

AURORA

Aurora Universal Protocol Converter (UPC) Application and Troubleshooting Guide

For use in single compressor water-to-air equipment utilizing firmware UPCSWASTD01-01



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UPC Overview



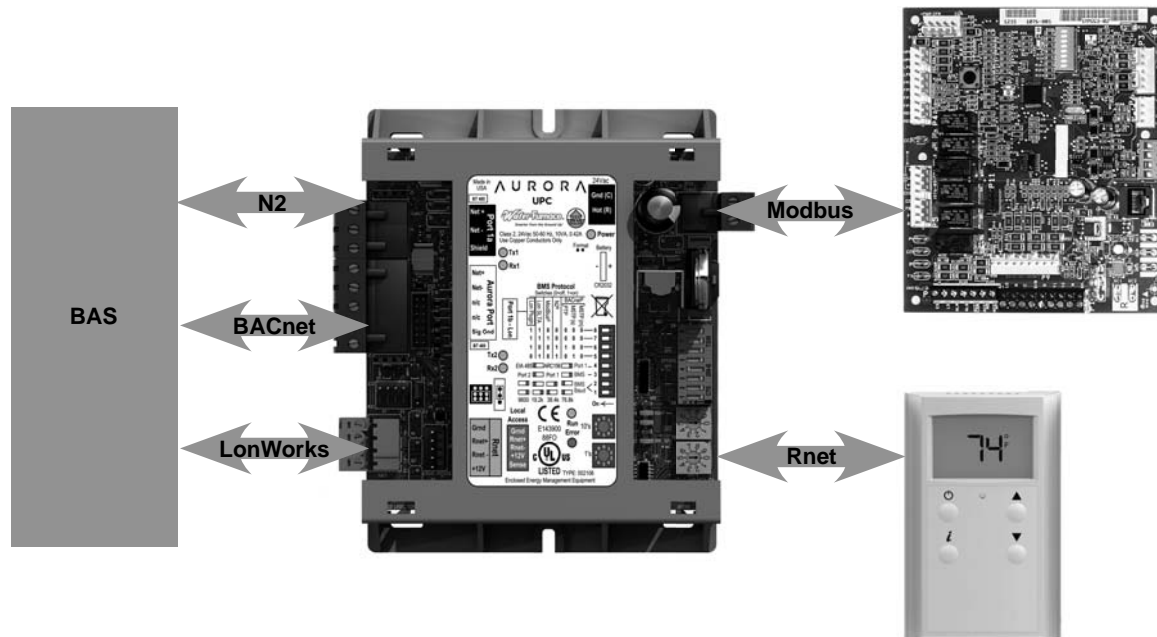
The Aurora Universal Protocol Converter (UPC) is designed to add-on to any Aurora based heat pump control. The Aurora Universal Protocol Converter (UPC) is designed to allow water source heat pumps to be integrated into Building Automation Systems (BAS) with ease. The Aurora UPC is an integrated solution and communicates directly with the Aurora Heat Pump Controls and allows access/control of a variety of internal Aurora heat pump operations such as sensors, relay operation, faults and other information. In turn, the UPC then converts internal Aurora Modbus protocol to BACnet MS/TP, LON, or N2 protocols and communicates to the BAS system. This provides the great benefit of complete control integration and a myriad of information available to the BAS from the heat pump control. Plus it also allows individual unit configuration such as ECM fan speeds or freeze protection setting directly over the BAS without the need for access to the actual heat pump.

The Aurora UPC may be factory integrated with the Aurora Base Controller (ABC) heat pump control into our latest water source heat pumps. This will allow for a BAS to integrate and communicate to the heat pump through a choice of 3 different communication

protocols. The Aurora UPC has the ability to communicate BACnet MS/TP, N2 open, or LonWorks (requires LON Plugin card). This flexibility is possible due to the onboard dipswitches which allow for the desired protocol and baud rate to be selected in the field. All zone sensors are connected to the UPC on an RNet bus, simplifying hook up at the unit. RNet sensors can include a combination of zone temperature and humidity, CO2, and VOC sensors. The UPC includes built-in support for a display unit - Aurora Touch (color touchscreen display or ATU). Only one display unit can be mounted remotely for configuration and troubleshooting.

There are an extensive number of points that the UPC has available over the network for integration into the BAS. Control programmers need to carefully determine which points they want to add into the BAS database. A list of the BACnet points, N2 points, and LON SNVTs are available along with their individual point descriptions by contacting the Commercial Solutions Group at 1-877-677-4420 or by going to <http://www.waterfurnace.com/ddc-controls>.

UPC Overview cont.



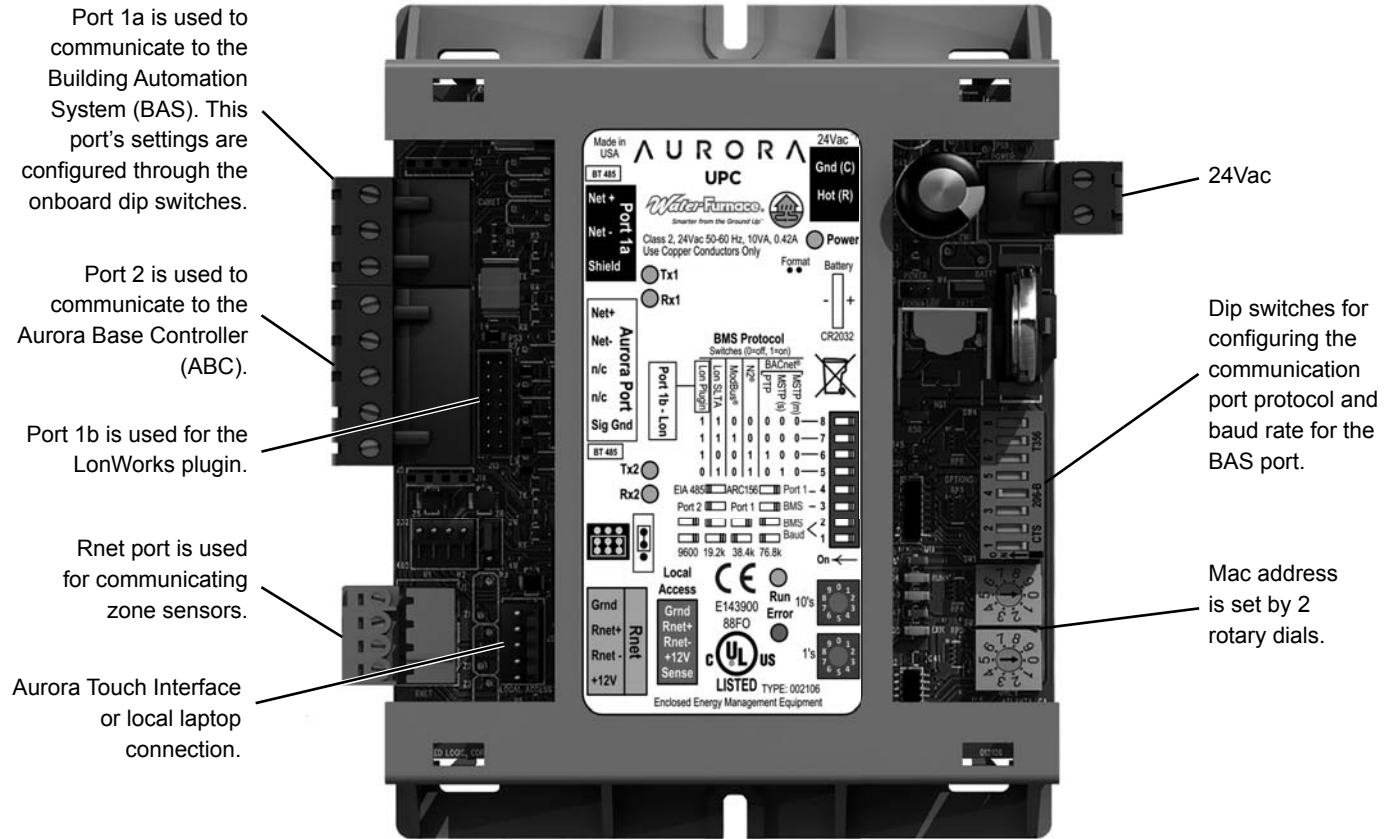
Aurora UPC Features

- Rugged enclosure made of GE C2950 Cyclopol plastic
- Built-in surge transient protection circuitry
- Operating range of -20° to 140°F; 10 to 95% relative humidity, non-condensing
- Onboard CR123A battery has a life of 10 years with 720 hours of cumulative power outage
- Multi-Protocol field selectable communication port that supports:
 - EIA-485 BACnet MS/TP @ 9600, 19.2k, 38.4k, 76.8k baud
 - Metasys N2 Open
 - LonWorks TP/FT-10 (Requires optional LON plug-in communication card)
- Status of all unit operating conditions and fault lockouts
- Visual LED's for status of power, network communication, processor operation, and errors
- Provides gateway into Aurora heat pump controls for unsurpassed control flexibility
 - Network point for commanding unit into load shed
 - Network point for commanding unit into emergency shutdown
 - Network points to assist in fan speed selection
 - Network points for freeze protection settings
- Heating and cooling control from a remotely located zone sensor
- Rnet communication port which allows for multiple Rnet zone sensors (5) to be connected for space temperature averaging if desired.
- Local laptop or Aurora Touch Interface connection for field service
- FCC, UL and CE listed. BTL Certification is pending

Aurora UPC Optional Features

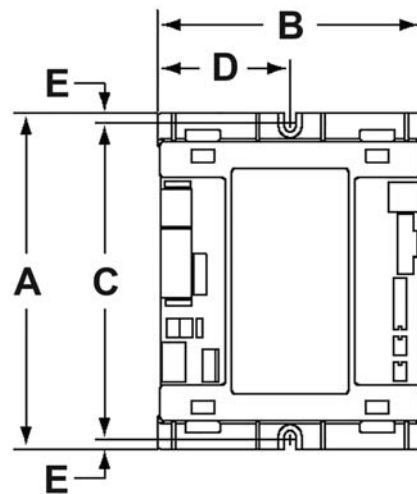
- LonWorks Communication Plug-in
- Aurora Touch Interface handheld display, needed for field configuration of fan speeds, set points, etc.
- Aurora Advanced Control adds the Aurora AXB expansion board and provides added I/O and standard features (Future Availability on Select Models/Configurations)
- Optional Sensor Kits (requires Aurora Advanced Control with AXB - Future Availability on Select Models/Configurations)
 - **Refrigeration Monitoring** – provides Suction and discharge pressure, Suction, liquid line temps and superheat and subcooling.
 - **Performance Monitoring** – provides entering and leaving loop water temperatures, loop flow rate as well as heat of extraction or rejection rate into the loop.
 - **Energy Monitoring** – provides real-time power measurement (Watt) of compressor, fan, auxiliary heat and zone pump.
- Graphics packages available in the future

UPC Layout



UPC Physical Data

Overall	A	5-3/16"	13.2 cm
	B	4-1/8"	10.5 cm
Mounting Hole Dimensions	C	4-7/8"	12.4 cm
	D	2-1/20"	5.2 cm
	E	3/16"	0.5 cm
Depth		1-9/16"	4.0 cm
Weight		0.44 lbs	0.2 kg



UPC Electrical Data

Power	24 Vac \pm 10%, 50 to 60 Hz, 10 VA power consumption (16 VA with Aurora Touch Interface attached) 26 Vdc (25 V min, 30 V max) Single Class 2 source only, 100 VA or less
Physical	Rugged GE C2950 Cyclopol plastic.
Operating Range	-20° to 140°F (-29° to 60°C); 10 to 95% relative humidity, non-condensing
Communication Ports	Port 1a: Jumper-configurable for ARC156 or EIA-485 communication. In ARCNET mode, the port speaks BACnet (at 156k bps). In EIA-485 mode, the communication protocol and baud rate desired are DIP switch selectable between BACnet MS/TP, or N2 Port 2: Used for Aurora communications RNET: Local laptop and/or Aurora Touch Interface access port
Optional Card Port	LonWorks Option Card for connection to Free Topology LON networks (TP/FT-10 Channel)
Status Indication	Visual (LED) status of power, network communication, running, and errors
Battery	Battery CR123A has a life of 10 years with 720 hours of cumulative power outage
Protection	Built-in surge transient protection circuitry. Controller protected by internal solid state Polyswitches on incoming power and network connections. Polyswitches do not need to be replaced, as they will reset themselves once the condition that caused them to "trip" returns to normal.
BACnet support	Conforms to the Advanced Application Controller (B-AAC) Standard Device Profile as defined in ANSI/ASHRAE Standard 135-2004 (BACnet) Annex L
BACnet Certification	BTL Certification is pending
Listed by	FCC, UL, cUL, and CE listed. UL916 (Canadian Std C22.2 No. 205-M1983, CE, FCC Part 15 - Subpart B - Class A

UPC LED Operation

If Run LED shows...	And Error LED shows...	Status is...
2 flashes per second	Off	Normal
2 flashes per second	On	Exec halted after frequent system errors, due to: <ul style="list-style-type: none"> • Controller halted • Program memory corrupted • Address conflicts - duplicate MS/TP MAC addresses • One or more programs stopped
5 flashes per second	On	Exec start-up aborted, Boot is running
5 flashes per second	Off	Firmware transfer in progress, Boot is running
7 flashes per second	7 flashes per second, alternating with Run LED	Ten second recovery period after brownout
14 flashes per second	14 flashes per second, alternating with Run LED	Brownout
On	On	Failure. Try the following solutions: <ul style="list-style-type: none"> • Turn the UPC off, then on. • Download memory to the UPC. • Replace the UPC.

Serial Number

If you need the UPC's serial number when troubleshooting, the number is on:

- a sticker on the back of the main translator board
- a Module Status report (modstat) from WebCTRL , or thru the Aurora Touch Interface by accessing the "Module Setup" menu.

FCC Compliance

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

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

CE Compliance

The Aurora UPC conforms to the following standards. A full Declaration of Conformity is available on request.

Electromagnetic Emissions:	EN55022: 1994 Class A
Electromagnetic Compatibility:	
Immunity for Commercial Environments	EN61000-6-1: 2007
Electrostatic Discharge:	EN61000-4-2: 2008
Radiated Electromagnetic Field:	EN61000-4-3: 2010
Electronic Fast Transient/ Burst Requirements:	EN6100-4-4: 2004
Surge Immunity:	EN6100-4-5: 2005
Immunity to Conductive Disturbance:	EN6100-4-6: 2008
Power Frequency Magnetic Field Immunity:	EN6100-4-8: 2009
Immunity to Voltage Dips and Variations	EN6100-4-11: 2004
European Low Voltage Directive	
Restriction of the Use of Certain Hazardous Substances (RoHS)	

BACnet Compliance

BACnet® is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to requirements of ASHRAE Standard 135 is the responsibility of the BACnet manufacturers Association (BMA). BTL certification is pending. BTL® is a registered trademark of the BMA.

UPC I/O Description

The Aurora UPC can be applied in two control systems: Aurora Base (ABC board only) or the Aurora Advanced (ABC plus the AXB expansion board). The following table illustrates the possible I/O with the two control schemes and the following text describes the I/O operation and point name.

Aurora UPC - I/O		UPC with Aurora Base	UPC with Aurora Advanced	Network Configurable	Hardware				
Ref #	Description	Uses	Std Config (PCB Labeling)	PCB Location	UPC - ABC Only	UPC - ABC + AXB Expansion Board	Network Configurable	Hardware	
Analog In									
1	Leaving Air Temperature	Leaving Air Temperature	EP2	ABC	✓	✓	Standard Program	Factory, Field Installed	
17	Leaving Water Temperature	Leaving Water Temperature	LWT	AXB			Standard Program	STD - Factory Installed Sensor	
	Entering Water Temperature	Entering Water Temperature	EWT	AXB			Standard Program	Optional Performance Monitoring Factory Installed Kit	
	All Leaving Air Temperature	All Leaving Air Temperature	LAT	AXB			Standard Program		
	Flow Meter In	Flow Meter In	FI	AXB			Standard Program		
18	Hg. Liquid Line Temperature	Hg. Liquid Line Temperature	LTL	AXB			Standard Program	Optional Refrigeration Monitoring Factory Installed Kit	
	Discharge Pressure	Discharge Pressure	DP	AXB			Standard Program		
	Suction Pressure	Suction Pressure	SP	AXB			Standard Program		
	Compressor Current 1	Compressor Current 1	CC1	AXB			Standard Program	Optional Energy Monitoring Factory Installed Kit	
19	Compressor Current 2	Compressor Current 2	CC2	AXB			Standard Program		
	Fan Current	Fan Current	FC	AXB			Standard Program		
	Aux Current	Aux Current	AC	AXB			Standard Program		
Digital In									
2	Compressor Proving	Compressor Proving	Y1	ABC	✓	✓	Standard Program	Factory Installed Option	
3	Valve End Switch	Valve End Switch	Y2	ABC	✓	✓	Standard Program	Field Installed Option	
4	Fan Proving	Fan Proving	G	ABC	✓	✓	Standard Program	Factory Options required for E Heat	
5	Room Occupancy Sensor Input	Room Occupancy Sensor Input	O	ABC	✓	✓	Standard Program	Field Installed Option	
6	Dry Filter Input	Dry Filter Switch	W	ABC	✓	✓	Standard Program	Field Installed Option	
Alarms									
7	Differentiated Alarms	All ABC/AXB Alarms		PCB	✓	✓	NA	Thru UPC	
8	English Alarm Description	All ABC/AXB Alarms in English		ABC	✓	✓	NA	Thru UPC	
Digital Out									
9	Alarm Contact Relay R1	Dry Alarm Z1/WAC	Alarm ACC1	PCB	✓	✓	Field Switchable and Installed (except Reheat Models)		
10	Accessory Relay 1 - Dry Contact Relay R2 (Selectable operation)	Swamped Valve w/ Delay Damper w/Compressor		ABC	✓	✓	Network Configurable Swamped Valve w/ Delay (Fcty) Close w/Compressor	Field or Factory installed pump/soolen valve with delay	
11	Electric Heat 1	EH Stage 1	EH1 - DC Out	ABC	✓	✓	Standard Program	WF EHeat Ready or Relay Kit for Other Eheat	
12	Electric Heat 2	EH Stage 2	EH2 - DC Out	ABC	✓	✓	Network Configurable DO	Field Installed Relay Kit	
13	Accessory Relay 2 - Dry Contact Relay (Selectable operation)	Swamped Valve Damper w/Fan Damper w/Compressor	K3 - ACC2	AXB	✓	✓	EH2 or DO using Relay Kit	Field Switchable and Installed	
Analog Out									
14	Modulating Reheat	Modulating Valve 0-10V	None	PCB		✓	Network Configurable	Analog Out 0-10V	
Specialty I/O									
15	Variable Speed Pump/Mod Valve - PWM Out	VS Pump/Mod Valve	VS Pump	AXB		✓	Standard Program	Field Installed Option	
16	Loop Pump Slaving	Slaving Other Aurora Units	Pump Slave	AXB		✓	Standard Program	Field Installed Option	

UPC with Aurora Base Control (ABC Board Only)

- Leaving Air Temperature (LAT) Sensor** – This 10 kOhm NTC sensor is factory installed on all UPC equipped heat pumps. It typically is attached to wiring inside the blower cabinet on the suction side of the blower. This sensor is attached on ABC FP2 pins available as LAT AV-30.
- Compressor Proving Sensors** – This optional factory installed current sensor is connected to confirm compressor operation via the power wires. The sensor is attached at ABC Y1 and available at point BV-65.
- Valve End Switch** – This optional input is setup for a field installed flow valve end switch. This end switch input is attached at ABC Y2 and available at point BV-67.
- Fan Proving Sensors** – This optional factory installed current sensor is connected to confirm fan operation via the power wires. The sensor is attached at ABC G and available at point BV-33.
- Occupancy Sensor** - This optional field installed and wired room sensor and occupancy sensor are typically found in DDC systems. The occupancy Sensors are attached at ABC 0 and can be found at point BV-49.
- Dirty Filter Switch** – This optional field installed switch is connected to confirm dirty filter operation. The dirty filter switch can be found thru your commercial representative. The sensor is attached at ABC W and available at point BV-63.
- Fault, Configuration, and Status Codes** – The codes can be visible to the BAS if desired

Aurora Base Fault Codes (ABC Only) Fault LED (LED1, Red)

	Red Fault LED	LED Flash Code*	Lockout	Reset/ Remove
ABC Basic Faults	Normal - No Faults	OFF	-	
	Fault - Input	1	No	Auto
	Fault - High Pressure	2	Yes	Hard or Soft
	Fault - Low Pressure	3	Yes	Hard or Soft
	Fault - Freeze Detection FP2	4	Yes	Hard or Soft
	Fault - Freeze Detection FP1	5	Yes	Hard or Soft
	Fault - Loss of Charge	6	Yes	Auto
	Fault - Condensate Overflow	7	Yes	Hard or Soft
	Fault - Over/Under Voltage	8	No	Auto
	Fault - FP1 & FP2 Sensor Error	11	Yes	Hard or Soft

NOTE: All codes >11 use long flash for tens digit and short flash for the ones digit. 20, 30, 40, 50, etc. are skipped.

Aurora Advanced Fault Codes (ABC + AXB Expansion Board) - Future Availability Fault LED (LED1, Red)

	Fault	Red Fault LED *	BAS Fault Code (Aurora UPC)	Lockout	Reset/ Remove	Fault Condition Summary
ABC Basic Faults	Normal - No Faults	Off	0	-		
	Fault-Input	1	1	No	Auto	Tstat input error. Autoreset upon condition removal.
	Fault-High Pressure	2	2	Yes	Hard or Soft	HP switch has tripped (>600 psi)
	Fault-Low Pressure	3	3	Yes	Hard or Soft	Low Pressure Switch has tripped (<40 psi for 30 continuous sec.)
	Fault-Freeze Detection FP2	4	4	Yes	Hard or Soft	Freeze protection sensor has tripped (<15 or 30 degF for 30 continuous sec.)
	Fault-Freeze Detection FP1	5	5	Yes	Hard or Soft	Freeze protection sensor has tripped (<15 or 30 degF for 30 continuous sec.)
	Fault - Loss of Charge (Only Available with Aurora UPC)	6	6	Yes	Hard or Soft	Low Pressure Switch Open Prior to Compressor Start. **Compressor operation suspended until problem is resolved.
	Fault-Condensate Overflow	7	7	Yes	Hard or Soft	Condensate switch has shown continuity for 30 continuous sec.
	Fault-Over/Under Voltage	8	8	No	Auto	Instantaneous voltage is out of range. **Controls shut down until resolved.
	Fault-FP1 & 2 Snsr Error	11	11	Yes	Hard or Soft	If FP1 or 2 Sensor Error
ABC & AXB Advanced Faults	Fault-Compressor Monitor	10	10	Yes	Hard or Soft	Open Crkt, Run, Start or welded cont
	Non-CriticAXBSnsrErr	13	13	No	Auto	Any Other Sensor Error
	CriticAXBSnsrErr	14	14	Yes	Hard or Soft	Sensor Error for EEV or HW
	Alert-HotWtr	15	15	No	Auto	HW over limit or logic lockout. HW pump deactivated.
	Fault-VarSpdPump	16	16	No	Auto	Alert is read from PWM feedback.
	Not Used	17	17	No	Auto	IZ2 Com Fault. Autoreset upon condition removal.
	Non-CritComErr	18	18	No	Auto	Any non-critical com error
	Fault-CritComErr	19	19	No	Auto	Any critical com error. Auto reset upon condition removal
	Alarm - Low Loop Pressure	21	21	No	Auto	Loop pressure is below 3 psi for more than 3 minutes
	Alarm - Home Automation 1	23	23	No	Auto	Closed contact input is present on Dig 2 input - Text is configurable
Alarm - Home Automation 2	24	24	No	Auto	Closed contact input is present on Dig 3 input - Text is configurable	
UPC Fault	UPC Communication Loss	None	20	No	Auto	UPC has lost communication with the ABC board.
	UPC Zone Temperature Sensor Unreliable	None	30	No	Auto	UPC has lost communication with all Rnet Zone Temperature Sensors.

Notes:
*All codes >11 use long flash for tens digit and short flash for the ones digit. 20, 30, 40, 50 etc. will only be used with Aurora UPC and will not have an associated flash code for the red LED.

Alert' is a noncritical sensor or function that has failed. Normal operation of the heat pump is maintained but service is desired at some point.

UPC with Aurora Base Control (ABC Board Only)

Aurora Base or Advanced Control Configuration and Status Codes

Status LED (LED3, Green)

Description of Operation	Fault LED, Green
Normal Mode	ON
Control is Non-functional	OFF
Test Mode	Slow Flash
Lockout Active	Fast Flash
Dehumidification Mode	Flash Code 2
Load Shed	Flash Code 5
Emergency Shutdown	Flash Code 6
On Peak Mode	Flash Code 7
(Future Use)	Flash Code 8
(Future Use)	Flash Code 9

Configuration LED (LED2, Yellow)

Description of Operation	Configuration LED, Yellow
No Software Overwritten	ECM Setting
DIP Switch Overwritten	Slow Flash
ECM Configuration Mode	Fast Flash
Reset Configuration Mode	OFF

9. **Alarm Relay** – The Alarm relay (ALM) is factory connected to 24 VAC via jumper JW2. By cutting JW2, ABC ALM becomes a dry contact connected to ABC ALG. The Relay is field switchable between Factory setting as an Alarm output or available for other uses.

Note on units with Hot Gas Reheat (DH, SW2-8 OFF)

When SW2-8 is set to the “OFF” position the Alarm/Reheat Output will be used to control a hot gas reheat valve. If the control receives a DH command and there is no requirement from the space for heating or cooling (Y1 or Y2 command) the control will operate in second stage cooling mode. 30 seconds after the compressor output (CC) energizes, the Alarm/Reheat output will be energized. The control will run reheat until the requirement has been satisfied or there is a command from the space for heating or cooling (Y1, Y2, or both). If the command from the space is for cooling (Y1, Y2, O) the control will simply de-energize the Alarm/Reheat output and cool the space without disabling the compressor. If there is still a command for dehumidification from the space once cooling is satisfied, the control re-energizes the Alarm/Reheat output without disabling the compressor output. If the command from the space is for heating the control will disable the compressor output and de-energize the Alarm/Reheat output. After the compressor short cycle delay is satisfied the control will re-start the unit in the heating mode. If there is still a command for dehumidification from the space once heating is satisfied the control will once again shut down the compressor for the compressor short cycle delay. Once the compressor short cycle delay has satisfied, the sequence for starting the reheat cycle will be repeated.

10. **Accessory Relay1** – A configurable, accessory relay on the ABC is provided that can be cycled with the compressor, blower, or the com t-stat hum command. A third (factory) setting cycles the relay with the compressor but delays the compressor and blower output for 90 sec. Source pump or slow opening solenoid valves in well systems or variable speed primary pumping systems would be a prime use of this feature.

Accessory Relay Operation	SW2-4	SW2-5
Cycle with Blower	ON	ON
Cycle with Compressor	OFF	OFF
Water Valve Slow Opening	ON	OFF
Cycle with Comm. T-stat Hum Cmd*	OFF	ON

*Not available with UPC

11. **Electric Heat EH1** – A digital 24VDC output is provided for electric heat powering. UPC’s Default programming has EH1 set for AUX/ELEC Heat operation and will be controlled using the UPC’s internal P.I.D. logic. However it can be changed by the BAS to be network controlled.
12. **Electric Heat EH2** – A digital 24VDC output is provided for field options converted from the original EH2 output. Default UPC program has the EH2 output set for Network Control but can be changed by the BAS to be controlled by the UPC’s internal P.I.D logic for Aux/Electric Heat.

UPC with Aurora Advanced Control (ABC + AXB Expansion Board)

Please note, these options will have future availability on select models/configurations.

1. **Accessory Relay2** – A second, configurable, accessory relay on the AXB is provided that can be cycled with the compressor 1 or 2, blower, or the Dehumidifier (DH) input. This is to complement the Accessory 1 Relay on the ABC board.

Position	DIP 4	DIP 5	Description
1	ON	ON	Cycles with Fan or ECM (or G)
2	OFF	ON	Cycles with CC1 first stage of compressor or compressor spd 1-12
3	ON	OFF	Cycles with CC2 second stage of compressor or compressor spd 7-12
4	OFF	OFF	Cycles with DH input from ABC board

2. **Analog Out** – A standard 0-10VDC analog output is provided. This output can be used to drive modulating dampers etc.
3. **Variable Speed Pump or Modulating Water Valve** - This input and output are provided to drive and monitor a variable speed pump. The VS pump output is a PWM signal to drive the variable speed pump. The minimum and maximum level are set using the Aurora Touch UPC (ATU). 75% and 100% are the default settings respectively. The VS data input allows a separate PWM signal to return from the pump giving fault and performance information. Fault received from the variable speed pump will be displayed as E16. **Modulating Water Valve** - This Variable speed PWM output is provided to optionally drive a modulating water valve. Through advanced design a 0-10VDC valve can be driven directly from the VS pump output. The minimum and maximum level are set in the same way as the VS pump using the ATU. 75% and 100% are the default settings respectively.
4. **Loop Pump Slaving** - This input and output are provided so that two units can be slaved together with a common flow center. When either unit has a call for loop pump, both unit's loop pump relays and variable speed pumps are energized. The flow center then can simply be wired to either unit. The output from one unit should be routed to the input of the other. If daisy chained up to 16 heat pumps can be wired and slaved together in this fashion.

Monitoring Sensor Kits

Please note, these options will have future availability on select models/configurations.

- 1. Energy Monitoring (Standard Sensor Kit on 'Advanced' models)** - The Energy Monitoring Kit includes two current transducers (blower and electric heat) added to the existing two compressor sensors so that the complete power usage of the heat pump can be measured. The Aurora Touch Interface Tool provides configuration detail for the type of blower motor and a line voltage calibration procedure to improve the accuracy. This real time power usage information can be displayed on the ATU and is available thru network points when using BACnet or N2 Open.
 - Compressor Current 1
 - Compressor Current 2
 - Fan Current
 - Aux Heat Current
 - Pump Selection
 - Voltage
 - Compressor Watts
 - Fan Watts
 - Aux Heat Watts
 - Pump Watts (VS Only)
- 2. Refrigerant Monitoring (optional sensor kit)** - The optional Refrigerant Monitoring Kit includes two pressure transducers, and three temperature sensors, heating liquid line, suction temperature and existing cooling liquid line (FP1). These sensors allow the measurement of discharge and suction pressures, suction and liquid line temperatures as well as superheat and subcooling. This information can be displayed on the ATU, or the network when using BACnet and N2.
 - Htg Liquid Line
 - Clg Liquid Line
 - Discharge pressure
 - Suction Pressure
 - Discharge Saturated Temp
 - Suction Saturated Temperature
 - Superheat
 - SubCooling
- 3. Performance Monitoring (optional sensor kit)** - The optional Performance Monitoring Kit includes: three temperature sensors, entering and leaving water, leaving air temperature and a water flow rate sensor. With this kit, heat of extraction and rejection will be calculated. This requires configuration using the ATU for selection of water or antifreeze.
 - Leaving Air Temperature (supply)
 - Alt Leaving Air Temperature (Supply)
 - Entering Water Temperature
 - Leaving Water Temperature
 - Water Flow Meter
 - Entering Air Temperature (from zone sensor)
 - Brine Selection (water/antifreeze)
 - Heat of Extraction/Rejection

Aurora UPC Communication

Communication Port Configuration and Setup

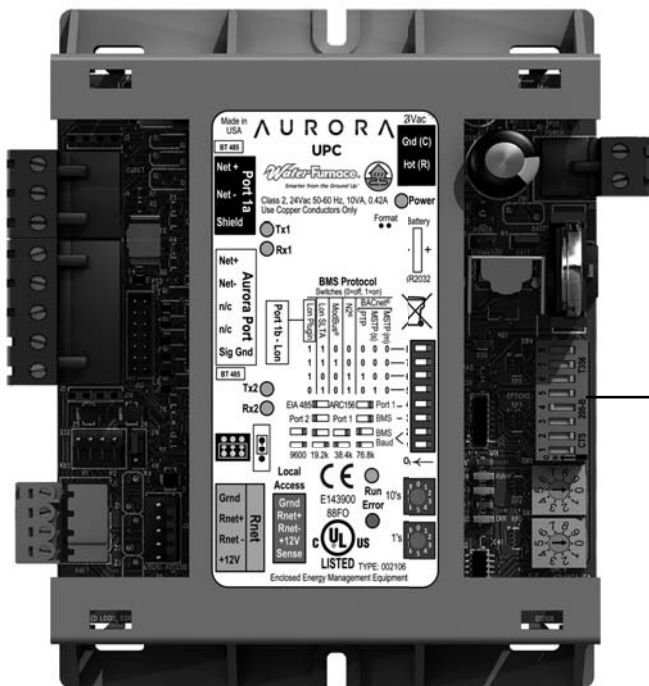
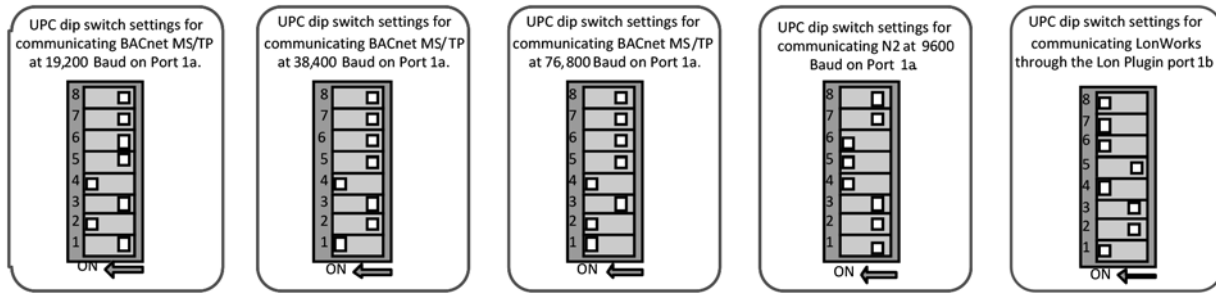
The UPC has a total of 4 communication ports; two of these communication ports are configured by adjusting the onboard dip switches. Field technicians can use the onboard dipswitches to configure the UPC's communication protocol and baud rate making this a very versatile controller. Port 1a is set to communicate over a BACnet network @ 38,400 Baud from the factory but can be reconfigured in the field. Port 1b is only used when LonWorks communications is desired, port 1b will accept the LonWorks plug-in module only. Port 2 is used for communicating to the ABC via Modbus RTU. The Rnet port is used for connecting Rnet communicating zone temperature/humidity sensors, Aurora Touch Interface service tool or a local laptop for troubleshooting. If there is a need to change the communications protocol or baud rate of Port 1a please refer figure 2. Port 1a.

Port 1a is used to communicate to the BAS network through a 2 wire shielded twisted pair communication cable. Port 1a is configured for EIA-485 communication. In EIA-485 mode, the communication protocol and baud rate are field selectable through the on board dip switches. The on board dip switches allow for port 1a to be set for BACnet MSTP or N2 Open. Refer to Figure 2 for the port 1a configuration settings.

Configuring Port 1

1. Turn power off to the unit.
2. Locate and identify the configuration dip switches.
3. Determine which switch(es) needs changed.
4. Adjust the dip switch(es) to match the desired protocol and baud rate.
5. Make any adjustments to the MAC address at this time if needed. (refer to page 16)
6. Turn power back on to the unit.

Figure 2: Port 1 DIP Switch Configurations

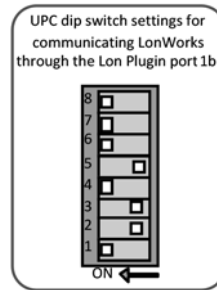


BMS Protocol		Switches (0=off, 1=on)							
Port 1b - Lon Lon Plug-in	Lon S/LTA	Modbus [®]	N2 [®]	BACnet [®]				Port 1 - 4	
				P/TP	MSTP (s)	MSTP (n)	BMS		
1	1	0	0	0	0	0	0	8	
1	1	1	0	0	0	0	0	7	
1	0	0	1	1	0	0	0	6	
0	1	0	1	0	1	0	0	5	
								Port 1 - 3	
								BMS - 2	
								BMS < 1	
								Baud	
								On ←	

Aurora UPC Communication cont.

Port 1b-LonWorks

Port 1b is only used for the Lon plugin communication card; this is not a standard item and must be added to the unit at the time the unit order is placed. When the LonWorks plugin is added to the UPC the dip switches need to be configured for the LonWorks plugin port 1b and the BAS baud rate (SW1 and SW2) must be set for 38.4 kbps. The LonWorks Plug-in has a 2 pin connector for wiring it to the BAS. There is a service pin also located on the LonWorks board that is used to alert the BAS of the device when it is pressed. The LonWorks board has a total of 4 LED's located on it, they are power, a service pin, transmit (TX), receive (RX) LED's.



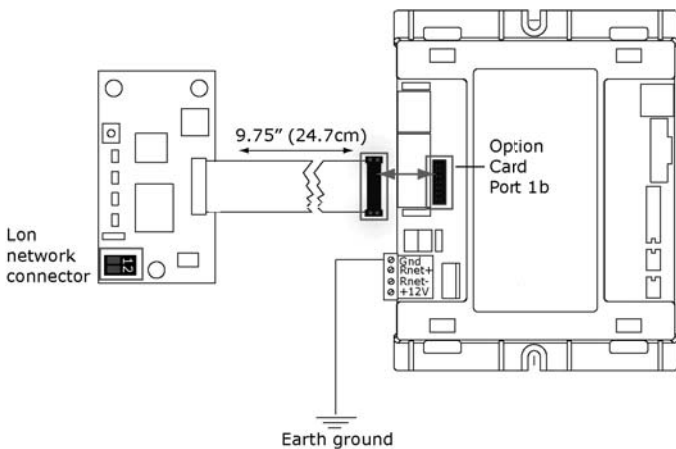
*Note: Port 1a is disabled when the UPC is configured for the LON plugin.

*Note: Lon SLTA communications is not offered currently.

To Mount the LonWorks Option Card

Mount the LonWorks Option Card to the left of the UPC. The distance cannot exceed the ribbon length of 9.75 inches. The standoff height is .625 inches. CAUTIONS

- You MUST ground the UPC to earth ground, using the Rnet Gnd connector.
- The translator must be OFF before being connected.



Port 2

Port 2 is used for communicating to the Aurora base controller via Modbus RTU. Port 2's configuration dip switches will be preconfigured at the factory to communicate to the Aurora. If there is a problem with the UPC communicating to the ABC there will be an alarm generated by the UPC and will be displayed on the Aurora Touch Interface and sent to the BAS as well. This alarm can be caused by various conditions such as the UPC dip switches set improperly, loss of power to the ABC, or the communication link between the UPC and ABC is disconnected or wired wrong. If a loss of communication alarm is generated in the UPC, please verify proper dip switch settings on the UPC, power supply and the fuse on the ABC, communication wiring between the UPC and ABC before replacing either controller.

Aurora UPC Communication cont.

Setting the Rotary Mac Address Switches

The Mac address is set by two rotary switches which are located below the dip switches on the UPC. There is a rotary switch for 1's and one for 10's. The mac address is set to 1 by default when it leaves the factory, to change the address follow the steps outlined below. The highest Mac address available is 99.

1. Turn power off to the unit or remove power to the UPC by removing the 24VAC connector labeled Hot and Grnd.
2. Locate and identify the two rotary switches and their associated values 1's and 10's
3. Determine which switch(es) need changed.
4. Adjust the rotary switch(es) to match the desired mac address up to 99.
5. EXAMPLE If the translator's address is 25, point the arrow on the Tens (10's) switch to 2 and the arrow on the Ones (1's) switch to 5.
6. Turn power back on to the unit.

NOTE: The UPC recognizes its address only after power has been cycled.

Device Instance or Device ID

The Device Instance/Device ID is auto generated based upon the network number and MAC address. For example if the network number is 7000 and MAC address of device is 12, the device instance would be '7012'.

BAS Port Wiring Connections

Port 1a has a 3 pin connector for the communication wiring, Net +, Net -, and a Shield terminal. This port is polarity sensitive and needs to be wired using the daisy chain method for best results.

Notes:

- Use 22 AWG or 24 AWG shielded, twisted pair communication wiring for connecting the controller to the network.
- Connect each controller using the daisy chain method and make sure to observe the proper polarity when wiring each controller.
- The BAS trunk should be limited to approximately 30 devices per trunk for best results.
- The BAS trunk should not exceed 2000 feet of communication cable.
- The UPC's Mac addresses must be unique on each BAS trunk.
- BACnet MS/TP: Device instances will be determined by the mac address and the controller's network number. (i.e. network number is 7000 and MAC address is set to 4, the device instance will be 7004).

Figure 3: MAC Address Switches

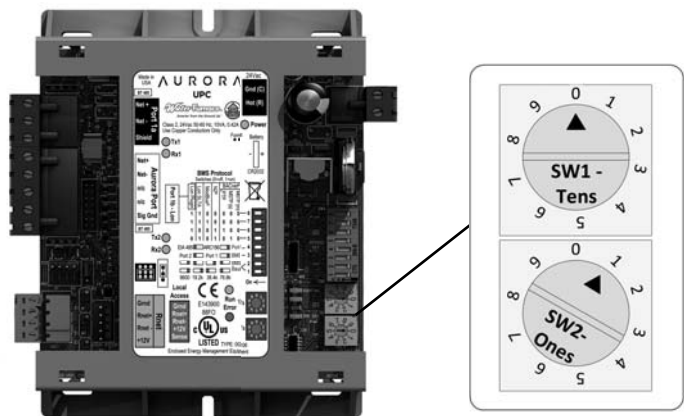
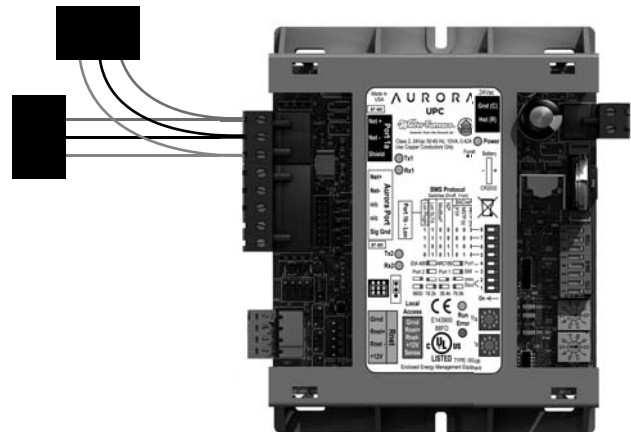


Figure 4: BAS Wiring



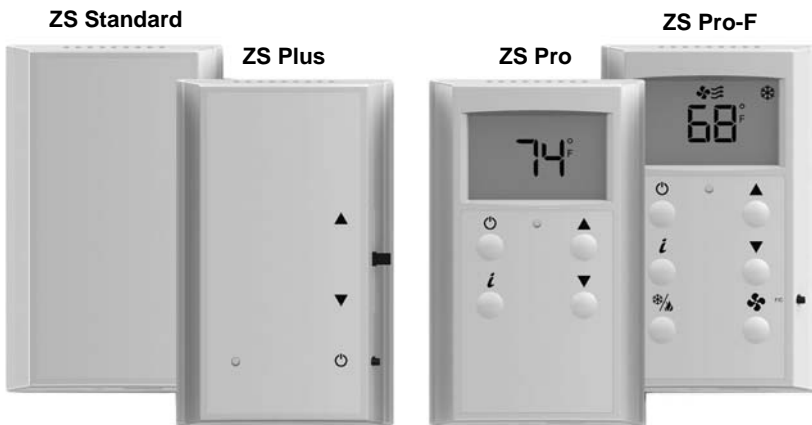
ZS Series RNet Zone Sensors

ZS Series RNet Sensor Overview

The ZS Series line of intelligent zone sensors provides the function and flexibility you need to manage the conditions important to the comfort and productivity of the zone occupants. The ZS sensors are available in a variety of zone sensing combinations to address your application needs. These combinations include temperature, relative humidity, and indoor air quality (carbon dioxide or VOCs (Volatile Organic Compounds)). Designed to work with the Aurora UPC controllers the ZS sensor line includes the ZS Standard, ZS Plus, ZS Pro and ZS Pro-F.

The UPC uses a proprietary communication called Rnet to receive

the space temperature from the zone sensor. This is done using (2) 18 AWG twisted pair unshielded cables for a total of 4 wires connected to the Rnet port. The sensor gets its power from the UPC controller and connecting multiple sensors to one UPC will allow for space temperature averaging. The UPC can support up to 5 ZS sensors. The sensors use a precise 10k ohm thermistor with less than 0.18°F drift over a ten year span, this allows for less maintenance or re-calibration after installation. The sensors also have a hidden communication port for connecting a Aurora Touch Interface or local laptop that provides access to the equipment for commissioning and maintenance. The table on page 18 shows the features of each of the four sensors that are currently available.



ZS Series RNet Zone Sensors cont.

RNet Sensor Nomenclature

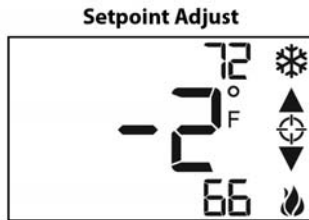
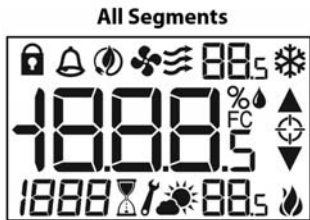
Features	ZS Base	ZS Plus	ZS Pro	ZS Pro-F
Temp, CO ² , Humidity, and VOC Options	√	√	√	√
Neutral Color	√	√	√	√
Addressable/supports daisy chaining	√	√	√	√
Hidden communication port	√	√	√	√
Mounts on a standard 2" by 4" electrical box	√	√	√	√
Occupancy Status indicator LED		√	√	√
Push button occupancy override		√	√	√
Setpoint adjust		√	√	√
Large, easy to read LCD			√	√
Alarm indicator			√	√
°F to °C conversion button				√

Options	Part Number	Part Number	Part Number	Part Number
Temperature Only	ZSU-WFI02	ZSUPL-WFI02	ZSUP-WFI02	ZSUPF-WFI02
Temp with CO ²	ZSU-C-WFI02	ZSUPL-C-WFI02	ZSUP-C-WFI02	ZSUPF-C-WFI02
Temp with Humidity	ZSU-H-WFI02	ZSUPL-H-WFI02	ZSUP-H-WFI02	ZSUPF-H-WFI02
Temp with Humidity, CO ²	ZSU-HC-WFI02	ZSUPL-HC-WFI02	ZSUP-HC-WFI02	ZSUPF-HC-WFI02
Temp, Humidity, VOC	ZSU-HV-WFI02	ZSUPL-HV-WFI02	ZSUP-HV-WFI02	ZSUPF-HV-WFI02
Temp with VOC	ZSU-V-WFI02	ZSUPL-V-WFI02	ZSUP-V-WFI02	ZSUPF-V-WFI02

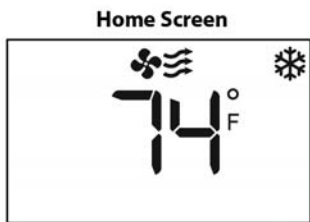
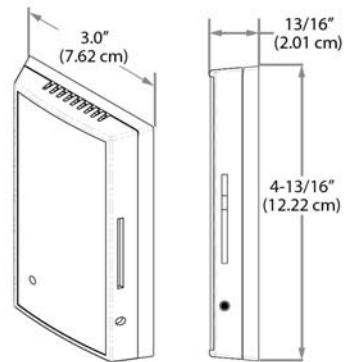
ZS Series RNet Zone Sensors cont.

RNet Sensor Physical and Electrical Data

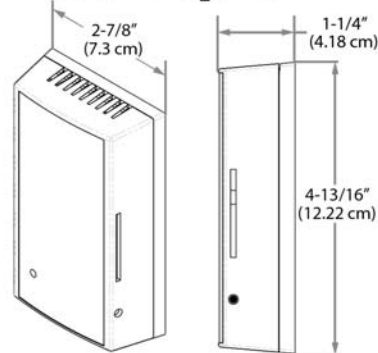
Sensing Element	Range	Accuracy
Temperature (on non-Humidity models)	-4° to 122° F (-20° C to 50° C)	±0.35° F (0.2° C)
Temperature (on Humidity models)	50° F to 104° F (10° C to 40° C)	±0.5° F (0.3° C)
Humidity	10% to 90%	±1.8% typical
CO2	400 to 1250 PPM 1250 to 2000 PPM	±30PPM or +/-3% of reading (greater of two) ±5% of reading plus 30 PPM
VOC	0 to 2,000 PPM	±100 PPM
Power Requirements	Sensor Type	Power Required
Temperature Only	All Models	12 Vdc @ 8 mA
Temperature with Humidity	All Models	12 Vdc @ 15 mA (idle) to 190 mA (CO2 measurement cycle)
Temp with VOC, or Temp/VOC/Humidity	All Models	12 Vdc @ 60 mA
Temp with CO2 , or Temp/ CO2/Humidity	All Models	12 Vdc @ 15 mA (idle) to 190 mA (CO2 measurement cycle)
Power Supply	A controller supplies the Rnet sensor network with 12 Vdc @ 210 mA. Additional power may be required for your application. See sensor ZS Installation Guide	
Communication	115 kbps Rnet connection between sensor(s) and controller 15 sensors max per Rnet network; 5 sensors max per control program	
Local Access Port	For connecting a laptop computer to the local equipment for maintenance and commissioning	
Environmental Operating Range	32° to 122° F (0° - 50° C), 10% to 90% relative humidity, non-condensing	
Mounting Dimensions	Standard 4"x 2" electrical box using provided 6/32" x 1/2" mounting screws	



Temperature Only or Temperature with Humidity



Sensor with CO2 or VOC



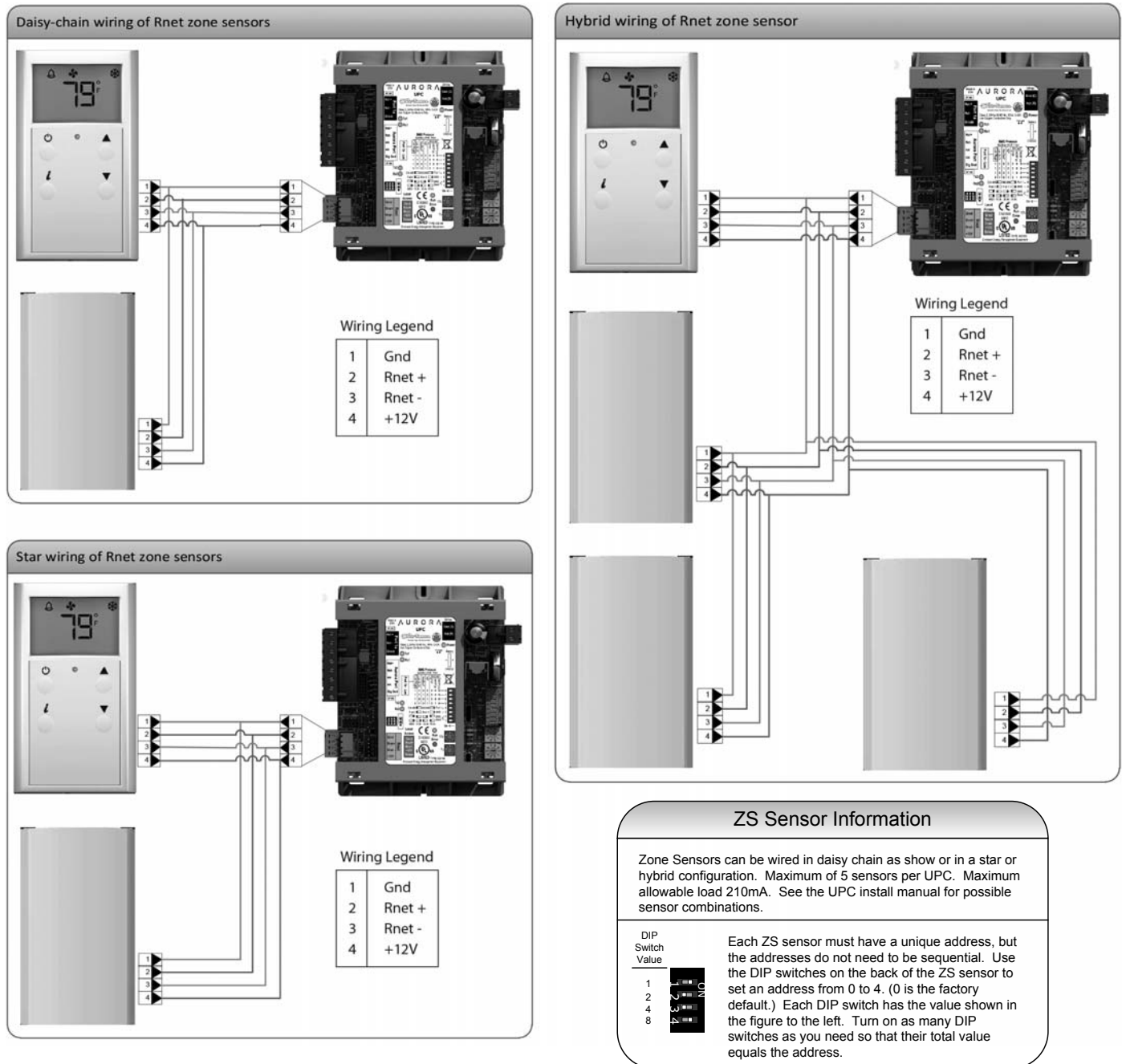
ZS Series RNet Zone Sensors cont.

Zone Sensor Wiring

Up to four zone sensors can be connected as shown. In the standard UPC application, zone sensor temperatures will automatically be averaged when using multiple zone sensors configured as shown below. It is possible to individually address and read each individual zone sensor but will require custom equipment profile software. Consult your WaterFurnace Commercial Representative for more information.

Using (2) 18AWG twisted pair unshielded communication cables connect the zone sensors to the UPC, be sure to use one twisted pair for the 12v supply and the grounding wire connections and the other twisted pair for the Rnet+ and Rnet- connection. If more than one sensor is required for the zone, connect the other sensors using one of the following schemes: Daisy-chain, Star, or the Hybrid method. Standard 18AWG thermostat wire is NOT recommended for use with the Rnet sensors.

Figure 5: Sensors Wiring



ZS Series RNet Zone Sensors cont.

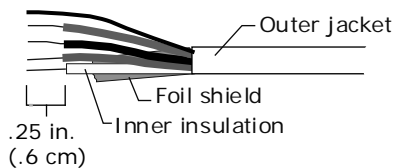
Rnet Wiring Specifications

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

Description	4 conductor, shielded or unshielded, CMP, plenum rated cable
Conductor	22 AWG (7x0096) bare copper if Rnet has only sensors 18 AWG (7x0152) bare copper if Rnet has a Aurora Touch Interface
Maximum length	500 feet (152 meters)
Insulation	Low-smoke PVC (or equivalent)
Color Code	Black, white, green, red
Shielding	If shielded, Aluminum/Mylar shield (100% coverage) with TC drain wire
UL temperature rating	32–167°F (0–75°C)
Voltage	300 Vac, power limited
Listing	UL: NEC CL2P, or better

To wire an ZS room sensor

1. Turn off the UPC's power.
2. Pull the screw terminal connector from the RS sensor.
3. Pull the screw terminal connector from the Rnet port.
4. Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the inner insulation.



5. Strip about .25 inch (.6 cm) of the inner insulation from each wire.
6. Wire each terminal on the UPC's Rnet port to the terminal of the same name on the ZS room sensor.
7. Turn on the UPC's power.

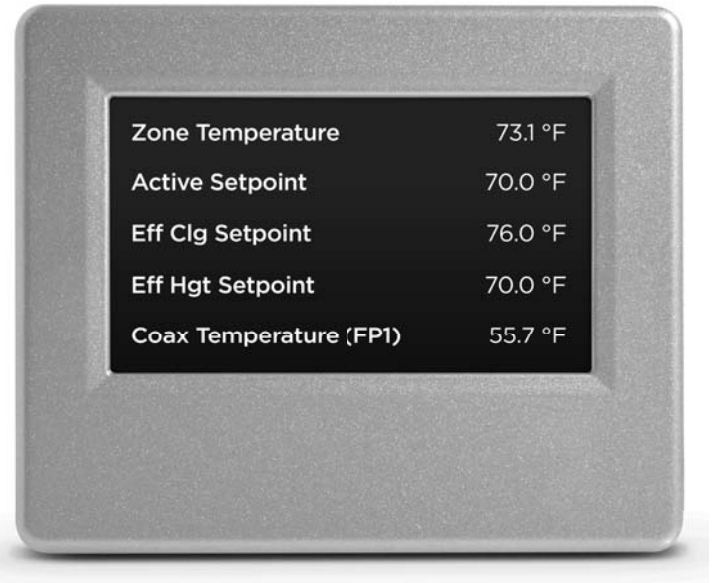
NOTES

- If using shielded wire, connect the shield wire and the ground wire to the Gnd terminal.
- Maintain same polarity

Aurora Touch UPC (ATU)

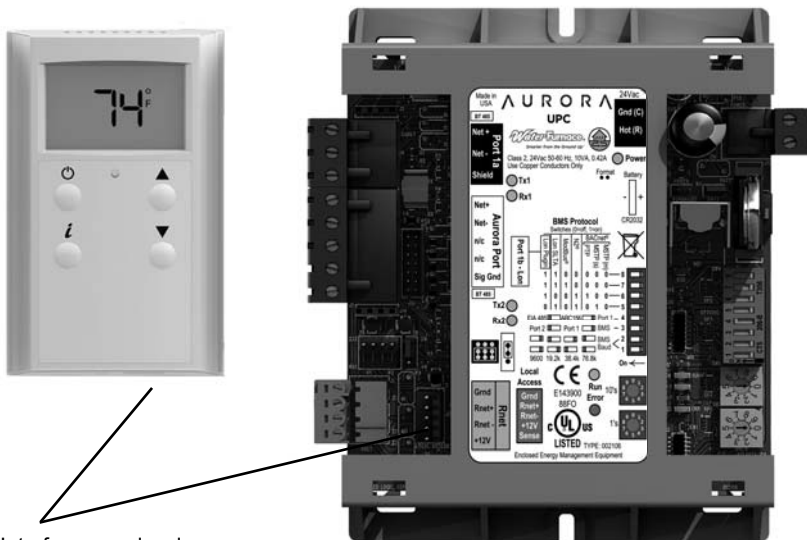
Aurora Touch UPC (ATU)

Utilizing a touch-screen interface, the UPC provides a technician the ability to configure and diagnose equipment at the unit or from any room sensor for added accessibility and simplified troubleshooting. The technician will have full access to equipment status, parameter values, temperature, and humidity sensing as well as access to alarm and trend history. With website-like navigation, the Aurora Touch Interface is easy to use and provides important insight into the system so your building can operate as efficiently as possible. Please note that the screens depicted in the following document show the screens in an “extended view”.



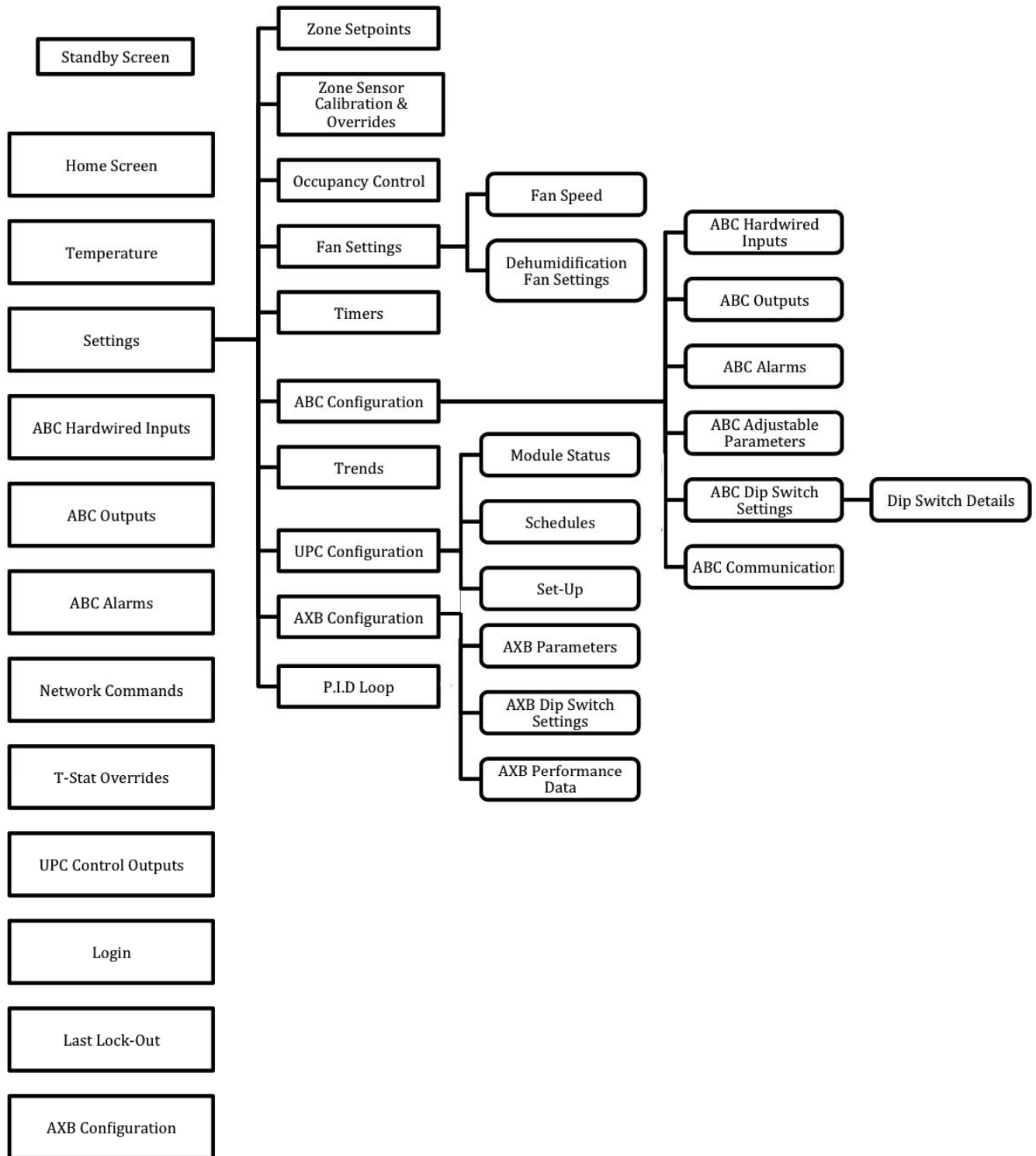
Connecting the Aurora Touch Interface

There are two ports that will accept the Aurora Touch UPC (ATU) connection, one is located on the UPC and the other is on the bottom of the ZS zone sensors. Either connection will allow the operator to access and edit the same information within the UPC.



Aurora Touch Interface, or a local laptop can be connected to either the UPC Controller or the ZS zone sensor.

Aurora Touch UPC (ATU) Software



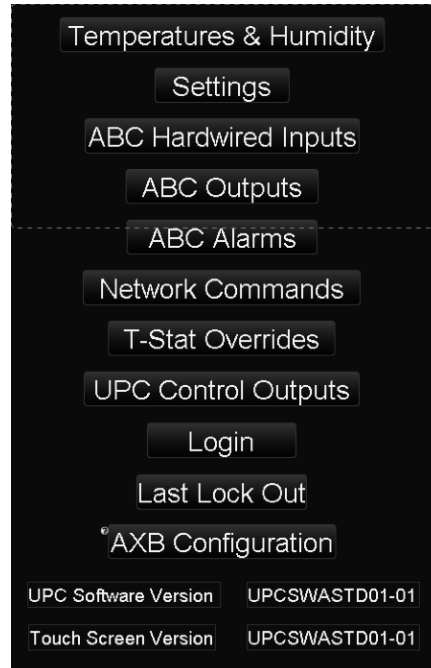
Aurora Touch UPC (ATU) Software cont.

Home

The home page list 11 buttons that contain information about the ABC and the UPC controllers. Navigate thru the screens by touching the item you which to select.

1. Temperatures & Humidity
2. Settings
3. ABC Hardwired Inputs
4. ABC Outputs
5. ABC Alarms
6. Network Commands
7. T-Stat Overrides
8. UPC Control Outputs
9. Login
10. Last Lock Out
11. AXB Configuration

The last two items displayed on the home page pertain to the Version of UPC Software and the Version of Equipment Touch Software that is loaded into the UPC Controller.



Temperatures & Humidity

1. Zone Temp: Connected Rnet zone sensor value.
2. Active Set Point: Displays the temperature value that the controller is actively controlling to.
3. Eff Clg Setpt: Result of the occupancy set point and the influence from the warm/cool adjust of the Rnet sensor.
4. Eff Hgt Setpt: Result of the occupancy set point and the influence from the warm/cool adjust of the Rnet sensor.
5. Coax Temp: Shows the refrigerant temperature at the coax heat exchanger.
6. Coax Low Temp Limit: Displays the level of freeze protection that is set by the SW2-1 dipswitch.
7. Leaving Air Temp: Displays the temperature of the air leaving the blower housing.
8. Humidity: Displays the space humidity if Rnet humidity sensor is connected.
9. OAT(Outside Air Temperature): Displays the value of a field supplied remote sensor that is read by the BAS and then written to the UPC.



The buttons at the bottom of this page will take you to the associated screen. This provides a quick way to navigate back and forth between the Zone temperature, set points, and calibrations pages. These pages are covered under the “Settings” page of this document.

Aurora Touch UPC (ATU) Software cont.

Settings

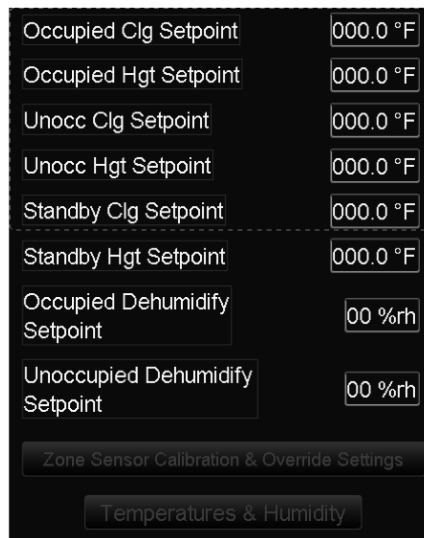
The settings page links to 8 pages that allow for various settings to be configured. Caution should be exercised when making changes with-in these pages as improper configuration may result in undesirable unit operation. Each page is explained below.

1. Zone Set Points
2. Zone Sensor Calibration
3. Occupancy Control Settings
4. Fan Settings
5. Timers
6. ABC Configuration
7. Trends
8. UPC Configuration
(?) Show/Hide: Only displayed if logged in with the password.
9. AXB Configuration: Only displayed if the AXB is present and enabled.
(?) Show/Hide: Only displayed if the AXB is present and enabled.
10. P.I.D Loop: Only displayed if logged in as a ADMIN



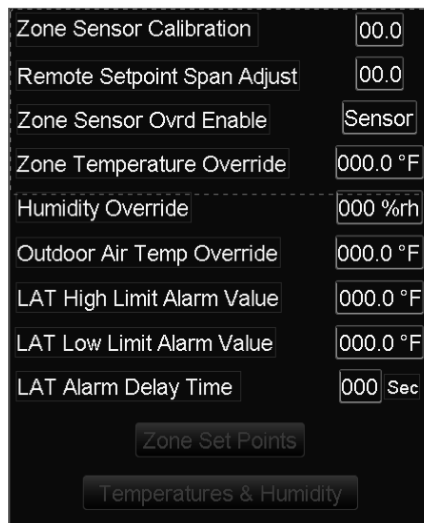
Zone Set Points

1. *Occupied Clg Setpt: Cooling set point in the occupied mode. Adjustable thru the BAS or the ATU.
2. *Occupied Hgt Setpt: Heating set point in the occupied mode. Adjustable thru the BAS or the ATU.
3. *Unoccupied Clg Setpt: Cooling set point in the unoccupied mode. Adjustable thru the BAS or the ATU.
4. *Unoccupied Hgt Setpt: Heating set point in the unoccupied mode. Adjustable thru the BAS or the ATU.
5. *Standby Clg Setpoint: Cooling set point in the standby mode, this is most likely not used. Adjustable thru the BAS or the ATU.
6. *Standby Hgt Setpoint: Heating set point in the standby mode, this is most likely not used. Adjustable thru the BAS or the ATU.
7. *Occupied Dehumidify Setpoint: Set point to determine when passive dehumidification or reheat is engaged. Adjustable thru the BAS or the ATU.
8. *Unoccupied Dehumidify Setpt: Set point to determine when passive dehumidification or reheat is engaged when the unit is unoccupied. Adjustable thru the BAS or the ATU.



Zone Sensor Calibration

1. *Zone Sensor Calibration: Allows for the zone temperature sensor to be calibrated if necessary.
2. *Remote Setpt Span: Allows for the remote set point span value to be adjusted. Remote set point span is used to tell the UPC how much influence the Rnet sensor's up and down arrows influence the effective heating and cooling set points.
3. *Zone Sensor Override Enable: To allow the zone temperature to be overridden or written to by the BAS, this point needs to be enabled. Default is disabled, which allows for a Rnet zone sensor to be connected to the Rnet bus and allows for the unit to read the temperature of the Rnet sensor.
4. *Zone Temperature Override: Allows for the zone temperature to be overridden if the zone sensor override enable point is set to enable.
5. *Humidity Override: Allows for the space humidity to be overridden or written to by the BAS if NO humidty sensor is connected to the Rnet port.
6. *Out Door Air Temp Override: Allows for the outdoor air temp to be



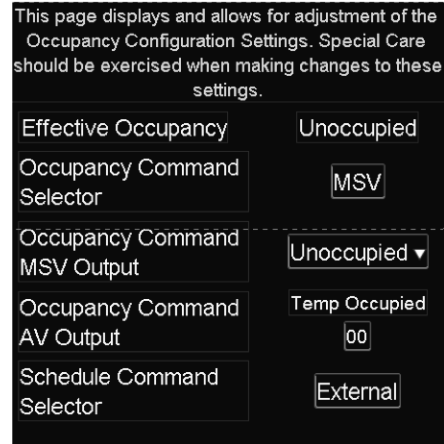
Aurora Touch UPC (ATU) Software cont.

overridden by the BAS, there is no provisions on the UPC or ABC to connect an outdoor air temperature sensor, the value has to come from the BAS.

7. *LAT High Limit Alarm Value: Allows for the user to adjust the value of the Leaving Air Temp High Limit Alarm.
8. *LAT Low Limit Alarm Value: Allows for the user to adjust the value of the Leaving Air Temp Low Limit Alarm.
9. *LAT Alarm Delay Time: Allows for adjustment of the time delay for the LAT Alarm.

Occupancy Control Parameters

1. Effective Occupancy: Displays the effective occupancy of the unit.
2. *Occupancy Command Selector: Allows for direct control of the point that determines which occupancy command is used to control the unit's occupancy. Caution should be taken when making changes to this point if a BAS is already communicating to the UPC.
3. *Occupancy Command (MSV): Allows for direct control of the occupancy command if the occupancy command selector is set for MSV.
4. *Occupancy Command (AV): Allows for direct control of the occupancy command if the occupancy command selector is set for AV.
5. *Schedule Command Selector: The UPC has an Internal schedule that is used to keep the unit in the occupied mode from 8am-5pm Monday thru Friday. If the BAS will be commanding the unit occupancy, this point will need to be set to "External".

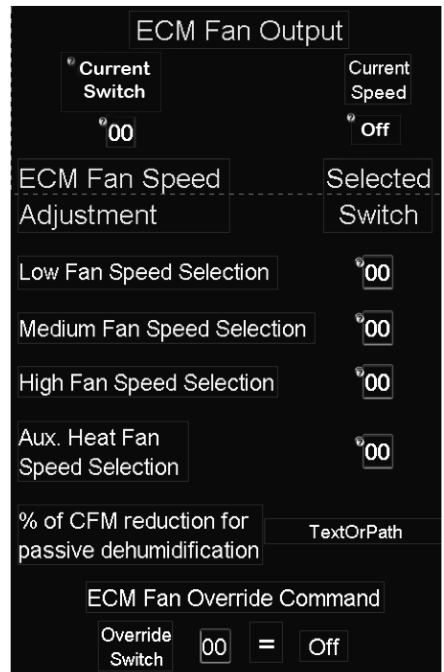


Fan Settings

Fan Speed Selection

If the fan speed values are displayed in red text, the fan speed has been overridden using the ECM Override Command. To release the override set the ECM Override Command to "0".

1. Current Fan Switch 1-12: Displays the current switch number and the fan speed percentage it is operating at.
2. Current Speed: Displays the current ECM speed.
3. *Low Fan Speed Selection: Allows for the low fan speed to be adjusted to the desired speed. The unit operates on the low fan speed when there is no call for compressor operation.
4. *Medium Fan Speed Selection: Allows for the medium fan speed to be adjusted to the desired speed. The unit operates on the medium fan speed when there is a Y1 call.
5. *High Fan Speed Selection: Allows for the high fan speed to be adjusted to the desired speed. The unit operates on the high fan speed when there is a Y1 and a Y2 call.
6. *Aux Fan Speed Selection: Allows for the aux heat fan speed to be adjusted to the desired speed as long as it is set to a speed equal or greater than the high fan speed selection.
7. % of CFM reduction for passive dehumidification: Displays the % of CFM reduction for passive dehumidification.
8. *Fan Override Command: Allows for all fan speed selections to be overridden to the same value. This point should be used carefully; if the airflow is set to low and there is a call for the compressor it could introduce a lock-out condition. To release an override set the value to "0".



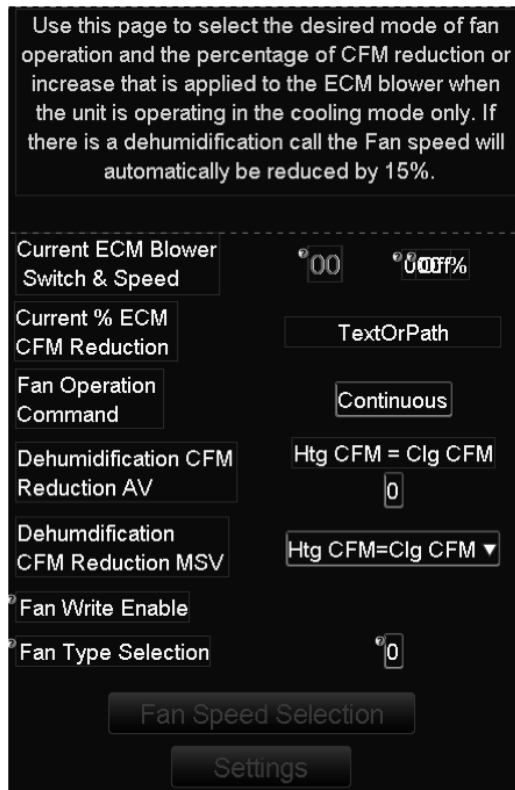
NOTE: Values with the (?) symbol may have various display options that are dependent on other settings within the unit.

Aurora Touch UPC (ATU) Software cont.

Dehumidification Fan Settings

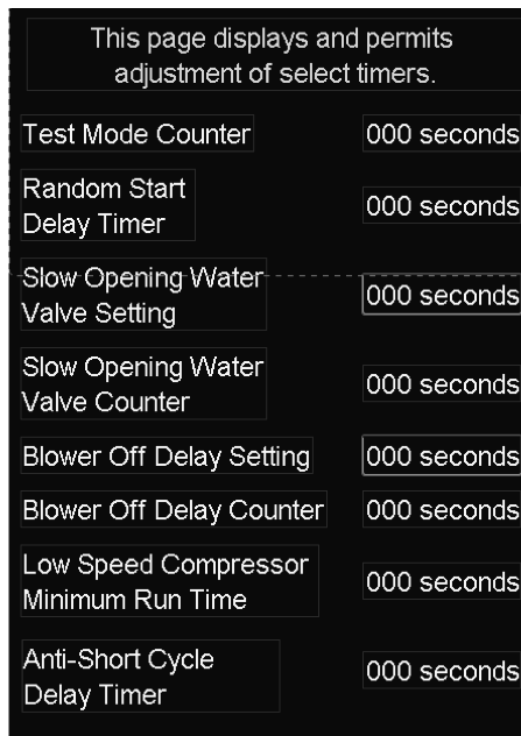
NOTE: "Δ" Requires the AXB to be present and enabled before it will be displayed.

1. Current ECM Blower Switch & Speed: Used to display the current Operating ECM Blower Switch and Speed.
2. Current % ECM CFM Reduction: Displays the percent of CFM reduction.
3. *Fan Operation Command: Allows for the fan's mode of operation to be changed from continuous to cycled.
4. *Dehum CFM Reduce AV: Used to reduce or increase the airflow when there is a dehumidification or cooling call. There are two points that can control this and the point with the highest value will be the point that the UPC controls from. There are 4 selections for this point -5% CFM, -10% CFM, -15% CFM, +5%CFM.
5. *Dehum CFM Reduce MSV: Used to reduce or increase the airflow when there is a dehumidification or cooling call. There are two points that can control this and the point with the highest value will be the point that the UPC controls from. There are 4 selections for this point -5% CFM, -10% CFM, -15% CFM, +5%CFM.
6. *Fan Write Enable: Used to enable the writable point that is used to select the type of fan that is installed in the unit. This is only visible when the AXB is present and enabled.
7. Δ*Fan Type Selection: Allows for the selection three different fan motor types. This only is used to improve the accuracy of the Energy Monitoring data when the Energy Monitoring Hardware is installed. This is only visible when the AXB is present and enabled



Timers

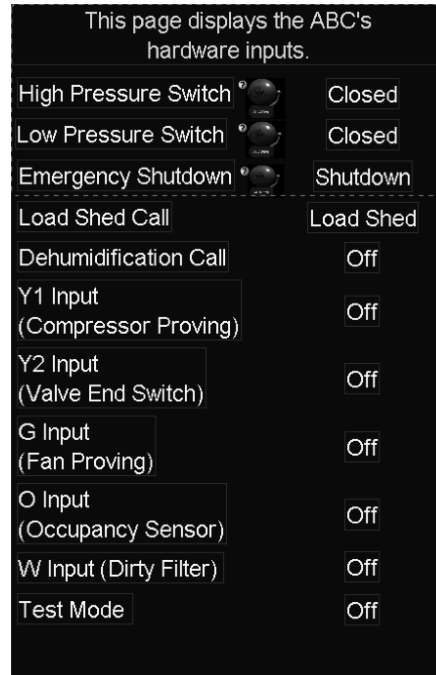
1. Test Mode Counter: Displays the countdown timer for test mode.
2. Random Start Timer: Displays the random start countdown timer.
3. *Slw Open Water Valve Setting: Allows for the adjustment of the slow opening water valve timer.
4. Slw Open Water Valve Counter: Displays the countdown timer for the slow open water valve (Acc1) output.
5. *Blower Off Delay Setting: Allows for the adjustment of the blower off delay. This will not be needed unless the unit has been configured for cycled fan operation.
6. Blower Off Delay Counter: Displays the countdown timer for the blower off delay.
7. Low Speed Comp Min Run Time: Displays the countdown timer for the minimum run time of the low stage compressor call.
8. Anti-Short Cycle Delay Timer: Displays the anti-short cycle timer for the compressor.



Aurora Touch Interface UPC (ATU) cont.

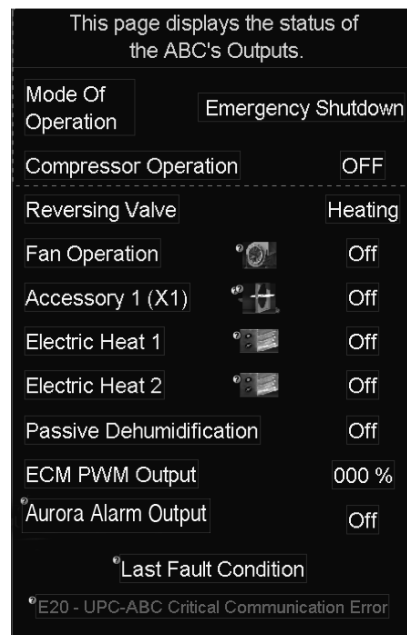
Aurora Base Controller Inputs

1. High Pressure Switch: Shows the current status of the high pressure switch input.
2. Low Press Switch: Shows the current status of the low pressure switch input.
3. Emergency Shutdown: Displays the current status of the emergency shutdown input. If the input is closed the unit will be disabled.
4. Load Shed Call: Displays the current status of the load shed input. Load shed will disable the compressor operation until the command is removed.
5. Dehumidification Call: Displays the status of a dehumidification hardware input.
6. Y1 Input (Compressor Proving): Displays the status of the Y1 hardware input that is used as a compressor proving input when a current switch is installed on one leg of the compressor wiring. The Y1 input has no effect on compressor operation when the UPC is communicating with the ABC.
7. Y2 Input (Valve End Switch): Displays the status of the Y2 hardware input that is used as a valve end switch proving input when a valve is installed. The Y2 input has no effect on compressor operation when the UPC is communicating with the ABC.
8. G Input (Fan Proving): Displays the status of G hardware input that is used as a fan proving input when a current switch is installed on one leg of the blower wiring. The G input has not effect on the blower or the compressor when the UPC is communicating with the ABC.
9. O Input (Occupancy Sensor): Displays the status of the O hardware input that is used as an occupancy sensing input. The O input has no effect on the units operation when the UPC is communicating with the ABC.
10. W Input (Dirty Filter): Displays the status of the W hardware input that can be used as a dirty filter proving input. The input requires a differential pressure switch be wired into the W input. The W input has no effect on the unit's operation when the UPC is communicating with the ABC.
11. Test Mode: Displays the status of the SW1 hardware switch that is used to put the ABC into test mode.



Aurora Base Controller Outputs

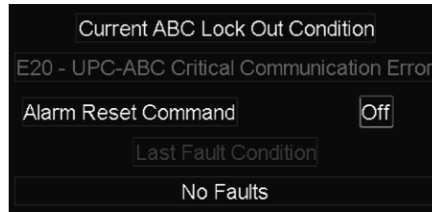
1. Compressor Operation: Displays the operating capacity of the compressor.
2. Reversing Valve: Displays the position of the reversing valve.
3. Fan Operation: Displays the status of the fan output.
4. Accessory 1 (X1): Displays the status of the 24V X1 output, this output can be configured to operate in four different modes. Refer to the dipswitch override page to determine the selected mode of operation for this output.
5. Electric Heat 1: Displays the status of the EH-1 output. The default setting is for EH-1 to be controlled by the UPC's P.I.D. Loop, however it can be configured to be controlled by the network if desired.
6. Electric Heat 2: Displays the status of the EH-2 output. The default setting is for EH-2 to be network controlled, however it can be configured to be controlled by the UPC's P.I.D. Loop if desired.
7. Dehumidification: Displays the status of the Dehumidification output.
8. ECM PWM Output: Displays the current operating blower speed as a percentage 0-99%
9. Aurora Alarm Output: Displays the current status of the ABC's Alarm output. If this output is actively keeping the unit from operating, it will display "Lock-Out".
10. Lock-Out Status: Displays the alarm condition that is preventing the unit from operating



Aurora Touch UPC (ATU) Software cont.

ABC Alarms

1. Current ABC Alarm: Displays any lock-out alarm that is preventing the unit from operating.
2. *Alarm Reset Command: Allows for a lock-out alarm to be reset once the issue that created the alarm has been resolved. To reset the alarm, command this point to ON and then back OFF using either the Aurora Touch UPC or the BAS.
3. Last Fault Condition: Displays the last fault condition present on the ABC. By touching the "Last Fault Condition" text you will be taken to the "Last Lock out" page which displays the inputs and outputs at the time of the last lock-out. A "fault" does not prevent the unit from operating but a "Lock-out" will suspend compressor operation.



ABC Adjustable Parameters

1. *Dehumidification Operation: Allows for passive dehumidification or reheat to enabled/disabled. The UPC's default setting is enabled. Passive dehumidification is accomplished by slowing the fan speed down by 5, 10 or 15%. Refer to the Fan Settings page (FN+0) to set the CFM reduction amount.
2. *EH-1 Control Selector: Allows for the EH-1 output to be configured for either Aux heat or Network controlled operation. By default the EH-1 output is pre-configured for Aux Heat operation.
3. *EH-2 Control Selector: Allows for the EH-2 output to be configured for either Aux heat or Network controlled operation. By default the EH-2 output is pre-configured for Network.



ABC Dip Switch Settings

This page should be used very cautiously and a record of the before and after values should be kept. These switch settings can also be changed using the BAS. To determine if there has been a network override or a UPC override of the physical dip switches, refer to the second line on this ATU screen.

Note 1 - ◊=Factory Set Switch

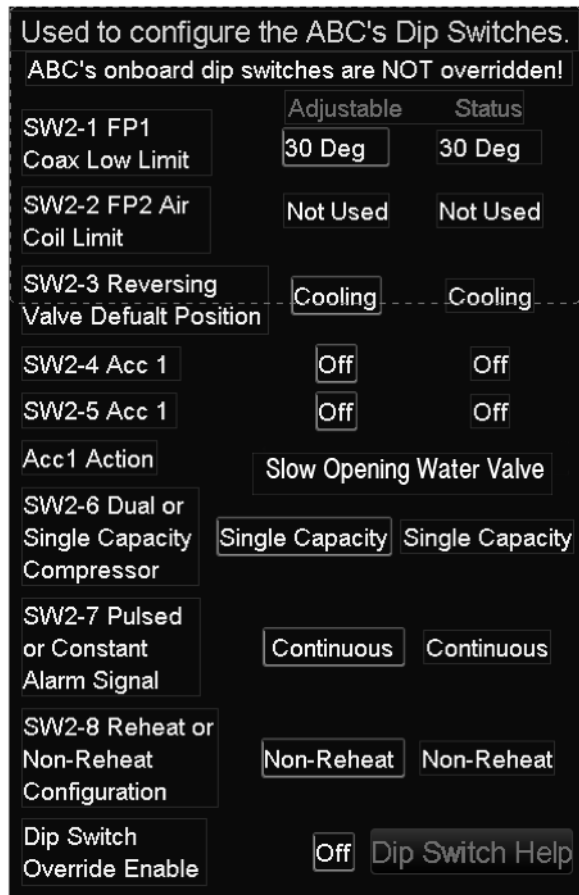
Note 2 - *=Adjustable Thru Aurora Touch

Command-able Points:

1. *SW2-1: Used to configure the freeze detection setpoint for either 30°F or 15°F.
2. SW2-2: This switch is not used.
3. ◊*SW2-3: Used to configure the reversing valve input on the ABC for either an "O" or "B" call.
4. *SW2-4: Used along with SW2-5 to configure the ACC-1 action.
5. *SW2-5: Used along with SW2-4 to configure the ACC-1 action.
6. Acc1 Action: Displays one of three possible configuration settings for the SW2-4 & SW2-5 switch settings. Refer to the table on page 35 for more information.
7. ◊*SW2-6: Used to configure the compressor output.
8. *SW2-7: Used to configure the alarm output for a pulsed or constant signal.
9. ◊*SW2-8: Used to configure ABC's alarm/reheat output.
10. *Dip Switch Override Enable: This point is used to enable the dip switch override; this point must be set to "on" to allow for the commands to happen.

Help page: Connects the user to a page that explains the steps required to make adjustments to the ABC Dipswitches.

Override Release: This point should only be used if you are directed by tech support.



Aurora Touch UPC (ATU) Software cont.

Status Points

1. SW2-1: Displays the current value of the freeze detection setpoint.
2. SW2-2: This switch is not used.
3. SW2-3: Displays the default position of the reversing valve.
4. SW2-4: Displays the switch setting for the Acc1 action. Refer to Dipswitch override table above for help with settings.
5. SW2-5: Displays the switch setting for the Acc1 action. Refer to Dipswitch override table above for help with settings.
6. ACC1 Action: Displays the configuration of SW2-4 & SW2-5.
7. SW2-6: Displays the switch setting for the compressor type, either a single stage or dual stage compressor. This will be set by the factory and should not be changed.
8. SW2-7: Displays the switch setting for the alarm output. A Pulsed setting will provide an audible sound that can be used to count the alarm code.
9. SW2-8: Displays the switch position that determines if the unit has reheat or not. This will be set by the factory and should not be changed.

Help Page: Connects the user to a page that explains the steps required to make adjustments to the ABC Dipswitches.

Override Release: This point should only be used if you are directed to by the Commercial Tech Support group.

ABC's onboard dip switches are overridden!

The Dip Switch Override page should be used very cautiously and a record of the before and after values should be logged by the technician. These switch settings can also be changed using the BAS. If the unit can be accessed easily any changes to the switches should be made on the ABC board, if the unit is not accessible then using the Equipment Touch Screen or the BAS is acceptable. Follow steps outlined below to make edits to the dip switches. Please note that any changes will not be applied until the last step has been finished.

1. Select the switches that you want to change, touch the text box next to the switch name and in the pop-up window chose the desired setting.
2. After you have finished making the desired changes, scroll to the bottom of the Dip Switch Override screen and set the "Dip Switch Override Enable" to On.
3. It will take a couple of seconds for the commands to reach the ABC, but the switch status will change to the previously selected value.

Override Release
 Off

ABC Dip Switch Override Command-able Points

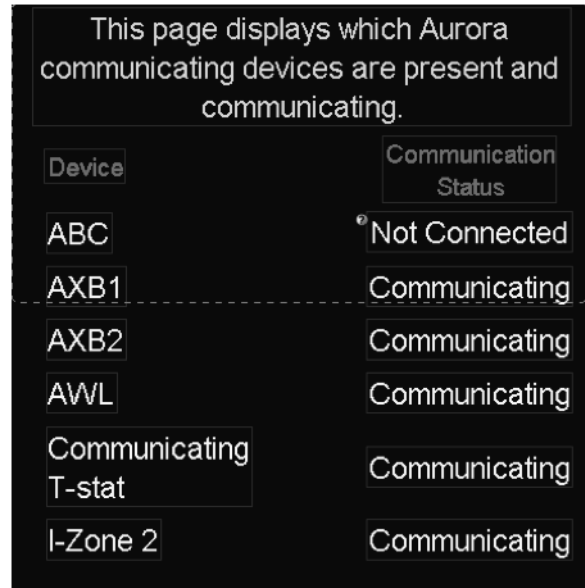
Aurora Dip Switch Override									
Switch #	Point Address	Point Name (Read/ Write)	Brief Descriptions						
1	BV-11	sw2_1_c	Selects FP1 freeze detection set point. {Inactive=15°, Active=30°}						
2	BV-12	sw2_2_c	Do not change						
3	BV-13	sw2_3_c	Do not change						
4	BV-14	sw2_4_c	Switch Position	ON	ACC 1 On w/Fan	Off	Acc 1 On w/Compr	On	Compressor Call Energizes Acc 1 For Slow Opening Water Valve with 90 Second Delay
5	BV-15	sw2_5_c		ON		Off		Off	
6	BV-16	sw2_6_c	Selects dual or single stage compressor. {Inactive=Dual stage, Active=Single stage}						
7	BV-17	sw2_7_c	Selects continuous or pulsed alarm relay action. {Inactive=Pulsed, Active=Continuous}						
8	BV-18	sw2_8_c	Selects reheat or non-reheat operation. {Inactive= Reheat, Active=Non-reheat}						

Aurora Touch UPC (ATU) Software cont.

ABC Communication settings

This page displays the status of devices that could be connected to the ABC; all devices except the ABC will be set to disabled by default unless they are actively communicating. If the ABC has a E19-Critical Comm Alarm, and any of the devices other than the ABC show "comm lost" they have been enabled using the Aurora AID tool and will need to be removed using that tool. The ATU does not have provisions for removing the communicating devices

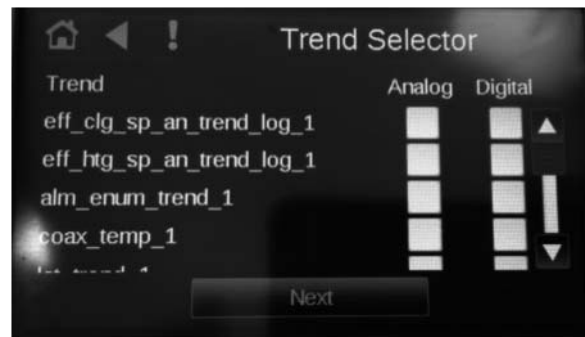
1. ABC: Displays the communication status of the ABC to the UPC, if the status shows "Not Connected", verify that the wiring between the UPC and the ABC is correct.
2. AXB1: Displays the communication status of the AXB to the ABC, if the AXB is present and communicating it will display "Communicating".
3. AXB2: Displays the communicating status of the AXB2 to the ABC, If the AXB2 is present and communicating it will display "Communicating".
4. AWL: Displays the communicating status of the AWL if present.
5. Communicating T-stat: Displays the communicating status of a Communicating t-stat with the ABC. This should always read "Disabled", the UPC does not support the Communicating T-Stat.
6. I-Zone 2: Displays the communicating status of the IntelliZone 2. This should always display "Disabled", the UPC does not support the IZ2



Trend Data

Trends can be configured in the UPC for the following points and will display on the ATU. Be careful not to select too many trends to display at a time as the screen can become hard to read.

1. Effective Cooling Setpoint: Select analog to display this trend properly, and then set the time frame.
2. Effective Heating Setpoint: Select analog to display this trend properly, and then set the time frame.
3. Alarms Enumerated: Select analog to display this trend properly, and then set the time frame.
4. Coax Temp: Select analog to display this trend properly, and then set the time frame.
5. LAT Temp: Select analog to properly display, then set the time frame.
6. Mode of Operation: Select analog to display this trend properly, and then set the time frame. There are 13 possible modes of operation that can be displayed. Refer to table ? to cross reference the trend data against



Aurora Touch UPC (ATU) Software cont.

Modes of Operation Table

1 = Standby
2 = Fan Only
3 = Cooling Stage 1
4 = Cooling Stage 2
5 = Hot Gas Reheat
6 = Heating Stage 1
7 = Heating Stage 2
8 = Emergency Heat
9 = Auxiliary Heat
10 = Emergency Shutdown
11 = Load Shed
12 = Unit In Lock Out
13 = Test Mode



UPC Configuration

The UPC Configuration page provides links to several pages that allow for the UPC's internal settings to be changed. Caution should be exercised when making changes within these pages, as improper configuration may result in undesired unit operation.

1. Module Status: only displayed if logged in as the admin.
2. Schedule
3. Setup

Module Status

This page links you to several other pages that are used to display information about the UPC.

Device Data: Displays the following

1. Device Instance
2. When the controller was last downloaded
3. Version of Software
4. Date and time of download
5. Number of Programs within the UPC

System Errors: Displays any system errors

Hardware: Displays the following

1. Core Board Hardware
 - a. Type
 - b. Date of Manufacture
 - c. Serial Number of UPC Controller
 - d. Ram
2. Base Board Hardware
 - a. Type
 - b. Date of Manufacture
 - c. Serial Number of UPC Controller

Driver Data: Displays the Version of Driver loaded into the UPC.

Warnings: Displays any UPC warnings that may be active.

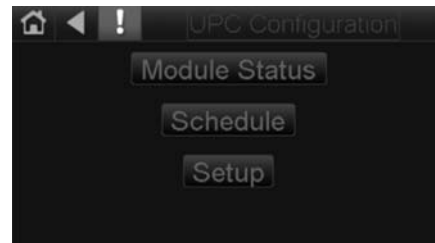
Database: Displays the following.

1. Database Size
2. Flash Storage Size
3. Module Communications

Reset Counters: Displays the counters that have been reset over the life of the controller.

Information: Displays various messages associated with UPC configuration changes.

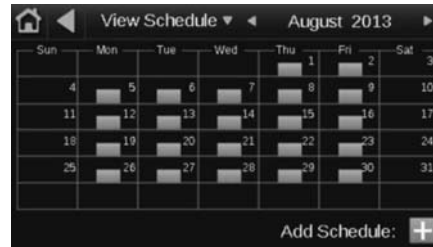
Network: Displays nothing, only used for devices that are communicating over BACnet /IP.



Aurora Touch UPC (ATU) Software cont.

Schedule

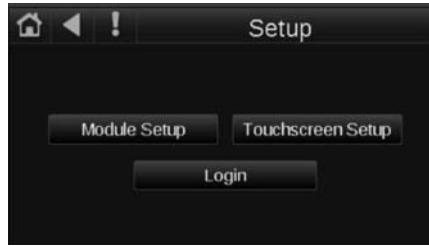
1. This page allows for the "Internal" Schedule to be edited within the UPC. BV-54 must be set to "Internal" for the schedule to affect the WSHP's operation.



Setup

This page links you to two more pages that are used to setup the UPC.

1. Module Setup
2. Touchscreen Setup



Module Setup

This page allows for the configuration of various UPC settings. The IP and Router Screens are not used.

1. Set Time and Date: Used to set the time and date if needed.
2. Communication: Used to configure and display the BACnet device instance number, Auto Generate, Max Master, Max Info Frames.
3. Time Master: Used to set the UPC Time sync and the interval.



Touch Screen Setup

1. About: Information pertaining to the Aurora Touch
2. Key Click: Allows for the Click to be turned "On" or "OFF"
3. Reload Firmware: Should only be used if directed by Tech Service
4. Passwords: Used to change the passwords for the User and the Administrator. These are preset to the following:
User= 5667
Admin= wfittech
5. Inactivity Timeout: Used to set the amount of time before the screen reverts back to the standby screen.
6. Clean Screen: Used to allow for the screen to be cleaned while connected and powered.
7. Alarm Sound: Allows for the alarm tone to be turned "ON" or "OFF".
8. Language: Used to select language displayed in the touch, we currently only offer English.
9. Calibrate Touch Panel: Allows for the user to calibrate the touch screen.



Aurora Touch UPC (ATU) Software cont.

Network Commands

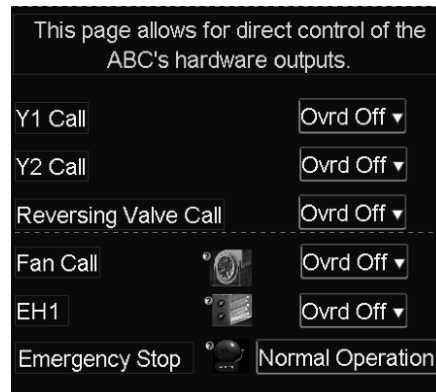
1. Y1 Command: Displays the network Y1 compressor command.
2. Y2 Command: Displays the network Y2 compressor command.
3. G Command: Displays the network G blower command. If the UPC has a valid zone temperature the blower will operate continuously unless changed using the Aurora Touch Interface or the BAS.
4. O Command: Displays the network command for the reversing valve.
5. W Command: Displays the network W command for the first stage of electric heat.
6. EH-1: Displays the network command for the EH-1 output.
7. EH-2: Displays the network command for the EH-2 output.
8. Dehumidification: If the unit has Hot Gas Reheat, a dehumidification call will enable the reheat mode if there is no need for space conditioning. If there is a call for cooling and dehumidification at the same time the unit will operate in the cooling mode and the blower motor will be slowed down by the amount that is selected on the Fan Settings page, under CFM Reduction. Reducing the blower CFM's will promote better passive dehumidification.
9. Emergency Stop: Used to put the unit into shutdown, this will disable unit operation until the command is removed.
10. Load Shed: Used to halt compressor operation, the compressor will remain off until this call is removed.
11. Occupancy Mode: Displays the network command for occupancy.



T-Stat Overrides

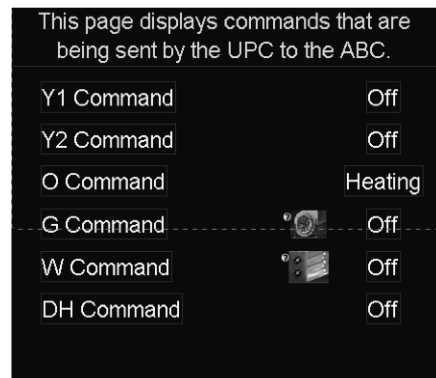
This page allows for the Aurora Touch Interface user to command and control the unit by overriding the commands being sent by the UPC. Make sure to set these points back to "Auto" to prevent undesired unit operation.

1. *Y1 Call: Used to command on/off the first stage compressor operation.
2. *Y2 Call: Used to command on/off second stage compressor operation.
3. *Reversing Valve Call: Used to command on/off the reversing valve.
4. *Fan Call: Used to enable/disable fan operation.
5. *EH1: Used to command on/off the electric heat output on ABC. This command will only work when there is no valid space temperature.
6. *Emergency Stop: Used to disable unit operation. Must be left is Auto for proper unit operation.



UPC Control Outputs

1. *Y1 Cmd: Will display the status of the command being sent by the UPC Controller.
2. *Y2 Cmd: Will display the status of the command being sent by the UPC Controller.
3. *O Cmd: Will display the status of the command being sent by the UPC Controller.
4. *G Cmd: Will display the status of the command being sent by the UPC Controller.
5. *W Cmd: Will display the status of the command being sent by the UPC Controller.
6. *DH Cmd: Will display the status of the command being sent by the UPC Controller.



Aurora Touch UPC (ATU) Software cont.

Login

This page allows for the ATU user to enter a password to display hidden screens that may help with unit diagnostics. Please contact the Tech Service Group for help with login in @ 1-800-257-5667



Last Lock Out

This page is used to display a snap shot of the ABC's active inputs and active outputs at the time the last lock out occurred. This may help to determine what happened when the unit locks out. One has to keep in mind that the type of lock out will greatly effect what is seen on the screen. If you are having issues troubleshooting a unit please contact tech support for help.

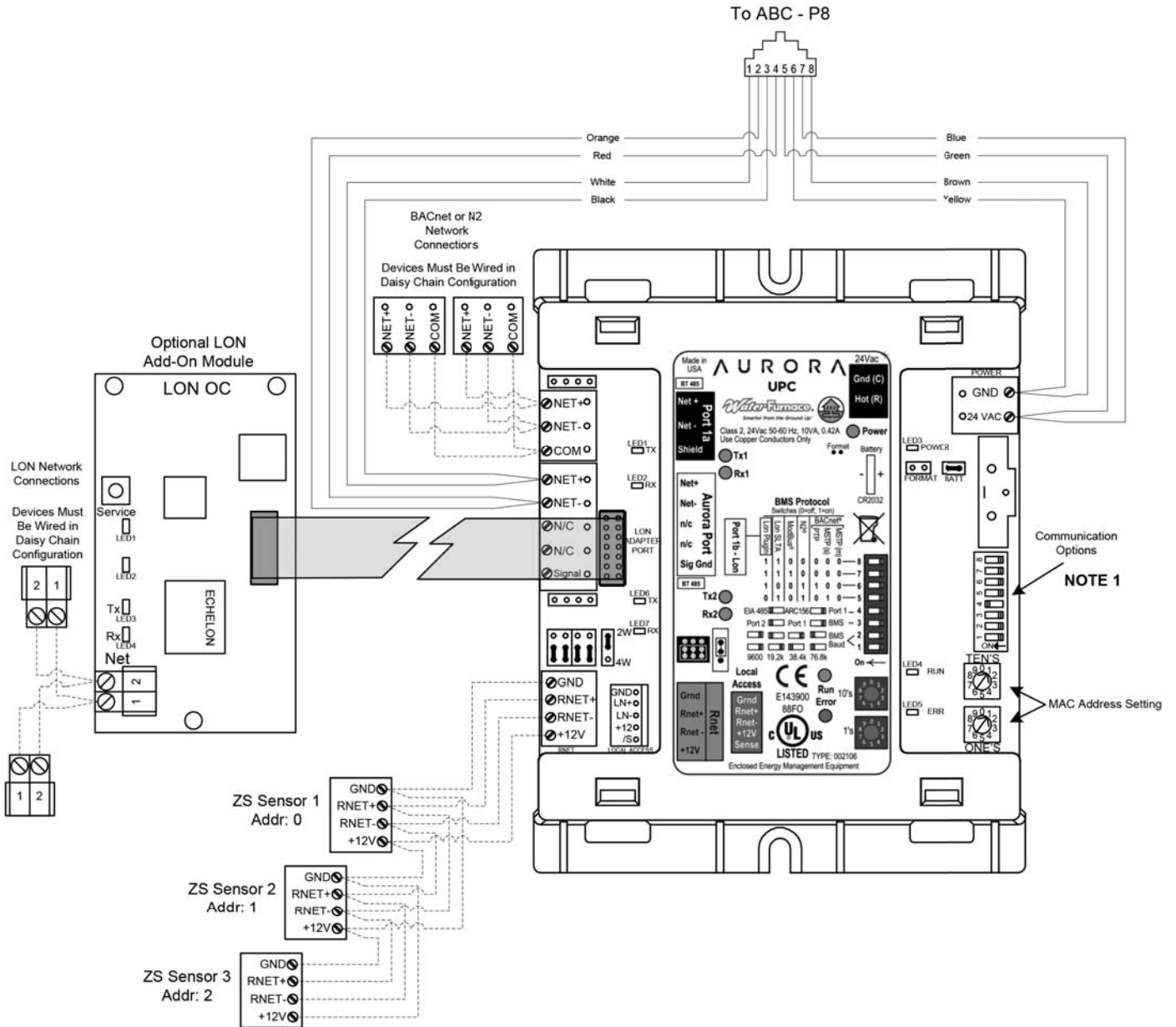


Aurora Touch UPC (ATU) Software cont.

Aurora with UPC Alarms Table

Aurora Base Controller with UPC		LED Flash Code	Alarm Values Enumerated on AV-44 to the BAS	Alarm Values Enumerated on MSV-8 to the BAS	Lockout	Reset
UPC With ABC & AXB Basic Faults	Normal - No Faults	Off	1	1	-	-
	E1 – Input Fault	1	2	2	No	Auto
	E2 - High Pressure	2	3	3	Yes	Hard or Soft
	E3 - Low Pressure	3	4	4	Yes	Hard or Soft
	E4 – Not Used	4	5	5	Yes	Hard or Soft
	E5 - Freeze Detection FP1	5	6	6	Yes	Hard or Soft
	E6 - Loss Of Charge	6	7	7	Yes	Hard or Soft
	E7 - Condensate Overflow	7	8	8	Yes	Hard or Soft
	E8 - Over/Under Voltage	8	9	9	No**	Auto
	E9 - Airflow Monitoring- Future	9	10	10	Future	Future
	E10 - Compressor Monitoring	10	11	11	Yes	Hard or Soft
	E11 - FP1 Snsr Error	11	12	12	Yes	Hard or Soft
	E12 - Refrigeration Monitoring- Future	12	13	13	Future	Future
	E13 - Non Critical AXB Sensor Error- Future	13	14	14	Future	Future
	E14 - Critical AXB Sensor Error- Future	14	15	15	Future	Future
	E15 - Hot Water Limit	15	16	16	No	Auto
	E16 - VarSpdPump	16	17	17	No	Auto
	E17 - Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
	E18 - Non-CritComErr	18	19	19	No	Auto
	E19 - UPC Loss of Comm to ABC	19	20	20	Yes	Auto
E30 - Zone Sensor Loss of Comm	N/A	30	N/A	Yes	Auto	

Wiring Schematic



ZS Sensor Information

Zone Sensors can be wired in daisy chain as shown or in a star or hybrid configuration. Maximum of 5 sensors per UPC. Maximum allowable load 210mA. See the UPC install manual for possible sensor combinations.

DIP Switch Value	Value
1	1
2	2
4	4
8	8

Each ZS sensor must have a unique address, but the addresses do not need to be sequential. Use the DIP switches on the back of the ZS sensor to set an address from 0 to 4. (0 is the factory default.) Each DIP switch has the value shown in the figure to the left. Turn on as many DIP switches as you need so that their total value equals the address.

Notes

1. Use DIP Switches 5 – 8 to change communication protocol and DIP switches 1 – 2 to change BACnet baud rate

Legend

— Factory Low Voltage Wiring
 - - - Field Low Voltage Wiring

RJ45 Connector

Aurora UPC Sequence of Operation

Power Up

When power is applied to the water source heat pump unit, the UPC processor will begin to communicate to and evaluate the condition of the Aurora; the Aurora will generate a random start timer at this time. Once the random start timer has expired the Aurora will determine if the internal safeties are made and communicate any faults to the UPC. If there is a fault the UPC will send an alarm enumeration to the BAS that can be cross referenced against the alarm table that is located with the points list.

Initialization

If there are no faults preventing compressor operation, the UPC will examine the occupancy input and determine if there is a Rnet zone sensor connected to the UPC controller. If the occupancy status is determined to be occupied the UPC will issue a command to the Aurora to start the fan. The fan is set to continuous operation when occupied by default. If the occupancy input is deemed unoccupied, the controller will operate the fan in a cycled fashion such that it will be off if the unoccupied heating and unoccupied cooling set points are not violated by the space temperature.

Temperature Control

The UPC uses the occupancy input status to determine which set points (Occupied or Unoccupied) it should control the unit from. The effective heating and the effective cooling set points will reflect the occupancy input status along with any influence from the zone sensor's warm/cool adjustment. The amount of influence the zone sensors warm/cool adjusts has on the effective set points can be adjusted over the BAS using the "Rem Setpoint Span" point. By default the zone sensors warm/cool adjust is set for 5°F up and 5°F down. The warm/cool adjustment is adjustable over the network and is only active when the unit is in the "occupied" mode or the "temporary occupancy" mode. In the occupied mode the UPC will operate on the occupied heating and occupied cooling set points. These points are displayed as "Effective Heating" and "Effective Cooling" set points over the network. If the zone temperature has violated either of the effective set points, the UPC will determine what mode of operation is needed and communicate a call for the compressor (Y1), and if cooling is needed the reversing valve (O) as well, the Aurora will initiate a compressor start delay timer, and this will also energize the accessory output with 24Vac. The start delay timer is used to delay the start of the compressor once a Y1 call is issued to the Aurora, this delay is to allow for a field connected device such as an isolation valve to open or a loop pump to turn on. When the compressor start delay timer has expired, the compressor contactor will be energized.

Occupant Override

Rnet zone temperature sensors that incorporate an occupancy override button will temporarily override the network established unoccupied status for a period of 120 minutes. When the "Temp Occ" button is pressed the UPC will report the occupancy status as "Temp OCC" over the network point "effective occupancy". Once the temporary occupancy timer expires the unit will return to the

unoccupied mode of operation until the override button is pressed again. The network point "T O Timer" will report the countdown timer for temporary occupancy override.

Reversing Valve

The position of the reversing valve is determined by the zone temperature's relationship to the Active Set point. If the reversing valve is energized (cooling mode) it will remain in this position until the space temperature drops below the Effective Heating Set Point. If the reversing valve is not energized (heating mode) it will stay there until the space temperature rises above the Effective Cooling Set Point.

Accessory 1 Output

The accessory 1 output can be configured one of 4 ways, refer to the Aurora Install Guide for configuration set-ups.

Access Relay Operation	SW2-4	SW2-5
Cycle with Blower	ON	ON
Cycle with Compressor	OFF	OFF
Water Valve Slow Opening	ON	OFF
Cycle with Comm. T-stat Hum Cmd*	OFF	ON

*Not available with Aurora UPC

Compressor

The UPC uses a predefined algorithm to determine which mode of the operation to run the heat pump to maintain the desired space temperature. If the space temperature violates either of the effective set points the UPC will issue a command to the ABC to energize the compressor and the reversing valve if deemed necessary. Depending on the configuration of the accessory 1 output, the compressor may have a 90 second delay after receiving the run command (Y1).

Fan Operation

By default the WSHP fan will operate continuously while in the occupied mode, the fan can be set to operate in the cycled mode of operation as well. This means it will only operate when there is a call for space conditioning. In the unoccupied mode the fan will operate in the cycled mode only.

There are three fan options available:

1. ECM Motor : Electrically Commutated Motor
2. PSC Motor : Permanent-Split Capacitor Motor
3. Five-Speed ECM Motor(X13) : Constant Torque Motor

ECM Blower Motor

The ECM blower motor is controlled using a Pulse Width Modulating (PWM) signal. The ECM motor can operate at 4 different speed selections that correspond to the thermostatic inputs of the UPC. These speeds are as follows: Fan Only, Y1 Compressor Call, Y2 Compressor Call, Aux Heat (W) Call, they can all be different or be set the same. ECM blower motor speeds can be adjusted using one of 2 methods listed below.

Aurora UPC Sequence of Operation cont.

ECM blower speed adjustment:

1. Using a Aurora Touch UPC connected to the unit, adjust the fan speeds in the “Settings -> Fan Settings” menu.
2. Using the BAS, select the desired fan speeds over the network.
3. In the occupied mode the UPC will run the fan in a continuous (factory default selection) fashion at the lowest speed selected until there is a Y1 call, it will then ramp up the ECM to the desired speed and maintain that speed until the call is either satisfied or the Y2 call is received. If the Y2 call is received it will ramp up the ECM to the desired speed and maintain that speed until the call is either satisfied or a W call is received. If the W call is received the ECM will ramp-up to the AUX fan speed until the call is satisfied. The AUX fan speed has a minimum CFM requirement hard coded into the ABC so that the fan meets the CFM requirement of the electric heat package.

Note: The WSHP can be configured with a single or dual capacity compressor. The ECM Motor operates in the same manner in either configuration.

PSC Blower Motor

The PSC Blower is controlled by ABC and is energized off of the “F” terminal. Fan speed adjustment has to be done manually by moving the wire on the blower motor speed taps.

Five-Speed ECM

The Five-Speed ECM or X13 is controlled using the ABC outputs for Fan (F), Stage 1 Compressor (CC), Stage 2 Compressor (CC2), and Electric Heat (EH1). The ABC outputs can control any of the 5 available speeds and are selected manually by moving the wire on the blower motor speed taps.

Dehumidification

Non-Reheat

Upon a call for dehumidification the UPC will energize the DH input on the ABC, if there is no call for cooling the dehumidification call will be ignored. Once a call for cooling is present and the DH input is made the unit will begin to operate in the passive dehumidification mode. When the passive dehumidification mode is enabled the fan is slowed down by -15% airflow. This change in airflow allows for more latent cooling to take place. Passive dehumidification is a process of slowing down the ECM fan to enable more moisture removal from the conditioned space. Please refer to the Aurora Manual for more information regarding passive dehumidification.

Reheat

Upon a call for dehumidification the UPC will energize the DH input on the ABC, if there is no call for space conditioning the ABC will begin the process of enabling the fan, the compressor and the reheat valve. If the space is in need of cooling the unit will begin to operate in the passive dehumidification mode until the space temperature is satisfied. If no call for space conditioning is present the unit will begin to operate in the Reheat mode. If a call for heating is present at the same time as a call for dehumidification, the DH call will be ignored until the space temperature is satisfied. Once the space temperature is satisfied the unit will begin to operate in the reheat mode. Please refer to the Aurora Manual for more information regarding how reheat works.

Additional Features

Alarm Reset

In the event of a manual reset lockout, the UPC will enumerate the alarm fault code over the network msv, or av point “Lockout Enumerated”. This point can be cross referenced against the alarms table located in the points list to provide a description of the alarm. Once the issue that created the alarm is resolved the alarm condition can be reset by either cycling power to the unit or by commanding the “Alarm Reset” point to a value of 2(on) then back to a 1(off). This point can be found in the Aurora Touch Interface or commanded over the network. The “Alarm Reset Point” is located on the “Alarms” page of the Aurora Touch Interface or on the BAS network. Sending a command to turn the point ON and then back OFF will reset the alarm if the condition that created the alarm has been cleared. Some alarms cannot be reset over the network but are auto reset once the condition is cleared, those alarms may include the loss of communication alarm or a under/over voltage alarm. The loss of communication may indicate that the UPC and the ABC are not communicating; the under/over voltage alarm is created whenever the ABC’s voltage has been outside the 18-30VAC range for more than 15 minutes. These alarms will auto reset once the condition creating the alarm is repaired.

Emergency Shutdown

The network point “Emergency Shutdown” can be used to command the unit into the shutdown mode if there is a condition that warrants this, and will disable all unit functions immediately. There is also a hardwired input on the Aurora that can be used to disable the unit. Refer to the Aurora install guide for help wiring the shutdown input.

Load Shed

The load shed input is used to disable the compressor while allowing normal fan operation. Load shed input can be used to disable the compressor call, it will allow for the fan to continue operating normally until the command is removed. Please refer to the Aurora Manual for more information regarding load shed.

Scheduling and Occupancy Commands

When trying to send occupancy commands to the Aurora-UPC there may be several steps required to actually take control of the unit's occupancy. By default the control is programmed to operate in the occupied mode when there is a valid space temperature on the AV-1 (zone_temp_an) input. The UPC has an internal schedule pre-programmed into the controller, refer to Internal Schedule table below for details. If the internal schedule does not meet the specific needs of the installation, the scheduled can either be changed using either the Aurora Touch Interface or by sending the occupancy commands from the BAS. For the BAS to have total control of the unit's occupancy, control contractors need to pay close attention to the several points that effect how the control responds to the commands being sent. To enable the UPC to respond to commands for scheduling sent by the BAS, BV-54 (schedule_selector_c) must be set to Active (External) or a value of 2. Once this point has been set to external, commands sent to MSV-1 will result in an occupancy mode change that can be seen on either AV-43 or MSV-10. There are two points that can be used to command the unit's occupancy. By default the program is set to respond to commands sent to MSV-1 (occ_man_cmd_c), if you desire to send the command to AV-42 (occ_man_cmd_ana_c) instead of MSV-1, you must first change BV-50 (occ_cmd_av_msv_select_c) to Active (AV). The effective occupancy can be read on either AV-43 (eff_occ_an) or MSV-10 (effect_occup_st).

If AV-1 (zone temp) has a valid space temperature and that measured space temperature has violated one of the effective heating or cooling set points. The UPC will then issue a command to the Aurora to start the compressor. Depending on the configuration of the Aurora's onboard dip switches, there may be a 90 second delay before the compressor starts. Dip switches 4 & 5 on the ABC are used to configure how the accessory 1 output will operate. There are 4 different configurations possible (refer to Dip Switch Override Page for details). During the delay the ACC-1 output maybe energized with 24Vac to allow for a pump to start or a valve to open, and then the compressor will start if all internal safeties are made.

Schedule Control

The Aurora UPC has an internal schedule that will allow the heat pump to operate on its own if it has a valid space temperature. The schedule can be edited using the Aurora Touch Interface please refer to page 32 for details on how to navigate through the Aurora Touch Interface screens. See the table below for details on the pre-programmed schedule.

Occupancy Control

When a Building Automation System is used to issue the occupancy commands to the Aurora UPC one must command BV-54 to Active(External). Then the BAS will be able to issue occupancy commands over the network.

AV-42		Read/Write
occ_man_cmd_ana_c		
Value	1	Occupied
	2	Unoccupied
	3	Temp Occ
	4	Standby

MSV-1		Read/Write
occ_man_cmd_c		
Value	1	Occupied
	2	Unoccupied
	3	Temp Occ
	4	Standby

AV-43 & MSV-10		Read Only
eff_occ_an		
Value	1	Occupied
	2	Unoccupied
	3	Temp Occ
	4	Standby

MSV-11 and AV-48				
mode_st and mode_st_an				
Values	1	Standby	8	Emergency Heat
	2	Fan Only	9	Auxiliary Heat
	3	Cool Stage 1	10	Operational Lockout
	4	Cool Stage 2	11	Load Shed
	5	Hot Gas Reheat	12	Unit in Lock Out
	6	Heat Stage 1	13	Test Mode
	7	Heat Stage 2		

Internal Schedule	Occupied Times	Unoccupied Times
Sunday	Unscheduled	Unscheduled
Monday	7:30am-5pm	5pm-7:30am
Tuesday	7:30am-5pm	5pm-7:30am
Wednesday	7:30am-5pm	5pm-7:30am
Thursday	7:30am-5pm	5pm-7:30am
Friday	7:30am-5pm	5pm-7:30am
Saturday	Unscheduled	Unscheduled

Notes

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