



PRODIGY® 2.0 INSTALLATION AND SETUP GUIDE

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Supersedes 507241-02



⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency.

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1. Prodigy 2.0 – M3 Unit Controller Description

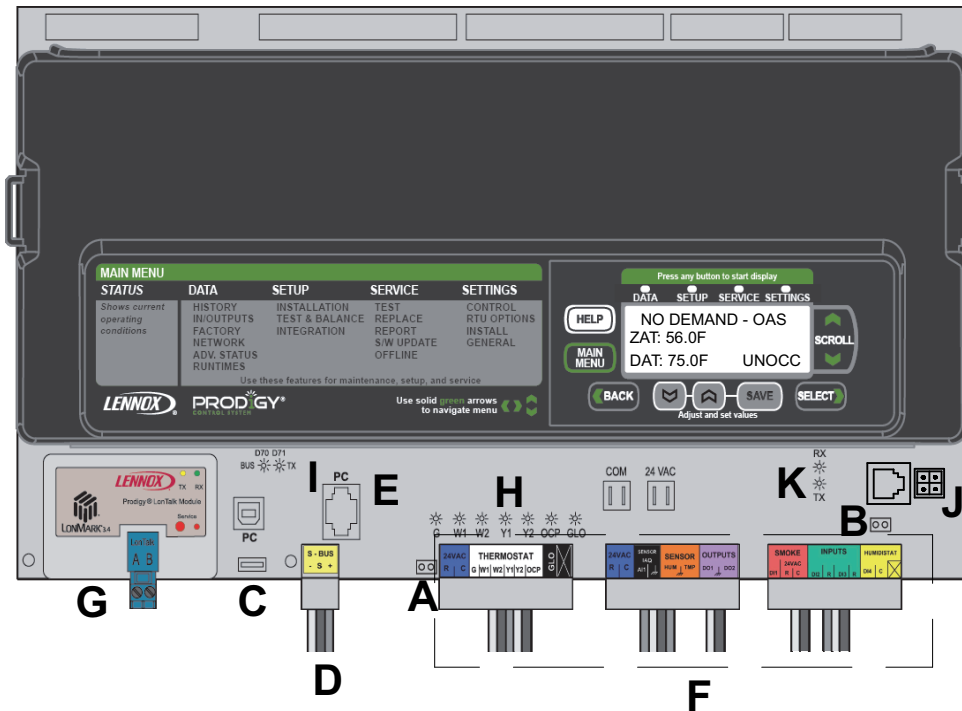
For all available M3 unit controller documentation, go to the Lennox Commercial website.

www.lennoxcommercial.com

The M3 unit controller:

- provides control functions for Emergence® Rooftop Units only,
- includes a 4 x 20 LCD display, USB port, menu selection LED and various navigation tools,
- provides status and diagnostic information for troubleshooting,
- allows adjustment of time delays and setpoints that enable advanced features,
- is controlled by a standard room thermostat, direct digital controller (DDC), or a room sensor,
- can be configured as a device on the network when daisy-chained to the L Connection® Network,
- may be connected to a PC which has been loaded with unit controller software,
- accepts add-on controls to build variations according to application or equipment type.

3. M3 Unit Controller - Connections, Inputs/Outputs, Jumpers, and LEDs Locations



- A. TO DISCONNECT TSTAT_COM FROM COM JUMPER (CUT JUMPER)
- B. TO DISCONNECT HMD_COM FROM COM JUMPER (CUT JUMPER)
- C. USB INTERFACE
- D. S-BUS INTERFACE
- E. RJ-11 PHONE JACK
- F. SMART WIRE INTERFACES
- G. COMMUNICATION MODULE INTERFACE
- H. DEMAND STATUS LEDES
- I. SYSTEM HEART BEAT LEDES
- J. MODBUS CONNECTOR (currently available only on Emergence Ultra-A Box M3 Unit Controller)
- K. MODBUS TX AND RX LEDES (available only on Emergence Ultra-A Box M3 Unit Controller)

- USB verification and profile sharing.

2. Start-Up Procedure

⚠ WARNING

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- A. Turn on unit and dismiss alarm messages as necessary by press the **BACK** button.
- B. Press the **SCROLL** button down **arrow** to navigate to the **SETUP** option and press the **SELECT** button. Press the **SELECT** button again for the **INSTALL** option. This will start the configuration process.

NOTE: The system needs to be in a normal operating mode as seen on display (NO DEMAND, COOLING, HEATING, IDLE, etc).

- C. To verify operation navigate to **SERVICE > TEST** menu.

See **Quick Start Guide** section at the end of this manual for additional start up information.

3.1. Thermostat / Humidistat Common Isolation

Thermostat (**TSTAT**) and humidity (**HUM**) sensor commons are located on connector P298 and may be isolated if they are powered remotely. Remove jumper.

- **TSTAT_COM Jumper:** This jumper is located to the left of P297 connector. This jumper would be removed only in unique situations where the device supplying the thermostat signals to the M3 unit controller has its own power source and does not share a common reference voltage with the M3 unit controller. Otherwise the jumper would remain installed across both pins, as shipped from the factory.
- **HMD_COM Jumper:** This jumper is located to the right of P299 connector. This jumper would be removed only in unique situations where the device supplying the thermostat/humidistat signals to the M3 unit controller has its own power source and does not share a common reference voltage with the M3 unit controller. Otherwise the jumper would remain installed across both pins, as shipped from the factory.

3.2. USB Flash Drive Interface Usage

This USB port is used for verifying service, downloading reports, transferring unit profiles and performing firmware updates. Onsite data collection requires use of a USB flash drive. Data written to the drive includes date, time, serial number, catalog number, basic data, error code buffer, and unit configuration.

3.3. Communication Interfaces

These interfaces are used with unit controller software to change programming.

- **USB:** The M3 interface uses a USB A to B male cable for PC connection.
- **S-BUS:** This is the L-connection connection interface. This is a RS485 network connection with other devices (NCP, comfort sensors, other RTU, etc.)

- **RJ-11 Phone Jack:** S-Bus connection is for factory tests. It is RS485 connection to the RJ-11 phone jack. Some DDC controllers may also be connected.

A list of service connection kits is listed on page 36.

3.4. SmartWire™ Field Wiring Connections (P297, P298 and P299)

These connectors allow for easy field wiring connection points. The M3 unit controller connects to the rooftop unit using SmartWire™ connectors. Each connector is *keyed* so that no connector can be installed in the incorrect location. Be sure all connectors are in place and completely inserted. See Section 22. on page 48 for connector information.

3.5. Communication Module Interface

This connection is used for either BACnet® or LonTalk® communication modules.

3.6. Thermostat Input LED Indicators

Indicates active state for G, W1, W2, Y1 and Y2 demands. Indicators are also available for occupied/unoccupied (OC) or global input (GLO). The indicators and their meanings are described in table 1.

3.7. Heart Beat LED Indicators

Some indicators on the circuit board are visible with the cover in place; others are not. The indicators and their meanings are described in table 1.

3.8. MODBUS Connection (P358)

This is a TIA-485 serial line over MODBUS (messaging structure) communication. This is currently used only in the Emergence Ultra-A Box models. This connection is used for communication between the M3 unit controller and inverter. See table 30 on page 50 for pin-out information.

3.9. MODBUS LEDS

There is a transmit (TX) and receive (RX) activity indicated near the MODBUS connector.

Table 1. LED Operation Indications

LED	Status	Indication	Meaning
Heartbeat (HB) (D33)	Green	Slow Flash	Normal Operation
	Green	Fast Flash	Bootloader / firmware update mode
	No light	Steady Off	No voltage to M3 board or defective board
	Green	Steady On	Unit in configuration / test mode (not in normal mode)
S-BUS / PC Connection (D70 and D71)	BUS (green)	Flickering ON	Network traffic present
	TX (yellow)	Flickering ON	Unit controller is transmitting
BACnet (option) - LEDs located on module	RX (green)	Flickering ON	Unit controller is receiving
	TX (yellow)	Flickering ON	Unit controller is transmitting
LonTalk (option) - LEDs located on module	RX (green)	Flickering ON	Unit controller is receiving
	TX (yellow)	Flickering ON	Unit controller is transmitting
	SERVICE (red)	Flashing 1 sec. on; 1 sec. off	Node is not configured; application loaded
	SERVICE (UNLIT)	Steady off	Node is completely configured
	SERVICE (red)	Constant on	Node is configured; no application loaded
	SERVICE (red)	Quick flashes during initialization	Messages being passed to M3; normal operation
Thermostat Input	Yellow	Indicates a thermostat demand	G - Blower on (D17) W1 - First-Stage Heating (D20) W2 - Second -Stage Heating (D23) Y1 - First-Stage Cooling (D26) Y2 - Second-Stage Cooling (D29) OCP - Occupied (D32) GLO - Global input (D38)
MODBUS	Two LEDs that indicate transmit (TX) and receive (RX) activity.		
Thermostat LEDs indicate only with incoming thermostat connection via SmartWire™ connectors.			
Slow Flash = 1 second on; 1 second off. Fast Flash = ½ second on; ½ second off. A "flickering" LED flashes significantly faster than a "fast flash".			
NOTE: LEDs are energized by 24VAC thermostat inputs.			

CAUTION

ELECTROSTATIC DISCHARGE (ESD)
Precautions and Procedures

Electrostatic discharge can affect electronic components. Take precautions during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface before performing any service procedure

4. System Status Screen

The display shows operating mode if in normal operation. Alarms will interrupt the display.

Alarm messages will appear on the display and remain there until dismissed. Dismissing an alarm is just clearing the alarm from using the entire screen to display the condition(s). The alarm condition still exists and up to two alarm codes are displayed along the right side of the screen above the thermostat demand type status. To dismiss an alarm, press the **BACK** button.

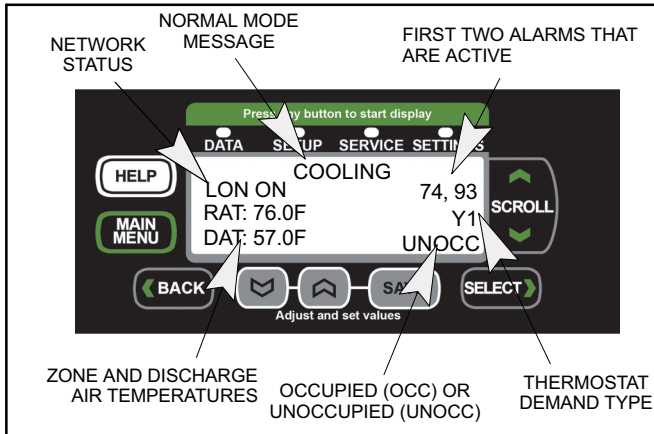


Figure 1. System Status Display

4.1. Network Status

The second line on the left side (see figure 1) is used for displaying network status. The status will indicate either ON or OFF for the network employed. Network types are listed in table 2.

Table 2. Network Status

Screen Label	Network Type
LON	LonTalk
BACNET	BACnet
LCONN	L-Connection
RTU	Rooftop Unit (this is not a networking status, but indicates if the RTU is ON or OFF.

4.2. Unit Operation

This section describes the display and control buttons, how to configure the unit, and how to read stored configuration data, status, and alarms.

The M3 unit controller is an input and output junction point. If in the thermostat mode, thermostat inputs at P297 result in an output to unit components (see table 26 on page 49). If the heartbeat LED is not flashing, see table 1 on page 5 for heartbeat operation. If the display shows an alarm, refer to alarm section for more information. If the thermostat input indicating lights are not responding appropriately, check the thermostat or a DDC control acting as thermostat inputs into P297.

Basic cooling and heating functions may be energized to test major unit components by using the M3 unit controller testing function or by using jumper wires on the Field Wiring Termination plug P297.

4.3. Alarm Status Display

Figure 2 shows how alarms are displayed. Alarming value may indicate the condition which triggered the alarm (temperature, voltage, pressure, time, etc.).

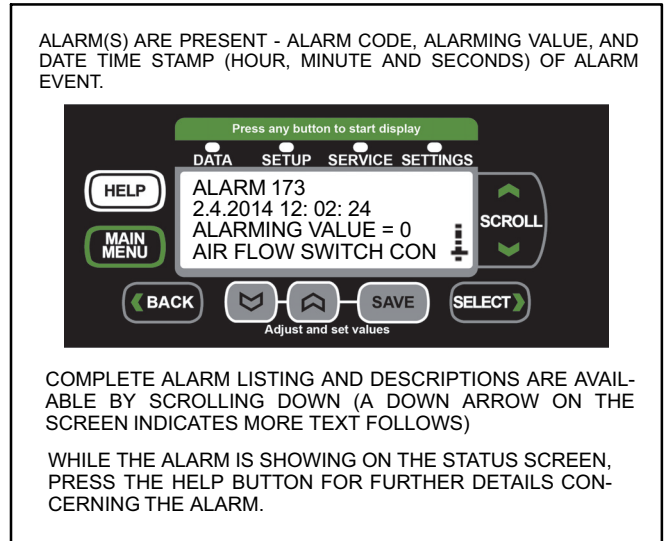


Figure 2. Alarm Code Readout Example

4.4. Normal Mode Messages

The format of the message is mode and setpoint (see table 3).

Table 3. Possible MODE messages

COMP LOAD SHEDDING	Unit is running at lower power capacity
COOLING	Cool demand present; unit is in mechanical cooling.
DEHUMIDIFICATION	Unit is dehumidifying
FREE COOLING	Cooling demand is present, no compressor cooling.
FRESH AIR COOLING	Cool ventilation air to neutral value
FRESH AIR HEATING	Heat ventilation air to neutral value
HEATING	Heat demand present; unit is heating
CONTROLLER LOCKOUT	User has disabled controller operation.
LOW AMBIENT LOCKOUT	Outdoor air is too cold to allow compressors to run.
MORNING WARMUP	Outdoor air damper closed
OFF ON ALARM	Unit is off due presence of alarm(s) that the system has determined will halt system operations. <i>NOTE: Not all alarms will halt system operation. The first two active alarms are displayed on the main system status screen (see figure 2).</i>
DELAY UP TO 5 MIN	If the system has cleared the alarm there is usually a five minute delay before resuming system operations.
DELAY UP TO 20 SEC	In certain models, the compressor turns on a few seconds after the outdoor fan is energized.
PRE-COOL	Compressor not allowed—free cooling. (During the first 30 minutes of the first cooling demand following a change from unoccupied to occupied, calls for mechanical [compressor] cooling are ignored if an economizer is installed and if outdoor air is suitable for free cooling.)
PREINSTALL	Unit has not been set up for operation. Must follow installation menus
START UP	Default start up delay before servicing demands. Go to M3 user interface: SETUP > INSTALL
SMOKE ALARM	Smoke input detected
TEST	Network has unit in test mode
BLOWER ON	Indoor blower is on.
BLOWER ON - OAS	Indoor blower is on and outdoor air is suitable.
NO DEMAND	System not receiving a demand for cooling or heating.
NO DEMAND - OAS	System not receiving a demand for cooling or heating and outdoor air is suitable.
COOL + MAX OPEN ECON	Mechanical cooling is operating with maximum free cooling.
COOL + MODULATE ECON	Mechanical cooling is operating with variable free cooling.

5. Firmware Update

5.1. Unit Controller USB Flash Drive Update Capability

Firmware updating is available using the USB port. To display the current firmware version, navigate to menu **DATA > FACTORY > SOFTWARE VERSION**.

5.2. Updating Firmware

The firmware on the M3 unit controller can be updated by inserting a USB flash drive containing the update.

NOTE - Flash drive media must be formatted using the FAT32 file system.

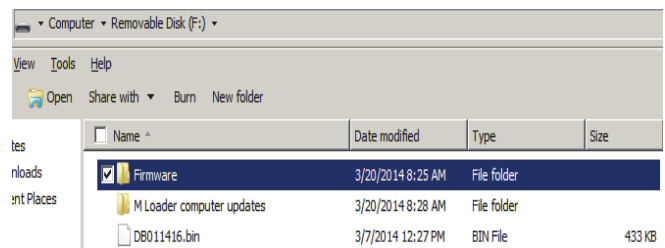
5.3. Files Needed for Update

Files needed to upgrade M3 unit controller from USB flash drive: **M3XXXXXXXX.P2F** (ALL UPPERCASE IS RECOMMEND, BUT NOT MANDATORY)

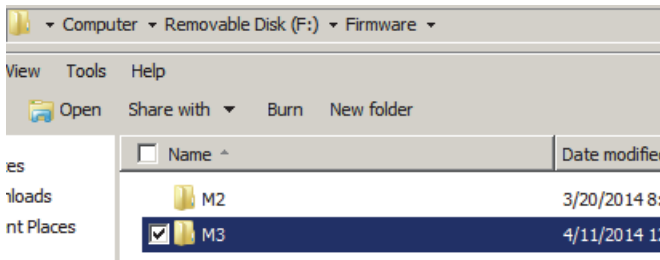
The **xxxxxxxx** are place holders for major and minor versions and build number information in the actual file name, and varies from one version to the next.

5.4. Where to Place the .P2F File on the USB Flash Drive.

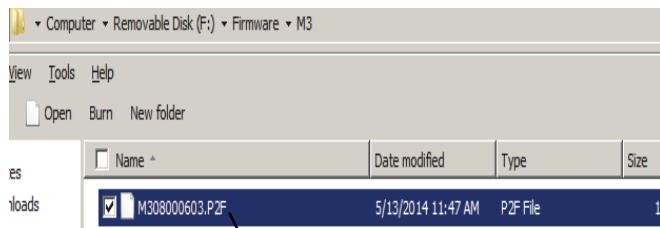
- A. Firmware folder is located in the root directory of the USB flash drive. (Note: Drive letter may differ from the one illustrated below.



B. The **M3** folder is located under the **Firmware** folder.



C. Place a copy of the **.P2F** file into the **M3** folder.



M3XXXXXXXX.P2F file goes here. (.P2F) file name suffix is recommended to be in all CAPS but not mandatory.

5.5. Updating Firmware

- A. After inserting the USB flash drive, navigate to **SERVICE > SOFTWARE UPDATE**.
- B. Press the **SELECT** button, then use the **adjust values** (up/down) arrows to select a firmware version.
- C. Press **SAVE**.
- D. The following update sequence should occur:
 - **SOFTWARE UPDATE STARTING**
 - **SOFTWARE UPDATE ERASING FLASH**
 - **SOFTWARE UPDATE PROGRAMMING FLASH**
 - **SOFTWARE UPDATE PROGRAMMING FLASH PROGRESS xx%** (xx% indicates update percentage completed)
 - **SOFTWARE UPDATE RESETTING CONTROLLER**.

E. After the unit controller resets, the first screen to appear will display the following (xx.xx.xxxx indicates the software version number):

PRODIGY 2.0
M3 CONTROLLER
xx.xx.xxxx

F. You may remove the USB flash drive anytime after the reset is completed.

G. Firmware version can also be verify by navigating to menu **DATA > FACTORY > SOFTWARE VERSION**.

***NOTE:** Firmware updates do not alter the unit controller configuration settings. All settings will be retained after the firmware has been updated.*

6. Saving and Loading User Profile

When saving the user profile, all information concerning model number, configuration ID1 / ID2, parameters modified using the EDIT PARAMETER option and Test & Balance information are all stored to a non-volatile location in memory.

The reference tasks are available from the M3 unit controller user interface:

- A. To **SAVE** a user profile, go to **SERVICE > REPORT > SAVE USER PROFILE = YES**
- B. To **LOAD** a user profile, go to **SERVICE > REPORT > LOAD USER PROFILE = YES**

7. Saving and Loading USB Profile

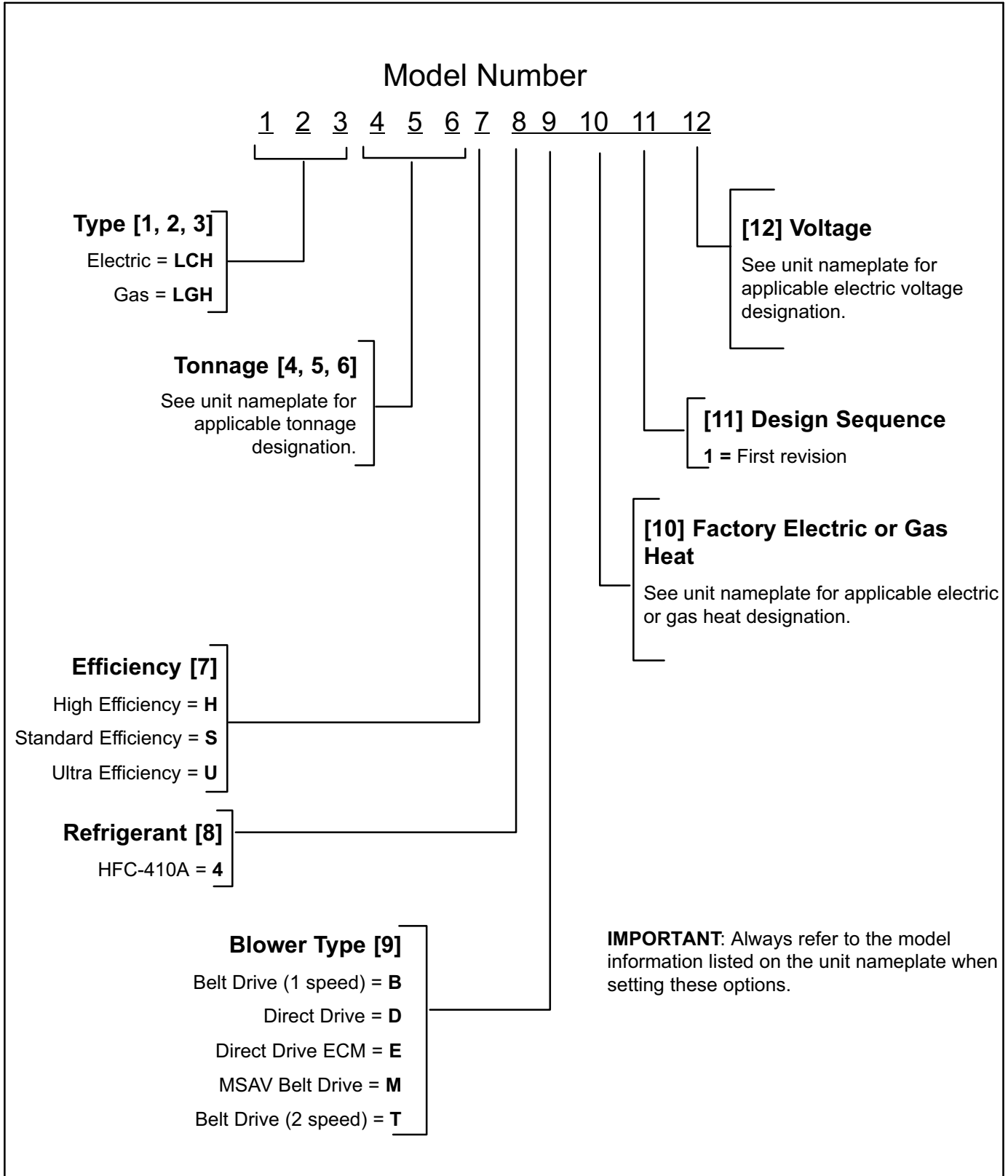
The USB Profile utility allows a copy of the profile to be save to a USB storage device. Only EDIT PARAMETER changed settings and Test & Balance information is saved. The installer will need to configure the Model Number, and Configurations ID 1 / ID2 first before loading the saved USB profile. The USB Profile is typically used when replacing the M3 unit controller with a new one.

The reference tasks are available from the M3 unit controller user interface:

- A. To **SAVE** a USB Profile, go to **SERVICE > REPORT > USB PROFILE SAVE >** enter a unique name for the profile and press **SAVE**.
- B. To **LOAD** a USB Profile, go to **SERVICE > REPORT > USB PROFILE LOAD >** use the adjust and save values arrows to select highlight the desired profile and press **SAVE**.

8. Model Number Description

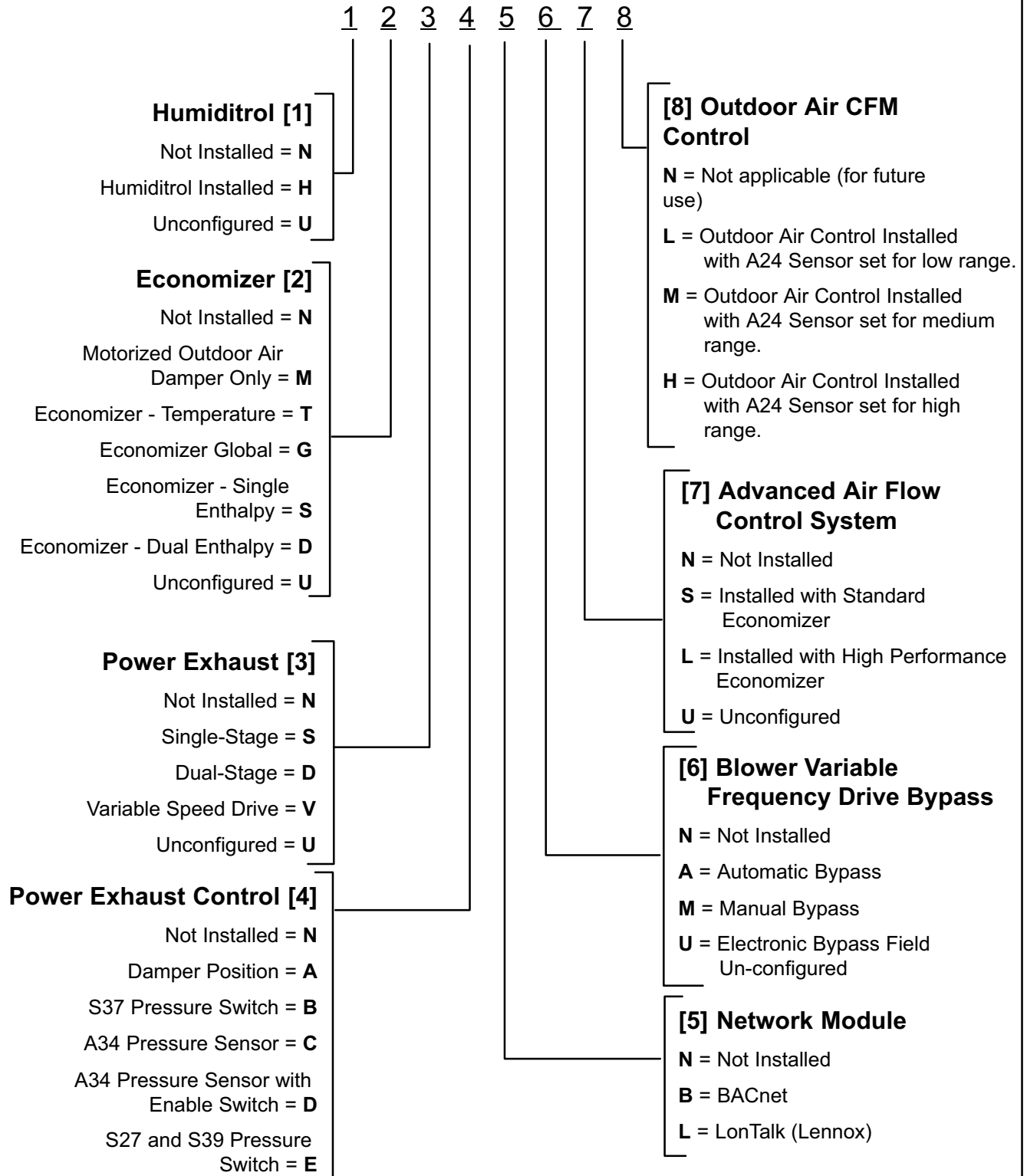
This section addresses the requirement that specific configuration information must be completed using the SETUP / INSTALL feature if a new unit controller was being installed. Other requirements are the addition of accessories that were not factory-installed. Model number, configuration ID 1 and 2, catalog number, serial number and RTU description are all key items required to be completed for the system to operate correctly. Running the SETUP / INSTALL wizard allows the installer to verify that all fields have been completed as required.



9. Configuration ID 1 Description

IMPORTANT: Always refer to the white sticker titled ORIGINAL FACTORY UNIT CONFIGURATION located inside the control box area.

CONFIGURATION ID 1

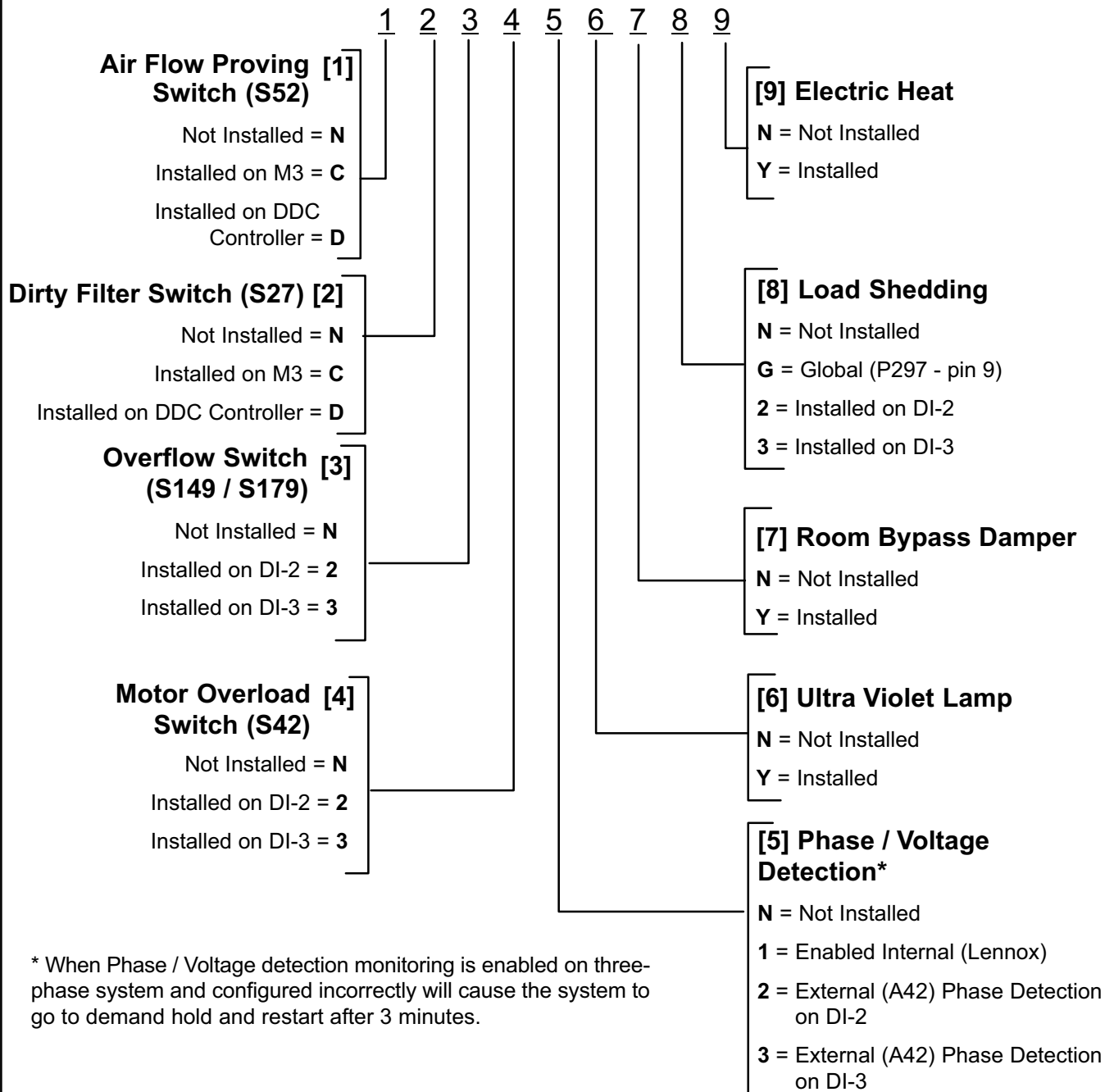


NOTE: The M3 unit controller will display applicable alarm(s) if any positions is left unconfigured (U).

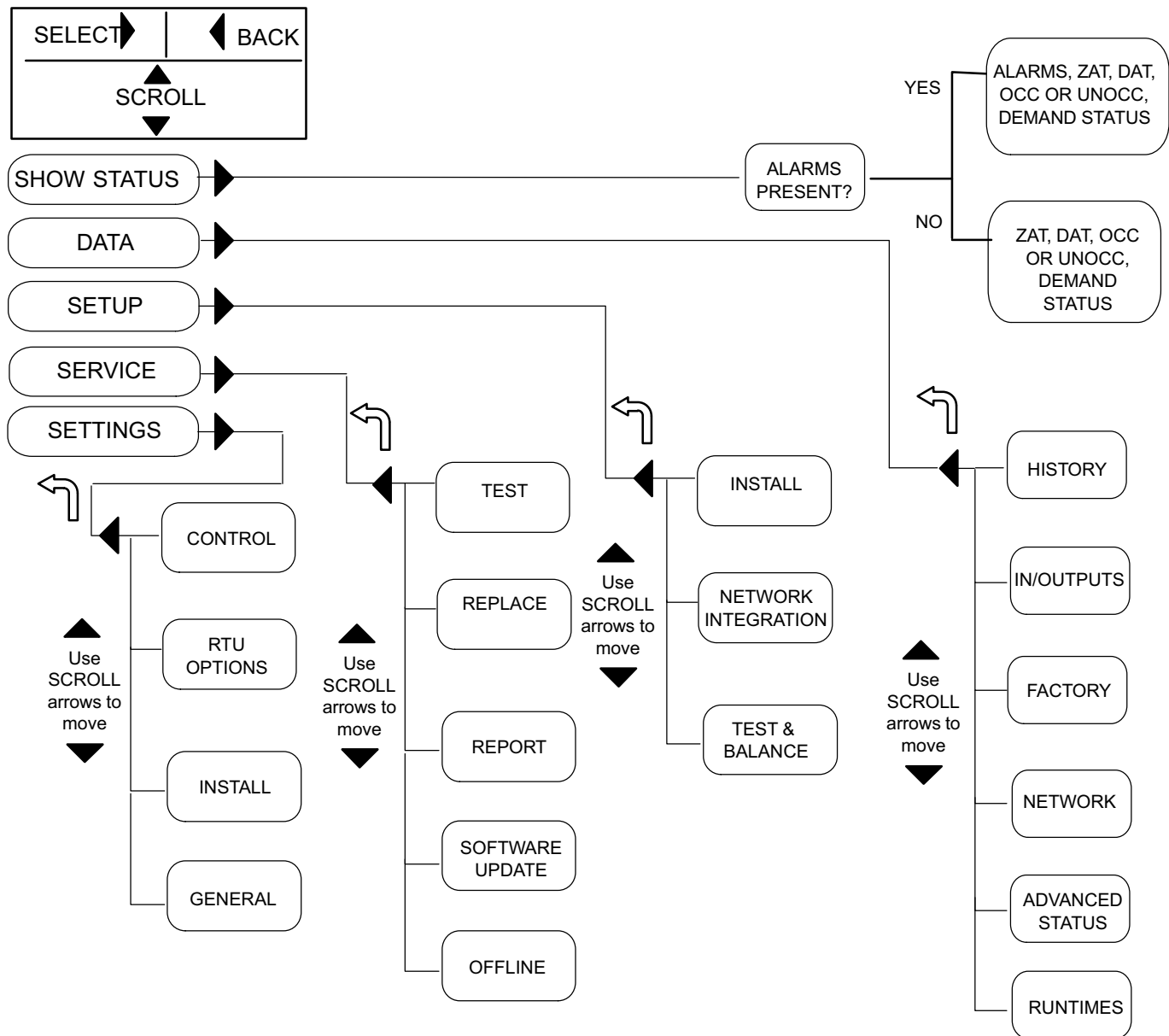
10. Configuration ID 2 Description

IMPORTANT: Always refer to the white sticker titled ORIGINAL FACTORY UNIT CONFIGURATION located inside the control box area.

CONFIGURATION ID 2



11. Menu Tree



12. Menu Interface Details

Table 1 lists the major levels of the menu interface. Many of these options have more levels and are described in the following sections that detail **DATA**, **SETUP**, **SERVICE**, and **SETTINGS**.

- Use SELECT button to progress to next menu level (i.e. level 1 to level 2).
- Use the SCROLL arrows ▲▼ to move (scroll) within a menu level.

- Use the BACK button to return to the previous menu level.
- Use the Adjust and set value arrows ▲▼ to change values of selected item.

12.1. Show Status

Selecting this option takes you to the main screen which will display the current demand, any active alarm codes, occupancy status and the DAT and ZAT temperatures.

12.2. Data

Table 1. Menu Interface (Level 1 - DATA)				
Level 2	Level 3	Level 4	Level 5	Level 6
HISTORY	ALARMS			
	CLEAR ALARM HISTORY = NO OR YES			
	LAST SERVICE (TIME STAMP OF LAST SERVICE)			
IN/OUTPUTS	SENSORS	LOCAL	THERMOSTAT BLOWER SPEED: X OAT: XX F RAT: XX F DAT: XX F ZAT (A2): XX F C02: XX PPM OAV: XX FT/MIN BP: XX IN H2O RH: XX % IE OE GLO: ON/OFF OCP: ON/OFF SMOKE: ON/OFF D12: ON/OFF D13: ON/OFF REHEAT D14: ON/OFF SUCTION1: XX PSIG SUCTION2: XX PSIG C1 SUMP: XX F C2 SUMP: XX F C3 SUMP: XX F C4 SUMP: XX F	G: ON/OFF W1: ON/OFF W2: ON/OFF Y1: ON/OFF Y2: ON/OFF
		NETWORK	THERMOSTAT	G: ON/OFF W1: ON/OFF W2: ON/OFF Y1: ON/OFF Y2: ON/OFF
			ZAT (A2): XX F C02: XX PPM RH: XX %	

Table 1. Menu Interface (Level 1 - DATA)

Level 2	Level 3	Level 4	Level 5	Level 6
IN/OUTPUTS	OUTPUTS (NOTE: COMPONENTS ARE ONLY DISPLAYED IF INSTALLED.)	COMPRESSOR 1: ON/OFF COMPRESSOR 1: ON/OFF COMPRESSOR 3: ON/OFF COMPRESSOR 4: ON/OFF BLOWER: ON/OFF EXHAUST: ON/OFF FAN 1: ON/OFF FAN 2: ON/OFF FAN 3: ON/OFF FAN 4: ON/OFF FAN 5: ON/OFF FAN 6: ON/OFF HEAT 1: ON/OFF HEAT 2: ON/OFF HEAT 3: ON/OFF HEAT 4: ON/OFF REHEAT COIL 1: ON/OFF REHEAT COIL 2: ON/OFF SERVICE RELAY: ON/OFF LCD HEATER: ON/OFF CRANKCASE HEATER 1: ON/OFF CRANKCASE HEATER 2: ON/OFF CRANKCASE HEATER 3: ON/OFF CRANKCASE HEATER 4: ON/OFF		
FACTORY	SOFTWARE VERSION RTU DESCRIPTION CATALOG NUMBER MODEL NUMBER SERIAL NUMBER CONFIGURATION ID 1 CONFIGURATION ID 2			
NETWORK	BACNET	MAC ADDRESS: XXX BAUD RATE: XXXXX DEVICE INSTANCE: X		
	LONTALK	PROGRAM ID NEURON ID		
	L-CONNECTION	LCONN ADDRESS: X		

Table 1. Menu Interface (Level 1 - DATA)

Level 2	Level 3	Level 4	Level 5	Level 6
ADVANCED STATUS	CURRENT ALARMS	ACTIVE ALARMS XXX		
	SETPOINTS	OCC HEAT UNOCC HEAT OCC COOL UNOCC COOL		
	APP MODE			
	BLOWER	BLOWER STATUS	BLOWER SPEED	X %
				X RPM.
			SUPPLY TARGET	X CFM
			SUPPLY ACTUAL	X CFM
DAMPER	DAMPER STATUS	TARGET: X % ACTUAL X % <i>(if advanced airflow is enabled)</i> ACTUAL OA CFM TARGET OA CFM ECON DIFF PRESSURE		
VAR SPEED COMPRESSOR	COMPRESSOR SPEED	TARGET: X % ACTUAL X %		
RUNTIMES	BELT X HRS BLOWER X HRS BLOWER X CYC COOLING	COMP 1: XX HRS - XX CYCLES COMP 2: XX HRS - XX CYCLES COMP 3: XX HRS - XX CYCLES COMP 4: XX HRS - XX CYCLES STAGE 1: XX HRS - XX CYCLES STAGE 2: XX HRS - XX CYCLES FAN 1: XX HRS - CYCLES FAN 2: XX HRS - CYCLES FAN 3: XX HRS - CYCLES FAN 4: XX HRS - CYCLES FAN 5: XX HRS - CYCLES FAN 6: XX HRS - CYCLES		
	EXHAUST X HRS FANS FILTER X HRS FREE COOL X HRS FREE COOL X CYC HEATING	FILTER X HRS FREE COOL X HRS FREE COOL X CYC HEAT 1: XX HRS - XX CYCLES HEAT 2: XX HRS - XX CYCLES HEAT 3: XX HRS - XX CYCLES HEAT 4: XX HRS - XX CYCLES		
	DEHUMID X HRS DEHUMID X CRC POWER ON X CYC POWER ON X HRS PREINSTALL X HRS UV LAMP XXX HRS	DEHUMID X HRS DEHUMID X CRC POWER ON X CYC POWER ON X HRS PREINSTALL X HRS UV LAMP XXX HRS		

12.3. Setup

Table 2. Menu Interface (Level 1 - SETUP)

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7		
INSTALL	LANGUAGE =	= ENGLISH, ESPANOL, OR FRANCAIS					
	DATE/TIME =	= DAY, MONTH, YEAR, HOURS, MINUTES, SECONDS					
	DISPLAY UNITS F/C	= FAHRENHEIT OR CELSIUS					
	MODEL NUMBER =	LOCATED ON UNIT NAMEPLATE.					
	CONFIGURATION ID 1	SEE WHITE STICKER TITLED "ORIGINAL FACTORY UNIT CONFIGURATION" LOCATED ON THE RIGHT SIDE OF THE CONTROL BOX NEAR THE M3 CONTROLLER.					
	CONFIGURATION ID 2	WHITE STICKER TITLED "ORIGINAL FACTORY UNIT CONFIGURATION" LOCATED ON THE RIGHT SIDE OF THE CONTROL BOX NEAR THE M3 CONTROLLER.					
	CATALOG NUMBER	LOCATED ON UNIT NAMEPLATE					
	SERIAL NUMBER	LOCATED ON UNIT NAMEPLATE					
	RTU DESCRIPTION	= UP TO 18 ALPHA/NUMERIC CHARACTERS					
	DEHUMIDIFIER MODE	= BLOWER, OCCUPIED	= LOCAL SENSOR, NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %			
				DEHUMIDIFIER DEHUMID DEADBAND = X.X %			
				= REHEAT DI4			
			= NO CONDITIONS	= LOCAL SENSOR OR NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %		
					DEHUMIDIFIER DEHUMID DEADBAND = X.X %		
				= REHEAT DI4			
		= REPORT RH ONLY		= LOCAL SENSOR OR NETWORK SENSOR			
		= DISABLED					
		= BLWR, OCC, PREV COOL	= LOCAL SENSOR OR NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %			
				DEHUMIDIFIER DEHUMID DEADBAND = X.X %			
			= REHEAT DI4				
= PREVIOUS COOLING		= LOCAL SENSOR, OR NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %				
	DEHUMIDIFIER DEHUMID DEADBAND = X.X %						
	= REHEAT DI4						

NOTE: PARAMETERS AVAILABLE ARE DEPENDENT ON MODEL NUMBER AND CONFIGURATION ID 1 AND 2 SETTINGS

Table 2. Menu Interface (Level 1 - SETUP)

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
NETWORK INTEGRATION	NETWORK = L-CONNECTION	LCONN ADDRESS = X			
		CONTROL MODE = ROOM SENSOR, MONITOR ONLY OR NETWORK THERMOSTAT	<ul style="list-style-type: none"> NETWORK SENSOR CO2 = YES OR NO NETWORK SENSOR RELATIVE HUMIDITY = YES OR NO NETWORK SENSOR TEMPEATURE = YES OR NO ROOM SENSOR OCC BLOWER MODE= AUTO CYCLES OR ON-CONTINUOUS 1, 2 OR 3 * BACKUP MODE = NONE, ROOM SENSOR, RETURN AIR BACKUP OR THERMOSTAT BACKUP SETPOINTS OCCUPIED HEAT = XX.X F BACKUP SETPOINTS UNOCCUPIED HEAT = XX.X F BACKUP SETPOINTS OCCUPIED COOL = XX.X F BACKUP SETPOINTS UNOCCUPIED COOL = XX.X F 		
	<p>* OCC (OCCUPIED) BLOWER MODE DESCRIPTION:</p> <ul style="list-style-type: none"> AUTO CYCLE: BLOWER CYCLES WITH DEMAND ON-CONTINUOUS 1: BLOWER IS ON WITH EITHER THE OCCUPANCY SENSOR OR OCCUPANCY SCHEDULER INDICATES OCCUPIED. ON-CONTINUOUS 2: BLOWER IS ON ONLY WITH BOTH THE OCCUPANCY SENSOR AND OCCUPANCY SCHEDULER, BOTH INDICATES OCCUPIED. ON-CONTINUOUS 3: BLOWER IS ON ONLY WHEN BOTH THE OCCUPANCY SENSOR AND OCCUPANCY SCHEDULER INDICATES OCCUPIED. IN ADDITION, BLOWER WILL BE ON A MINIMUM OF 25% OF THE TIME WHEN OCCUPANCY SCHEDULER INDICATES OCCUPIED HOWEVER THE OCCUPANCY SENSOR INDICATES NOT OCCUPIED. THE 25% MINIMUM IS ACHIEVED BY TURNING BLOWER ON FOR 30 MINUTES AND OFF FOR 90 MINUTES. 				
	NETWORK = BACNET	BACNET MAC ADDRESS = X			
BACNET BAUD RATE = 9.6, 19.2, 38.4 OR 76.8 K					
CONTROL MODE = ROOM SENSOR, MONITOR ONLY OR NETWORK THERMOSTAT		<ul style="list-style-type: none"> NETWORK SENSOR CO2 = YES OR NO NETWORK SENSOR RELATIVE HUMIDITY = YES OR NO NETWORK SENSOR TEMPERATURE = YES OR NO ROOM SENSOR OCC BLOWER MODE= AUTO CYCLES OR ON-CONTINUOUS 1, 2 OR 3 (SEE DESCRIPTION ABOVE) BACKUP MODE = NONE, ROOM SENSOR, RETURN AIR BACKUP OR THERMOSTAT BACKUP SETPOINTS OCCUPIED HEAT = XX.X F BACKUP SETPOINTS UNOCCUPIED HEAT = XX.X F BACKUP SETPOINTS OCCUPIED COOL = XX.X F BACKUP SETPOINTS UNOCCUPIED COOL = XX.X F 			
NETWORK = LONTALK	CONTROL MODE = ROOM SENSOR, MONITOR ONLY OR NETWORK THERMOSTAT	<ul style="list-style-type: none"> NETWORK SENSOR CO2 = YES OR NO NETWORK SENSOR RELATIVE HUMIDITY = YES OR NO NETWORK SENSOR TEMPERATURE = YES OR NO ROOM SENSOR OCC BLOWER MODE= AUTO CYCLES OR ON-CONTINUOUS 1, 2 OR 3 (SEE DESCRIPTION ABOVE) BACKUP MODE = NONE, ROOM SENSOR, RETURN AIR BACKUP OR THERMOSTAT BACKUP SETPOINTS OCCUPIED HEAT = XX.X F BACKUP SETPOINTS UNOCCUPIED HEAT = XX.X F BACKUP SETPOINTS OCCUPIED COOL = XX.X F BACKUP SETPOINTS UNOCCUPIED COOL = XX.X F 			
NETWORK = RTU STANDALONE	BACKUP MODE = NONE OR RETURN AIR BACKUP	<ul style="list-style-type: none"> SETPOINTS HEAT = XX.X F SETPOINTS COOL = XX.X F 			

Table 2. Menu Interface (Level 1 - SETUP)

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	
TEST & BALANCE	BLOWER	BLOWER HEATING HIGH = XXXX CFM				
		BLOWER COOLING HIGH = XXXX CFM				
		BLOWER COOLING LOW = XXXX CFM				
		BLOWER VENTILATION = XXXX CFM				
		ON (TARGET XXXX CFM) ADJUST BLOWER RPM = XXXX RPM				
		AUTO CALIBRATE = START CALIBRATION OR CALIBRATION DONE		STARTING BLOWER > BLOWER ON > CLOSING DAMPER > PROGRESS % WILL BE DISPLAYED. WILL RETURN TO AUTO CALIBRATE SCREEN AFTER REACHING 100%. PRESS THE ADJUST AND SET VALUE BUTTON FOR THE OPTION = CALIBRATION DONE. PRESS SAVE TO CONTINUE. RESULTS OF CALIBRATION ARE AVAILABLE IN SERVICE REPORT.		
	DAMPER	DAMPER FDBK CALIB > IS DAMPER CLOSED?		YES OR NO NOTE: INSTALLER WILL NEED TO VISUALLY INSPECT THE DAMPER TO ENSURE THAT IT IS CLOSED.		
		MIN DAMPER POSITION > BLOWER ON HIGH =		XX %		
		MIN DAMPER POSITION > BLOWER ON LOW=		X %		
		ECONOMIZER TEMP ECON TYPE = TEMPERATURE OFFSET OR TEMPERATURE SETPT		<i>NOTE: THIS OPTION IS DEPENDANT ON CONFIGURATION ID 1 SETUP.</i>		
		ECONOMIZER OAT SETPOINT = XX.X F.				
		ECONOMIZER ENTHALPY SETPOINT = XX MA		<i>NOTE: THESE OPTIONS ARE DEPENDANT ON CONFIGURATION ID 1 SETUP.</i>		
		ECONOMIZER ENTHALPY OFFSET = XX MA				
		FREE COOLING SUPPLY AIR SETPOINT = XX.X F				
		DAMPER OUTDOOR AIRFLOW = XXX CFM				
		ADVANCED AIRFLOW ALARMS = ENABLED OR DISABLED (ONLY VISIBLE IF CONFIGURATION ID 1, POSITION 2 IS SET CORRECTLY).		ADV AIRFLOW ALARMS LO SPLY AIRFLOW ALM = XX%		
				ADV AIRFLOW ALARMS LO OD AIRFLOW ALM = XX%		
				ADV AIRFLOW ALARMS HI OD AIFLOW ALM = XX%		
				ADV AIRFLOW ALARMS ALM TRIGGER PERIOD = XXXX SEC		
		VENTILATION OPTIONS		DEMAND CONTROL VENTILATION BUILDING PRESSURE CONTROL		
		IF DCV		DEMAND CONTROL VENT > DAMPER START OPEN = XXX PPM		
				DEMAND CONTROL VENT > DAMPER FULL OPEN = XXXX.X PPM		
				DEMAND CONTROL VENT > DAMPER MAX OA CFM = X CFM (ONLY VISIBLE IF CONFIGURATION ID 1, POSITION 2 IS SET CORRECTLY).		
				DEMAND CONTROL VENT > DAMPER MAX OPENING = XXX.X %.		
	IF BPC		BUILDING PRESS CTRL > PRESSURE SETPOINT = X.X IN H2O.			

Table 2. Menu Interface (Level 1 - SETUP)

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
		OUTDOOR AIR CONTROL (ONLY VISIBLE IF CONFIGURATION ID 1, POSITION 8 IS SET CORRECTLY)		VELOCITY SETPOINT = XXX FT/MIN	
		POWER EXHAUST ON BY ECON TRAVEL = XX.X %			
		FRESH AIR HEATING ENABLE FAH = NO OR YES	FRESH AIR HEATING FAH SETPOINT = XX F		
		FRESH AIR COOLING ENABLE FAC = YES OR NO	FRESH AIR COOLING AFC SETPOINT = XX F		
NOTE: PARAMETERS AVAILABLE ARE DEPENDENT ON MODEL NUMBER AND CONFIGURATION ID 1 AND 2 SETTINGS.					

12.4. Service

Table 3. Menu Interface (Level 1 - SERVICE)

NOTE: AVAILABLE MENU OPTIONS ARE DEPENDENT ON HARDWARE CONFIGURATION.

TEST MENU SECTION: EACH MAJOR COMPONENT OF THE M3 UNIT CONTROLLER WILL INCLUDE A TEST MODE TO VERIFY CRITICAL COMPONENT AND SYSTEM PERFORMANCE. ALL BLOWER TESTING WILL REMAIN ACTIVE FOR TWO HOURS UNLESS TERMINATED BY THE USER.

Level 1	Level 2	Level 3	Use the Adjust and set values arrows to scroll up or down for selection options.	WHEN SELECTED (PRESS BACK TO RETURN TO THE PREVIOUS MENU)	
SERVICE	TEST	COOL	OPTIONS ARE COOL 1, COOL 2, COOL 3 AND COOL 4.	COOL X ODN RAT: XX.X F DAT: XX.X F <i>(if advanced airflow is enabled then ACTUAL CFM is displayed.)</i> or NOT APPLICABLE EQUIPMENT NOT PRESENT	
				HEAT X ON RAT: XX.X F DAT: XX.X F <i>(if advanced airflow is enabled then ACTUAL CFM is displayed.)</i> or NOT APPLICABLE EQUIPMENT NOT PRESENT	
		BLOWER	BLOWER HI	BLH ON/OFF SET POINT	
				BLOWER LOW	BLL ON/OFF SET POINT
				PROVING SWITCH	PSW CLOSED/OPEN SET POINT
		BLOWER	FILTER SWITCH	FSW CLOSED/OPEN SET POINT	
				RPM XX RPM	FSW CLOSED/OPEN SET POINT
				SPEED XX RPM	TD: XX (IF COMPRESSOR IS TURNED ON)
		DAMPER	POSITION	ACTUAL: 0.1%. <i>NOTE: THIS FUNCTION IS ONLY AVAILABLE IF CONFIGURATION ID 1, POSITION 2 HAS BEEN CONFIGURED.</i>	
				EXHAUST 1 OR 2	SET ON/OFF SETPOINT (EX1 OR EX2 ON/OFF ACTUAL)
		FANS	FAN 1 (OR FAN L)	FN1 (OR FL) ON/OFF SETPOINT	
				FAN 2 (OR FAN H)	FN2 (OR FH) ON/OFF SETPOINT
				FAN 3 THROUGH 6.	ON/OFF
		DEHUMIDIFIER	OPTIONS ARE HUM 1 AND HUM 2	WHEN SELECTING OPTION, RESPONSE WILL BE EITHER DEHUMIDIFIER X ON OR NOT APPLICABLE EQUIPMENT NOT PRESENT.	

Table 3. Menu Interface (Level 1 - SERVICE)

NOTE: AVAILABLE MENU OPTIONS ARE DEPENDENT ON HARDWARE CONFIGURATION.

TEST MENU SECTION: EACH MAJOR COMPONENT OF THE M3 UNIT CONTROLLER WILL INCLUDE A TEST MODE TO VERIFY CRITICAL COMPONENT AND SYSTEM PERFORMANCE. ALL BLOWER TESTING WILL REMAIN ACTIVE FOR TWO HOURS UNLESS TERMINATED BY THE USER.

Level 1	Level 2	Level 3	Use the Adjust and set values arrows to scroll up or down for selection options.	WHEN SELECTED (PRESS BACK TO RETURN TO THE PREVIOUS MENU)	
SERVICE	TEST	OUTPUTS	SERVICE RELAY	SERVICE RELAY ON	
	REPLACE	FILTER	RESET RUNTIME? = NO OR YES		
		BELT (only available based on model number)	RESET RUNTIME? = NO OR YES		
		UV LAMP	RESET RUNTIME? = NO OR YES OR NOT APPLICABLE EQUIPMENT NOT PRESENT		
		FANS (1 through 6)	RESET RUNTIME? = NO OR YES OR NOT APPLICABLE EQUIPMENT NOT PRESENT		
		BLOWER	RESET RUNTIME? = NO OR YES		
		COMPRESSOR (1 through 4)	RESET RUNTIME? = NO OR YES OR NOT APPLICABLE EQUIPMENT NOT PRESENT		
	REPORT	USB SERVICE REPORT	USB SERVICE REPORT = DEFAULT NAME IS THE SERIAL NUMBER IF SET. OTHERWISE IT WILL BE 123456789. CAN BE RENAMED BY USER. MAXIMUM 18 CHARACTERS.		
		USB ADV AIRFLOW RPT	USB ADVANCED AIRFLOW REPORT = START USB REPORT OR USB REPORT DONE.	START USB REPORT = SAF_RPT (DEFAULT) AND CAN BE RENAMED BY USER. MAXIMUM 18 CHARACTERS.	
		SAVE USER PROFILE	SAVE USER PROFILE = YES OR NO		
		LOAD USER PROFILE	LOAD USER PROFILE = YES OR NO		
		USB PROFILE SAVE	USB PROFILE SAVE = 1234 UNLESS CATALOG NUMBER IS SET. DEFAULT IS CATALOG NUMBER. CAN BE RENAMED BY USER. MAXIMUM 18 CHARACTERS.		
		USB PROFILE LOAD	USB PROFILE LOAD = 1234XXXXXXXXXX (USER ASSIGNED NAME AS SPECIFIED. TYPICALLY CATALOG NUMBER.	WILL LOAD PREVIOUSLY SAVED USB PROFILE.	
		LOAD FACTORY PROF	LOAD FACTORY PROF = YES OR NO		
		LOG SERVICE EVENT	LOG SERVICE EVENT = YES OR NO		
	SOFTWARE UPDATE	SOFTWARE UPDATE	SOFTWARE UPDATE (EITHER THE UPDATE WILL BE SUCCESSFUL OR THE FOLLOWING MESSAGES WILL APPEAR. SW UPDATE FAILED OR SW UPDATE FILE NOT FOUND.	NOTE: IF USB FLASH DRIVE IS NOT INSTALLED OR THE M3 UNIT CONTROLLER CANNOT READ THE FLASH MEDIA, A MESSAGE WILL APPEAR "NOT APPLICABLE EQUIPMENT NOT PRESENT."	
	OFFLINE	CLEAR DELAYS	CLEAR DELAYS = YES OR NO.		
		RESET CONTROLLER	RESET CONTROLLER = YES OR NO.	NOTE: THIS REBOOTS THE M3 CONTROLLER. NO CONFIGURATION SETTINGS ARE CHANGED.	
		CONTROLLER LOCKOUT	CONTROLLER LOCKOUT = YES OR NO.		

NOTE: PARAMETERS AVAILABLE ARE DEPENDENT ON MODEL NUMBER AND CONFIGURATION ID 1 AND 2 SETTINGS.

12.5. Settings

Table 4. Menu Interface (Level 1 - SETTINGS)

NOTE: AVAILABLE MENU OPTIONS ARE DEPENDENT ON HARDWARE CONFIGURATION. USE THE ADJUST AND SET VALUES ARROWS TO SCROLL UP OR DOWN FOR SELECTION OPTIONS.

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7			
CONTROL	CONTROL TYPE = NETWORK OR WIRED THERMOSTAT	WIRED THERMOSTAT						
		NETWORK > BACNET	BACNET MAC ADDRESS = X					
			BACNET BAUD RATE = 9.6, 19.2, 38.4 OR 76.8 K					
			CONTROL MODE = ROOM SENSOR OR NETWORK THERMOSTAT					
			CONTROL MODE = MONITOR					
			CONTROL MODE = ROOM SENSOR OR NETWORK THERMOSTAT			NETWORK SENSOR C02 = YES OR NO		
						NETWORK SENSOR RELATIVE HUMIDITY = YES OR NO		
						NETWORK SENSOR TEMPERATURE = YES OR NO		
						ROOM SENSOR OCC BLOWER MODE = AUTO - CYCLES OR ON - CONTINUOUS 1, 2, 3		
			CONTROL MODE = ROOM SENSOR OR NETWORK THERMOSTAT			BACKUP MODE = NONE, ROOM SENSOR, RETURN AIR BACKUP OR THERMOSTAT		
						RAT OR ROOM	BACKUP SETPOINTS OCCUPIED HEAT = XX.X F	
							BACKUP SETPOINTS UNOCCUPIED HEAT = XX.X F	
							BACKUP SETPOINTS OCCUPIED COOL = XX.X F	
		BACKUP SETPOINTS UNOCCUPIED COOL = XX.X F						
		NETWORK > L-CONNECTION	LCONN ADDRESS = X					
			CONTROL MODE = MONITOR					
			CONTROL MODE = ROOM SENSOR OR NETWORK THERMOSTAT			NETWORK SENSOR C02 = YES OR NO		
						NETWORK SENSOR RELATIVE HUMIDITY = YES OR NO		
						NETWORK SENSOR TEMPERATURE = YES OR NO		
						ROOM SENSOR OCC BLOWER MODE=ON-CONTINUOUS 1, 2, 3 OR AUTO CYCLES		
			CONTROL MODE = ROOM SENSOR OR NETWORK THERMOSTAT			BACKUP MODE = NONE, ROOM SENSOR, RETURN AIR BACKUP OR THERMOSTAT		
						RAT OR ROOM	BACKUP SETPOINTS OCCUPIED HEAT = XX.X F	
							BACKUP SETPOINTS UNOCCUPIED HEAT = XX.X F	
							BACKUP SETPOINTS OCCUPIED COOL = XX.X F	
BACKUP SETPOINTS UNOCCUPIED COOL = XX.X F								

Table 4. Menu Interface (Level 1 - SETTINGS)

NOTE: AVAILABLE MENU OPTIONS ARE DEPENDENT ON HARDWARE CONFIGURATION. USE THE **ADJUST AND SET VALUES** ARROWS TO SCROLL UP OR DOWN FOR SELECTION OPTIONS.

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7		
CONTROL	CONTROL TYPE = NETWORK OR WIRED THERMOSTAT	NETWORK > LONTALK	CONTROL MODE = MONITOR				
			CONTROL MODE = ROOM SENSOR OR NETWORK THERMOSTAT	NETWORK SENSOR C02 = YES OR NO			
				NETWORK SENSOR RELATIVE HUMIDITY = YES OR NO			
				NETWORK SENSOR TEMPERATURE = YES OR NO			
				ROOM SENSOR OCC BLOWER MODE=ON-CONTINUOUS 1, 2, 3 OR AUTO CYCLES			
				BACKUP MODE = NONE, ROOM SENSOR, RETURN AIR BACKUP OR THERMOSTAT			
				RAT OR ROOM	BACKUP SETPOINTS OCCUPIED HEAT = XX.X F		
					BACKUP SETPOINTS UNOCCUPIED HEAT = XX.X F		
					BACKUP SETPOINTS OCCUPIED COOL = XX.X F		
			BACKUP SETPOINTS UNOCCUPIED COOL = XX.X F				
RTU OPTION	BLOWER	SPEEDS	BLOWER HEAT = XXXX CFM				
			BLOWER COOLING HIGH = XXXX CFM				
			BLOWER COOLING LOW = XXXX CFM				
			BLOWER HEATING HIGH = XXXX CFM				
			BLOWER VENTILATION = XXXX CFM				
			ON (TARGET XXXX CFM) ADJUST BLOWER RPM - XXXX RPM				
			A BOX (NON-EP) - HEATING, HIGH SPEED AND LOW SPEED	HIGH SPEED = % MEDIUM SPEED = % LOW SPEED = % ADJUST BLOWER % = XX% NOTE: DEPENDING ON CONFIGURATION, MEDIUM SPEED MAY BE AN OPTION AND IS USED FOR LOW HEAT.			
				ADVANCED AIRFLOW A BOX AND B BOX OR BIGGER HEATING, COOLING HIGH, COOLING MED, COOLING MED HIGH, COOLING MED LOW, COOLOW LOW AND VENTILATION			
			BLOWER CALIBRATION (HEATING, HIGH SPEED, LOW SPEED OR VENTILATION = CALIBRATION DONE OR TURN BLOWER ON. IF TURN BLOWER ON IS SELECTED, BLOWER ON XXXXX > TURN BLOWER OFF= NO OR YES.				
			VFD BYPASS	VFD BYPASS DISENGAGED ENGAGE? = NO OR YES			

Table 4. Menu Interface (Level 1 - SETTINGS)

NOTE: AVAILABLE MENU OPTIONS ARE DEPENDENT ON HARDWARE CONFIGURATION. USE THE **ADJUST AND SET VALUES** ARROWS TO SCROLL UP OR DOWN FOR SELECTION OPTIONS.

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	
RTU OPTION	DAMPER	ECONOMIZER ENTHALPY OFFSET = X MA				
		ECONOMIZER TEMP ECON TYPE = TEMPERATURE OFFSET OR TEMPERATURE SETPT				
		ECONOMIZER OAT SETPOINT = XX.X F				
		FREE COOLING SUPPLY AIR SETPOINT = XX F				
		OUTDOOR AIRFLOW = XXX CFM				
		ADVANCED AIRFLOW ALARMS = ENABLED OR DISABLED (ONLY VISIBLE IF CONFIGURATION ID 1, POSITION 2 IS SET CORRECTLY).		ADV AIRFLOW ALARMS LO SPLY AIRFLOW ALM = XX%		
				ADV AIRFLOW ALARMS LO OD AIRFLOW ALM = XX%		
				ADV AIRFLOW ALARMS HI OD AIFLOW ALM = XX%		
				ADV AIRFLOW ALARMS ALM TRIGGER PERIOD = XXXX SEC		
		MIN DAMPER POSITION BLOWER ON HIGH = X.X %				
		MIN DAMPER POSITION BLOWER ON LOW = X.X %				
		VENTILATION OPTIONS		DEMAND CONTROL VENTILATION BUILDING PRESSURE CONTROL		
		IF DCV		DEMAND CONTROL VENT DAMPER START OPEN = XXXX.X PPM		
				DEMAND CONTROL VENT DAMPER FULL OPEN = XXXX.X PPM		
				DEMAND CONTROL VENT > DAMPER MAX OA CFM = X CFM (ONLY VISIBLE IF CONFIGURATION ID 1, POSITION 2 IS SET CORRECTLY).		
				DEMAND CONTROL VENT DAMPER MAX OPENING = XXX.X%		
		IF BPC		BUILDING PRESS CTRL > PRESSURE SETPOINT = X.X IN H2O		
		OUTDOOR AIR CONTROL (ONLY VISISBLE IF CONFIGURATION ID 1, POSITION 8 IS SET CORRECTLY)		VELOCITY SETPOINT = XXX FT/MIN		
		POWER EXHAUST ON BY ECON TRAVEL = XX.X %				
		FRESH AIR HEATING ENABLE FAH = YES OR NO		FRESH AIR HEATING FAH SETPOINT = XX F		
FRESH AIR COOLING ENABLE AFC = YES OR NO		FRESH AIR COOLING AFC SETPOINT = XX F				

Table 4. Menu Interface (Level 1 - SETTINGS)

NOTE: AVAILABLE MENU OPTIONS ARE DEPENDENT ON HARDWARE CONFIGURATION. USE THE **ADJUST AND SET VALUES** ARROWS TO SCROLL UP OR DOWN FOR SELECTION OPTIONS.

Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
RTU OPTION	DEHUMIDIFIER MODE	= BLOWER, OCCUPIED	= LOCAL SENSOR, NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %	
				DEHUMIDIFIER DEHUMID DEADBAND = X.X %	
		= NO CONDITIONS	= LOCAL SENSOR OR NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %	
				DEHUMIDIFIER DEHUMID DEADBAND = X.X %	
		= REPORT RH ONLY	= LOCAL SENSOR OR NETWORK SENSOR		
		= BLWR, OCC, PREV COOL	= LOCAL SENSOR OR NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %	
				DEHUMIDIFIER DEHUMID DEADBAND = X.X %	
		= PREVIOUS COOLING	= LOCAL SENSOR, OR NETWORK SENSOR	DEHUMIDIFIER DEHUMID SETPOINT = X.XX %	
				DEHUMIDIFIER DEHUMID DEADBAND = X.X %	
EDIT PARAMETER	ENTER DATA ID =				
INSTALL	NEW UNIT SETUP	SEE TABLE 2 ON PAGE 16 FOR SETUP PROMPTS FOR NEW SETUP. (THIS IS THE SAME AS SETUP > INSTALL DEHUMIDIFIER MODE PORTION OF THE WIZARD.)			
	INSTALL NEW M3	CLEAR ALL CONFIG=YES OR NO. IF YES IS SELECTED. ARE YOU SURE?=YES OR NO. SEE TABLE 2 ON PAGE 16 FOR SETUP PROMPTS FOR NEW M3 UNIT CONTROLLER.			

NOTE: PARAMETERS AVAILABLE ARE DEPENDENT ON MODEL NUMBER AND CONFIGURATION ID 1 AND 2 SETTINGS. IN ORDER FOR ANY CHANGE TO THE SYSTEM TO TAKE AFFECT, BACK COMPLETELY OUT OF THE CURRENT LOCATION TO THE MAIN MENU OR STATUS SCREEN.

13. Blower Operation with Effective Occupancy

This section describes how network occupancy signals are combined to produce effective occupancy.

The blower runs to service heat and cool demands, regardless of the space occupancy. However when there is no heating or cooling demand there are options for how the blower should operate in conjunction with occupancy signals to keep the space ventilated, or the air stirred.

A. California Energy Commission Title 24

The legacy option settings for **OCC Blower Mode** are **AUTO CYCLES** or **ON-CONTINUOUS 1**. These settings govern whether the blower runs continuously when the space is considered occupied, or cycles on/off with the heating and cooling demand.

To comply with the California Energy Commission Title 24 standard there are two additional values for OCC Blower Mode which are **ON-CONTINUOUS 2** and **ON-CONTINUOUS 3**. See table 5 for their descriptions.

Table 5. Blower Operation Description

OCC Blower Mode	Description
AUTO CYCLES	Blower cycles on/off with demand. (Legacy usage.)
ON-CONTINUOUS 1	Blower runs when either the occupancy sensor or schedule, or both, indicates occupied. (Legacy usage.)
ON-CONTINUOUS 2	Blower runs when both the occupancy sensor and schedule indicate occupied.
ON-CONTINUOUS 3	The same as option 2, but blower runs for 30 minutes and is off for 90 minutes when schedule is occupied but the occupancy sensor is not occupied.

Table 6. BACnet Occupancy Points

	BACnet	Value
Manual	Occupancy Override Control AO 103	0: space occupied
		1: space unoccupied
		2: refresh space occupied override timer
		3-255: auto; clear timer and return to scheduler
Schedule	Occupancy Scheduler Control AO 104	0: space occupied
		1-255: space unoccupied
Sensor	Occupancy Sensor Input AO 107	0: space occupied
		1: space unoccupied
		2-255: auto; return to occupancy scheduler state
Effective Occupancy	Effective Occupancy AI 241	0: space occupied
		1: space unoccupied
		2: space occupied (timed override)

B. LonTalk, BACnet and L Connection: These two new options are available when using these networks types that supplies a room occupancy signal (in addition to the scheduled occupancy).

NOTE: For **L Connection** the same two options are also available when using an optional room occupancy sensor. If a room occupancy sensor is not physically installed and configured for the network, then the only options available for **OCC Blower Mode** are **AUTO CYCLES** or **ON-CONTINUOUS 1**.

C. RTU Standalone: Since a room occupancy sensor cannot be used in this configuration, then the only options for **OCC Blower Mode** are **AUTO CYCLES** or **ON-CONTINUOUS 1**.

D. Enabling Network Type

To **enable** the network module, go to **SETUP > INSTALL** and run the setup wizard. When **Configuration ID 1** appears on the screen, configure position 5 to one of the applicable network types. **N** = Not Installed, **B** = BACnet and **L** = LonTalk.

E. Menu Setup Procedure Method for OCC Blower Mode

These blower control options are handled by the OCC Blower Mode. These setting and be changed using the following menu path:

Go to **SETUP > NETWORK INTEGRATION > NETWORK = "BACNET, LONTALK or L CONNECTION" > (additional prompts concerning network configuration and sensor types will be asked) CONTROL MODE = ROOM SENSOR > ROOM SENSOR OCC BLOWER MODE = (see table 5)**

Table 7. LonTalk® Occupancy Points

Mode	LonTalk®	Value
Manual	nviOccManCmd Index = 11	0: space occupied
		1: space unoccupied
		2: refresh space occupied override timer
		3-255: auto; clear timer and return to scheduler
Schedule	nviOccSched1 Index = 10	0: space occupied
		1-255: space unoccupied
Sensor	nviOccSensor Index = 12	0: space occupied
		1: space unoccupied
		2-255: auto; return to occupancy scheduler state
Effective Occupancy	nvoEffectOccup Index = 26	0: space occupied
		1: space unoccupied
		2: space occupied (timed override)

Table 8. Blower Operation Modes

Blower Operation	Description
On	Blower runs continuously.
Cycles	Blower cycles on/off with demand.
Cycles w/Stir	Blower cycles on/off with demand; during off cycle blower is on 30 minutes of 120.

Table 9. Blower Operation Schedule

Manual	Schedule	Sensor	Effective Occupancy	OCC Blower Mode	Blower Operation
0, 2	n/a	n/a	OCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	On
				ON-CONTINUOUS 2	On
				ON-CONTINUOUS 3	On
1	n/a	n/a	UNOCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	Cycles
				ON-CONTINUOUS 2	Cycles
				ON-CONTINUOUS 3	Cycles
3-255	0	0, 2-225	OCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	On
				ON-CONTINUOUS 2	On
				ON-CONTINUOUS 3	On
3-255	0	1	OCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	On
				ON-CONTINUOUS 2	Cycles
				ON-CONTINUOUS 3	Cycles w/Stir
3-255	1-255	n/a	UNOCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	Cycles
				ON-CONTINUOUS 2	Cycles
				ON-CONTINUOUS 3	Cycles

14. Economizer

The economizer, when configured, controls:

- Damper position, which determines how much outdoor air is used to meet free cooling or indoor air quality requirements, and
- Optional power exhaust fans.

On a cooling demand, outdoor air is used for free cooling instead of first-stage compressor(s) when outdoor air is suitable.

14.1. Enabling Economizer and Settings

To enable the economizer if installed go to **SETUP > INSTALL** (see table 2 on page 16) and go through the wizard. When reaching **Configuration ID 1**, position **2** will need to be set to the applicable type of economizer. Valid types are as indicated below:

- **M** = Motorized Outdoor Air Damper Only
- **T** = Economizer - Temperature (*Note: Used for both set point and offset temperature control.*)
- **G** = Economizer - Global
- **S** = Economizer - Single Enthalpy
- **D** = Economizer - Dual Enthalpy

14.2. Damper Operation During Free Cooling

These are operating profile options for the economizer damper (parameter 164 - ECONOMIZER PROFILE) during free cooling when any compressor is on and can be selected as follows:

Option 0: Damper continues to modulate while compressors are on, but the effect of mechanical cooling may force the damper closed to its minimum position. After compressor starts, the free cooling set point is lowered to fixed temperature setting of 45°F.

Option 1: Damper opens to its max-open position (parameter 131 - FREE CL MAX DAMPER) when any compressors start.

NOTE: When using Option 1 and after the compressor is stopped, the M3 shall resume damper modulation.

Option 2: Is as follows:

- Holds-off compressor on Y2 call until damper has modulated to maximum position (parameter 131 - FREE CL MAX DAMPER) for three minutes.

- After three minutes, the compressor starts and the free cooling set point is lowered to 45°F. Damper is not locked at maximum open while compressor is on, but modulates to maintain 45°F discharge air temperature.
- When Y2 is satisfied, compressor goes off and free cooling set point is restored to 55°F (parameter 159 - FREE COOL SUPPLY SP).

Option 3: Same as Option 2, but with a 10 minute delay instead of a three minute delay.

14.3. Free Cooling Compressor Lockout Mode and Low Ambient Set Point

Go to **SETTINGS > RTU OPTION > EDIT PARAMETER = 285 (FRCL COMP LCKOUT MD)**. Default value is 2. Range is 0 to 2.

- **0** = Disable Compressor Lockout
- **1** = Lockout Compressor if outdoor air is suitable regardless of outdoor air temperature.
- **2** = Lockout Compressor if outdoor air temperature is below parameter 108 setting and Outdoor Air is Suitable (Default).

Go to **SETTINGS > RTU OPTION > EDIT PARAMETER = 108 (FREE LO AMB LCKT SP)**. Default value is 55.0°F. Range is 45.0 to 80.0°F.

14.4. Outdoor Air Suitable for Free Cooling

The M3 unit controller displays the outdoor air suitability information on the status screen.

The appropriate sensors are provided when the economizer is factory-configured. When the economizer is field-installed and configured, the single or dual enthalpy modes require additional field-provided sensor(s).

14.5. Enthalpy Set Point

This setting pertains to the single enthalpy free cooling mode only. The M3 unit controller will enable free cooling when outdoor air enthalpy (A7) is less than the enthalpy set point (parameter 162 - ECON FREECL ENTH SP). Figure 3 shows the approximate enthalpy sensor output at various temperatures and percentage of relative humidity.

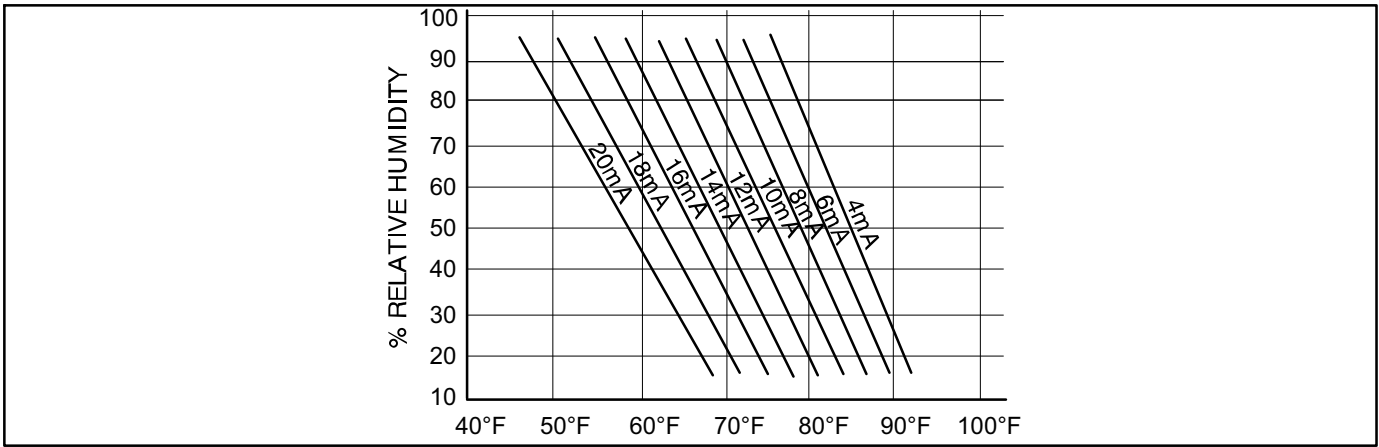


Figure 3. Enthalpy Sensor Output Current Honeywell C7400

Table 10 . Menu Interface (Level 1 - SETUP) - Single Enthalpy

The following settings are available when **Configuration ID 1**, position **2** is set to **S** (Single Enthalpy)

Level 2	Level 3	Level 4	USE THE ADJUST AND SET VALUES ARROWS TO SCROLL UP OR DOWN FOR SELECTION OPTIONS.
TEST & BALANCE	DAMPER	ECONOMIZER ENTHALPY SETPOINT = XX.X MA	ENTHALPY SET POINT MA SETTING 73°F 12.0 70°F 13.6 67°F 15.5 63°F 17.6
		FREE COOLING SUPPLY AIR SETPOINT = XX.X F	CLIMATE ZONE SINGLE SENSIBLE 1, 3, 5, 11-16 75.0°F 2, 4, 10 73.0°F 6, 8, 9 71.0°F 7 69.0°F
		MIN DAMPER POSITION BLOWER ON HIGH = X.X %	
		MIN DAMPER POSITION BLOWER ON LOW = X.X %	
		DEMAND CONTROL VENT DAMPER START OPEN = XXXX.X PPM	
		DEMAND CONTROL VENT DAMPER FULL OPEN = XXXX.X PPM	
		DEMAND CONTROL VENT DAMPER MAX OPENING = XXX.X%	
		FRESH AIR HEATING ENABLE FAH = YES OR NO	FRESH AIR HEATING FAH SETPOINT = XX F
		FRESH AIR COOLING ENABLE AFC = YES OR NO	FRESH AIR COOLING AFC SETPOINT = XX F

Table 11 . Menu Interface (Level 1 - SETUP) - Dual Enthalpy

The following settings are available when **Configuration ID 1**, position **2** is set to **D** (Dual Enthalpy)

Level 2	Level 3	Level 4	USE THE ADJUST AND SET VALUES ARROWS TO SCROLL UP OR DOWN FOR SELECTION OPTIONS.		
TEST & BALANCE	DAMPER	ECONOMIZER ENTHALPY OFFSET = X.XX MA	TEMP OFFSET* °F 2 3.5 5.3 7	RELATIVE HUMIDITY OFFSET %** 6 12 18 24	MA SETTING 1.0 2.0 3.0 4.0
		FREE COOLING SUPPLY AIR SETPOINT = XX F	CLIMATE ZONE 1, 3, 5, 11-16 2, 4, 10 6, 8, 9 7	SINGLE SENSIBLE 75°F 73°F 71°F 69°F	
		MIN DAMPER POSITION BLOWER ON HIGH = X.X %			
		MIN DAMPER POSITION BLOWER ON LOW = X.X %			
		DEMAND CONTROL VENT DAMPER START OPEN = XXXX.X PPM			
		DEMAND CONTROL VENT DAMPER FULL OPEN = XXXX.X PPM			
		DEMAND CONTROL VENT DAMPER MAX OPENING = XXX.X%			
		FRESH AIR HEATING ENABLE FAH = YES OR NO	FRESH AIR HEATING FAH SETPOINT = XX F		
		FRESH AIR COOLING ENABLE AFC = YES OR NO	FRESH AIR COOLING AFC SETPOINT = XX F		

14.6. Free Cooling Damper Maximum Position

Damper Maximum position for free cooling is by default set to 100%. To modify this settings, use the following path:

SETTINGS > RTU OPTION > EDIT PARAMETER - 131 (FREE CL MAX DAMPER)

14.7. Minimum Damper Position

Use the following menu path to modified the minimum damper positions for both high and low operations.

SETUP > TEST & BALANCE > DAMPER > MIN DAMPER POSITION BLOWER ON HIGH = .%

SETUP > TEST & BALANCE > DAMPER > MIN DAMPER POSITION BLOWER ON LOW = .%

14.8. Motorized Outdoor Air Damper

Set damper position according to “Minimum Damper Position” section for normal operation, make sure the motorized outdoor air damper is set correctly in **Configuration ID 1**, position **2** needs to be set to **M**. The damper will open to the specified position during the occupied time period and close during the unoccupied time period.

NOTE - When equipped with Motorized Outdoor damper Air Damper, Prodigy 2.0 provides only Demand Control Ventilation. Free Cooling/Economizer function is not available.

14.9. Economizer Checkout

The following checkout procedures are completed with unit energized. Confirm proper operation of the heartbeat LED. Step 1 will determine whether the economizer is allowing full damper travel. Use step 2 when the damper does not respond to step 1.

Steps 3, 4, 5, and 6 checkout the operating modes; checkout only the mode that applies to the unit being worked on.

⚠ CAUTION

Power exhaust fans will be functional. To prevent operation of power exhaust fans, disconnect power to unit and then PED jack/plug P/J18.:

Step 1. ECONOMIZER OUTPUT VOLTAGE

The M3 unit controller monitors P262 (DPOS) and operates as reference in Section *Damper Diagnostics in the Prodigy 2.0 (M3 unit controller) Application Guide (Advance Features)*.

- A** Go to **SERVICE > TEST > DAMPER>POSITION > DAMPER POSITION ACTUAL: 0.0%** The motor will slowly modulate to the closed position.
- B** Change **DAMPER POSITION ACTUAL** to 100.0%.The motor will slowly modulate to the fully opened position.
- C** If the motor does not respond, go to step 2. If the motor does respond properly, go to the appropriate mode of operation checkout.

Step 2. OUTPUT VOLTAGE CHECK

- A** Go to **SERVICE > TEST > DAMPER > POSITION > DAMPER POSITION ACTUAL: 0.0%**
- B** Adjust the **DAMPER POSITION ACTUAL:** to 0.0% position.
- C** Measure the voltage on P262 between pin 3 (VOT damper control) and pin 2 (GND) **using pin 1 as common.** Voltage should read approximately 2 VDC.
- D** Adjust the **DAMPER POSITION ACTUAL:** to 100.0% position.

NOTE: Allow approximately 90 seconds for actuator to react.

- E** Measure the voltage between P262 between pin 3 (VOT damper control) and pin 2 (GND) **using pin 1 as common.** Voltage should read approximately **10 volts DC.** If not, check wiring and trouble shoot system.

Step 3. SINGLE ENTHALPY OPERATION (ODE)

In the single enthalpy mode, dampers open for free cooling when the outdoor enthalpy is less than the enthalpy set point (parameter 162 - ECON FREECL ENTH SP); dampers will try to modulate discharge air temperature (RT6) to (parameter 159 - FREE COOL SUPPLY SP) which has a default setting of 55.0°F (13°C).

- A** Go to **SETUP > INSTALL > press SAVE** until you get to the **Configuration ID 1**, position **2** needs to be set to **S** for Economizer - Single Enthalpy and press **SAVE.**
- B** To simulate low outdoor enthalpy. Disconnect A7 outdoor enthalpy sensor jack/plugs J/P104. Connect a 750 ohm resistor across plug J104-1 and J104-2. J104 is located in the filter access area.
- C** Check all connections and wiring between J104 and the control.

Step 4. DUAL ENTHALPY MODE OF OPERATION

In dual enthalpy mode mode, dampers open for free cooling when the outdoor air enthalpy is lower than the return air enthalpy by difference value of (parameter 163 - ECN FRCL ENTH OFFST); dampers will modulate discharge air temperature (RT6) to (parameter 159 - FREE COOL SUPPLY SP) which has a default setting of 55.0°F (13°C).

- A** Go to **SETUP > INSTALL > press SAVE** until you get to the **Configuration ID 1** position **2** needs to be set to **D** for Economizer - Dual Enthalpy and press **SAVE** if performing an economizer field-install.
- B** Use two resistors to simulate outdoor air enthalpy suitable.
- C** Disconnect A62 return air enthalpy sensor jack/plug J/P105. Place a 1500 ohm resistor between J105-1 and J105-3. J/P105 is located in the filter access area.
- D** Disconnect A7 outdoor enthalpy sensor jack/plugs J/P104. Connect a 750 ohm resistor across J104-1 and J104-2.

Step 5. ALL TEMPERATURE MODES OF OPERATION

In the Economizer – Temperature mode, the damper opens for free cooling when the outdoor air temperature is:

- Less than return air temperature by at least a difference of (parameter 161 - ECON FRCL TMP OFFST) if Temperature Offset mode is selected
- Less than (parameter 160 - ECON FREECL TEMP SP)

In all modes, dampers will try to modulate discharge air temperature (RT6) to (parameter 159 - FREE COOL SUPPLY SP) which has a default setting of 55.0°F (13°C).

Refer to the “Displaying Sensor Inputs” section to read return air (RT16) and outdoor air (RT17) temperatures. If outdoor air is not cooler than return air, simulate a colder outdoor air temperature with a resistor. Select a resistor value that corresponds to a temperature (see table 12):

- A** Locate RT17 sensor in unit. Disconnect 1/4" quick connect terminals on wires leading from sensor.
- B** Jumper RT17 wires leading back to control with the appropriate resistor.
- C** Check all connections and wiring between RT17 and the M3 unit controller, and between RT16 and the M3 unit controller.

Temp. °F (°C)	Size Resistor	Temp. °F (°C)	Size Resistor	Temp. °F (°C)	Size Resistor	Temp. °F (°C)	Size Resistor
30 (-1)	34,566	50 (10)	19,904	70 (21)	11,884	90 (32)	7,332
40 (4)	26,106	60 (16)	15,313	80 (27)	9,298	100 (38)	5,826

Step 6. GLOBAL MODULATING (GLO) MODE OF OPERATION

In the GLO (modulating) mode, dampers modulate open for free cooling when the global input is energized; dampers will try to modulate discharge air temperature (RT6) to (parameter 159 - FREE COOL SUPPLY SP) which has a default setting of 55.0°F (13°C).

NOTE: The global input turns on the blower.

- A** Set **global** mode using the **Configuration ID 1**, position **2**, and set to character **G**.
- B** Connect a jumper between A55_P297-1 (24VAC) and A55_P297-9 (global). The blower is energized and the damper will slowly open if

discharge air temperature (RT6) is greater than (parameter 159 - FREE COOL SUPPLY SP) which has a default setting of 55.0°F (13°C).

- C** Disconnect 24VAC to A55_P297-9. The blower will turn off and the damper will close.
- D** If the damper does not actuate then check all connections and wiring between P262A and B.

Step 7. ENTHALPY SENSOR OPERATION (A7 and A62)

If enthalpy sensors are configured, current sensor reading by M3 controller can be verified through the user interface:

- A** Connect a direct current ammeter as shown in figure 4 to measure current output of A7 or A62.
- B** The reading will be between 4 and 20 ma. depending on outdoor temperature and humidity. Refer to figure 3 to approximate reading.
- C** Go to **DATA > IN/OUTPUTS > SENSORS > LOCAL** (scroll down to IE: x.x mA and OE: x.x mA)
- D** If the meter reads zero, check sensor wiring harness for continuity and/or check polarity of sensor wiring.

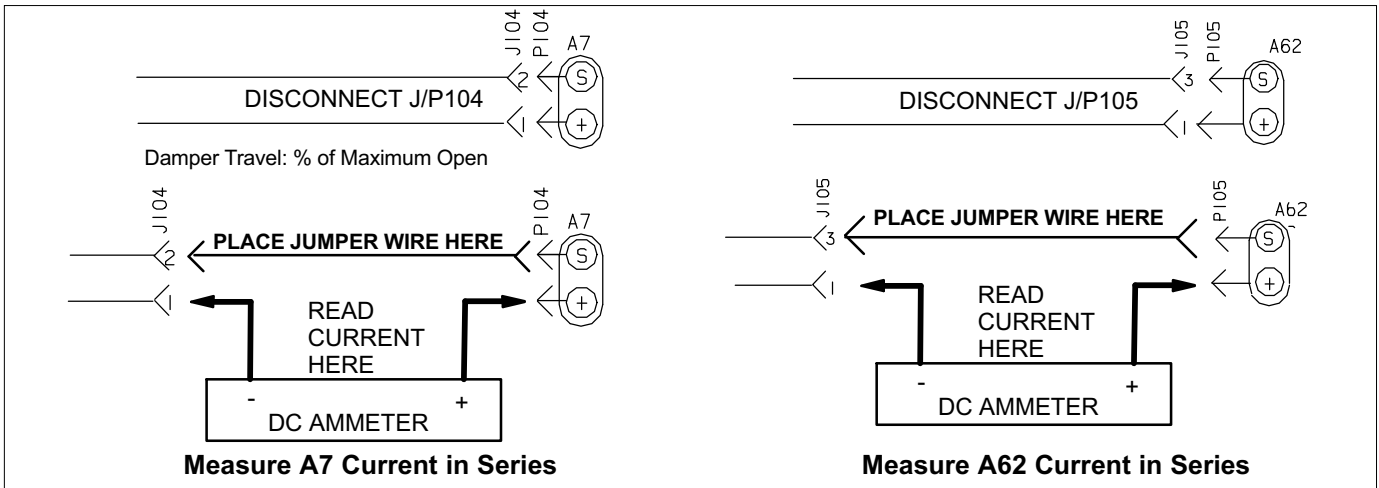


Figure 4. Measure A7 and A62 Current in Series

15. Demand Control Ventilation

A field-provided and installed indoor air quality (IAQ) sensor can be used with the modulating economizer or OADM to control carbon dioxide levels in the conditioned space. The carbon dioxide level in a space is an indicator of the number of people occupying a room. As the carbon dioxide level rises (indicating the occupancy of a room has increased), dampers modulate open - regardless of outdoor air suitability. Likewise, as the carbon dioxide level falls (indicating the occupancy has decreased), dampers modulate further closed.

Standard economizer installations have a minimum fresh air ventilation requirement based on maximum room occupancy. With standard economizer use, the amount of air required for maximum room occupancy is heated or cooled with each heating or cooling cycle. IAQ installations use the maximum amount of required ventilation air only with maximum room occupancy; less outdoor air needs to be heated or cooled when fewer people are in the conditioned space.

If the economizer is operating in the free cooling mode and the indoor air quality control requires the damper to open further, the indoor air quality demand will override the free cooling demand.

The IAQ function is not energized during the unoccupied or night time period.

NOTE: The IAQ sensor may also be used with systems containing a motorized outdoor air damper.

15.1. Default Operation

The M3 unit controller has a 0-10VDC indoor air quality input for a standard 0 - 2000ppm carbon dioxide sensor. The economizer starts opening at a carbon dioxide level of 500 ppm (default) (start open set point) and reaches full open at a carbon dioxide level of 1000ppm (default) (full open set point).

The damper opens to a default position of 100% (see parameter 117). Determine damper travel position using the following formula:

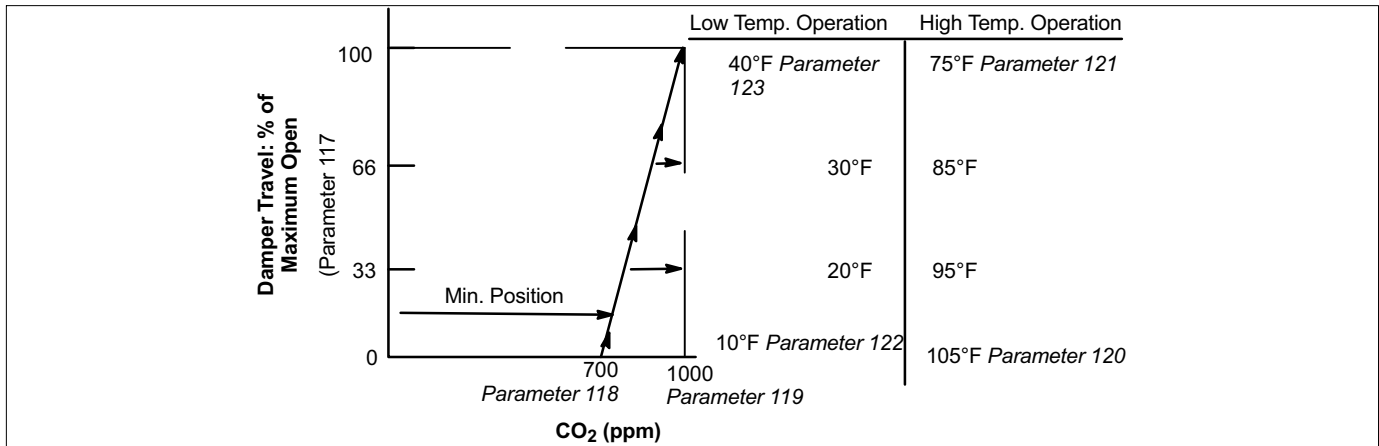


Figure 5. Default Demand Control Ventilation (DCV) Operation

$$\% \text{ Damper Travel} = \frac{\text{CO}_2 \text{ ppm} - \text{Start Open ppm}}{5}$$

Example: At a carbon dioxide level of 750ppm, the damper will be approximately 50% open:

$$\% \text{ Damper Travel} = \frac{750 - 500}{5} = 50\%$$

Use the menu interface to read carbon dioxide ppm. **DATA > IN/OUTPUTS > SENSORS > C02.** Figure 5 shows default or proportional operation.

15.2. Maximum and Minimum Demand Control Ventilation Damper Settings

A Maximum position is set using the following menu path:

Go to **SETUP > TEST & BALANCE > DAMPER > DAMPER MAX OPENING = .%**

B Use the following menu path to modified the minimum damper positions for both high and low blower operations.

Go to **SETUP > TEST & BALANCE > DAMPER > MIN DAMPER POSITION BLOWER ON HIGH = .%**

Go to **SETUP > TEST & BALANCE > DAMPER > MIN DAMPER POSITION BLOWER ON LOW = .%**

15.3. Parameter Adjustments

Default indoor air quality economizer operation is based on common or average applications. Adjustments may be made to the indoor air quality parameters to alter operation or meet required specifications. Use the user interface to change parameters 117 through 119.

Go to **SETTINGS > RTU OPTIONS > EDIT PARAMETER**

Select a demand control ventilation mode with parameter 134. Modes 3 and 4 will bring on the unit blower when demand control ventilation calls for maximum damper open, and returns to auto-blower when demand control ventilation damper returns to 0. The other modes only operate when the unit blower is on, but will not bring it on themselves.

Some applications require a different carbon dioxide set point range than default settings. Damper **start open** (parameter 118) and **full open** (parameter 119) carbon dioxide set points may be adjusted from 0 to 2000 ppm. Use the following formula to determine damper travel.

NOTE - When changing carbon dioxide set point range, **start open** set point should be less than **full-open** set point.

$$\% \text{ Damper Travel} = \frac{\text{carbon dioxide ppm} - \text{Start Open ppm}}{\text{Full Open} - \text{Start Open}} \times \text{Max Open (Parameter 117) Full Open} - \text{Start Open}$$

Example: An application requires the dampers open at 800 CO₂ ppm and reach full open at 1200. If the carbon dioxide level in the space reads 1000 ppm, calculate the damper percent open as follows.

$$\% \text{ Damper Travel} = \frac{1000 - 800}{1200 - 800} \text{ or } \frac{200}{400} \text{ or } .5 = 0.5 \times 100 = 50\%$$

Table 13. Demand Control Ventilation parameters

Control Parameters			Control Value			Units	Description
No	Screen Name	Parameter Short Description	Min.	Default	Max.		
117	DCV MAX DAMPER OPEN	Demand Control Ventilation Maximum Damper Open	0	100	100	%	Maximum allowed demand control ventilation damper open position.
118	DCV DAMP START OPEN	Demand Control Ventilation Damper Start Open	0	700	2000	PPM	<ul style="list-style-type: none"> Damper "start open" CO₂ set point for Demand Control Ventilation. Level where fresh air damper begins to open.
119	DCV DAMP FULL OPEN	Demand Control Ventilation Maximum Damper Full Open Set Point	0	1200	2000	PPM	<ul style="list-style-type: none"> Damper "full open" CO₂ set point for Demand Control Ventilation. Level where fresh air damper is opened to maximum.
120	DCV HI TMP OV FL CL	Demand Control Ventilation Outdoor Air Control Hi Temperature Override Full Closed	-31.0	105.0	132.0	°F	High outdoor air temp. where fresh air damper is closed to minimum position.
121	DCV HI TMP OV ST CL	Demand Control Ventilation Outdoor Air Control Hi Temperature Override Start Closing	-31.0	75.0	132.0	°F	High outdoor air temperature where fresh air damper begins to close.
122	DCV LO TMP OV FL CL	Demand Control Ventilation Outdoor Air Control Low Temperature Override Full Closed	-31.0	10.0	132.0	°F	Low outdoor air temperature where fresh air damper is closed to minimum position
123	DCV LO TMP OV ST CL	Demand Control Ventilation Outdoor Air Control Low Temperature Override Start Closing	-31.0	40.0	132.0	°F	Low outdoor air temp. where fresh air damper begins to close.

Table 13. Demand Control Ventilation parameters

Control Parameters			Control Value			Units	Description
No	Screen Name	Parameter Short Description	Min.	Default	Max.		
134	IAQ INPUT MODE	Indoor Air Quality Input Mode	0	1	7	Option	0- Ventilation is disabled. 1- DCV with outdoor temperature limit and blower on. (Default) 2- DCV without Outdoor Temperature Limit and Blower ON. 3- DCV with Outdoor Temperature Limit and Blower AUTO / ON. 4- DCV without Outdoor temperature Limit and no blower AUTO / ON. 5- Outdoor air control with outdoor temperature limit 6- Outdoor air control with outdoor temperature limit 7 - Building pressure control

15.4. Set Point Control Option

Set point control mode is commonly used in areas with high occupancy and frequent change out such as classrooms or conference rooms.

In applications requiring this on/off damper response to carbon dioxide levels, set the start open (parameter 118 - DCV DAMP START OPEN) set point higher than the full open (parameter 119 - DCV DAMP FULL OPEN) set point. The dampers will drive to fully-open position immediately. Figure 6 shows the set point control option.

Change parameters 122 and 123 to set the minimum

outdoor temperature limits. Change parameters 120 and 121 to set the maximum temperature limits.

IMPORTANT
Mixed air temperatures less than 45°F (7°C) on units with an aluminized heat exchanger or less than 30°F (-1°C) on stainless steel heat exchangers will void the manufacturer's warranty.

15.5. Determining Indoor Air Quality Inputs

Go to **DATA> IN/OUTPUTS > SENSORS** menu selection from the M3 unit controller menu display.

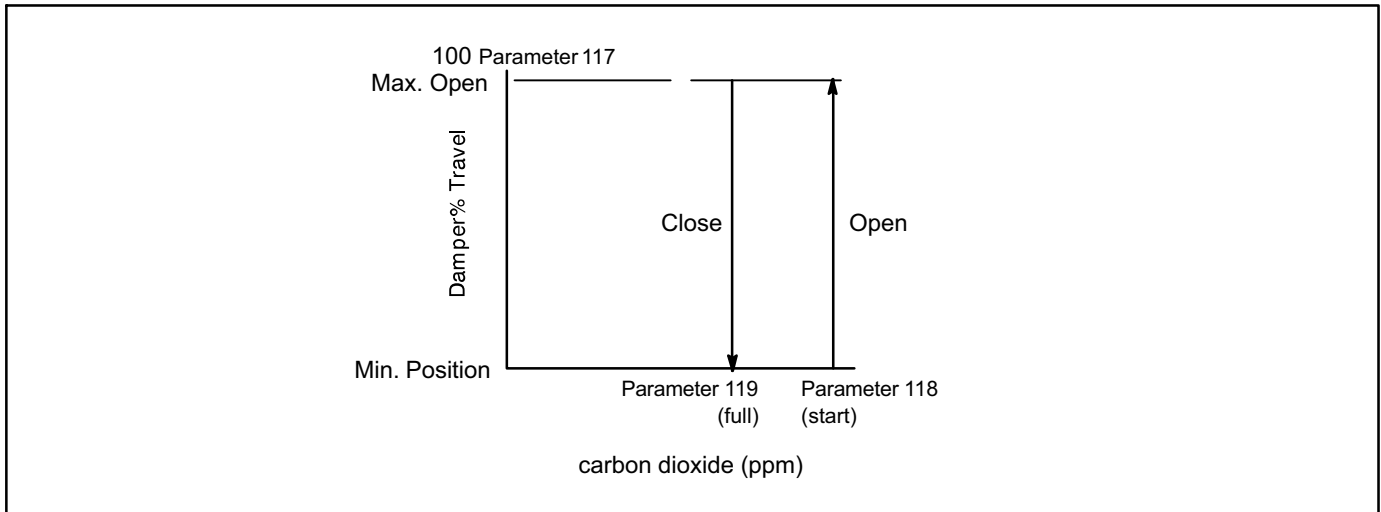


Figure 6. Set point Control Indoor Air Quality Option

16. Networking Serial Communications (RS-485)

16.1. BACNET

The configuration shown in figure 7 has terminations on the M3 unit controller BACnet modules at both ends and ONLY at both ends of the chain.

The configuration shown to the in figure 7 has a termination at the controller/router on one end and a termination at the M3 unit controller BACnet module on the other end; terminations are ONLY at the ends of the chain.

Cable type - twisted pair with shield, 22 awg minimum, Belden #88761 or #8761 (Lennox 27M19, 94L63, 68M35).

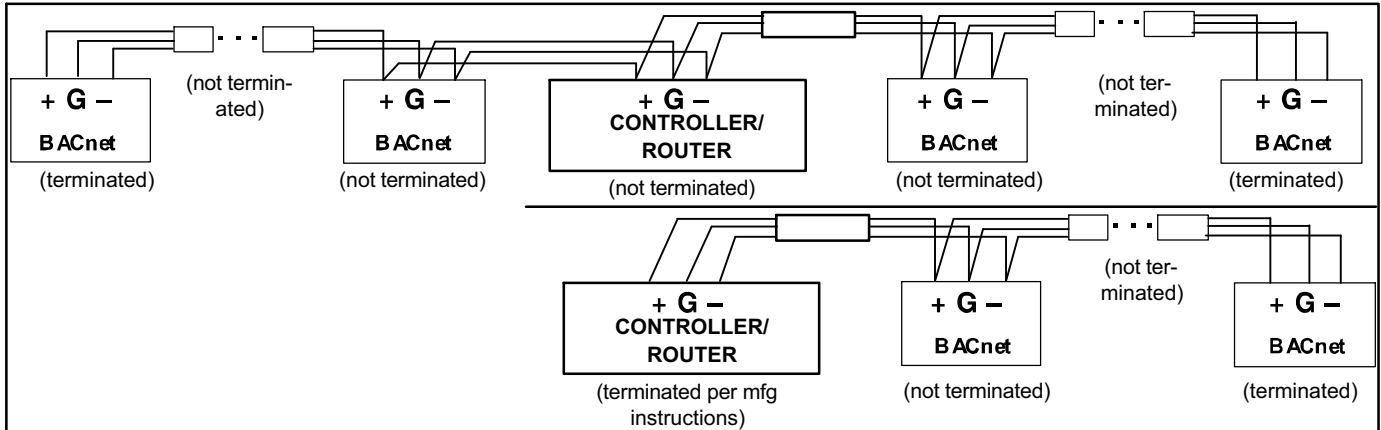


Figure 7. Terminating ends of daisy-chained networks

16.2. L CONNECTION

The network control panel is an L Connection direct digital controller used on units which are not equipped with an M3 unit controller. The Building Controller (BC) is used to control building functions such as lights and signs. Use L connection specific network cable and daisy chain as shown in figure 8. L Connection daisy chains also need termination at the end nodes of the chain.

Cable type - twisted pair with shield, 22 awg minimum, Belden #88761 or #8761 (Lennox 27M19, 94L63, 68M35).

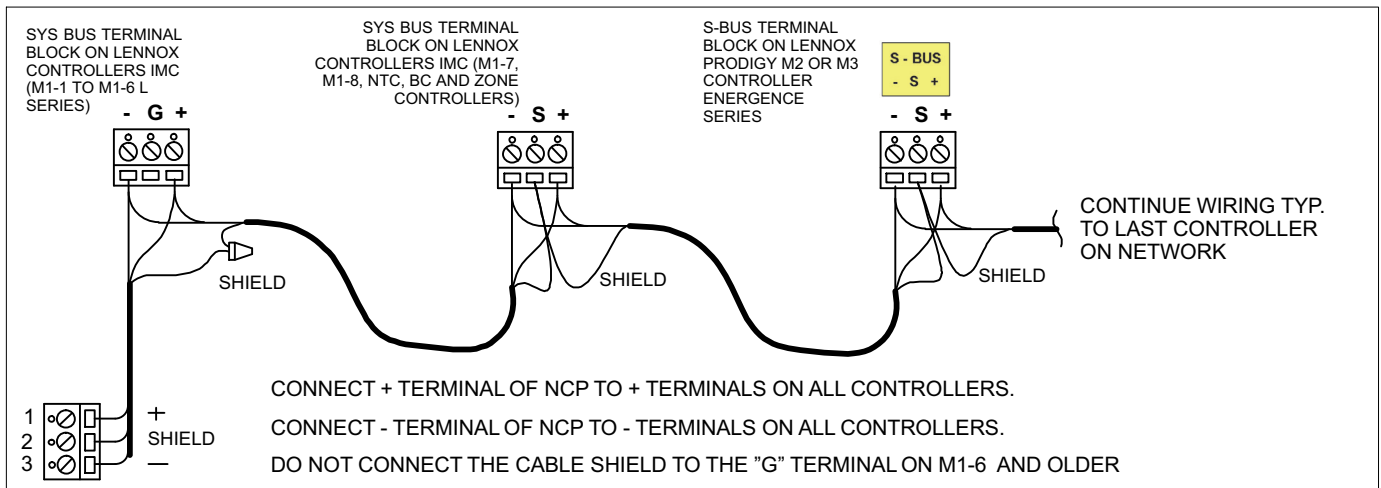


Figure 8. L Connection® Network Daisy-Chain Communication Wiring

17. Abbreviations

A55	M3 board. Main controller board for roof top units	"w.c.	Inches of water column
A178	C3 board. Compressor 3 and 4, 2 nd stage heat	LCONN	L Connection
AI	Analog input	LED	Light emitting diode. An indicator light, found either as individual elements or grouped together as segments to form characters
AO	Analog output	LP	Low pressure
BL	Blower	LT	Limit
BRPM	Blower RPM	M3	Main M3 unit controller board (A55).
C1	1st stage cooling	MGV	Modulating gas valve
C2	2nd stage cooling	MOAD	Motorized outdoor air damper
C3	3rd stage cooling	MSAV	Multi-Stage Air Volume
C4	4th stage cooling	OAC	Outdoor air control
CAI	Combustion air inducer	OAS	Outdoor air suitable for free cooling
CAVB	Constant air volume with bypass damper	OAT	Outdoor air temperature
COM	Electrical common	OCC	Unit controller demand, occupied mode
CLK	Clock	ODE	Outdoor enthalpy. Depends on temperature and humidity
CP1	Compressor 1	OE	Outdoor enthalpy.
CP2	Compressor 2	PPM	Parts per million (mostly used for CO ₂ measurements)
CP3	Compressor 3	RAP	Return air pressure
CP4	Compressor 4	RAT	Return air temperature
CSP	Cooling set point	RH	Relative humidity
DAC	Discharge (supply) air control	RS	Reset
DACC	Discharge (supply) air control cooling	RTU	Roof top unit
DACH	Discharge (supply) air control heating	RT6	Discharge air temperature sensor
DAP	Discharge (supply) air pressure	RT16	Return air temperature sensor
DAT	Discharge (supply) air temperature	RT17	Outdoor air temperature sensor
DB	Deadband	SMK	Smoke detection mode (alarm)
DCV	Demand controlled ventilation	SP	Set point
DDC	Direct Digital Controller	Stg	Stage
DI	Digital input	STPT	Set point
Diff	Differential	TB	Terminal block
DO	Digital output	TSTAT	Thermostat
ECON	Economizer	UNOCC	Unit controller demand, unoccupied mode
FAC	Fresh air cooling control	USB	Universal Serial Bus, connect to PC or flash drive
FAH	Fresh air heating control	W1	Thermostat demand, heat stage 1
FAT	Fresh air tempering control. See FAC & FAH	W2	Thermostat demand, heat stage 2
FC	Free cooling	W3	Thermostat demand, heat stage 3
G	Thermostat demand, blower	W4	Thermostat demand, heat stage 4
GLO	Global mode or input (economizer)	VAC	Alternating current voltage
H1	1st stage heating	VAV	Variable air volume. Accomplished with a variable frequency drive (VFD)
H2	2nd stage heating	VDC	Direct current voltage
H3	3rd stage heating	VFD	Var. frequency drive. An AC inverter used to vary motor speed
H4	4th stage heating	VT	Ventilation
HP1	Heat pump add-on board (A61)	Y1	Thermostat demand, cooling stage one
HP	High pressure	Y2	Thermostat demand, cooling stage two
HSP	Heating setpoint	Y3	Thermostat demand, cooling stage three
HT	Heating	Y4	Thermostat demand, cooling stage four
IAQ	Indoor air quality. Often synonymous with CO ₂ level in ppm	ZAT	Room air temperature
IDE	Indoor enthalpy. Depends on temperature and humidity		
IE	Indoor enthalpy.		

18. Parts and Kits

Table 14. Parts and Kits Available for M3 Unit Controller

Description	Catalog number	Description	Catalog number	Description	Catalog number
Unit Controller Replacement kit	10X84	USB service kit tube	59W52	SmartWire™ Field Termination kit	59W57
LCD Display Replacement Kit	10X85	M3 unit controller battery (10-pack)	59W53	Lennox Prodigy 2.0 USB Memory Stick (5-pack)	59W59
M3 unit controller cover	10X86	BACnet™ Replacement kit	59W51		

19. USB Service Report Example

```

=====
USB SERVICE REPORT
=====
Service Date      04:03:2014
Service Time     19:26:35
Serial No.
Software Version 08.00.0009
Hardware Version
Unit Number      UNIT 1
SBUS Address     2
BACnet Address   2
Catalogue Number
Model Number     LGH060H4EH1Y
CONFIGURATION ID 1  NTNNNNLN
CONFIGURATION ID 2  NNNNNNNN
Status           IDLE
=====
Runtime Data
Total Power On   23 HRS      8 CYCLES
Before Install   0 HRS      -----
Filter           12 HRS      -----
Belt             11 HRS      -----
Blower           12 HRS      50 CYCLES
Compressor 1     3 HRS      40 CYCLES
Compressor 2     4 HRS      27 CYCLES
Compressor 3     0 HRS      2 CYCLES
Compressor 4     0 HRS      3 CYCLES
Outdoor Fan 1    7 HRS      28 CYCLES
Outdoor Fan 2    2 HRS      22 CYCLES
Outdoor Fan 3    0 HRS      2 CYCLES
Outdoor Fan 4    0 HRS      3 CYCLES
Outdoor Fan 5    0 HRS      3 CYCLES
Outdoor Fan 6    0 HRS      3 CYCLES
POWER EXHAUST   0 HRS      0 CYCLES
Heat Stage 1    0 HRS      1 CYCLES
Heat Stage 2    0 HRS      1 CYCLES
Humiditrol      0 HRS      0 CYCLES
Free Cooling     0 HRS      4 CYCLES
UV Lamp         0 HRS      -----
=====
Sensor Data
OAT      66 degF
RAT      72 degF
DAT      73 degF
ZAT      78 degF
RH       50 %
CO2     460 ppm
=====
SmartAirFlow System Data

  Calibrated On 04/03/2014 19:12:56

  Supply Airflow Calibration Table
  -----
  PWM(%)   Speed(rpm)   Airflow(cfm)
  -----
    20      480         1031
    30      570         1274
    40      660         1493
    50      750         1687
    60      840         1857
    70      930         2004
    80     1020         2126
    90     1110         2223
   100     1200         2297

  Supply Airflow Targets
  -----
  Mode           Desired Airflow(cfm)   PWM(%)
  -----

```

```

Cool High      1800      57
Cool Low       1300      31
Heat           2000      70
Ventilation    1200      27
Smoke          2000      70
Economizer Differential Pressure(@ 2000 Supply
Airflow(cfm))
-----
Damper Position (%)   Diff.Pressure(in.H2O)
-----
          0             0.39
          50            0.23
          100           0.06
-----
Outside Airflow Targets
-----
Minimum Outside Air/Minimum DCV:    200 cfm
Maximum DCV:                          0 cfm
Minimum CO2:                           700 ppm
Maximum CO2:                            1200 ppm
-----
Alarm/Status Log
(143) 04:03:2014 19:26:13 RESET DAMPER PRESSURE
(141) 04:03:2014 19:26:13 RESET CFM TARGET TOO
HIGH
(143) 04:03:2014 19:06:19 SET DAMPER PRESSURE
(141) 04:03:2014 19:06:19 SET CFM TARGET TOO
HIGH
( 82) 04:03:2014 19:06:18 RESET CONTROLLER RESET
( 82) 04:03:2014 19:06:18 SET CONTROLLER RESET
(143) 04:03:2014 18:59:41 SET DAMPER PRESSURE
(141) 04:03:2014 18:59:41 SET CFM TARGET TOO
HIGH
( 82) 04:03:2014 18:59:40 RESET CONTROLLER RESET
( 82) 04:03:2014 18:59:40 SET CONTROLLER RESET
(143) 04:03:2014 18:35:19 SET DAMPER PRESSURE
(141) 04:03:2014 18:35:19 SET CFM TARGET TOO
HIGH
(148) 04:03:2014 18:21:36 RESET SMART AIRFLOW
CONFIG ERROR
(170) 04:03:2014 18:21:36 RESET POWER EXHAUST
UNCONFIGURED
(165) 04:03:2014 18:21:36 RESET ECONOMIZER
UNCONFIGURED
( 85) 04:03:2014 18:21:36 RESET INCORRECT
HUMIDITROL SETTINGS
(132) 04:03:2014 18:21:24 RESET VFD BYPASS
UNCONFIGURED
(148) 04:03:2014 18:21:23 SET SMART AIRFLOW
CONFIG ERROR
(132) 04:03:2014 18:21:23 SET VFD BYPASS
UNCONFIGURED
(170) 04:03:2014 18:21:23 SET POWER EXHAUST
UNCONFIGURED
(165) 04:03:2014 18:21:23 SET ECONOMIZER
UNCONFIGURED
( 85) 04:03:2014 18:21:23 SET INCORRECT
HUMIDITROL SETTINGS
( 82) 04:03:2014 18:20:31 RESET CONTROLLER RESET
( 82) 04:03:2014 18:20:31 SET CONTROLLER RESET
( 82) 04:03:2014 18:16:32 RESET CONTROLLER RESET
( 82) 04:03:2014 18:16:32 SET CONTROLLER RESET
( 82) 04:03:2014 18:14:10 RESET CONTROLLER RESET
( 82) 04:03:2014 18:14:10 SET CONTROLLER RESET
( 82) 04:03:2014 18:14:09 RESET CONTROLLER RESET
( 82) 04:03:2014 18:14:09 SET CONTROLLER RESET
=====
END OF REPORT
=====

```

20. USB Smart Airflow Report

```

=====
USB SMARTAIRFLOW REPORT
=====
Service Date      04:03:2014
Service Time     19:32:49
Serial No.
Software Version 08.00.0009
Hardware Version
Unit Number      UNIT 1
SBUS Address     2
BACnet Address   2
Catalogue Number
Model Number     LGH060H4EH1Y
CONFIGURATION ID 1 NTNNNNLN
CONFIGURATION ID 2 NNNNNNNN
Status           IDLE
=====

```

```

=====
0%      0.30      0      70
2004
5%      0.29      104     70
2004
10%     0.28      184     70
2004
15%     0.27      261     70
2004
20%     0.26      325     70
2004
25%     0.24      437     70
2004
30%     0.23      561     70
2004
=====
END OF REPORT
=====

```

Calibrated On 04/03/2014 19:12:56

Supply Airflow Calibration Table

PWM(%)	Speed(rpm)	Airflow (cfm)
20	480	1031
30	570	1274
40	660	1493
50	750	1687
60	840	1857
70	930	2004
80	1020	2126
90	1110	2223
100	1200	2297

Supply Airflow Set Points

Airflow (cfm)		Desired	Actual	
Mode	Econ dP	Airflow (cfm)	PWM(%)	(With Damper Closed)
Cool Low		1300	31	1687
	0.21			
Cool High		1800	57	1297
	0.13			
Heat		2000	70	1809
	0.25			
Ventilation		1200	27	2004
	0.30			
Smoke		2000	70	1204
	0.11			

Outside Airflow Targets

```

-----
Minimum Outside Air/Minimum DCV: 200 cfm
Maximum DCV: 0 cfm
Minimum CO2: 700 ppm
Maximum CO2: 1200 ppm

```

Ventilation Calibration(@ 2000 Supply Airflow (cfm))

Damper		Outdoor		Supply
Position (%)	Econ dP	Airflow (cfm)	PWM(%)	Airflow (cfm)

21. Alarms

21.1. Phase - Voltage Detection

The M3 unit controller has the ability to detect that the rooftop unit power source has the correct frequency, phasing and voltage levels. When this feature is enabled, the detection of frequency and phasing is determined at power-on and the voltage level is continuously monitored. If any of these is out of range, then an alarm is logged and the rooftop unit operation is locked out.

1.. Alarms Detected at Power-On Start up:

- 121 - LINE FREQ DOES NOT MATCH UNIT CONFIG
- 126 - LINE PHASING DOES NOT MATCH UNIT CONFIG

2.. Alarms - Continuously Monitoring

- 122 - 24VAC PRIMARY VOLTAGE LOW
- 123 - 24VAC PRIMARY VOLTAGE HIGH
- 134 - 24VAC SECONDARY VOLTAGE LOW
- 125 - 24VAC SECONDARY VOLTAGE HIGH

Alarms 122 through 125 are auto-resetting. The rooftop operation will be restored five (5) minutes after the proper voltage levels are restored. Alarms 121 and 126 requires removing the power and correcting the issue before restoring the rooftop operation

The frequency (60 or 50 Hz) and the phasing (single or three-phase) of the power source is determined by the model number stored in the M3 unit controller. This model number and enabling/disabling the Phase-Voltage

Detection feature can be modified through the M3 unit controller user interface. See the Installation and Setup Guide for instructions on how to configure the CONFIGURATION ID 2, Position 5. Options are:

- **N** = NOT INSTALLED
- **1** = ENABLED INTERNAL (LENNOX)
- **2** = EXTERNAL (A42) PHASE DETECTION ON DI-2
- **3** = EXTERNAL (A42) PHASE DETECTION ON DI-3

When an event occurs, the M3 unit controller will display a code which corresponds to control function. Error codes are stored and can be recalled later. See the *Installation & Setup Guide For The Prodigy M3 unit controller* for information about viewing and silencing the alarms via the user interface.

NOTE: Any references in the user interface referencing *Advanced Airflow* actually indicates *Smart Airflow*®.

21.2. Service Relays

Selected alarms (marked with * in table 15 result in the closure of the service relay contacts (DO1). The contacts remain closed until the Prodigy resets, or alarm condition is cleared AND alarm status is read via explicit SBUS command. Other modes of operation may be selected and are described in the Prodigy Application Guide (Advanced Features).

NOTE: Any references in the user interface referencing *Advance Airflow* actually indicates *Smart Airflow*®.

21.3. M3 Unit Controller Alarm and Event Codes

Table 15. Prodigy 2.0 Alarm and Event Codes		
Selected alarms (marked with * in table result in the closure of the service relay contacts (DO1).		
ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
1	LOSS OF POWER DETECTION (SINGLE PHASE UNITS)	Check power connections. The M3 unit controller will set an alarm "Erratic Power" whenever service is turned off due to detection of power loss. User will be able to clear "Erratic Power" alarm via user interface. The M3 unit controller will clear "Power Erratic" after the Compressor Min OFF Delay has expired. If compressor demand is still present the M3 unit controller will restart compressor(s) after the Compressor Min OFF Delay has expired.
2 - 3 RESERVED		
4*	SMOKE DETECTOR INPUT (A173)	A173 input is sensed as closed. Will automatically clears once input is detected open. For smoke mode, check for source of smoke. While Smoke Alarm is active, the M3 unit controller will not service any cooling, heating or ventilation demands.
5*	BLOWER S52	Unit off. Air flow switch is normally closed. Monitoring starts 16 seconds after blower is started. if air flow switch is detected open after 16 second delay period, all compressors are de-energized, gas valves closed, electric heat turned off, economizer damper closed, and blower is stopped. Alarm will automatically clear once the error timed off delay has expired and system will resume. Check blower operation.
6*	DIRTY FILTER SWITCH S27	Dirty filter switch is detected as closed and will automatically clear once switch is detected open. Replace filter or check filter switch S27.
7	RESERVED	
8*	STRIKE 3 ON BLOWER S52	Lockout is active with multiple alarm code 5 detected. Alarm can be manually cleared through the user interface. Check blower operation. Once problem is corrected, lockout alarm can be cleared by resetting the M3 unit controller.
9 - 11 RESERVED		

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
12	COMP 1 HIGH PRESS S4 OR HI TEMP S5	Compressor is off. Check charge, fans and coil. NOTE: On Emergence Ultra-High Efficiency units - if only alarm 12 is present then issue could be high temperature S5 switch. If alarm 12 is accompanied with alarm 14 then most likely it is the high pressure S4 switch The unit controller will clear high pressure switch alarm when corresponding high pressure switch is detected as closed. Compressor will not restart until corresponding high pressure switch is closed and Minimum Off Delay (cooling or heating) has expired.
13*	STRIKE 3 ON COMP 1 HIGH PRESS S4 OR HI TEMP S5	Compressor is lockout. Check charge, fans and coil. Use service menu to clear lockouts. User will be able to clear high pressure switch compressor lockout and alarm via user interface. High pressure switch compressor lockout and alarm will be cleared after the M3 unit controller reset. High pressure switch compressor lockout and alarm will be cleared on termination of cooling demand. Default is 3 occurrences and can be set between 1 and 7 occurrences.
14	COMP 2 HIGH PRESS S7	Compress is off. Check charge, fans and coil. NOTE: On Emergence Ultra-High efficiency units tandem alarms (14) compressor 2 high temperature S8 switch. If accompanied with alarm 15 then most likely the S4 high pressure switch is the issue. The M3 unit controller will clear high pressure switch alarm when corresponding high pressure switch is detected as closed. Compressor will not be restarted until corresponding high pressure switch is closed and Minimum Off Delay (cooling or heating) has expired.
15*	STRIKE 3 ON COMP 2 HIGH PRESS S5 OR S7	Compressor lockout. Check charge, fans and coil. Use service menu to clear lockouts. User will be able to clear high pressure switch compressor lockout and alarm via user interface. High pressure switch compressor lockout and alarm will be cleared after the M3 unit controller reset. High pressure switch compressor lockout and alarm will be cleared on removal of cooling demand. Default is 3 occurrences and can be set between 1 and 7 occurrences.
16	COMP 3 HIGH PRESS S28	Compressor is off. Check charge, fans and coil. The M3 unit controller will clear high pressure switch alarm when corresponding high pressure switch is detected as closed. Compressor will not be restarted until corresponding high pressure switch is closed and Minimum Off Delay (cooling or heating) has expired.
17*	STRIKE 3 ON COMP 3 HIGH PRESS S28	Compressor lockout. Check charge, fans and coil. Use service menu to clear lockouts. User will be able to clear high pressure switch compressor lockout and alarm through the user interface. High pressure switch compressor lockout and alarm will be cleared after the M3 unit controller reset. High pressure switch compressor lockout and alarm is cleared on removal of cooling demand. Default is 3 occurrences and can be set between 1 and 7 occurrences.
18	COMP 4 HIGH PRESS S96	Compressor lockout. Check charge, fans and coil. The M3 unit controller will clear high pressure switch alarm when corresponding high pressure switch is detected as closed. Compressor will not be restarted until corresponding high pressure switch is closed and Minimum Off Delay (cooling or heating) has expired.
19*	STRIKE 3 ON COMP 4 HIGH PRESS S96	Compressor lockout. Check charge, fans and coil. Use service menu to clear lockouts. User will be able to clear high pressure switch compressor lockout and alarm via user interface. High pressure switch compressor lockout and alarm will be cleared after the M3 unit controller reset. High pressure switch compressor lockout and alarm is cleared on removal of cooling demand. Default is 3 occurrences and can be set between 1 and 7 occurrences.
NOTE: EVENTS 12-19 COULD ALSO BE CAUSED BY A HIGH TEMPERATURE CONDITION ON SOME COMPRESSORS EQUIPPED WITH A HIGH TEMPERATURE SHUTDOWN.		
20	UNIT SHUTDOWN A42	Phase monitor.
21	RESERVED	
22	COMP 1 LOW PRESS S87	Compressor is off. Check charge, fans and coil. Use service menu to clear lockouts.

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
23*	STRIKE 3 ON COMP 1 S87	Compressor is off. Check charge, fans and coil. Use service menu to clear lockouts. Number of occurrences is set using parameter 99 (MAX LO OCCURRENCES). Default is 3 occurrences.
24	COMP 2 LOW PRESS S88	Compressor is off. Check charge, fans and coil.
25*	STRIKE 3 ON COMP 2 S88	Compressor is off. Check charge, fans and coil. Use service menu to clear lockouts. Number of occurrences is set using parameter 99 (MAX LO OCCURRENCES). Default is 3 occurrences.
26	COMP 3 LOW PRESS S98	Compressor if off. Check charge, fans and coil.
27*	STRIKE 3 ON COMP 3 S98	Compressor is off. Check charge, fans and coil. Use service menu to clear lockouts. Number of occurrences is set using parameter 99 (MAX LO OCCURRENCES). Default is 3 occurrences.
28	COMP 4 LOW PRESS S97	Compressor if off. Check charge, fans and coil.
29*	STRIKE 3 ON COMP 4 S97	Compressor is off. Check charge, fans and coil. Use service menu to clear lockouts. Number of occurrences is set using parameter 99 (MAX LO OCCURRENCES). Default is 3 occurrences.
30*	DRAIN PLAN OVERLFLOW SHUTDOWN (S149)	Check for block drain, condensate lines and drain pan overflow switch. Alarm set if overflow switch is detected opened and compressor will be locked out. system will automatically clear alarm once switch is detected closed. System will resume operation (compressor lockout), after the Error Timed OFF Delay has expired following the Overflow switch alarm clear.
31	RESERVED	
32	COMP 1 FRZSTAT OPEN S49	Compressor is off. Check freezestat, air flow, charge, coil, air filter and outside air temperature.
33*	STRIKE 3 COMP 1 FRZSTAT OPEN S49	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature. Number of occurrences is set using parameter 81 (MAX FREEZE SAT OCC). Default is 3 occurrences.
34	COMP 2 FRZSTAT OPEN S50	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature.
35*	STRIKE 3 COMP 2 FRZSTAT OPEN S50	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature. Number of occurrences is set using parameter 81 (MAX FREEZE SAT OCC). Default is 3 occurrences.
36	COMP 3 FRZSTAT OPEN S53	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature.
37*	STRIKE 3 COMP 3 FRZSTAT OPEN S53	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature. Number of occurrences is set using parameter 81 (MAX FREEZE SAT OCC). Default is 3 occurrences.
38	COMP 4 FRZSTAT OPEN S95	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature.
39*	STRIKE 3 COMP 4 FRZSTAT OPEN S95	Compressor is locked out. Check freezestat, air flow, charge, coil, air filter and outside air temperature. Number of occurrences is set using parameter 81 (MAX FREEZE SAT OCC). Default is 3 occurrences.
40	RETURN AIR OVER HEAT LIMIT RT16	Heat is above set point. Check space conditions and sensors.
41	RETURN AIR UNDER COOL LIMIT RT16	Cool is below set point. Check space conditions and sensors.
42*	BLOWER MOTOR OVERLOAD (S42 OR S135) SHUTDOWN	System will set an alarm if S42 witch is detected as open. System will automatically clear alarm once S42 switch is detected closed. System will resume operation (servicing the demands), after the Error Timed OFF Delay has expired following S42 or S135 clear. Check external motor overloads.
43	RESERVED	
44*	GAS VALVE ON NO DEMAND GV1	Unit is off. Gas valve 1 has power, but no demand. Check gas valve and wiring.
45*	GAS VALVE ON NO DEMAND GV2	Unit is off. Gas valve 2 has power, but no demand. Check gas valve and wiring.
46 - 48 RESERVED		

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
49	NO 24VAC ON A59 (C3) CONTROL	Third and fourth compressors are off. Alarm automatically clears once 24VAC is present. The M3 unit controller will resume operation once the ERROR TIME OFF DELAY is completed. parameter 110 is used to set the reference delay. Factory delay default is 300 seconds.
50	PRIMARY HEAT 1 LIMIT OPEN S10	Heat section 1 primary gas heat limit switch is open. Check air flow, air filter, limit switch and wiring.
51*	STRIKE 3 PRIMARY HEAT 1 LIMIT OPEN S10	Heat section 1 primary gas heat limit switch is open. Check air flow, air filter, limit switch and wiring. Number of occurrences is reached.
52	SECONDARY HEAT 1 LIMIT OPEN S21	Heat section 1 secondary gas heat limit switch is open. Check air flow, air filter, limit switch and wiring.
53*	STRIKE 3 SECONDARY HEAT 1 LIMIT OPEN S21	Heat section 1 secondary gas heat limit switch is open. Check air flow, air filter, limit switch and wiring. Number of occurrences is reached.
54	HEAT 1 S15 LIMIT OPEN	Heat section 1 primary electric heat limit switch is open. Check air flow, air filter, limit switch and wiring.
55*	ROLL OUT OPEN	Heat section 1 flame roll out burner 1 switch is open. Check gas roll out switch S47.
56	HEAT 1 CAI SWITCH S18	Check heat section 1 combustion air motor and proof switch.
57*	STRIKE 3 HEAT 1 CAI SWITCH S18	Check heat section 1 combustion air motor and proof switch. Number of occurrences is reached.
58	HEAT 1 NO PROOF GAS VALVE GV1	Check heat section 1 ignition control, flame proof, gas valve 1 and gas supply.
59*	STRIKE 3 NO PROOF GAS VALVE GV1	Check heat section 1 ignition control, flame proof, gas valve 1 and gas supply. Number of occurrences is reached.
60	PRIMARY HEAT 2 LIMIT OPEN S99	Check heat section 2 primary burner limit switch to see if it is open. Check air flow, limit switch and wiring.
61*	STRIKE 3 PRIMARY HEAT 2 LIMIT OPEN S99	Check heat section 2 primary burner limit switch to see if it is open. Check air flow, limit switch and wiring. Number of occurrences is reached.
62	HEAT 2 LIMIT OPEN S100	Heat section 2 secondary heat limit switch is open. Check air flow, limit switch and wiring.
63*	STRIKE 3 HEAT 2 LIMIT OPEN S100	Heat section 2 secondary heat limit switch is open. Check air flow, limit switch and wiring. Number of occurrences is reached.
64	RESERVED	
65*	HEAT 2 ROLLOUT OPEN S69	Check roll out sensor and gas supply.
66	HEAT 2 CAI SWITCH S45	Check heat section 2 combustion air motor and proof switch.
67*	STRIKE 3 HEAT 2 CAI SWITCH S45	Check heat section 2 combustion air motor and proof switch. Number of occurrences is reached.
68	HEAT 2 NO PROOF GAS VALVE GV2	Check heat section 2 ignition control, flame roof, gas valve 2 and gas supply.
69*	STRIKE 3 NO PROOF GAS VALVE GV2	Check heat section 2 ignition control, flame roof, gas valve 2 and gas supply. Number of occurrences is reached.
70 - 72 RESERVED		
73	NETWORK SENSOR ERROR	Check with integrator for refresh rate, network status lights and wiring.
74*	ZONE (ROOM) SENSOR A2	<p>If measurement is out of specified range (including open/short detection) the system will ignore the Zone Temperature Sensor readings and set the alarm.</p> <p>If measurement of Zone Temperature Sensor is out of specified range (including open/short detection) the system will change operating mode to the specified Backup mode (None, Local Thermistor or Return Air temp).</p> <p>The system will clear the alarm, if zone temperature sensor measurement is detected in specified operating range and return the system to monitoring the A2 sensor as the primary sensor input.</p> <p>Check zone (room) sensor and wiring</p>
75*	OUTDOOR TEMPERATURE SENSOR (RT17)	<p>if measurement of the outdoor temperature sensor is out of specified range (including open / short detection, the alarm will be activated. alarm will automatically clear once in range condition is detected.</p> <p>Check sensor and wiring.</p>

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
76*	HUMIDITY SENSOR A91	If measurement is below specified range (<5 % RH) the system will ignore the Relative Humidity readings. If measurement is above the specified range(>100% RH) the system will limit the value to 100%. If measurement of Relative Humidity Sensor is below specified range while the dehumidification mode using RH sensor is enabled, the system will set an alarm. The system will clear the alarm if Relative Humidity sensor measurement is detected in specified operating range OR dehumidification mode using RH sensor is disabled. Check sensor and wiring.
77*	DISCHARGE AIR TEMP SENSOR RT6	if measurement of the discharge air temperature sensor is out of specified range (including open / short detection, the alarm will be activated. alarm will automatically clear once in range condition is detected. Check sensor and wiring.
78*	RETURN AIR TEMP SENSOR (RT16)	if measurement of the return air temperature sensor is out of specified range (including open / short detection, the alarm will be activated. alarm will automatically clear once in range condition is detected. Check sensor and wiring.
79*	ADD-ON BOARD PROBLEM	Add-on board problem, reset M3 unit controller to clear. When the communication alarm 80 persists for more than 30 seconds even after several retries for establishing the communication this Alarm is logged. Alarm can only be cleared by M3 Unit controller reset.
80	ADD-ON BOARD COMMUNICATION PROBLEM	When the M3 unit controller is not able to communicate with any attached add-on boards (C3 and GP3) this alarm code is logged. The M3 unit controller will retry to establish the communication once every 5 second. Alarm is automatically cleared once communication is restored.
81	REHEAT SETUP ERROR	Check reheat settings. Alarm 81 is raised under these two conditions: 1. If the user sets up the unit to use supermarket reheat on a non-gas unit. 2. If the user sets up the unit to use Humiditrol reheat but the heater type is heat pump
82	CONTROLLER RESET	If set when M3 unit controller powers up. Will Indicated reason for reset if known.
83*	INCORRECT SETTINGS	Check system configuration (model number, Configuration ID 1 and ID 2. If a model number is used that requires a daughter card, the M3 unit controller will attempt to detect the presences of the add-on board if not detected, this alarm will be set. This hardware configuration alarm can be only cleared by resetting or power cycling the M3 unit controller.
84	RESERVED	
85	INCORRECT HUMIDITROL SETTINGS	Check Humiditrol settings. Check Configuration ID 1, position 1 and verify that the position is not set to U. Should be set to either N (not installed) or H (Humiditrol). Alarm will automatically clear once correct option is set.
86*	CONFLICTING THERMOSTAT INPUT	Check thermostat inputs for simultaneous heat and cooling wiring. Once condition is corrected, unit controller will resume operation after error time off day has expired.
87 -90 RESERVED		
91*	OUTDOOR ENTH SENSOR A7	If Enthalpy Sensor failure is detected, the system will disable 'Free Cooling' operation. NOTE: Valid Outdoor Enthalpy Sensor reading is required for both 'ODE' (Outdoor Enthalpy) and 'ODE differential' (Outdoor differential). Valid Indoor Enthalpy Sensor reading is required for 'ODE differential' (Outdoor differential). Check economizer parameters 160 and 161. Also check enthalpy parameters 162 and 163. Check sensor and wiring.
92*	INDOOR ENTH SENSOR A62	If Enthalpy Sensor failure is detected, the system will disable 'Free Cooling' operation. NOTE: Valid Outdoor Enthalpy Sensor reading is required for both 'ODE' (Outdoor Enthalpy) and 'ODE differential' (Outdoor differential). Valid Indoor Enthalpy Sensor reading is required for 'ODE differential' (Outdoor differential). Check wiring and test A62 sensor using specified method in M3 application guide, section titled economizer checkout.

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
93*	BACKUP MODE	<p>Check communication loss with network sensor or if M3 unit controller If NETWORK INTERGRATION is set to RTU STANDALONE MODE and backup sensor is set to RETURN AIR BACKUP.</p> <p>while running in backup mode the unit controller will set this alarm. The unit controller will return from Backup mode to Primary (Main) mode on a reset or after the Primary mode (room Sensor is not in error or OR network communication is re-established and available for 300 seconds.</p> <p>Backup mode alarm will be cleared on the reset OR after the unit controller has returned to primary (main) system mode.</p>
94*	BAD ZONE SENSOR SET POINT	Ensure that the heating and cooling set points honor the auto-changeover deadband.
95 - 98 RESERVED		
99*	OUTDOOR ECON SENSOR A24	Check sensor and wiring. This alarm activates when the A24 sensor input signal is continuously above 25% of sensor measuring range for more than five minutes with blower stopped. The M3 unit controller will disable the Outdoor Air CFM control. The alarm automatically clears when the sensor reading is below 10% sensor measuring range for one minute.
100*	AIR VOL CONTROL SETUP ERROR	Check for proper installation of GP board and settings.
101*	MGV CONTROL SETUP ERROR	Check for proper installation of GP board and settings.
102*	GP CONTROL SETUP ERROR	Check for proper installation of GP board and settings.
103*	ADVANCED CONTROL SETUP ERROR	Check M3 unit controller Configuration ID 1 settings.
104 - 105 RESERVED		
106*	BUILDING PRESS SENSOR A34	Check sensor and wiring.
107*	DUCT SUPPLY PRESS SENSOR A30	<p>Check sensor and wiring.</p> <p>The unit controller will set Supply Air Static Pressure Sensor (A30) error status if:</p> <ul style="list-style-type: none"> • Input signal is above 4.9" wc for more than 30 seconds. • OR • Input signal is below 0.1"wc 20 seconds after the blower has started with setting at or above Blower Output - Static Duct Alarm Check. <p>The M3 unit controller will clear the Supply Air Static Pressure Sensor (A30) error status and alarm after the expiration of Error Time OFF delay.</p>
108	DUCT SUPPLY HIGH PRESS SENSOR A30	<p>Check sensor and wiring.</p> <p>The M3 unit controller will shutdown operation for Error Off time (parameter 110) if supply air static pressure exceeds supply static shutdown setpoint for 20 seconds (default) parameter 42.</p> <p>The M3 unit controller will clear High Supply Static (Duct) Pressure after Error Off Time has expired and static duct pressure is below Supply Static Set Point Shut-down.</p>
109*	STRIKE 3 DUCT SUPPLY PRESS SENSOR A30	<p>Check sensor and wiring.</p> <p>Prodigy controller shall "lock-out" a unit operation after the Max Static Duct Pressure Occurrences have occurred of Supply Static Pressure Sensor Error (alarm 107) and/or High Supply Static (Duct) Pressure (alarm 108).</p> <p>User shall be able to clear Supply Static Pressure lockout & alarm via User Interface. Supply Static Pressure lockout and alarm shall be cleared after the Prodigy controller reset.</p> <p>The number of strikes is three by default. this can be changed using parameter 43. Optional occurrence setting is 1 to 7.</p>
110	WAITING ON NETWORK DATA	Check network or comfort sensor and wiring.
111	PROFILE ERROR	Configuration profile unrecoverable. Settings may have changed.
112 - 120 RESERVED		
121*	LINE FREQ DOES NOT MATCH UNIT CONFIG	Power-source line frequency is determined by the entered model number. This alarm is enabled by the Phase-Voltage Detection feature. The M3 unit controller does not have an automatic clearing method, unit power cycle or reset will be required to re-evaluate the phase sequence again.

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
122*	24VAC PRIMARY VOLTAGE LOW	<p>Low output voltage on T1 transformer. alarm set when 24VAC voltage low if calculated RMS voltage is below low voltage alarm threshold for more than two seconds. System will stop unit operations (cooling, heating and ventilation). Low voltage threshold is 18VAC.</p> <p>The M3 unit controller will clear alarm 24VAC Voltage Low if calculated RMS voltage is above Low Voltage Alarm Threshold + 1 VAC for more than two seconds. After the low 24VAC alarm has been cleared, the M3 unit controller will ignore all service demands until the Error Time Off Delay has expired.</p>
123*	24VAC PRIMARY VOLTAGE HIGH	<p>High output voltage on T1 transformer. alarm set when 24VAC voltage high if calculated RMS voltage is below low voltage alarm threshold for more than two seconds. System will stop unit operations (cooling, heating and ventilation). Low voltage threshold is 30VAC.</p> <p>The M3 unit controller will clear alarm 24VAC Voltage high if calculated RMS voltage is above High Voltage Alarm Threshold + 1 VAC for more than two seconds. After the HIGH 24VAC alarm has been cleared, the M3 unit controller will ignore all service demands until the Error Time Off Delay has expired.</p>
124*	24VAC SECONDARY VOLTAGE LOW	<p>Low output voltage on T1 transformer. alarm set when 24VAC voltage low if calculated RMS voltage is below low voltage alarm threshold for more than two seconds. System will stop unit operations (cooling, heating and ventilation). Low voltage threshold is 18VAC.</p> <p>The M3 unit controller will clear alarm 24VAC Voltage Low if calculated RMS voltage is above Low Voltage Alarm Threshold + 1 VAC for more than two seconds. After the low 24VAC alarm has been cleared, the M3 unit controller will ignore all service demands until the Error Time Off Delay has expired.</p>
125*	24VAC SECONDARY VOLTAGE HIGH	<p>High output voltage on T1 transformer. alarm set when 24VAC voltage high if calculated RMS voltage is below low voltage alarm threshold for more than two seconds. System will stop unit operations (cooling, heating and ventilation). Low voltage threshold is 30VAC.</p> <p>The M3 unit controller will clear alarm 24VAC Voltage HIGH if calculated RMS voltage is above high voltage alarm Threshold + 1 VAC for more than two seconds. After the high 24VAC alarm has been cleared the M3 unit controller will ignore all service demands until the Error Time Off Delay has expired.</p>
126*	LINE PHASING DOES NOT MATCH UNIT CONFIG	during power up or reset of unit, Mismatch on single or 3-phase power, or reverse rotation on 3-phase detected. This alarm is enabled by the Phase-Voltage Detection feature.
127 - 128 RESERVED		
129*	VFD SHUTDOWN	VFD fault detected. Check belt and for blower overload. Fix source of fault and reset M3 unit controller.
130	VFD BYPASS ENGAGED	VFD bypass mode. Mode is engaged. Blower may or may not be disengage.
131	RESERVED	
132	VFD BYPASS NOT CONFIGURED	VFD bypass mode has not been selected. Unit operates as if bypass is not installed.
133	RESERVED	
134	ADVANCED AIRFLOW LOW SUPPLY CFM	Advanced Airflow enabled RTU - indicates airflow target cannot be achieved. Check cause of airflow reduction such as dirty filter, changes in duct work, etc
135*	ADVANCED AIRFLOW NO AIRFLOW	Blower RPM is too low as indicates by blower status. This means that the blower is not working. Repair blower and reset M3 unit controller.
136*	ADVANCED AIRFLOW OUTSIDE AIR DAMPER/ECON MECHANICAL FAULT	Outdoor air damper stuck or actuator problem.
137	ADVANCED AIRFLOW LOW OUTDOOR AIRFLOW	Outdoor airflow is too low so the building is not getting the designed outdoor airflow based on IAQ.
138	RESERVED	
139	ADVANCED AIRFLOW OUTDOOR AIRFLOW TOO HIGH	Ventilation CFM is too high so the RTU is wasting energy.
140	ADVANCED AIRFLOW CFM UNATTAINABLE - TARGET TOO LOW	Verify the MSAV blower settings and set the CM targets below set CFM. The alarm value will be displayed on the M3 unit controller screen.
141	ADVANCED AIRFLOW CFM UNATTAINABLE - TARGET TOO HIGH	
142	RESERVED	
143*	ADVANCED AIRFLOW DAMPER PRESSURE ERROR.	Outdoor air differential pressure sensor value not in valid range. Might be tubing problem or high return duct resistance.
144 - 145 RESERVED		

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
146	SERVICE LOGGED	Service event logged.
147*	OA DAMPER ERROR	During free cooling damper is not modulating.
148*	ADVANCED AIRFLOW CONFIG ERROR	Economizer should be installed and blower should be ECM type.
149*	OUTDOOR AIR DIFF PRESSURE SENSOR ERROR	Check outdoor air damper differential pressure sensor and wiring.
150*	NOT ECONOMIZING WHEN OUTDOOR AIR IS SUITABLE	May be due to the damper motor being unplugged or disconnected.
151*	ECONOMIZING WHEN OUTDOOR AIR IS NOT SUITABLE	This may be due to damper motor being blocked or stuck open and therefore not closing.
152 - 164	RESERVED	
165	ECONOMIZER NOT CONFIGURED	Configuration ID 1, position 2 is set to U. Select applicable option using setup/install wizard.
166	CAI PRESSURE SWITCH STUCK CLOSED - GV1	This alarm will occur when the combustion air pressure switch (S18) is detected as closed immediately after the furnace demand relay is energized and before the combustion air blower is energized. Gas valve 1.
167	CAI PRESSURE SWITCH STUCK CLOSED - GV2	This alarm will occur when the combustion air pressure switch (S45) is detected as closed immediately after the furnace demand relay is energized and before the combustion air blower is energized. Gas valve 2.
168*	COMBUSTION AIR SW NOT OPEN LOCKOUT - GV1	System locked out due to S45 switch closed and a specific number occurrences detected based on parameter 72 (MAX CAI NO PRF OCC) setting during a single cycle.
169*	COMBUSTION AIR SW NOT OPEN LOCKOUT - GV2	
170	POWER EXHAUST NOT CONFIGURED	Configuration ID 1, position 3 is set as U (unconfigured).
171	POWER EXHAUST CONFIGURATION ERROR	Configuration ID 1, position 4 is set correctly. if position 3 is configured then position 4 must be also.
172	RESERVED	
173	AIR FLOW SWITCH CONFIG ERROR	Verify that Configuration ID 2, position 1 is set correctly.
174	ZONE (ROOM) BYPASS DAMPER CONFIGURATION ERROR	Room bypass damper operation is only compatible with cab blowers. prodigy will only allow zone bypass unit operation if configuration ID1 is set to installed for units with B or T type blowers. alarm will automatically clear when configuration conflict is corrected.
175	INVALID LOAD SHEDDING INPUT CONFIGURATION	Alarm will occur if load shedding input is shared with other optional devices or inputs, for example - global, blower overload, drain pan overflow, etc.
176	SBUS RECEIVED AN OBSOLETE M3 COMMAND	This alarm occurs when a SBUS master device sends a M2 style command to the M3 unit controller. The alarm is immediately cleared and a history of the event is stored.
177	MODEL NUMBER NOT DEFINED	Missing model configuration data. run setup > install and complete model number information.
178 - 181	RESERVED	
182	ULTRA: SUCTION PRESSURE SENSOR ERROR	<p>Prodigy provides 0-5VDC analog input for the suction pressure sensor. Sensor output is connected to P333, pin 1. valid suction pressure range is 0 to 300 psig.</p> <p>If Suction Pressure Sensor is detected on Emergence Ultra-high efficiency unit falls below the 30 psig then Prodigy will assume that the Pressure Sensor sensor is faulty and ignore Pressure Sensor readings. alarm will automatically clear once input is within normal operating range.</p> <p>The alarming value indicates which suction pressure sensor failed.</p> <p>0 - Tandem 1 Suction Pressure Sensor Failure 1 - Tandem 2 Suction Pressure Sensor Failure</p>
183	ULTRA: COMPRESSOR 1 SUMP TEMPERATURE SENSOR ERROR	Alarm will occur when an open or short condition is detected. Alarm will also occur when unit controller via the temperature sensor detects an out of range. Valid range is -30°F to 150°F. Possible causes are faulty temperature sensor / circuit or improper installation.
184	ULTRA: COMPRESSOR 2 SUMP TEMPERATURE SENSOR ERROR	<p>The alarming value indicates which Compressor Sump Temp sensor failed.</p> <p>0 - Tandem 1 Compressor 2 Sump Temp Sensor Failure 1 - Tandem 2 Compressor 2 Sump Temp Sensor Failure</p>
185	ENGINEERING USE ONLY.	

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
186*	BLOWER MOTOR FAULT	In systems with EBM blower, prodigy shall start monitoring the motor alarm output (normally closed relay contact) ten seconds after blower command is sent. The M3 unit controller will stop unit operation if fault conditions (relay contact open - logic input high) are detected. NOTE: Motor alarm is wired to P259-7; shared with VFD alarm and ECM blower rpm inputs. Alarm will clear when in-range temperature is detected.
187	INVERTER LOW LEVEL ALARM	Alarming Value = Inverter error code Possible alarming values for Prodigy Alarm 187 are: 12 - High Comp Current 13 - High Heat sink temperature 14 - High PFC input current If the alarm continues after outdoor conditions have moderated, check the fan, charge and coil. Alarm 187 will automatically clear when minimum off time expires. REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.
188	INVERTER HIGH LEVEL ALARM	Alarming Value = Inverter error code Possible alarming values for Prodigy Alarm 188 are: 21 - Peak DC current 22 - Maximum current reached lockout 23 - DC Link low voltage 26 - Locked Rotor 28 - DC Link high voltage 29 - Compressor over current 61 - Low outdoor ambient inverter lockout 62 - High Heat Sink Temperature lockout 75 - Low Input Voltage No action required. Compressor stops for the duration of the minimum run time. Unit shuts down after ten occurrences in one hour and Alarm 189 is initiated. Alarm 188 will automatically clear when inverter error clears. REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.
189	INVERTER FATAL ALARM	Alarming Value = Inverter error code Possible alarming values for Prodigy Alarm 189 are 21, 22, 23, 26, 28, 29, 61, 62 and 75. Alarm 189 will clear upon manual reset. REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.
190	INVERTER COMMUNICATION ERROR	Unable to communicate with inverter. Prodigy will disable compressor operation. Replace communication cable between inverter and M3 unit controller. If alarm continues, replace M3 unit controller or inverter.
191	INVERTER VOLTAGE MISMATCH	Prodigy will disable compressor operation. Replace with correct inverter part.
192	TEMP SWITCH TRIP	Check temperature trip switch. Compressor is off. Also check charge, fans and coil. The unit controller will clear the temperature trip alarm when corresponding compressor top cap temperature trip switch is detected as closed. Compressor will not restart until the corresponding temperature trip switch is closed and the minimum off delay has expired.
193	STRIKE 3 TEMP TRIP	Prodigy will disable compressor operation (lockout). Check switch, charge, fans and coil. Default is three occurrences. Alarm will be automatically cleared after removal of cooling demand.

22. Controller Signal References

22.1. M3 Unit Controller

Table 16. P259 Blower ECM Motor

Pin #	Label	Description	Type
1	ODF / PWM 1	OUTDOOR FAN PWM1	PWM
2	ODF / PWM 2	OUTDOOR FAN PWM2	PWM
3	GND	DIGITAL GROUND	GND
4	IDB / PWM / VO	A-BOX: INDOOR BLOWER PWM	PWM
*		MSAV / VAV: VFD VOLT OUT	0-10 VAC OUT
*		EBM ULTRA: VOLT OUT	0-10 VAC OUT
*		ZONE: DAMPER ACUATOR (CAV)	0-10 VAC
5	MSAV RELAY		
*		A BOX: 2 ND STAGE COMPRESSOR 1	24VAC DO
*		MSAV / VAV: EXHAUST 2 ND BYPASS	24VAC DO
6	GND	DIGITAL GROUND	GND
7	IDB	A-BOX: IDB FEEDBACK	5VDC
*		MSAV / VAV / ULTRA B-C ALARM CONTACT (MUST BE WIRED TO GND)	5VDC
8	V BIAS	V-BIAS	18VDC

Table 17. P262 Economizer Control

Pin #	Label	Description	Type
1	T1	24VAC POWER	24VAC
2	GND	DIGITAL GROUND	24VAC COM
3	VOT	DAMPER CONTROL	2-10VDC DO
4	DPOS	DAMPER POSITION FEEDBACK	2-10VDC DI
5	GND	DIGITAL GROUND	RES 0-5VDC
6	RT16 +	RETURN AIR TEMP	
7	A7 S	OUTDOOR ENTHALPY SENSOR	4-20 mA AI
8	18VDC	18VDC POWER	18VDC
9	A62 S	INDOOR ENTHALPY SENSOR	4-20 mA AI
10	A173	SMOKE DETECTOR	24VAC DI
11	T1	SMOKE DETECTOR 24VAC	24VAC POWER
12	COM	SMOKE DETECTOR 24VAC COMMON	

Table 18. P263 High and Low Pressure

Pin #	Label	Description	Type
1	UTS2	ULTRA SUMP TEMP COMPRESSOR 2	RES 0-5VDC
2	GND	GROUND	
3	S4	HIGH PRESSURE COMPRESSOR 1	SW 24VAC
4	T1	24VAC POWER	24VAC
5	S87	LOW PRESSURE COMPRESSOR 1 NC	SW 24VAC
6	S7	HIGH PRESSURE COMPRESSOR 2	SW 24VAC
7	T1	24VAC POWER	24VAC
8	S88	LOW PRESSURE COMPRESSOR 2	SW 24VAC

Table 19. P264 Blower Deck Area

Pin #	Label	Description	Type
1	RT6	DISCHARGE AIR TEMP	RES 0-5VDC
2	GND	DIGITAL GROUND	
3	S49	FREEZESTAT 1 (NC)	SW 5VDC
4	VSS	5VDC	5VDC
5	S50	FREEZESTAT 2 (NC)	SW 5VDC
6	S52	AIR FLOW SWITCH (NO)	SW 5VDC
7	VSS	5VDC	5VDC
8	S27	DIRTY FILTER SWITCH (NO)	SW 5VDC

Table 20. P265 Contactors / Relays

Pin #	Label	Description	Type
1	COM	24VAC COMMON	24VAC COM
2	K1	CONTACTOR COMPRESSOR 1	24VAC DO
3	K2	CONTACTOR COMPRESSOR 2	24VAC DO
4	K3	CONTACTOR BLOWER	24VAC DO
*		A-BOX INDOOR BLOWER LOW	24VAC DO
5	COM	24VAC COMMON	24VAC COM
6	K10	RELAY OUTDOOR FAN 1	24VAC DO
*		RELAY K191 ULTRA: CRANKCASE HEATER	24VAC DO
7	K68	RELAY OUTDOOR FAN 2	24VAC DO
*		A-BOX: INDOOR BLOWER HIGH	24VAC DO
*		RELAY K196 ULTRA: CRANKCASE HEATER	24VAC DO
8	COM	24VAC COMMON	24VAC COM
9	K13	RELAY COMBUSTION AIR BLOWER 1	24VAC DO
10	COM	24VAC COMMON	24VAC COM
11	K85	RELAY EXHAUST FAN	24VAC DO

Table 21. P266 Heating Control and Damper ΔP Sensor

Pin #	Label	Description	Type
1	COM	24VAC COMM	24VAC COM
2	A3, K15	HEAT 1, ELECTRIC HEAT 1	24VAC DO
3	W2, K16	HEAT 2, ELECTRIC HEAT 2	24VAC DO
4	DDPS	DAMPER DIFFER. PRESSURE SENSOR	0-5VDC
5	GND	GROUND	GND
6	5VDC	5VDC SUPPLY	5VDC

Table 22. P267 Outdoor Fan Area

Pin #	Label	Description	Type
1	RT17	OUTDOOR AIR TEMP	RES 0-5VDC
2	GND	DIGITAL GROUND	
3	S11	LOW PRESSURE FAN 1	SW 24VAC
4	R	24VAC	24VAC DO
5	S84	LOW PRESSURE FAN 2	SW 24VAC
6	A30	STATIC DUCT PRESSURE	10VDC
7	GND	GROUND	GND
8	5VDC	5VDC SUPPLY	5VDC

Table 23. P268 Power

Pin #	Label	Description	Type
1	T1-1	24VAC POWER TRANSFORMER 1	24VAC
2	T1-COM	24VAC COMMON TRANSFORMER 1	24VAC COM
3	T18-1	24VAC POWER TRANSFORMER 1	24VAC
4	T18-COM	24VAC COMMON TRANSFORMER 1	24VAC COM

Table 24. P269 Reheat - Humiditrol: Ultra - TXV

Pin #	Label	Description	Type
1	T43	24VAC POWER	24VAC
2	T43	24VAC COMMON	24VAC COM
3	L14	REHEAT SOLENOID 1: ULTRA TXV 1	24VAC DO
4	L30	REHEAT SOLENOID 2: ULTRA TXV 2	24VAC DO
5	RSV	RESERVED	24VAC DI

Table 25. P271 Heating 1 Safety

Pin #	Label	Description	Type
1	S10-C	PRIMARY LIMIT BURNER 1C	SW 24VAC
2	S10-NC	PRIMARY LIMIT BURNER 1 NC	
3	S10-NO	PRIMARY	
4	S21-C	SECONDARY LIMIT BURNER 1C	SW 24VAC
5	S21-NC	SECONDARY LIMIT BURNER 1 NC	
6	S47	ROLL OUT SWITCH BURNER 1	SW 24VAC
7	S47	ROLL OUT SWITCH BURNER 1	
8	S18	CAB PROOF SWITCH 1	SW 24VAC
9	S18	CAB PROOF SWITCH 1	
10	GV1	GAS VALVE SENSE 1	24VAC

Table 26. P297 Thermostat

Pin #	Label	Description	Type
1	R	TRANSFORMER 1 24VAC POWER	24VAC
2	C	TRANSFORMER 1 24V COMMON	24VAC COMM
3	G	BLOWER SIGNAL	24VAC DI
4	W1	1ST STAGE HEATING	24VAC DI
5	W2	2ND STAGE HEATING	24VAC DI
6	Y1	1ST STAGE COOLING	24VAC DI
7	Y2	2ND STAGE COOLING	24VAC DI
8	OCF	OCCUPIED SIGNAL	24VAC DI
9	GLO	GLOBAL CONTROL INPUT	24VAC DI
10	RSV	RESERVED	NA

Table 27. P298 IAQ Interface

Pin #	Label	Description	Type
1	R	TRANSFORMER 1 24VAC POWER	24VAC
2	C	TRANSFORMER 1 24V COMMON	24VAC COMM
3	IAQ+	INDOOR AIR QUALITY	0-10VDC AI
4	GND	INDOOR AIR QUALITY	0-10VDC AI
5	HUM	RH SENSOR	0-10VDC AI
6	GND	DIGITAL GROUND	GND
7	TMP	ROOM SENSOR	THERMISTOR
8	DO1	SERVICE RELAY OUTPUT	24VAC DO
9	GND	24 VAC COMMON	24VAC COMM
10	DO2	EXHAUST FAN	24VAC DO

Table 28. P299 Safety

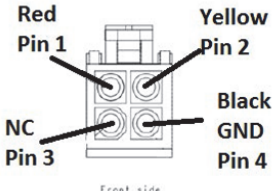
P299 Safety			
1	DI1	SMOKE DETECTOR (NO)	24VAC DI
2	R	TRANSFORMER 1 24VAC POWER	24VAC
3	C	TRANSFORMER 1 24V COMMON	24VAC COMM
4	DI2	DIGITAL INPUT 2 FORMER (S42 & S135)	24VAC DI
5	R	TRANSFORMER 1 24VAC POWER	24VAC
6	DI3	DIGITAL INPUT 3 FORMER (S149 & A42 FOR A BOX)	24VAC DI
7	R	TRANSFORMER 1 24VAC POWER	24VAC
8	DI4	DIGITAL INPUT 4 FORMER (HUMIDITROL INPUT)	24VAC DI
9	C	TRANSFORMER 1 24V COMMON	24VAC COMM
10	RSV	RESERVED	NA

Table 29. P333 Ultra - Sensors

Pin #	Label	Description	Type
1	UPS1	SUCTION PRESSURE	0-5VDC
2	5VDC	5VDC SUPPLY	5VDC
3	GND	DIGITAL GROUND	RES 0-5VDC
4	UTS1	SUMP TEMP COMPRESSOR 1	

Table 30. P358 (Ultra-A Box Only M3 Unit Controller)

Pin #	Label	Wire Color
1	RS485_A	RED
2	RS485_B	YELLOW
3	NOT USED	
4	GND	BLACK



22.2. GP3 Control

Table 31. P348

Pin #	Description	Type
1	5VDC SUPPLY (10MA MAX)	5VDC
2	ANALOG/PWM OUTPUT 4	AO: 0-10VDC; PWM: 0-15V
*	ULTRA C: PWM FAN B23/B24	PWM: 0-15V
3	ANALOG/PWM OUTPUT 2	AO: 0-10VDC; PWM: 0-15V
4	ANALOG/PWM OUTPUT 3	AO: 0-10VDC; PWM: 0-15V
*	ULTRA C: PWM FAN B22	PWM: 0-15V
5	ANALOG/PWM OUTPUT 1	AO: 0-10VDC; PWM: 0-10V
6	RELAY 1 - NORMALLY OPEN	RELAY (DRY) CONTACT
7	RELAY 1 - COM	RELAY (DRY) CONTACT
8	RELAY 2 - COM	RELAY (DRY) CONTACT
9	RELAY 2 - NORMALLY OPEN	RELAY (DRY) CONTACT
10	DIGITAL INPUT 3	24V DI
11	DIGITAL INPUT 4	24V DI
12	DIGITAL INPUT 2	24V DI
13	THERMISTOR INPUT 2 (10K@25C)	RES 0 - 3.3 VDC
*	ULTRA C: SENSOR THERMISTOR COMPRESSOR 4	
14	ANALOG INPUT 1	0-10VDC
*	ULTRA C: TRANSDUCER TANDEM COMP B	0-5VDC
15	ANALOG INPUT 2	0-10VDC
16	THERMISTOR INPUT 1 (10K@25C)	RES 0 - 3.3 VDC
*	ULTRA C: SENSOR THERMISTOR COMPRESSOR 3	
17	ANALOG INPUT 3 (0-10VDC)	0-10VDC
18	GROUND	GND
19	GROUND	GND
20	GROUND	GND
21	GROUND	GND
22	COM	COM
23	COM	COM
24	DIGITAL INPUT 1	24V DI

22.3. C3 Control

Table 32. P118

Pin #	Label	Description	Type
1	24VAC	24VAC SUPPLY (FOR RELAY OUTPUTS)	24VAC
2	COM	24VAC COM	24VAC COM
3		OPEN (NOT USED)	
4		OPEN (NOT USED)	
5	FAN3	RELAY OUTDOOR FAN 3	24VAC DO
*		ULTRA C: RELAY K233 CRANK-CASE HEATER COMP 3	
6		OPEN (NOT USED)	
7		OPEN (NOT USED)	
8	FAN4	RELAY OUTDOOR FAN 4	24VAC DO
*		ULTRA C: RELAY K234 CRANK-CASE HEATER COMP 4	
9	FAN5	RELAY OUTDOOR FAN 5	24VAC DO
10	FAN6	RELAY OUTDOOR FAN 6	24VAC DO
11	CMP3	CONTACTOR COMPRESSOR 3	24VAC DO
12	CMP4	CONTACTOR COMPRESSOR 4	24VAC DO

Table 33. P119

Pin #	Label	Description	Type
1	HPSW3	HIGH PRESSURE SWITCH	SW 24VAC
2		COMPRESSOR 3	
3	HPSW4	HIGH PRESSURE SWITCH	SW 24VAC
4		COMPRESSOR 4	
5	FRZST3	FREEZESTAT COMPRESSOR 3	SW 5VDC
6			
7	LPSW3	LOW PRESSURE SWITCH	SW 24VAC
8		COMPRESSOR 3	
9	FRZST4	FREEZESTAT COMPRESSOR 4	SW 5VDC
10			
11	LPSW4	LOW PRESSURE SWITCH	SW 24VAC
12		COMPRESSOR 3	
13		OPEN (NOT USED)	
14		OPEN (NOT USED)	
15		OPEN (NOT USED)	
16		OPEN (NOT USED)	

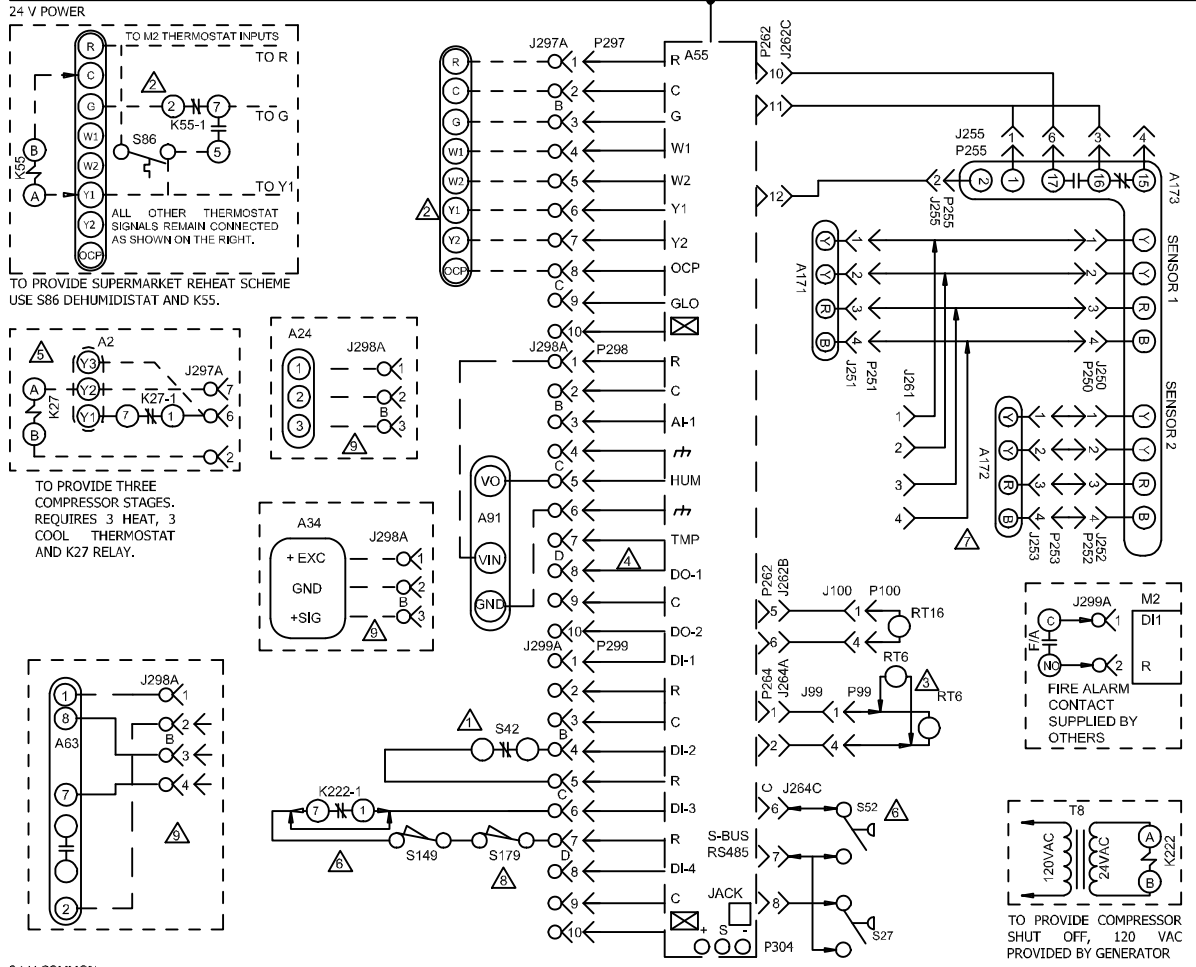
Table 34. P272

Pin #	Label	Description	Type
1	PRIMARY LIMIT	PRIMARY LIMIT BURNER 2 C	SW 24VAC
2		PRIMARY LIMIT BURNER 2 NC	
3		PRIMARY LIMIT BURNER 2 NO	
4	SECONDARY	SECONDARY LIMIT BURNER 2 C	SW 24VAC
5		SECONDARY LIMIT BURNER 2 NC	
6	GAS2 SAFETY SWITCHES	ROLLOUT SWITCH BURNER 2	SW 24VAC
7			
8		CAB PROOF SWITCH 2	SW 24VAC
9			
10		GAS VALVE SENSE 2	24VAC DI

Table 35. P332

Pin #	Label	Description	Type
1	COM	24VAC COM	24VAC COM
2	A12 K17	HEAT 3, ELECTRIC HEAT 3	24VAC DO
3	W2 K18	HEAT 4, ELECTRIC HEAT 4	24VAC DO
4	CAB2	RELAY COMBUSTION AIR BLOWER 2	24VAC DO

23. Wiring Diagram




KEY	DESCRIPTION
A2	SENSOR, ELECTRONIC THERMOSTAT
A24	CONTROL, OUTDOOR AIR CFM FLOW
A34	DUCT STATIC PRESS
A55	PANEL, MAIN
A63	SENSOR, CO2 (IAQ) OPTIONAL
A91	SENSOR, HUMIDITY
A171	SENSOR ONE, SMOKE, RETURN AIR
A172	SENSOR TWO, SMOKE, SUPPLY AIR
A173	MODULE, CONTROL SMOKE DETECTION
J99	JACK, RT16 RETURN AIR SENSOR
J100	JACK, RT6 SUPPLY AIR SENSOR
J250	JACK, SMOKE DETECTOR ONE
J251	JACK, SMOKE DETECTOR ONE
J252	JACK, SMOKE DETECTOR TWO
J253	JACK, SMOKE DETECTOR TWO
J255	JACK, MODULE, CONTROL SMOKE DETECTION
J261	JACK, SUPPLY SMOKE DETECTOR JUMPER
J262	JACK, ECONOMIZER
J264	JACK, BLOWER DECK
J297	JACK, THERMOSTAT - DDC INTERFACE
J298	JACK, IAQ INTERFACE
J299	JACK, SAFETY INTERFACE
K27, -1	RELAY, TRANSFER
K55, -1	RELAY, BLOWER
K222, -1	RELAY, COMPRESSOR LOCKOUT
P99	PLUG, RT16 RETURN AIR SENSOR
P100	PLUG, RT6 SUPPLY AIR SENSOR
P250	PLUG, SMOKE DETECTOR ONE
P251	PLUG, SMOKE DETECTOR ONE
P252	PLUG, SMOKE DETECTOR TWO

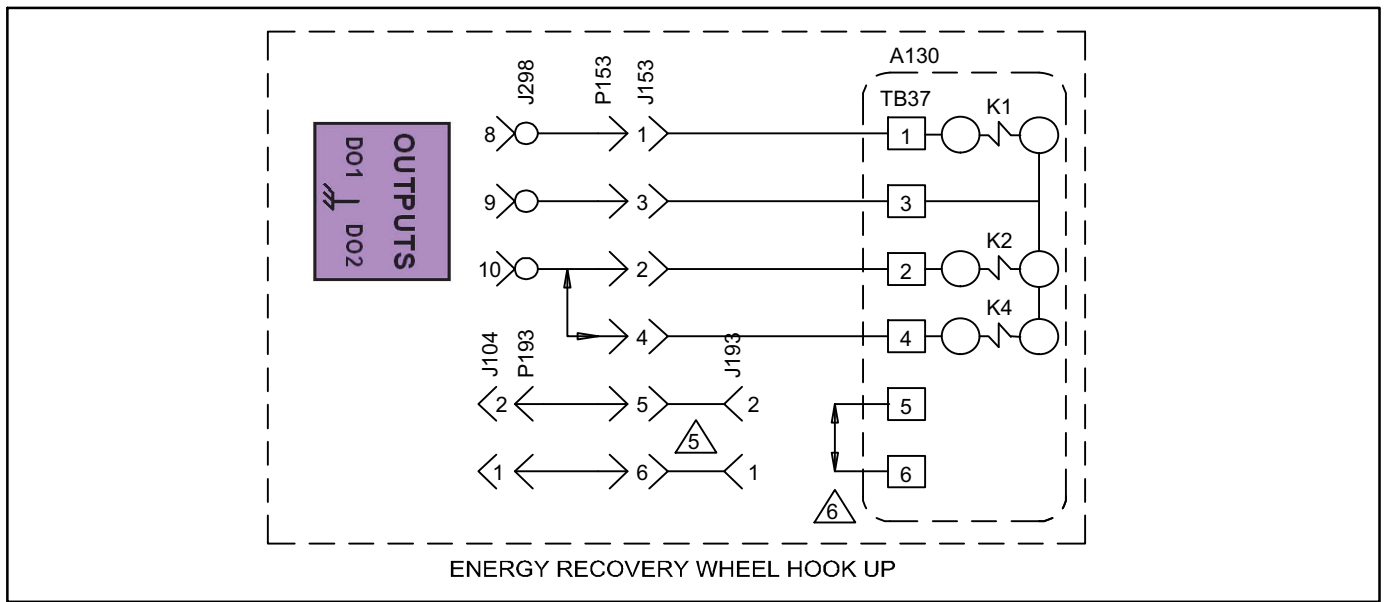
P253	PLUG, SMOKE DETECTOR TWO
P255	PLUG, MODULE, CONTROL SMOKE DETECTION
P262	PLUG, ECONOMIZER
P264	PLUG, BLOWER DECK
P297	PLUG, THERMOSTAT - DDC INTERFACE
P298	PLUG, IAQ INTERFACE
P299	PLUG, SAFETY INTERFACE
P304	PLUG, SYS BUS
RT6	SENSOR, SUPPLY AIR TEMP
RT16	SENSOR, RETURN AIR TEMP
S27	SWITCH, FILTER
S52	SWITCH, AIRFLOW
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S86	SWITCH, DEHUMIDISTAT
S149	SWITCH, OVERFLOW ONE
S179	SWITCH, OVERFLOW TWO
T8	TRANSFORMER, 120 V GENERATOR POWERED

- ▲ FOR MOTORS WITH S42 EXTERNAL OVERLOAD LESS INVERTER, SEE INVERTER WITH BY PASS FOR S42 HOOK UP
- ▲ USE S86 DEHUMIDISTAT AND K55 FOR OPTIONAL SUPERMARKET REHEAT SCHEME, PRODIGY PARAMETERS NEED TO BE MODIFIED UNDER THE SETTINGS MENU OR VIA UC SOFTWARE FOR SIMULTANEOUS HEATING AND COOLING.
- ▲ REMOTE LOCATION OF RT6
- ▲ P298-8 (DO-1) IS SERVICE RELAY OUTPUT (24VAC) IF USED CONNECT TO AN INDICATOR LIGHT
- ▲ THERMOSTAT HOOKUP FOR PROGRAMMABLE CONFIGURATION OF THE BOARD (A55).
- ▲ PRODIGY SETTINGS MUST BE MODIFIED WHEN K222, S42, S52, S149 OR S179 ARE INSTALLED
- ▲ CONNECT A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY
- ▲ S179, OVERFLOW SWITCH USED ON LGH/LCH 420-600 UNITS ONLY
- ▲ A63, A34 & A24 ARE MUTUALLY EXCLUSIVE

————— DESIGNATES OPTIONAL WIRING
 - - - - - CLASS II FIELD WIRING

01/15		WIRING DIAGRAM 537108-03	01/15
	ACCESSORIES ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT FOR EMERGENCE		
SECTION C		REV. 0	
Supersedes		New Form No. 537108-03	

24. Accessories Wiring Diagram



25. Quick Start Guide

CAUTION

Check rooftop unit electrical power for proper voltage and phasing. Check gas train components.

- A. Turn on unit and dismiss alarm messages as necessary.
- B. Follow SETUP > INSTALL menu to properly configure unit
- C. Be sure unit is in normal operating mode as seen in display (COOLING, HEATING, IDLE, etc).
- D. To verify operation use SERVICE > TEST menu.

Control Mode	Menu Setup Needed	Tips
THERMOSTAT	(Factory set for 2-stage thermostat)	<ul style="list-style-type: none"> • Check LEDs for signals.
BACnet	SETUP > NETWORK INTEGRATION > NETWORK TYPE = BACNET	<ul style="list-style-type: none"> • Setup information to be verified with integrator. • Follow wiring instructions including network termination • Remember to set MAC address 0-127 • Expert level BACnet service manual available.
LonTalk	SETUP > NETWORK INTEGRATION > NETWORK TYPE = LONTALK	<ul style="list-style-type: none"> • Setup information to be verified with integrator. • Follow wiring instructions including network termination • XIF file available. Neuron ID on sticker. • Expert level LonTalk service manual available.
L Connection	SETUP > NETWORK INTEGRATION > NETWORK TYPE = L-CONNECTION	<ul style="list-style-type: none"> • Follow wiring instructions including network termination • Comfort Sensors are 24 VAC polarity sensitive. • All network devices need to be correctly addressed
Damper	SETUP > TEST & BALANCE > DAMPER	<ul style="list-style-type: none"> • Verify damper minimum positions • Refer to Economizer section of manual for more detail
Local Mode	SETUP > NETWORK INTEGRATION > NETWORK TYPE = RTU STANDALONE	<ul style="list-style-type: none"> • Give unit time to start-up. • Humidity control requires sensor or error code 7649
Dehumidifier	Dehumidifier setup will be done during the SETUP > INSTALL wizard. It's the last part of that wizard.	<ul style="list-style-type: none"> • Three possible connections, LOCAL SENSOR, NETWORK SENSOR and REHEAT DI4. • Analog sensor wiring is polarity sensitive
Blower	Change motor torque; see SETUP > TEST & BALANCE > BLOWER	<ul style="list-style-type: none"> • Final motor CFM should be set by Test and Balance technician • Blower charts are located in the unit installation instruction.

For Lennox Service Support 1-800-4LENNOX. For Lennox Commercial website, go to www.lennoxcommercial.com.

26. Prodigy 2.0 Release History

08.02.0143 – Firmware update released on 8-17-15

- Enhanced alarm reporting and error code tables to eliminate nuisance error codes in the heating cycle.
- Enhanced Humiditrol operation for better control and improved setpoint tolerance.
- Improved smoke detector options and operations in remote demand mode.
- Enhanced status screen alarm notification.
- Enhanced timings and settings to allow better starting and operations in Emergence single compressor units.
- Enhanced re-establishing communication with the L Connection Zone Link after a communication loss or shutdown.
- Enhanced alarm reporting on four compressor Ultra units.
- Enhanced unit BACnet network identification options
- Improved override functionality in room sensor mode.

08.02.0129 – C Box operations released on 4-13-15

- General Purpose Digital and Analog IO on GP3 card release.
- C-Ultra Box operations.
- Capable of four stages of heating.

- L Connection Zone Bypass Damper on High Efficiency A-Box units.
- Outdoor air control with velocity sensor.
- Enhanced UI for EP in test mode.
- Building Pressure Control – using factory economizer and power exhaust.
- Crankcase heater control on Standard and High Efficiency A-Box units.

08.01.0136 – Firmware update released on 12-11-14

- Enhanced room sensor calibration.
- Enhanced communications to NOVAR LSE.
- Enhanced communications to L Connection (NCP).
- BACnet enhancements for Title 24.
- Enhanced communications with LonTalk integration.
- Enhanced options for A Box load shedding.
- Enhanced error codes reporting for room sensor failures.

08.01.0121 – A Box operations released on 9-5-14

- Enhanced BACnet protocol communication.
- Enhanced tolerances to error codes.
- Enhanced humidity sensor operations.

08.00.0604 – Firmware update released on 7-9-14

- Enhanced enthalpy sensor operations.

08.00.0603 – Original B Box released 5-12-14

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