

System Controller for Up To 10 PLC Based HVAC Systems



GENERAL DESCRIPTION

The Marvair MPC-10 is an HVAC system controller designed to control up to ten PLC-equipped air conditioners, that can be either single or dual compressor, for equipment enclosures. In addition to the control of the air conditioners, the MPC-10 provides alarms remotely, through BACnet or Modbus, and locally using a built-in Human Machine Interface (HMI). The controller is factory programmed with standard industry set points, but can be configured on site or remotely. Settings are retained indefinitely in the event of a power loss.

► Control 2-Stage or 5-Stage A/C Units

The Marvair MPC-10 HVAC controller can control up to:

- Six 2-Stage A/C units using CAT5/6 ethernet connections
- Ten 2-Stage A/C units using RS485 (3-Wire) connections
- Four 5-Stage A/C units using an CAT5/6 ethernet connection

► Ease of Control and Configuration

The MPC-10 comes standard with a approximately 4-inch color touchscreen HMI which provides a user-friendly interface. From the main screen of the HMI the user can see room conditions, HVAC status for each unit, and change cooling/heating set points. The statuses that can be displayed for each unit are as follows: Cooling, Heating, Blower, Fault, and T-Stat status. The Alarm screen displays a description of the alarm, the time/date at which it occurred, and the current status of the alarm. The alarms will be maintained until the fault is fixed and the alarm is cleared.

The initial setup of the MPC-10 will be done from the built-in HMI. The wide range of access to parameters gives the end users the ability to change setpoints, calibrate sensors, view unit status and more.

► Marvair Part Numbers

MPC10 HVAC Controller – 2-Stage A/C Units.....	K/40119-2
MPC10 HVAC Controller – 5-Stage A/C Units.....	K/40119-5
Additional Humidity & Dry Bulb Sensor (1 Included, Up to 4 Max)	70676
Dry Bulb Sensor.....	70916



Features and Benefits

Programmable Logic Board with Lead/Lag Control

- *Balanced Use of Conditioning Equipment*
- *Sequence the Operation of up to 10 PLC Based Units*
- *Ensures Maximum Efficiency*
- *Independent Economizer Control*
- *Remote Communication (BACnet/Modbus)*

Alarms and Lockouts

- *High Pressure Lockout (Both Circuits If Applicable)*
- *Low Pressure Lockout (Both Circuits If Applicable)*
- *Communication Alarm*
- *Emergency Shutdown Alarm*
- *High Shelter Temperature Alarm*
- *Low Shelter Temperature Alarm*

SPECIFICATIONS/FEATURES

➤ Remote Communication Protocol

The Marvair MPC-10 comes standard with both BACnet and Modbus TCP/IP communication protocols and can be user selected in the initial setup menu. Using these communication protocols allows the user to access and change various data points.

Read Only Access

- Room Temperature
- Room Humidity
- Lead Unit
- High Pressure Refrigeration Circuit A (For Each Unit)
- High Pressure Refrigeration Circuit B (For Each Unit)
- High Temperature Cut-Off (For Each Unit)
- High Temperature Alarm
- Low Temperature Alarm
- Phase Fault (For Each Unit)
- Low Pressure Refrigeration Circuit A (For Each Unit)
- Low Pressure Refrigeration Circuit B (For Each Unit)
- Emergency Shutdown (For Each Unit)

Read/Write Access

- Cooling Set Point
- Continuous Blower
- Cooling Stage Differential
- Low Temperature Alarm Set Point
- Y Fan Purge Time
- Anti-Short Cycle Time
- Thermostat Offset
- Heating Set Point
- Lead Swap
- Heating Stage Differential
- High Temperature Alarm Set Point
- W Fan Purge Time
- Lead Swap Period
- AC Unit Shutdown (For Each Unit)

➤ Thermostat

- Cooling Set Point: 35°F through 95°F (1.7°C through 35°C) in 1° increments
- Heating Set Point: 35°F through 95°F (1.7°C through 35°C) in 1° increments

➤ Differential

- Cooling Stage Differential: 1°F through 5°F (1°C through 3°C) in 1° increments
- Heating Stage Differential: 1°F through 5°F (1°C through 3°C) in 1° increments

➤ Incoming Power

- 100-240 VAC

➤ Ambient Temperature During Operation

- Minimum: 30°F (0°C)
- Maximum: 122°F (50°C)

➤ Unit Weight

- 27 lbs (12.25 kg)

➤ Ease of Installation

The use of MODBUS RTU or BACnet-MSTP communication makes wiring simple. All communication between the HVAC units and the controller is handled over CAT 5/6 cables, and/or RS485 (3-wire) cable depending on whether it's controlling 2-Stage or 5-Stage A/C units, or to control more than 6 A/C units. The MPC-10 has ten ethernet ports located at the bottom of the controller, one for each unit and one for remote communication. The order in which the units are connected does not matter.

➤ Lead/Lag Operation

User selectable changeover from 12 hours to 10 days in 1-hour increments. If the lead unit loses power, the next available unit automatically becomes the lead unit with all the set points of the lead unit. Once a unit is locked out or loses power it is removed from the list of available units and will not be called for by the controller. When the unit is repaired/regains power it will be added back to the list of available units and can be called for by the controller. Additionally, a lead swap

button can be found on the HMI allowing service techs to easily check the operation of each unit.

➤ Alarms

Alarms can be viewed remotely via BACnet/Modbus, through an on-screen alarm window, or on the display screen of the respective unit. There are two classifications of alarms. Unit alarms are specific to the unit. Shelter alarms apply to the entire building. These alarms include high/low temperature alarms and emergency shutdown.

Unit Alarms

- *High Pressure Switch A* – The refrigerant pressure on side “A” has exceeded the set point pressure twice in a cooling cycle. The air conditioner will shut down and notification will be sent that there is a high-pressure “A” alarm.
- *Low Pressure Switch A* – The refrigerant pressure on side “A” has dropped below the set point pressure twice in a cooling cycle. The air conditioner will shut down and notification will be sent that there is a low-pressure “A” alarm.
- *High Pressure Switch B (If Applicable)* – The refrigerant pressure on side “B” has exceeded the set point pressure twice in a cooling cycle. The air conditioner will shut down and notification will be sent that there is a high-pressure “B” alarm.
- *Low Pressure Switch B (If Applicable)* – The refrigerant pressure on side “B” has dropped below the set point pressure twice in a cooling cycle. The air conditioner will shut down and notification will be sent that there is a low-pressure “B” alarm.
- *Emergency Shutdown* – This alarm is activated when the unit is shut down by the user via remote access or thru the HMI.
- *Communication* – This is activated when a unit loses communication to the main controller. If this alarm is activated the alarm window on the HMI will pop-up and have a message reading “Unit X Communication Fault”. In the event of this alarm the controller will not call for the affected unit.

Shelter Alarms

- *Low Building Temperature* – Activated if the temperature in the building drops to the selected temperature. Factory default is 50°F but can be changed from the parameters page of the HMI in 1° increments between 30°F and 95°F. If this alarm is activated the alarm window on the HMI will pop-up and have a message reading “Low Temperature Alarm”.
- *High Building Temperature* – Activated if the temperature in the building reaches the selected temperature. Factory default is 90°F but can be changed from the parameters page of the HMI in 1° increments between 30°F and 95°F. If this alarm is activated the alarm window on the HMI will pop-up and have a message reading “High Temperature Alarm”.

IMPORTANT SAFETY PRECAUTIONS

WARNING

ALWAYS TURN OFF POWER AT THE MAIN POWER SUPPLY BEFORE INSTALLING, CLEANING, OR REMOVING THERMOSTAT.

- Do not short across terminals of system control to test operation; this will damage your controller and may void your warranty.
- All wiring must conform to local and national electrical and building codes. Please follow provided wiring diagrams.
- Use this controller only as described in this manual.

TO INSTALL MPC-10 SYSTEM CONTROLLER

WARNING ELECTRICAL SHOCK HAZARD

TURN OFF POWER AT THE MAIN SERVICE PANEL BY REMOVING THE FUSE OR SWITCHING THE APPROPRIATE CIRCUIT BREAKER TO THE OFF POSITION BEFORE REMOVING THE EXISTING THERMOSTAT.

IMPORTANT

Marvair MPC-10 installation must conform to local and national building and electrical codes and ordinances.

Note: Mount the MPC-10 about five feet above the floor. Do not mount the MPC-10, in direct sunlight, behind a door, or in an area affected by a vent or duct. The MPC-10 is designed for interior use only.

1. Turn off power to the heating and cooling system by removing the fuse or switching off the appropriate circuit breaker.
2. Put controller against the wall where you plan to mount it (Be sure wires will feed through the wire opening in the base of the MPC-10).
3. Mark the placement of the mounting holes.
4. Using a drill bit, drill holes in the places you have marked for mounting.
5. Use screws to mount MPC-10 to wall.
6. Feed wires through the bottom left cable gland.
7. Insert stripped, labeled wires in matching wire terminals. See Wiring Diagrams. CAUTION! Be sure exposed portion of wires do not touch other wires.
8. Gently tug wire to be sure of proper connection. Double check that each wire is connected to the proper terminal.
9. Tighten the cable gland to make a water tight seal.
10. Close the cover on the MPC-10.
11. Plug in ethernet cables from each unit to the bottom of the MPC-10.
12. Turn on power to the system at the main service panel.
13. Test MPC-10 operation as described in "Testing the MPC-10".

REMOTE SENSOR INSTALLATION

1. Remove cover from the remote sensor housing
2. Select an appropriate location for mounting the remote sensor
3. Mount remote sensor unit using hardware provided
4. Install 4 wires between remote sensor and MPC-10 (use shielded cable that is adequately grounded)
 - a. Use provided wiring diagrams to wire sensors

OPERATING THE MPC-10

The purpose of this document is to explain how to navigate through the interface along with describing the function of each selectable option on the screen.

Note: Failure to observe the instructions contained in this document may result in personal injury and/or property damage along with voiding warranty. Read this manual before installing, replacing or using the product.

PREREQUISITES

1. Power to controller

The MC-10 controller requires 100-240 VAC 1PH power supply input to operate. Note that the typical power supply has a 100-240 VAC 1PH input requirement and sourcing this input would be the user's responsibility if independent power is required.

2. Network Wiring

System needs to be appropriately wired to facilitate proper communication. Please follow wiring diagram provided and manufacturers best practice recommendation. Deviation from instructions/guidelines could result in poor or interrupted communication between devices.

3. HVAC Unit PLC Setup

Communication between each unit is predefined in the controller and it requires the end user to manually set the unique MODBUS IP ADDRESS on each unit that is being controlled. See table below

UNIT	MODBUS ID
1	10.0.0.120 (Factory Default)
2	10.0.0.121
3	10.0.0.122
4	10.0.0.123
5	10.0.0.124

Note:

1. Connection between each unit requires CAT 5/6 Cable or RS485 (3-Wire). This is supplied by the end user.
2. "Star" communication topology is used. Ethernet switch in this controller is central node.

HMI INTERFACE NAVIGATION

► HOME Screen

This is the second page that is populated when the HMI is powered up. This page allows the user to set:

1. **T-Stat Mode** – Use the Left and Right arrows to scroll between modes.
 - a. OFF – Turns the Thermostat "Off". No Air conditioning operation can be active.
 - b. COOL – Allows the cooling process ONLY. Heating will remain inactive irrespective of setpoint.
 - c. HEAT – Allows the heating process ONLY. Cooling will remain inactive irrespective of setpoint.
 - d. AUTO – Allows both the Cooling and Heating process with respect to User defined setpoint.
5. **Space Temperature** – This variable displays the measured temperature of the space.
6. **Space Humidity** – This variable displays the measured humidity of the space.
7. **Date and Time** – Values displayed here are set on the first screen that is displayed on startup of the device.
8. **Setpoint Adjust** – This digital button displays the "Cooling Setpoint", "Heating Setpoint" and "Humidity Setpoint". These values remain visible on the main screen for 2 minutes after "ADJUST" is pressed. See "Figure 2" below.
9. **Parameter Page** – This button opens the "Parameter" page. See "Figure 3"

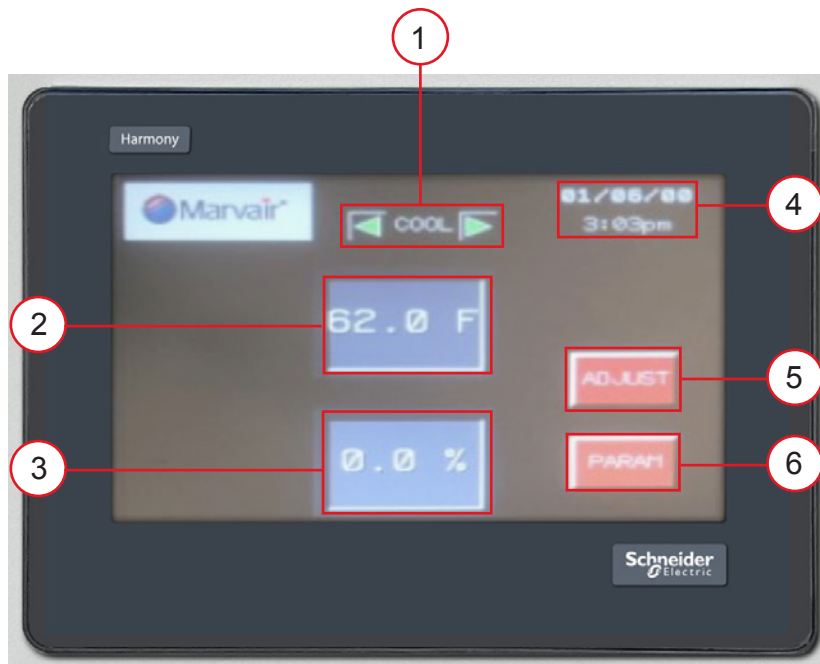


Figure 1 – “Home” Screen. See description above for further details

1	T-Stat Mode
2	Space Temperature
3	Space Humidity
4	Date and Time
5	Setpoint Adjust
6	Parameter

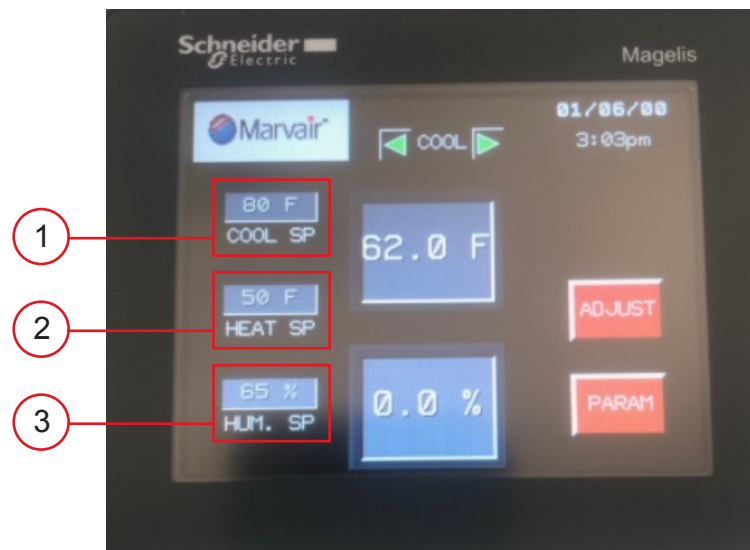


Figure 2 – “Home” Screen after the “Adjust” button is selected

1	Cooling Setpoint
2	Heating Setpoint
3	Humidity Setpoint

➤ Parameter Screen



Figure 3 – “Parameter” Screen

This screen provides the user with the ability to setup basic variables for operation. Each variable is described below.

1. **Cooling Differential (COOL DIF)** – This variable dictates when the subsequent stage is energized in the cooling process. For example, if the “Cool SP” = 80 and “Cool Dif” = 2. The first cooling stage is energized at 80, the second cooling stage is energized at 82, the third cooling stage is energized at 84 and so on.
2. **Heating Differential (HEAT DIF)** – This variable dictates when the subsequent stage is energized in the heating process. For example, if the “Heat SP” = 50 and “Heat Dif” = 4. The first heating stage is energized at 50, the second heating stage is energized at 46, the third heating stage is energized at 42 and so on.
3. **Number of Units (# of UNITS)** – This variable gives the user the ability to dictate the number of units that is being controlled. ONLY these units can be A “LEAD” unit (see variable below for explanation).
4. **LEAD** – This variable displays the unit that will come on first if any operation is requested.
5. **LEAD PERIOD** – This variable provides the user with the ability to set how long a unit should remain as a “LEAD”. This allows all systems being controlled to get equal runtime. Number at the top is multiplied with the variable underneath. The variable underneath gives the user the ability to select “DAYS”, “HOURS” or “MINU” (minutes). For example, if the number above equals 7.0 and the variable underneath is set to days, the lead will be incremented (+1) every 7 days.
6. **BLOWER MODE** – This allows the user to dictate how the Indoor Motors should operate. It provides 3 selections:
 - a. **AUTO (DEFAULT)** – This option only brings on the Indoor Blower when there is an active request for an air conditioning operation. The Indoor Blower goes off once the setpoint for the respective operation is satisfied.
 - b. **ON** – This option can be described as continuous blower operation. That is, the Indoor blower does stay On, irrespective of a air conditioning request.
 - c. **Cycle** – This option provides the user with the ability to have the Indoor blower cycle ON and OFF for a user defined period in minutes. Note that during an air conditioning request, the blower runs continuously and will not cycle.
7. **SYSTEM BWR OP** – This variable controls whether the “BLOWER MODE” operation occurs on all units or just on the lead unit. For example, if “BLOWER MODE” = ON and “SYSTEM BWR OP” = LEAD, then only the lead unit blower would run continuously. All other unit indoor blower would come on based on a request for the blower. However, if “BLOWER MODE” = ON and “SYSTEM BWR OP” = ALL, then all blowers would run continuously and not just the lead unit blower.
8. **ALARM** – This variable dictates when the respective alarm contact is triggered.
 - a. **High** – Setpoint for the space high temperature alarm
 - b. **Low** – Setpoint for the space low temperature alarm
9. **Buttons** – Each button opens a different page. Each page will be described in their respective sections.
 - a. **ADVANCED**
 - b. **STATUS**
 - c. **ALARM LOG**
 - d. **HOME**

► Advanced Screen

On this screen, more advanced modification, calibrations and functionality can be altered to the user's comfort or equipment performance. Each button will take the user to a different screen to view/modify the respective variables. Each page and its contents are described in details below.

1. **TEMP SENSOR** – Allows user to properly calibrate the temperature sensors if necessary.
2. **HUM SENSOR** – Allows user to properly calibrate the humidity sensor if necessary.
3. **ECONOMIZER** – Allows user to setup economizer operation in the units. Note that each setting is replicated on all units. This is only applicable in units with economizers.
4. **SYSTEM CONFIG** – Allows user to access bios settings of the HMI. Modifications in the bios can render the system inoperable.
5. **HOME** – Brings user back to the “HOME” screen.
6. **MOTOR SPEED** – Allows the end user to configure the speed of the indoor motor for the various stages of cooling and other air conditioning operation.
7. **Communication** – Allows the end user to configure the RS 485-1 Slave port for remote communication.

► TEMP SENSOR Screen



Figure 4 – “Temperature Sensor” Screen

1. Range

- **MAX** – This variable represents the maximum value of the range of the temperature sensor. The manufacturer's value for the sensor must be multiplied by 10 for correct scaling.
- **MIN** – This variable represents the minimum value of the range of the temperature sensor. The manufacturer's value for the sensor must be multiplied by 10 for correct scaling.

For example, if the manufacturer lists the range for the sensor as 32-122, the maximum value the user would input is 1220 and the minimum value would be 320.

2. **OFFSET** – This variable allows the end user to alter the measured temperature by the amount placed in this variable.
3. **VALUE** – This variable displays the temperature value for all the associated sensors. Note that sensors that are not normally used should have an offset of “-32”.
4. **NO. of Sensors** – This variable allows the user to define the number of sensors being used by the controller. Note that the “VALUE” tab for all sensor not being used should be equal to “0”. The “OFFSET” variable of the respective sensor should be used to alter the “VALUE” of the sensor in question to 0. This is critical for calculation.
5. **HIGHEST/AVERAGE** – This variable allows the user to select if the “HIGHEST” temperature measured should take priority in operation or “AVERAGE” temperature of the sensors should take priority. It is critical that the instructions in “No. of Sensors” above is followed.
6. **PARAM** – This button opens the “PARAMETER” screen. See above for description.

► HUMIDITY SENSOR Screen



Figure 5 – “HUMIDITY SENSOR” Screen.

1. **OFFSET** – This variable allows the end user to alter the measured space humidity by the amount placed in this variable.
2. **VALUE** – This variable displays the space humidity that the controller is using for operation. It is the same value being shown on the “HOME” screen.
3. **NO. of Sensors** – This variable allows the user to define the number of sensors being used by the controller. Note that the “VALUE” tab for all sensor not being used should be equal to “0”. The “OFFSET” variable of the respective sensor should be used to alter the “VALUE” of the sensor in question to 0. This is critical for calculation.
4. **HIGHEST/AVERAGE** – This variable allows the user to select if the “HIGHEST” temperature measured should take priority in operation or “AVERAGE” temperature of the sensors should take priority. It is critical that the instructions in “No. of Sensors” above is followed.
5. **PARAM** – This button opens the “PARAMETER” screen. See above for description.

► ECONOMIZER Screen



Figure 6 – “ECONOMIZER” Screen.

1. **Cool Option** – This variable allows the user to select if the system should run the free cooling feature (Economize) first or go directly to mechanical cooling.
 - a. **ECONOMIZE** – If the outdoor conditions are satisfied, the system attempts to satisfy the cooling requirement by bringing in outside air. Note that if outside air is not desired, this feature should NOT be selected.
 - b. **DX (DIRECT EXPANSION)** – This feature energizes the compressor(s) to satisfy the cooling requirement. It will NOT bring in outside air to satisfy the cooling requirement.
2. **Sensor Type** – This allows the end user to select what psychrometric properties (in this case, Temperature or Enthalpy) should be used to energize the free cooling feature.
 - a. **DRYBULB** – If “DRYBULB” is selected, only the Temperature property is considered when deciding to economize. See “Temp Setpoint” below.

- b. **TEMP/HUM** – If “TEMP/HUM” is selected, both the temperature setpoint and humidity setpoint must be satisfied for the system to economize. See “Temp Setpoint” and “Hum Setpoint” below.
- 3. **Temp Setpoint** – This is the maximum temperature at which the outdoor air will be allowed to be used for free cooling. Basically, the maximum temperature at which the economizer opens.
- 4. **Hum Setpoint** – This is the maximum humidity that the unit would economize.
- 5. **Capacity OP** – This describes the staging of the unit during operation
 - a. **FULL** – The unit runs at full cooling capacity at all times. That is, all cooling stages in the unit will be energized. No partial capacity or economizer operation will be allowed.
 - b. **VARIABLE** – Only used on units with two (qty), staged compressors. It is critical that “Capacity OP” on the controller is NOT set to variable if the 4th character in the model number is not a “7”. This allows the end user to achieve 5 stages of cooling operation during. ****Special Controller Needed****
 - c. **STAGE** – This setting allows the unit to operate with 2 distinct stages. Note that the unit must be equipped with stage compressors or two single stage compressors which can be operated independently.
- 6. **ADVANCED** – This opens the “ADVANCED” screen. Details addressed earlier in this document .
- 7. **DAMPER** – This opens the “DAMPER” screen. See below for details.

► DAMPER



Figure 7 – “DAMPER” Screen.

- 1. **Damper Control** – This dictates how the dampers will function during the economizer process.
 - a. **AUTO** – If “AUTO” is selected, the damper would modulate to maintain a pre-defined mixed air temperature of 55 OF.
 - b. **MANUAL** – If “MANUAL” is selected, when there is a request for economizer, the damper will open to a user defined position [Set Damper Pos %].
- 2. **Override Damper** – This allows the end user to open the damper irrespective of a cooling request. Basically, the damper remains open continuously at a user defined position [Set Damper Pos %].
- 3. **Pos. Requested** – TBD
- 4. **Set Damper Pos %** - This allows the user to set the dampers to a user defined position. Note that this only works if “Override Damper” is set to “ON” or if there is an active request for economizer cooling and “Damper Control” is set to “MANUAL”.
- 5. **Damper Max Pos %** - This is the maximum position (0-100) that the damper will be allowed to open to during operation. This number is user defined.
- 6. **Damper Min Pos %** - This is the minimum position (0-100) that the damper will close to during operation. This number is user defined.
- 7. **ECONOMIZER** – This opens the “ECONOMIZER” screen. Previously addressed in this document.

NOTE: ALL ECONOMIZER AND DAMPER SETTINGS ARE REPLICATED ON ALL DEVICES. THAT IS, EACH SYSTEM CANNOT BE SETUP INDEPENDENTLY FROM THE CONTROLLER.

► UNIT STATUS Screen

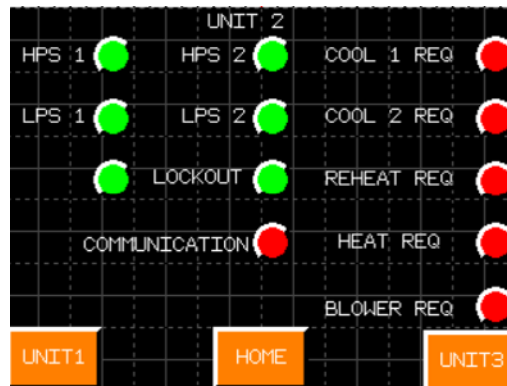


Figure 8 – “UNIT STATUS” Screen.

This screens illustrates the basic status of the respective unit. The unit number is identified top center of the screen. To go to the next or previous unit screen, use the “UNIT #” is located at the bottom corners of the screen. The center bottom [HOME], will open the “HOME” screen.

ALARM STATUS

1. **HPS 1** – High Pressure Fault on Circuit 1 of the respective unit. Solid “Green” means OK. Flashing “RED” means Fault.
2. **HPS 2** – High Pressure Fault on Circuit 2 of the respective unit. Solid “Green” means OK. Flashing “RED” means Fault.
3. **LPS 1** – Low Pressure Fault on Circuit 1 of the respective unit. Solid “Green” means OK. Flashing “RED” means Fault.
4. **LPS 2** – Low Pressure Fault on Circuit 2 of the respective unit. Solid “Green” means OK. Flashing “RED” means Fault.
5. **LOCKOUT** – Signifies a lockout in the unit. Left light Flashing “Red” means lockout on circuit 1. Right light Flashing “Red” means lockout on circuit 2. Solid Green signifies “NO LOCKOUT PRESENT”.
6. **COMMUNICATION** – “Solid Green” represents communication between the controller and respective unit. “Flashing Red” represent “NO COMMUNICATION”.

REQUESTS

NOTE: AN ACTIVE REQUEST IS REPRESENTED BY A “GREEN” LIGHT ADJACENT TO THE RESPECTIVE REQUEST. AN INACTIVE REQUEST IS REPRESENTED BY A “RED” LIGHT ADJACENT TO THE RESPECTIVE REQUEST.

1. **COOL 1 REQ** – This represents a stage 1 cooling request from the controller for the unit respectively.
2. **COOL 2 REQ** – This represents a stage 2 cooling request from the controller for the unit respectively.
3. **REHEAT REQ** – This represents a dehumidification request from the controller for the unit respectively.
4. **HEAT REQ** – This represents a stage 1 heat request from the controller for the unit respectively.
5. **BLOWER REQ** – This represents a request for fan from the controller for the unit respectively.

► ALARM LOG Screen

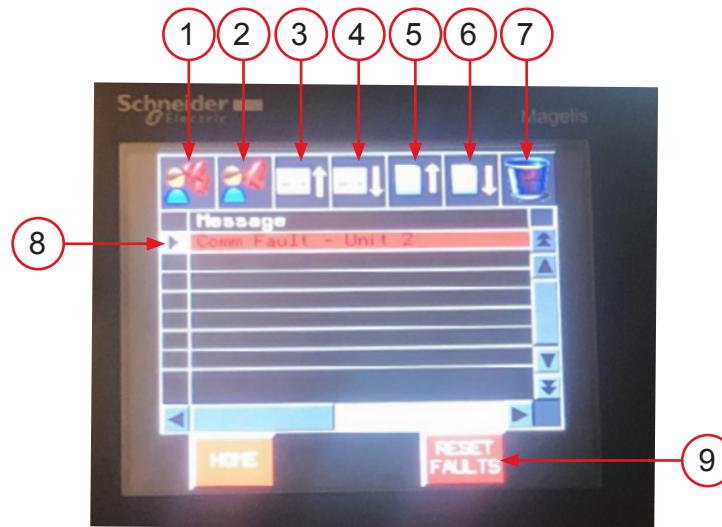


Figure 9 – “Alarm Log” Screen.

1	Acknowledge independent fault
2	Acknowledge all faults
3	Go to previous Page
4	Go to next Page
5	Scroll to previous message
6	Scroll to next message
7	Delete all faults
8	Fault message
9	Remote reset pressure switch lockout faults. <u>Press and hold for 5 seconds. The controller will only allow this function if the Cooling Setpoint is satisfied.</u>

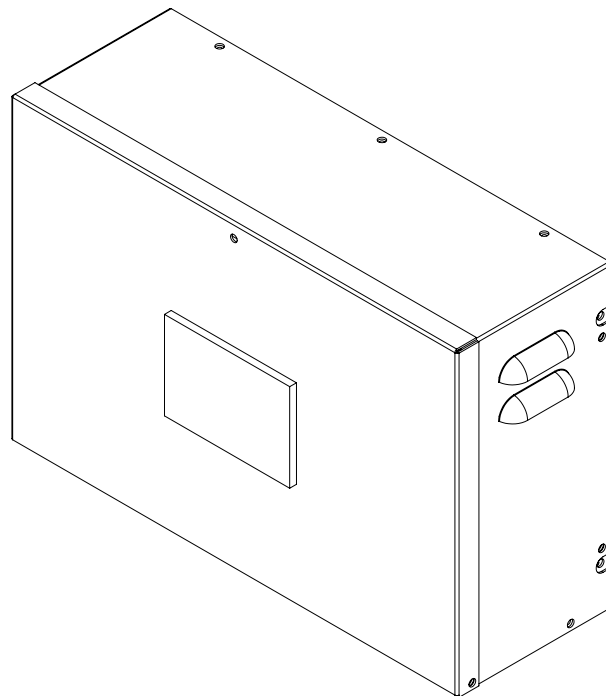
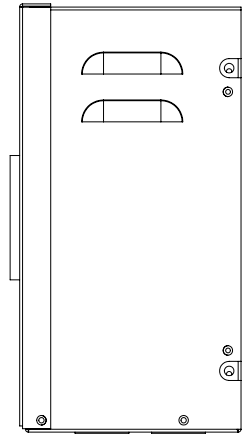
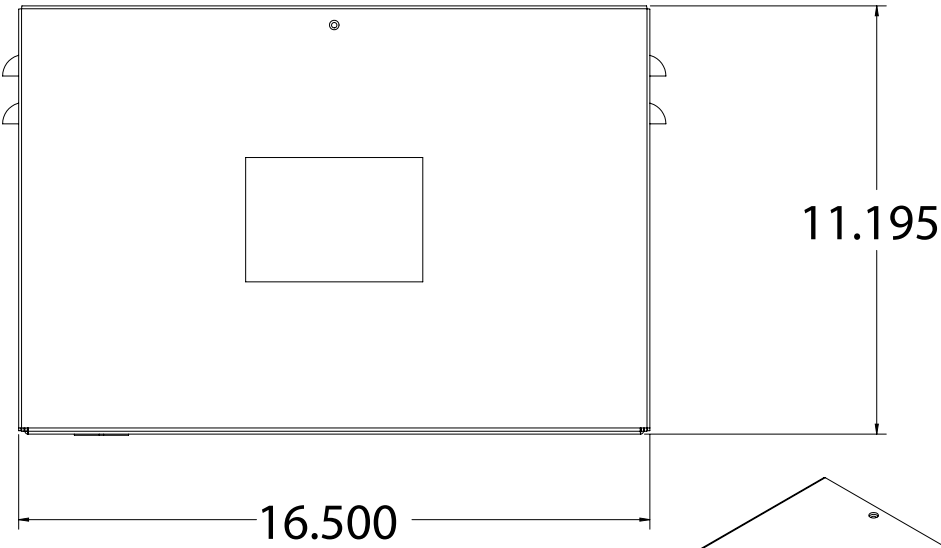
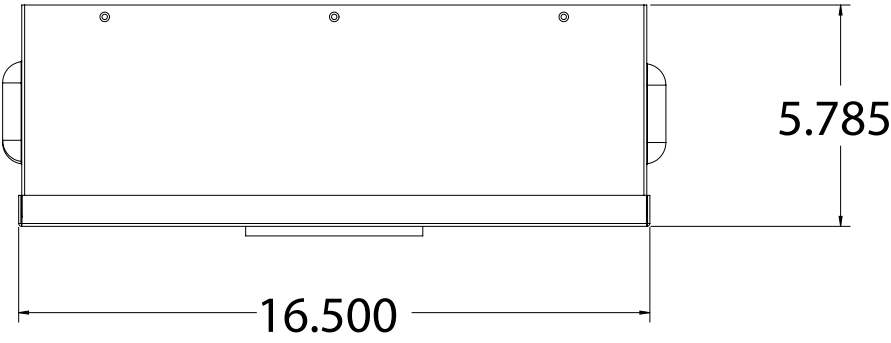
TROUBLESHOOTING COMMUNICATION ISSUES

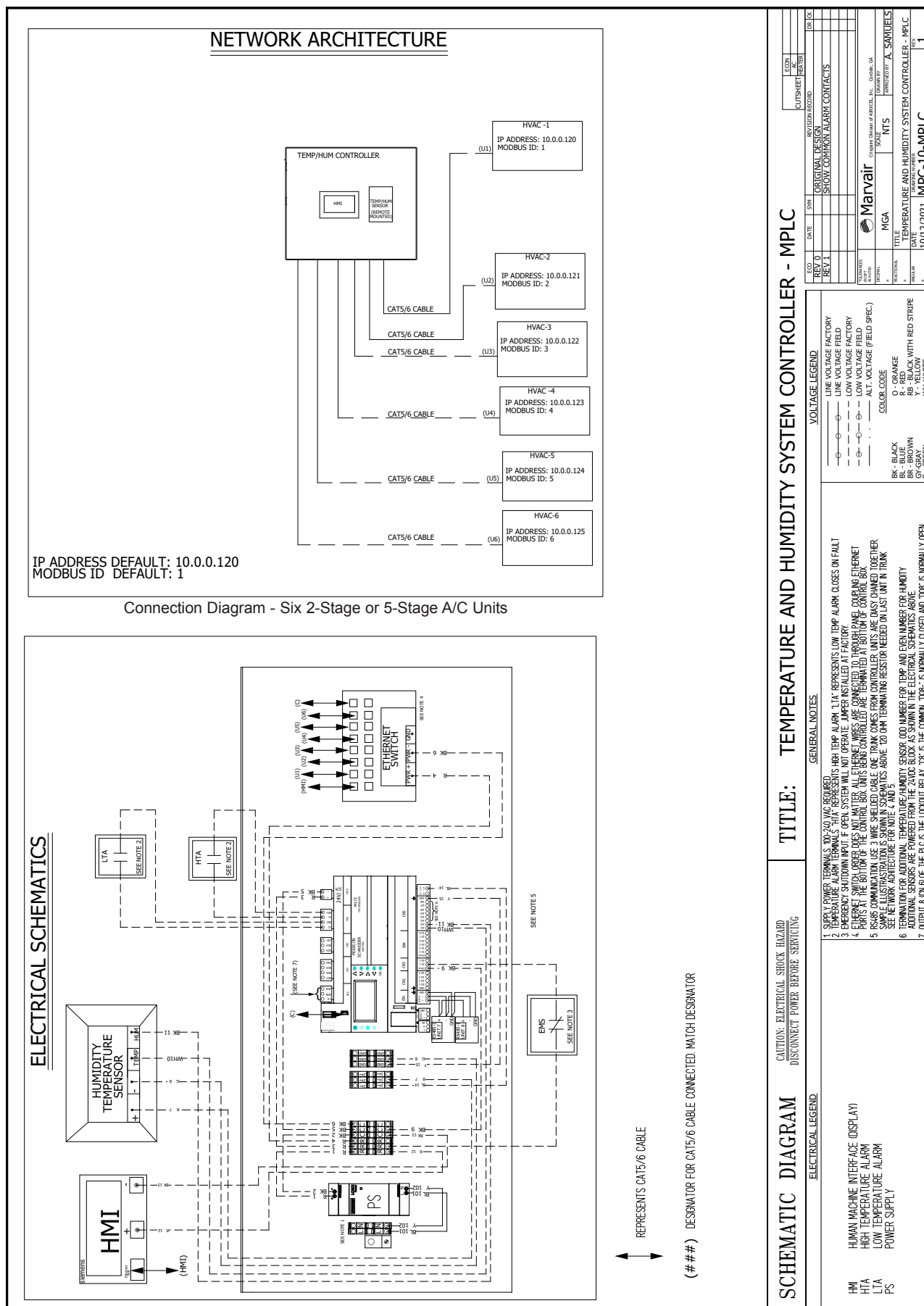
IMPORTANT

Be sure that the crankcase heater (if used) has been energized for at least 24 hours before starting the unit(s). Double-check all electrical connections before applying power. Air conditioners with scroll compressors running on 3Ø power must be checked for proper rotation during the initial start-up. Please refer to the Installation & Operation manual for determining if the 3Ø compressors are rotating correctly. Incorrect rotation can damage the compressor and may not be covered by the warranty.

1. Ensure that the wires are terminated correctly based on the wiring diagram provided.
2. Type of communication to HVAC units
 - a. If MODBUS TCP (CAT5/6 Cable) is used between the controller and the HVAC units.
 - i. Use the appropriate IP address for the respective unit.
 - ii. Ensure that the Controller, the HVAC unit and the HMI is on the same subnet (Highlighted in **BLUE**). That is, only the last section of the IP address should be different. For example, Controller IP Address: 10.0.0.100
 HVAC Unit 1 IP Address: 10.0.0.120
 HMI IP Address: 10.0.0.150
 - b. If MODBUS RTU (RS 485-2) is used between the controller and the HVAC units.
 - i. Use the appropriate MODBUS ID for the respective units
 - ii. BAUD rate, Parity, Stop Bit and Data Bit are preconfigured. See “page 2” above for configuration.
3. “**Status**” screen for the respective unit monitors communication between the units. Verify that the communication bubble for the unit in question is “SOLID Green”. If it is not connected, the bubble will be flashing RED.
4. If the HMI comes up with exclamation marks (!) beside all the values, that means that the HMI is not communicating with the PLC in the Controller (Not the PLC in the HVAC units).

MPC-10 DIMENSIONS





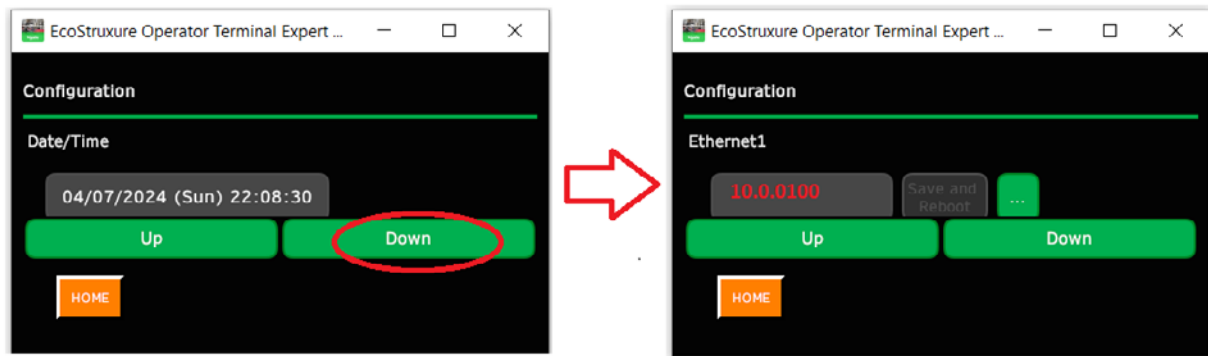
APPENDIX A - NETWORK CONFIGURATION

► Network configuration of the MPC-10 and associated HVAC units

1. How to navigate to page that allows IP address configuration



2. How to change the IP address of the HMI

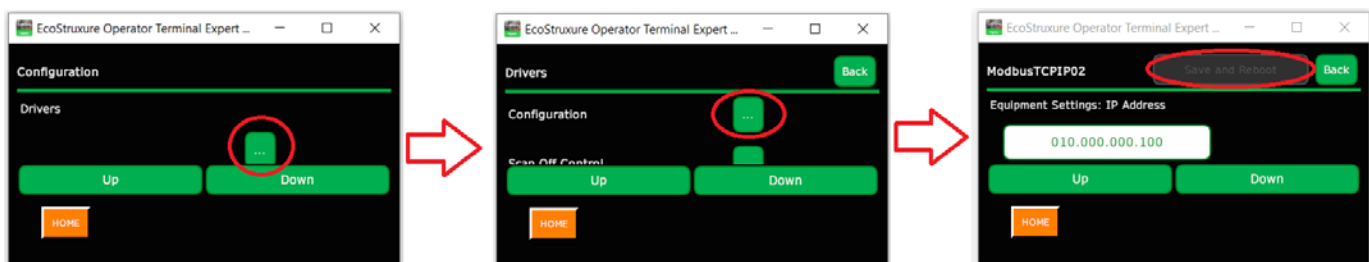


PRESS DOWN UNTIL "ETHERNET1" APPEARS

TYPE THE DESIRED ADDRESS FOR THE HMI HERE. THE "..." ALLOWS CONFIG OF SUBNET MASK AND DEFAULT GATEWAY. SAVE AND REBOOT AFTER MAKING THE NECESSARY CHANGES

3. How to change the IP address of the reference PLC the HMI is communicating with.

Note: The master PLC's IP address still has to be changed at the PLC.



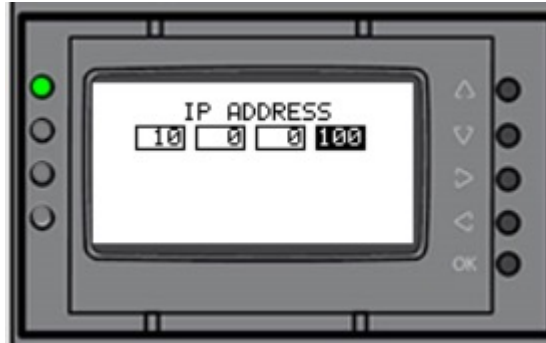
FOLLOW STEP 1 AFTER REBOOT. USE "DOWN" TO GET TO THE SCREEN ABOVE. SELECT THE "..." CIRCLED ABOVE

ON THE "DRIVERS" SCREEN, SELECT THE "..." TO THE LEFT OF CONFIGURATION CIRCLED ABOVE.

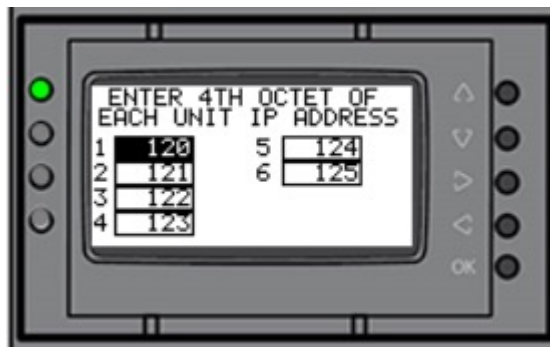
USE "DOWN" TO NAVIGATE TO THE SCREEN ABOVE. THE IP ADDRESS USED HERE SHOULD BE THE SAME IP ADDRESS AS THE PLC IN THE MASTER CONTROLLER. SAVE AND REBOOT.

► **How to change the IP address on the PLC (master controller)**

1. Use buttons on the right of the PLC display to navigate to the “IP ADDRESS” screen. Note that the IP address used here should be same IP address used in “Step 3” for the HMI configuration above



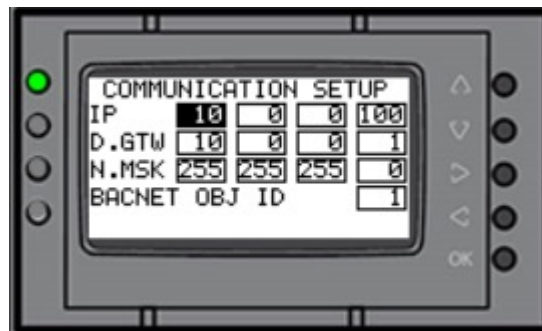
2. The fourth octet of the IP address associated to each HVAC unit PLC's need to be configured on the screen below.



Note: The PLC is located inside the MPC-10 controller behind the HMI

► **How to change the IP address on the PLC in the HVAC units**

1. Use buttons on the right of the plc display to navigate to the “IP ADDRESS” screen.



► **General notes concerning network architecture**

1. Each device on the network must have a unique IP address
2. All devices must be on the same subnet. That is, the first 3 octets must be the same for all devices. If the IP address is 10.0.0.100, the bold and underlined portion of the IP address must be same for all devices on that network for them communicate.
3. Building management systems also need to be on the same subnet in order to establish communication. See “2.” For explanation of subnet



Please consult the Marvair® website at www.marvair.com for the latest product literature. Detailed dimensional data is available upon request. A complete warranty statement can be found in each product's Installation/Operation Manual, on our website or by contacting Marvair at 229-273-3636. As part of the Marvair continuous improvement program, specifications are subject to change without notice.



P.O. Box 400 • Cordele, GA 31010
156 Seedling Drive • Cordele, GA 31015
Ph: 229-273-3636 • Fax: 229-273-5154
Email: marvair@airxcs.com • Internet: www.marvair.com

