules screen from the Settings page. To delete or edit the Saturdays schedule (for example), click on View schedule drop down and select week view. Now Click on the green bar for a Saturday.

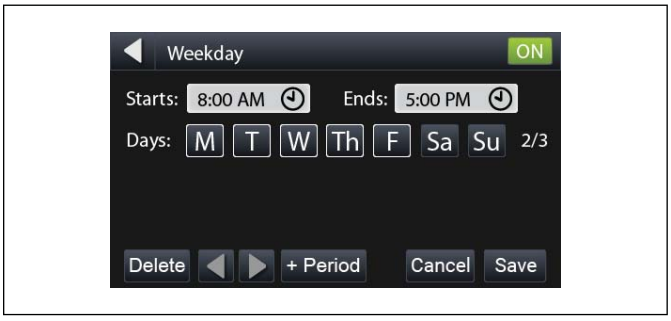


*Figure 39*

Click Delete to Delete this schedule,or modify as needed. To add another schedule (period) to the current schedule, click add period. A weekly schedule can have multiple periods.

For example, the first period could be every Saturday 7:00AM to 3:00PM. The second period could be every Saturday, 6:00PM to 8:00PM.

### 9.2.8 Lead/Lag Screen

This screen is accessed from the Setting screen and allows the user to configure the compressor rotation. This screen can only be accessed if the unit has 2 separate compressors and i configured accordingly in the unit settings screen. Under this menu, one can view and adjust the following:

- **Demand:** This parameter displays how many compressors/ compressor stages are being called.
- **Compressor rotation frequency:** This parameter gives the user the option to set the frequency at which the compressors are switched from lead to lag or vice-versa. Based on this selection the user can set the next parameter value accordingly

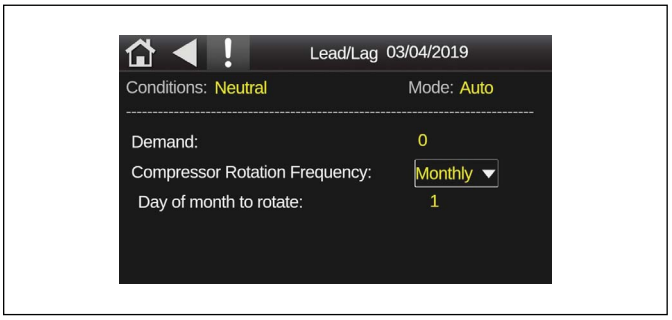


*Figure 40*

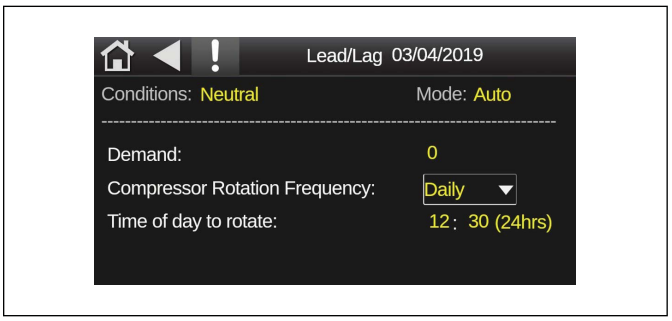


*Figure 41*

## 9.3 Service Screen

The Service menu allows the qualified technician to adjust or reset any settings on the WSHP, and efficiently troubleshoot and correct issues on the unit. Under this menu, one can scroll up/down to view and adjust the following:

- Analog Inputs
- Binary Inputs/Outputs

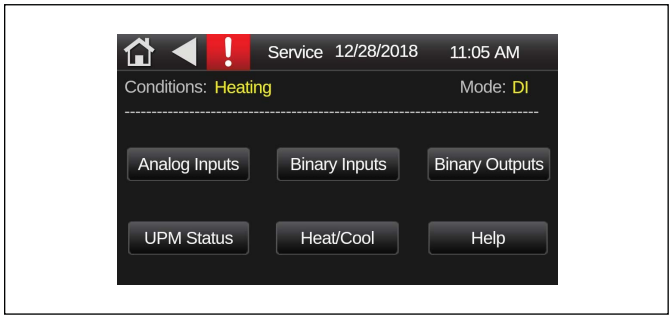


*Figure 42*

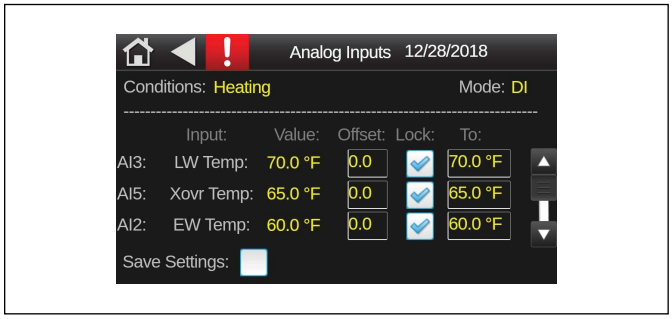


*Figure 43*

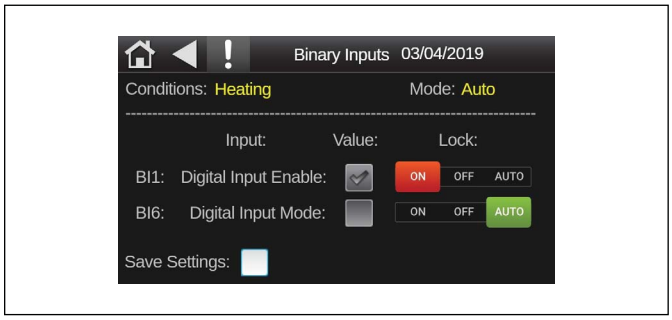


*Figure 44*

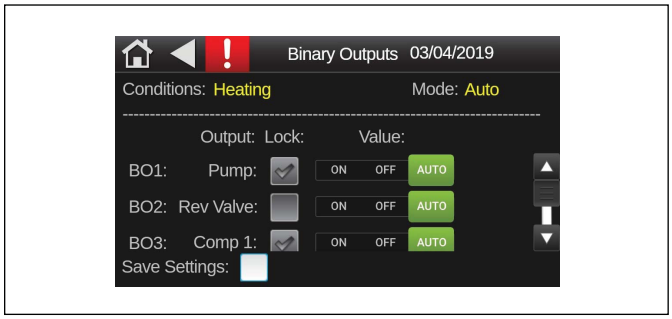


*Figure 45*

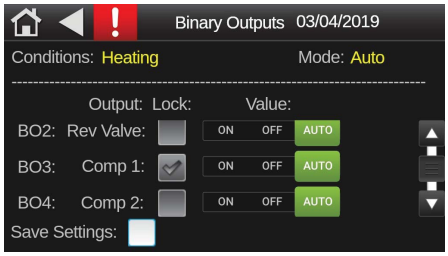


*Figure 46*

### 9.3.1 Heat/Cool Screen

The Heating/Cooling screen can be accessed from the Home screen through the Service menu. From the Heating/ Cooling screen the user can see the actual state of the different points that are involved and needed for the cooling and heating operation respectively.

The runtime hours and counters for the compressors are displayed and can be reset by navigating selecting and changing the particular value.

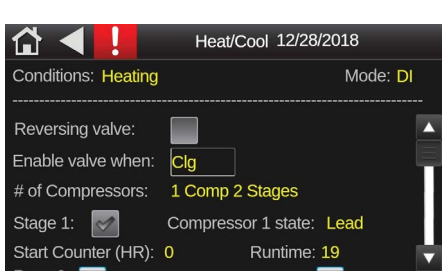


*Figure 47*

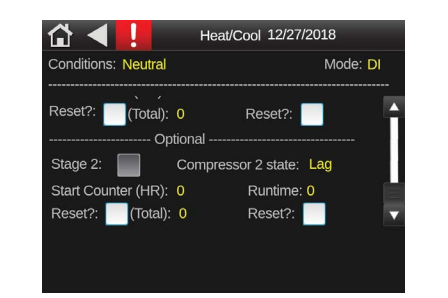


*Figure 48*

### 9.3.2 UPM Status Screen

The UPM Status screen can be accessed from the home Screen via the Service Menu. Once an alarm is received via pulse feedback from the UPM board, it is displayed in the screen as shown below. From this screen the user may reset the UPM board after it has enter the lockout mode by navigating to “Reset UPM now?” selecting yes.

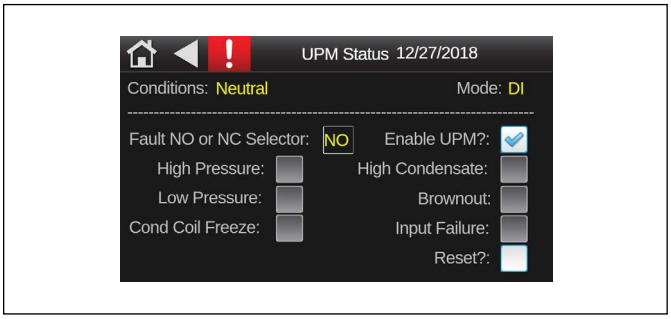


*Figure 49*

### 9.3.3 Help Screen

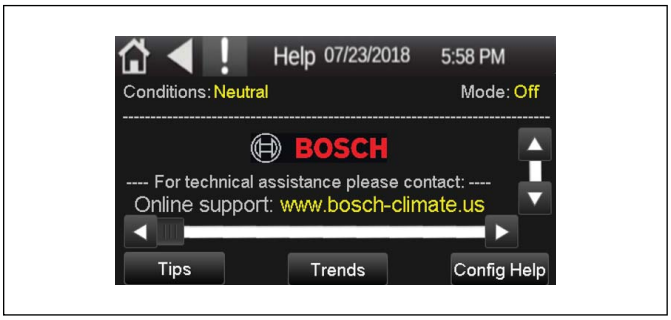


*Figure 50*

The Help screen can be accessed from the home Screen via the Service Menu. From this screen the user is able to access the software version of the controller to which they are connected.

Other information on this screen include the controller part number and unit serial number. This information will be useful whenever technical support is contacted, or may be required to download the correct manuals or integration point list files from our website. The technical support phone numbers can also be found in this screen.

In addition, troubleshooting tips as well as configuration help tips may also be accessed from this screen.

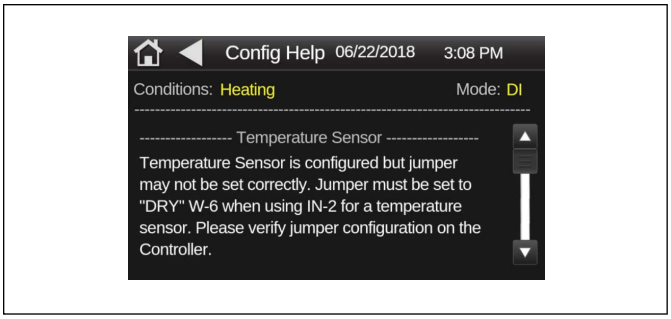


*Figure 51*

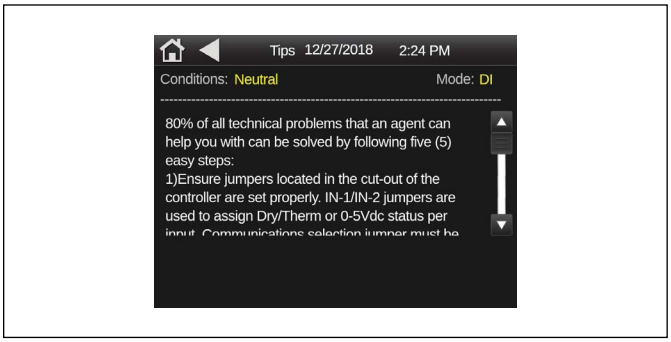


*Figure 52*

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