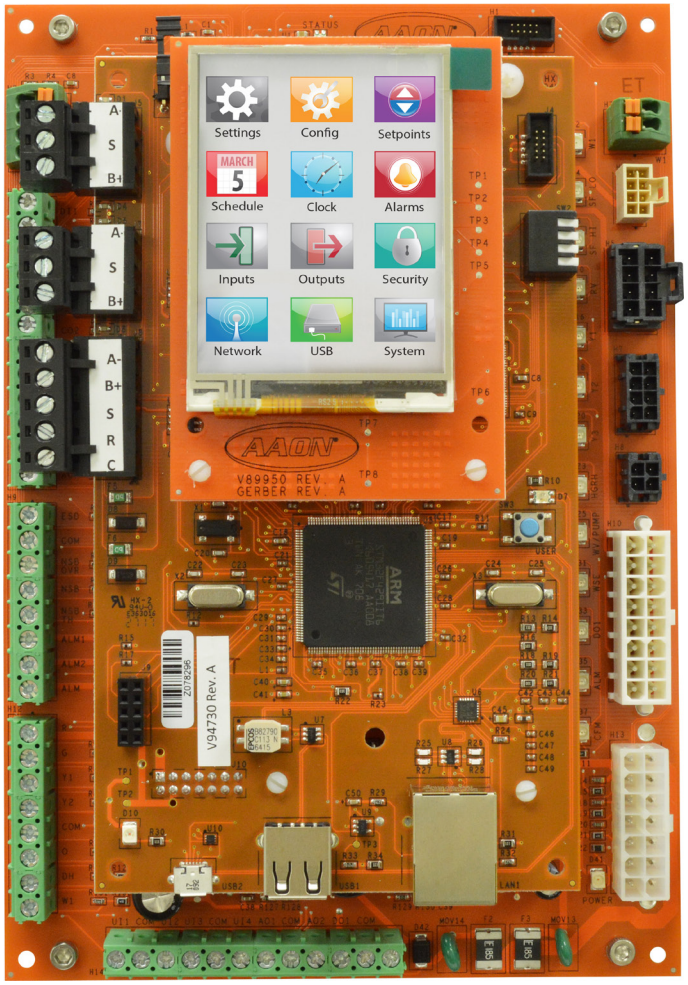
Pioneer Gold Controller Technical Guide

Pioneer Gold Controller Code: SS1128/DT005092-001, Version 2.09 and up
Bootloader: Version 1.04 and up; I/O Board: Version 1.01 and up
Pioneer Gold Touchscreen Temp and Humidity Sensor: Version 2.03 and up
Prism 2 Software: Version 5.04 and up
Electric Heat Expansion Module Code: Version 1.0
Used with AAON WSHP WV Series Vertical and WH Series Horizontal



SAFETY

Attention should be paid to the following statements:

NOTE - Notes are intended to clarify the unit installation, operation and maintenance.

⚠ **CAUTION -** Caution statements are given to prevent actions that may result in equipment damage, property damage, or personal injury.

⚠ **WARNING -** Warning statements are given to prevent actions that could result in equipment damage, property damage, personal injury or death.

⚠ WARNING

QUALIFIED INSTALLER

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 trained, qualified installer. A copy of this manual should be kept with the unit.

⚠ WARNING

ELECTRIC SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing of HVAC equipment could result in dangerous operation, serious injury, death or property damage.

- ▷ Before servicing, disconnect all electrical power to the equipment. More than one disconnect may be provided.
- ▷ When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- ▷ Verify proper operation after servicing. Secure all doors with key-lock or nut and bolt.

⚠ WARNING

Electric shock hazard. Before servicing, disconnect all electrical power to the equipment, including remote disconnects, to avoid shock hazard or injury from rotating parts. Follow proper Lockout-Tagout procedures.

⚠ WARNING

GROUNDING REQUIRED

All field installed wiring must be completed by qualified personnel. Field installed wiring must comply with NEC/CEC, local and state electrical code requirements. Failure to follow code requirements could result in serious injury or death. Provide proper unit ground in accordance with these code requirements.

⚠ WARNING

During installation, testing, servicing and troubleshooting of the equipment, it may be necessary to work with live electrical components. Only a qualified licensed electrician or individual properly trained in handling live electrical components shall perform these tasks.

Standard NFPA-70E, an OSHA regulation requiring an Arc Flash Boundary to be field established and marked for identification of where appropriate Personal Protective Equipment (PPE) be worn, should be followed.

1. READ THE ENTIRE USER'S MANUAL. OTHER IMPORTANT SAFETY PRECAUTIONS ARE PROVIDED THROUGHOUT THIS MANUAL.
2. KEEP THIS MANUAL AND ALL LITERATURE SAFEGUARDED NEAR THE EQUIPMENT.

PIONEER GOLD REVISION LOG	
REVISION AND DATE	**CHANGE**
01C, March 17, 2020	Removed Harness Part Number Tables from Chapter 1. Removed Suction Line Temp Setpoint and added Supply Air. Reheat Setpoint to Dehum screen, Added Alarms Screen 3.
01C, July 22, 2020	Added Waterside Economizer Cooling and Heating Failure Times to MODBUS- 40227 and 40228, Legacy BACnet® - AV: 50 and AV: 51, and BACnet® MSTP/IP - AV: 30 and AV: 31, Added Water Econ Cooling/ Heating Failure Time to Economizer Setpoints. Added Bootloader Update instructions. Added Remote Touchscreen Sensor occupancy override information to the Appendix. Added Occupied Fan / Unoccupied Auto to Supply Fan Control.
01C, August, 2020	Added software version 1.10 and version 1.0 of the board to be included in the 2.04 manual since 2.04 can now be loaded onto version 1.0 boards. Version 1.0 boards do not have an Ethernet connection, however, so do not have BACnet® IP functionality.
01D, October 2, 2020	Added changes for software version 2.05. Revisions to high discharge pressure and low suction pressure alarms. Added Reheat Valve Percentage BACnet parameter to AV: 54 (Legacy), AI: 20 (MS/TP and IP), and 30257 (MODBUS). Added Reheat Valve Percentage BACnet parameter to AV: 55 (Legacy), AV: 32 (MS/ TP and IP), and 40231 (MODBUS), Supply Fan Speed High Speed Operation change. Added Harness 10 WSHP wiring.
E, July, 2021	Added DI1 and DI2 Comp Interlock Alarms, ALM, and ALM1/ALM2 definitions. Added new Gycol Percentage Freeze Protection Setpoint tables. Changed values of BACnet values for Water Flow Status and Supply Fan. Amp Status to DI1 and DI2 Input Status, respectively. Changed values of BACnet values for Water Flow Alarm to DI2 Interlock. Alarm and added BACnet values for DI1 Interlock Alarm. Added Trend Log values.
F, September 17, 2021	Updated BACnet points
G, December 21, 2021	Clarification of Electric Heat Operation - External Duct Heater(s)
H, January 17, 2022	Added support for a Wall Mount Space Temperature Sensor with Setpoint Adjust and Override. Added slide offset input (UI2) for analog space sensor. Added support for receiving a Wattcomm broadcast schedule from GPC-XP. Added BACnet point BV:9 Water Valve Force Enable to allow remote force open of water valve when unit is not running. Moved Parallel Reheat Piping option to separate dialog box with a warning to not enable unless instructed to do so by Tech Support.

PIONEER GOLD PARTS REFERENCE	
PART DESCRIPTION	**PART NUMBER**
Pioneer Gold 3.0 Controller	ASM02780
Pioneer Gold 2.09 Controller (replaced by ASM02780)	ASM02323
Pioneer Gold 1.10 Controller (replaced by ASM02780)	V94730 / V94731
Pioneer Gold Electric Heat Board	V98550
Pioneer Gold Touchscreen Space Temp and RH Sensor	G000181
Wall Mount Space Temperature Sensor	R38430 or ASM02227
Wall Mount Space Temperature Sensor with Setpoint Adjust and Override	ASM01643
Prism 2 Software	ASM02533
CommLink 5	ASM01874
IP Module Kit	ASM01902
USB-Link 2	ASM02244
MiniLink PD 5	ASM01626
Heat Pump Thermostat	By Others or via AAON Parts
Horizontal Water-Source Heat Pump Unit	WHA-XXX
Vertical Water-Source Heat Pump Unit	WVA-XXX

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All manuals are also available for download from www.aaon.com/controlsmanuals.

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AAON Controls Support: 866-918-1100
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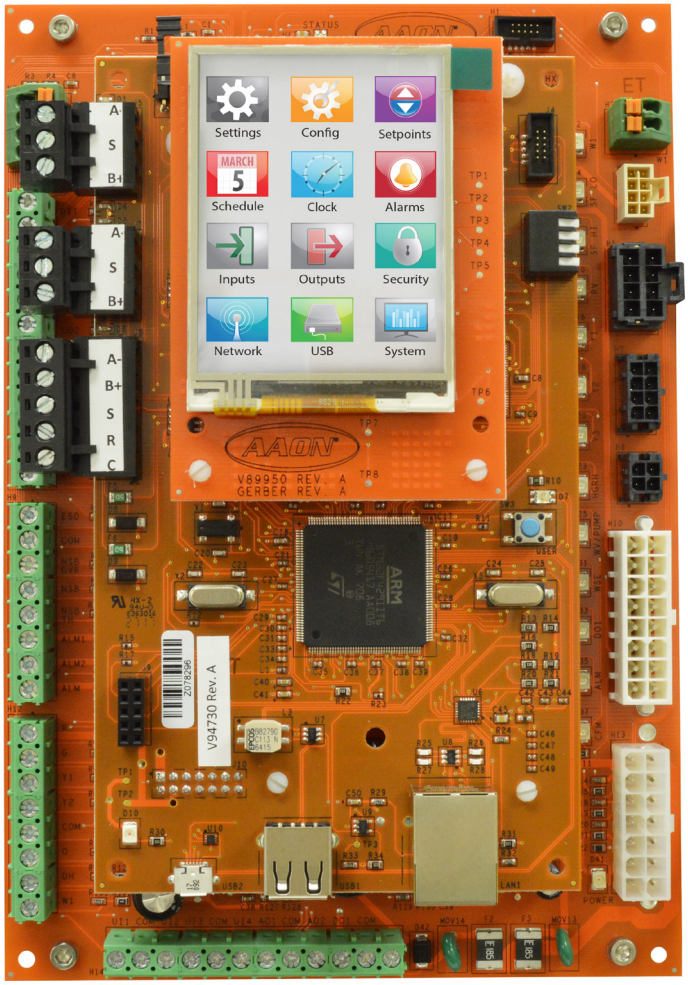
AAON P/N: G011010, Rev. H

Chapter 1
Pioneer Gold 2.0 Controller



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Applications

The AAON® Pioneer Gold 3.00 Controller with Touchscreen interface, BACnet® MS/TP, BACnet® IP, and MODBUS RTU communication protocols is designed for AAON® horizontal and vertical water-source heat pump units—WH and WV series. All of the energy saving features and options available on AAON® WH and WV Series water-source heat pumps can be controlled with the Pioneer Gold Controller.

The Water-Source Heat Pump (WSHP) Pioneer Gold Controller contains all the functionality required to operate basic and advanced configurations of AAON® WH and WV Series WSHP units. The controller can operate with a standard heat pump room thermostat (by others) or can operate as a Stand-Alone system with the Pioneer Gold Touchscreen Space and Humidity Sensor or Simple Space Temperature Sensor.

The controller also contains a terminal block for communication to the Pioneer Gold Electric Heat Board for additional heat stages.

NOTE: If the application currently uses an obsolete mercury bulb type thermostat, it must be upgraded to an electronic thermostat. The unit will not function properly when controlled via a mercury bulb thermostat.

The controller has outputs to control a supply fan, compressor, and reversing valve. It also provides I/O for additional functionality.

The Pioneer Gold is used for Constant Volume applications.

PIONEER GOLD FEATURES AND OPTIONS			
UNIT CAPACITY CONTROL	½ to 30 ton WSHPs	**ADVANCED ALARMS**	• Space Sensor Alarm • Air Flow Alarm
USER INTERFACE	2.8” Touchscreen LCD Color Interface with Two Levels of Security Prism 2 Computer Software Interface	**SERVICE AND RELIABILITY FEATURES**	• Firmware Update via USB Port • Fault and Status Indicator LED • Factory Wiring Harness Connectors • High/Low Control Voltage Lockout (Auto Reset) • Alarm and Relay Status LEDs • Alarm Status - LCD Interface
STAND-ALONE CAPABILITY	Stand-Alone with Space Sensors or Thermostat Terminals		
NETWORKING CAPABILITY	Built-In BACnet® MS/TP and BACnet® IP MODBUS RTU	**ADVANCED FEATURES**	• Waterside Economizer Operation • Two-Speed EC Fan Operation • PSC Fan Control • Rotary or Scrolled Compressor Control • Hot Gas Reheat Dehumidification Control • Two-Step Compressor Operation • Motorized Water Valve Control • CAV Operation • Externally Controlled EC Motor (0-10VDC) • Supply Air Temperature (SAT) Staging Control • Two Stage Auxiliary/Emergency Heat • BACnet® Compliant • Compressor Signal LED • Alarm Mode Indicator LED • 2.8” Color Touchscreen LCD Interface • Space Sensor Control • 4.3” Color Pioneer Gold Touchscreen Space Temperature and Humidity Sensor (Optional)
BASIC FEATURES	• Thermostat Control • Random Start Delay • Compressor Minimum On/Off Timers • High Condensate Level Sensor • High Refrigerant Pressure Protection • Loss of Refrigerant Charge Protection • Reversing Valve Default to Heating Mode • Dry Alarm Contacts • Emergency Shutdown Input (not to be used as a fire/life safety device) • Night Setback Mode • Night Setback Override Thermostat Input • High Condensate Level Sensor • Auxiliary Alarm Input • I/O Status LEDs • Occupancy Scheduling • Seven-Day, Two-Event-Per-Day Scheduling		
BASIC ALARMS	• High/Low Control Voltage Alarms (24 VAC) • Air Coil Low Refrigerant Temperature Alarm • Leaving Water Temperature Alarm		

Table 1-1: Pioneer Gold - Features and Options

Important Wiring Considerations

Control Device	Voltage	VA Load	Operating Temperature	Humidity (Non-Condensing)
Pioneer Gold Controller	18-30 VAC (25%/-15%) Class 2	75*	32°F to 158°F (0°C to 70°C)	0-95% RH
	Inputs		Resistive Inputs require 10K ohm Type III Thermistor	
			24 VAC Inputs provide 4.7K ohm Load	
	Outputs		Relay Outputs: 1 amp maximum per output. All outputs combined: 2.5 amp maximum	
	*NOTE: Controller uses 15 VA. Output relays are rated for 60 VA combined.			

Table 1-2: Pioneer Gold - Electrical and Environmental Requirements.

Control Device	Voltage	VA Load	Operating Temperature	Humidity (Non-Condensing)
Electric Heat Expansion Board	18-30 VAC (25%/-15%) Class 2	20	32°F to 158°F (0°C to 70°C)	0-95% RH
	Inputs		Resistive Inputs require 10K ohm Type III Thermistor	
			24 VAC Inputs provide 4.7K ohm Load	
	Outputs		Relay Outputs: 1 amp maximum per output. All outputs combined: 2.5 amp maximum	

Table 1-3: Pioneer Gold Electric Heat Expansion Board - Electrical and Environmental Requirements.

General

Correct wiring of the Pioneer Gold Controller and its Electric Heat Board, if applicable, is the most important factor in the overall success of the controller installation process. In general, most Pioneer Gold Controllers are factory installed and wired at the AAON® factory. Some of the following information may not apply to your installation if it was pre-wired at the factory. However, if troubleshooting of the controller is required, it is a good idea to be familiar with the system wiring.

The Pioneer Gold Controller dimensions are 8” x 5.5”. The Electric Heat Board dimensions are 3.5” x 3.5”.

Electrical and Environmental Requirements

The Pioneer Gold Controller and Electric Heat Board must be connected to a 24 VAC power source of the proper size for the calculated VA load requirements. All transformer sizing should be based on the VA rating listed in **Table 1-2 and 1-3, this page**.

NOTE: If the temperature at the module is below -4ºF (-20ºC), the display refresh rate could be less responsive.

WARNING: When using a single transformer to power more than one controller or electric heat board, the correct polarity must always be maintained between the boards. Failure to observe correct polarity will result in damage to the Pioneer Gold Controller and Electric Heat Board.

Important Wiring Considerations

Please carefully read and apply the following information when wiring the Pioneer Gold Controller and the Electric Heat Board.

1. All wiring is to be in accordance with local and national electrical codes and specifications.
2. All 24 VAC wiring must be connected so that all ground wires remain common. Failure to follow this procedure can result in damage to the controller and connected devices.
3. Minimum wire size for 24 VAC wiring should be 18-gauge
4. Minimum wire size for all sensors should be 24-gauge. Some sensors require two-conductor wire and some require three-or four-conductor wire.
5. Minimum wire size for 24 VAC thermostat wiring should be 22 gauge.
6. Be sure that all wiring connections are properly inserted and tightened into the terminal blocks. Do not allow wire strands to stick out and touch adjoining terminals which could potentially cause a short circuit.
7. When communication wiring is to be used to connect to other communication devices, all wiring must be plenum-rated, minimum 18-gauge, two-conductor, twisted-pair with shield. AAON can supply communication wire that meets this specification and is color coded for the network or local loop. Please consult your AAON distributor for information. If desired, Belden #82760 or equivalent wire may also be used.
8. Before applying power to the Pioneer Gold Controller, be sure to recheck all wiring connections and terminations thoroughly.

Powering Up

When the controller and electric heat board are first powered up, the POWER LEDs should light up and stay on continuously. If they do not light up, check to be sure that you have 24 VAC connected to the controller and expansion module, that the wiring connections are tight, and that they are wired for the correct polarity. The 24 VAC power must be connected so that all ground wires remain common. If after making all these checks, the POWER LEDs do not light up, please contact AAON Technical Support for assistance.

Connection Components

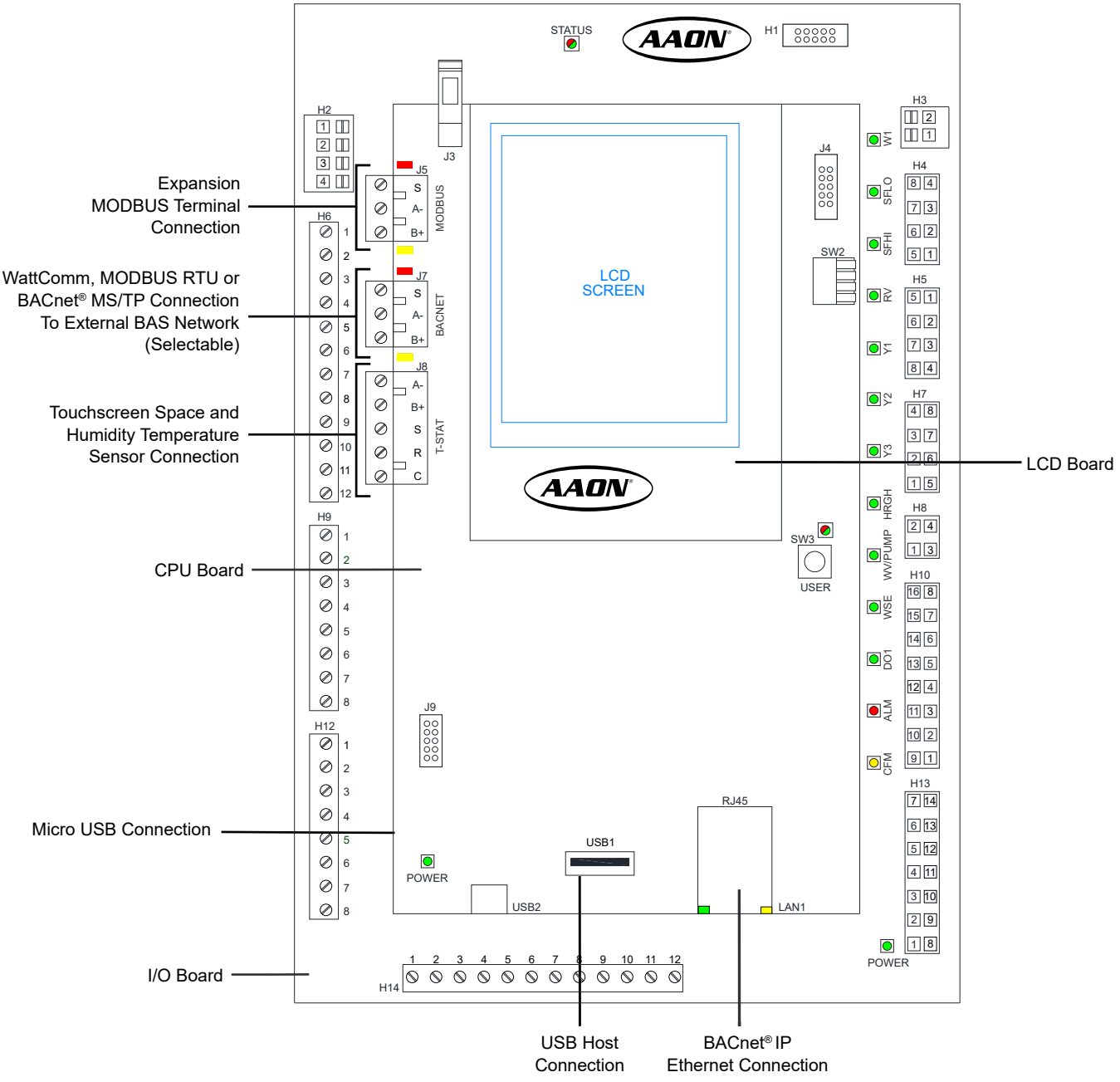


Figure 1-1: Pioneer Gold Controller Connection Components, Jumper and Switches

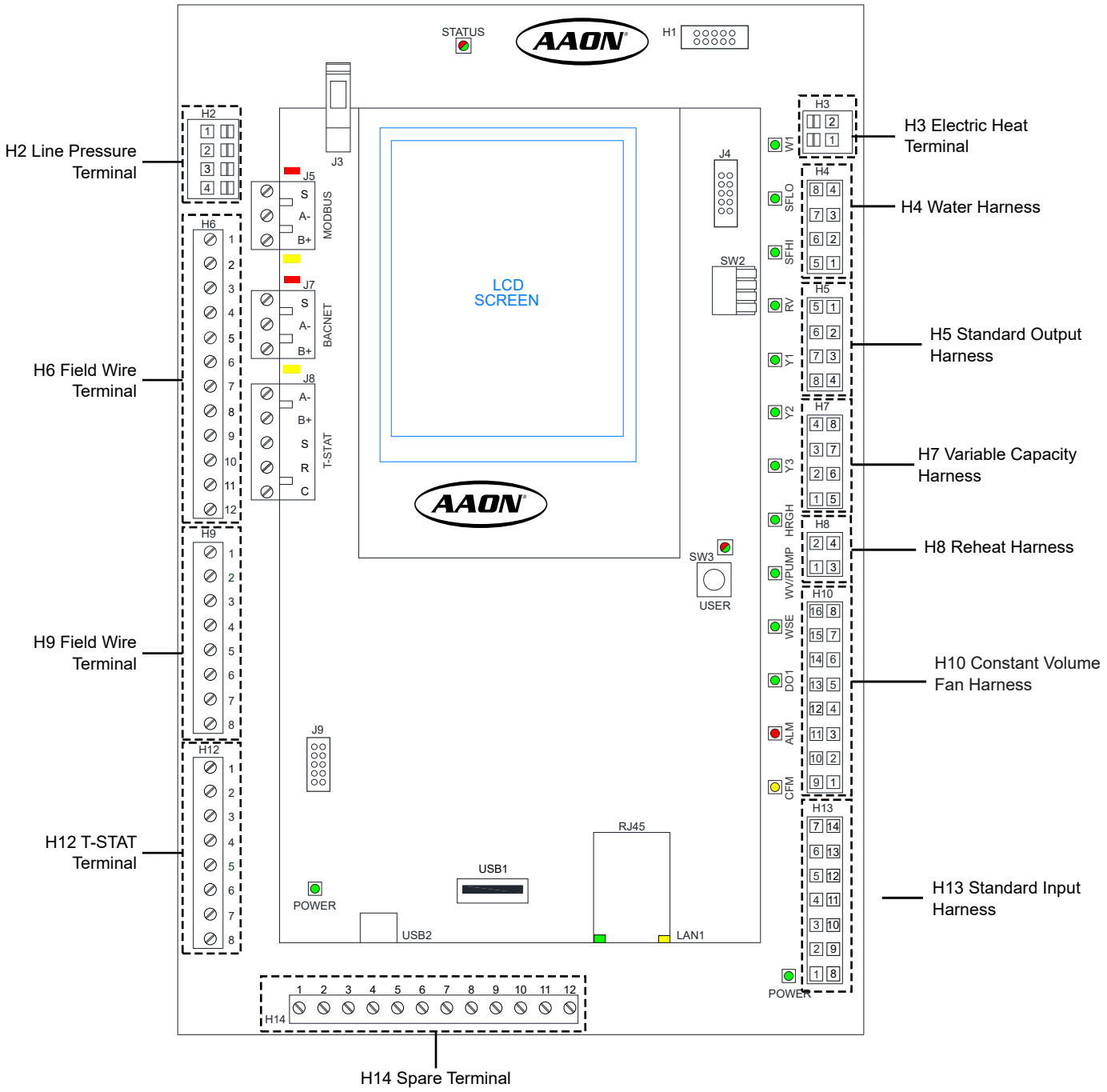


Figure 1-2: Pioneer Gold Controller Terminal and Harness Components

Pioneer Gold Controller and Electric Heat Board Input/Output Maps

Input/Output Map

See **Table 1-4 through 1-7, this page** for Pioneer Gold Controller Inputs/Outputs. Future items are grayed out.

PIONEER GOLD CONTROLLER	
DIGITAL INPUTS	
G	Fan Call (T-STAT)
Y1	Compressor Stage 1 Call (T-STAT)
Y2	Compressor Stage 2 Call (T-STAT)
O	Cooling Call (T-STAT)
DH	Dehumidification Call (T-STAT)
W1	Heat Stage 1 (T-STAT)
NSB	Night Setback (T-STAT)
NSB OVR	Night Setback Override Input (T-STAT)
ESD	Emergency Shutdown
NSB TH	Night Setback TSTAT Input (T-STAT)
COF	Condensate Overflow
COF2	Secondary Condensate Overflow
AUX	Auxiliary Fault Switch
HPS	High Pressure Switch
LPS	Low Pressure Switch
DI1	Compressor Interlock 1
DI2	Compressor Interlock 2
*** Not a Fire/Life Safety Device**	
ANALOG INPUTS	
SPT	Suction Pressure
DPT	Discharge Pressure
EWT	Entering Water Temperature
LLT	Liquid Line Temperature
ECT	Evaporator Coil Temperature
HWT	Not Used
SAT	Supply Air Temperature
SPAT	Space Temperature
CO2	Space CO_2
TOUCHSCREEN INPUTS	
SPAT	Space Temperature
SPAH	Space Humidity
UNIVERSAL INPUTS	
UI1	LWT - Leaving Water Temperature
UI2	Space Sensor Slide Adjust
UI3	Spare
UI4	Spare

Table 1-4: Pioneer Gold Inputs

DIGITAL OUTPUTS (24 VAC)	
R/C	Thermostat Power (T-STAT)
ALM	Alarm Output
ALM1/ALM2	Alarm Dry Contact Output
Fan/Fan	Supply Fan Enable
Fan2/Fan	Supply Fan Stage 2 Enable
Y1/Y1	Compressor Stage 1
Y2/Y2	Compressor Stage 2
Y3/Y3	Not Used
RV/RV	Reversing Valve
W1/W	Electric Heat Stage 1
MV/MV	Motorized Water Valve/Pumps
HG/HG	HGRH Valve
WSE/WSE	WSE Valve
DO1	RLY (on H14) Spare
ANALOG OUTPUTS (0-10 VDC)	
SFS	Supply Fan Speed
PUMP	Not Used
MWV	Not Used
DMPR OVR	CO_2 Damper Override
AO1	Spare
AO2	Spare

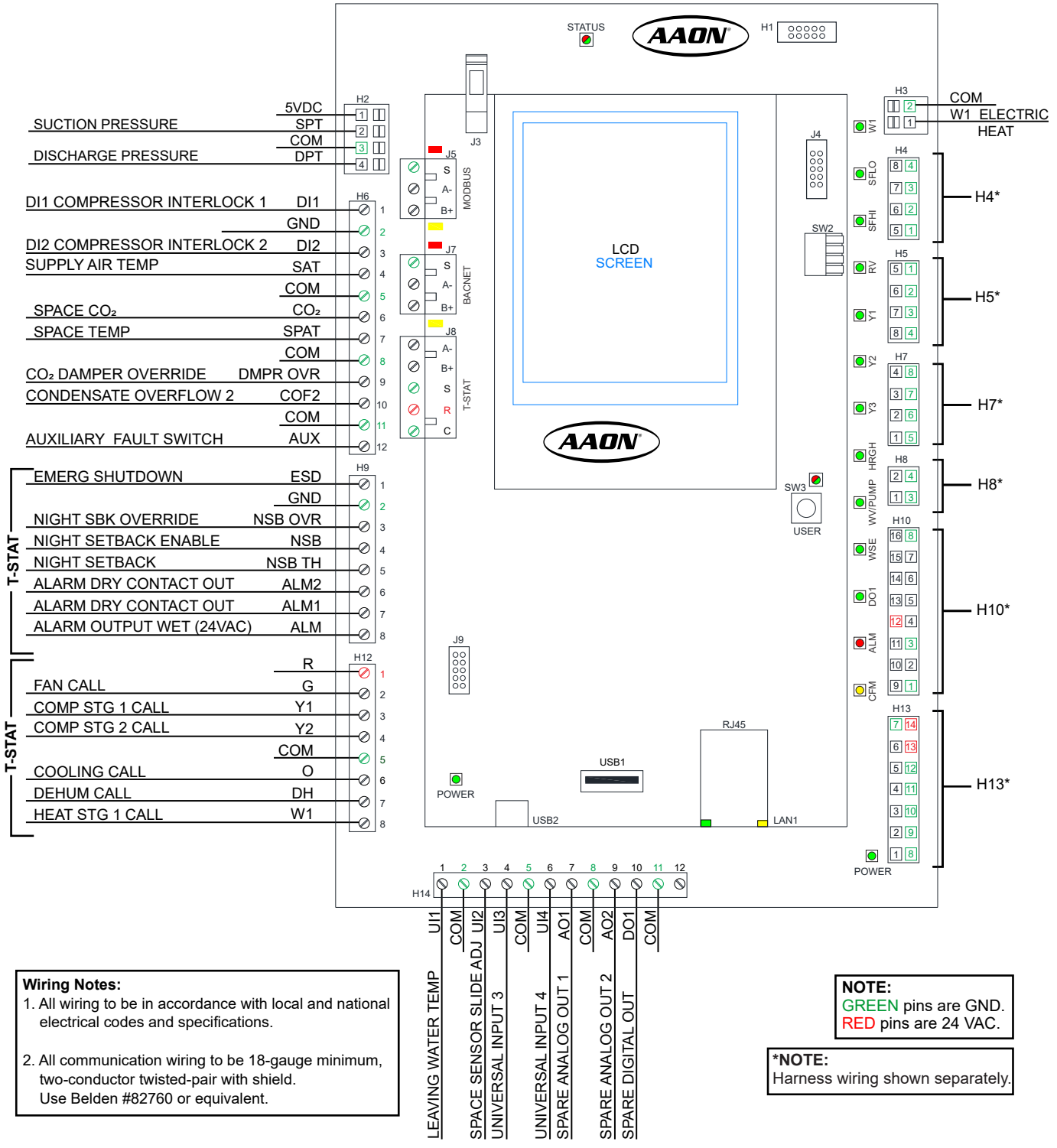
Table 1-5: Pioneer Gold Outputs

COMMUNICATION TERMINALS	
R/C	Extra Power Terminals
BACnet®	WattComm, MODBUS RTU, or BAS MS/TP Terminal (Selectable)
T-STAT	Pioneer Gold Touchscreen Space / RH Temperature Sensor
3 MODBUS Ports	MODBUS Expansion Communication
Ethernet Port	IP Communication

Table 1-6: Pioneer Gold Communication Terminals

ELECTRIC HEAT BOARD INPUTS	
LIMIT	Limit (Hi) Switch
ELECTRIC HEAT BOARD OUTPUTS	
Heat 1	Electric Heat Stage 1 Relay
Heat 2	Electric Heat Stage 2 Relay

Table 1-7: Pioneer Gold Electric Heat Board Inputs and Outputs



Wiring Notes:
1. All wiring to be in accordance with local and national electrical codes and specifications.
2. All communication wiring to be 18-gauge minimum, two-conductor twisted-pair with shield. Use Belden #82760 or equivalent.

NOTE:
GREEN pins are GND.
RED pins are 24 VAC.

***NOTE:**
Harness wiring shown separately.

Figure 1-3: Pioneer Gold Controller Wiring

Harness Wiring

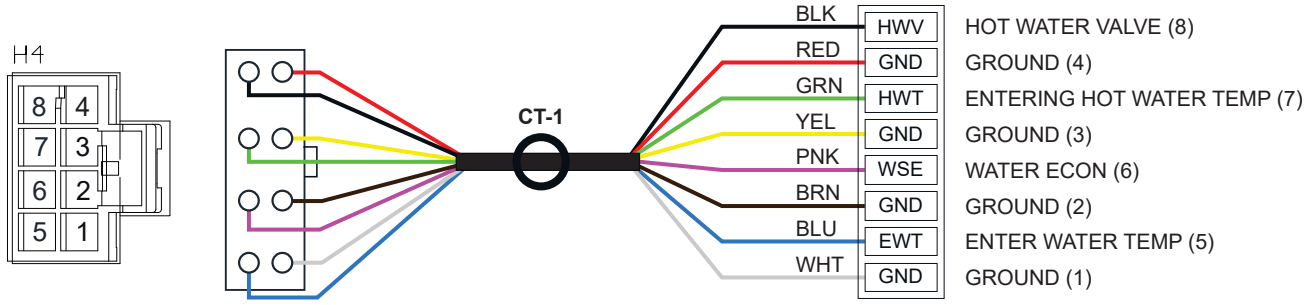


Figure 1-4: H4 Water Harness Wiring

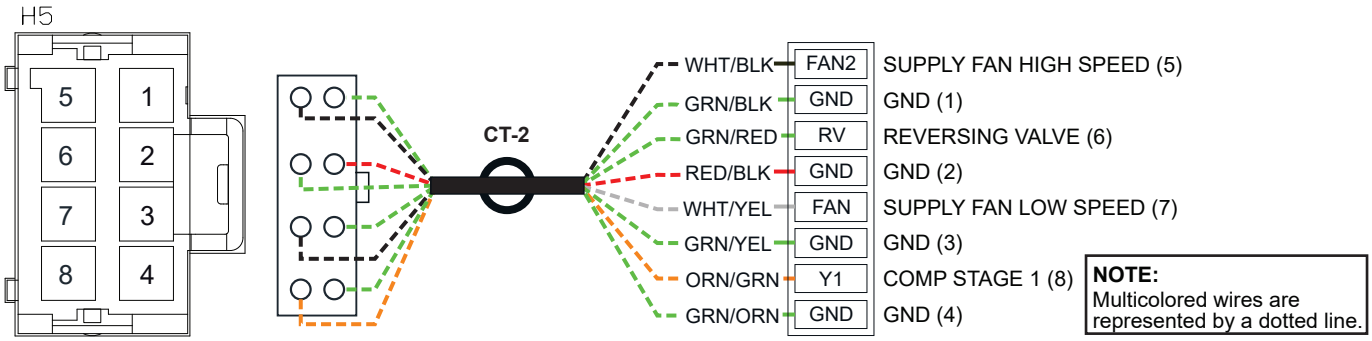


Figure 1-5: H5 Standard Output Harness Wiring

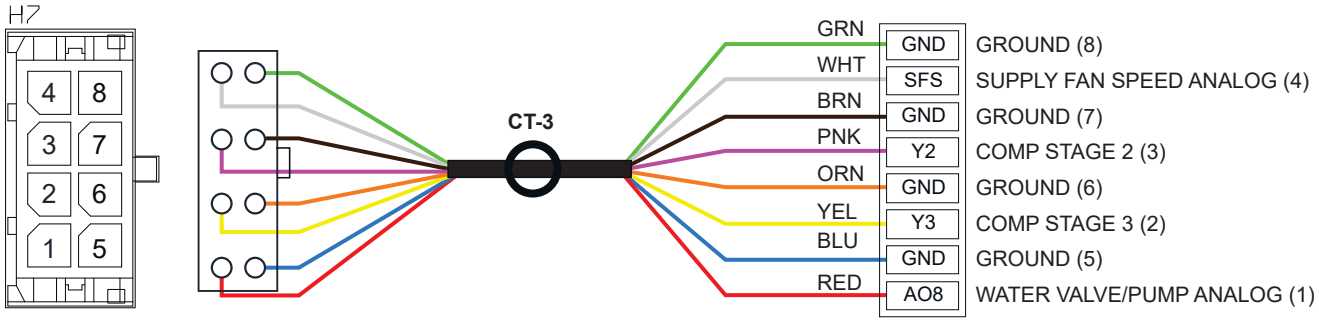


Figure 1-6: H7 Variable Capacity Harness Wiring

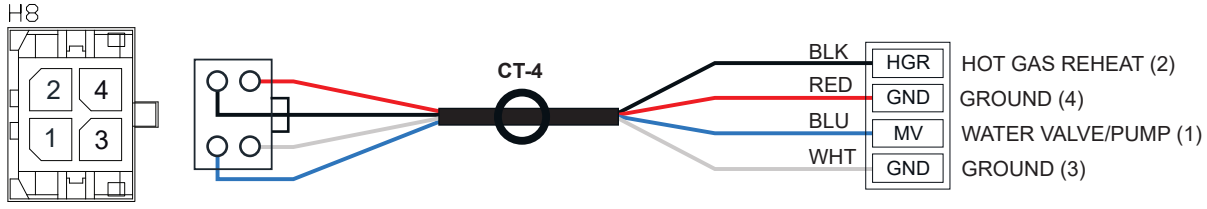


Figure 1-7: H8 Reheat and Water/Valve Pump Harness Wiring

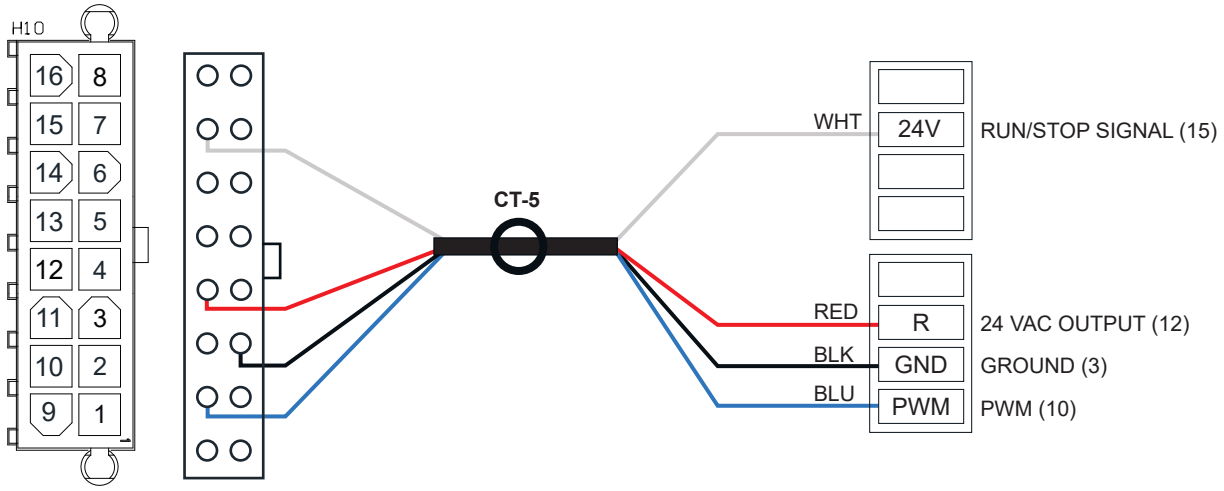


Figure 1-8: H10 WSHP Harness Wiring

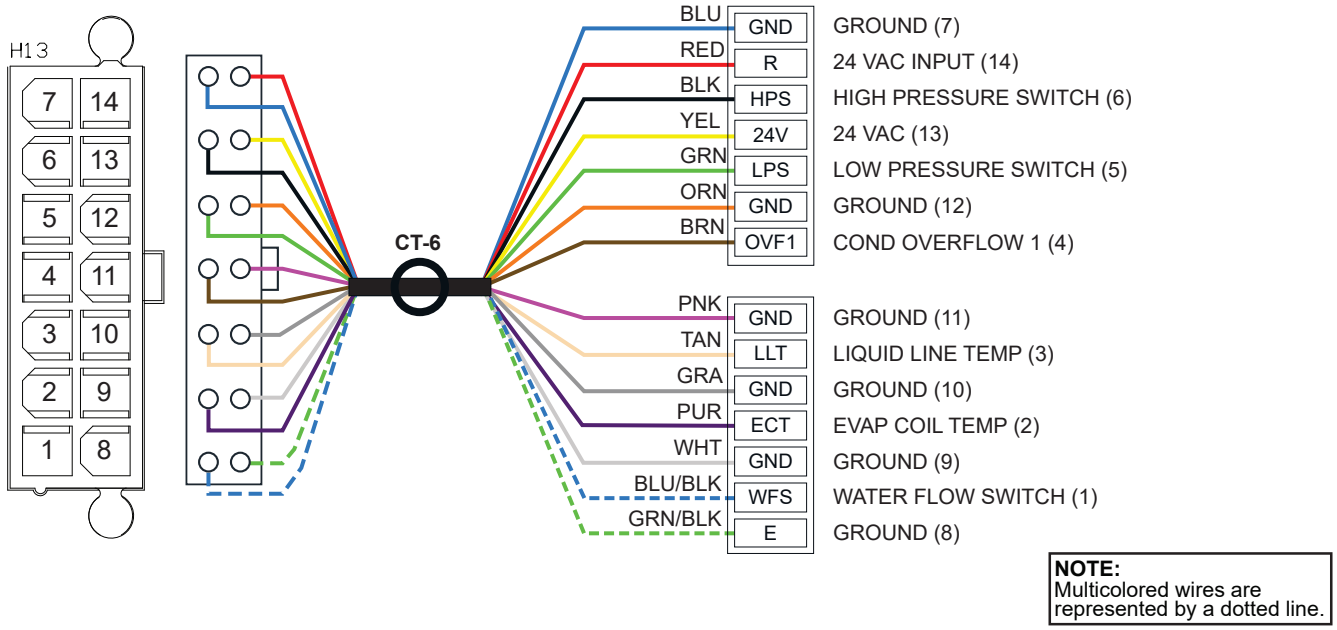


Figure 1-9: H13 Standard Input Harness Wiring

Pioneer Gold Electric Heat Board Components and Wiring

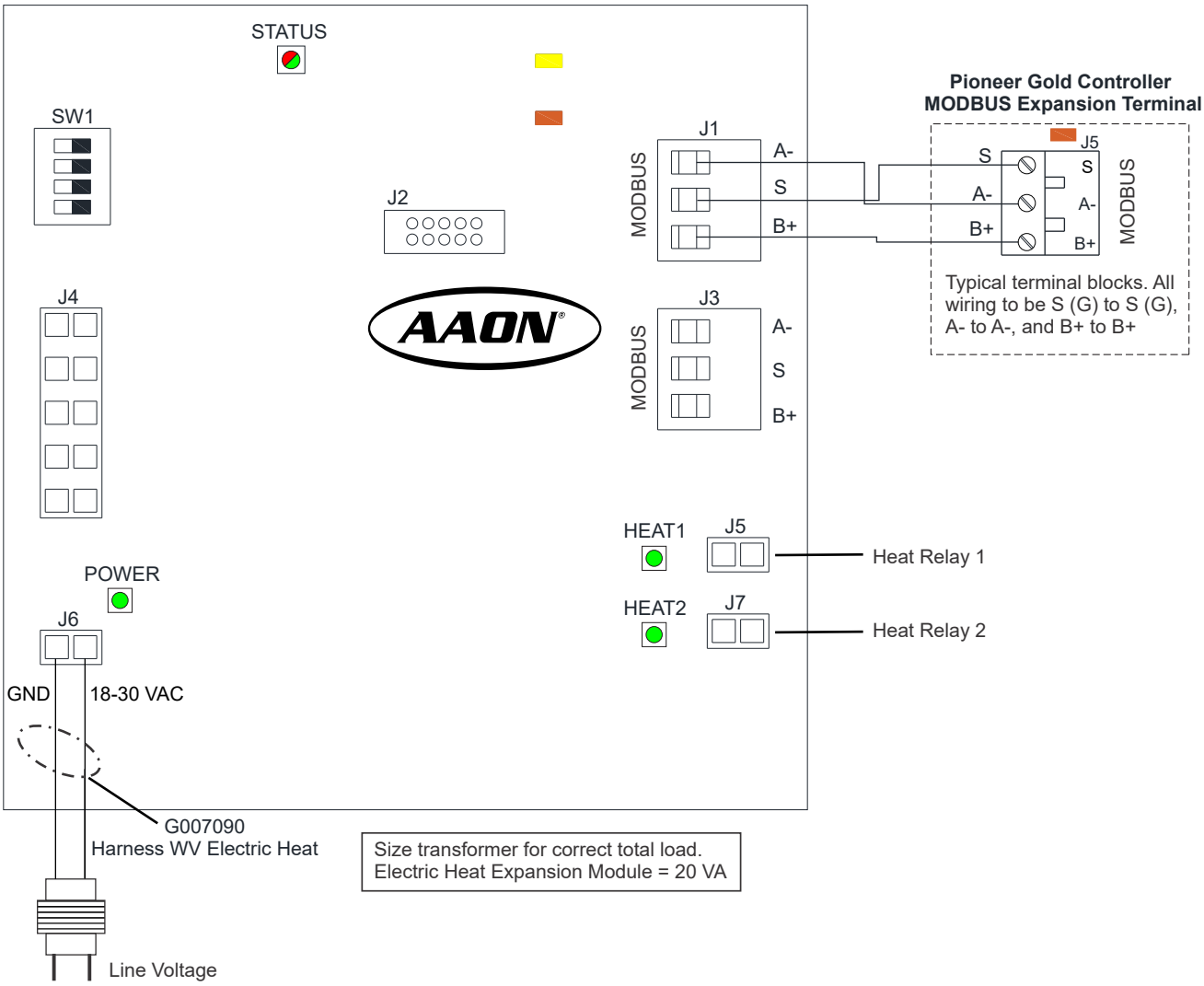


Figure 1-10: Pioneer Gold Electric Heat Board Components and Wiring

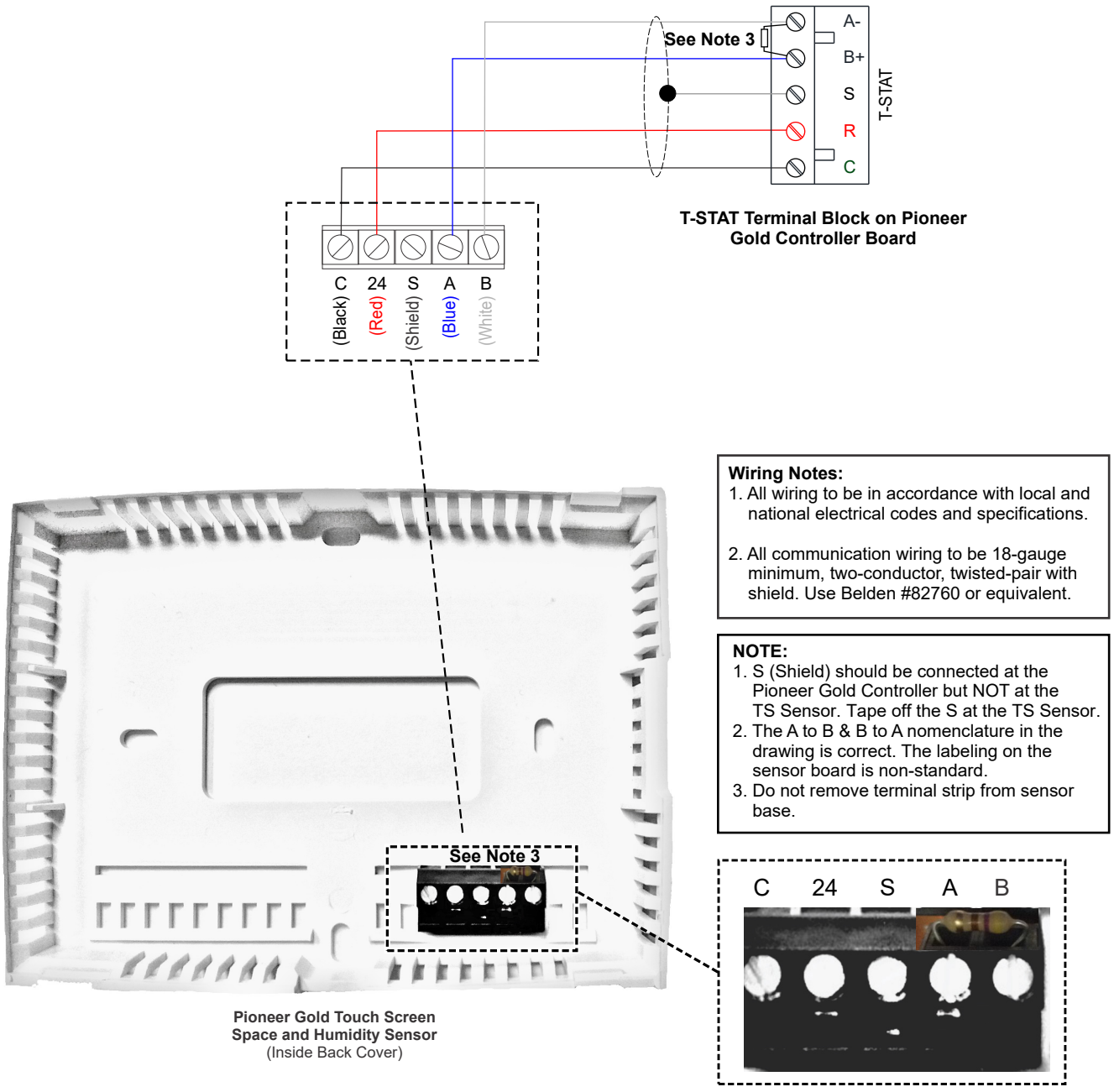


Figure 1-11: Pioneer Gold Touchscreen Space and Humidity Sensor Wiring

Pioneer Gold Controller I/Os

SPT - Suction Pressure Transducer (By Others)

The Suction Pressure Transducer is an optional transducer used to monitor the Suction Pressure (0-500 psi).

DPT - Discharge Pressure Transducer (By Others)

The Discharge Pressure Transducer is an optional transducer used to monitor Discharge Pressure (0-667 psi).

SAT - Supply Air Temperature Sensor

The Supply Air Temperature Sensor is a 10k ohm Type III thermistor sensor used to measure the Supply (Discharge) Air Temperature. This sensor comes shipped loose in the WSHP when the Pioneer Gold Controller is ordered.

CO_2 - Space CO_2 Sensor

This is an input for a field-installed CO_2 Sensor. Sensor must output 0-10V and have a range of 0-2000 ppm.

SPAT - Space Temperature Sensor

The Space Temperature Sensor is a 10k ohm Type III thermistor sensor used to measure the Space Temperature. If also using the Pioneer Gold Digital Touchscreen Space Temperature and Humidity Sensor, the controller will default to the digital sensor.

DMPR OVR - CO_2 Damper Override

This output is used to signal an Outdoor Air Damper if the CO_2 level goes above the setpoint. Output is 0 volts when below the setpoint and 10 volts when above the setpoint.

COF 2 - Condensate Overflow 2

This is a secondary, field-wired Condensate Overflow Alarm Input. An alarm will be generated any time the resistance between this input and ground is less than 100K ohm. This Alarm disables the Compressor outputs as well as the main fan. This can either be a 24 VAC wet input or a dry contact between COM and the input.

AUX - Auxiliary Fault Switch

When this input is energized, the Auxiliary Fault Alarm will occur. Once the compressor completes its Minimum Run Time, it will be de-energized and the fan will continue to run. This can either be a 24 VAC wet input or a dry contact between COM and the input.

ESD - Emergency Shutdown Input

The Emergency Shutdown is a 24 VAC wet input. If 24 VAC is removed from this input, all outputs are de-energized.

WARNING: The Emergency Shutdown input is not to be used for Life Safety applications.

NSB OVR - Night Setback Override

If the "Night Setback Enable" (see next Input) is energized and this input is momentarily energized, the unit will go into Occupied Mode for two hours and look at normal thermostat inputs and then return back to Unoccupied Mode. If the "Night Setback Enable" is removed, the two-hour timer is reset. This is a 24 VAC wet input.

NSB - Night Setback Enable

If the unit is being controlled by a thermostat, this input can be used to force the unit into Unoccupied Mode. While in the Unoccupied Mode, the unit will look at the "Night Setback" input for a Heating call. All other thermostat inputs are ignored. This is a 24 VAC wet input.

NSB TH - Night Setback Thermostat

If the Night Setback Enable is energized, this input is used to put the unit into Heat mode while Occupied. Typically this signal would come from a separate thermostat set at a different setpoint. This is a 24 VAC wet input.

R - 24 VAC - Thermostat

This is the 24 VAC output to thermostat "R" connection.

G - Fan Call - Thermostat

This is the Fan call from a thermostat. This is a 24 VAC wet input

Y1 - Compressor Stage 1 Call - Thermostat

This is the Compressor Stage 1 Call from a thermostat. This is a 24 VAC wet input.

Y2 - Compressor Stage 2 Call - Thermostat

This is the Compressor Stage 2 Call from a thermostat. This is a 24 VAC wet input.

COM - Common or Ground - Thermostat

This is the common or ground connection for the thermostat.

O - Reversing Valve Call - Thermostat

This is the Reversing Valve Call from the thermostat. When energized, the reversing valve will go into the Cool Mode position. This is a 24 VAC wet input.

NOTE: If used in a unit where the reversing valve energizes for heating, you will need to install a normally closed pilot relay to control the reversing valve.

DH - Dehumidification Call - Thermostat

This is the Dehumidification Call from a thermostat. This is a 24 VAC wet input.

W1 - Auxiliary Heat Stage 1 Call - Thermostat

This is the Aux Heat Call from the thermostat. This is a 24 VAC wet input.

ALM - Alarm Output

ALM to COM delivers 24 VAC in an alarm condition.

ALM1/ALM2 - Alarm 1 / Alarm 2 Ouput

ALM1/ ALM2 is a normally closed DRY contact between the two which OPENS in an alarm condition.

HWT - Entering Hot Water Temperature

This input is a 10k ohm Type 3 Thermistor input. It monitors the temperature of water entering the Hot Water Heat Coil. It is currently for monitoring only and not used for control.

WSE - Waterside Economizer Valve

This 24 VAC relay output signal is used to energize the Waterside Economizer valve during Waterside Economizer operation.

EWT - Entering Water Temperature

This input is a 10k ohm Type III thermistor input. It is the temperature of water entering the unit. The only time it is used for control is to determine if the water temperature is sufficient for Waterside Economizer (WSE). If you do not have WSE configured, this input is for status only.

FAN 2 - Supply Fan High Speed

This 24 VAC relay output signal is used to engage the fan to run at high speed.

RV - Reversing Valve

This 24 VAC relay output signal is used to energize the reversing valve (to cooling position).

FAN - Supply Fan Low Speed

This 24 VAC relay output signal is used to engage the fan to run at low speed.

Y1 - Compressor Stage 1

This 24 VAC relay output signal is used to energize the compressor contactor (i.e. step 1 of 2-step compressor).

SFS - Supply Fan Speed Analog

This 0-10VDC output signal is used to provide the speed command for an electronically commutated motor (ECM). The VDC level outputted corresponds with the Supply Fan Minimum Percentage Setpoint when the Supply Fan Low Speed command is active, and increases to the Supply Fan Maximum Percentage Setpoint when the Supply Fan High Speed command is active.

Y2 - Compressor Stage 2

This 24 VAC relay output signal is used to energize the solenoid for the second step of the Compressor for full capacity.

HGR - Hot Gas Reheat Valve

This 24 VAC relay output signal is used to energize the HGRH valve during Dehumidification Mode.

MV - Motorized Water Valve/Pump

This 24 VAC relay output signal is used to energize the Water Valve/Pump during normal compressor operation, unless the "Full Reheat" during Dehumidification option is enabled. Please use the H8 Harness to wire-in an open/closed 24 VAC Water Valve.

HPS - High Pressure Switch

This input is used to monitor the High Pressure Switch. If the compressor is running and the signal is removed from this input, a High Pressure Switch Alarm will be generated. It will also immediately disable the compressors and the fan will remain running. The compressor will not be allowed to start if this input signal is missing. This input is a 24 VAC wet input.

LPS - Low Pressure Switch

This input is used to monitor the Low Pressure Switch. If the compressor is running and the signal is removed from the input for more than 10 seconds, a Low Pressure Switch Alarm is generated. It will also disable the compressors and the fan will remain running. If this alarm is generated two times within two hours, the unit will "hard" lockout and require a power cycle to continue operation.

COF - Condensate Overflow 1

This is a factory wired Condensate Overflow Alarm Input. An alarm will be generated any time the resistance between this input and ground is less than 100K ohm. This Alarm disables the compressor outputs as well as the main fan. This is a dry input (contact closure to COM).

LLT - Liquid Line Temperature

This is a 10k ohm Type III thermistor input. It is the temperature of the refrigerant liquid line. If the Liquid Line Temperature (LLT) drops to a dangerous level, the Liquid Line Temperature Alarm will be generated and the compressors will be disabled. When the LLT rises above the safe limit again, this alarm will be reset. The temperatures for triggering and clearing this alarm are based on the glycol % programmed into the board. See **Table 1-14, page 1-32**.

UI1 - Leaving Water Temperature

This is a 10k ohm Type III thermistor input. It is the temperature of the leaving water. If the Leaving Water Temperature (LWT) drops to a dangerous level, the Low Leaving Water Temperature Alarm will be generated and the compressors will be disabled. When the LWT rises above the safe limit again, this alarm will be reset. The temperatures for triggering and clearing this alarm are based on the glycol % programmed into the board. See Table 1-10, page 1-36.

UI2 - Space Sensor Slide Adjust

If the Space Temperature Sensor being used has the optional slide adjust feature, its AUX output is connected to this input. The slide adjust control is used to vary the Heat and Cool Setpoints by a user-configured maximum amount.

ECT - Evaporator Coil Temperature

This is a 10k ohm Type III thermistor input. It is the temperature of the Suction Line. If the Suction Line Temperature drops below 30ºF, a Low Evaporator Coil Temperature Alarm will be generated. The compressors will be disabled and the fan will remain energized. The alarm will clear when the Suction Line Temperature rises above 45ºF

DI1 and DI2 - Compressor Interlock 1 and 2

These inputs provide generic status and alarms that can be used for field-installed equipment such as airflow switches, waterflow switches, or water valve end switches. The compressor will not be allowed to start until the input is energized. Once running, the compressor will be disabled if the input is de-energized. The compressor interlock option must be enabled using the Configuration Menu to enable the alarm; otherwise, these inputs are status-only.

Space/Room Sensor Controlled

Configuration must be set to Space Sensor Controlled (CAV).

Random Start Delay

The controller will enter a random start delay in these situations:

- The unit powers up.
- Recovery from emergency shutdown alarm.
- Recovery from high voltage alarm.
- Recovery from low voltage alarm.

The Random Start Delay will be between three and 60 seconds. The fan, compressor, and reversing valve will not be operational during this time.

Occupancy/Supply Fan Operation

Building Occupancy Status

Occupied Mode Operation Options:

- Internal Schedule
- Network Occupancy Point (BACnet®)

Occupied Mode Operation

The controller will use Occupied Setpoints for Heating, Cooling, and Dehumidification Modes.

Unoccupied Mode Operation

While in Unoccupied Mode, the controller will use unoccupied setpoints for Heating and Cooling Modes and the Occupied Dehumidification Mode Setpoint for Dehumidification Mode.

Supply Fan

Any time the Supply Fan is requested to start, a 30 second minimum off timer must be satisfied. If the timer is satisfied, the Supply Fan will be energized. In Auto Mode or when transitioning to Unoccupied Mode, the Supply Fan is held on for 15 seconds after the last stage of Cooling, Heating, or Dehumidification stages off.

The Supply Fan can be configured for three modes:

- **Auto:** Default. Cycles on with Cooling, Heating, and Dehumidification Modes.
- **On:** To run continuously.
  Off: Unit will not run with Cooling, Heating, and Dehumidification demands.
- **Occupied On / Unoccupied Auto:** During Occupied Mode, the fan will be on. During Unoccupied Mode, the fan will operate as in Auto.

Ventilation Mode

Ventilation Mode occurs during the Occupied or Unoccupied Mode when the Supply Fan is configured for continuous (ON) operation and there is no demand for cooling, heating, or dehumidification.

Supply Fan Motors

Single Speed Permanent-Split Capacitor (PSC) or Electronically Commutated Motor (ECM)

With a single speed PSC or ECM, the Supply Fan will be enabled and will always run at full speed when called for.

Two-Speed Electronically Commutated Motor (ECM)

With a two-speed ECM, the Supply Fan will have two speed operations—low speed and high speed.

The Supply Fan speeds will correspond to the below listed operating functions.

- **Ventilation Mode:** Low Speed
- **Single Stage Compressor "Y1":** High Speed
- **Two Stage Compressor "Y1":** Low Speed
- **Two Stage Compressor "Y2":** High Speed
- **Supplemental Heating:** High Speed
- **Dehumidification:** Low Speed
- **Waterside Economizer:** High Speed

Supply Fan Control

Constant Air Volume (CAV)

The Supply Fan will always run at a constant speed. If two-speed ECM is selected, the Supply Fan will operate according to low or high speeds as defined previously.

NOTE: CFM settings are preprogrammed on the fan. Supply Fan Min and Max Setpoints are used to set fan speed.

Space/Room Sensor Control Compressor Operation

Compressor Operation

Compressor(s) will only operate if the Supply Fan has been enabled for a minimum of five seconds.

Cooling Mode is enabled when the Space Temperature rises above the active Cooling Setpoint (default: 74°F) plus the deadband (default: 1°F; range: 1-5°F). Cooling Mode is disabled when the Space Temperature falls below the active Cooling Setpoint minus the deadband.

Heating Mode is enabled when the Space Temperature falls below the active Heating Setpoint (default: 70°F) minus the deadband (default: 1°F; range: 1-5°F). Heating Mode is disabled when the Space Temperature rises above the active Heating Setpoint plus the deadband.

Compressor staging up and staging down are subject to the following setpoints:

- **Compressor On Delay**
  - (5 seconds, non-adjustable)
- **Compressor Minimum On Time**
  - (default: 180 seconds; range: 120-255 seconds)
- **Compressor Minimum Off Time**
  - (default: 120 seconds; range: 60-255 seconds)
- **Compressor Interstage On Delay**
  - (default: 60 seconds; range: 30-255 seconds)
- **Compressor Interstage Off Delay**
  - (default: 60 seconds; range: 30-255 seconds)

If the unit goes into an alarm, the minimum on time of the compressor(s) will be ignored and the compressor(s) will be disabled.

On/Off Compressor (Scroll or Rotary)

In Cooling or Heating Mode, the compressor will be enabled. There is no Supply Air Temperature Control.

Multiple Stage Compressors

Stage Up Sequence

In Cooling Mode, as the Supply Air Temperature rises above the active Supply Air Temperature Cooling Setpoint (default: 55°F; range: 45-65°F) plus the deadband (2°F; non-adjustable), the compressor(s) will stage up. The compressors will operate on a PID loop function. Once the PID loop calls for the next stage to be on and the Compressor Interstage On Delay time has been met, the next stage of cooling will be enabled.

In Heating Mode, as the Supply Air Temperature falls below the active Supply Air Temperature Heating Setpoint (default: 90°F; range: 55-120°F) minus the deadband (2°F; nonadjustable), the compressor(s) will stage up. The compressors will operate on a PID loop function. Once the PID loop calls for the next stage to be on and the Compressor Interstage On Delay time has been met, the next stage of Compressor will be enabled.

Stage Down Sequence

In Cooling Mode, as the Supply Air Temperature falls below the active Supply Air Temperature Cooling Setpoint (default: 55°F; range: 45-65°F) minus the deadband (2°F; non-adjustable), the compressor(s) will stage off as minimum run times and stage down delays allow.

In Heating Mode, as the Supply Air Temperature rises above the active Supply Air Temperature Heating Setpoint (default: 90°F; range: 55-120°F) plus the deadband (2°F; non-adjustable), the compressor(s) will stage off as minimum run times and stage down delays allow.

Reversing Valve Operation

For a single stage compressor, the Reversing Valve will enable if the controller calls for compressor cooling and the compressor has been operational for a minimum of five seconds. This delay allows the difference in line pressures to assist the reversing valve in changing positions. Once the mode of operation has been satisfied and there is no longer a need for compressor operation, the Reversing Valve will stay in the last mode until the mode changes and (one second later) the compressor will be disabled.

For a single compressor two-stage application, when the first compressor stage "Y1" is called for, the compressor will first enable at full capacity "Y2". After five seconds, the reversing valve will change positions, and following an additional three seconds, the compressor will stage down to "Y1" operation.

The default Reversing Valve position is for Heating operation.

NOTE: The Pioneer Gold energizes its reversing valve for cooling. If the Pioneer Gold is used in a unit where the reversing valve energizes for heating, you will need to install a normally closed pilot relay to control the reversing valve.

Electric Heat Operation

External Duct Heaters

The W1 Heat Output is designed to be used with duct heaters. The duct heaters will provide any staging, delays, and safety protections required.

If the Electric Heat Configuration is set to off, then the W1 additional heat staging output will not be used for external duct heat.

If the Electric Heat Configuration is set to Auxiliary, then the W1 heat output will be used as a supplemental stage of heating to the compressors. It will be the last stage of heating enabled and the first stage disabled when maintaining the PID Heating Supply Air Temperature Setpoint. Auxiliary Heat is enabled when the Supply Air Temperature is below the active Supply Air Temperature Heat Setpoint (default: 90°F; range: 55-120°F) minus the Auxiliary Heat deadband (default: 5°F; range: 1-10°F) and the PID staging and interstage delays have been met. Additionally, if the compressor is locked out, the Electric Duct Heat will be used in an attempt to maintain the active Supply Air Temperature Heat Setpoint.

If the Electric Heat Configuration is set to Emergency, then the W1 heat output will be enabled when compressor heating is locked out and there is a demand for heating. Emergency heat will not operate in addition to compressor heating. There is no supply air control.

Waterside Economizer Operation

On/Off Waterside Economizer (WSE) Coil Operation

In this operation, the Waterside Economizer (WSE) can be configured for four modes:

- **Off:** Default. No condenser water loop function.
- **Cool Only:** WSE Valve cycles on based on Cooling Entering Water Temperature Setpoints.
- **Heat Only:** WSE Valve cycles on based on Heating Entering Water Temperature Setpoints.
- **Dual:** WSE Valve cycles on based on Entering Water Temperature Setpoints of corresponding mode demand.

Cool Only Operation

The WSE will act as the unit's first stage of Cooling. As the Entering Water Temperature drops below the Cooling Entering Water Temperature Setpoint (default: 45°F; range: 45-60°F), the call for the compressor, if enabled, will be removed once the minimum on time has been satisfied, and the WSE 24VAC output will be enabled, sending the cold loop water through the air coil to utilize "free cooling". Once the Entering Water Temperature rises above the Cooling Entering Water Temperature Setpoint plus the deadband (2.5°F; non-adjustable), the WSE will be disabled, and compressor cooling will be utilized following a 60 second delay.

If the cooling call has not been satisfied within 10 minutes of operation, the WSE valve will disable. Following a 60 second delay, the unit will resume normal compressor cooling operation until the cooling input is removed. When this happens, the display will signify the WSE was unable to meet the cooling call.

For Freeze Protection, the Entering Water Temperature will be monitored.

Heat Only Operation

The WSE will act as the unit's first stage of Heating. As the Entering Water Temperature rises above the Heating Entering Water Temperature Setpoint (default: 85°F; range: 80-90°F), if the compressor is enabled, the call for the compressor will be removed once the minimum on time has been satisfied, and the WSE 24 VAC output will be enabled, sending the hot loop water through the air coil to utilize "free heating". Once the Entering Water Temperature falls below the Heating Entering Water Temperature Setpoint minus the deadband (2.5°F; non-adjustable), the WSE will be disabled, and compressor heating will be utilized following a 60 second delay.

NOTE: The max allowable Entering Water Temperature as listed in the WH/WV operating limits is 90°F when the unit is in Heating Mode.

If the heating call has not been satisfied within 10 minutes of operation, the WSE valve will disable. Following a 60 second delay, the unit will resume normal compressor heating operation until the heating input is removed. When this happens, the display will signify the WSE was unable to meet the heating call.

Dual Operation

The Entering Water Temperature is monitored according to the demand required (heating or cooling), as described in its corresponding mode above.

Dehumidification Operation

Dehumidification Mode is enabled when the Space Humidity Sensor value rises above the Dehumidification Enable Setpoint (default: 50% RH; range: 40-60% RH) plus the deadband (2%, non-adjustable). Dehumidification Mode is disabled when the Space Humidity Sensor value falls below the Dehumidification Enable Setpoint minus the deadband.

Dehumidification can be selected as a priority mode and will be active any time the Space Humidity is above the Dehumidification Enable Setpoint. Default is non-priority, where Dehumidification will only be available when the Cooling and Heating demands are satisfied.

Fan Speed Dehumidification

During Fan Speed Dehumidification, the unit operates according to the Cooling sequence of operation, with the exception that the Supply Fan low/dehumidification speed output is enabled in lieu of high/cooling speed (low speed for discrete speed ECMs and dehumidification for constant CFM ECM). Compressor(s) operates at full capacity (Y1 and Y2) during Dehumidification.

If a WSE is present, and the Entering Water Temperature falls below the Cooling Entering Water Temperature Setpoint (default: 45°F; range: 45-60°F), the Waterside Economizer Coil will be enabled and operate as described in the Waterside Economizer Operation section.

For Freeze Protection, the Leaving Water Temperature and Evaporator Coil Temperature will be monitored, and the unit will be protected according to the selected setpoints.

Hot Gas Reheat Dehumidification

During Hot Gas Reheat Dehumidification, the compressor is enabled at full capacity “Y2” when Dehumidification Mode is enabled. The supply fan low/dehumidification speed and reheat valve “HG” 24 VAC outputs are enabled. If the unit is equipped with WSE, the Entering Water Temperature Setpoint for WSE transition is ignored, and freeze protection is still monitored. The Hot Gas Reheat Solenoid will stage on/off subject to the minimum on and off times being met (one minute each).

For Freeze Protection, the Leaving Water Temperature and Evaporator Coil Temperature will be monitored, and the unit will be protected according to the selected setpoints.

If Dehumidification Mode is priority, and the controller is in Dehumidification Mode, but the Control Temperature Sensor also requires cooling or heating, the cooling or heating calls will be ignored until the Dehumidification call is satisfied.

If Dehumidification Mode is NOT priority, and the controller is in Dehumidification Mode, but the Control Temperature Sensor then requires Cooling Mode, the controller will disable reheat and transition to Cooling Mode. If Dehumidification Mode is NOT priority, and the controller is in Dehumidification Mode, but the Control Temperature Sensor then requires Heating Mode, the controller will disable reheat and disable the reversing valve, entering Heating Mode.

If the controller is transitioning from Cooling Mode directly to Dehumidification Mode, when Dehumidification Mode is NOT priority, the compressors will remain enabled, reheat will be enabled, and the Supply Fan will stage down.

Additional Feature Sequences

Outdoor Air Damper Operation

CO_2 Control Override

As the CO_2 (Space or Return Sensor) rises above the CO_2 Setpoint (default: 900ppm; range: 500-1500ppm), a (10 VDC) signal will be sent to the outside air damper to modulate open, and a General Alarm will be displayed. As the CO_2 falls below the CO_2 Setpoint minus the deadband (20ppm, non-adjustable), the signal to the outside air damper will be removed.

Thermostat Controlled

Configuration must be set to Thermostat Controlled (T-STAT).

Random Start Delay

The controller will enter a random start delay in these situations:

1. The unit powers up
2. Recovery from emergency shutdown alarm
3. Recovery from high voltage alarm
4. Recovery from low voltage alarm
5. Night setback mode is disabled

The Random Start Delay will be between three and 60 seconds. The fan, compressor, and reversing valve will not be operational during this time. The Random Start Delay will be ignored if the unit is in test mode.

Occupancy/Supply Fan Operation

Building Occupancy Status

Normal/Occupied Mode

The controller will operate according to the thermostat inputs.

Night Setback Mode

Night Setback Mode is enabled upon receiving a 24 VAC or 24 VAC common input to the "NSB" terminal. While in Night Setback Mode, the controller will ignore all normal thermostat fan and compressor enable inputs on "G", "Y1", and "Y2" terminals. Instead, the controller will use the "NSB TH" input as the fan and compressor enabling signal, operating at full "Y2" compressor operation.

The Night Setback Mode can be overridden with a 24 VAC input to the Night Setback override terminal "NSB OVR". Once the override signal is received, Night Setback will be overridden for two hours, even if the signal is removed. While Night Setback is overridden, the controller will respond to the normal thermostat signals.

Supply Fan Operation

The Supply Fan will enable upon receiving a 24VAC input on the "G" terminal or upon a call for compressor operation, unless an alarm prevents the fan from operating. Any time the Supply Fan has a request to start, a 30 second minimum off timer must be satisfied. The Supply Fan is held on for 15 seconds after the last stage of cooling, heating, or dehumidification stages off.

Single Speed Permanent-Split Capacitor (PSC) or Electronically Commutated Motor (ECM)

With a single speed PSC or ECM, the Supply Fan will be enabled and will always run at full speed when called for (through the "Fan" Relay Output terminal).

Two Speed Electronically Commutated Motor (ECM)

With a two speed ECM, the Supply Fan will have two speed operations: "low speed" and "high speed". Relay output "Fan" will correspond to "low speed" and "Fan2" will correspond to "high speed".

The Supply Fan speeds will correspond to the below listed operating functions.

- **Supply Fan "G" call only:** Low Speed
- **Single Stage Compressor "Y1":** High Speed
- **Two Stage Compressor "Y1":** Low Speed
- **Two Stage Compressor "Y2":** High Speed
- **Supplemental Heating:** High Speed
- **Dehumidification:** Low Speed
- **Waterside Economizer:** High Speed

CFM Controlled Electronically Commutated Motor (ECM)

With a CFM controlled ECM, the Supply Fan will modulate to maintain a target CFM based on the operating functions through a 16-pin connector. Fan Speed Settings for Cooling, Heating, and Dehumidification Modes are selected through the display.

Thermostat Controlled Compressor, Reversing Valve, and Electric Heat

Compressor Operation

Unless an alarm is active, the compressor will enable upon receiving a 24 VAC input on the "Y1" terminal or upon receiving a 24 VAC input on the "TH_NS" terminal if in Night Setback Mode. The water valve/pump terminal will energize right away when the input is received into "Y1". If the Supply Fan was not enabled prior to the compressor call, then the Supply Fan will enable for 5 seconds before the compressor is started.

Compressor staging up and staging down are subject to the following setpoints:

- **Compressor On Delay**
  - (5 seconds, non-adjustable)
- **Compressor Minimum On Time**
  - (default: 180 seconds; range: 120-255 seconds)
- **Compressor Minimum Off Time**
  - (default: 120 seconds; range: 60-255 seconds)
- **Compressor Interstage On Delay**
  - (default: 60 seconds; range: 30-255 seconds)
- **Compressor Interstage Off Delay**
  - (default: 60 seconds; range: 30-255 seconds)

If the unit goes into an alarm, the minimum on time of the compressor(s) will be ignored and the compressor(s) will be disabled. All alarms will disable the compressor(s).

Reversing Valve Operation

For a single stage compressor, the Reversing Valve will enable if the controller receives a 24 VAC input on the "O" terminal and the compressor has been operational for a minimum of five seconds. This delay allows the difference in line pressures to assist the Reversing Valve in changing positions. Once the compressor call is removed, the Reversing Valve will remain in the same position until the mode change requires it to shift and (one second later) the compressor will be disabled.

For a single compressor two-stage application, when the first compressor stage "Y1" is called for and the Reversing Valve in the opposite state required, the compressor will first enable at full capacity "Y2", and after five seconds, the reversing valve will change positions. Following an additional three seconds, the compressor will stage down to "Y1" operation.

The default Reversing Valve position is for heating operation, no 24 VAC input on the "O" terminal. Therefore, in compressor cooling operation, 24 VAC must be applied to the "O" terminal.

Electric Heat Operation

External Duct Heater(s)

The W1 Heat Output is designed to be used with duct heaters. The W1 heat output will be enabled whenever the W1 input has 24VAC applied to it. The duct heaters will provide any staging, delays, and safety protections required.

Integral Electric Heat (Electric Heat Board)

Integral Electric Heat Inputs and Outputs will be contained within an expansion module. The Electric Heat configuration must be set to "Aux" or "Emergency". Whenever the W1 input has 24VAC applied to it, the heat stages will enable and disable according to its interstage delays.

Waterside Economizer Operation (WSE)

On/Off Waterside Economizer (WSE) Coil Operation

In this operation, the Waterside Economizer (WSE) can be configured for four modes:

- **Off:** Default. No condenser water loop function.
- **Cool Only:** WSE Valve cycles ON based on Cooling Entering Water Temperature Setpoints.
- **Heat Only:** WSE Valve cycles ON based on Heating Entering Water Temperature Setpoints.
- **Dual:** WSE Valve cycles ON based on Entering Water Temperature Setpoints of corresponding mode demand.

Cool Only Operation

The WSE will act as the unit's first stage of cooling. As the Entering Water Temperature drops below the Cooling Entering Water Temperature Setpoint (default: 45°F; range: 45-60°F), the call for the compressor, if enabled, will be removed once the minimum on time has been satisfied, and the WSE 24 VAC output will be enabled, sending the cold loop water through the air coil to utilize "free cooling". Once the Entering Water Temperature rises above the Cooling Entering Water Temperature Setpoint plus the deadband (2.5°F; non-adjustable), the WSE will be disabled, and compressor cooling will be utilized following a 60 second delay.

If the cooling call has not been satisfied within a user-adjustable time in minutes of operation (default: 10 minutes; range: 10-255 minutes), the WSE Valve will disable. Following a 60 second delay, the unit will resume normal compressor cooling operation until the cooling input is removed. When this happens, the Waterside Economizer alarm will signify the WSE was unable to meet the cooling call.

For Freeze Protection, the Entering Water Temperature will be monitored.

Heat Only Operation

The WSE will act as the unit's first stage of heating. As the Entering Water Temperature rises above the Heating Entering Water Temperature Setpoint (default: 85°F; range: 80-90°F), if the compressor is enabled, the call for the compressor will be removed once the minimum on time has been satisfied, and the WSE 24VAC output will be enabled, sending the hot loop water through the air coil to utilize "free heating". Once the Entering Water Temperature falls below the Heating Entering Water Temperature Setpoint minus the deadband (2.5°F; non-adjustable), the WSE will be disabled, and compressor heating will be utilized.

NOTE: The max allowable Entering Water Temperature as listed in the WH/WV operating limits is 90°F when the unit is in heating mode.

If the heating call has not been satisfied within user-adjustable time in minutes of operation (default: 10 minutes; range: 10-255 minutes), the WSE valve will disable. Following a 60 second delay, the unit will resume normal compressor heating operation until the heating input is removed. When this happens, the controller will display a Waterside Economizer Failed alarm.

Dual Operation

The Entering Water Temperature is monitored according to the demand required (heating or cooling), as described in its corresponding mode above.

Dehumidification Operation

Dehumidification Mode is enabled when 24 VAC is receiving into the "DH" input. Dehumidification Mode is disabled when 24 VAC is removed.

Dehumidification can be selected as a priority mode and will be active anytime the "DH" input is receiving 24 VAC, regardless of a demand for heating or cooling. Default is non-priority, where dehumidification will only be available when the cooling and heating demands are satisfied.

Fan Speed Dehumidification

When in Dehumidification Mode, the unit operates according to the cooling sequence of operation, with the exception that the supply fan low/dehumidification speed output is enabled in lieu of high/cooling speed (low speed for discrete speed ECMs, and dehumidification for constant CFM ECM). Compressor(s) operates at full capacity (Y1 and Y2) during Dehumidification Mode.

If a WSE is present, and the Entering Water Temperature falls below the Cooling Entering Water Temperature Setpoint (default: 45°F; range: 45-60°F), the WSE coil will be enabled and operate as described in the Waterside Economizer Operation section (**page 1-20**).

For Freeze Protection, the Leaving Water Temperature will be monitored, and the unit will be protected according to the selected setpoints.

Hot Gas Reheat Dehumidification

The compressor is enabled at full capacity "Y2" when dehumidification mode is enabled. The supply fan low dehumidification speed and reheat valve "HG" 24VAC outputs are enabled. If the unit is equipped with WSE, the Entering Water Temperature Setpoint for WSE transition is ignored, and freeze protection is still monitored. The Hot Gas Reheat Solenoid will stage on/off subject to the minimum on and off times being met (one minute each).

For Freeze Protection, the Leaving Water Temperature will be monitored, and the unit will be protected according to the selected setpoints.

If Dehumidification Mode is priority, and the controller is in Dehumidification Mode, but the Control Temperature Sensor also requires Cooling or Heating, the Cooling or Heating calls will be ignored until the Dehumidification call is satisfied.

If Dehumidification Mode is NOT priority, and the controller is in the Dehumidification Mode, but Control Temperature Sensor then requires Cooling Mode, the controller will disable reheat and transition to Cooling Mode. If Dehumidification Mode is NOT priority, and the controller is in Dehumidification Mode, but the Control Temperature Sensor then requires Heating Mode, the controller will disable reheat and disable the Reversing Valve, entering Heating Mode.

If the controller is transitioning from Cooling Mode directly to Dehumidification Mode when Dehumidification Mode is NOT priority, the compressors will remain enabled, reheat will be enabled, and the supply fan will stage down.

Additional Feature Sequences

Outdoor Air Damper Operation

CO_2 Control Override

As the CO_2 (Space or Return Sensor) rises above the CO_2 Setpoint (default: 900ppm; range: 500-1500ppm), a (10 VDC) signal will be sent to the outdoor air damper to modulate open, and a General Alarm will be displayed. As the CO_2 falls below the CO_2 Setpoint minus the deadband (20ppm; non-adjustable), the signal to the outdoor air damper will be removed.

Alarms

All alarms will be monitored and displayed through the Pioneer Gold Controller, unless otherwise specified.

A Status LED indicates the unit status. A green status light indicates that the unit is powered up. A red "Alarm" relay LED indicates that the controller has detected a fault condition and is now in Alarm mode.

Automatic Reset Alarms

The following alarms will automatically reset themselves once the fault condition clears.

Low Control Voltage Alarm

The Low Control Voltage Alarm will trigger when the 24 VAC control voltage drops to 18 VAC +/-5%. Below this voltage, the onboard normally open relays are not guaranteed to close. This alarm will disable the compressor, the supply fan, and the Reversing Valve. The low voltage alarm will release when the voltage rises above 20 VAC +/-5%. Once the fault is cleared, the controller will activate a random start delay.

High Control Voltage Alarm

The High Control Voltage Alarm will trigger when the 24 VAC control voltage increases to 32 VAC +/-5%. Any voltage higher than this risks damaging components on the control board. This alarm will disable the compressor, the supply fan, and the Reversing Valve. The alarm will release when the control voltage decreases to 30 VAC +/-5%. Once the fault is cleared, the controller will activate a random start delay.

Entering Water Temperature Alarm

The Entering Water Temperature Alarm will trigger if the entering water temperature becomes too cold or becomes out of range. The alarm will trigger if the entering water temperature drops below 30°F for two minutes. This alarm will disable waterside economizer operation but allow operation of the compressor and supply fan. The alarm will release when the entering water temperature rises above 35°F.

Evaporator Coil Temperature Alarm

The Evaporator Coil Temperature Alarm will trigger if the suction line temperature drops below 30°F or becomes out of range. The alarm will release when the coil temperature increases to 45°F. This alarm will disable the compressor but allow operation of the supply fan.

Space Sensor Alarm

The Space Sensor Alarm will trigger if the space temperature or humidity sensor readings are out of range, or communication is lost to the sensor. This alarm will disable the compressor but allow operation of the supply fan. The alarm will release when the space sensor reading is in the acceptable range (Space Temperature: 35-110°F; Space Humidity: 5-99%).

Entering Hot Water Temperature Alarm

The Entering Hot Water Temperature Alarm will trigger if the entering hot water temperature becomes too cold or becomes out of range. The alarm will trigger if the entering hot water temperature drops below the space temperature or hot water temperature readings are out of range. This alarm will disable hot water coil operation but will allow operation of the compressor and supply fan. The alarm will release when the entering hot water temperature rises above the space temperature. Acceptable water temperature range is -10°F to 212°F.

CO_2 Override Alarm

The CO_2 Override Alarm will trigger if the space CO_2 level reads above setpoint or becomes out of range. This alarm will allow operation of all functions, and will output a signal through the CO_2 Damper Override terminal. The alarm will release when the CO_2 level drops below the setpoint minus deadband.

Emergency Shutdown Alarm

The Emergency Shutdown Input requires a constant connection to 24 VAC for normal operation. If the 24 VAC signal is removed, then the controller will enter Emergency Shutdown Mode. This alarm will disable the compressor and the supply fan. This alarm will release when the 24 VAC input is restored.

WARNING: The Emergency Shutdown Alarm is not a Fire/Life Safety Device.

High Supply Air Temperature (SAT) Cutoff Alarm

The High SAT Cutoff Alarm will disable compressor operation if the SAT is above 125°F for two minutes. The alarm will release after five minutes and the SAT is below 120°F.

Lock-Out Alarms

The lock-out alarms will not automatically reset themselves once the fault condition clears. For these alarms to clear, one of the following conditions must be met:

1. Controller is power cycled.
2. Fault condition is corrected and the compressor call is removed.
3. BACnet® "Unit Lockout Remote Reset" (point BV:46) is set true.

Auxiliary Input Alarm

The Auxiliary Input Alarm will enable if the compressor has been operational for the minimum on time and a dry contact has been made between the "AUX" and "COM" quick disconnect terminals for 10 seconds. This alarm will disable the compressor but will allow the supply fan to operate.

Condensate Overflow Alarm

The Condensate Pan Overflow Alarm will enable if the resistance between the condensate overflow sensor(s) and 24 VAC common is less than 100k ohm for more than 30 seconds. This alarm will disable both the compressor and the supply fan.

High Discharge Pressure Alarm

The High Discharge Pressure Alarm will enable if the high pressure switch opens. This alarm will immediately disable the compressor but will continue to allow the supply fan to operate. The High Discharge Pressure Alarm will remain active for a minimum of 15 minutes. The compressor will restart after 15 minutes if the high pressure switch is closed. A second High Discharge Pressure alarm within two hours will cause a soft lockout.

DI1 Compressor Interlock Alarm

The DI1 Compressor Interlock Alarm will trigger if the input is not energized for at least five seconds within one minute of a compressor call. If the compressor is running, the alarm will trigger if the input is de-energized for five seconds. In either case, once the alarm has been triggered, it can be cleared once the input has been re-energized for five seconds or the call for the compressor is removed.

DI2 Compressor Interlock Alarm

The DI2 Compressor Interlock Alarm will trigger if the input is not energized for at least five seconds within one minute of a compressor call. If the compressor is running, the alarm will trigger if the input is de-energized for five seconds. In either case, once the alarm has been triggered, it can be cleared once the input has been re-energized for five seconds or the call for the compressor is removed.

Leaving Water Temperature Alarm

The Leaving Water Temperature Alarm will trigger if the leaving water temperature drops below the freeze protection temperature. The glycol percentage will be configured through the Pioneer Gold interface, determining what temperature will trigger the alarm and what temperature will release the alarm. This alarm will disable the compressor but will allow operation of the supply fan. Acceptable water temperature range is -10ºF-120°F. The alarm is released only if 10 minutes has expired and the leaving water temperature has risen 5°F above the freeze protection temperature. If the leaving water temperature drops below the freeze protection temperature again within two hours, then the alarm will be active until the leaving water temperature has risen 5°F above the freeze protection temperature and either the unit is power cycled, the Y call is removed, or a reset is sent from the BMS (soft lockout).

Liquid Line Temperature Alarm

The Liquid Line Temperature Alarm will trigger if the refrigeration line temperature drops below the freeze protection temperature. The glycol percentage will be configured through the Pioneer Gold interface, determining what temperature will trigger the alarm and what temperature will release the alarm. This alarm will disable the compressor but will allow operation of the supply fan. Acceptable water temperature range is -10ºF-120°F. The alarm is released only if 10 minutes has expired and the refrigeration line temperature has risen 5°F above the freeze protection temperature. If the refrigeration line temperature drops below the freeze protection temperature again within two hours, then the alarm will be active until the refrigeration line temperature has risen 5°F above the freeze protection temperature and either the unit is power cycled, the Y call is removed, or a reset is sent from the BMS (soft lockout).

Low Suction Pressure Alarm

The Low Suction Pressure Alarm will enable if the low pressure switch opens for more than 10 seconds. This alarm will disable if both of these conditions occur: 15 minutes has expired and the low pressure switch has closed. The compressor will not start if the switch is open. If the alarm is enabled again within two hours, there will be a hard lockout and require a power cycle to reset. Removal of the compressor call will not reset the alarm while in hard lock out.

There will be a delay of 30 seconds after the compressor starts before the alarm will enable.

Using LEDs To Verify Operation

The Pioneer Gold Controller is equipped with LEDs that can be used to verify operation and perform troubleshooting. See **Figure 1-12, page 1-27,** for the LED locations. The LEDs associated with these outputs allow you to see what is active without using a voltmeter. The LEDs and their uses are as follows:

Operation LEDs

POWER: These green LEDs will light up to indicate that 24 VAC power has been applied to the controller and that all boards are powered up. There are POWER LEDs on the Input/Output board and the CPU board.

STATUS: If solid green, this LED confirms that there is communication between the I/O board and the CPU board. If the LED turns red, then communication has been lost between the boards.

Communication LEDs

MODBUS EXPANSION: This pair yellow and red LED will light up and blink continuously to indicate there is MODBUS Expansion communications.

BACNET (BAS) / WATTCOMM: This pair of yellow and red LED will light up and blink continuously to indicate BACnet®/BAS or WattComm communications.

USB Port LED

D7: This LED, located directly above the User Manual Reset button, should blink red no more than five times total when the controller is powered on at start up as it checks the USB port. It will then turn off.

After inserting a USB flash drive with a firmware update and cycling power to the controller, the LED should turn solid green once the board detects the update and then should flash green to indicate the download is in process.

Output LEDs

W1 - Electric Heat Stage 1 LED—This green LED will light up when the Electric Heat Stage 1 relay is active.

SFLO - Supply Fan Low Speed LED—This green LED will light up when the Low Speed Supply Fan relay is active.

SFHI - Supply Fan High Speed LED—This green LED will light up when the High Speed Supply Fan relay is active.

RV - Reversing Valve LED: This green LED will light up when the Reversing Valve relay is active.

Y1 - Compressor Stage 1 LED: This green LED will light up when the Compressor Stage 1 relay is active.

Y2 - Compressor Stage 2 LED: This green LED will light up when the Compressor Stage 2 relay is active.

Y3 - Compressor Stage 3 LED: This green LED will light up when the Compressor Stage 3 relay is active. (FUTURE)

HGRH - Hot Gas Reheat Valve LED: This green LED will light up when the Reheat Valve relay is active.

WV/PUMP LED: This green LED will light up when the Water Valve relay is active.

WSE - Waterside Economizer LED: This green LED will light up when the Waterside Economizer is active.

DO1 - Spare Digital Output LED: This green LED will light up when the Spare Digital Output is active. (FUTURE)

ALM - Alarm LED: This red LED will light up when there is an active alarm.

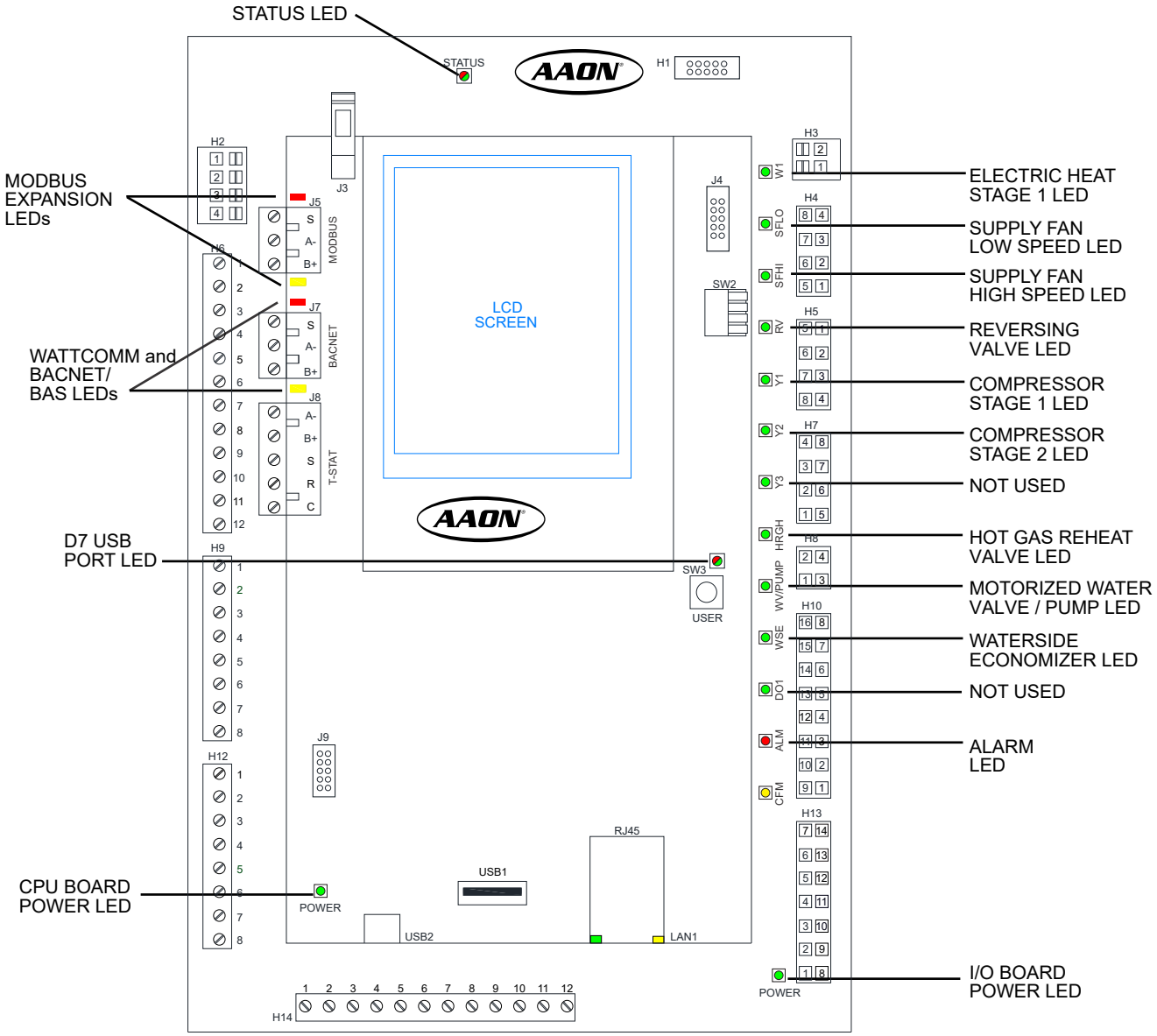


Figure 1-12: Pioneer Gold Controller LED Locations

Electric Heat Board Diagnostics

Using LEDs To Verify Operation

The Pioneer Gold Electric Heat Board is equipped with LEDs that can be used to verify operation and perform troubleshooting. See **Figure 1-15, this page,** for the LED locations. The LEDs associated with these outputs allow you to see what is active without using a voltmeter. The LEDs and their uses are as follows:

Operation LEDs

POWER: This green LED will light up and stay on solid to indicate that 24 VAC power has been applied to the board.

STATUS: If solid green, the Limit Switch input/safety is closed. If the LED turns red, the Limit Switch input/safety is open.

MODBUS LEDs

D2: This yellow LED will light up and blink continuously to indicate there is MODBUS communications.

D3: This orange LED will light up and blink continuously to indicate there is MODBUS communications.

Output LEDs

HEAT 1 - Electric Heat Stage 1 LED: This green LED will light up when the Electric Heat Stage 1 relay is active.

HEAT 2 - Electric Heat Stage 2 LED: This green LED will light up when the Electric Heat Stage 2 relay is active.

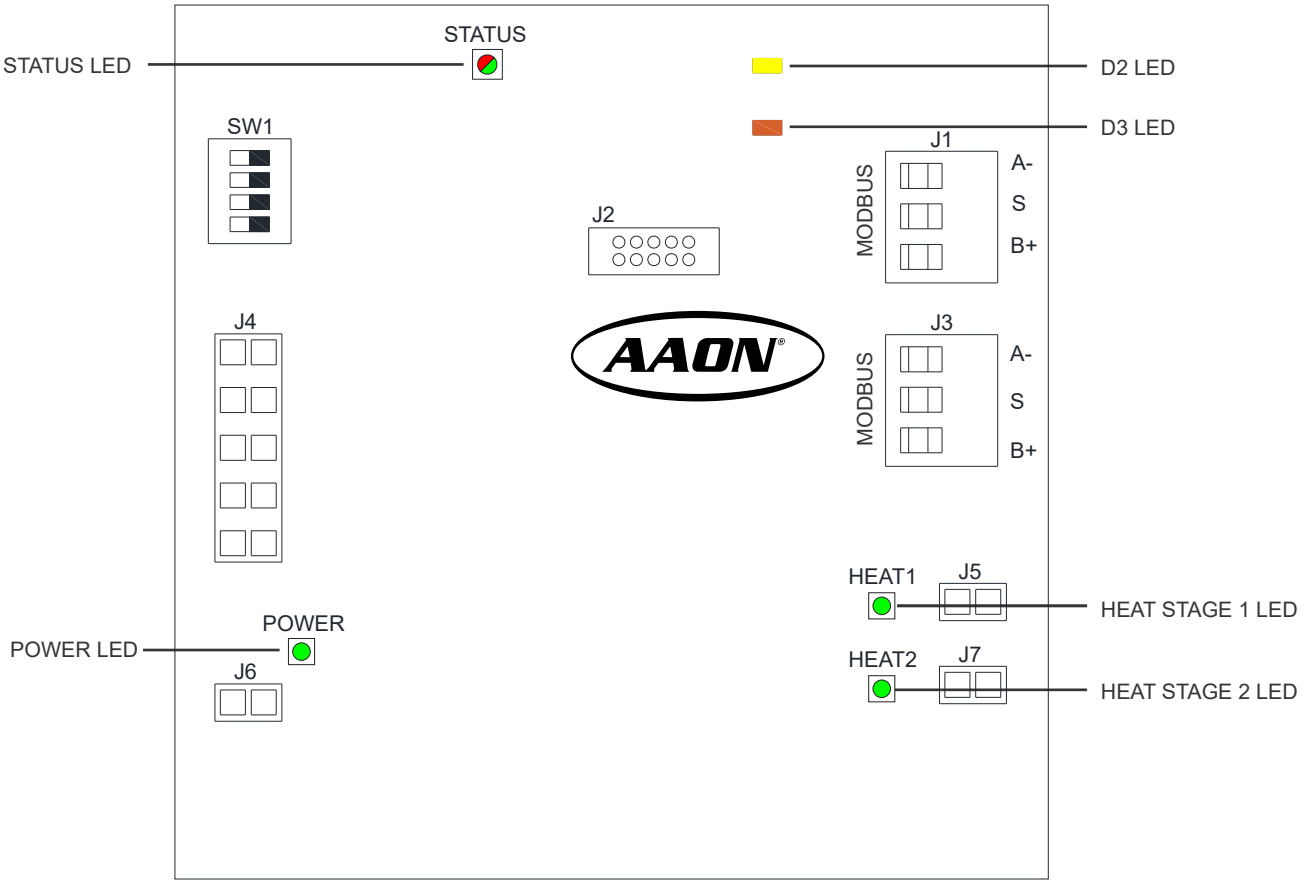


Figure 1-13: Pioneer Gold Electric Heat Board LED Locations

Suction Pressure Transducer Testing for R410-A Refrigerant 0-500 psi

The Suction Pressure is obtained by using the Suction Pressure Transducer, which is connected into the Suction Line of the compressor.

Use the voltage column to check the Suction Pressure Transducer while connected to the Pioneer Gold Controller. The controller must be powered for this test. Read voltage with a meter set on DC volts. Place the positive lead from the meter on the SPT input terminal located on the controller. Place the negative lead from the meter on the ground (COM) terminal located adjacent to the SPT terminal on the controller. Use a refrigerant gauge set to measure the Suction Line Pressure near where the Suction Pressure Transducer is connected to the Suction Line. Measure the voltage at the SPT and COM terminals and compare it to the appropriate chart depending on the refrigerant you are using. If the pressure/voltage readings do not align closely with the chart, your Suction Pressure Transducer is probably defective and will need to be replaced.

Suction Pressure Transducer Coil Pressure – Voltage Chart for R410A Refrigerant 0-500 psi			
Pressure PSI	Signal DC Volts	Pressure PSI	Signal DC Volts
20	0.66	280	2.74
40	0.82	300	2.9
60	0.98	320	3.06
80	1.14	340	3.22
100	1.3	360	3.38
120	1.46	380	3.54
140	1.62	400	3.7
160	1.78	420	3.86
180	1.94	440	4.02
200	2.1	460	4.18
220	2.26	480	4.34
240	2.42	500	4.5
260	2.58		

Table 1-8: Coil Pressure/Voltage for Suction Pressure Transducers - R410-A Refrigerant

Discharge Pressure Sensor Testing 0-667 psi

The Discharge Pressure is obtained by using the Discharge Pressure Sensor, which is connected into the Discharge Line of the compressor.

Use the voltage column to check the Discharge Pressure Sensor while connected to the Pioneer Gold Controller. The controller must be powered for this test. Read voltage with a meter set on DC volts. Place the positive lead from the meter on the DPT input terminal located on the controller. Place the negative lead from the meter on the ground (COM) terminal located adjacent to the DPT terminal on the controller. Use a refrigerant gauge set to measure the Suction Line Pressure near where the Discharge Pressure Sensor is connected to the Discharge Line. Measure the voltage at the terminals DPT and COM terminals and compare it to the appropriate chart depending on the refrigerant you are using. If the pressure/voltage readings do not align closely with the chart, your Discharge Pressure Transducer is probably defective and will need to be replaced.

Discharge Pressure Transducer Pressure – Voltage Chart for R410-A Refrigerant 0-667 PSI			
Pressure PSI	Signal DC Volts	Pressure PSI	Signal DC Volts
20	0.62	360	2.66
40	0.74	380	2.78
60	0.86	400	2.9
80	0.98	420	3.02
100	1.1	440	3.14
120	1.22	460	3.26
140	1.34	480	3.38
160	1.46	500	3.5
180	1.58	520	3.62
200	1.7	540	3.74
220	1.82	560	3.86
240	1.94	580	3.98
260	2.06	600	4.1
280	2.18	620	4.22
300	2.3	640	4.34
320	2.42	660	4.46
340	2.54		

Table 1-9: Discharge Pressure/Voltage for Discharge Pressure Transducers

Type III 10K Ohm Temp Sensor Testing

The following sensor voltage and resistance table is provided to aid in checking sensors that appear to be operating incorrectly. Many system operating problems can be traced to incorrect sensor wiring. Be sure all sensors are wired per the wiring diagrams in this manual.

If the sensors still do not appear to be operating or reading correctly, check voltage and/or resistance to confirm that the sensor is operating correctly per the tables. Please follow the notes and instructions that appear after the chart when checking sensors.

Thermistor Sensor Testing Instructions

Use the resistance column to check the thermistor sensor while disconnected from the controllers (not powered).

Use the voltage column to check sensors while connected to powered controllers. Read voltage with meter set on DC volts. Place the "-" (minus) lead on GND terminal and the "+" (plus) lead on the sensor input terminal being investigated.

Temperature – Resistance – Voltage for Type III 10K ohm Thermistor Sensors							
Temp (ºF)	Temp (ºC)	Resistance (Ohms)	Voltage @ Input (VDC)	Temp (ºF)	Temp (ºC)	Resistance (Ohms)	Voltage @ Input (VDC)
-10	-23.3	93333	3.05	**66**	18.9	12758	2.02
-5	-20.6	80531	3	**68**	20	12191	1.98
0	-17.8	69822	2.97	**69**	20.6	11906	1.97
5	-15	60552	2.92	**70**	21.1	11652	1.95
10	-12.2	52500	2.87	**71**	21.7	11379	1.93
15	-9.4	45902	2.81	**72**	22.2	11136	1.91
20	-6.7	40147	2.76	**73**	22.7	10878	1.9
25	-3.9	35165	2.69	**74**	23.3	10625	1.88
30	-1.1	30805	2.62	**75**	23.9	10398	1.86
35	1.6	27140	2.55	**76**	24.4	10158	1.84
40	4.4	23874	2.47	**77**	25	10000	1.82
45	7.2	21094	2.39	**78**	25.6	9711	1.8
50	10	18655	2.3	**80**	27.8	9302	1.77
52	11.1	17799	2.27	**82**	27.8	8893	1.75
54	12.2	16956	2.24	**84**	28.9	8514	1.69
56	13.3	16164	2.2	**86**	30	8153	1.66
58	14.4	15385	2.17	**88**	31.1	7805	1.62
60	15.6	14681	2.13	**90**	32.2	7472	1.59
62	16.7	14014	2.1	**95**	35	6716	1.49
64	17.8	13382	2.06	**100**	37.8	6047	1.41

NOTE: If the voltage is above 3.05 VDC, then the sensor or wiring is "open". If the voltage is less than 0.18 VDC, the sensor or wiring is shorted.

Table 1-10: Temperature/Resistance for Type III 10K ohm Thermistor Sensors

Glycol % Freeze Protection Setpoints

The Pioneer Gold setpoints are preset at AAON and are based on the unit's design as well as the type of coolant being used in the water loop. See **Tables 1-14 and 1-15, below,** for default settings for the LLT and LWT sensors, respectively.

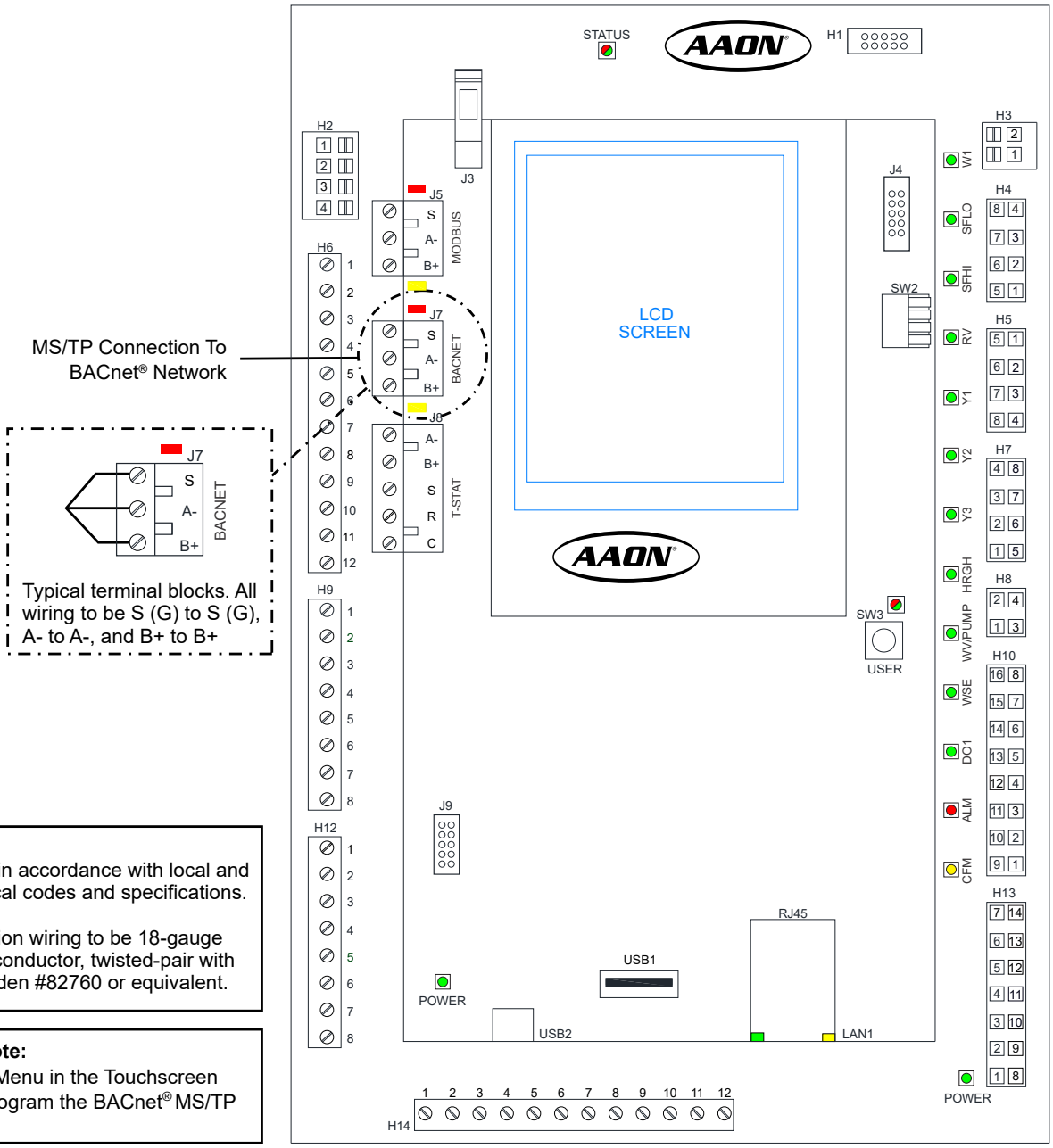
Glycol % Freeze Protection Setpoints for LLT Sensor		
Glycol %	**Activation Temp Setpoint (ºF)**	**Alarm Release Setpoint (ºF) (+5 ºF offset)**
0%	35°F	40°F
10%	28°F	33°F
15%	24°F	29°F
20%	19°F	24°F
25%	14°F	19°F
30%	8°F	13°F
35%	1°F	6°F
40%	-6°F	-1°F

Table 1-11: Factory-Set Default Setpoints for LLT Sensor - Glycol

Glycol % Freeze Protection Setpoints for LWT Sensor		
Glycol %	**Activation Temp Setpoint (ºF)**	**Alarm Release Setpoint (ºF) (+5 ºF offset)**
0%	40°F	45°F
10%	33°F	38°F
15%	29°F	34°F
20%	24°F	29°F
25%	19°F	24°F
30%	13°F	18°F
35%	6°F	11°F
40%	-1°F	4°F

Table 1-12: Factory-Set Default Setpoints for LWT Sensor - Glycol

BACnet® Legacy Connection to MS/TP BAS Network



Wiring Notes:
1. All wiring to be in accordance with local and national electrical codes and specifications.
2. All communication wiring to be 18-gauge minimum, two-conductor, twisted-pair with shield. Use Belden #82760 or equivalent.

Programming Note:
Use the Network Menu in the Touchscreen LCD Display to program the BACnet® MS/TP setting.

Figure 1-14: BACnet® Legacy Connection to MS/TP BAS Network

BACnet® Legacy Analog Values

BACnet® Legacy Analog Values					
BACnet® Point #	**Default**	**Limit Range**	**BACnet® Point Name**	**BACnet® Description**	**Unit**
AV: 0	N/A	N/A	Entering Water Temp	Temperature of the loop water entering the water coil	Fahrenheit
AV: 1	N/A	N/A	Liquid Line Temp	Temperature of the refrigerant liquid line	Fahrenheit
AV: 2	N/A	N/A	Entering Hot Water Temp	Temperature of the water entering the hot water coil	Fahrenheit
AV: 3	N/A	N/A	Air Coil Temp	Temperature of the air coil	Fahrenheit
AV: 4	N/A	N/A	Supply Air Temp	Temperature of the leaving discharge air	Fahrenheit
AV: 5	N/A	N/A	Space Temperature	Temperature reading from the space sensor	Fahrenheit
AV: 6	N/A	N/A	Space Relative Humidity	Relative Humidity reading from the space sensor	Relative Humidity
AV: 7	N/A	N/A	CO_2	CO_2 level reading from the space sensor	PPM
AV: 8	N/A	N/A	Firmware Version	Version of the controller's firmware	No Units
AV: 9	N/A	N/A	Discharge Pressure	Pressure reading from the discharge pressure transducer	PSI
AV: 10	N/A	N/A	Suction Pressure	Pressure reading from the suction pressure transducer	PSI
AV: 11	N/A	N/A	Water Valve/Pump Percentage	Percentage output to an analog water valve or pump	Percent
AV: 12	N/A	N/A	Hot Water Valve Percentage	Percentage output to the hot water heat coil valve	Percent
AV: 13	N/A	N/A	Supply Fan Percentage	Percentage output for a variable speed supply fan	Percent
AV: 14	N/A	N/A	Damper Override Percentage	Output percentage of the 0-10VDC damper override output	Percent
AV: 15	N/A	N/A	Compressor Percentage	Current value of the compressor PID control loop	Percent
AV: 16	N/A	N/A	Network Address	BACnet® device ID currently assigned to the controller	No Units
AV: 17	900	500-1500	CO_2 Setpoint	CO_2 setpoint to control the damper override output	PPM
AV: 18	74	55-85	Occupied Cooling Setpoint	Cooling mode enable setpoint when space is occupied	Fahrenheit
AV: 19	79	55-85	Unoccupied Cooling Setpoint	Cooling mode enable setpoint when space is unoccupied	Fahrenheit
AV: 20	55	45-65	Supply Cooling Setpoint	Temperature setpoint of the leaving discharge air while in Cooling Mode	Fahrenheit
AV: 21	180	120-255	Compressor On Time	Minimum on time setpoint for compressor(s)	Seconds
AV: 22	120	60-255	Compressor Off Time	Minimum off time setpoint for compressor(s)	Seconds
AV: 23	60	30-255	Compressor Interstage On Delay	Interstage on delay setpoint when unit has more than one compressor stage	Seconds
AV: 24	60	30-255	Compressor Interstage Off Delay	Interstage off delay setpoint when unit has more than one compressor stage	Seconds
AV: 25	75	55-85	Space Cooling Hi Reset	High Space Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV: 26	72	55-85	Space Cooling Lo Reset	Low Space Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV: 27	57	45-65	Supply Cooling Hi Reset	High Supply Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV: 28	53	45-65	Supply Cooling Lo Reset	Low Supply Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV: 29	70	55-85	Occupied Heating Setpoint	Heating Mode Enable Setpoint when space is occupied	Fahrenheit
AV: 30	65	55-85	Unoccupied Heating Setpoint	Heating Mode Enable Setpoint when space is unoccupied	Fahrenheit
AV: 31	90	55-120	Supply Heating Setpoint	Temperature setpoint of the Leaving Discharge Air while in Heating Mode	Fahrenheit

Table 1-13: BACnet® Legacy Analog Values

BACnet® Legacy Analog Values

BACnet® Legacy Analog Values					
BACnet® Point #	**Default**	**Limit Range**	**BACnet® Point Name**	**BACnet® Description**	**Unit**
AV: 32	72	55-85	Space Heating Hi Reset	High Space Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV: 33	69	55-85	Space Heating Lo Reset	Low Space Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV: 34	100	55-120	Supply Heating Hi Reset	High Supply Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV: 35	90	55-120	Supply Heating Lo Reset	Low Supply Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV: 36	50	40-60	Dehum Enable Setpoint	Relative humidity setpoint for enabling Dehumidification Mode	Relative Humidity
AV: 37	5	1-10	Aux Heat Deadband	Degrees Fahrenheit that the supply air must be under setpoint for auxiliary heat to enable	Fahrenheit
AV: 38	100	35-100	Supply Fan Max Percentage	Maximum allowed output for a variable speed supply fan	Percent
AV: 39	40	40-100	Supply Fan Minimum Percentage	Minimum allowed output for a variable speed supply fan	Percent
AV: 40	0	-20-20	Space Temp Offset	Temperature offset for the space sensor	Fahrenheit
AV: 41	0	-20-20	Supply Temp Offset	Temperature offset for the supply temperature sensor	Fahrenheit
AV: 42	0	-20-20	Space RH Offset	Relative humidity offset for the space sensor	Fahrenheit
AV: 43	N/A	N/A	Leaving Water Temp	Temperature of the loop water leaving the water coil	Fahrenheit
AV: 44	45	40-60	Suction Temp Setpoint	Not Used	Fahrenheit
AV: 45	50	50-100	Compressor Minimum Percentage	Not Used	Percent
AV: 46	N/A	N/A	Not Used	Not Used	GPM
AV: 47	0	0 - 10	Space Sensor Maximum Setpoint Offset	Maximum allowed user setpoint adjustment on the Touchscreen Temperature/Humidity Sensor	Fahrenheit
AV: 48	N/A	N/A	Occupied Cooling Setpoint with Offset	Occupied cooling setpoint with the user adjustment from the Touchscreen Temperature/Humidity Sensor added	Fahrenheit
AV: 49	N/A	N/A	Occupied Heating Setpoint with Offset	Occupied heating setpoint with the user adjustment from the Touchscreen Temperature/Humidity Sensor added	Fahrenheit
AV: 50	30	5 - 75	Water Valve Opening Delay Time	Amount of time given for the water valve to open before compressor operation is allowed	Seconds
AV: 51	120	30 - 480	User Occupancy Override Time	Amount of time unit stays in user occupancy override	Minutes
AV: 52	10	10-255	Waterside Econo Cooling Failure Time	Amount of time unit stays in Economizer Mode before going into compressor cooling.	Minutes
AV: 53	10	10-255	Waterside Econo Heating Failure Time	Amount of time unit stays in Economizer Mode before going into compressor heating.	Minutes
AV: 54	N/A	N/A	Reheat Valve Percentage	Position of modulating hot gas reheat valve	Percent
AV: 55	70	55-120	Supply Reheat Setpoint	Temperature setpoint of the discharge air while in Dehumidification Mode.	Fahrenheit
AV: 56	-1000	40-120	Space Temp Override	Allows BAS to send Space Temp to controller. Set to -1000 to cancel BAS override.	Fahrenheit
AV: 57	-1000	0-100	Space Humidity Override	Allows BAS to send Space Humidity to controller. Set to -1000 to cancel BAS override.	Fahrenheit
AV: 58	2	NA	Fan Mode Configuration	This is an enumeration: 0 = Off (setting to Off will disable unit operation) 1 = On 2 = Auto 3 = Occupy On/ Unoccupy auto	NA

Table 1-13: BACnet® Legacy Analog Values (Continued)

BACnet® Legacy Binary Values			
BACnet® Point #	**Default**	**BACnet® Point Name**	**BACnet® Description**
BV: 0	N/A	G Thermostat Call	Status of the G input terminal
BV: 1	N/A	Y1 Thermostat Call	Status of the Y1 input terminal
BV: 2	N/A	Y2 Thermostat Call	Status of the Y2 input terminal
BV: 3	N/A	O Thermostat Call	Status of the O input terminal
BV: 4	N/A	W1 Thermostat Call	Status of the W1 input terminal
BV: 5	N/A	Dehumidistat Call	Status of the DH input terminal
BV: 6	N/A	Night Setback Enable	Status of the Night Setback Enable input terminal
BV: 7	N/A	Night Setback Override	Status of the Night Setback Override input terminal
BV: 8	N/A	Night Setback Tstat	Status of the Night Setback Thermostat input terminal
BV: 9	N/A	Emergency Shutdown Status	Status of the Emergency Shutdown input terminal
BV: 10	N/A	Waterside Economizer	Status of the Waterside Economizer relay output
BV: 11	N/A	Compressor 1 Output	Status of the Compressor 1 relay output
BV: 12	N/A	Compressor 1 2nd Step	Status of the Compressor 1 second step relay output for a two stage compressor
BV: 13	N/A	Compressor 2 Output	Status of the compressor 2 relay output for a unit with two compressors
BV: 14	N/A	Supply Fan Low Speed	Status of the Low Speed Supply Fan relay output
BV: 15	N/A	Supply Fan High Speed	Status of the High Speed Supply Fan relay output
BV: 16	N/A	Electric Heat	Status of the Electric Heat relay output
BV: 17	N/A	Reversing Valve	Status of the Reversing Valve relay output
BV: 18	N/A	Water Valve/Pump	Status of the Water Valve or Pump relay output
BV: 19	N/A	HGRH	Status of the Hot Gas Reheat relay output
BV: 20	N/A	Alarm	Status of the alarm relay output and indicates if any alarm is present
BV: 21	N/A	Occupancy Status	Indication of space occupancy
BV: 22	N/A	Digital Input 2 Status	Status of DI2 input.
BV: 23	N/A	Dehum Mode	Indicates if unit is in Dehumidification Mode
BV: 24	N/A	Cool Mode	Indicates if unit is in Cooling Mode
BV: 25	N/A	Heat Mode	Indicates if unit is in Heating Mode
BV: 26	N/A	Vent Mode	Indicates if unit is in Vent Mode
BV: 27	N/A	Water Economizer Failed	Indicates if waterside economizer has failed to meet Cooling Setpoint within allotted time
BV: 28	N/A	High Discharge Pressure Alarm	Status of the High Discharge Pressure Alarm
BV: 29	N/A	Emergency Shutdown Alarm	Status of the Emergency Shutdown Alarm
BV: 30	N/A	Auxiliary Alarm	Status of the Auxiliary Alarm
BV: 31	N/A	Condensate Overflow Alarm	Status of the Condensate Overflow Alarm
BV: 32	N/A	Low Control Voltage Alarm	Status of the Low Control Voltage Alarm
BV: 33	N/A	High Control Voltage Alarm	Status of the High Control Voltage Alarm
BV: 34	N/A	Low Suction Pressure Alarm	Status of the Low Suction Pressure Alarm
BV: 35	N/A	Water Leaving Temp Alarm	Status of the Water Leaving Temperature Alarm
BV: 36	N/A	DI2 Compressor Interlock Alarm	Status of the DI2 Compressor Interlock Alarm
BV: 37	N/A	Air Coil Temp Alarm	Status of the Air Coil Temperature Alarm
BV: 38	N/A	Water Entering Temp Alarm	Status of the Water Entering Temperature Alarm

Table 1-14: BACnet® Legacy Binary Values

BACnet® Legacy Binary Values

BACnet® Legacy Binary Values			
BACnet® Point #	**Default**	**BACnet® Point Name**	**BACnet® Description**
BV: 39	False	Network Occupy	Allows building management system to force occupancy
BV: 40	False	Network Emergency Shutdown	Allows building management system to force the Emergency Shutdown
BV: 41	False	Dehum Priority	Allows dehumidification to have priority over any other unit mode
BV: 42	False	Space/Supply Cooling Reset Enable	Enables space/supply setpoint reset control while in Cooling Mode
BV: 43	False	Space/Supply Heating Reset Enable	Enables space/supply setpoint reset control while in Heating Mode
BV: 44	N/A	Digital Input 1 Status	Status of DI1 input.
BV: 45	N/A	Occupancy Sensor	Status of occupancy sensor which will force the unit into occupancy
BV: 46	False	Unit Lockout Remote Reset	Allows building management system to remotely release a unit from an alarm lockout
BV: 47	False	Password Reset	Resets the manager and admin passwords back to factory defaults
BV: 48	N/A	DI1 Compressor Interlock Alarm	Status of the DI1 Compressor Interlock Alarm.
BV: 49	N/A	Liquid Line Temperature Alarm	Status of Liquid Line Temperature Alarm.
BV: 50	N/A	High SAT Cutoff Alarm	Status of the High SAT Cutoff Alarm
BV: 51	False	Network Force Unoccupied	This will override any local scheduled occupancy.
BV: 52	False	Water Valve Force Enable	Allows building management system to remotely energize water valve output.

Table 1-14: BACnet® Legacy Binary Values (Continued)

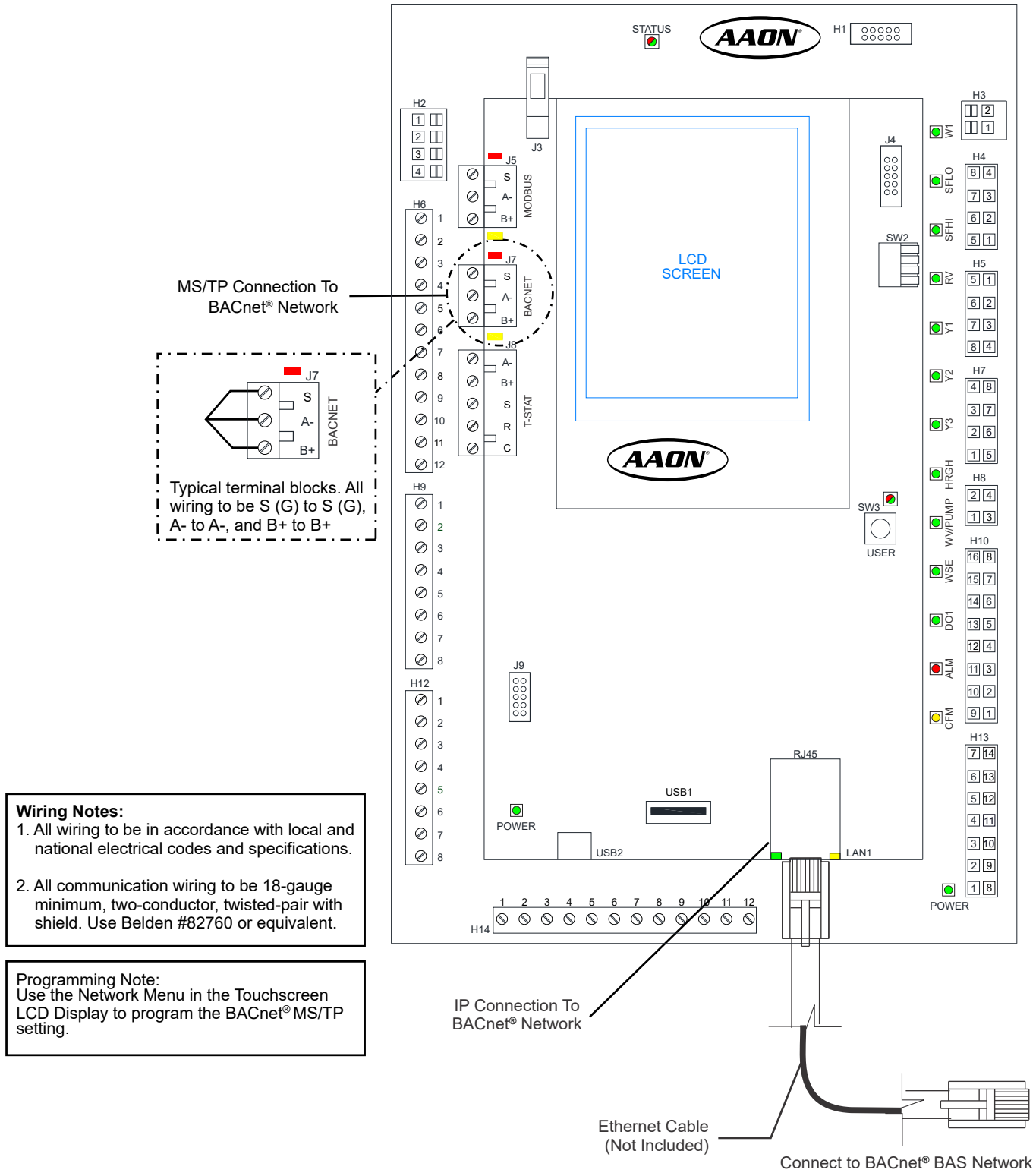


Figure 1-15: BACnet® Connection to MS/TP Network or IP BAS Network (ASM02323 Only)

BACnet® MS/TP and IP Analog Inputs

BACnet® MS/TP and IP Analog Inputs			
BACnet® Point #	**BACnet® Point Name**	**BACnet® Description**	**Unit**
AI:1	Entering Water Temp	Temperature of the loop water entering the water coil	Fahrenheit
AI:2	Liquid Line Temp	Temperature of the refrigerant liquid line	Fahrenheit
AI:3	Entering Hot Water Temp	Temperature of the water entering the hot water coil	Fahrenheit
AI:4	Air Coil Temp	Temperature of the air coil	Fahrenheit
AI:5	Supply Air Temp	Temperature of the discharge air	Fahrenheit
AI:6	Space Temperature	Temperature reading from the space sensor	Fahrenheit
AI:7	Space Relative Humidity	RH reading from the space sensor	Relative Humidity
AI:8	CO_2	CO_2 level reading from the space sensor	PPM
AI:9	Firmware Version	Version of the controller's firmware	No Units
AI:10	Discharge Pressure	Pressure reading from the discharge pressure transducer	PSI
AI:11	Suction Pressure	Pressure reading from the suction pressure transducer	PSI
AI:12	Water Valve/Pump Percentage	Percentage output to an analog water valve or pump	Percent
AI:13	Hot Water Valve Percentage	Percentage output to the hot water heat coil valve	Percent
AI:14	Supply Fan Percentage	Percentage output for a variable speed supply fan	Percent
AI:15	Damper Override Percentage	Output percentage of the 0-10 VDC damper override output	Percent
AI:16	Compressor Percentage	Current value of the compressor PID control loop	Percent
AI:17	Leaving Water Temp	Temperature of the loop water leaving the water coil	Fahrenheit
AI:18	Occupied Cooling Setpoint with Offset	Occupied cooling setpoint with the user adjustment from the touchscreen sensor added	Fahrenheit
AI:19	Occupied Heating Setpoint with Offset	Occupied heating setpoint with the user adjustment from the touchscreen sensor added	Fahrenheit
AI:20	Reheat Valve Percentage	Position of modulating hot gas reheat valve	Percent

Table 1-15: BACnet® MS/TP and IP Parameter Analog Inputs

BACnet® MS/TP and IP Analog Values					
BACnet® Point #	**Default**	**Limit Range**	**BACnet® Point Name**	**BACnet® Description**	**Unit**
AV:1	900	500-1500	CO_2 Setpoint	CO_2 setpoint to control the damper override output	PPM
AV:2	74	55-85	Occupied Cooling Setpoint	Cooling Mode Enable Setpoint when space is occupied	Fahrenheit
AV:3	79	55-85	Unoccupied Cooling Setpoint	Cooling Mode Enable Setpoint when space is unoccupied	Fahrenheit
AV:4	55	45-65	Supply Cooling Setpoint	Temperature setpoint of the discharge air while in cooling mode	Fahrenheit
AV:5	180	120-255	Compressor Min On Time	Minimum on time setpoint for compressor(s)	Seconds
AV:6	120	60-255	Compressor Min Off Time	Minimum off time setpoint for compressor(s)	Seconds
AV:7	60	30-255	Compressor Interstage On Delay	Interstage on delay setpoint when unit has more than one compressor stage	Seconds
AV:8	60	30-255	Compressor Interstage Off Delay	Interstage off delay setpoint when unit has more than one compressor stage	Seconds
AV:9	75	55-85	Space Cooling Hi Reset	High Space Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV:10	72	55-85	Space Cooling Lo Reset	Low Space Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV:11	57	45-65	Supply Cooling Hi Reset	High Supply Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV:12	53	45-65	Supply Cooling Lo Reset	Low Supply Temperature Setpoint when using space/ supply reset control in Cooling Mode	Fahrenheit
AV:13	70	55-85	Occupied Heating Setpoint	Heating Mode Enable Setpoint when space is occupied	Fahrenheit
AV:14	65	55-85	Unoccupied Heating Setpoint	Heating Mode Enable Setpoint when space is unoccupied	Fahrenheit
AV:15	90	55-120	Supply Heating Setpoint	Temperature setpoint of the discharge air while in heating mode	Fahrenheit
AV:16	72	55-85	Space Heating Hi Reset	High Space Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV:17	69	55-85	Space Heating Lo Reset	Low Space Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV:18	100	55-120	Supply Heating Hi Reset	High Supply Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV:19	90	55-120	Supply Heating Lo Reset	Low Supply Temperature Setpoint when using space/ supply reset control in Heating Mode	Fahrenheit
AV:20	50	40-60	Dehum Enable Setpoint	Relative Humidity Setpoint for enabling dehumidification setpoint	Relative Humidity
AV:21	5	1-10	Aux Heat Deadband	Degrees Fahrenheit that the supply air must be under setpoint for Auxiliary Heat to enable	Fahrenheit
AV:22	100	35-100	Supply Fan Maximum Percentage	Maximum allowed output for a variable speed supply fan	Percent
AV:23	35	35-100	Supply Fan Minimum Percentage	Minimum allowed output for a variable speed supply fan	Percent
AV:24	0	-20 - 20	Space Temp Offset	Temperature offset for the space sensor	Fahrenheit
AV:25	0	-20 - 20	Supply Temp Offset	Temperature offset for the supply temperature sensor	Fahrenheit
AV:26	0	-20 - 20	Space RH Offset	Relative humidity offset for the space sensor	Fahrenheit

Table 1-16: BACnet® MS/TP and IP Parameter Analog Values

BACnet® MS/TP and IP Analog Values

BACnet® MS/TP and IP Analog Values					
BACnet® Point #	**Default**	**Limit Range**	**BACnet® Point Name**	**BACnet® Description**	**Unit**
AV:27	0	0 - 10	Space Sensor Maximum Setpoint Offset	Maximum allowed user setpoint adjustment on the touchscreen temp/humidity sensor	Fahrenheit
AV:28	30	5 - 75	Water Valve Opening Delay Time	Amount of time given for the water valve to open before compressor operation is allowed	Seconds
AV:29	120	30 - 480	User Occupancy Override Time	Amount of time unit stays in user occupancy override	Minutes
AV: 30	10	10-255	Waterside Econo Cooling Failure Time	Amount of time unit stays in economizer mode before going into compressor cooling.	Minutes
AV: 31	10	10-255	Waterside Econo Heating Failure Time	Amount of time unit stays in economizer mode before going into compressor heating.	Minutes
AV: 32	70	55-120	Supply Reheat Setpoint	Temperature setpoint of the discharge air while in Dehumidification Mode.	Fahrenheit
AV: 33	-1000	40-120	Space Temp Override	Allows BAS to send Space Temp to controller. Set to -1000 to cancel BAS override.	Fahrenheit
AV: 34	-1000	0-100	Space Humidity Override	Allows BAS to send Space Humidity to controller. Set to -1000 to cancel BAS override.	Fahrenheit
AV: 35	2	NA	Fan Mode Configuration	This is an enumeration: 0 = Off (setting to Off will disable unit operation) 1 = On 2 = Auto 3 = Occupy On/ Unoccupy auto	NA

Table 1-16: BACnet® MS/TP and IP Parameter Analog Values (AV) (Continued)

BACnet® MS/TP and IP Binary Inputs		
BACnet® Point #	**BACnet® Point Name**	**BACnet® Description**
BI: 1	G Thermostat Call	Status of the G input terminal
BI: 2	Y1 Thermostat Call	Status of the Y1 input terminal
BI: 3	Y2 Thermostat Call	Status of the Y2 input terminal
BI: 4	O Thermostat Call	Status of the O input terminal
BI: 5	W1 Thermostat Call	Status of the W1 input terminal
BI: 6	Dehumidistat Call	Status of the DH input terminal
BI: 7	Night Setback Enable	Status of the night setback enable input terminal
BI: 8	Night Setback Override	Status of the night setback override input terminal
BI: 9	Night Setback Tstat	Status of the night setback thermostat input terminal
BI: 10	Emergency Shutdown Status	Status of the emergency shutdown input terminal
BI: 11	Waterside Economizer	Status of the waterside economizer relay output
BI: 12	Compressor 1 Output	Status of the compressor 1 relay output
BI: 13	Compressor 1 2nd Step	Status of the compressor 1 second step relay output for a 2 stage compressor
BI: 14	Compressor 2 Output	Status of the compressor 2 relay output for a unit with 2 compressors
BI: 15	Supply Fan Low Speed	Status of the low speed supply fan relay output
BI: 16	Supply Fan High Speed	Status of the high speed supply fan relay output
BI: 17	Electric Heat	Status of the electric heat relay output
BI: 18	Reversing Valve	Status of the reversing valve relay output
BI: 19	Water Valve/Pump	Status of the water valve or pump relay output
BI: 20	HGRH	Status of the hot gas reheat relay output
BI: 21	Alarm	Status of the alarm relay output and indicates if any alarm is present
BI: 22	Occupancy Status	Indication of space occupancy
BI: 23	DI Input 2 Status	Status of DI2 input.
BI: 24	Water Economizer Failed	Indicates if waterside economizer has failed to meet cooling setpoint within allotted time
BI: 25	High Discharge Pressure Alarm	Status of the High Discharge Pressure Alarm
BI: 26	Emergency Shutdown Alarm	Status of the Emergency Shutdown Alarm
BI: 27	Auxiliary Alarm	Status of the Auxiliary Alarm
BI: 28	Condensate Overflow Alarm	Status of the Condensate Overflow Alarm
BI: 29	Low Control Voltage Alarm	Status of the Low Control Voltage Alarm
BI: 30	High Control Voltage Alarm	Status of the High Control Voltage Alarm
BI: 31	Low Suction Pressure Alarm	Status of the Low Suction Pressure Alarm
BI: 32	Water Leaving Temp Alarm	Status of the Water Leaving Temperature Alarm
BI: 33	DI2 Compressor Interlock Alarm	Status of the DI2 Compressor Interlock Alarm
BI: 34	Air Coil Temp Alarm	Status of the Air Coil Temperature Alarm
BI: 35	Water Entering Temp Alarm	Status of the Water Entering Temperature Alarm
BI: 36	Occupancy Sensor	Status of occupancy sensor which will force the unit into occupancy
BI: 37	DI Input 1 Status	Status of DI1 input.
BI: 38	DI1 Compressor Interlock Alarm	Status of the DI1 Compressor Interlock Alarm
BI: 39	Liquid Line Temperature Alarm	Status of Liquid Line Temperature Alarm.
BI: 40	High SAT Cutoff Alarm	Status of High SAT Cutoff Alarm

Table 1-17: BACnet® MS/TP and IP Parameter Binary Inputs

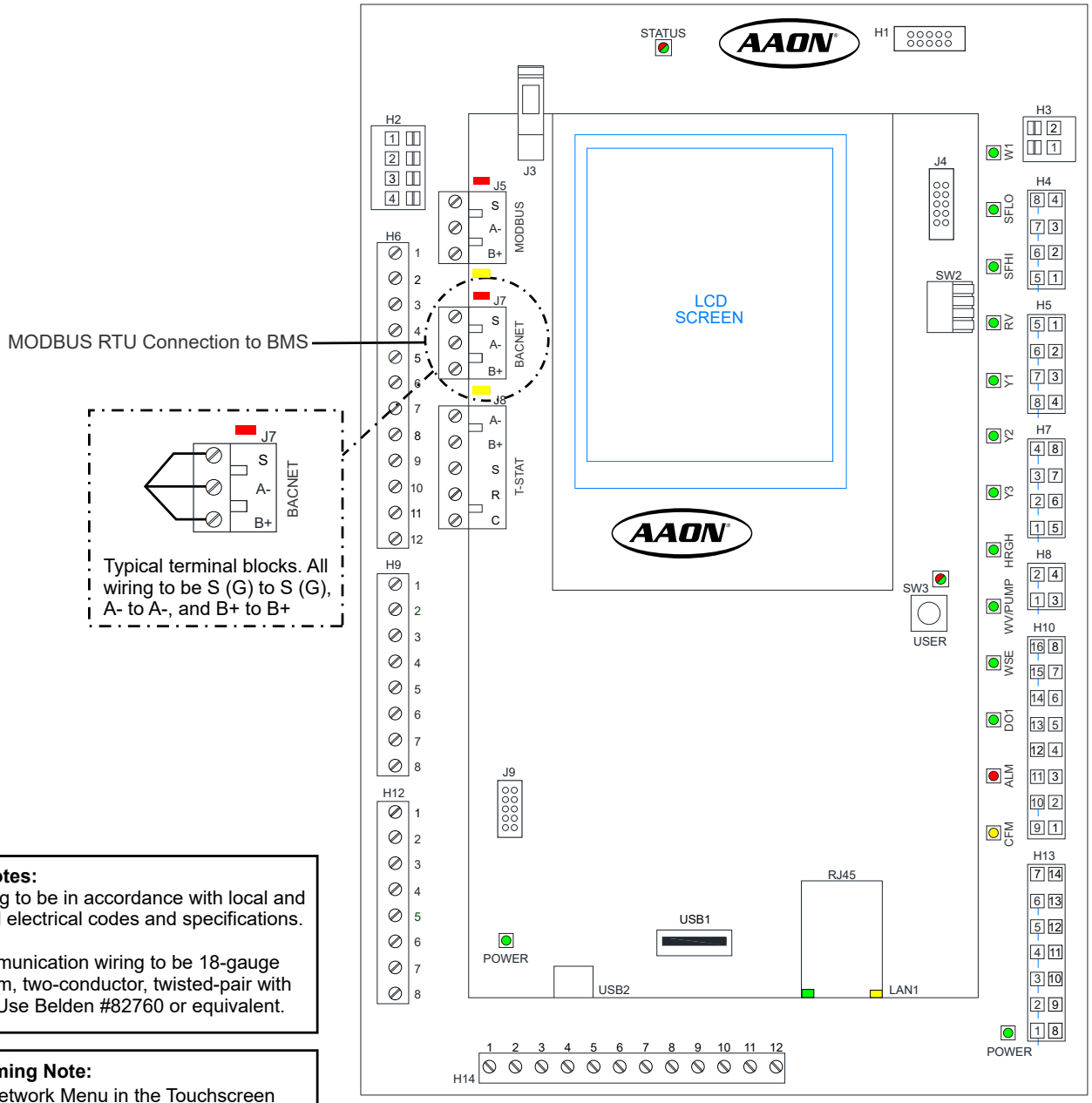
BACnet® MS/TP and IP Binary Values and Multi-State Input

BACnet® MS/TP and IP Binary Values		
BACnet® Point #	**BACnet® Point Name**	**BACnet® Description**
BV: 1	Network Occupy	Allows building management system to force occupancy
BV: 2	Network Emergency Shutdown	Allows building management system to force the emergency shutdown
BV: 3	Dehum Priority	Allows dehumidification to have priority over any other unit mode
BV: 4	Space/Supply Cooling Reset Enable	Enables space/supply setpoint reset control while in cooling mode
BV: 5	Space/Supply Heating Reset Enable	Enables space/supply setpoint reset control while in heating mode
BV: 6	Unit Lockout Remote Reset	Allows building management system to remotely release a unit from an alarm lockout
BV: 7	Password Reset	Resets the manager and admin passwords back to factory defaults
BV: 8	Network Forced Unoccupied	This will override nay local scheduled occupancy
BV: 9	Water Valve Force Enable	Allows building management system to remotely energize water valve output.

Table 1-18: BACnet® MS/TP and IP Parameter Binary Values

BACnet® MS/TP and IP Multi-State Input			
BACnet® Point #	**BACnet® Point Name**	**BACnet® Description**	**States**
MS: 1	Unit Mode	Current Unit Mode	1 = Off 2 = Vent 3 = Cooling 4 = Heating 5 = Dehum

Table 1-19: BACnet® MS/TP and IP Parameter Multi-State Input



Wiring Notes:
1. All wiring to be in accordance with local and national electrical codes and specifications.

2. All communication wiring to be 18-gauge minimum, two-conductor, twisted-pair with shield. Use Belden #82760 or equivalent.

Programming Note:
Use the Network Menu in the Touchscreen LCD Display to program the BACnet® MS/TP setting.

Figure 1-16: MODBUS TRU Connection to BMS

MODBUS Coil and Discrete Input Points

MODBUS Coil Points							
Name	**Type**	**Function Codes**	**Addr**	**Data Type**	**Default Value**	**Allowed Range**	**Description**
Network Occupy	Coil	0x01(Read), 0x05(Write)	00201	Boolean	False	0/1	Allows building management system to force occupancy
Network Emergency Shutdown	Coil	0x01(Read), 0x05(Write)	00202	Boolean	False	0/1	Allows building management system to force emergency shutdown
Dehum Priority	Coil	0x01(Read), 0x05(Write)	00203	Boolean	False	0/1	Allows dehumidification to have priority over any other unit mode
Space/Supply Cooling Reset Enable	Coil	0x01(Read), 0x05(Write)	00204	Boolean	False	0/1	Enables space/supply setpoint reset control while in cooling mode
Space/Supply Heating Reset Enable	Coil	0x01(Read), 0x05(Write)	00205	Boolean	False	0/1	Enables space/supply setpoint reset control while in heating mode
Unit Lockout Remote Reset	Coil	0x01(Read), 0x05(Write)	00206	Boolean	False	0/1	Allows building management system to remotely release a unit from an alarm lockout
Software Reset	Coil	0x01(Read), 0x05(Write)	00207	Boolean	False	0/1	Allows building management system to remotely reset a control board

Table 1-20: MODBUS Coil Points

MODBUS Discrete Input Points					
Name	**Type**	**Function Codes**	**Addr**	**Data Type**	**Description**
Digital Input 1 Status	Discrete Input	0x02(Read)	10201	Boolean	Status of DI1 input.
Occupancy Sensor	Discrete Input	0x02(Read)	10202	Boolean	Status of occupancy sensor
Night Setback Enable	Discrete Input	0x02(Read)	10203	Boolean	Status of the night setback enable input terminal
Night Setback Override	Discrete Input	0x02(Read)	10204	Boolean	Status of the night setback override input terminal
Night Setback Tstat	Discrete Input	0x02(Read)	10205	Boolean	Status of the night setback thermostat input terminal
Emergency Shutdown Status	Discrete Input	0x02(Read)	10206	Boolean	Status of the emergency shutdown input terminal
Waterside Economizer	Discrete Input	0x02(Read)	10207	Boolean	Status of the waterside economizer relay output
Compressor 1 Output	Discrete Input	0x02(Read)	10208	Boolean	Status of the compressor 1 relay output
Compressor 1 2nd Step	Discrete Input	0x02(Read)	10209	Boolean	Status of the compressor 1 second step relay output for a 2 stage compressor
Compressor 2 Output	Discrete Input	0x02(Read)	10210	Boolean	Status of the compressor 2 relay output for a unit with 2 compressors
Supply Fan Low Speed	Discrete Input	0x02(Read)	10211	Boolean	Status of the low speed supply fan relay output
Supply Fan High Speed	Discrete Input	0x02(Read)	10212	Boolean	Status of the high speed supply fan relay output
Electric Heat	Discrete Input	0x02(Read)	10213	Boolean	Status of the electric heat relay output
Reversing Valve	Discrete Input	0x02(Read)	10214	Boolean	Status of the reversing valve relay output
Water Valve/Pump	Discrete Input	0x02(Read)	10215	Boolean	Status of the water valve or pump relay output
HGRH	Discrete Input	0x02(Read)	10216	Boolean	Status of the hot gas reheat relay output
Alarm	Discrete Input	0x02(Read)	10217	Boolean	Status of the alarm relay output and indicates if any alarm is present

Table 1-21: MODBUS Discrete Input Points

MODBUS Discrete Input Points					
Name	**Type**	**Function Codes**	**Addr**	**Data Type**	**Description**
Occupancy Status	Discrete Input	0x02(Read)	10218	Boolean	Indication of space occupancy
Digital Input 2 Status	Discrete Input	0x02(Read)	10219	Boolean	Status of DI2 input.
Dehum Mode	Discrete Input	0x02(Read)	10220	Boolean	Indicates if unit is in Dehumidification mode
Cool Mode	Discrete Input	0x02(Read)	10221	Boolean	Indicates if unit is in Cooling mode
Heat Mode	Discrete Input	0x02(Read)	10222	Boolean	Indicates if unit is in Heating mode
Vent Mode	Discrete Input	0x02(Read)	10223	Boolean	Indicates if unit is in Vent mode
Water Economizer Failed	Discrete Input	0x02(Read)	10224	Boolean	Indicates if waterside economizer has failed to meet cooling setpoint within allotted time
High Discharge Pressure Alarm	Discrete Input	0x02(Read)	10225	Boolean	Status of the high discharge pressure alarm
Emergency Shutdown Alarm	Discrete Input	0x02(Read)	10226	Boolean	Status of the emergency shutdown alarm
Auxiliary Alarm	Discrete Input	0x02(Read)	10227	Boolean	Status of the auxiliary alarm
Condensate Overflow Alarm	Discrete Input	0x02(Read)	10228	Boolean	Status of the condensate overflow alarm
Low Control Voltage Alarm	Discrete Input	0x02(Read)	10229	Boolean	Status of the low control voltage alarm
High Control Voltage Alarm	Discrete Input	0x02(Read)	10230	Boolean	Status of the high control voltage alarm
Low Suction Pressure Alarm	Discrete Input	0x02(Read)	10231	Boolean	Status of the low suction pressure alarm
Leaving Water Temp Alarm	Discrete Input	0x02(Read)	10232	Boolean	Status of the water leaving temperature alarm
DI2 Compressor Interlock Alarm	Discrete Input	0x02(Read)	10233	Boolean	Status of the DI1 compressor interlock alarm.
Air Coil Refrigerant Temp Alarm	Discrete Input	0x02(Read)	10234	Boolean	Status of the air coil refrigerant temp alarm
Entering Water Temp Alarm	Discrete Input	0x02(Read)	10235	Boolean	Status of the water entering temperature alarm
Desuperheater Pump Status	Discrete Input	0x02(Read)	10236	Boolean	Status of Desuperheater Pump
DI1 Compressor Interlock Alarm	Discrete Input	0x02(Read)	10237	Boolean	Status of the DI1 compressor interlock alarm.
Liquid Line Temperature Alarm	Discrete Input	0x02(Read)	10238	Boolean	Status of liquid line temperature alarm.

Table 1-21: MODBUS Discrete Input Points (Continued)

MODBUS Input Register Points

MODBUS Input Register Points						
Name	**Type**	**Function Codes**	**Addr**	**Data Type**	**Unit**	**Description**
Entering Water Temp	Input Register	0x04(Read)	30201	Float	Fahrenheit	Temperature of the loop water entering the water coil
Liquid Line Temp	Input Register	0x04(Read)	30203	Float	Fahrenheit	Temperature of the refrigerant liquid line
Entering Hot Water Temp	Input Register	0x04(Read)	30205	Float	Fahrenheit	Temperature of the water entering the hot water coil
Air Coil Refrigerant Temp	Input Register	0x04(Read)	30207	Float	Fahrenheit	Temperature of the refrigerant line between TXV and air coil
Supply Air Temp	Input Register	0x04(Read)	30209	Float	Fahrenheit	Temperature of the discharge air
Space Temperature	Input Register	0x04(Read)	30211	Float	Fahrenheit	Temperature reading from the space sensor
Space Relative Humidity	Input Register	0x04(Read)	30213	Float	Relative Humidity	RH reading from the space sensor
CO_2	Input Register	0x04(Read)	30215	Float	PPM	CO_2 level reading from the space sensor
Firmware Version	Input Register	0x04(Read)	30217	Float	No Units	Version of the controller firmware
Discharge Pressure	Input Register	0x04(Read)	30219	Float	PSI	Pressure reading from the Discharge Pressure Transducer
Suction Pressure	Input Register	0x04(Read)	30221	Float	PSI	Pressure reading from the Suction Pressure Transducer
Hot Water Valve Percentage	Input Register	0x04(Read)	30223	Float	Percent	Percentage output to the hot water heat coil valve
Supply Fan Percentage	Input Register	0x04(Read)	30225	Float	Percent	Percentage output for a variable speed supply fan
Damper Override Percentage	Input Register	0x04(Read)	30227	Float	Percent	Output percentage of the 0-10 VDC damper override output
Compressor Percentage	Input Register	0x04(Read)	30229	Float	Percent	Current value of the compressor PID control loop
Suction Temperature	Input Register	0x04(Read)	30231	Float	Fahrenheit	Temperature of suction line
Discharge Temperature	Input Register	0x04(Read)	30233	Float	Fahrenheit	Temperature of discharge line
Line Voltage	Input Register	0x04(Read)	30235	Float	Volts	Line voltage
Watts	Input Register	0x04(Read)	30237	Float	Watts	Incoming true power
VA	Input Register	0x04(Read)	30239	Float	VA	Incoming apparent power
Power Factor	Input Register	0x04(Read)	30241	Float	N/A	Power factor
Leaving Water Temp	Input Register	0x04(Read)	30243	Float	Fahrenheit	Temperature of the loop water leaving the water coil
Water Flow	Input Register	0x04(Read)	30245	Float	GPM	Amount of water flow in gallons per minute
Domestic Entering Water Temp	Input Register	0x04(Read)	30247	Float	Fahrenheit	Temperature of the domestic entering water line.
Boot Loader Firmware Version	Input Register	0x04(Read)	30249	Float	No Units	Displays the current firmware version of the bootloader
IO Board Version	Input Register	0x04(Read)	30251	Float	No Units	Displays the current firmware version of the I/O board
Reheat Valve Percentage	Input Register	0x04(Read)	30257	Float	Percentage	Position of modulating hot gas reheat valve.

Table 1-22: MODBUS Input Register Points

MODBUS Holding Register Points								
Name	**Type**	**Function Codes**	**Addr**	**Data Type**	**Default**	**Range**	**Unit**	**Description**
CO2 Setpoint	Holding Register	0x03(Read), 0x06(Write)	40201	Integer	900	500-1500	PPM	CO_2 setpoint to control the damper override output
Occupied Cooling Setpoint	Holding Register	0x03(Read), 0x06(Write)	40202	Integer	74	55-85	Fahrenheit	Cooling Mode Enable Setpoint when space is occupied
Unoccupied Cooling Setpoint	Holding Register	0x03(Read), 0x06(Write)	40203	Integer	79	55-85	Fahrenheit	Cooling Mode Enable Setpoint when space is unoccupied
Supply Cooling Setpoint	Holding Register	0x03(Read), 0x06(Write)	40204	Integer	55	45-65	Fahrenheit	Temperature setpoint of the discharge air while in Cooling Mode
Compressor Min On Time	Holding Register	0x03(Read), 0x06(Write)	40205	Integer	180	120-255	Seconds	Minimum on time setpoint for compressor(s)
Compressor Min Off Time	Holding Register	0x03(Read), 0x06(Write)	40206	Integer	120	60-255	Seconds	Minimum off time setpoint for compressor(s)
Compressor Interstage On Delay	Holding Register	0x03(Read), 0x06(Write)	40207	Integer	60	30-255	Seconds	Interstage on delay setpoint when unit has more than one compressor stage
Compressor Interstage Off Delay	Holding Register	0x03(Read), 0x06(Write)	40208	Integer	60	30-255	Seconds	Interstage Off Delay Setpoint when unit has more than one compressor stage
Space Cooling Hi Reset	Holding Register	0x03(Read), 0x06(Write)	40209	Integer	75	55-85	Fahrenheit	High Space Temperature Setpoint when using space/supply reset control in Cooling Mode
Space Cooling Lo Reset	Holding Register	0x03(Read), 0x06(Write)	40210	Integer	72	55-85	Fahrenheit	Low Space Temperature Setpoint when using space/supply reset control in Cooling Mode
Supply Cooling Hi Reset	Holding Register	0x03(Read), 0x06(Write)	40211	Integer	57	45-65	Fahrenheit	High Supply Temperature Setpoint when using space/supply reset control in Cooling Mode
Supply Cooling Lo Reset	Holding Register	0x03(Read), 0x06(Write)	40212	Integer	53	45-65	Fahrenheit	Low Supply Temperature Setpoint when using space/supply reset control in Cooling Mode
Occupied Heating Setpoint	Holding Register	0x03(Read), 0x06(Write)	40213	Integer	70	55-85	Fahrenheit	Heating Mode Enable Setpoint when space is occupied
Unoccupied Heating Setpoint	Holding Register	0x03(Read), 0x06(Write)	40214	Integer	65	55-85	Fahrenheit	Heating Mode Enable Setpoint when space is unoccupied
Supply Heating Setpoint	Holding Register	0x03(Read), 0x06(Write)	40215	Integer	90	55-120	Fahrenheit	Temperature setpoint of the discharge air while in Heating Mode
Space Heating Hi Reset	Holding Register	0x03(Read), 0x06(Write)	40216	Integer	72	55-85	Fahrenheit	High Space Temperature Setpoint when using space/supply reset control in Heating Mode
Space Heating Lo Reset	Holding Register	0x03(Read), 0x06(Write)	40217	Integer	69	55-85	Fahrenheit	Low Space Temperature Setpoint when using space/supply reset control in Heating Mode

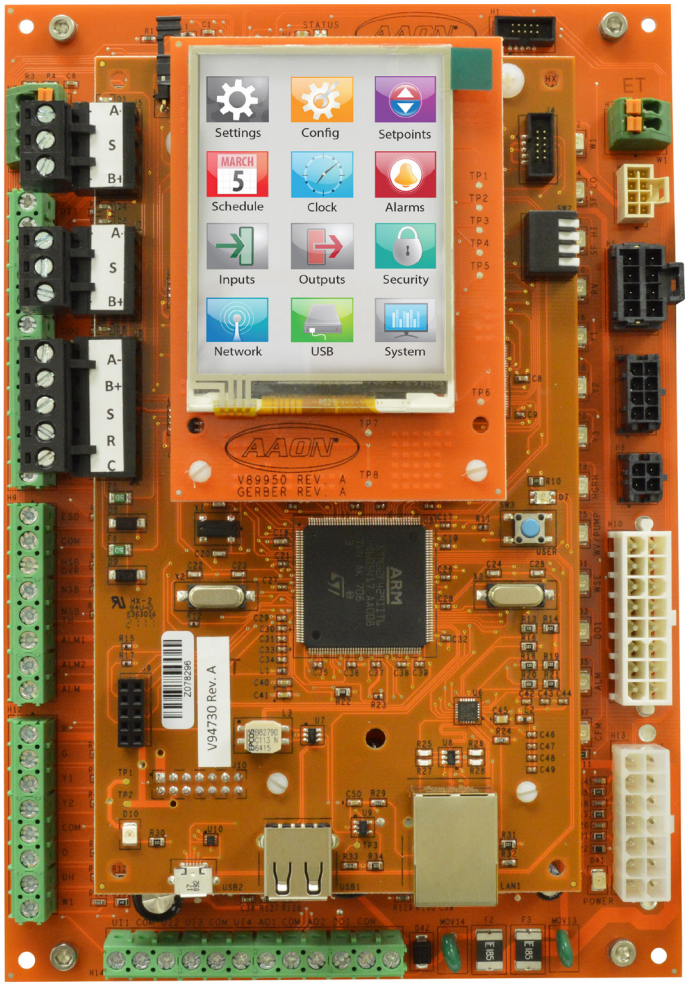
Table 1-23: MODBUS Holding Register Points

MODBUS Holding Register Points

MODBUS Holding Register Points								
Name	**Type**	**Function Codes**	**Addr**	**Data Type**	**Default**	**Range**	**Unit**	**Description**
Supply Heating Hi Reset	Holding Register	0x03(Read), 0x06(Write)	40218	Integer	100	55-120	Fahrenheit	High supply temperature setpoint when using space/supply reset control in Heating Mode
Supply Heating Lo Reset	Holding Register	0x03(Read), 0x06(Write)	40219	Integer	90	55-120	Fahrenheit	Low Supply Temperature Setpoint when using space/supply reset control in Heating Mode
Dehum Enable Setpoint	Holding Register	0x03(Read), 0x06(Write)	40220	Integer	50	40-60	Relative Humidity	Relative Humidity Setpoint for enabling dehumidification setpoint
Aux Heat Deadband	Holding Register	0x03(Read), 0x06(Write)	40221	Integer	5	1-10	Fahrenheit	Degrees Fahrenheit that the supply air must be under setpoint for auxiliary heat to enable
Supply Fan Maximum Percentage	Holding Register	0x03(Read), 0x06(Write)	40222	Integer	100	35-100	Percent	Maximum allowed output for a variable speed supply fan
Supply Fan Minimum Percentage	Holding Register	0x03(Read), 0x06(Write)	40223	Integer	35	35-100	Percent	Minimum allowed output for a variable speed supply fan
Space Temp Offset	Holding Register	0x03(Read), 0x06(Write)	40224	Integer	0	-20 - 20	Fahrenheit	Temperature offset for the space sensor
Supply Temp Offset	Holding Register	0x03(Read), 0x06(Write)	40225	Integer	0	-20 - 20	Fahrenheit	Temperature offset for the supply temperature sensor
Space RH Offset	Holding Register	0x03(Read), 0x06(Write)	40226	Integer	0	-20 - 20	Fahrenheit	Relative humidity offset for the space sensor
Waterside Economizer Cooling Failure Time	Holding Register	0x03(Read), 0x06(Write)	40227	Integer	10	10 - 255	Minutes	Amount of time unit stays in Economizer Mode before going into compressor cooling.
Waterside Economizer Heating Failure Time	Holding Register	0x03(Read), 0x06(Write)	40228	Integer	10	10 - 255	Minutes	Amount of time unit stays in Economizer Mode before going into compressor heating.
Supply Air Reheat Setpoint	Holding Register	0x03(Read), 0x06(Write)	40231	Integer	70	55-120	Fahrenheit	Temperature setpoint of the discharge air while in Dehumidification Mode.

Table 1-23: MODBUS Holding Register Points (Continued)

Chapter 2
Pioneer Gold 2.0 Controller Touchscreen Operator Interface



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FIGURES

TABLES

Overview and Features

The AAON Pioneer Gold Controller Touchscreen provides a direct, graphic-enhanced, menu-driven link to enable you to view the status and adjust the setpoints and configurations of the Pioneer Gold Controller. See **Figure 2-1, this page.**

Easy to configure and easy to use, the AAON Pioneer Gold Controller Touchscreen has many features, including the following:

- User-friendly, high-contrast, 2.8 inch color touchscreen interface
- Graphic programming screens provide easy setup and operation without the need for specialized training
- Provides protection from unauthorized users through integral two-level password authorization programming
- Multiple built-in alarms enhance system monitoring
- USB port provides the ability to update firmware and upload and download job site configurations and setpoints
- Comes equipped with real-time clock backup power supply for short power losses

Main Screen

Once you have powered up the Pioneer Gold Controller with the proper power supply, the Main Screen will appear. See **Figure 2-1, this page**.

The top of the screen displays the Time of Day and the Date. The current Operation Mode is displayed underneath those items and whether the unit is in Occupied or Unoccupied Mode. Underneath those items, the screen displays the Alarms, Inputs, Outputs, About, and Settings icons.

Figure 2-1: Pioneer Gold Controller Touchscreen Main Screen

Icons and Button Functions

System settings and screens are easily accessible by simply touching one of the five icons on the *Main Screen*. The subscreens contain data entry boxes with accessible number keypads for data entry and screen maneuvering buttons such as **<Next>**, **<Back>**, and **<OK>**.

Main Screen Icons

There are seven Main Screen icons. See **Table 2-1, this page**, for a list of the Main Screen icons and their functions.

Icon	Description
	**Occupied/Unoccupied** This icon is darkened to show Occupied and lightened to show Unoccupied. The User Occupancy Override Time is set in the Configuration Screens.
	**Operation Mode** This icon will display at the top right of the Main Screen. It will display a flame for Heating Mode, a snowflake for Cooling Mode, a fan for Vent Mode, or a no water droplet for Dehumidification Mode. It will display the word OFF when the unit is in Off Mode.
	**Inputs** This icon takes you to the *Inputs Screens*. The Input Screens display the status of all possible inputs connected to the board.
	**Outputs** This icon takes you to the *Outputs Screens*. The *Output Screens* display the status of all possible outputs connected to the board.
	**Alarms** This icon takes you to the *Alarm Screens*. The *Alarm Screens* display the status of all possible alarms.
	**Settings** This icon is password protected. Only a qualified user can access the *Settings Screen*. The *Settings Screen* categories are described in **Table 2-2, page 2-3**.
	**About** This icon takes you to the *About Screen*. The *About Screen* displays the firmware version and provides other information about the board.

Table 2-1: Main Screen Icons

Manager Settings

The *Manager Settings Screen* is password protected. Only a qualified user can access this screen. See **Table 2-2, this page**, for a list of these icons and their functions.

Figure 2-2: Manager Settings Screen

Icon	Description
	**Setpoints** This icon takes you to the *Setpoint Screens* where you can access and change setpoints.
	**Schedule** This icon takes you to the *Set Schedule Screen*. This screen allows you to set the desired schedule for the controller.
	**Clock** This icon takes you to the *Clock Screen*. This screen allows you to do three things: set the current date and time and configure Daylight Saving Time.
	**Alarms** This icon takes you to the *Alarms Screens*. The *Alarm Screens* display the status of all possible alarms.
	**Inputs** This icon takes you to the *Inputs Screens*. The *Inputs Screens* display the status of all possible inputs connected to the board.
	**Outputs** This icon takes you to the *Outputs Screens*. The *Outputs Screens* display the status of all possible outputs connected to the board.
	**USB** This icon takes you to the *USB Screen* where you can update firmware, download setpoints to USB, and upload setpoints from USB.

Table 2-2: Manager Settings Screen Icons

Administrator Settings

The *Administrator Settings Screen* is password protected. This menu includes all of the Settings Icons of the Manager Settings and adds Security, Configuration, and Network. See **Table 2-3, this page**, for a list of these icons and their functions.

Figure 2-3: Administrator Settings Screen

Icon	Settings Screen Icons
	**Setpoints** This icon takes you to the Setpoint Screens where you can access and change setpoints.
	**Schedule** This icon takes you to the *Set Schedule Screen*. This screen allows you to set the desired schedule for the controller.
	**Clock** This icon takes you to the *Clock Screen*. This screen allows you to do three things: set the current date and time and configure Daylight Saving Time.
	**Alarms** This icon takes you to the *Alarms Screens*. The *Alarms Screens* display the status of all possible alarms.
	**Inputs** This icon takes you to the *Inputs Screens*. The *Inputs Screens* display the status of all possible inputs connected to the board.
	**Outputs** This icon takes you to the *Outputs Screens*. The *Outputs Screens* display the status of all possible outputs connected to the board.
	**USB** This icon takes you to the *USB Screen* where you can update firmware, download setpoints to USB, and upload setpoints from USB.
	**Network** This icon displays Network information where you can access and change network configurations.
	**Configuration** This icon takes you to the *Configuration Screens* where you can access and change configurations.
	**Security** This icon takes you to the *Security Screen*. This screen allows you to set the Manager's password and the Administrator's password.

Table 2-3: Administrator Settings Screen Icons

Button Functions

See **Table 2-4, this page**, for a list of Navigation buttons and their functions and **Table 2-5, this page**, for Configuration buttons and functions.

Home	Use the **<Home>** button to return to the Main Screen.
Menu	Use the **<Menu>** button to return to the Settings Screen.
Back	Use the **<Back>** button to return to the previous screen.
Next	Use the **<Next>** button to advance to the next screen.
Cancel	Use the **<Cancel>** button to exit the screen without saving changes.

Table 2-4: Navigation Buttons

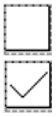
Ok	Use the **<OK>** button to save the data you just selected or entered.
Back	Use the **<Back>** button on the number keypad to delete data.
Apply Settings	Use the **<Apply Settings>** button to save your changes.
Enter	Use the **<Enter>** button to save the data you selected or entered.
Cancel	Use the **<Cancel>** button to exit the screen without saving changes.
	Select the square selection box to make your selection. An empty square designates that the item is NOT selected. A check mark in the square designates that the item IS selected.
Down	Use the **<Down>** button to enter a lower value.
Up	Use the **<UP>** button to enter a higher value.

Table 2-5: Configuration Buttons

Administrator Step-by-Step Guide

In order to operate the Pioneer Gold Controller successfully, you should read this entire guide. This guide will lead you through each step in configuring the Pioneer Gold Controller using its on-board touchscreen operator interface. Below is a quick overview of each step.

Step 1: Login using your Administrator Password
From the *Main Screen*, Press <**Settings>** and enter your Administrator Password.

Step 2: Change the Passwords
From the *Administrator Settings Screen*, Press <**Security>** to change both your Administrator Password and the Manager Password.

Step 3: Set the Correct Date & Time
From the *Administrator Settings Screen*, Press <**Clock>** to change the date and time.

Step 4: Set the Schedules
From the *Administrator Settings Screen*, Press <**Schedule>** and set up the controller schedule.

Step 5: Verify Controller Configuration
From the *Administrator Settings Screen*, Press <**Configuration>** and verify the controller's configurations.

Step 6: Set the Setpoints
From the *Administrator Settings Screen*, Press <**Setpoints>** and set up all of the setpoints.

Step 7: Set the Network Settings
From the Administrator Settings Screen, Press <**Network>** and set up the network settings.

Step 8: Download Setpoints to USB
From the *Administrator Settings Screen*, Press <**USB>** and download the Setpoints and Configurations you just created to a USB flash drive.

Logging into the Settings Screens

Select the **<Settings>** icon found on the bottom right of the Main Screen and enter your manager or administrator password using the number keypad to gain access to the setpoint and configuration items.

NOTE: There are two password levels: Manager and Administrator. The Administrator sets the Manager's password.

Press **<Enter>** once you have entered your password.

The Password Screen will automatically close, and the Settings Screen will display. The touchscreen will stay in Administrator or Manager mode until you log out or until the password times out.

NOTE: Passwords have a non-adjustable timeout of five minutes.

Password Clearance Levels

Below is a list of the password levels, default codes, and actions that can be performed at the various levels.

Level 0 No Password Needed, System Secured
Level 0 users can view alarms and input and output status points. No changes to schedules or other settings can be made.

Manager Level - Default: 1988
Manager Level users can view alarms and input and output status points. They can change Setpoint values. They can also change the system date and time, but no changes to any controller configurations can be made. They can also update firmware, download setpoints to USB, and upload setpoints from USB.

Administrator Level - Default: 2425
Administrator Level users have system administration access and can change the date and time, schedules, and all setpoints and configurations, including default passwords. They can also update firmware, download setpoints to USB, and upload setpoints from USB. They can change network configurations and can run system tests and logs. This level is normally reserved for qualified HVAC service personnel.

Edit Passwords

WARNING: Make sure you change the passwords as soon as possible to secure the system.

NOTE: Only the Administrator Level can change passwords.

From the Administrator Settings Screen, press the **<Security>** icon. The Security Screen will appear. See **Figure 2-4, this page**. Press **<Menu>** to return to the Settings Screen.

On this screen, you have two options: Change Manager Password and Change Administrator Password. Press your menu selection and enter a four-digit password using the keypad. The numbers appear in bold at the top of the screen.

NOTE: Do not use the same password for Administrator and Manager passwords. If you do, each password will default to Level 0.

Figure 2-4: Security Screen

Changing the Date

When you first power up your touchscreen, you will need to change the time, month, day, and year to the current time and date. If your system has been turned off or has been down for a long time, you may have to update the time and date, even though the time and date can maintain itself for several days. Only Managers and Administrators can change the time and date.

The time and date appear at the top right of the *Main Screen* and the *Settings Screen*.

To Change the Date:

From the Settings Screen, select the **<Clock>** icon. See **Figure 2-5, this page**.

This screen displays the current settings for the date, month, and year. Use the arrow keys at the top right and left of the calendar to change the month and year. When you have arrived at the current month and year, press the current date in the calendar itself. The date you choose will change to a shaded red box.

From the Clock Screen, press <**Set Date>**. The *Set Date Screen* will appear. See **Figure 2-6, this page**.

Press **<Apply Settings>** to save your settings and return to the Clock Screen or press **<Cancel>** to return to the Clock Screen.

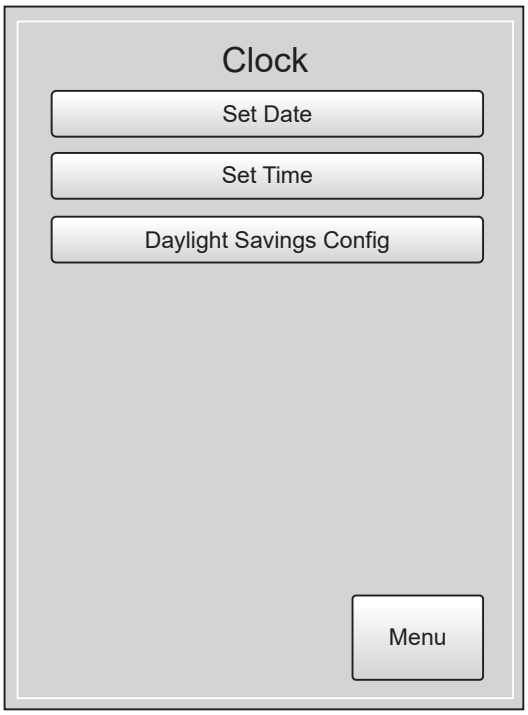


Figure 2-5: Clock Menu Screen

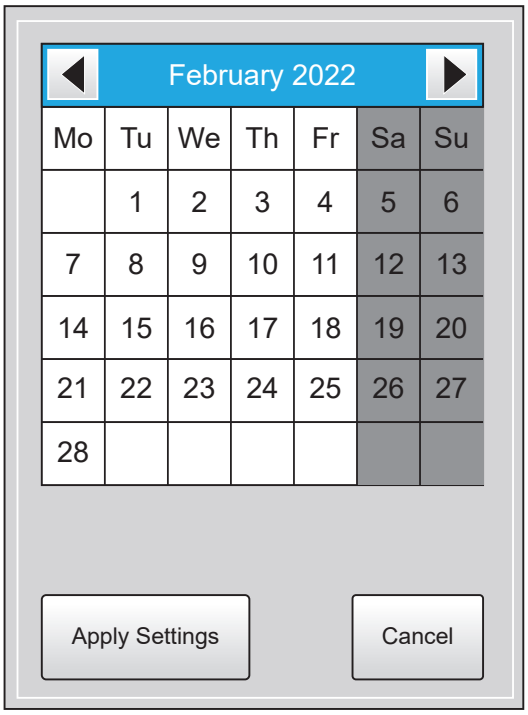


Figure 2-6: Set Date Screen

To Change the Time:

From the *Settings Screen*, select the **<Clock>** icon. From the *Clock Screen*, Press <**Set Time>**. The *Set Time Screen* will appear. See **Figure 2-7, this page**.

- **Set Clock Hour:** Use the up and down arrow keys to select the current hour in 24 hour format. Valid entries are from 0-23. See **Table 2-6, page 2-23** for 24-Hour Time table.
- **Set Clock Minutes:** Use the up and down arrow keys to select the current minutes. Valid entries are from 0-59.
- **Set Clock Seconds:** Use the up and down arrow keys to select the current seconds. Valid entries are from 0-59.

Press **<Apply Settings>** to save your settings and return to the *Clock Screen* or press **<Cancel>** to return to the *Clock Screen*.

Daylight Saving Configuration:

From the *Settings Screen*, select the **<Clock>** icon. From the *Clock Screen*, press <**Daylight Savings Config>**. There are two options on this screen: Daylight Savings Options and Daylight Savings Manual Dates.

Daylight Savings Options

In the *Daylight Savings Options Screen*, Select the option you are using. Select one option. Press **<OK>** to save. The available selections are as follows:

- **Disable:** Default. Select this option if your system is installed in an area of the world that does not use daylight saving time.
- **Auto Adjust:** Select this option to use the current United States' observance of daylight saving time, which begins at 2 a.m. on the second Sunday in March and ends at 2 a.m. on the first Sunday in November.
- **Manual Adjust:** Select this option to manually set the begin date and end date.

Manually Adjust Daylight Savings Dates

If you have selected Manual Adjust in the *Daylight Savings Options Screen*, you can manually select the start date and stop date for daylight saving time. See **Figure 2-8, this page.**

The defaults are 1 in all fields. Use the up and down arrow keys to select the month and day for the Start Date and the month and day for the Stop Date. Press **<Apply Settings>** to save the dates and return to the *Daylight Savings Screen*. Daylight saving time adjustments will take effect at 2 a.m. on the selected days.

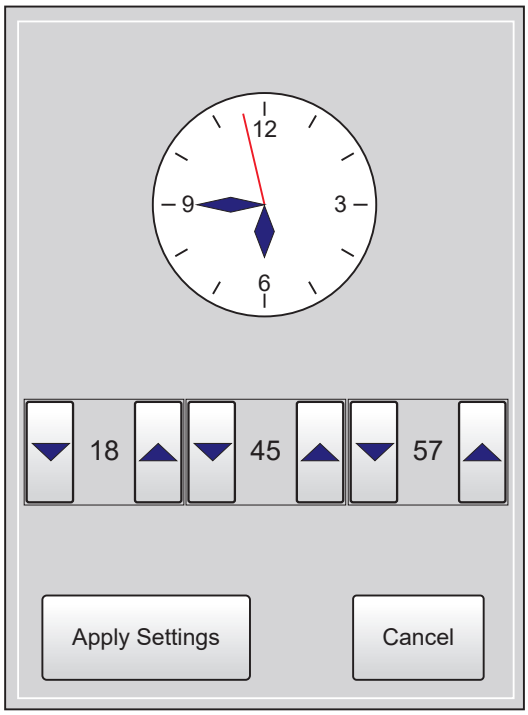


Figure 2-7: Set Time Screen

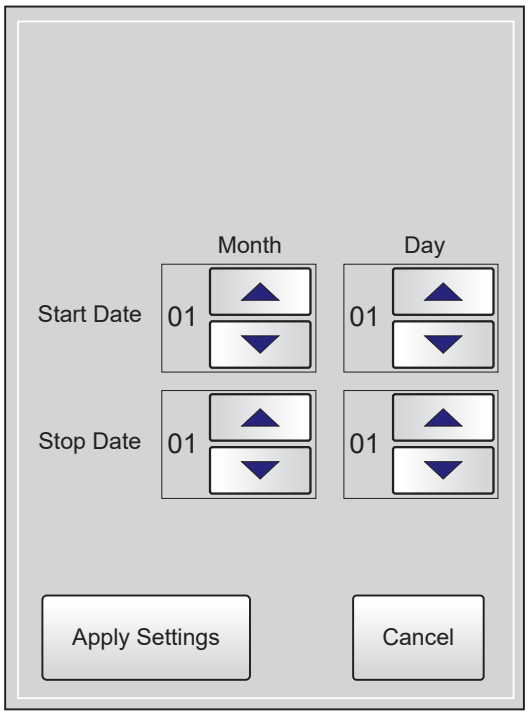


Figure 2-8: Daylight Savings Dates Screen

Set Operating Schedule

When you first power up your touchscreen, you will need to change the operation schedule. Only Managers and Administrators can change the Operation Schedule.

From the *Settings Screen*, select the **<Schedule>** icon. See **Figure 2-9, this page**.

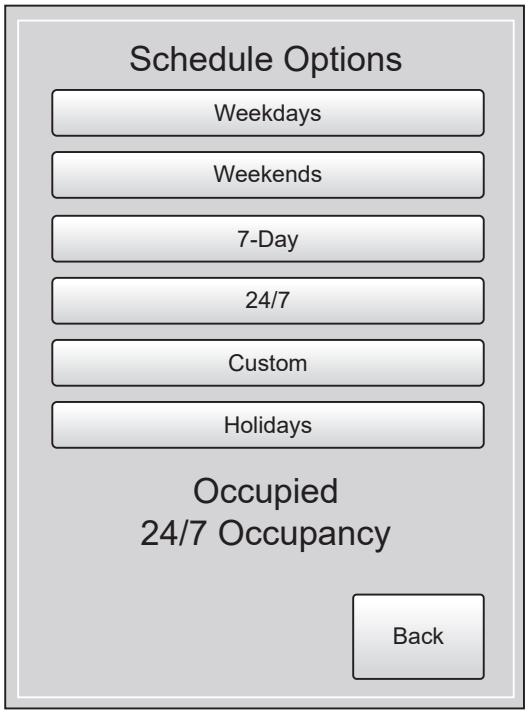


Figure 2-9: Schedule Options Screen

If the unit is unoccupied, "Unoccupied" will be displayed at the bottom of the screen.

If the unit is occupied, "Occupied" will be displayed at the bottom of the screen, and the second line of text will show what is causing occupancy.

- It will display "24/7 Occupancy" if 24/7 occupancy is selected;
- "Scheduled Occupancy" if the internal schedule is causing occupancy;
- "Network Occupancy" if occupancy is caused by the BAS, or
- "User Occupancy" if occupancy is caused by the remote occupancy input.
- If the controller is using a schedule broadcast from a GPC-XP, it will display "Network Schedule".

You can set separate schedules for weekdays and weekends, set schedules for the entire week, set a 24/7 schedule, or create a custom schedule. You can also set the holiday schedule and holiday periods from this screen.

Broadcast Schedule

Eight external broadcast schedules are available with the use of a GPC-XP controller. If a broadcast schedule is configured, it overrides any programmed internal schedule. The controller must be wired to a WattComm network with a GPC-XP. The schedule is configured using the Prism 2 software.

Weekday Schedule

Press <**Weekdays>**. The *Weekdays Schedule Screen* will appear. See **Figure 2-10, this page**. The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format. Press **<Apply Settings>** and then press **<OK>** to return to the *Schedule Options Screen*.

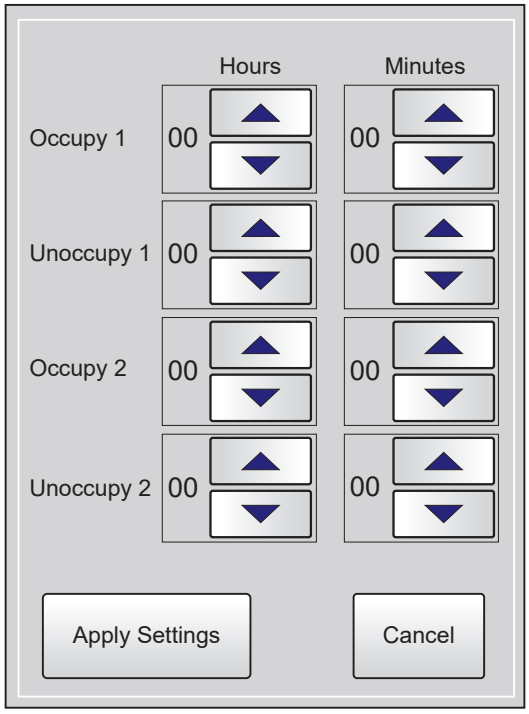


Figure 2-10: Weekdays Schedule Screen

Weekend Schedule

Press <**Weekend>.** The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format. Press **<Apply Settings>** and then press **<OK>** to return to the *Schedule Options Screen*.

7-Day Schedule

Press <**7-Day>**. The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format. Press **<Apply Settings>** and then press **<OK>** to return to the *Schedule Options Screen*.

24-7 Schedule

Press <**24/7>.** Select the 24/7 schedule by touching the selection box to display a check mark. De-select the 24/7 schedule by leaving the selection box blank. When you have finished your selection, Press **<OK>** to return to the *Schedule Options Screen*.

Custom Schedule

Press <**Custom>**. The screen contains each day of the week. Select a day of the week from the menu and that day's selection schedule will appear. The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format. Press **<Apply Settings>** and then press **<OK>** to return to the *Custom Schedule Screen*. When you have finished programming each desired weekday, Press **<Back>** to return to the *Schedule Options Screen*.

NOTE: If you don't set a schedule for a certain day of the week, the equipment will not operate on that day.

Holidays Schedule

Press <**Holidays>**. This screen has two entries: Holiday Time and Holiday Dates. For Holiday Time, follow the instructions for 7-Day Schedule above. For holiday dates, enter up to 14 holiday periods and their start and end dates. For example, New Year's Day start date is January 1 and end date is January 2. Press **<Apply Settings>**.

Press the **<Configuration>** icon on the *Administrator Settings Screen* to access the Configuration Screens. See **Figure 2-11, this page**. There are two Configuration Screens and 10 configuration categories.

Press the **<Next>** button to access the second screen. Press the **<Back>** button to access the previous screen. Press the **<Menu>** button to return to the *Administrator Settings Screen*.

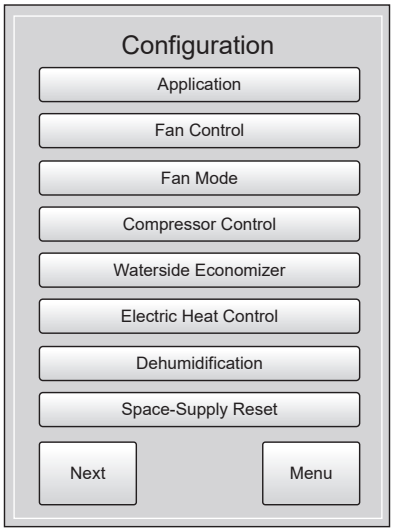


Figure 2-11: Configuration Menu Screens

Press the configuration category you wish to access. See the Application Selection Screen in **Figure 2-12, this page**, for an example of what a selection screen looks like.

Press **<OK>** to save your selection and return to the *Configuration Screen*, Press **<Cancel>** to return to the *Configuration Screen* without saving your selection.

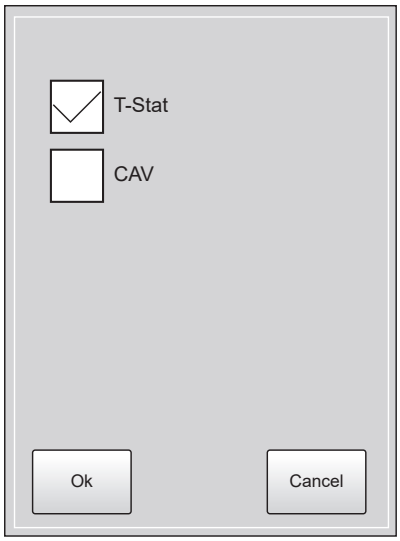


Figure 2-12: Application Selection screen

Application (Factory Set)

Select one option, and then press **<OK>** to save.

- **T-Stat** - Thermostat Control: Standard third party thermostat is used
- **CAV** - Constant Air Volume Space Sensor Control: On-Board Space Sensor or AAON Touchscreen Space and Humidity Sensor

Fan Control (Factory Set)

Select the fan control you are using. Press **<OK>** to save.

- **Single Speed:** Single speed permanent-split capacitor
- **2 Speed ECM:** Low speed and high speed electronically commutated motor

Select the additional option.

- **Compressor Interlock Button:** Only select if using the Compressor Interlock.

Fan Mode (Field Set)

Select one option, and then press **<OK>** to save.

- **Off:** Forces Fan off. Unit will not run with Cooling, Heating, and Dehumidification demands.
- **On:** Default. Forces Fan on during Occupied Mode and Unoccupied Mode.
- **Auto:** Fan Cycles on with Cooling, Heating, and Dehumidification modes. No Call = Fan Off.
- **Occ On/Unocc Auto:** During Occupied Mode, Fan will be on. During Unoccupied Mode, Fan will operate as in Auto, above.

Compressor Control (Factory Set)

Select the type of compressor control you are using. Select one option, and then press **<OK>** to save.

- **Single ON/OFF:** This option is only for a single speed On/Off Compressor
- **2 Step:** This option is only for a single Two-Speed Compressor (uses Unloader technology)

Waterside Economizer (WSE) (Field Set)

Select the type of Waterside Economizer (WSE) control you are using. Select one option, and then press **<OK>** to save.

- **OFF:** Default. No Economizer. No Condenser Water Loop function.
- **COOL:** WSE Valve cycles on based on Cooling Entering Water Temperature Setpoints.
- **HEAT:** WSE Valve cycles on based on Heating Entering Water Temperature Setpoints.
- **COOL/HEAT:** Dual. WSE Valve cycles on based on Entering Water Temperature Setpoints of corresponding mode demand.

Electric Heat Control (Field Wired)

Select the type of electric heat control you are using. Select one option, and then press **<OK>** to save.

- **OFF:** The W1 additional Heat Stage will not be used for external duct heat.
- **Auxiliary Heat:** The W1 heat output will be used as a supplemental stage of heating to the compressors. Duct Mounted Electric Aux Heat. Used to augment Compressor Heat
- **Emergency Heat:** The W1 heat output will be enabled when compressor heating is locked out and there is a demand for heating. There is no supply air control. Duct mounted Electric Emergency Heat. Used to replace Compressor Heat.

Dehumidification

Select the type of Dehumidification control you are using. Select one option.

- **OFF:** No Reheat/Dehumidification
- **Fan Speed Dehum:** Runs compressor at full capacity and fan at low speed while in Dehumidification mode. Unit must be equipped with a two-speed fan to use this feature.
- **Hot Gas Reheat:** Reheat will operate Cooling, Heating, and Economizer modes as a priority over Dehumidification Mode.

Select any additional options. When you are finished, press **<OK>** to save.

- **Dehum Priority:** Dehumidification will operate as a priority over Cooling, Heating, and Economizer modes.
- **Full Reheat:** For use when a Hot Gas Reheat coil is present in the unit. This closes the water valve while in Dehumidification Mode. Should only be used for units in which the reheat coil is piped in series with the coaxial heat exchanger. Not for use in very early production units designed with the piping in parallel.
- **Advanced Options:** This option applies only to very early production units ordered with Hot Gas Reheat which use Parallel Reheat Piping in which the reheat coil was piped in parallel with the coaxial heat exchanger. This option should only be used if instructed by AAON Controls Tech Support.

Desuperheater Control

Select the Desuperheater control. Check the box to have Desuperheater On. Uncheck the box to leave Desuperheater Off. Press **<OK>** to save.

- **Desuperheater On:** Check this box if using a Desuperheater Control Valve. Desuperheater uses Hot Leaving Water from the unit to heat domestic hot water tank.

Water Flow Sensor for Desuperheater

Select the type of water flow sensor you are using for Desuperheater. The AAON part number will be printed on the sensor or wiring diagram. Select one option, and then press **<OK>** to save.

- No Sensor
- V97450
- V97460
- V97470
- V97480

Compressor Interlock Inputs

Compressor operation will disable when selected inputs open. Press <**OK>** to save.

- DI1 Comp Interlock
- DI2 Comp Interlock

Trendlog Rate

An internal Trend Log is constantly updated at a rate equal to this value. Default: 15 minutes; Range: 1-60 minutes.

Accessing Setpoints

Press the **<Setpoints>** icon on the *Settings Screen* to access the *Setpoints Screens*. See **Figures 2-13, this page**. There are two Setpoint Screens and ten setpoint categories. Each setpoint category can have many setpoints.

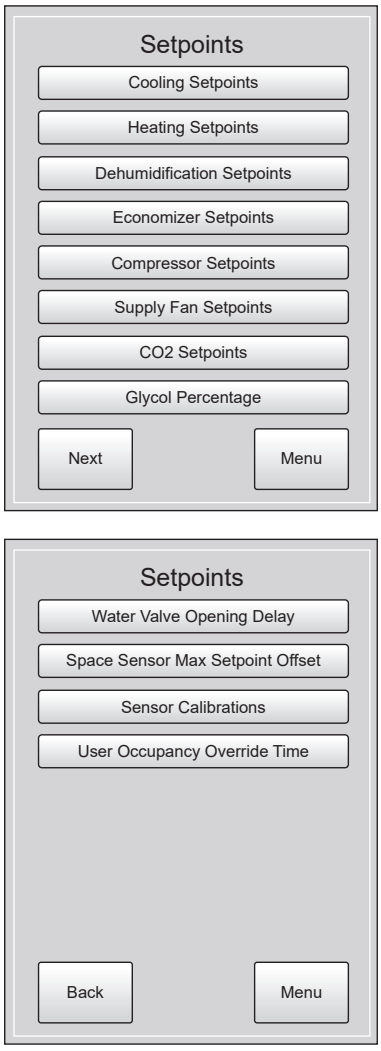


Figure 2-13: Setpoint Screens

Press the **<Next>** button to access the second screen. Press the **<Back>** button to access the previous screen. Press the **<Menu>** button to return to the *Setpoints Screen*.

Press the setpoint category you wish to access. See **Figure 2-14, this page**, for the *Cooling Setpoints Screen* as an example.

Select an individual setpoint from the setpoint category screen. The setpoint's data entry screen will display. See **Figure 2-15, this page**, for an example. Press **<Back>** to return to the *Setpoints Screen*.

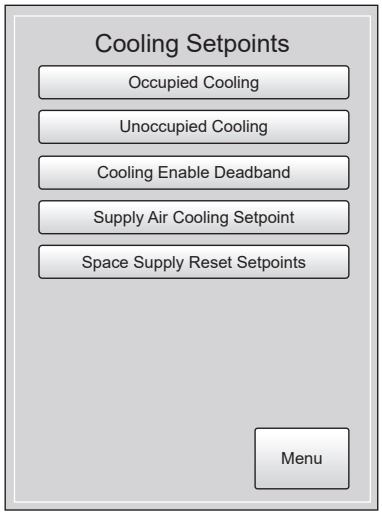


Figure 2-14: Cooling Setpoints Screen

The name of the setpoint will be displayed at the top of the screen. Press the **<UP>** and/or **<Down>** arrows to change the value. Press **<OK>** to save the value. Press **<Cancel>** to exit without saving. The system will return to the Setpoint Category Screen. Press **<Back>** to return to the *Setpoints Screen*.

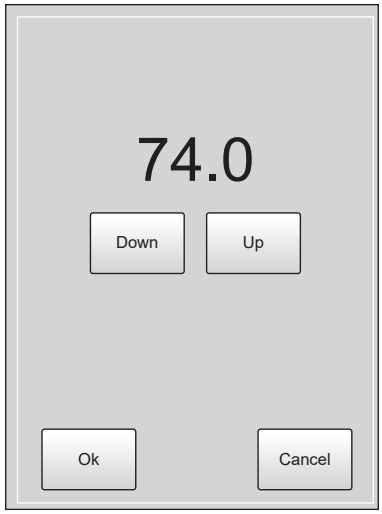


Figure 2-15: Setpoint Data Entry Screen

Setpoint Values

Refer to the following for setpoint names and their min/max and defaults.

Cooling Setpoints

- **Occupied Cooling:** Sets the Cooling Setpoint. Default: 74°F; Range: 55-85°F
- **Unoccupied Cooling:** Sets the Unoccupied Cooling Setpoint. Default: 79°F; Range: 55-85°F
- **Cooling Enable Deadband:** How far away from Setpoint to generate or remove Call. Default: 1°F; Range: 1-5°F
- **Supply Air Cooling Setpoint:** Default: 55°F; Range: 45-65°F

Heating Setpoints

- **Occupied Heating:** Sets the Heating Setpoint. Default: 70°F; Range: 55-85°F
- **Unoccupied Heating:** Sets the Unoccupied Heating Setpoint. Default: 65°F; Range: 55-85°F
- **Heating Enable Deadband:** How far away from the Setpoint to generate or remove Call. Default: 1°F; Range: 1-5°F
- **Supply Air Heating Setpoint:** Default: 90°F; Range: 55-120°F
- **Auxiliary Heat Deadband:** Space Temp has to be this far below setpoint before Aux Heat can energize. Default: 5°F; Range: 1-10°F

Dehumidification Setpoints

- **Dehumidification Enable:** If Space RH is above this value, Unit will go into Dehumidification Mode. Default: 50%; Range: 40-60%
- **Dehumidification Lockout:** If the Space Temp is below this value, the Dehumidification Mode will be locked out. Default: 55°F; Range: 35-75°F
- **Supply Air Reheat Setpoint:** In the Modulating Reheat mode, the controller will try to maintain this setpoint. Default: 70°F; Range: 55-120°F

Economizer Setpoints

- **Economizer Cooling Enable:** If the Entering Water Temperature is below this value, the Economizer can be used for "Free" Cooling. Default: 45°F; Range: 45-60°F
- **Economizer Heating Enable:** If the Entering Water Temperature is Above this value, the Economizer can be used for "Free" Heating. Default: 85°F; Range: 75-90°F
- **Water Econ Cooling Failure Time and Water Econ Heating Failure Time**
  If the Waterside Economizer is enabled for cooling or heating, the failure time is the time period before it switches to Compressor Cool or Heat. Setting the value to 255 will disable the timer so the Waterside Economizer will run indefinitely in that mode and never timeout. Default: 10 minutes; Range: 10-255 minutes

Compressor Setpoints

- **Minimum On Time:** Compressor must run for this amount of time before it can turn off. Default: 180 seconds; Range: 120-255 seconds
- **Minimum Off Time:** Compressor must remain for this amount of time before it can turn on. Default: 120 seconds; Range: 60-255 seconds
- **Interstage On Delay:** If Stage 1 is energized, the controller must wait for this amount of time before turning on Stage 2. Default: 60 seconds; Range: 30-255 seconds
- **Interstage Off Delay:** If Stage 2 is energized, the controller must wait for this amount of time before turning off Stage 2. Default: 60 seconds; Range: 30-255 seconds

Supply Fan Setpoints

- **Supply Fan Minimum Speed:** This is the Low Fan Speed setting for a two-speed ECM Fan. Default: 63%; Range: 20-100%
- **Supply Fan Maximum Speed:** This is the High Fan Speed setting for a two-speed ECM fan. Default: 80%; Range: 20-100%

CO2 Setpoints

- **CO2 Override:** If CO_2 is above this value, the OA damper will be opened. Default: 900ppm; Range: 500-1500ppm

Glycol Percentage

This is the percentage of Glycol mixed in the loop water. It is needed to calculate Lockout setpoints. Default: 0%; Range: 0-40%

Water Valve Opening Delay

This is the amount of time that the Water Valve needs to be open before Compressor operation is allowed. Default: 30 seconds; Range: 5-75 seconds

Space Sensor Maximum Setpoint Offset

This setpoint limits how much the user can adjust the Cooling and Heating setpoints above and below the Room Sensor temperature. Default: 0°F; Range: +/- 10°F

Sensor Calibrations

- **Space Temperature, Supply Temperature and Space Humidity Sensor Calibrations**: You can adjust the offset temperature when the sensor is reading incorrectly. Enter a positive value to raise the reading or a negative value to lower the reading. Default: 0°F; Range: +/- 20°F

User Occupancy Override Time

This setpoint allows the user to adjust the occupancy override time for the Remote Touchscreen Temperature and Humidity Sensor. Default: 120 minutes; Range: 30-480 minutes. Entering 0 will disable the override.

USB Screen

From the Administrator Settings Screen, press the **<USB>** icon. See **Figure 2-16, this page**. This screen provides you with options to update the controller's firmware and/or bootloader, upload setpoints, and download setpoints.

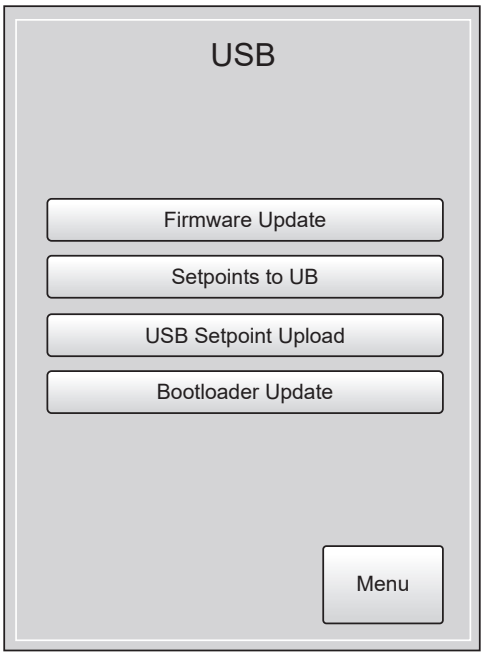


Figure 2-16: USB Screen

To Update the Firmware

Once you obtain the firmware update from AAON Technical Support, download it onto a USB flash drive. There are two ways to update the firmware:

- Plug the USB flash drive into the USB port on the board and Press <**Firmware Update>** from the USB Screen
- Plug the USB flash drive into the USB port and cycle power to the controller.

Either way, the firmware will automatically update. Verify the firmware version in the *About Screen* by accessing the **<About>** icon. See page 20 for the *About Screen*. Follow the detailed instructions below to update the firmware:

1. To install the new firmware, copy the firmware update file from AAON Technical Support directly onto the root directory of a totally empty USB flash drive. The name of the firmware file will always include the PG, the version number, and have a *.bin extension.

NOTE: Do not rename the file.

2. Insert the USB flash drive into the USB port of the Pioneer Gold Controller and cycle power to the Controller or Press <**Firmware Update>** from the USB Screen and this option will automatically cycle power to the controller.
3. Once power is restored, the STAT2 LED should blink red no more than five times total as it checks the USB port at startup. If it is detected, the LED should turn solid green and then after several moments should flash green to indicate the download is in process. When the download is complete, the LED will turn off.
4. Once complete, the controller should be running the new version. Verify the firmware version in the *About Screen* by accessing the **<About>** icon.
5. You can now remove the flash drive.

Download Setpoints to USB

Once you have all of your setpoints and configurations set up for your job site, it's a good idea to save them in a file. Plug your USB flash drive into the USB port of the controller and Press <**Setpoints to USB>.** You can then use the file created to restore setpoints or copy setpoints from one controller to another.

Upload Setpoints

Once you have your setpoints saved to USB, you can upload the setpoints to another controller or restore setpoints to a replacement controller. Plug your USB flash drive containing the setpoint file into the USB port of the controller and Press <**USB Setpoint Upload>**.

To Update the Bootloader

Follow the detailed instructions below to update the bootloader:

1. To install the new bootloader firmware, copy the boot-loader update file from AAON Technical Support directly onto the root directory of a totally empty USB flash drive. The name of the bootloader file will always include BL, the version number, and have a *.bin extension.

NOTE: Do not rename the file.

2. Insert the USB flash drive into the USB port of the Pioneer Gold Controller and Press <**Bootloader Update>** from the USB Screen.
3. The update should take about 1 second, and the screen will display "Bootloader Update Successful."
4. Once complete, the controller should be running the new version. Verify the bootloader version in the *About Screen* by accessing the **<About>** icon.
5. You can now remove the flash drive.

Network Information

From the *Administrator Setting Screen*, press the **<Network>** icon. The first of two Network Screens will appear. See **Figure 2-17, this page**. These screens allow you to setup network information for MODBUS, WattComm, BACnet® MS/TP, BACnet® IP (if your board has a programmed Ethernet connection), and other network communications. This information can be obtained from your BAS Administrator and can be useful when contacting AAON Technical Support.

The first screen contains the Protocol RS485, Baud Rate, Word Length, Parity, Stop Bits, MAC Address, Device ID, and MODBUS Slave Address. The second screen contains the Protocol IP, IP Address, Subnet Mask, Gateway, Foreign Device configuration, and the factory-generated MAC address.

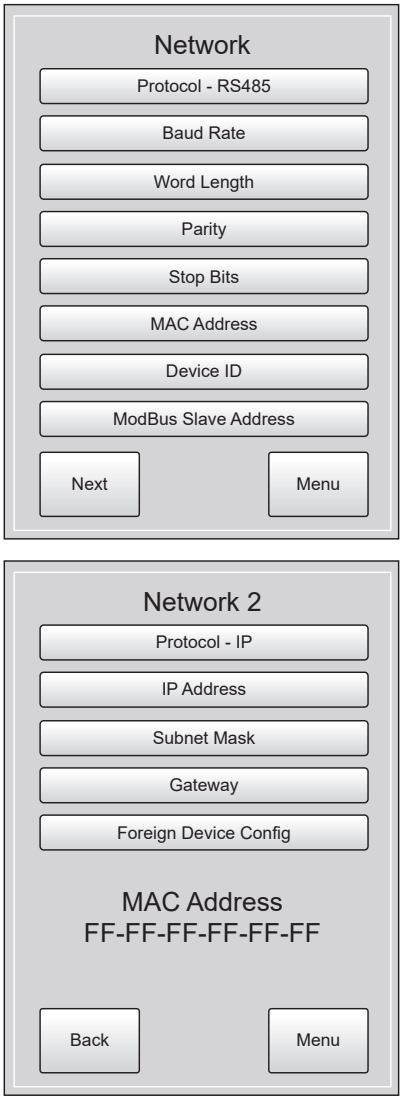


Figure 2-17: Network Information Screens

NOTE: If your board does not have a programmed Ethernet connection, the second screen will instead display, "BacnetIP is not available on this unit."

After making your selection from each category's screen, press the **<OK>** button to return to the Network Screen(s).

Protocol - RS485 (MODBUS, WattComm, and BACnet® MS/TP applications)

Select one option. Press **<OK>** to save. The available selections are as follows:

- **None**
- **MODBUS RTU**
- **WattComm**
- **BACnet MS/TP**

NOTE: BACnet® MS/TP and BACnet® IP cannot be used simultaneously and neither can BACnet® MS/TP and WattComm.

Select the additional option.

- **Legacy BACnet Points:** This option will allow you to use the BACnet® points list used prior to PG version 2.0.
- **Baud Rate:** 9600, 19200, 38400, 57600, 76800. Default is 19200.
- **Word Length:** For Technical Support use only.
- **Parity:** For Technical Support use only.
- **Stop Bits:** For Technical Support use only.
- **MAC Address:** Use the up and down buttons to enter the BACnet® MAC address. Default is 27. Valid range is 0 to 127.
- **Device ID:** Valid range is 0 to 4194302. Default is 27.
- **MODBUS Slave Address:** Valid range is 1 to 254. Default is 100.
- **Protocol - IP (For BACnet IP):** Select one option. Press **<OK>** to save. The available selections are as follows:
  - **None**
  - **BACnet IP**

NOTE: BACnet® IP and BACnet® MS/TP and cannot be used simultaneously.

Select the additional option.

- **DHCP Enable:** Check this box if you are using Dynamic Host Configuration Protocol
- **IP Address:** The default IP address is 192.168.000.001.
- **Subnet Mask:** The default subnet mask 255.255.255.000.
- **Gateway IP Address:** The default Gateway IP address is 000.000.000.000.

Foreign Device Configuration

- **Foreign Device Enable/Disable:** The default is Disabled.
- **Time to Live:** This is the device's time to live in seconds. Selection is in 30 second increments from zero to 600. Default is 30 seconds.
- **BBMD Port:** This is the BACnet®/IP Broadcast Management Device Port. Default is 47408.
- **BBMD IP Address:** This is the BACnet®/IP Broadcast Management Device IP Address. Default is 000.000.000.000.
- **Ethernet MAC Address:** The MAC address is displayed at the bottom of the *Network 2 Screen* and should match the MAC address sticker placed on the controller board.

Input Status

From the *Main Screen*, press the **<Inputs>** icon. The *Inputs 1 Screen* will appear. See **Figure 2-18, this page**.

The setpoint values are displayed on each screen. For digital inputs, the status should be Normal unless there is an alarm. If there is an alarm, the word Alarm will appear in red.

There are four Inputs Screens. See **Figures 2-18, this page**. Press the **<Next>** button to access each screen. Press the **<Back>** button to access the previous screen. Press the **<Menu>** button to return to the *Main Screen*.

Figure 2-18: Inputs Screens

Output Status

From the *Main Screen*, press the **<Outputs>** icon. The *Outputs 1 Screen* will appear. See **Figure 2-19, this page,** for both Outputs Screens. The output values or status are displayed on each screen.

Press the **<Next>** button to access the second screen. Press the **<Back>** button to access the first screen. Press the **<Menu>** button to return to the *Main Screen*.

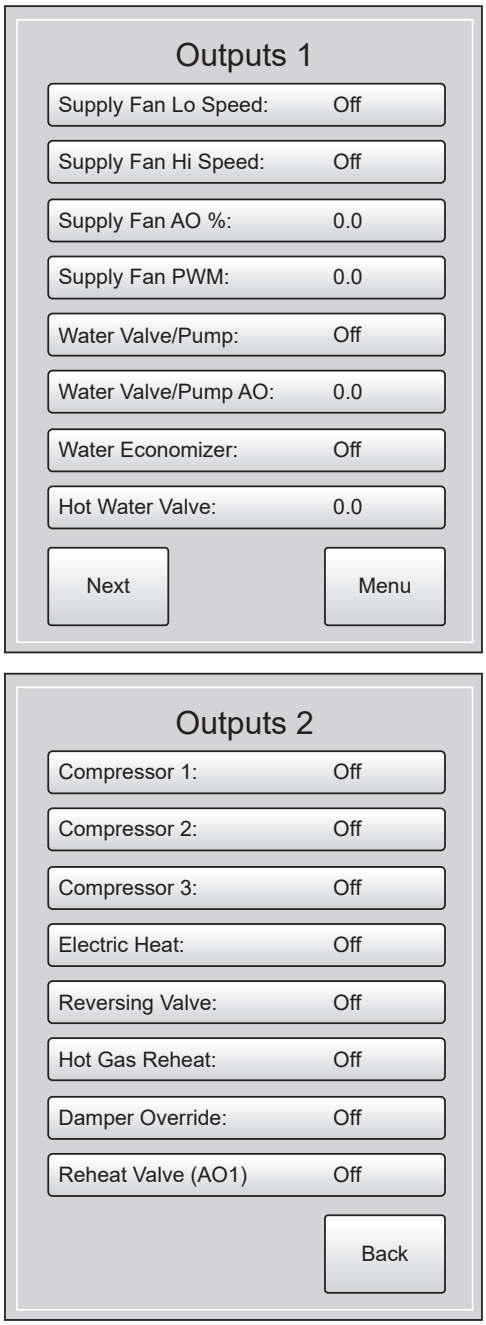


Figure 2-19: Outputs Screens

Alarm Status

From the *Main Screen*, press the **<Alarms>** icon. The *Alarms 1 Screen* will appear. See **Figures 2-20, this page.** There are three Alarms Screens. Press the **<Next>** button to access each screen. Press the **<Back>** button to access the previous screen. Press the **<Menu>** button to return to the *Main Screen*.

The status for each alarm should be Ready or Normal. If there is an alarm, the word Alarm will appear in red. The abbreviation L.O. in red stands for "Locked Out". This means that there is currently one or more alarms active, and any item that shows L.O. is conveying that this particular item(s) is/are being affected by the particular alarm. Continue scrolling through the Alarms pages until you see the item that shows "Alarm" to identify which item is in an alarm state that is causing associated items to be Locked Out.

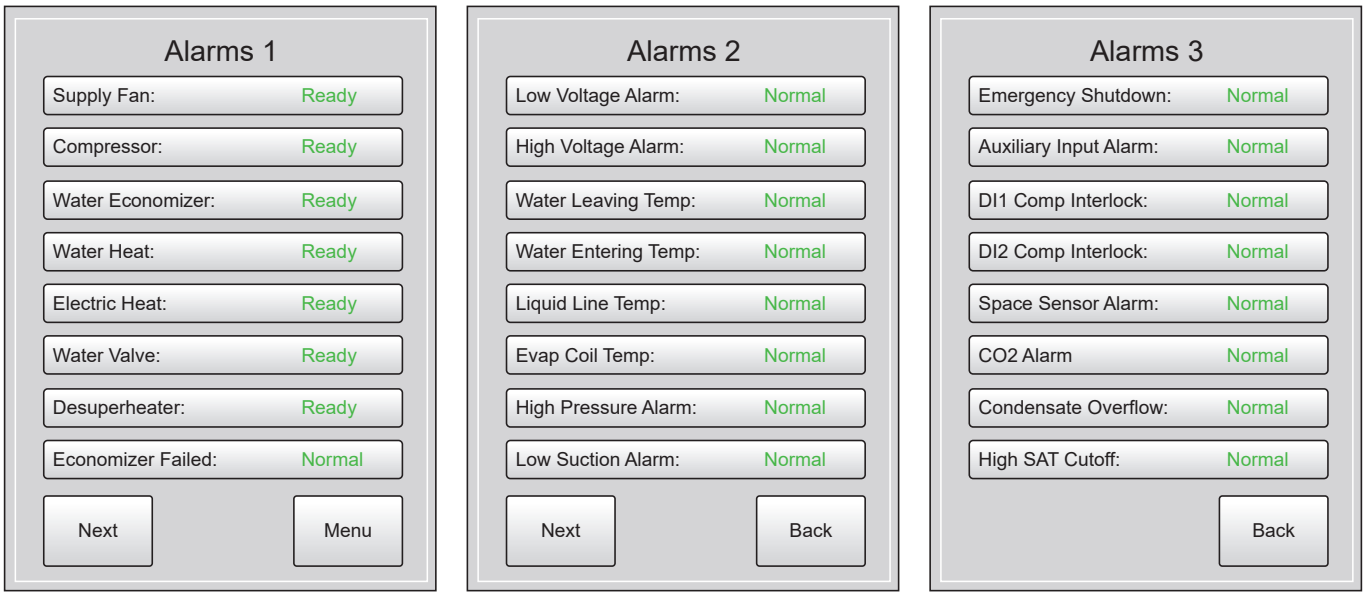


Figure 2-20: Alarms Screens

Care

The Pioneer Gold Touchscreen comes equipped with a thin protective film over the LCD screen. You can remove this protective cover if you so desire. The LCD display should be cleaned with a soft, dust-free cloth. Do not use any liquid to clean your touchscreen.

About

From the *Main Screen,* press the **<About>** icon. The *About Screen* will appear. See **Figure 2-21, this page**. This screen provides you with manufacturer information, the name of the board, the password reset key, and the firmware, bootloader, and I/O board versions.

This information may be useful when contacting AAON Technical Support for help with your touchscreen or the controller.

24-Hour Conversion Time Table

The main difference between standard and 24-hour time is how hours are expressed. Standard time uses numbers 1 to 12 and a.m. and p.m. to identify each of the 24 hours in a day. In 24-hour time, the hours are numbered from 0000 to 2300.

The first two digits indicate the hour and the last two digits indicate the minutes. 24-hour time does not exceed 2359 hours. For example, midnight is recorded as 0000; one minute past midnight is 0001; 1 a.m. is 0100, 1 p.m. is 1300, and so on.

When converting from standard to 24-hour time and vice versa, the minutes and seconds do not change.

Standard time requires the use of a.m. and p.m. to clearly identify the time of day. Since 24-hour time uses a unique two-digit number to identify each of the 24 hours in a day, a.m. and p.m. are unnecessary.

Figure 2-21: About Screen

Standard Time	24-Hour Time	Standard Time	24-Hour Time
12:00 a.m.	0000	**12:00 p.m.**	1200
12:30 a.m.	0030	**12:30 p.m.**	1230
1:00 a.m.	0100	**1:00 p.m.**	1300
1:30 a.m.	0130	**1:30 p.m.**	1330
2:00 a.m.	0200	**2:00 p.m.**	1400
2:30 a.m.	0230	**2:30 p.m.**	1430
3:00 a.m.	0300	**3:00 p.m.**	1500
3:30 a.m.	0330	**3:30 p.m.**	1530
4:00 a.m.	0400	**4:00 p.m.**	1600
4:30 a.m.	0430	**4:30 p.m.**	1630
5:00 a.m.	0500	**5:00 p.m.**	1700
5:30 a.m.	0530	**5:30 p.m.**	1730
6:00 a.m.	0600	**6:00 p.m.**	1800
6:30 a.m.	0630	**6:30 p.m.**	1830
7:00 a.m.	0700	**7:00 p.m.**	1900
7:30 a.m.	0730	**7:30 p.m.**	1930
8:00 a.m.	0800	**8:00 p.m.**	2000
8:30 a.m.	0830	**8:30 p.m.**	2030
9:00 a.m.	0900	**9:00 p.m.**	2100
9:30 a.m.	0930	**9:30 p.m.**	2130
10:00 a.m.	1000	**10:00 p.m.**	2200
10:30 a.m.	1030	**10:30 p.m.**	2230
11:00 a.m.	1100	**11:00 p.m.**	2300

Table 2-6: 24-Hour Time Conversion

Chapter 3
Pioneer Gold 2.0 Controller
Prism 2 Operator Interface
Overview

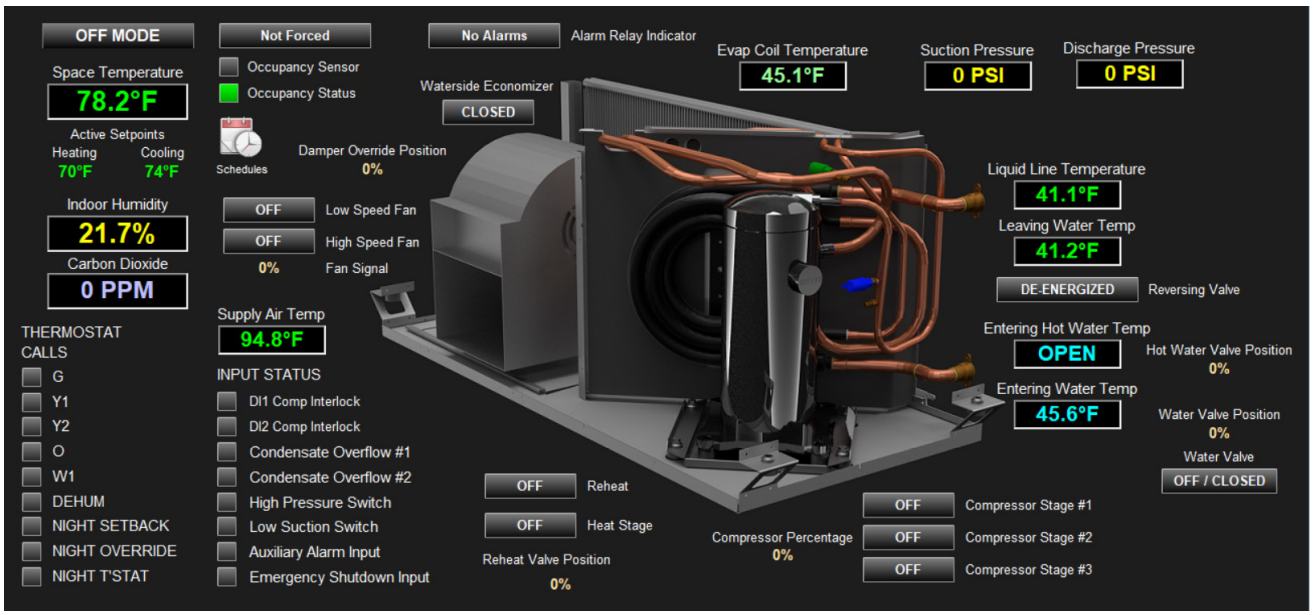


TABLE OF CONTENTS

FIGURES

TABLES

Prism 2 is a complete Windows®-based graphical interface controls and management program that allows you to interact with your digital controls. The program provides standard, easy-to-understand status, setpoint, and configuration screens for the Pioneer Gold Controller and other controllers in your system.

Prism 2 allows you to access and control schedules, trend logs, and alarm conditions. The program can be configured for direct on-site installation or TCP/IP Internet connection.

Feature Summary

Prism 2 provides a broad set of features:

- Easy to use
- Available on our website, www.aaon.com/Prism
- On-site or TCP/IP communications
- User programmable description for every piece of equipment and user-defined custom screens
- Automatic retrieval of trend logs and export capability to spreadsheet and database programs
- Alarm Logs maintained on disk
- Alarm E-mail/texting capability when using a CommLink
- Encrypted History Logs
- Trend Logs

System Requirements

To use Prism 2 you must have a computer that meets or exceeds the following requirements:

Operating System

Microsoft® Windows® 10

NOTE: Prism 2 is not intended for a server/client environment or any version of Windows Server.

Minimum Hardware

- Windows® compatible computer
- CommLink 5 or USB Link 2 for direct, on-site connection
- IP Module for remote connection
- Prism is NOT supported in a server environment. It does not support client/server systems. Prism is a LAPTOP/DESKTOP ONLY system.

Software License

Prism 2 does not require any license agreement and may be freely copied and distributed.

WARNING: Older operating systems, while they still might be capable of running Prism, are not recommended due to security updates being obsoleted by Microsoft®. We also do not support troubleshooting of any version of Windows® operating the Prism program. Some new models of laptops running the latest release of Windows® 10 have also experienced issues running Prism, and we cannot troubleshoot customer computer issues.

Additional Information

In order to successfully establish Prism 2 communications with your controls system, you will want to refer to one or more of the following technical guides, all downloadable from our website, *www.aaon.com/controlsmanuals*

- *Prism 2 Technical Guide*
- *CommLink 5 Technical Guide*
- *IP Module Technical Guide*
- *USB-Link 2 Technical Guide*
- *MiniLink PD 5 Technical Guide*

Prism 2 Manual Overview

Prism 2 Technical Guide Overview

The Prism 2 Technical Guide will lead you through each step in configuring Prism 2—from entering passcodes to searching and selecting units for troubleshooting. Below is a quick overview of each step of the guide that pertains to the Pioneer Gold Controller.

Step 1: **Installing Prism 2 -** This section explains how to install the Prism 2 software, initiate communications, navigate the program, and enter and edit passcodes.

Step 2: **Setting Up Job Sites -** This section provides instructions for setting up each job site's name, port, or IP address, CommLink type and configuration, alarm notification, and custom screen designation.

Step 3: **Configuring Prism 2 -** This section describes how to have Prism 2 automatically restart after a power failure and broadcast time to all controllers. It also explains how to set up the main screen display picture.

Step 4: **Setting Up Communications -** This section explains how to establish communications via TCP/IP connection through your CommLink.

Step 5: **Searching for Installed Units -** This section explains how to perform a unit search per job-site.

Step 6: **Selecting and Renaming Loops and Units -** This section explains how to select and rename loops and units.

Step 7: **Configuring Units -** This section describes how to configure controller setpoints, schedules, and holidays. It also explains how to configure units while off-line.

The appendices include examples of status and setpoint screens, instructions for DEMOMODE, and a list of controllers, E-BUS modules, and other devices that can be updated using Prism 2.

Controller Status Screen

After successful Prism 2 installation and job-site setup, you will be able to access the Pioneer Gold Status Screen. See **Figure 3-1, this page**.

Besides displaying the current operating status and inputs and outputs, from this screen you can force occupancy, set schedules, view alarms, and access and change setpoints.

NOTE: Only the Administrator and top level users can access and change setpoints and schedules.

Figure 3-1: Pioneer Gold Controller Status Screen

The following status points are displayed in the Pioneer Gold Controller Status Screen shown above:

- Mode of Operation
- Active Cooling Setpoint
- Space Temp
- Leaving Water Temp 1
- Supply Air Temp
- Leaving Water Temp 2
- Indoor Humidity
- Entering Hot Water Temp
- CO_2 Level
- Reversing Valve Status
- Evap Coil Pressure
- Occupancy Status
- Suction Pressure
- Hot Water Valve Position
- Discharge Pressure
- Entering Water Temp
- Water Valve Status
- Waterside Economizer
- Active Heating Setpoint
- Heat Stage On/Off
- Reheat On/Off
- Thermostat Calls
- Compressor Interlock 1 (DI1)
- Compressor Interlock 2 (DI2)
- Force Mode
- Damper Override
- Alarm Indicator
- Fan Signal
- Low Speed Fan
- High Speed Fan
- Compressor Stage 1
- Compressor Stage 2
- Compressor Stage 3
- Compressor Percentage
- Outdoor Air Airflow
- Condensate Overflow 1
- Condensate Overflow 2
- High Pressure Switch
- Low Pressure Switch
- Auxiliary Alarm
- Emergency Shutdown
- 24 Hour Operation

Controller Setpoint Screens

Setpoints are accessed by clicking on **<Setpoints>** at the top left of *Pioneer Gold Status Screen* (**Figure 3-2, this page**). The Temperature & Ratios Setpoints Screen will display. See **Figure 3-3, this page**.

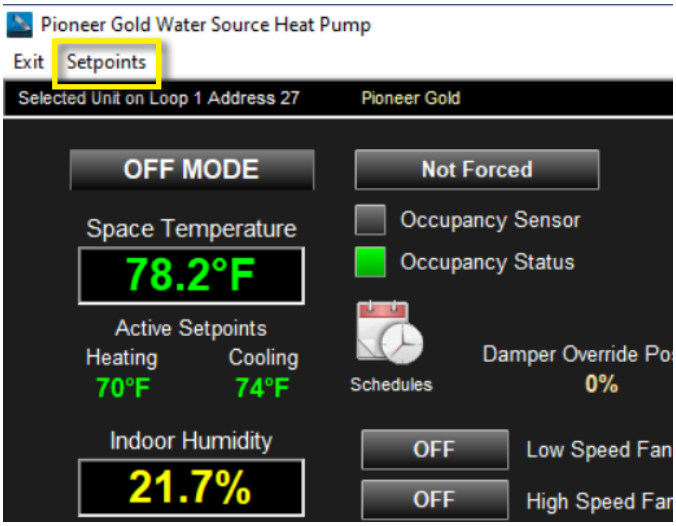


Figure 3-2: Status Screen - Setpoints

At the bottom of any *Setpoints Screen*, you can access all other Setpoint Screens by clicking the icons, **<Temperatures>**, **<Staging Delays>**, **<Miscellaneous>**, **<Calibration>**, **<Configuration>**, and **<Administrative>**. See **Figure 3-3, this page**.

The figures that follow show the rest of the screens available under Setpoints.

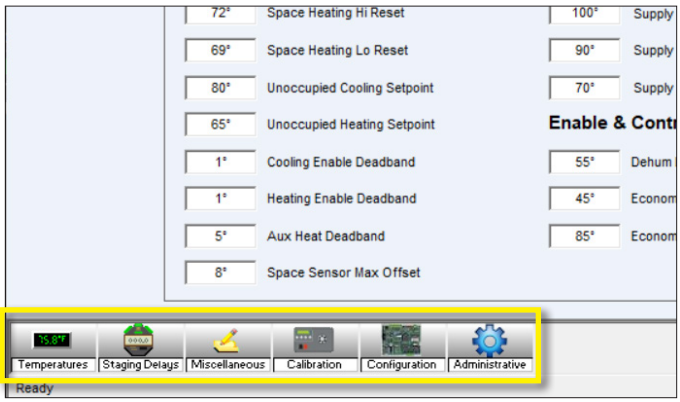


Figure 3-4: Setpoints Screen Icons

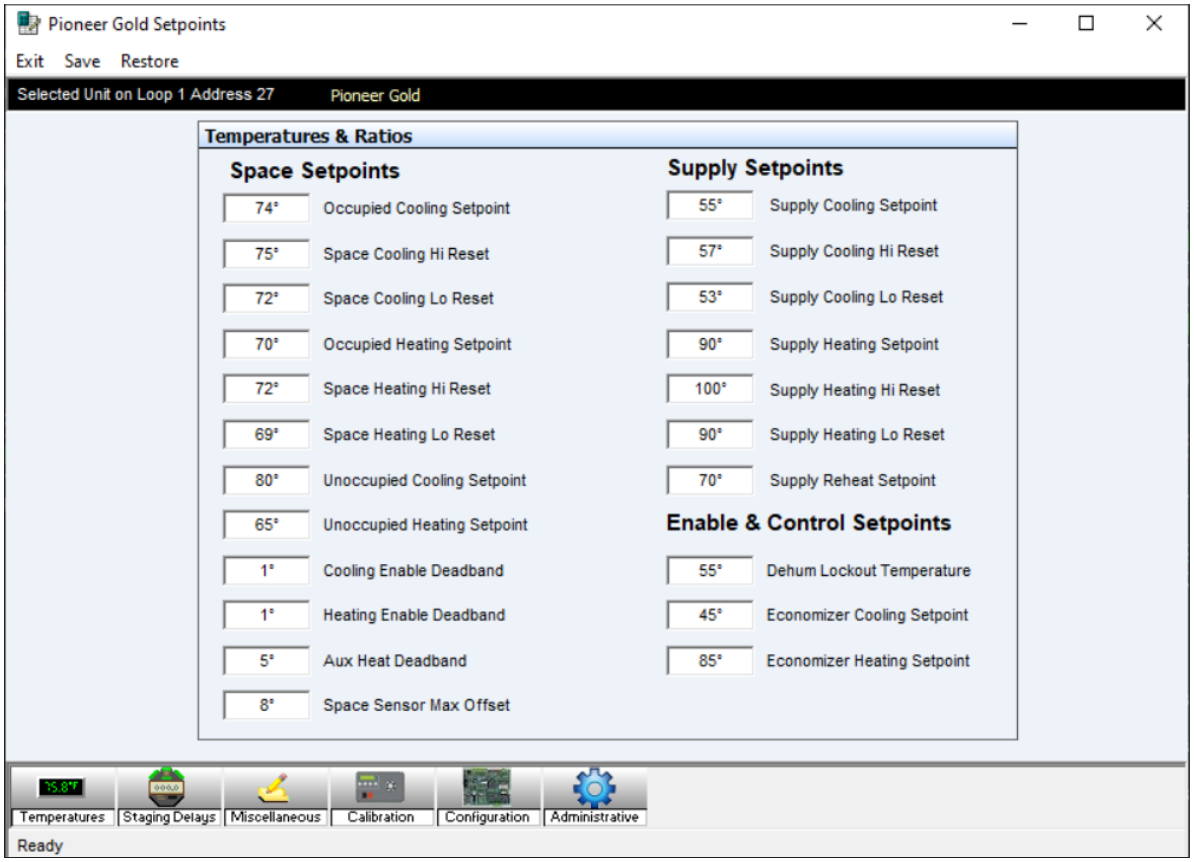


Figure 3-3: Temperature & Ratios Setpoints Screen

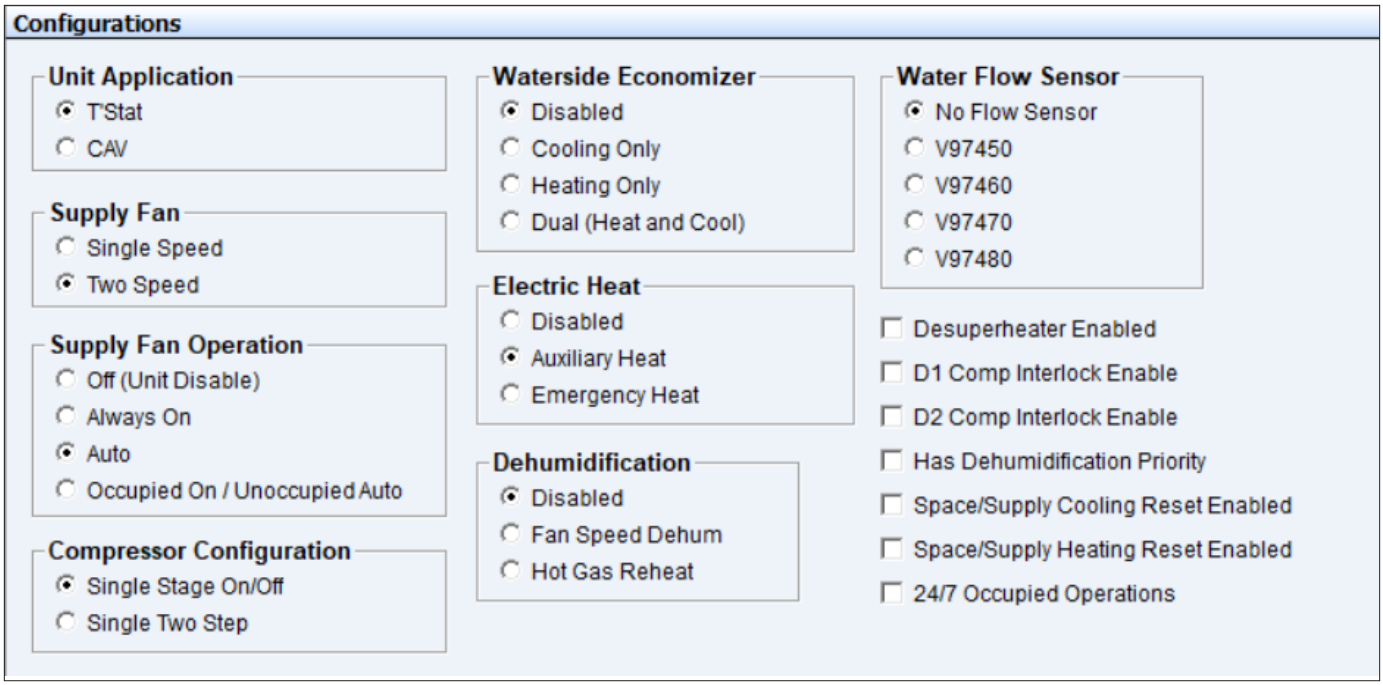


Figure 3-5: Configurations Screen

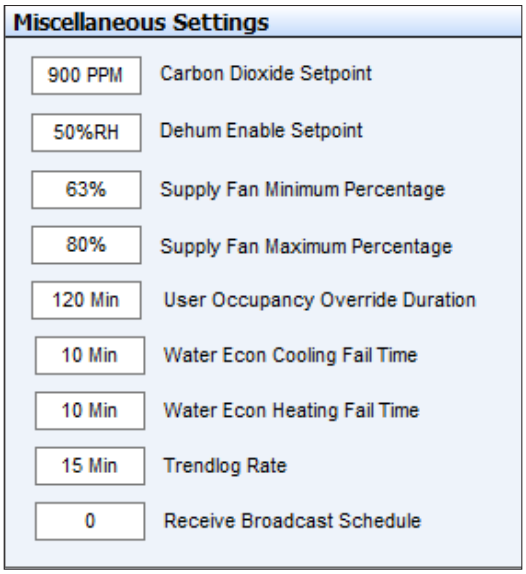


Figure 3-6: Miscellaneous Settings Screen

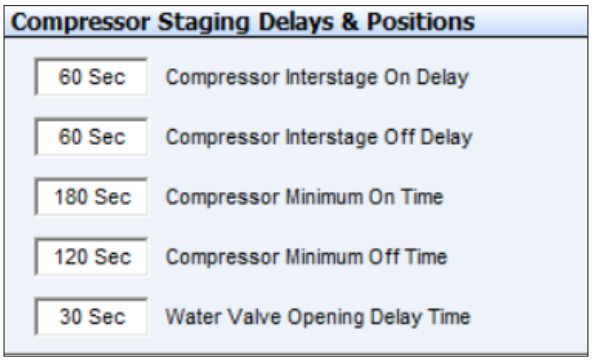


Figure 3-7: Compressor Staging Delays & Positions Screen

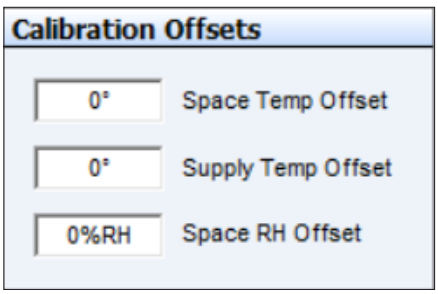


Figure 3-8: Calibration Offsets Screen

Administrative Functions

The Administrative Functions Screen has three functions: *Alarm Lockout Reset*, *Password Reset*, and *Emergency Shutdown*.

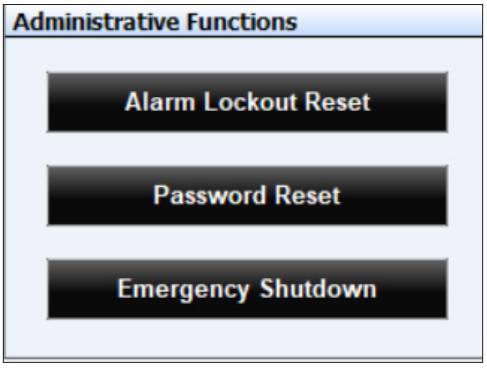


Figure 3-9: Administrative Functions Screen

Alarm Lockout Reset

Selecting this option will immediately reset any alarm(s) that has been cleared. It will also restore operation after an emergency shutdown.

Password Reset

Selecting this option will reset the Pioneer Gold Touch Screen system passwords to their defaults.

Emergency Shutdown

This will immediately shut the controller's relays down. To restore operation, select **<Alarm Lockout Reset>**.

Changing Setpoints

If you position the cursor over the top of a setpoint box, a Help Window will pop up indicating how that setpoint is used by the controller.

If you enter a setpoint that is either too high or too low or if you don't have Level 3 access, Prism 2 will not accept the new value and will restore the previous value in that field. When you enter a value, you must press **<Enter>** to have Prism 2 save the value.

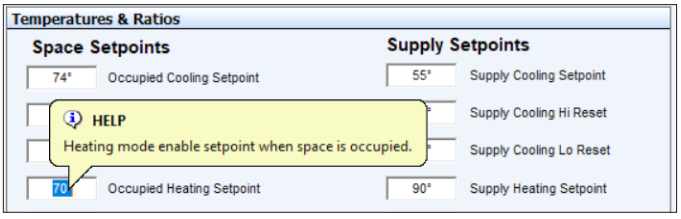


Figure 3-10: Setpoints Help Window

Saving and Restoring Setpoints

At the top of each setpoint screen, you can select **<Save>** or **<Restore>**. These two functions save and copy over ALL of the setpoints for a controller, not only those on a single setpoint screen.

Saving all setpoints from the controller to a file on your computer for use in restoring the setpoints or for copying to another specific controller will save time in configuring your controller and save valuable time in having to reenter setpoints for another controller.

NOTE: Saving and restoring setpoints in Prism 2 to a flash drive is not the same as saving and restoring setpoints using the Pioneer Gold Touch Screen USB function.

Force Occupied

You can override the schedule mode of operations to go occupied by clicking on the **<Not Forced>** button. The button will change to **<Force Occupied>** and the Occupancy Status button will turn green.

A forced occupied will remain in effect until canceled. To cancel the override, click on the **<Force Occupied>** button to turn it off.

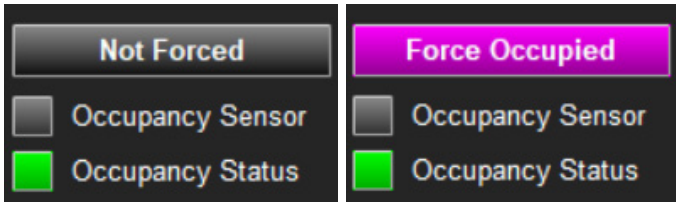


Figure 3-11: Forced Occupied Option

Schedules and Holidays

When you select the **<Schedules>** icon found on the Controller Status Screen (**Figure 3-12, this page**), the *Schedules Menu* will appear (**3-13, this page**).

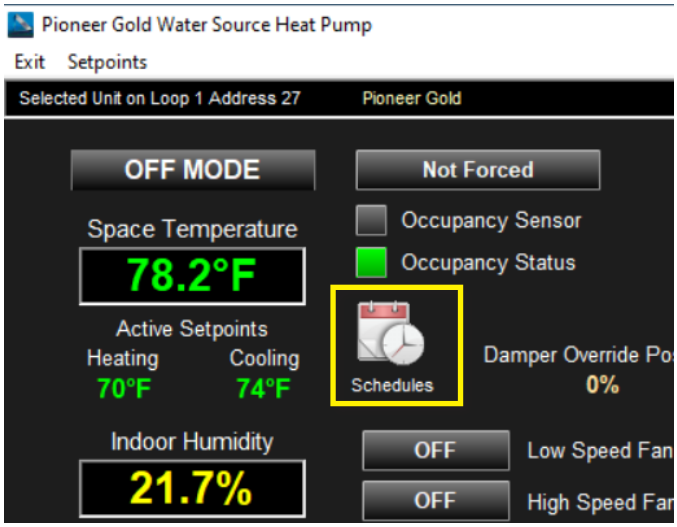


Figure 3-12: Status Screen - Schedules

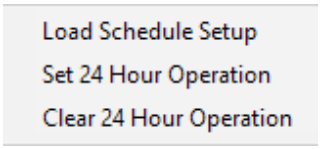


Figure 3-13: Schedules Menu

Select **<Load Schedule Setup>** and the *Schedules Screen* will appear. See **Figure 3-14, this page**.

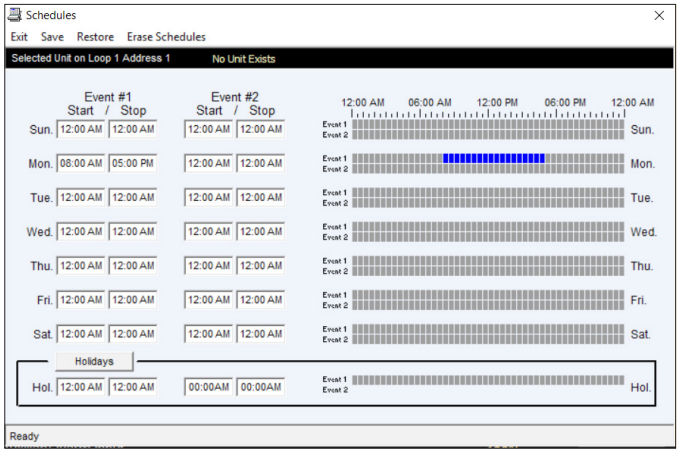


Figure 3-14: Schedules Screen

NOTE: 24 Hour Operation must be cleared in order for the Schedules Screen to load.

The controller has two event start and stop times per day and two event start and stop times for holidays. The holiday start and stop times will override the standard operating hours.

When you enter a time in any field, you must designate AM or PM and press **<ENTER>**.

To schedule holidays, press the **<Holidays>** button. The *Holiday Schedule Screen* will appear. See **Figure 3-15, this page**.

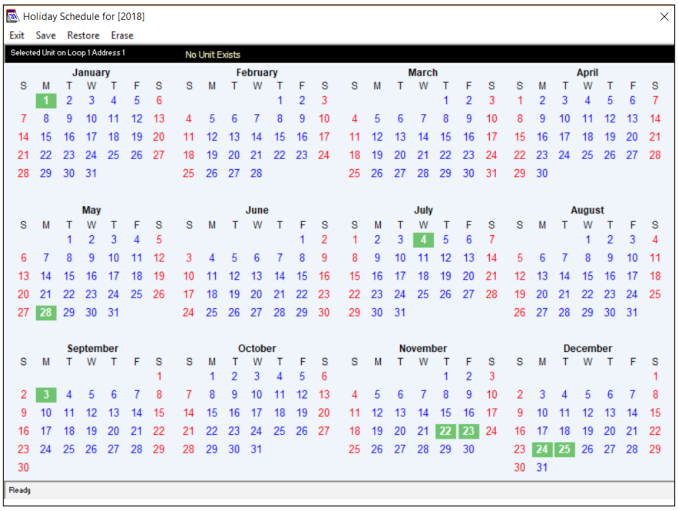


Figure 3-15: Holiday Schedule Screen

Click on the date to highlight it and tag it as a holiday. Days selected as holidays are indicated with a green background and white text.

There are 14 holiday periods available for each year. These holiday periods can span a single day or they can span weeks or even months.

If your job-site has days during the year when you need to override the standard operating hours to accommodate holidays or other special events, you can use this window to select the holidays.

You cannot program holidays for next year and holidays do not automatically adjust for the new year, so you will need to access this screen after the new year and make necessary adjustments to the days that float, such as Memorial Day.

Saving and Restoring Schedules and Holidays

While at the *Schedules Screen*, select **<Save>** to save your schedule. Select **<Restore>** to restore a previously saved schedule. Select **<Erase Schedules>** to completely erase the schedule appearing in the window. See **Figure 3-16, this page**.

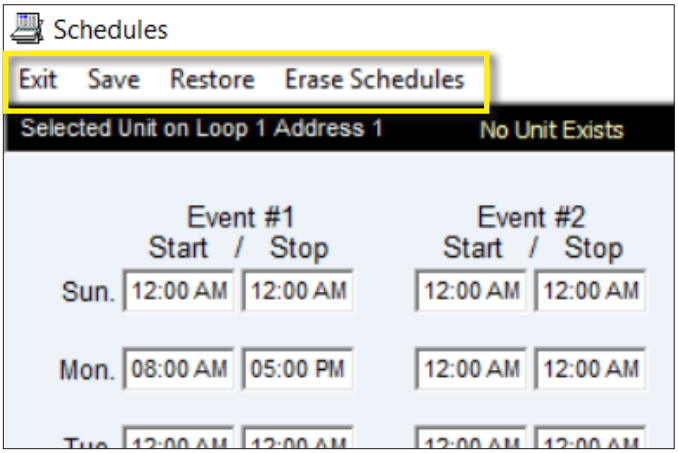


Figure 3-16: Schedules Screen - Menu

WARNING: **<Erase Schedules>** will clear ALL entered stop/start times, so use with caution.

While at the Holiday Schedule Screen, select **<Save>** to save the Holidays. Select **<Restore>** to restore previously saved Holidays. Select **<Erase>** to completely erase the holidays appearing in the window. See **Figure 3-17, this page**.

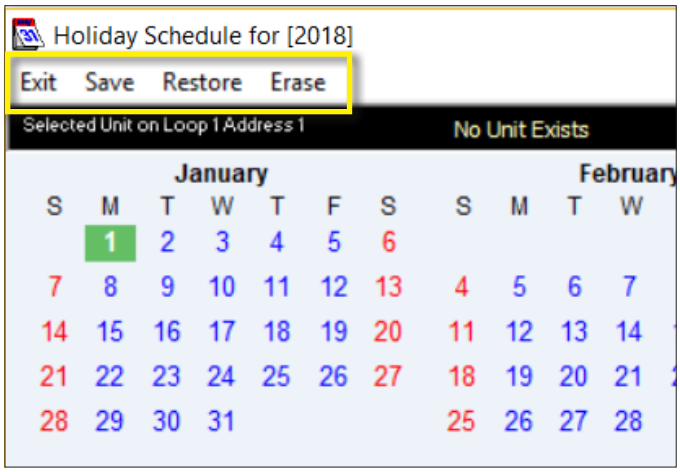


Figure 3-17: Holidy Schedule - Menu

Saving all schedules from the controller to a file on your computer for use in restoring the schedules or for copying to another specific controller will save time in configuring your controller and save valuable time in having to reenter schedules for another controller.

Set and Clear 24 Hour Operation

From the *Schedules Menu*, select **<Set 24 Hour Operation>**. After a brief pause, the 24 Hour Operation signifier will appear on the screen to the right of the Schedules icon.

To cancel 24 Hour Operation, from the *Schedules Menu*, select **<Clear 24 Hour Operation>**. After a brief pause, the 24 Hour Operation signifier will disappear from the screen.

Broadcast Schedule

Eight external broadcast schedules are available with the use of a GPC-XP controller. If a broadcast schedule is configured, it overrides any programmed internal schedule. The controller must be wired to a WattComm network with a GPC-XP. The schedule is configured using the Prism 2 software.

Viewing Alarm Status

The Unit Alarm Screen is accessed from each controller's status screen by clicking the **<ALARM>** button. This button will be a dull red and display **<No Alarms>** when there are no alarms present or will be bright red and display **<ALARM>** if active alarms exist.

Click the **<ALARM>** button when bright red or the **<No Alarms>** button when dull red. The *Unit Alarm Status Screen* will appear. See **Figure 3-18, this page**.

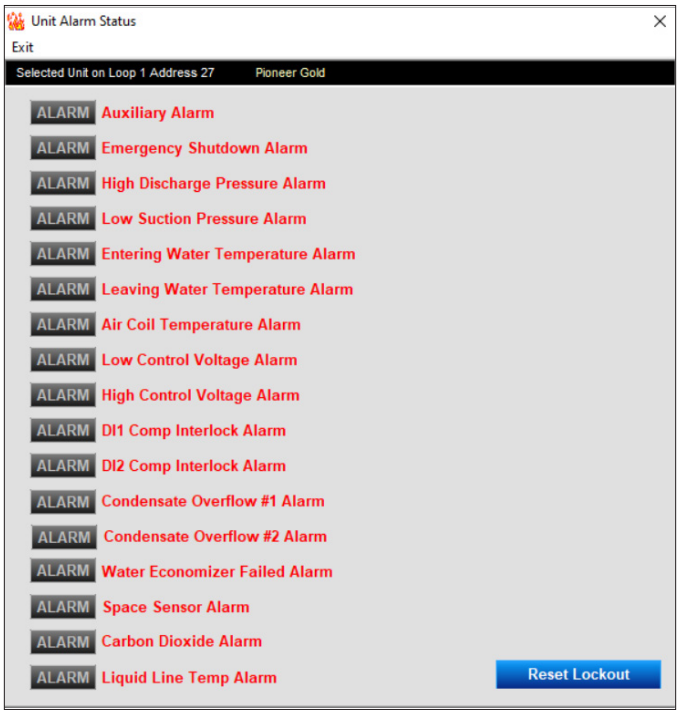


Figure 3-18: Unit Alarm Status Screen

Each individual **<ALARM>** button will be bright red if an alarm exists and will be gray if no alarm exists.

Click the blue **<Reset Lockout>** button at the bottom right of the screen to immediately reset an alarm once it has cleared.

Trendlogs

Trendlogging are accessed from the Prism 2 Main Screen by highlighting the Pioneer Gold Controller in the unit selection list and clicking the **<LOGGING>** button. See **Figure 3-19, this page**.

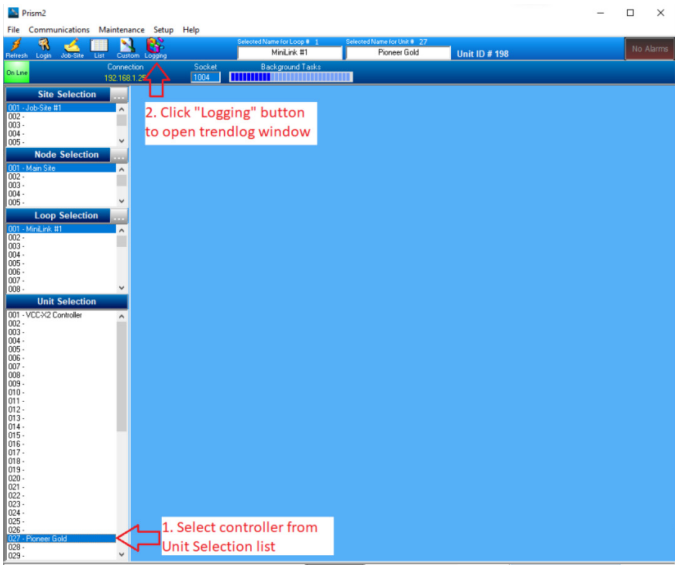


Figure 3-19: Prism 2 Main Screen

The Trend Logs Window will open. See **Figure 3-20, this page**. Click **<Select Log>**. The Trendlog Report will display. See **Figure 3-21, this page**.

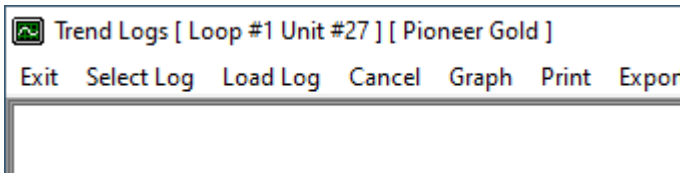


Figure 3-20: Trend Logs - Menu

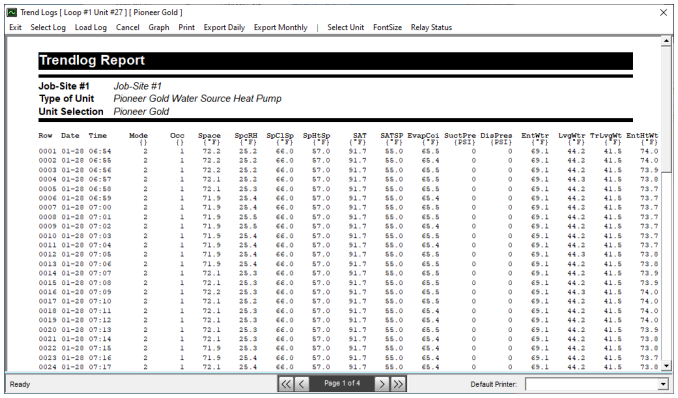


Figure 3-21: Trend Log Report

Pioneer Gold Controller Trend Logs

PIONEER GOLD CONTROLLER TREND LOGS		
Log Abbreviation (Unit)	**Item Description**	**Enumerated Values or Bits***
Mode	HVAC mode	See **Table 3-2**.
Occ	Occupancy status	See **Table 3-2**.
Space	Space Temperature	
SpcRH	Space Relative Humidity	
SpClSp	Space Temp Cooling Setpoint	
SpHtSp	Space Temp Heating Setpoint	
SAT	Supply Air Temperature	
SATSP	Supply Air Temp Setpoint	
EvapCoil	Evap Coil Temperature	
SuctPres	Suction Pressure	
DisPres	Discharge Pressure	
EntWtr	Entering Water Temperature	
RefLqLn	Refrigerant Liquid Line Temp	
LvgWtr	Leaving Water Temp	
EntHtWtr	Entering Hot Water Temp	
CO2	Space CO_2 Level	
WtrFlw	Water Flow Rate	
CtrlVolt	Control Supply Voltage	
Fan	Supply Fan Speed	
Pump	Pump Speed	
DmprOvr	Damper Position	
HtWtrVlv	Hot Water Valve Position	
HGRHVlv	Hot Gas Reheat Valve Position	
Alarm1	Alarms Group 1	See **Table 3-3**.
Alarm2	Alarms Group 2	See **Table 3-3**.
BinOut	Binary Outputs	See **Table 3-3**.
BinIn	Binary Inputs	See **Table 3-3**.
Tstat	T-STAT Inputs	See **Table 3-3**.
RSV1	Reserved	
RSV2	Reserved	
RSV3	Reserved	
RSV4	Reserved	
RSV5	Reserved	
RSV6	Reserved	
RSV7	Reserved	
RSV8	Reserved	
RSV9	Reserved	
RSV10	Reserved	

Table 3-1: Pioneer Gold Controller Trend Logs

NOTE: Trend Logging requires Prism 2 v.5.02 or higher.

TREND LOG ENUMERATED VALUES		
Item Description	**Value**	**Description**
Occupancy Status	0	Unoccupied
	1	Occupied
HVAC Mode	0	Off
	1	Vent
	2	Cool
	3	Heat
	4	Dehum

Table 3-2: Trend Log Enumerated Values

Trend Log Bit String Decoding

Bit String values allow the manipulation of binary data in useful ways. For instance, a single trend log item may need to represent multiple simultaneous true conditions. An example would be a trend log item indicating what binary inputs are currently active, what relays are currently active, or what alarms are currently active. A single bit string value can be decoded to determine which multiple conditions might be simultaneously true. This section is not intended to be a full explanation of how bit strings work, but just to explain how to decode the trend log items that are indicated as being bit string values.

Example:

Binary Input Bit String Values

0 = No Binary Inputs Active
1 = Emergency Shutdown
2 = High Pressure Switch
4 = Low Suction Switch
8 = Aux Fault Alarm
16 = Digital Input 1 (DI1)
32 = Digital Input 2 (DI2)

If the trend log bit string value was 22 for Binary Inputs, you first identify the highest value shown above that can be subtracted from 22. That would be 16 (Digital Input 1). So, the Digital Input 1 binary input is currently active. From the remainder of 6 (22 - 16 = 6) you then subtract out the next highest possible number. That would be 4 = Low Suction Switch. So, the Low Suction Switch binary input is also currently active. From the remainder of 2 (6 – 4 = 2) you subtract out the next highest possible number which is 2 = High Pressure Switch. So, the High Pressure Switch binary input is also currently active. There is no remainder (2 – 2 = 0), so there are no more inputs that are active. From the one value of 22 you are able to determine that three binary inputs were active when that trend item was recorded.

With any trend log value that is designated to be a bit string value you simply identify from the trend log section in this technical guide what the bit string values are for each status condition and perform the same calculation.

TREND LOG BIT STRINGS			
Item	**Bit**	**Value**	**Description**
Alarm Group 1	0	1	Condensate Overflow
	1	2	Leaving Water Temp
	2	4	Entering Water Ttemp
	3	8	Liquid Line Temp
	4	16	Evaporator Coil Temp
	5	32	High Discharge Pressure
	6	64	Low Suction Pressure
	7	128	DI1 Compressor Interlock
	8	256	DI2 Compressor Interlock
Alarm Group 2	0	1	Emergency Shutdown
	1	2	Low Control Voltage
	2	4	High Control Voltage
	3	8	Aux Fault Alarm
	4	16	Economizer Failed
	5	32	CO_2 Override
	6	64	Space Sensor Missing
Binary Outputs	0	1	Electric Heat (W1)
	1	2	Supply Fan Low (SF LO)
	2	4	Supply Fan High (SF HI)
	3	8	Reversing Valve (RV)
	4	16	Compressor 1 (Y1)
	5	32	Compressor 2 (Y2)
	6	64	Compressor 3 (Y3)
	7	128	Reheat Valve (HGRH)
	8	256	Water Valve/Pump (WV/PUMP)
	9	512	Waterside Economizer (WSE)
	10	1024	Spare Digital Out (DO1)
	11	2048	Alarm Active (ALM)
Binary Inputs	0	1	Emergency Shutdown
	1	2	High Pressure Switch
	2	4	Low Suction Switch
	3	8	Aux Fault Alarm
	4	16	Digital Input 1 (DI1)
	5	32	Digital Input 2 (DI2)
Tstat Inputs	0	1	G
	1	2	Y1
	2	4	Y2
	3	8	RV
	4	16	W1
	5	32	DH
	6	64	NSB Override
	7	128	NSB Enable
	8	256	NSB Tstat

Table 3-3: Trend Log Bit Strings

CommLink 5 Connection

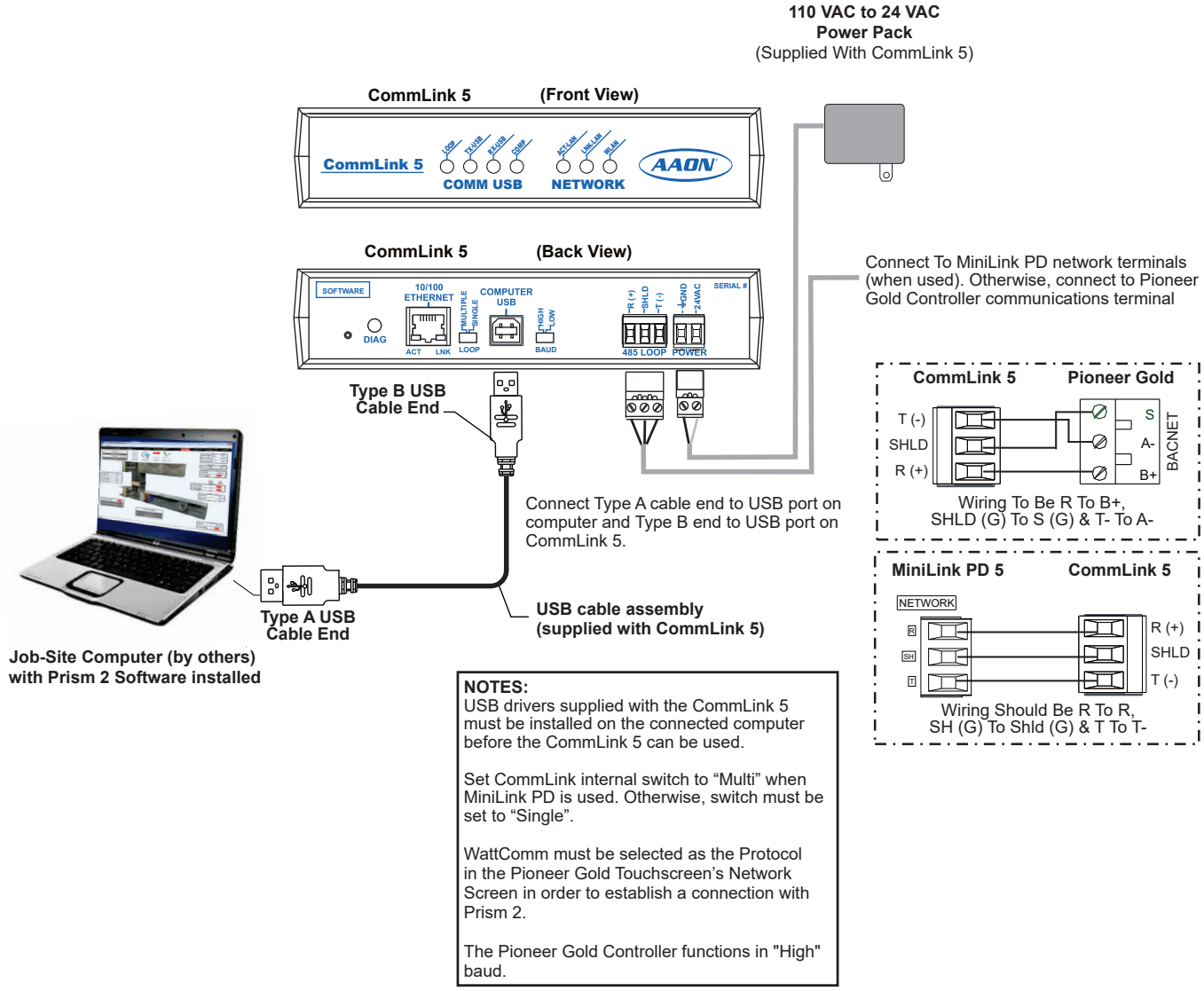


Figure 3-22: CommLink 5 Connection

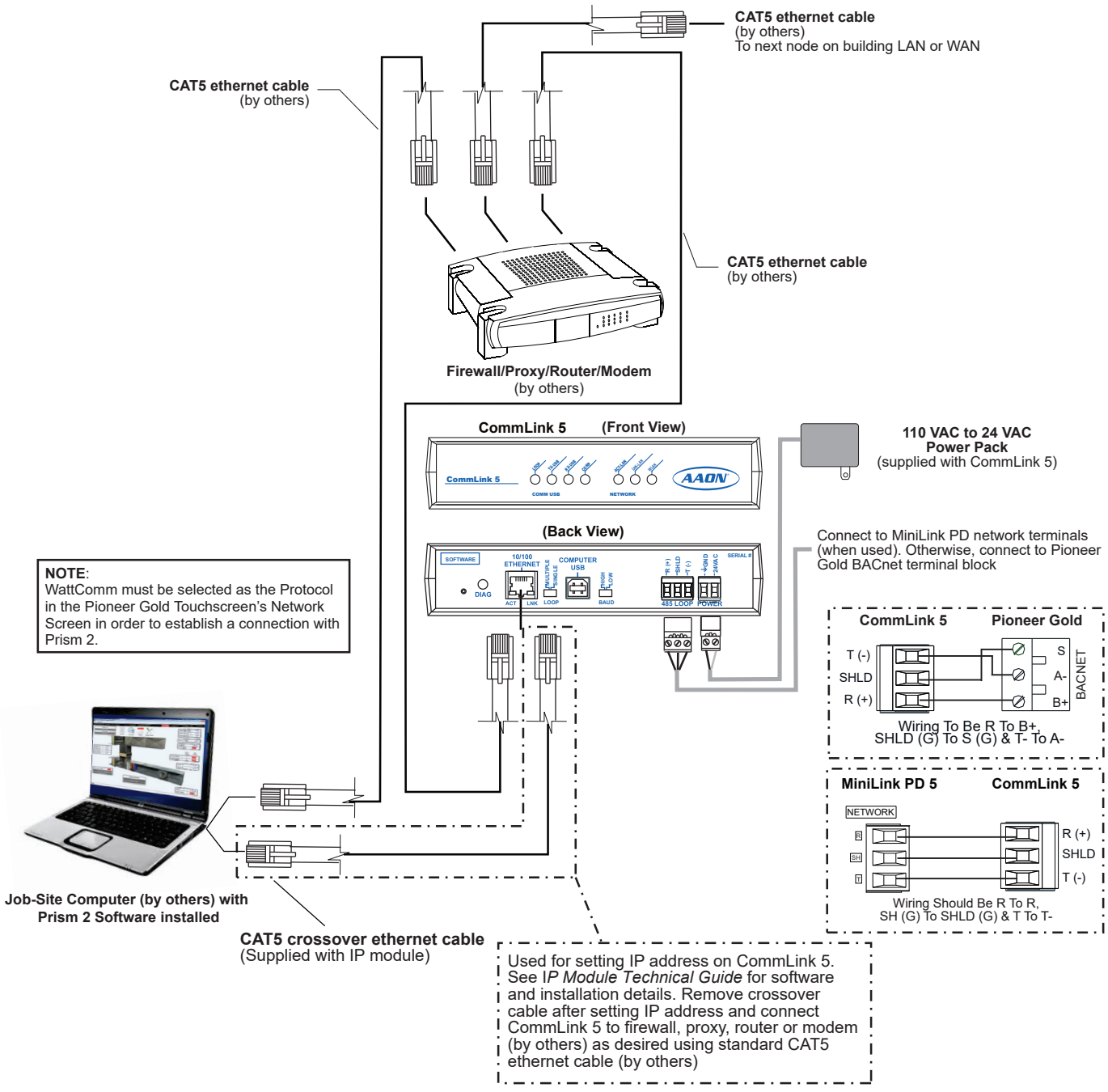
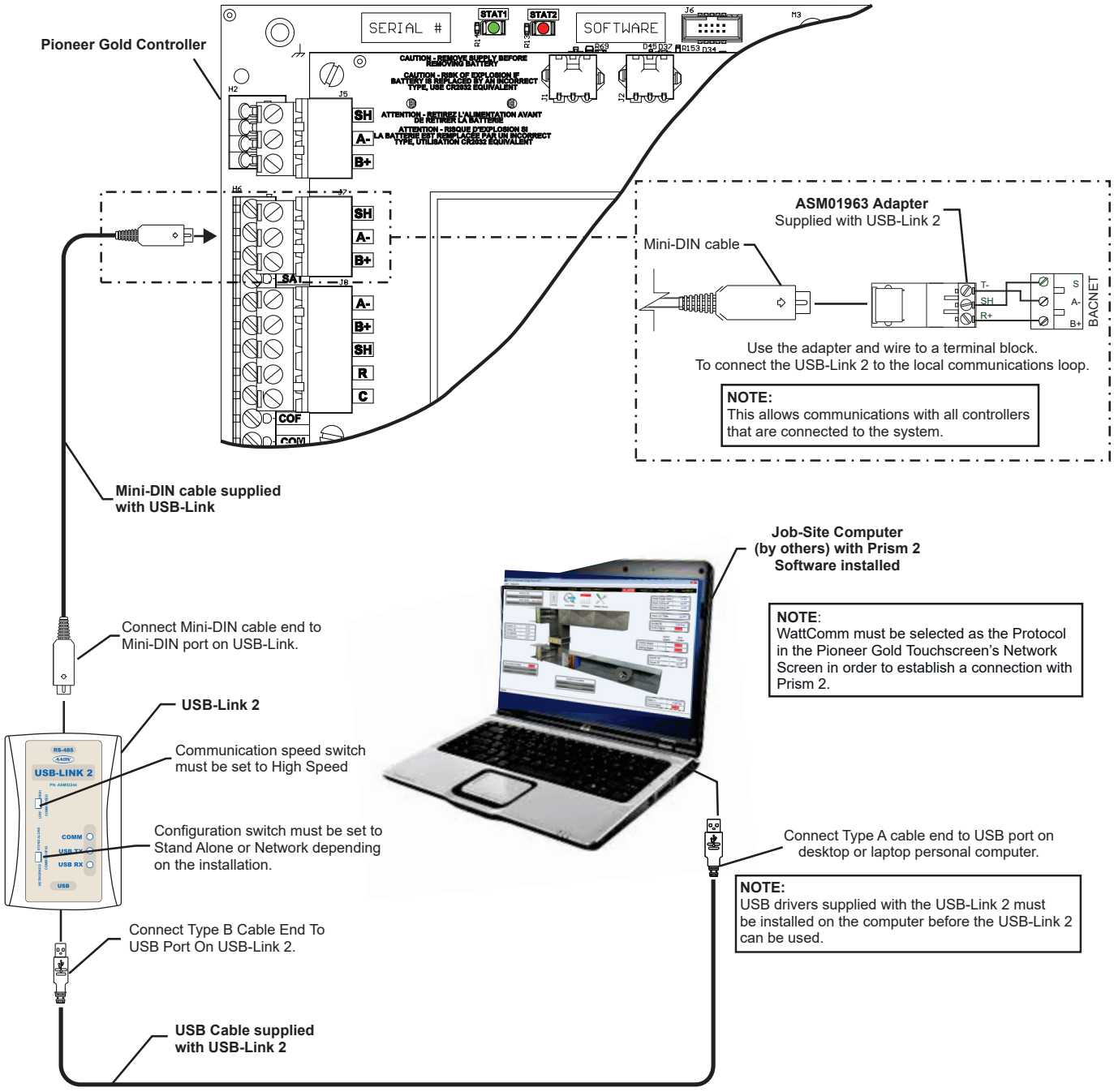


Figure 3-23: IP Module Connection

USB-Link 2 Connection



Chapter 4
Pioneer Gold 2.0 Controller Touchscreen Sensor

TABLE OF CONTENTS

FIGURES

TABLES

Overview and Features

The AAON Pioneer Gold Touchscreen Temperature and Humidity Sensor provides a direct, graphic-enhanced, menu-driven link to enable you to view the status and adjust the setpoints of the Pioneer Gold Controller. See **Figure 4-1, this page.**

The Touchscreen Sensor has many features, including the following:

- User-friendly, high-contrast, touchscreen interface
- Graphic programming screens provide easy setup and operation without the need for specialized training
- Multiple built-in alarms enhance system monitoring

Main Menu

When you press the MAIN MENU button, Cool/Heat Setpoints are replaced by Supply Air Temperature and four buttons at the bottom:

- Setpoints
- General Alarms
- Schedules
- EXIT

The Setpoints and Schedule screens are locked behind a password screen. The default password is 2425. See **Figure 4-3,** this page.

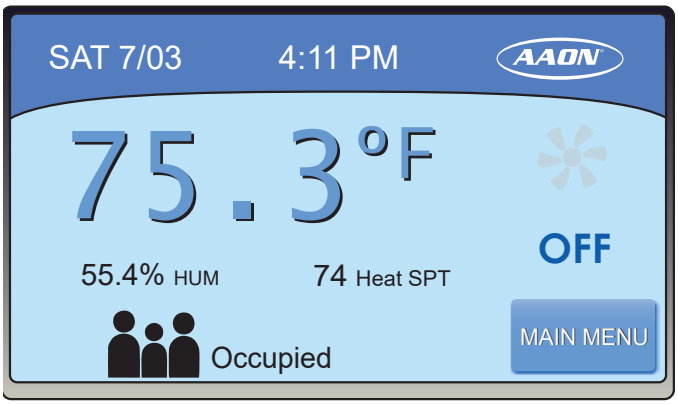


Figure 4-1: Home Screen

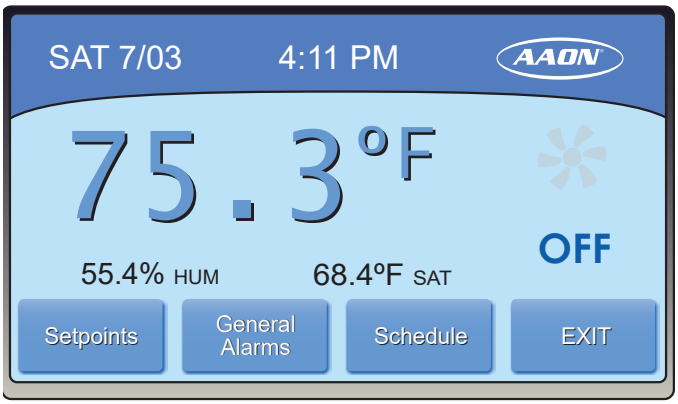


Figure 4-2: Main Menu

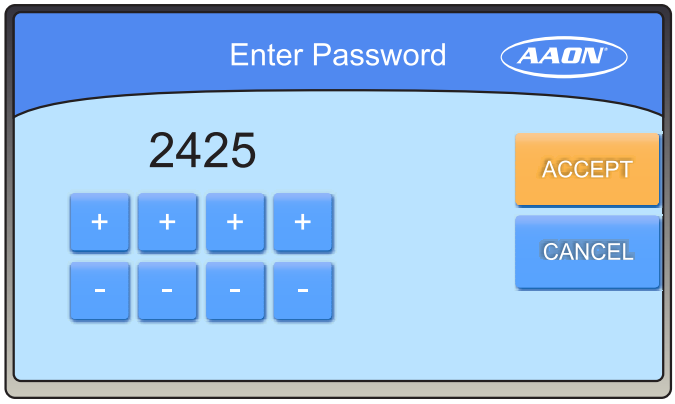


Figure 4-3: Password Screen

Home Screen Navigation

Startup

Home Screen Navigation

- **Fan:** Indicates supply fan operation. Animated icon indicates the fan is operating. Motionless icon indicates fan is not operating.
- **Mode:** Indicates the current Mode of Operation: Cooling, Heating, Dehumidification, Ventilation, Economizer, or Off.
- **Occupied/Unoccupied:** Indicates the current occupancy status. Black icon indicates Occupied and gray icon indicates Unoccupied. During Unoccupied Mode if the icon is pressed the controller will override into Occupied Mode for a user defined override period.
- **Menu:** Touch to open up Setpoints, I/O Alarms, Schedule, and Setup Menus
- **Temperature/Humidity:** Space temperature and space relative humidity are displayed
- **Space Temperature:** Press the temperature to access the Setpoint Override Screen.

NOTE: The Space Sensor Max Setpoint Offset can only be modified from the Pioneer Gold Controller or Prisom II.

	Shutdown Alarm (Red)
	Occupied
	Unoccupied
	Dehumidification Mode
	Heating Mode
	Economizer Mode
	Fan On (Animated)
	Fan Off (Static)
	Cooling Mode
VENT	Ventilation Mode
OFF	Off Mode

Table 4-1: Home Screen Icons

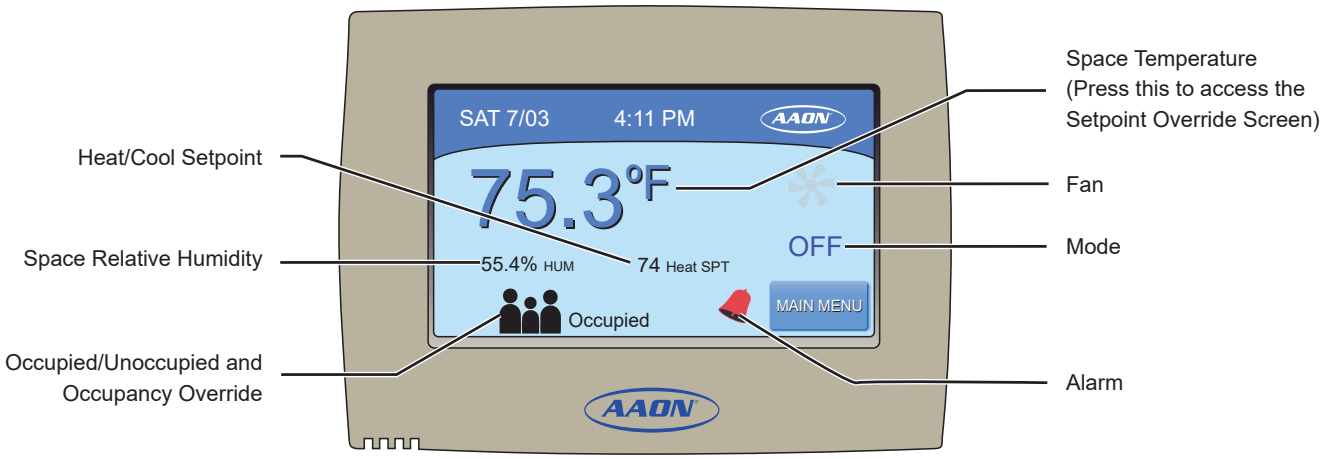


Figure 4-4: Touchscreen Sensor Screen Callouts

Setpoint Values

Refer to the following for setpoint names and their min/max and defaults.

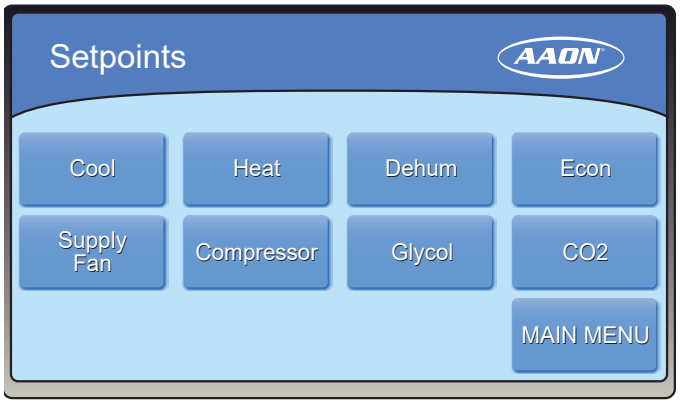


Figure 4-5: Setpoints - Menu

Cooling Setpoints

- **Occupied Cooling:** Sets the Cooling Setpoint. Default: 74°F; Range: 55-85°F
- **Unoccupied Cooling:** Sets the Unoccupied Cooling Setpoint. Default: 79°F; Range: 55-85°F
- **Cooling Enable Deadband:** How far away from Setpoint to generate or remove Call. Default: 1°F; Range: 1-5°F
- **Supply Air Cooling Setpoint:** Default: 55°F; Range: 45-65°F

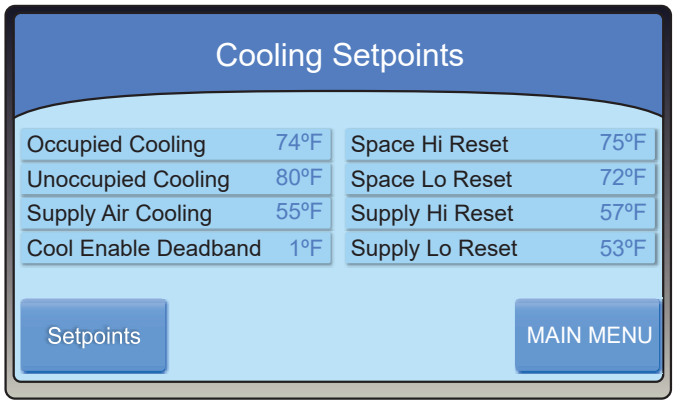


Figure 4-6: Setpoints - Cooling

Heating Setpoints

- **Occupied Heating:** Sets the Heating Setpoint. Default: 70°F; Range: 55-85°F
- **Unoccupied Heating:** Sets the Unoccupied Heating Setpoint. Default: 65°F; Range: 55-85°F
- **Heating Enable Deadband:** How far away from the Setpoint to generate or remove Call. Default: 1°F; Range: 1-5°F
- **Supply Air Heating Setpoint:** Default: 90°F; Range: 55-120°F
- **Auxiliary Heat Deadband:** Space Temp has to be this far below setpoint before Aux Heat can energize. Default: 5°F; Range: 1-10°F

Figure 4-7: Setpoints - Heating

Dehumidification Setpoints

- **Dehumidification Enable:** If Space RH is above this value, Unit will go into Dehumidification Mode. Default: 50%; Range: 40-60%
- **Dehumidification Lockout:** If the Space Temp is below this value, the Dehumidification Mode will be locked out. Default: 55°F; Range: 35-75°F
- **Supply Air Reheat Setpoint:** In the Modulating Reheat mode, the controller will try to maintain this setpoint. Default: 70°F; Range: 55-120°F

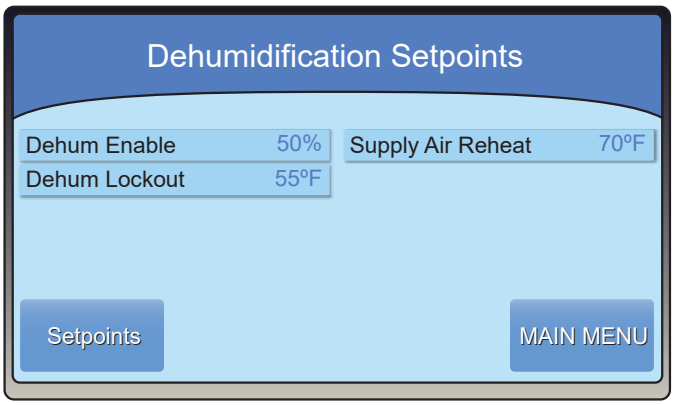


Figure 4-8: Setpoints - Dehumidification

Economizer Setpoints

- **Economizer Cooling Enable:** If the Entering Water Temperature is below this value, the Economizer can be used for "Free" Cooling. Default: 45°F; Range: 45-60°F
- **Economizer Heating Enable:** If the Entering Water Temperature is Above this value, the Economizer can be used for "Free" Heating. Default: 85°F; Range: 75-90°F
- **Water Econ Cooling Failure Time and Water Econ Heating Failure Time**
  If the Waterside Economizer is enabled for cooling or heating, the failure time is the time period before it switches to Compressor Cool or Heat. Setting the value to 255 will disable the timer so the Waterside Economizer will run indefinitely in that mode and never timeout. Default: 10 minutes; Range: 10-255 minutes

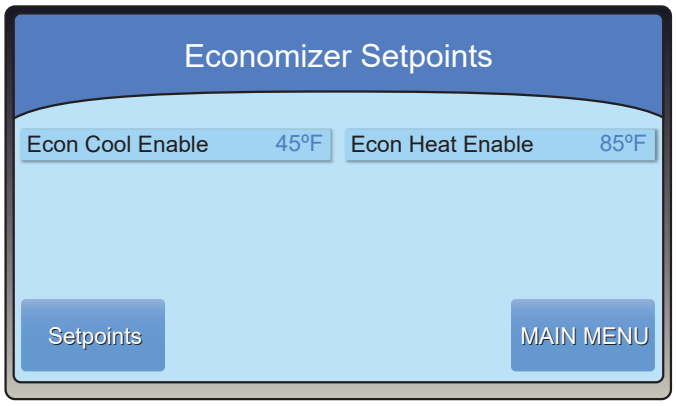


Figure 4-9: Setpoints - Economizer

Compressor Setpoints

- **Minimum On Time:** Compressor must run for this amount of time before it can turn off. Default: 180 seconds; Range: 120-255 seconds
- **Minimum Off Time:** Compressor must remain for this amount of time before it can turn on.
  Default: 120 seconds; Range: 60-255 seconds
- **Interstage On Delay:** If Stage 1 is energized, the controller must wait for this amount of time before turning on Stage 2. Default: 60 seconds;
  Range: 30-255 seconds
- **Interstage Off Delay:** If Stage 2 is energized, the controller must wait for this amount of time before turning off Stage 2. Default: 60 seconds;
  Range: 30-255 seconds

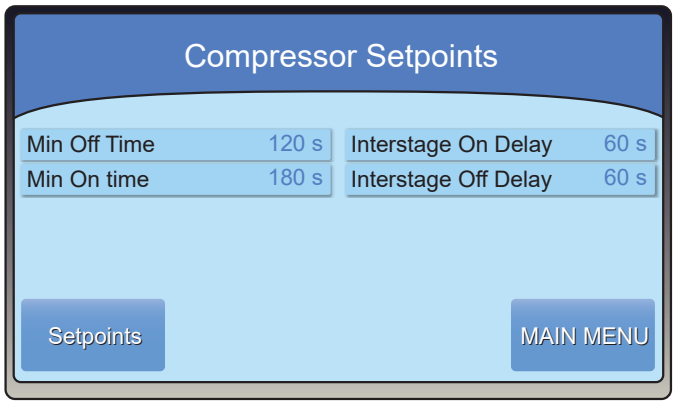


Figure 4-10: Setpoints - Compressor

Supply Fan Setpoints

- **Supply Fan Minimum Speed:** This is the Low Fan Speed setting for a two-speed ECM Fan. Default: 63%; Range: 20-100%
- **Supply Fan Maximum Speed:** This is the High Fan Speed setting for a two-speed ECM fan. Default: 80%; Range: 20-100%

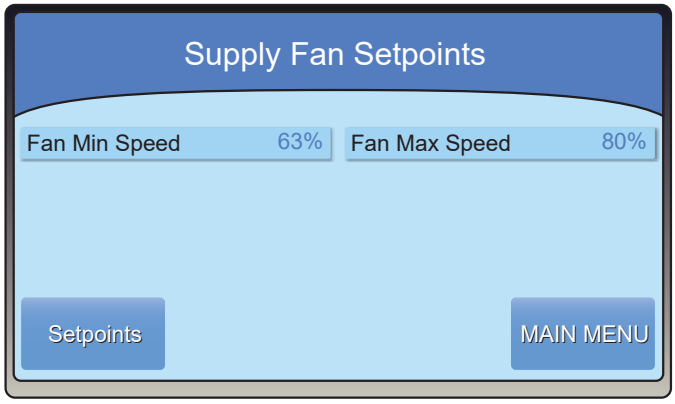


Figure 4-11: Setpoints - Supply Fan

Glycol Percentage

This is the percentage of Glycol mixed in the loop water. It is needed to calculate Lockout setpoints. Default: 0%; Range: 0-40%

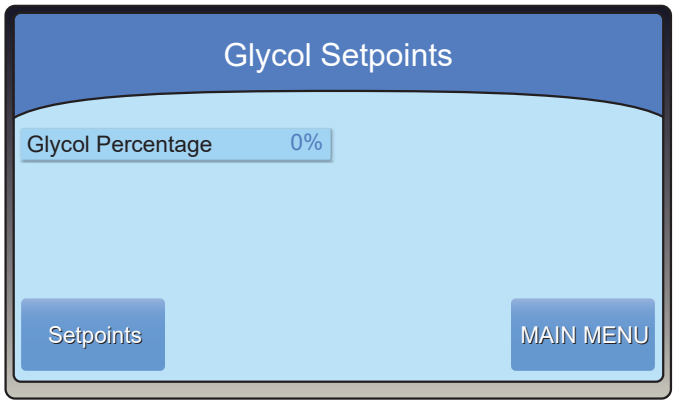


Figure 4-12: Setpoints - Glycol

CO2 Setpoints

- **CO2 Override:** If CO_2 is above this value, the OA damper will be opened. Default: 900ppm; Range: 500-1500ppm

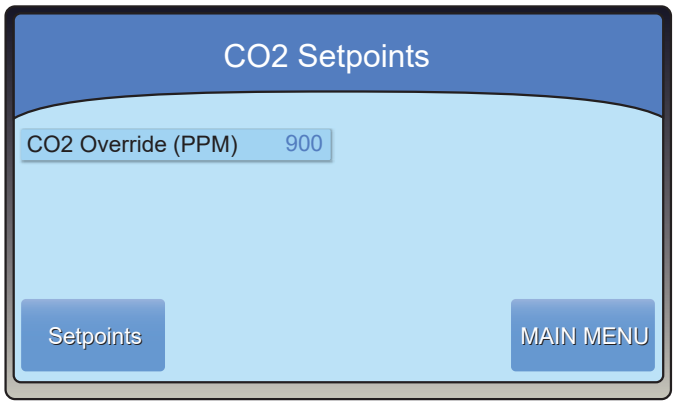


Figure 4-13: Setpoints - CO2

Alarm Status

From the *Main Menu Screen*, press the **<Alarms>** icon. The *Alarms 1 Screen* will appear. See **Figures 4-14, this page.** There are two Alarms Screens. Press the **<Next>** button to access the next screen. Press the **<Back>** button to access the previous screen. Press the **<EXIT>** button to return to the *Main Screen*.

The status for each alarm should be Ready or Normal. If there is an alarm, the word Alarm will appear in red. The abbreviation L.O. in red stands for "Locked Out". This means that there is currently one or more alarms active, and any item that shows L.O. is conveying that this particular item(s) is/are being affected by the particular alarm. Continue scrolling through the Alarms pages until you see the item that shows "Alarm" to identify which item is in an alarm state that is causing associated items to be Locked Out.

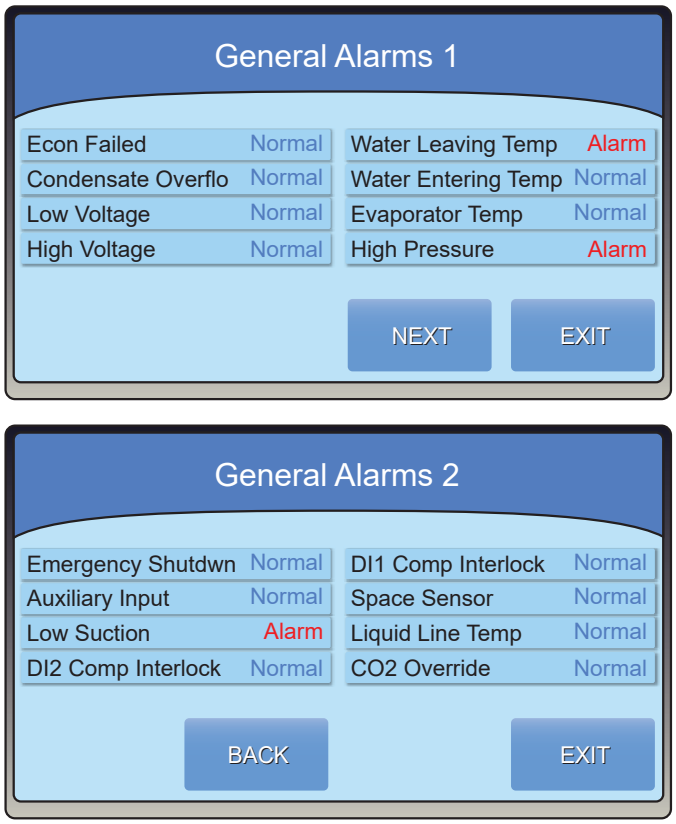


Figure 4-14: General Alarms Screens

Set Operating Schedule

From the *Main Menu Screen*, select the **<Schedule>** icon. See **Figure 4-15, this page**. To view or change any of the schedules, input the administrator password.

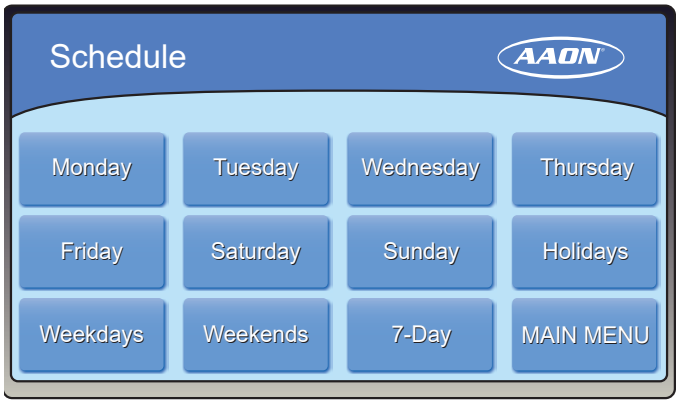


Figure 4-15: Schedule Screen

You can set separate schedules for weekdays and weekends, set schedules, or for the entire week. You can also set the holiday schedule and holiday periods from this screen.

Weekday Schedule

Press **<Weekdays>**. The *Weekdays Schedule Screen* will appear. See **Figure 4-16, this page**. The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format.

Weekend Schedule

Press **<Weekend>.** The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format.

7-Day Schedule

Press **<7-Day>**. The defaults are 0 in all fields. You can select two events per day. Select an hour and minute start time for Occupy 1 and an hour and minute stop time for Unoccupy 1. Repeat this for Occupy 2 and Unoccupy 2. All times are entered in 24-hour time format.

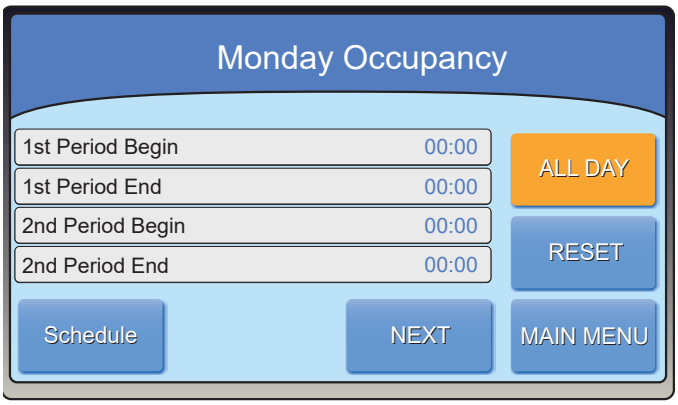


Figure 4-16: Weekday, Weekend, 7-Day and Holiday Occupancy Schedule Screen

Holidays

Holidays Schedule

Press <**Holidays>**. Select the Holiday Period you want to change. See **Figure 4- 17, this page**. A Holiday with 0's indicates a unscheduled Period. Select the Month and Day to start and end the holiday. For entering the first and second Time Period, refer to **Figure 4-16, page 4-15**.

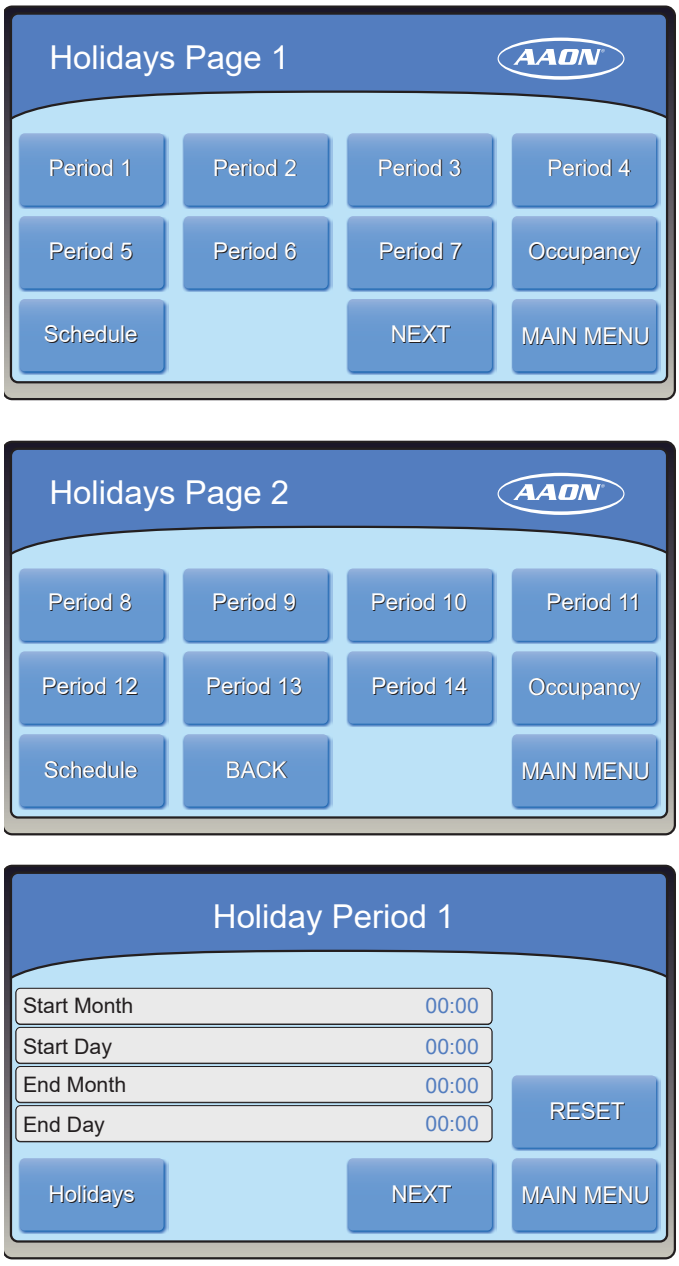


Figure 4-17: Holiday Screens

Touchscreen Sensor Override

The Pioneer Gold Remote Touchscreen Temperature and Humidity Sensor has an override feature. The silhouette on the main screen of the Touchscreen Sensor will be shaded black during the occupied mode and will be shaded white during the unoccupied mode.

Configuring Occupancy Override

Occupancy override has a system default of 120 minutes and a user-adjustable range of 30-480 minutes. You can change this value in the *Touchscreen Setpoint Screens* under *User Occupancy Override Time* (see **page 2-16**) on the Pioneer Gold Cotnroller or through Prism II To disable the override feature, enter a 0.

Using Occupancy Override

While in Unoccupied mode, from the Touchscreen Sensor's main display, press and hold the white silhouette for five seconds. The screen will display, "Occupied" and five seconds later it will display, "Occupancy Override", and the silhouette will turn black.

To reset the override before the configured time period ends, press the silhouette again for one second and the screen will display, "Override Timer Reset" for a few seconds. The override timer will reset to 0 and start over, and the screen will return to "Occupancy Override".

To end the override early, press the silhouette for five seconds. The screen will display, "Occupied" for five seconds and then display, "Unoccupied", and the silhouette will return to white, ending the override early.

Cooling/Heating Setpoint Override

To Override the Cooling/Heating Setpoints from the Touchscreen Sensor, press the temperature to display the Setpoint Override screen. See **Figure 4-18, this page.**

The Space Sensor Max Setpoint Offset can only be modified from the Pioneer Gold Controller or from Prism II.

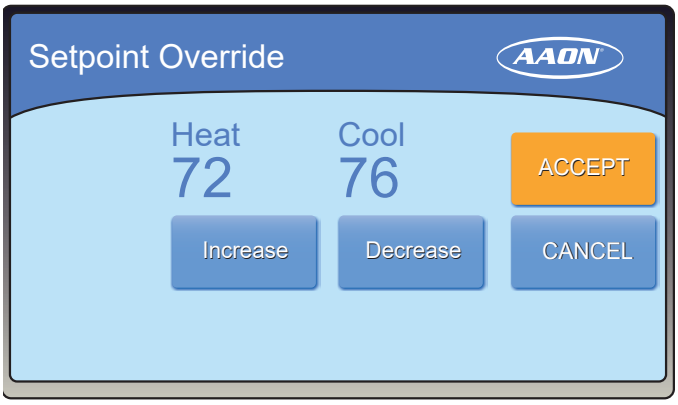


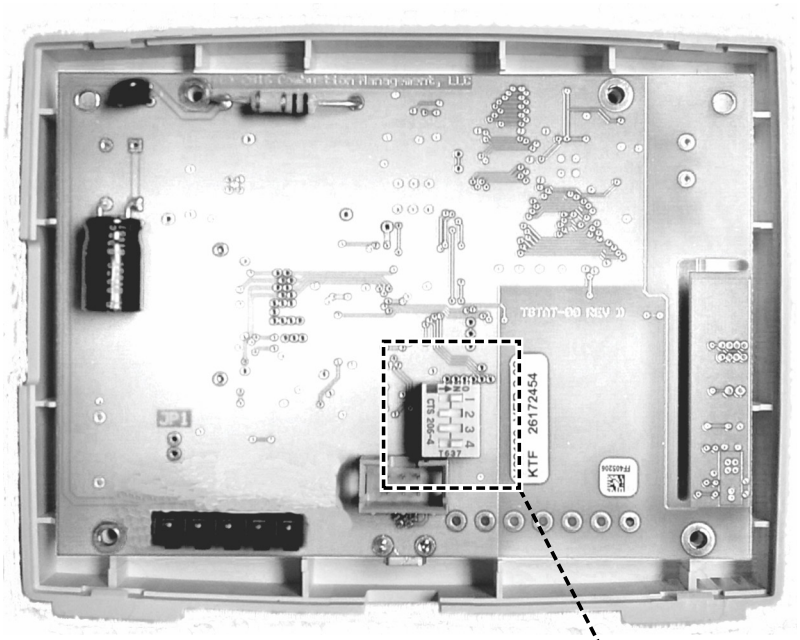
Figure 4-18: Setpoint Override Screen

Touchscreen Sensor Calibration and Dip Switch Values

Touchscreen Sensor Calibration

If it seems that your Touchscreen Sensor's buttons and other menu options are not responding properly to your interaction with them, follow the instructions below to calibrate your touchscreen sensor's screen. Refer to **Figure 4-19, this page**

1. Remove the Touchscreen Sensor from its wall base.
2. Turn the Touchscreen Sensor over and turn off Dipswitch 1.
3. Return the Touchscreen Sensor to its wall base.
4. Using a stylus or your finger, touch the blue circle that appears on the screen.
5. After touching this blue circle three times, the Home Screen will appear.
6. Test the calibration to see if the buttons, etc. are working properly.
7. If not, repeat steps 1-6. If yes, remove the Touchscreen Sensor from its wall base and turn Dipswitch 1 back on.



Pioneer Gold Touchscreen
Space and Humidity Sensor
(Inside Front Cover)

DIP SWITCH VALUES

Dip Switch 1 - Screen Touch Calibration
ON = Calibration Bypass - Default
OFF = Calibrate at Power Up

Dip Switch 2 - Not used - Default: Off

Dip Switch 3 - Display Power Savings
ON = Display Always On
OFF = Display Dimming - Default

Dip Switch 4 - Default: Always On

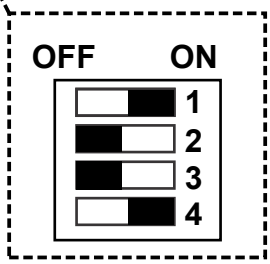


Figure 4-19: Touchscreen Sensor's Dip Switch Values

Increasing Data Signal Integrity

You can increase data signal integrity by installing a 120 ohm termination resistor on either the Touchscreen Sensor or the Pioneer Gold Controller's main board. The Pioneer Gold Controller and Touchscreen Sensor both have the resistor installed before they are shipped.

On the Touchscreen Sensor, install the resistor between terminals A- and B+. See **Figure 4-20, this page**.

On the PG Controller's main board, install the resistor on connector "J8" between terminals A- and B+.

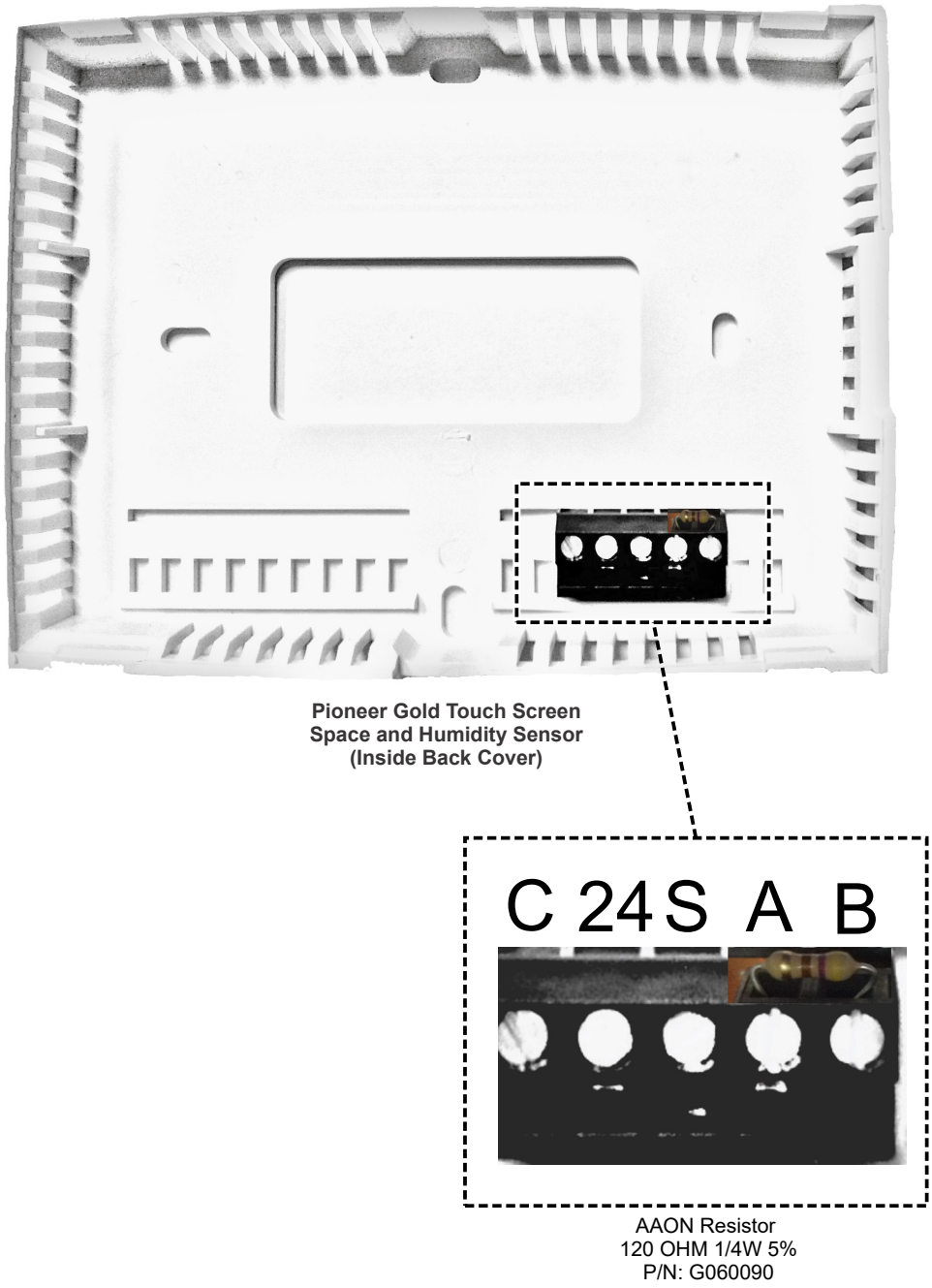


Figure 4-20: Installing the Resistor in the Touchscreen Sensor

Pioneer Gold 2.09 Technical Guide

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AAON Controls Support: 866-918-1100
Monday through Friday, 7:00 AM to 5:00 PM
Central Standard Time

Controls Support website:
www.aaon.com/controlstechsupport

AAON Factory Technical Support: 918-382-6450
techsupport@aaon.com

NOTE: Before calling Technical Support, please have the model and serial number of the unit available.

PARTS: For replacement parts, please contact your local AAON Representative.

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