**AIREDALE**

MODINE CONTROLS SYSTEM MANUAL
ClassMate® and SchoolMate® Units
Models CMD/CMP/CMS, and SMG/SMW
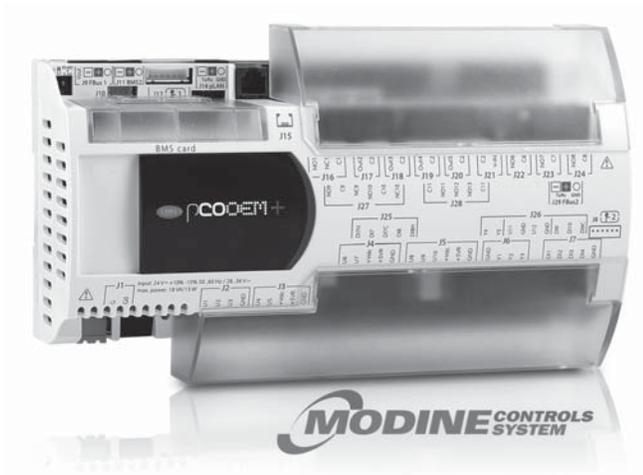
⚠ WARNING

1. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.
2. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
3. Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of this unit must be performed by a qualified installation and service agency.
2. These instructions must also be used in conjunction with the Installation and Service Manual originally shipped with the appliance, in addition to any other accompanying component supplier literature.
3. This manual applies to Modine Controls System program version series 1. For any other version, please contact Modine. The program version that resides in the unit controller can be found in the Information section of the Installer Sub Menu. Refer to the manual for instructions on accessing this screen.

General Information

Controls are one of the most important components of specialized HVAC equipment. The Modine Controls System is designed and engineered for the ClassMate and SchoolMate units to ensure that they will operate safely, reliably, with optimized performance, and maintain maximum energy efficiency.

Table of Contents

Table 2.1 - Acronyms Used

Acronym	Phrase
BMS	Building Management System
BPS	Bits Per Second
CCS	Capacity Control Solenoid
CF	Condenser Fan
CFM	Cubic Feet per Minute
Comp	Compressor
Dehum	De-humidify
Diff	Difference
EA	Exhaust Air
Econ	Economizer
Elec	Electric
ERV	Energy Recovery Ventilator
Ex	Exhaust
HGRH	Hot Gas Re-Heat
hr	Hour
Ht	Heat
ID Fan	Indoor Fan
LL	Liquid Line
min	"Minutes" or "Minimum"
Mod	Mode
OA	Outside Air
Perc	Percentage "%"
psig	Pounds per Square Inch gage
RA	Return Air
Rev Vl	Reversing Valve
RH	Relative Humidity
s	Seconds
SA	Supply Air
SetPt	Setpoint
Sp	Speed
St-by	Standby
Str	Start
Temp	Temperature
Vlv	valve

Controller Overview

Description and Features

The Modine Controls System utilizes a Carel pCOOEM+ programmable microprocessor controller. Highly advanced with a powerful microprocessor and fast processing speed, the controller features a high number of I/O's for complex HVAC/R applications.

The main controller board is housed in a plastic case that ensures a high index of protection and reduces the risk of electrostatic discharges due to incorrect handling. The controller offers greater safety due to the optical isolation of the serial pLAN, protection of the analog inputs in the event of incorrect connections, and an extended range of operating temperatures. Given the increasing demand for integration, pCOOEM+ can interface with BMS systems via many of the most commonly-used serial communication standards, using optional boards. Some of the features of the Carel pCOOEM+ programmable microprocessor controller are listed below.

pCOOEM+ Main Features:

- 12 Universal Inputs
  - Uses 10K NTC temperature sensors
  - 4-20mA humidity and CO2 sensors for reliability
- 5 Analog Outputs
  - 0-10 Vdc for emodulating control
- 8 Digital inputs
  - Used to monitor all aspects of the unit
- 13 Digital Outputs
  - True relayed outputs for reliability
- Real Time Clock
  - With battery backup and daylight savings adjustment
- pLAN Communication
  - To allow connectivity to space sensors and other controllers
- Alarm Logging
  - With a snapshot of the unit sensors
- Run Hours Logging
  - With maintenance setpoints
- Password Protection
  - Two levels of password protection
- Manual Control
  - For easy startup and service
- Simple Interface
  - Easy to understand menus and settings
- Built in Scheduler
  - Up to 7 periods per day - Either On/Off control or Occupied/Unoccupied
  - Holiday scheduler with up to 16 holiday periods
- Remote Display Option
  - Can be 100 ft from unit using standard RJ12 cable
- All reset points fully adjustable

Standard and Optional Sensors Monitored

The Modine Controls System monitors a number of sensors within the ClassMate and SchoolMate units as follows:

Standard sensors monitored:

- Supply Air Temperature (Unit Mounted)
  - Used to monitor supply air temperature; supply air limit control
- Return Air Temperature (Unit Mounted)
  - Used to monitor space temperature
- Indoor Coil Temperature (Unit Mounted)
  - Used as a limit on the indoor coil to prevent frost buildup
- Outside Air Temperature (Unit Mounted)
  - Used in Econ Control, Hot Water Control and Compressor Lockout
- Compressor High Pressure Switch (Unit Mounted)
  - With retry control
- Compressor Low Pressure Switch (Unit Mounted)
  - With retry control
- Geo Water Out (Unit Mounted On Schoolmate Units only)
  - Displays the liquid temperature while leaving the unit
- Outside Coil Temperature (Unit Mounted)
  - Used for defrost control

Optional sensors available:

- CO_2 Sensor (Unit Mounted)
  - Measures Return Air CO_2 level for ventilation
- Outside Temperature and Outside Humidity
  - Used to calculate OA enthalpy and dew point
- pAD Space Temperature and Humidity (Field Installed or Unit Mounted)
  - Used for space temperature and humidity control
- Liquid Line Pressure (Unit Mounted)
  - Used for head pressure control for dehumidification
- Dirty Filter Switch (Unit Mounted)
  - Used to monitor pressure drop through the filter
- Condensate Float Switch High Level Alarm (Unit Mounted)
  - Disables the compressors if the drain pan is not draining properly
- Mechanical Temperature only Thermostat (Field installed or Unit Mounted)
  - Slight manual adjustment of temperature setpoints
- Freeze Thermostat (Unit Mounted)
  - Coil Freeze protection
- Occupancy Sensor (Field Installed or Unit Mounted)
  - Infrared motion detector
- Current Switch (Unit Mounted)
  - Verifies component is functioning

Model Nomenclature - ClassMate

1,2	3	4,5	6	7	8	9	10	11	12	13	14	15,16
PT	UC	MBH	SV	G	C	VC	F	CC	DS	DO	D	HO

1,2 - Product Type (PT)
CM - ClassMate

3 - Unit Configuration (UC)
D - DX Cooling
P - HP Heating & Cooling
S - Split Fan Coil Unit

4,5 - Nominal Capacity (MBH)
24 - 24,000 Btu/Hr
36 - 36,000 Btu/Hr
48 - 48,000 Btu/Hr
60 - 60,000 Btu/Hr

6 - Supply Voltage (SV)
B - 208/60/1
C - 230/60/1
D - 208/60/3
E - 230/60/3
F - 460/60/3
G - 575/60/3
H - 277/60/1

7 - Generation (G)
A - Current Design

8 - Control (C)
M - Modine Control System
F - Factory Installed Free Issue
B - By Others - Field Installed

9 - Ventilation Configuration (VC)
CMD & CMP
  A - Economizer
  B - Economizer with OA Damper
  C - ERV with OA Damper
  D - ERV with OA Damper & Economizer
  E - ERV with OA & RA Damper & Economizer
  Z - Return Air Only
CMS - No Exhaust
  A - Economizer
  B - Economizer with OA Damper
  Z - Return Air Only
CMS - Gravity Damper
  F - Economizer
  G - Economizer with OA Damper
  H - ERV with OA Damper
  J - ERV with OA Damper & Economizer
  K - ERV with OA & RA Damper & Economizer
CMS - Powered Exhaust
  L - Economizer
  M - Economizer with OA Damper
  N - ERV with OA Damper & Economizer
  P - ERV with OA & RA Damper & Economizer

10 - Filtration (F)
A - MERV 8
B - MERV 11
C - MERV 13
D - MERV 16

11 - Case Construction (CC)
A - 20Ga (Standard)
B - 16Ga
S - STUDY Package 20Ga

12 - Door Mounted Stat (DS)
N - None
V - Vertical Stat
H - Horizontal Stat

13 - Door Mounted Other (DO)
N - None
K - Key Over-ride
S - Occupancy Sensor
L - Indicator Light
T - Twist Timer

14 - Dehumidification (D)
N - None
A - HGRH Coil

15,16 - Heating Option (HO)
00 - None
02 - 2 kW (1-stage)
03 - 3 kW (1-state)
04 - 4 kW (1-stage)
05 - 5kW (1-stage)
08 - 7.5 kW (1-stage)
09 - 9kW (1-stage)
10 - 10 kW (2-stage)
12 - 12kW (2-stage)
15 - 15 kW (2-stage)
18 - 18 kW (2-stage)
20 - 20 kW (2-stage)
81 - 1R HW Coil (1/2") - Bottom Connection
82 - 1R HW Coil (3/4") - Bottom Connection
83 - 2R HW Coil (1/2") - Bottom Connection
84 - 2R HW Coil (3/4") - Bottom Connection
91 - 1R HW Coil (1/2") - Top Connection
92 - 1R HW Coil (3/4") - Top Connection
93 - 2R HW Coil (1/2") - Top Connection
94 - 2R HW Coil (3/4") - Top Connection

Model Nomenclature - SchoolMate

1,2	3	4,5	6	7	8	9	10	11	12	13	14	15,16	17
PT	UC	MBH	SV	G	C	VC	F	CC	DS	DO	D	HO	CO

1,2 - Product Type (PT)
SM - SchoolMate

3 - Unit Configuration (UC)
G - Ground Source
W - Water Source

4,5 - Nominal Capacity (MBH)
24 - 24,000 Btu/Hr
30 - 30,000 Btu/Hr
36 - 36,000 Btu/Hr
42 - 42,000 Btu/Hr
48 - 48,000 Btu/Hr
60 - 60,000 Btu/Hr

6 - Supply Voltage (SV)
B - 208/60/1
C - 230/60/1
D - 208/60/3
E - 230/60/3
F - 460/60/3
G - 575/60/3
H - 277/60/1

7 - Generation (G)
A - Current Design

8 - Control (C)
M - Modine Control System
F - Factory Installed Free Issue
B - By Others - Field Installed

9 - Ventilation Configuration (VC)
No Exhaust
  A - Economizer
  B - Economizer with OA Damper
  Z - Return Air Only
Gravity Exhaust
  F - Economizer
  G - Economizer with OA Damper
  H - ERV with OA Damper
  J - ERV with OA Damper & Economizer
  K - ERV with OA & RA Damper & Economizer
Powered Exhaust
  L - Economizer
  M - Economizer with OA Damper
  N - ERV with OA Damper & Economizer
  P - ERV with OA & RA Damper & Economizer

10 - Filtration (F)
A - MERV 8
B - MERV 11
C - MERV 13
D - MERV 16

11 - Case Construction (CC)
A - 20Ga (Standard)
B - 16Ga
S - STUDY Package 20Ga

12 - Door Mounted Stat (DS)
N - None
V - Vertical Stat
H - Horizontal Stat

13 - Door Mounted Other (DO)
N - None
K - Key Over-ride
S - Occupancy Sensor
L - Indicator Light
T - Twist Timer

14 - Dehumidification (D)
N - None
A - HGRH Coil

15,16 - Heating Option (HO)
00 - None
02 - 2 kW (1-stage)
03 - 3 kW (1-state)
04 - 4 kW (1-stage)
05 - 5kW (1-stage)
08 - 7.5 kW (1-stage)
09 - 9kW (1-stage)
10 - 10 kW (2-stage)
12 - 12kW (2-stage)
15 - 15 kW (2-stage)
18 - 18 kW (2-stage)
20 - 20 kW (2-stage)
81 - 1R HW Coil (1/2") - Bottom Connection
82 - 1R HW Coil (3/4") - Bottom Connection
83 - 2R HW Coil (1/2") - Bottom Connection
84 - 2R HW Coil (3/4") - Bottom Connection
91 - 1R HW Coil (1/2") - Top Connection
92 - 1R HW Coil (3/4") - Top Connection
93 - 2R HW Coil (1/2") - Top Connection
94 - 2R HW Coil (3/4") - Top Connection

17 - Coaxial Coil Option (CO)
1 - Copper (Standard Bottom Pipe Connections)
2 - Cupro-nickel (Standard Bottom Pipe Connections)
3 - Copper (Top Pipe Connections)
4 - Cupro-nickel (Top Pipe Connections)

Figure 7.1 - pCOOEM+ Controller Layout
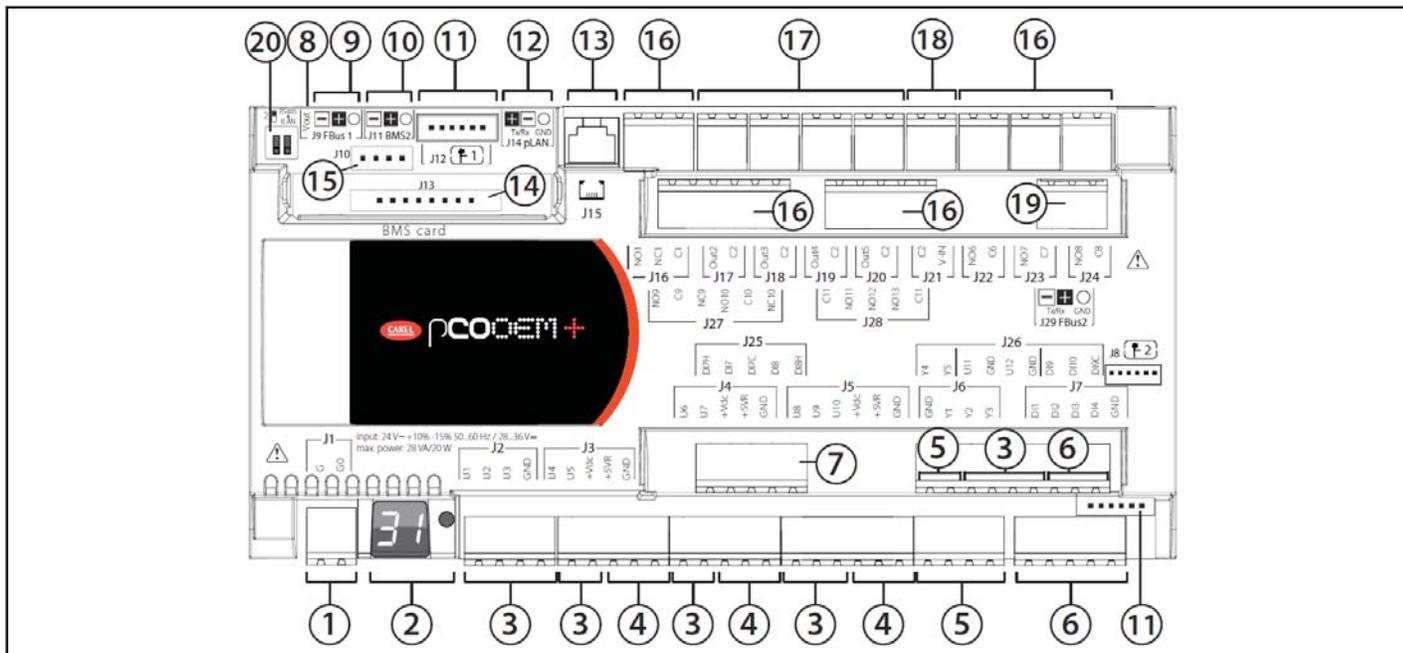
Table 7.1 - pCO¹ Controller Layout Descriptions

Reference	Description
1	Power supply connector [G (+), G0 (-)]
2	Button for setting pLAN Address and secondary display, LEDs
3	Universal inputs/outputs (Refer to page 31-32 for descriptions)
4	+Vdc: power to active probes ; +5VR power to ratiometric probes
5	Analog outputs
6	DI (Digital inputs): voltage free contact digital inputs
7	DI..: digital inputs at 24Vac or 28 to 36 Vdc ; DIH (Digital Inputs High): digital inputs at 230Vac -50/60 Hz.
8	+Vout: power to additional terminal
9	Fieldbus 1 Connector
10	BMS2 Connector
11	Unipolar Valve Connectors
12	pLAN plug-in connector
13	pLAN telephone connector for remote terminal/downloading application program
14	BMS1 optional card connector
15	PLD terminal connector
16	Relay digital outputs
17	Powered-on relay digital outputs
18	Power supply for "powered-on relay digital outputs"
19	Fieldbus2 Connector
20	Microswitch to select Rs485/tLAN level on Fieldbus1

Display/Keypad Functions

Figure 8.1 pGD1 Remote Display Keypad (Optional)[1]

1 Refer to Literature AIR 2-542 for installation instructions and AIR 2-526 for quick start guide. Normally the keypad display is automatically addressed by the controller. In the event that the keypad is not recognized refer to the Board Settings section for instructions on programming the remote display keypad to the controller.

Table 8.1 - Standard Buttons

pGD1 Remote Display	Function	Description
	ALARM	When one or more alarms are active the ALARM button will blink/flash red. Pressing the ALARM button once will indicate information regarding any active alarms. Pressing the ALARM button twice will reset any active manual-reset alarms.
	PRG	Pressing the PRG button will select the main navigation menu.
	ESC	Pressing the ESC button will return the user to the main display screen showing unit status.
	UP	Pressing the UP button can either: Scroll through the various display screens, providing the cursor is in the top left position. Increase the value of a setpoint adjustment.
	ENTER	Pressing the ENTER button will confirm any set point adjustments and move the cursor to the next available setpoint.
	DOWN	Pressing the DOWN button can either: Scroll through the various display screens, providing the cursor is in the top left position. Decrease the value of a setpoint adjustment.

Table 8.2 - Extra Function Button Sequences

pGD1 Remote Display	Function	Description
	UP + DOWN+ ENTER	Allows access to controller address.
	ALARM + ENTER	Allows access to controller system information.

Menu Navigation

The following instructions refer to using the remote keypad for navigating the menu and changing settings.

The Main Status Screen is displayed when the unit is first turned on or after five minutes of keypad inactivity. From this Main Status Screen, eight sub menus can be accessed by pressing the PRG button and using the UP or DOWN buttons to move to the desired menu. The selected menu will be highlighted with a black bar. Press ENTER to enter the selected menu.

Table 9.1 - Navigation Sub Menus

Sub Menu	Description
A. Unit On/Off	Switch on or switch off the unit.
B. Setpoints	View the user setpoints.
C. Clock/Scheduler	View the current time and date, and set time zones on/off.
D. Input/Output	View the status of the controller inputs and outputs.
E. Alarm Log	View the alarm log.
F. Board Switch	Change the controller pLAN board address.
G. Service	View maintenance related parameters, such as hours run, sensor calibration and manual overrides.
H. Manufacturer	Manufacturer menu and adjustment of various manufacturer related parameters.

Details on the Main Status Screen and each sub menu will be covered in the following sections of this manual.

Example Navigation to On/Off Sub Menus (Similar for all other sub menus):

From the Main Status Screen, press the PRG key to access the Sub Menu selection screen. Use the UP or DOWN buttons to navigate to the On/Off sub menu as shown in the following picture:
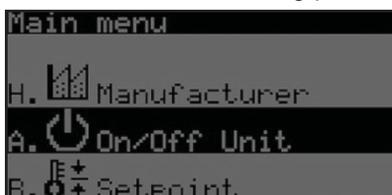
Press ENTER to access the On/Off sub menu screen:
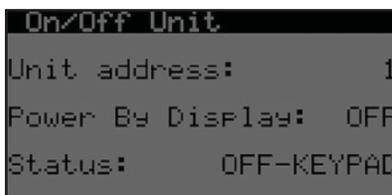
Press ENTER to navigate to the parameter to change, then use the UP or DOWN button to change the value. Press again to confirm the setting. Press the ESC button to exit the sub menu screen and to return to the Main Status Screen

Password Protection

> **⚠ WARNING**
>
> **Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.**

To prevent unauthorized adjustments, a password is required to gain access to certain menus. When a password is requested use the UP or DOWN keys to enter the number and ENTER to access the pate. The passwords for the sub menus are as follows:

SETPOINTS: None
CLOCK/SCHEDULER: None
PW1: SERVICE SETTINGS: 1500
MANUFACTURER: Contact Modine

Main Menu - Tree of Functions

Regardless of the current screen displayed, pressing the PRG key accesses the main menu as shown below:

Adjusting Customer Control Settings

The following procedure is used to access and adjust control parameters (refer to Parameters List and Factory Values pages 13-28).

1. After entering the correct password the cursor will appear at the top left corner (home location).

2. Use the UP or DOWN keys to move to the desired menu.

3. To move the flashing cursor to the required adjustable fields press ENTER.

4. Use the UP or DOWN keys to change the values and press the ENTER key to move the cursor to the next field or home location.

5. When the cursor is home either use the UP or DOWN keys to scroll to the next sub-menu or the ESC key to exit and return to the main menu page.

Unit Status

A. On/Off Unit
- On/Off By Display
- On/Off By pAD (Optional)

B. Setpoints
- Occupied Setpoints
- Unoccupied Setpoints
- Standby Setpoints (Optional)
- Dehum Setpoints Humidity Control (Option
- Economizer Setpoint (Optional)
- CO2 Economizer Setpoints (Optional)
- ERM Setpoints (Optional)
- Electric Heat Setpoints (Optional)

C. Clock/Scheduler
- Date/time
- Daylight Savings
- Scheduler
- Holidays

D. Input/Output
- a. Analog inputs
- b. Digital inputs
- c. Analog outputs
- d. Digital outputs

E. Data Logger

F. Board Switch

G. Service
- b. Information
- d. Working Hours
- e. BMS configuration
- f. Service Settings
  - a. Working hours
  - b. Probe adjustme
  - c. Control Settings
  - d. User Save/Chan
- g. Manual Management

🔒 To access the branches in this area, enter password PW1

H. Manufacturer

🔒 To access the branches in this area, contact Modine

Main Status Screen

The main status screen is displayed when the unit is first turned on or after five minutes of keypad inactivity.

The following information is displayed on the main screen:
- Time/date
- Unit number
- Return / space air temperature
- Current return / space air setpoint
- Unit status
- Unit mode

Figure 12.1 Main Status Screen
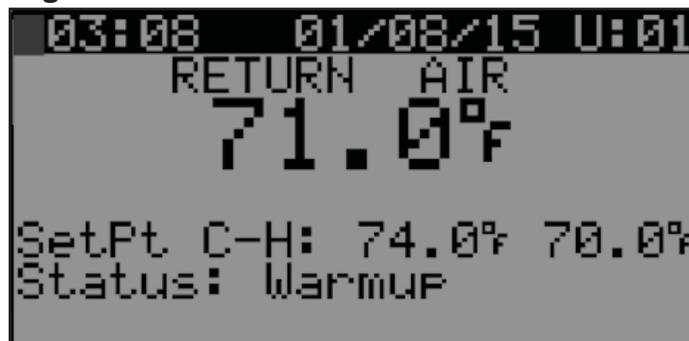
Once this screen is displayed, the user can navigate up and down through the list of main status screen parameters by using the UP or DOWN buttons. These screens are described in further detail in the next section

Main Status Screen Parameters

The status screens can be seen when the UP or DOWN buttons are pressed on the main status screen. The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Main Screen	**Time and date**	Current time and date	-	-
	Unit network address	Actual Value	1 to 32	-
	Control Temperature Source	Actual Value	Return Air Space pAD Space FW Stat	-
	Control Temperature	Actual Value	-	°F / °C
	Econ (If Enabled)	Actual Value	0-100	%
	SetPt C-H: (Cooling and Heating Setpoints)	Actual Value	-	°F / °C
	Unit Status	Current status of unit	Waiting Unit On OFF by Alarm OFF by pLAN OFF by BMS OFF by Clock OFF by Input OFF by Keypad OFF by Manual Unoccupied Warmup Occupied Standby	
	Unit Mode	Current Mode of operation	Cooling Econ Cooling Heating Dehum	-
Space Temperatures *(Screen Visible only if pAD is Enabled)*	**pAD Temperature:**	Actual Value	-	°F / °C
	pAD Humidity: (If Available on pAD)	Actual Value	0-100	%

Main Status Parameters (continued)

The status screens can be seen when the UP or DOWN buttons are pressed on the main status screen. The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Temperatures	**Return Air:**	Actual Value	-	°F / °C
	Outside Air: (If Enabled)	Actual Value	-	°F / °C
	Supply Air:	Actual Value	-	°F / °C
	Indoor Coil:	Actual Value	-	°F / °C
	Outdoor Coil / Coax Water Out: (If Enabled)	Actual Value	-	°F / °C
	Control Temp:	Actual Value	-	°F / °C
Faceless Wall Stat	**Modbus Address:**	Actual Value	0-128	-
	Temperature:	Actual Value	-	°F / °C
	Humidity:	Actual Value	0-100%	%
	Dew Point:	Actual Value (Calculated)	-	°F / °C
Humidity / CO2 *(Screen Visible only if CO2 or Humidity sensors are Enabled)*	**CO2 Level:** (If Enabled)	Actual Value	0-2000	PPM
	Outside Air Humidity: (If Enabled)	Actual Value	0-100	%RH
	Return Air Humidity: (If Enabled)	Actual Value	0-100	%RH
	Outside Air Enthalpy: (If Enabled)	Actual Value (Calculated)	0-9999.9	BTU/Lb.
	Inside Air Enthalpy: (If Enabled)	Actual Value (Calculated)	0-9999.9	BTU/Lb.
Compressor Status	**Defrosting Status:**	Actual Value	ON/OFF	-
	Compressor:	Actual Value	ON/OFF	-
	Countdown On:	Actual Value	0-60	s
	Countdown Off:	Actual Value	0-60	s
	Coax Valve Poss:	Actual Value	0-100	%
	LL Pressure : (If Enabled)	Actual Value	0-600	psig
ERM Output Status *(Screen only visible if ERM is Enabled)*	**ERM Wheel:** (If Enabled)	Actual Value	Running or Stopped	-
	Defrosting Status:	Actual Value	ON/OFF	-
	Outside Air Fan: (If Enabled)	Actual Value	ON/OFF	-
	EA Vent Fan: (If Enabled)	Actual Value	ON/OFF	-
	ERM Fan Mod: (If Enabled)	Actual Value	0-999	cfm
	Outside Air Damper: (If Enabled)	Actual Value	Closed or Open	-
Output Status (Page 1)	**ID Fan:** (Supply Fan)	Actual Value	ON/OFF	-
	Fan HI: (Supply Fan Hi Setting)	Actual Value	ON/OFF	-
	Comp: (Compressor 1st stage)	Actual Value	ON/OFF	-
	Comp HI: (Compressor 2nd stage)	Actual Value	ON/OFF	-
	Rev VI: (Reversing Valve) (If Enabled)	Actual Value	ON/OFF	-
	HGRH: (If Enabled)	Actual Value	ON/OFF	-
	Electric Heat 1: (If Enabled)	Actual Value	ON/OFF	-
	Electric Heat 2: (If Enabled)	Actual Value	ON/OFF	-

Main Status Parameters (continued)

The status screens can be seen when the UP or DOWN buttons are pressed on the main status screen. The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Output Status (Page 2) *(Screen only visible with Exhaust fan.)*	**Exhaust Fan:** (If Enabled)	Actual Value	ON/OFF	-
	Exhaust Fan speed: (If Enabled)	Actual Value	0-100	%
Demand Status	**Cooling Demand:**	Actual Value	0-100	%
	Heating Demand: (If Enabled)	Actual Value	0-100	%
	Hot Water Valve position: (If Enabled)	Actual Value	0-100	%
	Baseboard Heating: (If Enabled)	Actual Value	0-100	%
BaseBoard Heat	**Baseboard Heat Type:**	Actual Value	Analogue 0-10vDC Digital 1 Stage Digital 2 Stage	-
	Baseboard Heat Demand:	Actual Value	0-100	%
BaseBoard Heat	**Digital Stage 1:**	Actual Value	ON/OFF	-
	Digital Stage 2: (if Enabled)	Actual Value	ON/OFF	-
Scheduler	**Clock Override:**	Actual Value	ON/OFF	-
	Override Time:	Actual Value	0-4	Hours
Manual Control Status	**Unit in Manual:**	No	No or Yes	-
	Reset Unit to Auto:	Actual Value	No or Yes	-

On/Off Sub Menu
Main Status Screen = On/Off

The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
On/Off Unit	**Unit address**	Actual Value	1-32	-
	Power by Display	Off	On or off	-
	Status	Off By Keypad	WAITING UNIT ON OFF by pLAN OFF by BMS OFF by CLOCK OFF by INPUT OFF by KEYPAD OFF by MANUAL Unoccupied Warmup Occupied Standby	-
On/Off Unit *(Screen visible only With pAD Enabled)*	**pAD Address**		1-32	-
	On/Off	Off	On Off Permanently Off	-

Setpoint Sub Menu
Main Status Screen = Setpoint

The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Occupied Setpoints	**Cooling setpoint:**	74.0°F	50.0°F-90.0°F	°F / °C
	Heating Offset: (if unit has Heat)	4.0°F	0.0°F-40.0°F	°F / °C
	Heating setpoint: (Calculated by : Cooling setpoint - Heating Offset)	70.0°F	-	°F / °C
Unoccupied Setpoints	**Unoccupied Cooling Setpoint:**	85.0°F	50.0°F-90.0°F	°F / °C
	Unoccupied Heating Setpoint: (if unit has Heat)	62.0°F	50.0°F-90.0°F	°F / °C
Standby Setpoints *(Screen only Visible If Occupancy Type is Clock or BMS)*	**St-by Cool Set:** (Standby Cooling Setpoint)	78.0°F	50.0°F-90.0°F	°F / °C
	St-by Heat: (Standby Heating Setpoint)	66.0°F	50.0°F-90.0°F	°F / °C
	St-by Hum: (Standby Humidity Setpoint)	60%RH	0%-100%	%RH
Dehum Setpoints Humidity Control *(Screen only Visible with Humidity Sensor)*	**Occupied Set:**	60%RH	0%-100%	%RH
	Unoccupied Set:	70%RH	0%-100%	%RH
	Differential:	5%RH	0%-10%	%RH
	Temp Low Diff Above Ht. Setpt.:	1.0°F	1.0°F-4.0°F	°F / °C
Ventilation Setpoints (Screen Only visible with Econ Damper Only - CO2 Disabled)	**Econ. Damper Min. Position:**	20.0%	0-100	%
Ventilation Setpoints (Screen Only visible with ERM Only - CO2 Disabled)	**ERM OA & EA Fans Vent Rate:**	350CFM	0-500	CFM
Ventilation Setpoints (Screen Only visible with Econ Damper & ERM - CO2 Disabled)	**Econ. Damper Min. Position:**	0.0%	0-100	%
	ERM OA & EA Fans Vent Rate:	350CFM	0-500	CFM
Ventilation Setpoints (Screen Only visible with Econ Damper Only - CO2 Enabled)	CO2 Control Econ. Damper			
	Low CO2 Setp:	800PPM	0-9999	PPM
	Min. Position:	20.0%	0.0-100.0	%
	Hi. CO2 Setp:	100PPM	0-9999	PPM
	Hi. CO2 Min Pos:	40.0%	0.0-99.9	%
Ventilation Setpoints (Screen Only visible with ERM Only - CO2 Enabled)	CO2 Control ERM OA & EA Fans			
	Low CO2 Setp:	800PPM	0-9999	PPM
	Low Vent Rate:	350CFM	0-500	CFM
	Hi. CO2 Setp:	1000PPM	0-9999	PPM
	Hi. Vent Rate:	500CFM	0-500	CFM
Ventilation Setpoints (Screen Only visible with Econ Damper & ERM - CO2 Enabled)	**Low CO2 Setp:**	800PPM	0-9999	PPM
	Low Vent Rate:	350CFM	0-500	CFM
	Hi. CO2 Setp:	1000PPM	0-9999	PPM
	Hi. Vent Rate:	500CFM	0-500	CFM
	Low CO2 Econ Min:	0.0%	0.0-99.9	%
	Hi. CO2 Econ Min:	40.0%	0.0-99.9	%
CO2 Setpoints (Screen Only visible CO2 Sensor & CO2 Standby enabled)	**CO2 Standby Enable Setpoint:**	500PPM	0-2000	PPM

Clock/Scheduler Sub Menu
Main Status Screen = Clock/Scheduler

NOTE: The schedule/holidays can b used to either turn the unit On/Off or to cycle the unit from Occupied to Unoccupied.

The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Clock	**Date:**	Actual Date	MM/DD/YY	-
	Hour: (Military Time)	Actual Time	00:00-23:59	Hrs:Min
	Day	Actual Day (Calculated)	MTWTFSS	-
Scheduler	**Number of Schedules**	0	0-7	-
Scheduler (This Screen is repeated based on number of Schedules Selected)	**Schedule #:**	Actual Value	1-7	-
	Time On:	00:00	00:00-23:59	Hrs:Min
	Time Off:	00:00	00:00-23:59	Hrs:Min
	Days Enabled:	none	MTWTFSS	-
Holidays	**Number:**	0	0-16	Days
Holidays (Screen will show only if 1 or more holidays are selected)	**Holiday 1 Start - Stop**	00/00-00/00	1/1-12/31	Days
	Holiday 2 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 3 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 4 Start - Stop	00/00-00/00	1/1-12/31	Days
Holidays (Screen will show only if 5 or more holidays are selected)	**Holiday 5 Start - Stop**	00/00-00/00	1/1-12/31	Days
	Holiday 6 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 7 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 8 Start - Stop	00/00-00/00	1/1-12/31	Days
Holidays (Screen will show only if 9 or more holidays are selected)	**Holiday 9 Start - Stop**	00/00-00/00	1/1-12/31	Days
	Holiday 10 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 11 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 12 Start - Stop	00/00-00/00	1/1-12/31	Days
Holidays (Screen will show only if 13 or more holidays are selected)	**Holiday 13 Start - Stop**	00/00-00/00	1/1-12/31	Days
	Holiday 14 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 15 Start - Stop	00/00-00/00	1/1-12/31	Days
	Holiday 16 Start - Stop	00/00-00/00	1/1-12/31	Days
Clock	**DST: (daylight Savings Time)**	On	On / Off	-
	Transition Time:	60	0-60	Minute
	Start: (Date placement in month)	Last	Last, 1st-4th	-
	Start: (Day)	Sunday	Mon-Sun	Day
	Start: (Month)	March	Jan-Dec	Month
	Start: (Time)	2:00	0-12	Hour
	End: (Date placement in month)	Last	Last, 1st-4th	-
	End: (Day)	Sunday	Mon-Sun	Day
	End: (Month)	October	Jan-Dec	Month
	End: (Time)	3:00	0-13	Hour

Input/Output Sub Menu
Main Status Screen = Input/Output

The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

| SCREEN NAME	PARAMETER DESCRIPTION	INPUT	FACTORY VALUE	RANGE	UNITS
	Return Air	U1	Actual Value	-	°F / °C
	Indoor coil	U2	Actual Value	-	°F / °C
	Outside coil	U3	Actual Value	-	°F / °C
	Coax Water out (Schoolmate units)	U3	Actual Value	-	°F / °C
	Supply Air	U4	Actual Value	-	°F / °C
a. Analog Inputs	CO2 (optional)	U5	Actual Value	0-2000	ppm
	OA Humidity (Optional)	U6	Actual Value	0-100	%RH
	Inside Humidity (Optional)	U7	Actual Value	0-100	%RH
	OA Temperatures (Optional)	U8	Actual Value	-	°F / °C
	Temp. adjust (Optional)	U10	Actual Value	-	°F / °C
	LL Pressure (Optional)	U11	Actual Value	0-650	PSI
	Serial Probe	128	Actual Value	-	-
Faceless Wall Stat	Temperature	-	Actual Value	-	°F / °C
	Humidity	-	Actual Value	0-100	%
	Dew Point	-	Actual Value	-	°F / °C
	Condensate Float	DI1	Actual Value	Closed or Open	-
	Freeze Stat	DI2	Actual Value	Closed or Open	-
	Supply Fan	DI3	Actual Value	Closed or Open	-
	Outdoor fan	DI4	Actual Value	Closed or Open	-
b. Digital Inputs	Filter	DI5	Actual Value	Closed or Open	-
	Occupied (Optional)	DI6	Actual Value	Closed or Open	-
	Low pressure	DI7	Actual Value	Closed or Open	-
	High Pressure	DI8	Actual Value	Closed or Open	-
	Supply Fan High	NO1	Actual Value	ON/OFF	-
	Hot Gas Re-Heat (Optional)	OUT 2	Actual Value	ON/OFF	-
	Reversing Valve (Heatpump)	OUT 3	Actual Value	ON/OFF	-
	Compressor	OUT 4	Actual Value	ON/OFF	-
	Compressor CCS	OUT 5	Actual Value	ON/OFF	-
	Supply Fan	NO6	Actual Value	ON/OFF	-
c. Relay Outputs	Electric Heat 1 (Optional)	NO7	Actual Value	ON/OFF	-
	Electric Heat 2 (Optional)	NO8	Actual Value	ON/OFF	-
	Outside Air damper	NO9	Actual Value	ON/OFF	-
	Exhaust Fan (Optional)	NO10	Actual Value	ON/OFF	-
	ERM Wheel (Optional)	NO11	Actual Value	ON/OFF	-
	Exhaust Vent Fan	NO12	Actual Value	ON/OFF	-
	Outside Air Vent Fan	NO13	Actual Value	ON/OFF	-
	Economizer (Optional)	Y1	Actual Value	0-10	VDC
	Hotwater (Optional)	Y2	Actual Value	0-10	VDC
d. Analog Output	Outdoor Fan (ClassMate Units)	Y3	Actual Value	0-10	VDC
	ERM Fans (Optional)	Y4	Actual Value	0-10	VDC
	Baseboard Heat (Optional)	Y5	Actual Value	0-10	VDC
	Coax Water Valve (Schoolmate Units)	Y5	Actual Value	0-10	VDC

Data Logger Sub Menu
Main Status Screen = Data Logger

To access contents of the Data Logger menu simply press the ENTER button. The most recent alarm will be displayed on the screen. The upper bar will display the time and date of the most recent alarm. The second line will indicate the alarm generated. The rest of the page will contain readings of certain variables at the time of the alarm.

Use the UP button to navigate through previous alarms and the DOWN button to navigate to the most recent. The alarms are chronologically stored and the most recent alarm will be the first displayed.

Figure 18.1 Alarm Log
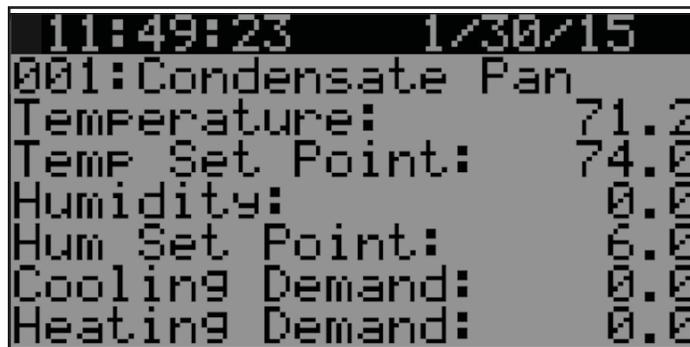
Board Switch Sub Menu

Main Status Screen = Board Switch

The Board Switch screen will indicate the current devices connected to the pLAN network (Keypad and pAD Wall Stat). In the screen below, the main controller is on address 1.

The pCOOEM+ controller is factory defaulted to the following for modules communiated with on the pLAN:

- pCOOEM+ Controller: Address1
- Remote Wall Stat (pAD):   Address 4
- Remote Display (pGD1):   Address 32

In the situation that module addresses need to be set up, the board address can be changed within the Board Switch sub menu

Figure 18.2 Board Switch
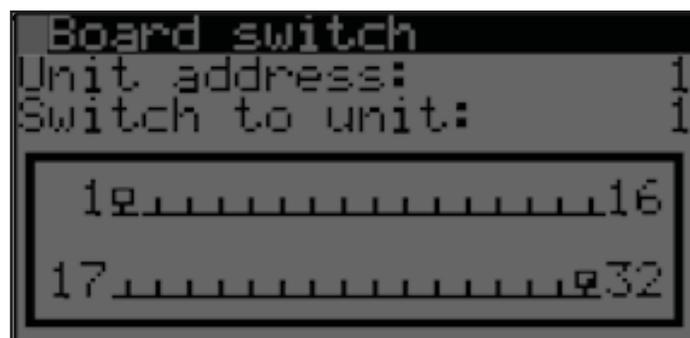
Programming the Remote Display Keypad to the Controller

Normally the Remote Display Keypad is addressed by the controller, however in the situation that the Remote Display address is required to be set up, the following procedure applies:

1. Connect the handheld remote display keypad to the controller and then power up the unit.

2. By simultaneously pressing and holding ENTER + UP + DOWN, the display will show the Display Address screen (Figure 19.1) to the right.

3. Pressing UP will change the I/O board address to the controller address 1. Press ENTER to display the terminal configuration screen (Figure 19.2) to the right:

4. Press ENTER again. The display will show the terminal configuration screen (Figure 19.3) to the right:

5. To select Termiinal 1, press ENTER until the cursor is underneath Trm1 00 Pr (PRIVATE).

6. Pressing UP or DOWN will change the to the required value to 32.

7. To set as Private or Shared, press ENTER until the cursor is underneath the Pr symbol.

8. Pressing UP or DOWN will change the Pr to Sh (SHARED) symbol. Pr for Normal.

9. Press ENTER until the cursor is underneath the NO.

10. Pressing UP or DOWN will change the NO to YES. Press ENTER and the display is programmed.

Figure 19.1 Display Address Screen
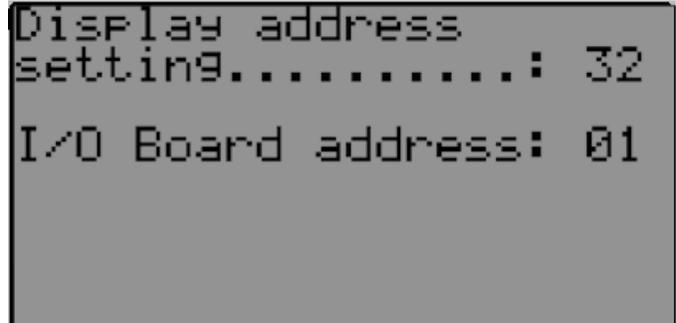

Figure 19.2 Terminal Configuration
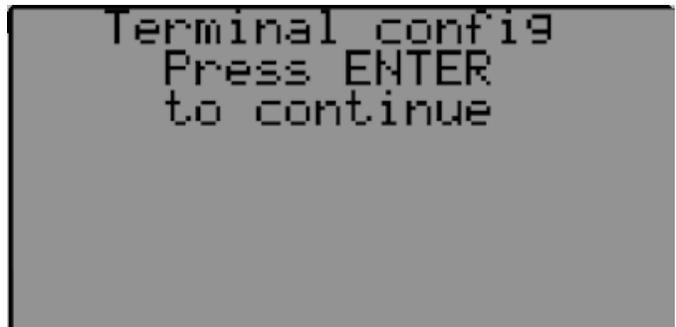
Figure 19.3 Terminal Configuration
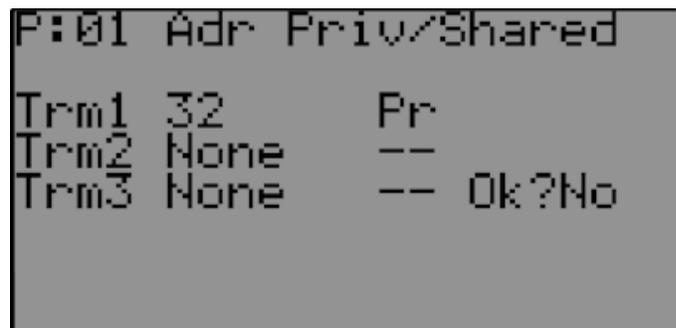
Service Sub Menu

Information

Main Status Screen = Service = Information

The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
INFORMATION	**Code (Name of Program)**	Actual Value	-	-
	Ver. (Software Version) & Date	Actual Value	-	MM/DD/YY
	Bios Version & Date	Actual Value	-	MM/DD/YY
	Boot Version & Date	Actual Value	-	MM/DD/YY
INFORMATION PAGE 2	**pCO Type**	pCOOEM+	-	-
	FLASH	Actual Value	-	Kb
	RAM	Actual Value	-	Kb
	FLASH 2	Actual Value	-	Kb
	FLASH 3	Actual Value	-	Kb
	Memory Type	Actual Value	-	Mb
	T Memory Writes	Actual Value	-	-
	Main Cycle	Actual Value	-	Cycles/s
INFORMATION (Power Cycle Status) PAGE 3	**Last Off Time**	Actual Value	-	MM/DD/YY HH:MM:SS
	Last On Time	Actual Value	-	MM/DD/YY HH:MM:SS
	Length Time Off	Actual Value	-	Days/Hrs./Min.
Information Control Power Status	**Voltage**	Actual Value	-	Voltage
	Current	Actual Value	-	Current
Information EVO	**Fw Version:**	Actual Value	-	-
	Service Version:	Actual Value	-	-

Working Hours

Main Status Screen = Service = Working Hours

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Run Hours Unit ON	**Run Hours**	Actual Value	0-32,767,999	Hours
	Number of Starts	Actual Value	0-32,767,999	Starts
Run Hours	**Supply Fan**	Actual Value	0-32,767,999	Hours
	Supply Fan High	Actual Value	0-32,767,999	Hours
Run Hours	**Compressor**	Actual Value	0-32,767,999	Hours
	Comp. CSS:	Actual Value	0-32,767,999	Hours
Run Hours	**Exhaust Fan**	Actual Value	0-32,767,999	Hours
Run Hours	**ERM Wheel**	Actual Value	0-32,767,999	Hours
Run Hours	**Exhaust Air Vent Fan:**	Actual Value	0-32,767,999	Hours
	Outside Air Vent Fan:	Actual Value	0-32,767,999	Hours

Service Sub Menu (continued)

BMS Configuration

Main Status Screen = Service = BMS Configuration

The following table describes the menu parameters (NOTE: changes in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
BMS Configuration (Modine Control System Supports the Following Protocols: **Lon BACnet IP/Eth BACnet MSTP**)	**BMS CARD Protocol:**	BACnet MSTP	Lon BACnet IP\Eth BACnet MSTP PCOLOAD MODBUS EXT MODBUS MODEM CAREL	-
	BMS PORT 2 Protocol	PCOLOAD	Lon BACnet IP\Eth BACnet MSTP PCOLOAD TH-TUNE MODBUS EXT CAREL	-
BMS Configuration (Page 2) (Select "YES" to Change BACnet IP/Eth and BACnet MSTP Settings)	**Termconf PlugIn?**	No	No Yes	-
BMS Configuration	**Enable heartbeat:**	No	No/Yes	
	Thresholds:	5	0-999	-
	Timeout:	300s	0-9999	s
	Period:	Actual Value	0-999.9	s
BMS Configuration	**If BMS Offline turn unit:**	Off	On/Off	-
MSTP SETUP (Screen only Visible When BACnet MSTP is Selected and Termconf Plugin is Enabled.)	**Instance**	0	0-4194999	-
	Baud rate	N/A	N/A 9600 18200 36400 76800	bps
	MAC Address:	0	0-127	-
	MaxMasters:	0	0-127	-
	MaxInfoFrames:	0	0-99	-
TCP/IP Setup (Screen Only Visible when BACnet IP/Eth is Selected and Termconf Plugin is Enabled.)	**Instance:**	Actual Value	0-99,000	-
	IP:	Actual Value	0.0.0.0-255.255.255.255	-
	SubNet:	Actual Value	255.0.0.0-255.255.255.0	-
	Gateway:	Actual Value	0.0.0.0-255.255.255.255	-
TCP/IP Setup (Page 2) (Screen Only Visible when BACnet IP/Eth is Selected and Termconf Plugin is Enabled.)	**DNS 1**	Actual Value	0.0.0.0-255.255.255.255	-
	DNS 2	Actual Value	0.0.0.0-255.255.255.255	-
	Type	Actual Value	IP, Ethernet	-
BACnet Read/Write	**Function:**	Read	Read/Write	-
	Update?	No	No/Yes	-
Bms Configuration	**Heartbeat Select:**	No	No/Yes	-
	Heartbeat Delay:	120s	0-999	seconds
	Heartbeat Active:	Actual Value	No/Yes	-

Service Sub Menu (continued)

Working Hour Setpoint
Main Status Screen = Service = Service Settings= Working Hour Setpoint
(🔒 requires password PW1)

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Maintenance Hours Unit On (When the run hours exceeds the setpoint an alarm is generated but no other action is taken)	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Supply Fan	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Supply Fan High	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Compressor	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Compressor CCS	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Exhaust Fan	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours ERM Wheel	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Exhaust Air Vent Fan	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-
Maintenance Hours Outside Air Vent Fan	Set Point:	0h	0-32,767,999	Hours
	Reset to Zero? (resets run hours)	No	Yes or No	-
	Run Hours: Can be changed if required	Actual Value	0-32,767,999	-

Probe Adjustment
Main Status Screen = Service = Service Settings= Probe Adjustment
(🔒 requires password PW1)

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Return Air (As the probes (sensors) for each component have already been listed (see "Analog Inputs") only the Return Air is detailed here but all sensors listed under Analog Inputs have the same settings)	Input:	B001	-	-
	Offset: Calibration Offset	0	-99.9-99.9	°F / °C
	Value: The actual value after the offset has been added	Actual Value	-	-

Service Sub Menu (continued)
Control Settings (continued)
Main Status Screen = Service = Service Settings= Control Settings
(🔒 requires password PW1)

The following table describes the menu parameters (NOTE: change in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Manual Control Reset (If Enable is on, the unit will revert to Full Auto control afar the time period has elapsed)	Enable:	Yes	Yes or No	-
	Time:	30 mins	0m-500m	Minutes
Compressor Delays	Minimum ON Time:	10s	10s-999s	Seconds
	Minimum OFF Time:	10s	10s-999s	Seconds
	Stage Delay:	10s	10s-999s	Seconds
Compressor Lockouts ("Low Heating" and "Off Diff" settings are enabled with Classmate Units with Heatpump)	Low Cooling:	50.0°F	50.0-99.9°F	°F / °C
	Off Diff:	5.0°F	0.0-9.9°F	°F / °C
	Low Heating:	28.0°F	17.0-99.9°F	°F / °C
	Off Diff:	2.0°F	0.0-9.9°F	°F / °C
Dehum Control **Dehum Delays**	Minimum ON Time:	5m	0m-30m	Minutes
	C.F. Low Speed:	300s	0s-300s	Seconds
Dehum Control Outside Air Temperature For High Speed Compressor	Enable:	85.0°F	0-999.9	°F / °C
	Disable:	84.0°F	0-999.9	°F / °C
Dehum Control Return Air Temperature For High Speed Compressor	Enable:	72.0°F	0-999.9	°F / °C
	Disable:	71.0°F	0-999.9	°F / °C
Dehum Control Return Air Humidity For High Speed Compressor	Enable:	60%	0-100%	%
	Disable:	55%	0-100%	%
Defrost (Screen Visible on Classmate Units with Heatpump. Note :Screen will display "Defrost: Defrosting…" if unit is in Defrost, otherwise just "Defrost:")	Start Temp:	28.0°F	20.0°F-35.0°F	°F / °C
	End Temp:	50.0°F	40°F-99.9°F	°F / °C
	Max Time:	10m	0m-999m	Minutes
	Cycle:	45m	30m-90m	Minutes
	Defrost Count:	Actual Value	-	Minutes
	Manual:	No	Yes or No	-
OD Fan: Condenser Fan (Screen visible with Classmate Models CMD and CMP. "Med speed HT" and "High Speed HT" Visible on Heatpump Units.)	Low Speed:	37%-47% (Varries on unit)	0.0%-100.0%	%
	Med Speed:	46%-80% (Varries on unit)	0.0%-100.0%	%
	Med Speed HT (Heat):	48%-63% (Varries on unit)	0.0%-100.0%	%
	High Speed:	58%-90% (Varries on unit)	0.0%-100.0%	%
	High Speed HT (Heat):	52%-75% (Varries on unit)	0.0%-100.0%	%
OD Fan: "Condenser Fan" (Screen Visible only on Classmate Units with a Condenser Fan)	Pressure Set	310psig	0-999psig	psig
	Min Speed:	5.0%	0.0%-100.0%	%
	OA Fan Start Percentage:	100%	0%-999%	%
	OA Fan Start Time:	15s	0s-99s	seconds

Control Settings (continued)
Main Status Screen = Service = Service Settings= Control Settings
(🔒 requires password PW1)

The following table describes the menu parameters (NOTE: change in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
OD Fan: "Exhaust Fan"	Low Speed:	32.0%	0.0%-100.0%	%
	High Speed:	43.0%	0.0%-100.0%	%
Coax Water Mod Valve: (Screen Visible only on Schoolmate Units)	Pressure Set:	310psig	0-999psig	psig
	Min Position:	5.0%	0.0%-100.0%	%
	Str. Percentage:	100%	0%-999%	%
	Str. Time:	15s	0s-99s	seconds
Coax Water Out (Screen Visible only on Schoolmate Units)	Lockout Set:	40.0°F	-99.9°F-99.9°F	°F / °C
	Lockout Diff:	10.0°F	0°F-99.9°F	°F / °C
	Lockout Delay:	1m	0m-99m	Minutes
Hot Water / Steam (Screen Visible with a Heat Type of Hot water or Steam)	Bleed Set:	30.0%	0.0%-100.0%	%
	OA Bleed Enable:	45.0°F	0.0°F-99.9°F	°F / °C
	Supply Set:	50.0°F	0.0°F-100.0°F	°F / °C
	OA Enable:	45.0°F	0.0°F-99.9°F	°F / °C
Electric Heat Control (Screen Visible with Heatpump units with Electric Heat)	OA Lockout Temp: (Outside Air Lockout Temperature)	60	50°F-70°F	°F / °C
	Electric HT Delay:	10	5-20	Minutes
Baseboard Heat Control (Screen Visible with Baseboard heat)	Heating Control Type	Standalone	Standalone or Cascade	-
	Offset:	2°F	-10.0 to 10.0	°F / °C
Cascade Baseboard Heat Settings	Primary Heat Occupied:	Unit	Unit Or Baseboard	-
	Primary Heat Unoccupied:	Unit	Unit Or Baseboard	-
	Secondary demand Enable:	50%	0 to 100%	Heating Demand %
Baseboard Digital 1 stage Heat Demand Enable (Screen visible with baseboard controlled by 1 relay output)	Stage 1 On:	0.1	0 to 100%	Heating Demand %
	Stage 1 Off:	0	0 to 100%	Heating Demand %
Baseboard Digital 2 stage Heat Demand Enable (Screen visible with baseboard controlled by 2 relay output)	Stage 1 On:	10%	0 to 100%	Heating Demand %
	Stage 1 Off:	0%	0 to 100%	Heating Demand %
	Stage 2 On:	50%	0 to 100%	Heating Demand %
	Stage 2 Off:	25%	0 to 100%	Heating Demand %
ERM Defrost (Screen Visible with an ERM unit.)	Enable Temp:	15.0°F	0°F-35°F	°F / °C
	Cycle Time:	60m	1m-99m	Minutes
	Defrost Time:	5m	1m-99m	Minutes
Econ: "Drybulb, Drybulb Diff, Enthalpy, or Enthalpy Diff" (Screen only Visible with an Economizer)	OA Low Limit:	35.0°F	30.0°F-40.0°F	°F / °C
	Compare Diff:	5.0°F	0.0°F-99.9°F	°F / °C
	OA Close:	-10.0°F	-40.0°F-99.9°F	°F / °C
	Supply Low Limit:	55.0°F	45.0°F-70.0°F	°F / °C
	RA Close	60.0°F	40.0°F-90.0°F	°F / °C
Econ: "Enthalpy, or Enthalpy Diff" (Page 2) (Screen Visible with Economizer set to Enthalpy or Enthalpy Diff)	OA Enthalpy Set:	20.0 Btu.	0.0Btu-90.0Btu	Btu
	Atm. Pressure	1000mbar	600-1100	mbar

Service Sub Menu (continued)

User Save
Main Status Screen = Service = Service Settings= User Save (🔒 requires password PW1)

The following table describes the menu parameters (NOTE: change in shading indicates change to next screen by using the UP or DOWN buttons):

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
User Save	Save?	No	Yes or No	-
	Restore?	No	Yes or No	-
	Enable Auto Save:	Yes	Yes or No	-
Alarm History Reset (This will clear the Alarm history)	Continue?	No	Yes or No	-

Manual Management

⚠ WARNING	⚠ ATTENTION
Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.	**The Manual Control has an automatic reset setting located in the Service Settings under the Control Settings.**

Analog Input
Main Status Screen = Service = Manual Management = Analog Input
(🔒 requires password PW1)

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Analog Input Return Air (As the analog inputs have been listed under "inputs/ Outputs" section, Only the Return Air sensor has been detailed.)	**Manual Control B001 Puts the input into manual mode**	Off	ON/OFF	-
	Manual Position: Set the Manual Value for this input (only has an affect when the input is in manual control, item above is On).	0	-3276.8-3276.7	°F / °C
	Value: If Manual Control is Off it is the actual value of the Sensor, If Manual Control is On it is the value of the Manual Position	Actual value	-3276.8-3276.8	°F / °C

Service Sub Menu (continued)

Digital Input
Main Status Screen = Service = Manual Management = Digital Input
(🔒 requires password PW1)

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Digital Input Condensate Float **(As the digital inputs have been listed under "inputs/ Outputs" section, Only the Condensate Float has been detailed.)**	**Manual Control DI 1** **Puts the input into manual mode**	Off	ON/OFF	-
	Manual Position **Set the Manual Value for this input (only has an affect when the input is in manual control, item above is On).**	Closed	Closed or Open	-
	DI 1 Status **If Manual Control is Off it is the actual status of the input, If Manual Control is On it is the status of the Manual Position**	Actual value	Closed or Open	-

Relay Output
Main Status Screen = Service = Manual Management = Relay Output
(🔒 requires password PW1)

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Relay Output Supply Fan High **(As the digital outputs have been listed under "inputs/Outputs" section, Only the Supply Fan High has been detailed.)**	**Manual Relay 1 Puts the output into manual mode**	Off	ON/OFF	-
	Manual Position: Set the Manual Value for this output (only has an affect when the output is in manual control, item above is On).	Off	ON/OFF	-
	Relay 1 Status: If Manual Control is Off it is the actual status of the output, if Manual Control is On it is the status of the Manual Position	Actual value	ON/OFF	-

Analog Output
Main Status Screen = Service = Manual Management = Analog Output
(🔒 requires password PW1)

SCREEN NAME	PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Analog Output Outdoor fan **(As the analog inputs have been listed under "inputs/Outputs" section, Only the Outdoor Fan value has been detailed.)**	**Mode Puts the output into manual mode**	Off	ON/OFF	-
	Manual Value Set the Manual Value for this output (only has an affect when the output is in manual control, item above is On).	0.00	0.00-10.00	VDC
	Value: If Manual Control is Off it is the actual value of the output, if Manual Control is On it is the value of the Manual Position	Actual value	0.00-10.00	VDC

Unit Alarms

Alarm	Auto Reset	Unit Disabled	Component Disabled	Cause	Action
Clock board fault or not connected	●		●	Indicated an error with the real time clock on-board the controller. During alarm any time zones set up is ignored	Once the clock is functioning correctly, the alarm will be automatically reset and any time zones settings will be restored.
Extended memory	●		●	Controller memory fault	Alarm is generated- No other action taken
Run Hours	●		●	Run Hours exceed Maintenance hours	Alarm is generated- No other action taken
Return Air Temperature Sensor Failure	●		●	Return Air sensor faulty or not connected	Alarm is generated- No other action taken
Inside Coil Temperature Sensor Failure	●		●	Inside Coil sensor faulty or not connected	Alarm is generated- No other action taken
Outside Coil Temperature Sensor Failure	●		●	Outside Coil sensor faulty or not connected	Alarm is generated- No other action taken
Supply Temperature Sensor Failure	●		●	Supply Air sensor faulty or not connected	Alarm is generated- No other action taken
CO2 sensor Failure	●		●	CO2 sensor faulty or not connected	Alarm is generated- No other action taken
Outside Air Humidity Sensor Failure	●		●	Outside Air sensor faulty or not connected	Alarm is generated- No other action taken
Return Air Humidity Sensor Failure	●		●	Return Air sensor faulty or not connected	Alarm is generated- No other action taken
Outside Air Temperature Sensor Failure	●		●	Outside Air sensor faulty or not connected	Alarm is generated- No other action taken
Liquid Line Pressure Sensor Failure	●		●	Liquid Line Pressure sensor faulty or not connected	Alarm is generated- No other action taken
pCOe Off-line	●		●	The pCOe is not connected or incorrectly setup and is not communicating to the pCOOEM+	Alarm Generated- Supplemental Electric heat is locked out
pAD Temperature Failure	●		●	pAD Temperature sensor faulty or not connected	Alarm is generated- No other action taken
pAD Humidity Failure	●		●	pAD Humidity sensor faulty or not connected	Alarm is generated- No other action taken
pAD Off-line	●		●	pAD is faulty or not connected	Alarm is generated- No other action taken
Low Pressure (compressor)	●		●	Compressor low pressure sensor has tripped	Compressor turned off, after three attempts alarm is generated
High Pressure (compressor)	●		●	Compressor high pressure sensor has tripped	Compressor turned off, after three attempts alarm is generated
Condensate Pan	●		●	The main drain pan is not draining	This input generates an alarm after a 10 second delay and locks out the compressor
Freeze Condition		●	●	Air Temperature over Hotwater or Steam coils drops below 35˚F	Alarm is generated after three attempts then the Unit is in shutdown and the hot water/steam and baseboard valves shall open

Unit Alarms (continued)

Alarm	Auto Reset	Unit Disabled	Component Disabled	Cause	Action
Supply Fan Status	●		●	Supply fan is either faulty or not connected	All outputs will be locked out except for supply fan, baseboard heat, hot water heat and steam heat
Condenser Fan	●		●	Condenser fan is either faulty or not connected	Compressor is held off and alarm is generated after three tries
Dirty Filter	●			Main Filters are dirty	Alarm is generated - No action taken.
Low coil Temperature	●		●	Temperature drops below setpoint 28˚F (adjustable) on the indoor coil	Compressor is held off and alarm is generated after three tries
Coaxial Water out Temperature Sensor Failure	●		●	Coaxial Water Out sensor faulty or not connected	Alarm is generated
Low Coaxial water out temperature	●		●	If Ground Water out temperature drops below 40˚F (adjustable)	Compressor is held off and alarm is generated after three attempts
Current Sensor Failure	●		●	Current sensor faulty or not connected	Alarm is Generated
Exhaust Fan	●		●	Exhaust Fan faulty or not connected	Alarm is Generated
High Supply Temperature	●		●	Supply Air Temperature exceeds 120F	One bank of Electric Heat is disabled for three minutes No alarm is generated.
Supply Air Temperature Shutdown		●	●	Supply Air Temperature exceeds 120F after two attempts	Alarm is generated and one bank of electric heat is disabled.
High Supply Temperature	●		●	Supply Air Temperature exceeds 120?F	One bank of Electric Heat is disabled for three minutes No alarm is generated.
Supply Fan High Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
Compressor On Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
Compressor CSS Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
Exhaust Fan On Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
ERM Wheel Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
Exhaust Air Vent Fan Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
Outside Air Vent Fan Maintenance Run Hours				Run Hours exceed Maintenance hours	Alarm is Generated
Door Switch		●		Panel Door is open	Heating and Cooling are locked out
Temperature Adjust Sensor Failure	●		●	±3°F Temperature Adjust sensor is disconnected	No Temperature offset will be applied to setpoint.
BMS Offline (No Heart Beat)		●	●	BMS System is offline or disconnected	Depending on unit setup, This can turn the unit off or keep unit in occupied mode.
Faceless Wall Stat Offline	●		●	Faceless Wall stat is Disconnected	Reverts to return air control
Faceless Wall Stat Offline Humidiy Failure	●		●	FW Stat Humidity Sensor is faulty	Reverts to return air control
Faceless Wall Stat Offline Temperature Failure	●		●	FW Stat Temperature Sensor is faulty	Reverts to return air control

Main Unit controller Inputs/Outputs

pCOOEM+ Input and Output Terminals

The inputs and outputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

I/O Type	Output #	Voltage	Description	Notes	Standard	Model Nomenclature Digit Or Optional
Universal I/O	U1	Universal	Return Air Sensor	Carel NTC 10K@77˚F	●	
	U2	Universal	Indoor Coil Sensor	Carel NTC 10K@77˚F	●	
	U3	Universal	Outdoor Coil Sensor Or Coaxial Coil Sensor	Carel NTC 10K@77˚F		Outdoor Coil Digit 1,2 =CM Coaxial Coil Digit 1,2= SM
	U4	Universal	Supply Air Sensor	Carel NTC 10K@77˚F	●	
	U5	Universal	CO2 Sensor	4-20mA		Optional
	U6	Universal	Outdoor Humidity Sensor	4-20mA		Optional
	U7	Universal	Indoor Humidity Sensor	4-20mA		Optional
	U8	Universal	Outdoor Air Sensor	Carel NTC 10K@77˚F	●	
	U9	Universal	Not Used	Not Used		
	U10	Universal	Mechanical Thermostat	+/- 3˚F mechanical setpoint		Optional
	U11	Universal	Head Pressure Transducer	4-20mA		Optional
	U12	Universal	Not used	Not Used		
Digital Input	DI1	Voltage Free, Uses Continuity to Test Status	Condensate Pan Float Switch	Normally Closed		Optional
	DI2		Low Limit Status	Normally Open		Optional
	DI3		Supply Fan Status	Normally Closed while running	●	
	DI4		Condenser Fan Status Or Exhaust Fan Status	Both Normally Closed while running	●	
	DI7	24Vac	Dirty Filter Status	Normally Open		Optional
	DI8	24Vac	Mechanical Thermostat Or Occupancy Sensor Or Key Override Or Twist Timer	All All Normally open When Closed it sends unit into occupied mode		Optional
	DI9	24Vac	Low Pressure Switch	Normally Open	●	
	DI10	24Vac	High Pressure Switch	Normally Open	●	
Analog Output	Y1	0-10V	Economizer Damper	with Economizer		Digit 9 = B,D,E,G,J,K,M,N,P
	Y2	0-10V	Hot Water Valve	with Hot water Heat		Optional
	Y3	0-10V	Condenser Fan Speed Control Or Exhaust Fan Speed Control	With Condenser Fan With Exhaust Fan	●	Condenser Fan Digit 3= D,P Exhaust Fan Digit 3= S,G,W
	Y4	0-10V	Ventilation Fan Speed Control	with ERV and Economizer		Digit 9 =C,D,E,H,J,K,N,P
	Y5	0-10V	Baseboard Heat	Controls baseboard heat output		Optional

Main Unit controller Inputs/Outputs (continued)

pCOOEM+ Input and Output Terminals

The inputs and outputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

I/O Type	Output #	Voltage	Description	Notes	Standard	Model Nomenclature Digit Or Optional
Digital Output	NO1 - C1	NO Relay	Supply Fan Motor Control High Speed	Closed when Supply fan High is enabled	●	
	NC1 - C1	NC Relay	Supply Fan Motor Control Low Speed	Normally Closed while running	●	
	NO6 - C6	NO Relay	Supply Fan Enable	Enable Supply Fan	●	
	NO7 - C7	NO Relay	Electric Heating 1	Enable Electric heat 1		Digit 15,16= 02-20
	NO8 - C8	NO Relay	Electric Heating 2	Enable Electric heat 2		Digit 15,16= 10-20
	NO9 - C9	NO Relay	Outside Air Damper	Air damper opens when enabled		Digit 9= B,C,D,E,G,H,J,K,M,N,P
	NC9 - C9	NC Relay	Not used	Not used		
	NO10 - C10	NO Relay	Exhaust Fan	Enables Exhaust Fan		Digit 3=S,G,W
	NC10 - C10	NC Relay	Not used	Not used		
	NO11 - C11	NO Relay High Voltage (230 Vac)	ERV Wheel	Turns wheel when closed		Digit 9=C,D,E,H,J,K,N,P
	NO12 - C11		ERV Exhaust Ventilation Fan	Enable fan when closed		Digit 9=C,D,E,H,J,K,N,P
	NO13 - C11		ERV Supply Ventilation Fan	Enable fan when closed		Digit 9=C,D,E,H,J,K,N,P
	Out 2 - C2	24V Relay	Hot Gas Reheat Valve	Available on base units		Digit 14= A
	Out 3 - C2	24V Relay	Reversing Valve	Heatpump Units or Schoolmate Closed during Cooling, Open during Heatpump		Digit 1,2,3= CMP,SMG,SMW
	Out 4 - C2	24V Relay	Compressor And/or **Coaxial Coil Valve**	Controls Compressor on all units, as well as **The Coaxial Coil Only On Schoolmate Units**	●	
	Out 5 - C2	24V Relay	Capacity Control Solenoid	Closed When compressor in high stage/stage 2	●	

Typical BMS - EMS - BAS System Variables

Carel Side					BMS Side		
Carel Index	Description	Read/ Write	Variable Name	Data Type	BACNet	Lon Name	SNVT
1	Return Air Temperature Sensor	R	ra_temp	A	AV1	nvora_temp	temp_p
2	Indoor Coil Temperature Sensor	R	indoor_coil_temp	A	AV2	nvoid_coil_temp	temp_p
3	Outdoor Coil Temperature Sensor	R	oa_coil_temp	A	AV3	nvooa_coil_temp	temp_p
4	Supply Air Temperature Sensor	R	sa_temp	A	AV4	nvosa_temp	temp_p
5	Outside Air Humidity Sensor	R	oa_humidity	A	AV5	nvooa_humidity	lev_percent
6	Outside Air Temperature Sensor	R	oa_temp	A	AV6	nvooa_temp	temp_p
7	Liquid Line Pressure	R	ll_pressure	A	AV7	nvoll_pressure	count
8	Control Temperature	R	cntrl_sensor	A	AV8	nvocntrl_sensor	temp_p
10	Cooling Temperature Setpoint from Keypad	R/W	pco_temp_setpt	A	AV9	nvo/nvipco_temp_setp	temp_p
11	Heat Setpoint Offset from Cooling Setpoint	R/W	ht_offset	A	AV10	nvo/nviht_offset	temp_p
12	Heating Setpoint = Cooling Setpoint Minus Heating Diff	R	main_ht_sp	A	AV11	nvomain_ht_sp	temp_p
13	TH-Tune Temperature Setpoint	R/W	ThTune_1_Temperature_setpoint	A	AV12	nvo/nviThTune_Setp_T	temp_p
14	pAD Temperature Setpoint	R/W	pAD_Setp_Temp	A	AV13	nvo/nvipAD_Setp_T	temp_p
15	Unoccupied Cooling Setpoint	R/W	Unocc_clg_setp	A	AV14	nvo/nviUnoc_clg_setp	temp_p
16	Unoccupied Heating Setpoint	R/W	Unocc_ht_setp	A	AV15	nvo/nviUnoc_ht_setp	temp_p
17	Standby Cooling Setpoint	R/W	standby_clg_setp	A	AV16	nvo/nviStby_clg_setp	temp_p
18	Standby Heating Setpoint	R/W	standby_ht_setp	A	AV17	nvo/nviStby_ht_setp	temp_p
19	Low Limit for Economizer to be Enabled	R/W	ec_low_limit	A	AV18	nvo/nviEcon_low_stpt	temp_p
20	Actual Control Cooling Setpoint	R	Cntrl_set	A	AV19	nvoCntrl_setp	temp_p
21	Geo Water Out	R	geo_water_out_temp	A	AV20	nvogeo_water)out	temp_p
22	Set Maximum Temperature for PAD	R/W	SetMax_Temp	A	AV21	nvo/nviSetMax_Temp	temp_p
23	Set Minimum Temperature for PAD	R/W	SetMin_Temp	A	AV22	nvo/nviSetMin_Temp	temp_p
24	Economizer Setpoint	R/W	ec_oa_set	A	AV23	nvoec_oa_set	temp_p
30	Economizer Supply Low Limit	R/W	ec_sa_ll_bd_BMS	A	AV24		
1	Space CO2 Level	R	co2_sensor_disp	I	AV1001	nvoco2_level	count
2	CO2 Maximum Setpoint	R/W	ec_co2_max	I	AV1002	nvo/nviCO2_max_stpt	NotSet
3	Control Humidity	R	cntrl_h_sensor	I	AV1003	nvocntrl_h_sen	lev_percent
4	Humidity Setpoint from Keypad	R/W	pco_hum_setpt	I	AV1004	nvo/nvipco_setp_h	lev_percent
5	pAD Humidity Setpoint	R/W	pAD_Setp_Humid	I	AV1005	nvo/nvipAD_setp_h	lev_percent
6	TH-Tune Humidity Setpoint	R/W	ThTune_1_Humidity_setpoint	I	AV1006	nvo/nviThTune_setp_h	NotSet
7	Economizer Damper Position	R	econ_disp	I	AV1007	nvoecon_disp	lev_percent
8	Inside Humidity Sensor	R	inside_humidity	I	AV1008	nvoinside_hum	lev_percent
9	Hot Water Valve Position	R	hot_water_valve-Disp	I	AV1009	nvoHw_Valve_disp	lev_percent
10	Ventilation Fan CFM Rate	R	cfm_vent_rate_disp	I	AV1010	nvoERM_CFM	count
11	CO2 Minimum Set Point	R/W	ec_co2_min	I	AV1011	nvo/nviCO2_min_stpt	temp
12	CO2 Damper Max Position	R/W	ec_damper_max_co2	I	AV1012	nvo/nviec_max_co2	lev_percent
80	Current Day	R	CURRENT_DAY	I	AV1013		
81	Current Month	R	CURRENT_MONTH	I	AV1014		
82	Current Year	R	CURRENT_YEAR	I	AV1015		

Typical BMS - EMS - BAS System Variables

Carel Side					BMS Side		
Carel Index	Description	Read/ Write	Variable Name	Data Type	BACNet	Lon Name	SNVT
83	Current Hour	R	CURRENT-HOUR	I	AV1016		
84	Current Minute	R	CURRENT-YEAR	I	AV1017		
1	Supply Fan High Relay	R	supply_fan_high	D	BV1	nvosupply_fan_hi	switch
2	Hot Gas Re-Heat Relay	R	HG_reheat	D	BV2	nvoHG_reheat	switch
3	Reversing Valve Relay	R	Reversing_valve	D	BV3	nvoRev_val	switch
4	Compressor Relay	R	comp_on	D	BV4	nvocomp_on	switch
5	Compressor Capacity Solenoid Relay	R	Comp_CCS	D	BV5	nvoComp_CCS	switch
6	*Supply Fan Relay	R	Supply_fan	D	BV6	nvoSupply_fan	switch
7	Electric Heat Stage 1 Relay	R	Electric_ht1	D	BV7	nvoElectric_ht1	switch
8	Electric Heat Stage 2 Relay	R	Electric_ht2	D	BV8	nvoElectric_ht2	switch
9	Outside Air Damper Relay	R	OA_damper	D	BV9	nvoOA_damper	switch
10	Door Switch Input	R	door_window_sw	D	BV10	nvodoor_win_sw	switch
11	*Energy Recovery Wheel Relay	R	ERM_wheel	D	BV11	nvoERM_wheel	switch
12	ERM Exhaust Air Fan Relay	R	EA_vent_fan	D	BV12	nvoEA_vent_fan	switch
13	ERM Ventilation Fan	R	OA_vent_fan	D	BV13	nvoOA_vent_fan	switch
14	Exhaust Fan Relay	R	Exhaust_fan_on	D	BV14	nvoExhaust_fan	switch
15	General Alarm	R	General_Alarm	D	BV15	nvoGeneral_Alarm	switch
16	Supervisor (BMS) On-Off	R/W	Superv_OnOff	D	BV16	nvo/nviSuperv_OnOff	switch
20	Heartbeat sSignal from BMS	R/W	heartbeat	D	BV17	nvo/nviheartbeat	NotSet
21	Condensate Digital Input NC	R	din_cond_float	D	BV18	nvodin_con_float	switch
22	Freeze Stat Digital Input NO	R	din_freeze	D	BV19	nvodin_freeze	switch
23	*Supply Fan Status Digital Input NC (when running)	R	din_supply_fan	D	BV20	nvodin_sup_fan	switch
24	*Outside Air Fan Alarm Digital Input NO	R	din_oa_fan	D	BV21	nvodin_oa_fan	switch
25	Filter Dirty Digital Input NO	R	din_filter	D	BV22	nvodin_filter	switch
26	Occupied or Standby Digital Input NO	R	din_occupied	D	BV23	nvodin_occupied	switch
27	Low Pressure Switch Digital Input	R	din_lp	D	BV24	nvodin_lp	switch
28	High Pressure Switch Digital Input NO	R	din_hp	D	BV25	nvodin_hp	switch
29	Alarm Reset by BMS	R/W	BMS_Reset	D	BV26	nvo/nviAL_Restet_BMS	switch
30	Occupied Command from BMS Command	R/W	bms_occ	D	BV27	nvo/nvibms_occ	switch
31	Unit in Dehumidification Mode	R	dehum	D	BV28	nvodehum	switch
32	Unit in Defrost Mode	R	defrost_mode	D	BV29	nvodefrost_mode	switch
40	Condensate Float Alarm	R	mal_cond_float	D	BV30	nvomal_con_float	switch
41	Freeze Stat Alarm	R	mal_freeze_stat	D	BV31	nvomal_frze_stat	switch
42	*Supply Fan Status Alarm	R	mal_sup_fan	D	BV32	nvomal_sup_fan	switch
43	*Condenser Air Fan Alarm	R	mal_cond_fan	D	BV33	nvomal_cond_fan	switch
44	Filter Dirty Alarm	R	mal_dirty_filter	D	BV34	nvomal_dirty_fil	switch
45	Compressor Low Pressure Alarm	R	mal_low_pressure	D	BV35	nvomal_low_press	switch
46	Compressor High Pressure Alarm	R	mal_high_pressure	D	BV36	nvomal_high_pres	switch
47	Low Indoor Coil Temperature Alarm	R	mal_lo_coil_t	D	BV37	nvomal_lo_coil_t	switch
48	Low Geo Water Temperature Alarm	R	mal_lo_gwo_t	D	BV38	nvomal_lo_gwo_t	switch
49	Exhaust Fan Alarm	R	mal_exh_fan	D	BV39	nvomal_exh_fan	switch

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