



Operation and Maintenance

OM 732-5

Group: **Controls**

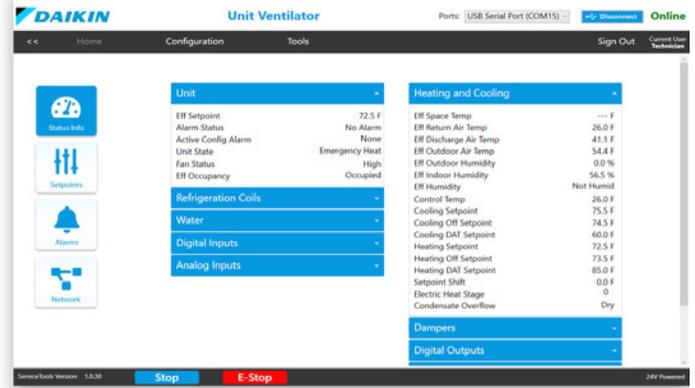
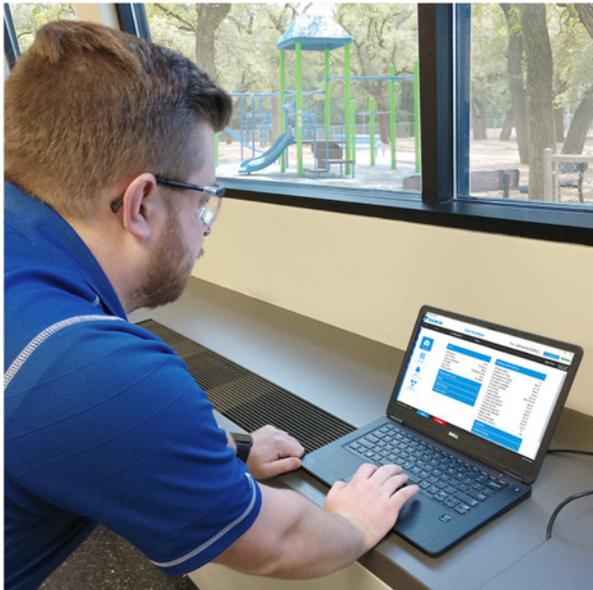
Part Number: **OM 732**

Date: **August 2020**

ATS ServiceTools Software

Connect, Download, and Troubleshoot MicroTech® Unit Controllers

- **SmartSource® DOAS Water Source Heat Pumps**
- **Unit Ventilators**



General Information	3	Scheduling	41
Hazardous Information Messages	3	Occupancy Schedule	41
Limited Warranty	3	Holiday Schedule	42
Trademark Notices	3	Set Clock	43
Revision History	3	Set Clock and Daylight Savings Time	43
Reference Documents	3	Download and Import	44
Overview	4	Configuration File Import/Export	44
Capabilities	4	Application File Download	45
Requirements	4	Diagnostics	47
Installation	6	Inputs (Offsets)	56
Installation and Setup	6	PID Loop Settings	57
Using ServiceTools	9	PID Settings	57
Getting Started with ATS ServiceTools	9	Overview of PID Loop Control	58
Unit Status	9	Network Settings	61
Status Info	10	Network Communication Inputs	61
Setpoints	18	Manual Override	64
Network	28	Troubleshooting	66
Configuration	30	Troubleshooting and Support	66
Alarms	39	USB Connection Errors	66
Tools	40	Confirm Power	66
Using Tools	40	FTDI Conflicts	66
		Network Issues	66
		Unit Controller LED Activity	66
		Technical Support	66

Hazardous Information Messages

⚠ CAUTION
 Cautions indicate a potentially hazardous situation which can result in a minor injury and property damage if not avoided.

⚠ WARNING
 Warnings indicate potentially hazardous situations which can result in injury, death, and property damage if not avoided.

⚠ WARNING
 Warning indicates potentially hazardous situations for PVC (Polyvinyl Chloride) and CPVC Chlorinated Polyvinyl Chloride) piping in chilled water systems. In the event the pipe is exposed to POE (Polyester) oil used in the refrigerant system, the pipe can be chemically damaged and pipe failure can occur.

⚠ DANGER
 Dangers indicate a hazardous electrical situation which will result in death or serious injury if not avoided.

ℹ NOTICE
 Notices give important information concerning a process, procedure, special handling or equipment attributes.

Limited Warranty

Consult your local Daikin Applied Representative for warranty details. To find your local Daikin Applied Representative, go to www.DaikinApplied.com.

Trademark Notices

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Revision History

OM 732-3	Apr 2019	Initial release for the "MicroTech" version of the UV controller. Refreshed user interface and functionality
OM 732-4	Sept 2019	Updated cover image, Fig 13-16, 19, 27, 49 with new data table descriptions. Added aux heat, emergency shutdown, entering water temp and others. Added note to clarify DIs 5-8 are dry contacts and 24VAC input must be avoided. Added Software Compatibility Matrix on p.1, removed CO2 and Reset Volts AI options from Table 10
OM 732-5	Aug 2020	Major changes to document to support new v2.0 ServiceTools desktop interface and addition of DOAS WSHP application

Reference Documents

Number	Company	Title	Source
IM 1286	Daikin Applied	MicroTech Unit Ventilator Unit Controller Installation Manual	www.daikinapplied.com
OM 1280		MicroTech Unit Ventilator Unit Controller Operation Manual	
ED 19110		MicroTech UV Unit Controller Integration Guide	
ED 19118		MicroTech DOAS WSHP Integration Guide	
		MicroTech DOAS WSHP Unit Controller Installation Manual	
OM 1308		MicroTech Controls for Daikin SmartSource DOAS Water Source Heat Pump	
ANSI/ASHRAE 135-2008	BACnet International	BACnet A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org

Overview

Daikin's ATS ServiceTools is a free, multi-purpose desktop application for use with MicroTech® Unit Ventilator (UV) and SmartSource® DOAS Water Source Heat Pump (DOAS WSHP) applied products. ServiceTools software is intended for service technicians or installing contractors who are performing unit startup and configuration, network addressing and diagnostics. The ServiceTools application is a convenient way to view and make changes when a laptop is available.

Capabilities

- View dashboard of current unit settings
- Adjust operational parameters and setpoints
- Modify unit controller setup and configuration
- Download and update unit controller software
- Configure the software for specific unit hardware options
- Set up the unit for network communications
- Capture and save trending data to SD card

Requirements

Hardware

- Laptop with Microsoft Windows® 7 or newer operating system
- **USB v2.0 Type A Male to Type A Male** cable equivalent (Figure 1). A compatible USB cable can be ordered from the Daikin Parts and Aftermarket. Call 800-377-2787 and request PN 910295895. A USB cable ships with each DOAS WSHP sales order, but not for UVs.

Do not use a data transfer or cross-over cable

- MicroTech unit controller baseboard with either UV or DOAS application software loaded
- SD Card (optional for saving downloaded application files and/or trending data)

Figure 1: Correct USB Type A Male to Male Connector



The cable shown is C&E model #CNE20650

Software

- Standard web browser for accessing ServiceTools software from Daikin Applied's public website.
- The most recent version of MicroTech software application loaded on unit controller.

Refer to Table 1 and Table 2 to see the interaction of ServiceTools software with unit controller firmware, local LUI keypad display, bootloader application, and optional LonWorks software.

Software Compatibility Matrix for UV and DOAS WSHPs

Table 1: Unit Ventilator - Software Compatibility

		UV Application				
		v1.01	v1.02	v1.03		
ServiceTools	v1.xx	Yes	Yes ¹	No		
	v2.00	No	No	Yes		
LUI Keypad Display Firmware	v1.00	No	Yes	Yes		
	v1.01	No	Yes	Yes		
	v1.02	No	Yes	Yes		
Bootloader	v1.01	Yes	Yes	Yes		
LonWorks	v1.00	No	No	Yes		

¹UV application v1.02 is compatible with ServiceTools v1.2.1 but not v1.1.4.

Table 2: DOAS WSHP - Software Compatibility

		DOAS WSHP Application					
		v1.00					
ServiceTools	v1.xx	No					
	v2.00	Yes					
LUI Keypad Display Firmware	v1.00	No					
	v1.01	No					
	v1.02	Yes					
Bootloader	v1.01	Yes					

Figure 2: Using the ServiceTools Interface (UV Status Info Screen Shown when Signed in as a Technician)

Click on a tab label to move to another screen

Click here to sign in or change user type

Displays the current user access level

Click these buttons to access sub-menu screens. The active sub-menu is blue

Click on arrow to expand or contract menu item

Press the blue Stop button to properly shut down the unit. Pressing the E-Stop button causes an immediate unit shutdown. Doing so generates an Emergency Shutdown alarm. E-Stop should only be used after first consulting Daikin Applied ATS Technical Response (TRC).

Scroll bar appears here when a menu is expanded. Drag the bar to view more of the window when expanding multiple menu items

ATS ServiceTools

Unit Ventilator

Ports: USB Serial Port (COM5) Disconnect Online

Sign Out Current User Technician

Home Configuration Tools

Status Info

Setpoints

Alarms

Network

Unit	
Eff Setpoint	61.0 F
Alarm Status	No Alarm
Active Config Alarm	None
Unit State	Off
Fan Status	Off
Eff Occupancy	Unoccupied

Heating and Cooling	
Eff Space Temp	73.2 F
Eff Return Air Temp	64.2 F
Eff Discharge Air Temp	75.0 F
Eff Outdoor Air Temp	78.1 F
Eff Outdoor Humidity	32.3 %
Eff Indoor Humidity	13.5 %
Eff Humidity	Not Humid
Control Temp	64.2 F
Cooling Setpoint	82.0 F
Cooling Off Setpoint	81.0 F
Cooling DAT Setpoint	60.0 F
Heating Setpoint	61.0 F
Heating Off Setpoint	62.0 F
Heating DAT Setpoint	85.0 F
Setpoint Shift	0.0 F
Electric Heat Stage	0
Condensate Overflow	Dry

Refrigeration Coils

Water

Digital Inputs

Analog Inputs

Dampers

Digital Outputs

Analog Outputs

PWM Outputs

Application Info

ServiceTools Version 2.0.0

Stop E-Stop

44V Powered

Installation and Setup

Step 1. Download ATS ServiceTools Software

NOTE: It is important to download ServiceTools v2.0. Previous versions of the software are not supported by the controller. Refer to the software compatibility matrix table for UV (Table 1) or table for DOAS WSHP (Table 2).

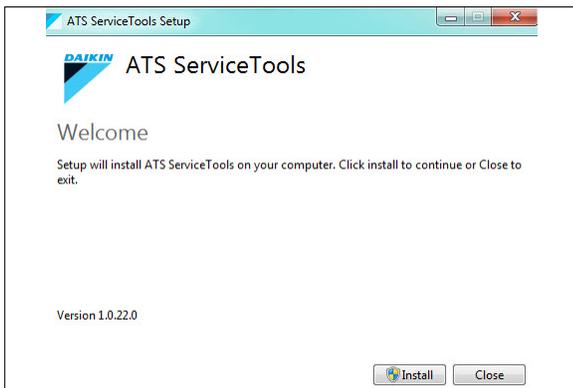
1. Launch your web browser and navigate to the Daikin Applied website page: www.daikinapplied.com/resources/application-software (available from the Water Source Heat Pump and Unit Ventilator product pages).
2. Click on the “DaikinAppliedServiceTools_2.0.0.exe” installer and save the file to your hard drive.
3. Right-click on the .exe file and select “Run as administrator” to install the application.
4. When the ATS ServiceTools Setup screen appears (Figure 3), press the Install button to begin the download. This takes just a few seconds and then the “Installation Successfully Completed” screen appears. Click Close.

NOTE: The install process overwrites any previous versions of ATS ServiceTools. The Uninstall screen may appear if you are uninstalling an older version of the software through the Control Panel ► Programs and Features. Otherwise, the Uninstall screen does not appear.

Also note that ServiceTools v2.0 (and newer) only overwrites 2.x versions. It does not overwrite 1.xx versions.

An ATS ServiceTools desktop icon appears once installed. The ATS ServiceTools application can also be accessed from the Windows icon/Start/Programs menu.

Figure 3: ATS ServiceTools Setup



⚠ DANGER

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Only personnel who are knowledgeable in the operation of the equipment being controlled must perform connections and service to the unit controller.

⚠ CAUTION

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables or control modules while power is applied to the unit controller.

⚠ NOTICE

This equipment generates; uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It 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. 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 or her own expense. **Daikin Applied disclaims any liability resulting from any interference or for the correction thereof.**

Step 2. Connect Laptop to Unit Controller

1. Connect the USB “Type A Male to Type A Male” cable from your laptop to either the USB port on the MicroTech unit control board (Figure 4 and Figure 5) or the USB port located on the exterior side of the unit control panel box. The same baseboard hardware is used for UV and DOAS WSHP applications.

NOTE: The unit controller can be energized through its 24 VAC input or through its USB port (with limited power). If power has been disconnected to the unit, the controller is capable of being energized through the USB port if it is connected to another USB device capable of supplying power. When being powered through the USB port, the controller attempts to exercise the outputs based on standard sequences of operations, but it may not have adequate power for optimal control of all sequences. It is, however, still possible to read inputs, download, and configure the application when power is provided through the USB port.

Without 24 VAC power, certain alarms or errors may appear in ServiceTools such as high pressure alarms and/or invalid sensor readings.

2. Verify that the unit controller LED activity is normal (Figure 5). If not, see [Troubleshooting and Support](#) for descriptions of LED activity.

Figure 4: Connect to Your Laptop

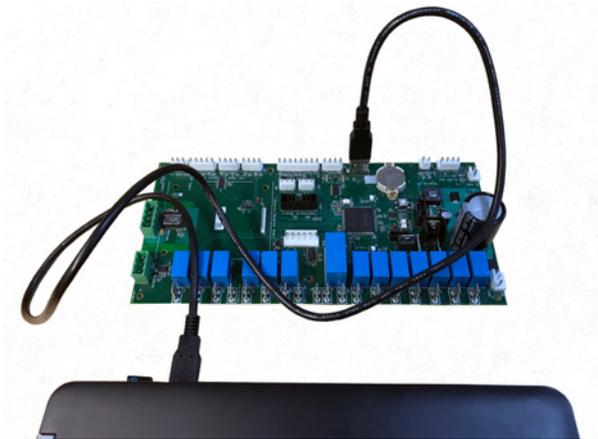
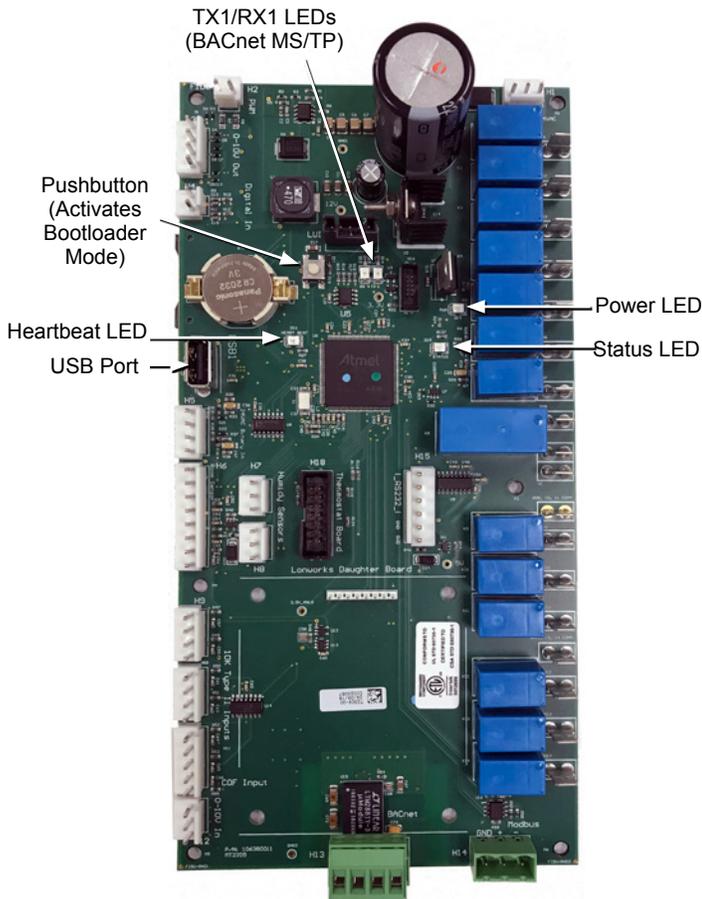


Figure 5: MicroTech Unit Controller USB Port and LED Locations

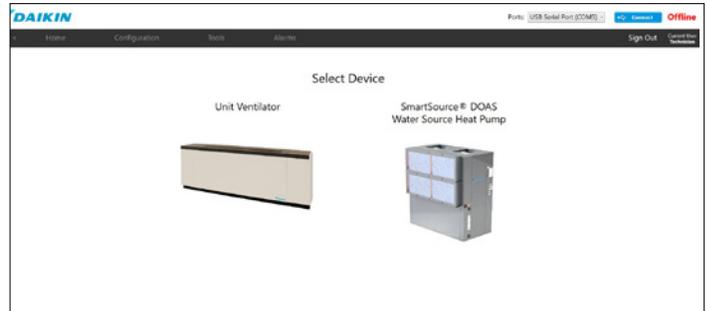


Step 3. Launch ATS ServiceTools

1. Click the ATS ServiceTools desktop icon or select from the Windows icon/Programs menu.
2. The software opens to the Select Device screen (Figure 6).

NOTE: It is possible to navigate among screens even without being connected to a unit. However, no valid data is provided without actual connection.

Figure 6: Select Device



Step 4. Sign in to ATS ServiceTools

ServiceTools automatically launches with guest (default) level access. The guest level offers the ability to view all pages but limits the amount of unit configuration possible. The two user options and passwords are described in the next section and in Table 3. To change from the default guest user:

1. Click on the Sign In link from the top, right-hand side of the navigation bar (Figure 2) and the screen shown in Figure 7 appears.
2. Select either Maintenance or Technician from the Username drop-down, depending on your user preferences.
3. Enter the password from Table 3 and click the Sign In button or press Enter from the laptop.

Contact Daikin Applied ATS Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434 for assistance with accessing or installing ATS ServiceTools.

Figure 7: User Name and Password .

The image shows a login interface with two input fields: 'Username' and 'Password'. The 'Username' field is a dropdown menu, and the 'Password' field is a standard text box. Below these fields is a blue 'Sign In' button.

Table 3: User Types and Passwords

Use the table below as a general guideline. Most of the menu items (i.e. parameters) on a given page are visible to anyone. However, the ability to make changes varies by parameter. Specific user permissions are noted in each section as applicable.

User Type	Password	Description
Guest (Default)	No password required	No login required. Guest can select a device from the Sign-In screen. Read-only access to Home menus (Status Info, Setpoints, Alarms, and Network.) No write access other than the ability to set occupancy schedules and clear active alarms.
Maintenance	Maintenance492	Read and write access to the Home menus (Status Info, Setpoints, Network, and selected Tools menus (Occupancy Schedule, Clock, Configuration Import/Export, Download and Diagnostic. Provides ability to modify unit configuration options, adjust setpoint values, download application files, and restore factory settings.
Technician	Technician385	All Maintenance level permissions. Also read and write access to Configuration screen. Allows ability to calibrate analog inputs and manually override outputs for startup and commissioning.

Getting Started with ATS ServiceTools

Once you are connected and signed in, the next step is to choose which type of unit you are accessing. Hover over and click on either the Unit Ventilator or the DOAS WSHP image from the Select Device screen (Figure 8).

ServiceTools launches to the Status Info screen (Figure 9). ServiceTools automatically detects and displays the current unit configuration options, operating modes, active alarms, and other relevant status information for the unit controller.

Access to features depend on the user permissions. If the unit controller does not have an application loaded, ServiceTools opens directly to the Download page.

NOTE: If you are connected to a unit controller (with power applied) and then launch ServiceTools, the software automatically detects the type of unit and opens directly to the Status screen.

Figure 8: Select Device (with Unit Ventilator Chosen)

The Ports menu shows the laptop USB serial port that is connected to the device and available for use with ServiceTools. This menu displays more options only if additional USB serial ports are actively connected to more than one device (Ex: laptop is direct-connected to two UVs)

Online = device is connected and active data displayed
Offline = no device connected and no active data displayed

Click the double arrows to return to the Select Device screen from any other page

The Connect status bar turns bright blue when ServiceTools detects the USB port

Press the blue Stop button to initiate a normal (recommended) unit shutdown process. Press the E-Stop button to initiate an immediate (forced) unit shutdown. Note that using E-Stop generates an Emergency Shutdown alarm. Initiating a forced shutdown should only be used after first consulting Daikin Applied ATS Technical Response

Saving Changes and Refreshing Settings

Click the Save button after making changes so they take effect. ServiceTools prompts you to save if you are switching to another screen without saving.

The Refresh button reads and displays parameters from the unit controller. This can be useful when you have made changes on any page that you do not want to use, AND HAVE NOT SAVED. If a change is made using the LUI keypad display, it does not display as live data in ServiceTools until one of two conditions are met:

1. The Refresh button is pressed

2. You navigate to another page and return to the page that shows the new setting

NOTE: *Once changes have been saved, they cannot be undone.*

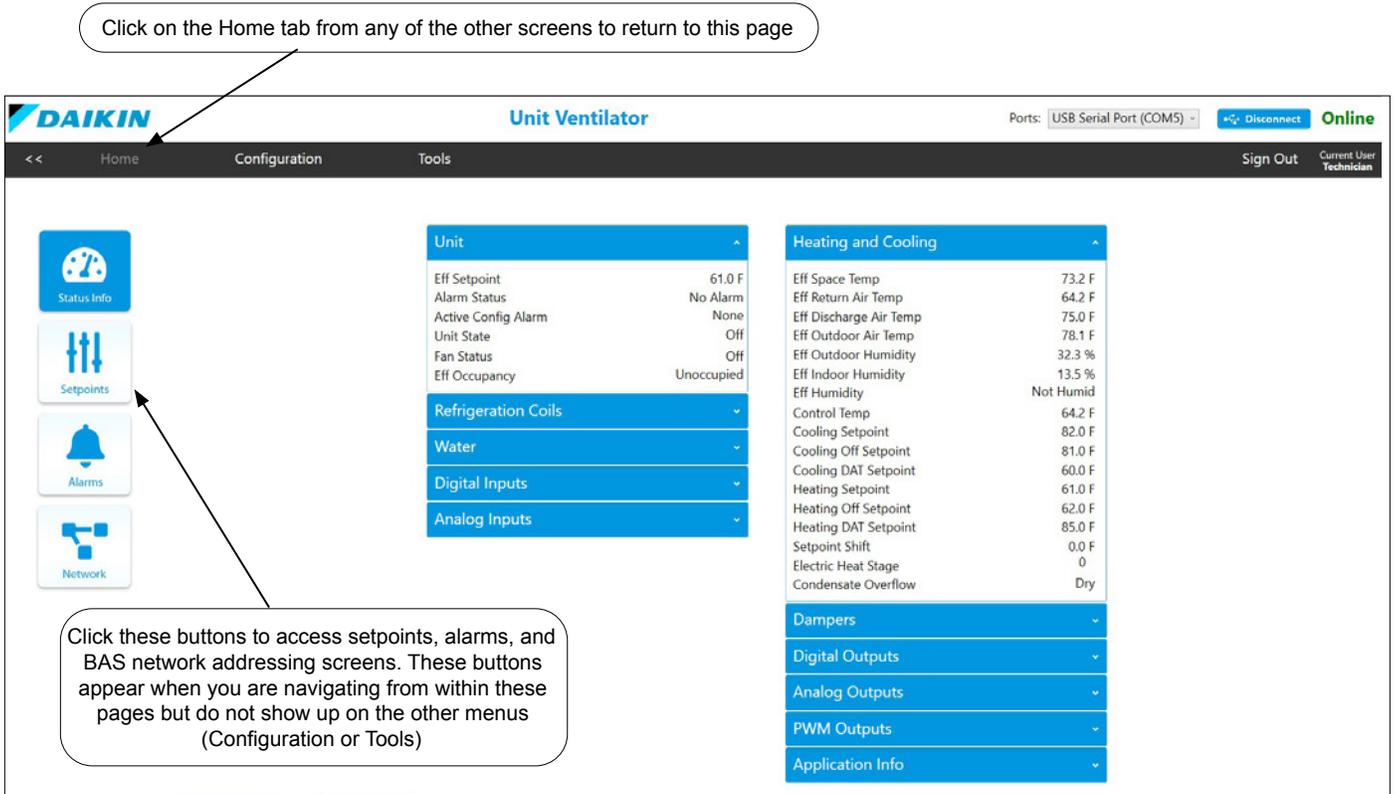
In order to protect the equipment from damage and maintain expected unit performance, verify all changes before saving and exiting ServiceTools.

Status Info

The Status screen is where all the unit parameters can be viewed (Figure 9). This is particularly useful during unit start-up. See notes below for additional reference. See Table 4 for menu item descriptions. Note that your unit configuration may not have all of the items shown here and as listed in Table 4.

The Status Info screen updates from the unit controller once per second. In other words, the information shown is in real-time and values change frequently when connected to the unit.

Figure 9: Status Info Screen



Using ServiceTools for Unit Start-Up

NOTE: Verify all unit configuration settings prior to connecting supply power.

A complete list of all unit parameters can be found in the unit controller Operation Manual (Reference Documents). The settings available in ServiceTools can also be changed from the local user interface (LUI) keypad display.

Unit Ventilator Start-Up Notes

- Before enabling compressor operation on air-source units, make sure the outdoor fan Digital Output (DO) and the correct indoor fan (DO1, DO2 or DO3) are configured and are on.
- Before testing electric heat stages 1,2 or 3, make sure the correct indoor fan (DO1, DO2, or DO3) is configured and is on. It is also recommended that compressors are turned off before electric heat is enabled.

DOAS WSHP Start-Up Notes

DOAS WSHP units ship in the unoccupied mode by default. This is done to prevent the unit from running without a certified HVAC technician on-site prior to operation. To enter the occupied mode and allow the unit to run, the occupancy command must be changed to either Auto or Occupied. This is done by changing KyOccManCmd from the LUI keypad display or by changing Occupancy Manual Command from the ServiceTools Setpoints ► Keypad Display menu (see Setpoints section).

- Confirm steady state operation refrigerant temperatures and pressures.
- Confirm relative air (DB/WB) and water temperatures shown are within 10% of measured values.

Table 4: Status Info Details

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
Unit							
Eff Setpoint	x		0	-40	212	°F	Effective / Effective DAT setpoint is the target control temperature setpoint based on the current unit mode.
Eff DAT Setpoint		x	70				
Alarm Status	x	x	No Alarm	-	-	-	If any alarms are active, the "In Alarm" status is displayed. If so, click on the Alarms button to view and then clear once the problem has been resolved.
Active Config Alarm	x		None	-	-	-	Indicates that the "Configuration Alarm Status" parameter is active. This means that multiple, or duplicate, inputs have been configured for the same functionality.
Unit State	x	x	Powerup	-	-	-	The active unit operating state, determined by current operation and temperature control conditions. Refer to the MicroTech unit controller OM for descriptions of all unit state transitions (see Reference Documents).
Fan Status	x		Off	-	-	-	The fan operation speed. Options are low, medium, high or off.
Eff Occupancy	x	x	Null	-	-	-	The unit occupancy mode (occupied, unoccupied, bypass, or standby). The effective occupancy is determined based on inputs from occupancy override, occupancy scheduler, an internal schedule, and/or an occupancy sensor.
Unit Mode		x	Auto	-	-	-	Unit mode of operation (heating, cooling, or dehumidification)
Control Mode		x	Off	-	-	-	Unit control method (off, fan-only, heat, cool, heat/cool, auto).
Refrigeration Coils							
High Pressure Status	x		Normal	-	-	-	The output provided by the compressor high pressure switch, if installed and configured correctly.
Indoor Coil Temp	x		---	-40	212	°F	Indoor coil/suction refrigerant temperature value. Displays a null value (---) if no sensor is installed or is not functioning properly.
Outdoor Coil Temp	x		---	-40	212	°F	Outdoor refrigerant coil temperature value. Displays a null value (---) if no sensor is installed or is disabled.
Water							
Hot Water Valve Position	x		0	0	100	%	The position of the modulating hot water valve.
Chilled Water Valve Position	x		0	0	100	%	The position of the modulating chilled water valve.
Eff Entering Water Temp	x	x	0	-40	212	°F	The effective entering water temperature value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Leaving Water Temp		x	0	-40	212	°F	The effective leaving water temperature value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Pump Command	x		Inactive	-	-	-	Commands the pump on or off depending on the unit mode (heating, cooling, dehumidification). Indicates when the unit is requesting flow from the main water loop. The loop pump must be running to provide adequate flow through the unit so the compressor(s) can operate safely.
Compressor							
Compressor Stage		x	0	-	-	-	The current compressor stage (0-8) being commanded by the unit controller.
Eff Suction Refrig Temp		x	0	-	-	°F	Suction refrigerant temperature value. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Suction Refrig Press		x	0	-	-	psi	Suction refrigerant pressure value. Displays a null value (---) if no sensor is installed or is not functioning properly.
Suction Saturated Temp		x	0	-	-	°F	The calculated suction refrigerant saturated temperature value.
Suction Superheat		x	0	-	-	°F	The calculated suction refrigerant superheat value.
Eff Discharge Refrig Temp		x	0	-	-	°F	Discharge refrigerant temperature value. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Discharge Refrig Press		x	0	-	-	psi	Discharge refrigerant pressure value. Displays a null value (---) if no sensor is installed or is not functioning properly.
Discharge Condensing Temp		x	0	-	-	°F	The calculated discharge refrigerant condensing temperature value.

Table 4. Status Info Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
Discharge Superheat		x	0	-	-	°F	The calculated discharge refrigerant superheat value.
Compressor 1 Run Time		x	0	-	-	hours	The accumulated compressor 1 hours of operation.
Compressor 1 Starts		x	0	-	-	-	The accumulated number of times compressor 1 has been energized.
Compressor 2 Run Time		x	0	-	-	hours	The accumulated compressor 2 hours of operation.
Compressor 2 Starts		x	0	-	-	-	The accumulated number of times compressor 2 has been energized.
Digital Inputs¹							
DI1 High Pressure	x	x	Off	-	-	-	24 VAC high pressure switch input. ² Used in conjunction with phase monitor and low pressure (DI2). See Configuration section.
DI2 Freeze Stat	x	x	Off	-	-	-	24 VAC freeze stat sensor input. See Configuration section. ²
DI3 None (Not Used)	x		-	-	-	-	Extra 24 VAC binary input available. Not used.
DI3 Phase Mon & Low Press		x	Off	-	-	-	24 VAC shared binary input for phase monitoring and low pressure. Also used in conjunction with high pressure (DI1). See Configuration section.
DI4 None (Not Used)	x		-	-	-	-	Extra 24 VAC binary input available. Not used.
DI4 Duct High Limit		x	Off	-	-	-	24 VAC binary input for the duct high limit switch, if sensor is installed and configured. This switch is normally closed. When in an open position, an alarm is indicated.
DI5 Boilerless EH	x		Off	-	-	-	Closed to ground (0 vdc) contact input. Disables compressor heat and enables boilerless electric heat if enabled.
DI5 Dirty Filter		x	Off	-	-	-	Dry contact input that indicates the dirty filter alarm is active and the filter should be replaced. Applies when the binary input, biDirtyFilter, has been configured properly.
DI6 Vent Lockout	x		Off	-	-	-	Dry contact input that indicates if the energy recovery alarm is active. Applies if energy recovery is enabled.
DI6 Energy Recovery Feedback		x	Off	-	-	-	Dry contact input that indicates if the energy recovery alarm is active. Applies if energy recovery is enabled.
DI7 Unoccupied	x	x	Off	-	-	-	Closed to ground (0 vdc) contact input. Used in conjunction with other inputs to set the unit into occupied/unoccupied modes.
DI8 Shutdown	x	x	Off	-	-	-	Closed to ground (0 vdc) contact input. Commands the unit to an emergency stop state.
Analog Inputs¹							
AI1 Room Sensor Setpoint Adjust	x		75	55	95	°F	The remote wall sensor setpoint adjustment input. It reflects the long-range sensor value using one of two methods: <ul style="list-style-type: none"> • ABS (absolute): 55° to 95°F adjustment (long range sensor) • DIFF (differential): +/-3°F adjustment
		x	-	55	95	°F	
AI2 Room Sensor System Mode	x	x	Cool	-	-	-	The unit mode input value (heat/cool/auto/off).
AI3 Room Sensor Fan Speed	x		Auto	-	-	-	The fan speed input value. If Auto is selected, the unit controller determines the fan speed. This same input is used to indicate a unit OFF command from the sensor's mode button.
AI4 Space Temp	x	x	-	-40	212	°F	The space temperature value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI5 Indoor Humidity	x		-	-0.1	100.1	%	The indoor relative humidity (RH) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI5 Suction Refrig Press		x	-	0	300	psi	The suction refrigerant pressure value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI6 Outdoor Humidity	x		-	-0.1	100.1	%	The outdoor relative humidity (RH) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI6 Discharge Refrig Press		x	-	0	750	psi	The discharge refrigerant pressure value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.

Table 4. Status Info Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
AI7 Discharge Air Temp	x	x	-	-40	212	°F	The discharge air temperature (DAT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI8 Return Air Temp	x		-	-40	212	°F	The return air temperature (RAT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI8 Discharge Refrig Temp		x	-	-40	300	°F	The discharge refrigerant coil temperature (DRT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI9 Outdoor Air Temp	x	x	-	-40	212	°F	The outdoor air temperature (OAT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI10 Entering Water Temp*	x	x	-	-40	212	°F	The entering water temperature (EWT) or outside coil temperature (OCT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly. <ul style="list-style-type: none"> • *AI10 input for UV = OCT or EWT • AI10 input for DOAS WSHP = EWT or Unused
AI11 Leaving Water Temp	x		-	-40	212	°F	The leaving water temperature (LWT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI11 Leaving Coil Temp		x	-	-40	212	°F	The leaving coil temperature (LCT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI12 Indoor Coil Temp	x		-	-40	212	°F	The indoor refrigerant coil temperature (ICT) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI12 Suction Refrig Temp		x	-	-40	212	°F	The suction refrigerant temperature (SRT) value provided by the local sensor. Displays a null value (---) if a valid input is not available.
AI13 Condensate Overflow	x	x	-	-	-	-	The status of the condensate overflow sensor (wet or dry). Displays a null value (---) if no sensor is installed or is not functioning properly.
AI14 CO2	x		-	10	2000	ppm	The CO ₂ value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
AI15 Outside Humidity		x	-	-0.1	100.1	%	The outdoor relative humidity (OAH) value provided by the local sensor. Displays a null value (---) if no sensor is installed or is not functioning properly.
Heating and Cooling							
Eff Space Temp	x	x	---	-40	212	°F	The effective space temperature input value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Return Air Temp	x		---	-40	212	°F	The effective return air temperature (RAT) input value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Discharge Air Temp	x	x	---	-40	212	°F	The effective discharge air temperature (DAT) input value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Outdoor Air Temp	x	x	---	-40	212	°F	The effective outdoor air temperature (OAT) input value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Outdoor Humidity	x	x	---	0	100	%	The effective outdoor relative humidity (OAH) input value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Indoor Humidity	x	x	---	0	100	%	The effective indoor (space) relative humidity (IAH) input value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Humidity	x		Not Humid	-	-	-	The effective humidistat value, which reflects the effective condition of the indoor/outdoor air (dry or humid) based on either a binary humidistat input or comparison of the relative humidity input to a humidity setpoint, indicating if dehumidification is required.

Table 4. Status Info Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
Control Temp	x		-	-40	212	°F	Control Temp determines if the unit should be in heating or cooling mode. Depending on how the unit is configured, one of the installed sensors is used to set this value.
Cooling Setpoint	x		73	61	86	°F	The value used to determine when the unit should enter the cooling mode.
Cooling Off Setpoint	x		-	-	-	°F	The cooling off setpoint value used to determine when the unit should exit the cooling mode. This value is calculated using the cooling setpoint (see above) and the occupied or unoccupied differential depending on effective occupancy.
Cooling DAT Setpoint	x		60	-40	212	°F	When in cooling mode, this is the discharge air temperature target that the unit uses to determine its capacity.
Heating Setpoint	x		70	50	82	°F	The value used to determine when the unit should enter the heating mode.
Heating Off Setpoint	x		---	-	-	-	The heating off setpoint value used to determine when the unit should exit the heating mode. This value is calculated using the heating setpoint (see above) and the occupied or unoccupied differential depending on effective occupancy.
Heating DAT Setpoint	x		85	-40	212	°F	When in heating mode, this is the discharge air temperature target that the unit uses to determine its capacity.
Setpoint Shift	x		0	-5	5	°F	Reflects incremental setpoint shifts made to the effective space temperature based on the local room sensor or BAS network input. Displays a null value (---) if no sensor is installed or is not functioning properly.
Electric Heat Stage	x		0	0	3	-	Indicates the electric heat stage (1,2,3) if enabled.
Condensate Overflow	x		Dry	-	-	-	The status of the condensate overflow sensor (wet or dry). Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Leaving Coil Temp		x	---	-40	212	°F	The effective leaving coil temperature (LCT) value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Dewpoint		x	---	0	100	°F	Reflects the calculated effective dewpoint value. It is used to determine proper unit mode. The effective dewpoint is calculated using the inputs for effective outdoor air temperature, relative humidity, and elevation.
Active Setpoint		x	0	-40	212	°F	Reflects the active control setpoint used for compressor control and staging strategy. The current operating mode determines the setpoint to which the unit is controlling: <ul style="list-style-type: none"> Dehumidification = Effective LCT setpoint Cooling = Effective LCT setpoint Heating = Effective DAT setpoint
Active Setpoint Upper Bound		x	0	-40	212	°F	Reflects the calculated upper range of the temperature that results in compressor stage-up in cooling or stage-down in heating.
Active Setpoint Lower Bound		x	0	-40	212	°F	Reflects the calculated lower range of the temperature that results in compressor stage-down in cooling or stage-up in heating.
Cooling Stage Change		x	None	-	-	-	Indicates if the compressor capacity is shifting up or down to attain the desired cooling state setpoint. Displays "None" when the cooling state has been achieved and the compressors are no longer staging up or down. A true unit steady-state is achieved when both the cooling and heating setpoints have been reached, and "None" is displayed in both of these fields.
Heating Stage Change		x	None	-	-	-	Indicates if the compressor capacity is shifting up or down to attain the desired heating state setpoint. Displays "None" when the heating state has been achieved and the compressors are no longer staging up or down. A true unit steady-state is achieved when both the cooling and heating setpoints have been reached, and "None" is displayed in both of these fields.

Table 4. Status Info Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
OAT High Lockout		x	Unlocked	-	-	-	Indicates if the unit has been disabled (locked) because the outdoor air temperature exceeds the OAT high lockout setpoint range of 80 - 115 °F. Applies when the lockout functionality is enabled.
OAT Low Lockout		x	Unlocked	-	-	-	Indicates if the unit has been disabled (locked) because the outdoor air temperature is below the OAT low lockout setpoint range of -20 - 20 °F. Applies when the lockout functionality is enabled.
Dampers - UV							
OA Damper Position	x		0	0	100	%	The outdoor air damper position signal being sent to the actuator. 100% indicates full outdoor air.
OA Damper Min Position	x		0	0	100	%	Outdoor air damper minimum position. This value is determined by setpoint inputs and fan speed. The damper may be open more than this value depending on economizer availability, CO ₂ levels, or other factors.
Face & Bypass Damper Position	x		---	0	100	%	The face and bypass (FB) damper position signal being sent to the actuator. Applies when the FB control is active. A value of 0% indicates full bypass of the heating/cooling coils.
Face & Bypass Damper PI Output	x		---	0	100	%	The face and bypass (FB) damper PI loop output signal. Applies when FB damper control is active. The PI loop modulates the damper in order to maintain the control temperature when it goes above the heating setpoint or below the cooling setpoint.
Outdoor Enthalpy	x		---	0	100	BTU	Calculated outdoor enthalpy value based on the outdoor air temperature and outdoor humidity inputs. Displays a null value (---) if no sensor is installed or is not functioning properly.
Indoor Enthalpy	x		---	0	100	BTU	Calculated indoor enthalpy value based on the indoor air space temperature and indoor humidity inputs. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff CO ₂ *	x		0	0	2000	ppm	The effective space CO ₂ value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly. *Displayed under Fan menu for DOAS WSHP as Eff Space CO ₂ .
Fan - DOAS WSHP							
Fan Status		x	Off	-	-	-	The fan operation status, which is either on or off.
Fan Speed		x	0	0	100	%	Fan speed output as a percentage of total capacity.
Fan Run Time		x	-	0	300,000	hours	The total fan run time hours.
Eff Duct Static Press		x	---	0	2.1	inches	The effective duct static pressure (DSP) input value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Building Static Press		x	---	-0.25	0.25	inches	The effective building static pressure (BSP) input value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Space CO ₂		x	-	0	5000	ppm	The effective space CO ₂ input value provided by either the local sensor (including any calibration offsets) or the BAS network. Displays a null value (---) if no sensor is installed or is not functioning properly.
Eff Outside Air Flow		x	-	0	4095	CFM	The effective outdoor airflow value provided by the local sensor (including any calibration offsets). Displays a null value (---) if no sensor is installed or is not functioning properly.
Reset Min CO ₂		x	-	-	-	%	The minimum CO ₂ reset value determines the minimum fan speed.
Reset Max CO ₂		x	-	-	-	%	The maximum CO ₂ reset value determines the maximum fan speed.
Digital Outputs							
DO1 Fan Low	x		Off	75	50	%	The 24 VAC output for a PWM low fixed-speed fan. This output must be energized before the PWM signal to control the fan. Applies to applications with ECM fans controlled by a PWM signal.
DO1 Fan Out		x	Off	-	-	-	The 24 VAC output for fan control output. Determines if fan is enabled (on) or disabled (off).

Table 4. Status Info Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
DO2 Fan Med	x		Off	-	-	-	The 24 VAC output for a PWM medium fixed-speed fan. This output must be energized before the PWM signal to control the fan. Applies to applications with ECM fans controlled by a PWM signal.
DO2 Crank Case Heater		x	Off	-	-	-	24 VAC output for the compressor crank case heater. The crank case heater turns on when both compressors are de-energized. It turns off when either one of the compressors is energizes.
DO3 Fan High	x		Off	-	-	-	The 24 VAC output for a PWM high fixed-speed fan. This output must be energized before the PWM signal to control the fan. Applies to applications with ECM fans controlled by a PWM signal.
DO4 Hot Water EOC	x		Off	-	-	-	The 24 VAC output for the hot water end of cycle valve used with 4-pipe heating, 2-pipe heating and 2-pipe cooling configurations.
DO4 Reversing Valve		x	Off	-	-	-	24 VAC reversing valve output. This output moves the reversing valve into either a heating or cooling position based on the unit operating mode.
DO5 Fault Output	x	x	Off				The 24 VAC output signal used to indicate an alarm condition. The output is energized when there is a fault alarm or problem (displayed as Fault Problem) alarm. A problem alarm disables the output but does not shut down the unit. A fault alarm disables the output and forces the unit to shut down This output is reverse-acting. Refer to the Alarm Output in the Digital Output Polarity menu.
DO6 None	x		Off	-	-	-	-
DO6 Energy Recovery Enable		x	Off	-	-	-	Output indicates if energy recovery is enabled.
DO7 None	x		Off	-	-	-	-
DO7 Outside Air Damper		x	Off	-	-	-	Outside air damper status output.
DO8 None	x		Off	-	-	-	-
DO8 Pump Request/Isolation Valve		x	Off	-	-	-	Compressor pump output.
DO9 None	x		Off	-	-	-	-
DO9 Comp 1 Low		x	Off	-	-	-	Compressor 1-stage low output.
DO10 None	x		Off	-	-	-	-
DO10 Comp 1 High		x	Off	-	-	-	Compressor 1-stage high output.
DO11 None	x		Off	-	-	-	-
DO11 Comp 2 Low		x	Off	-	-	-	Compressor 2-stage low output.
DO12 None	x		Off	-	-	-	-
DO12 Comp 2 High		x	Off	-	-	-	Compressor 2-stage high output.
DO13 None	x		Off	-	-	-	-
DO13 PreHeat		x	Off	-	-	-	24 VAC output for hydronic or electric preheat. This output can be configured for preheat in order to maintain the DAT setpoint when the unit is in heating mode.
DO14 None	x		Off	-	-	-	-
Analog Outputs							
AO1 Outdoor Air Damper	x		-	0	100	%	The current position of the outdoor air damper.
AO1 Electronic Expansion Valve		x	-	0	100	%	The current position of the electronic expansion valve (EEV).
AO2 Face & Bypass Damper	x		-	0	100	%	The current position of the face and bypass (F&BP) damper.
AO2 Hot Gas Reheat Valve		x	-	0	100	%	The current position of the hot gas reheat (HGR) valve.
AO3 Chilled Water Valve	x		-	0	100	%	The current position of the chilled water valve.
AO4 Hot Water Valve	x		-	0	100	%	The current position of the hot water valve.
AO4 Preheat		x	-	0	100	%	The current output signal to a field-installed preheat device (electric or hot water.)
PWM Outputs							
PWM1 Supply Fan	x	x	-	0	100	%	PWM supply fan speed output.
PWM2 Condenser Fan	x		-	0	100	%	PWM condenser fan speed output.

Table 4. Status Info Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ^{2,3}	Minimum Value	Maximum Value	Units	Description
Application Info							
Application Version	x	x	-	-	-	-	The software application (i.e. build) version loaded on the unit controller.
Application Number	x	x	-	-	-	-	The full software part number and unit type for the application loaded on the unit controller.
Bootloader Version	x	x	-	-	-	-	The current version of the bootloader application file. The bootloader is required so that the unit controller application installs properly.
Local User Interface Version	x	x	-	-	-	-	The current version of the local user interface (LUI keypad display) application.
Lon Application Number*	x		-	-	-	-	The current version of the LONWORKS ¹ application. Applies only if optional LONWORKS communication module is installed. *Available for UV applications only. The DOAS WSHP menu displays a "Not Present" value to indicate that LONWORKS is not currently supported.

¹ Accessible from the LUI keypad display.

² If no sensor is installed, the input defaults to null value, displayed in ServiceTools as (---).

³ The default values are based on unit type selected. These are the defaults the application uses when first downloaded into a new controller.

Setpoints

The Setpoints screen is where unit parameters can be configured for your specific conditions. See Figure 10 for an overview of the available features. See Table 5 for descriptions of all menu items. Select a field and enter the desired value. Make any additional changes and then click Save. A prompt appears in the event changes have not been saved before leaving this screen. In other words, changes cannot be inadvertently lost. The cell turns red to indicate that a value

has been entered that is outside of the acceptable range for that parameter. The System Info status bar (Figure 11) is a convenient tool for quickly viewing the most relevant parameters. It can be pinned to the screen to see any changes after they have been saved. System Info settings remain pinned only on the Setpoint screen.

Figure 10: Setpoints Screen

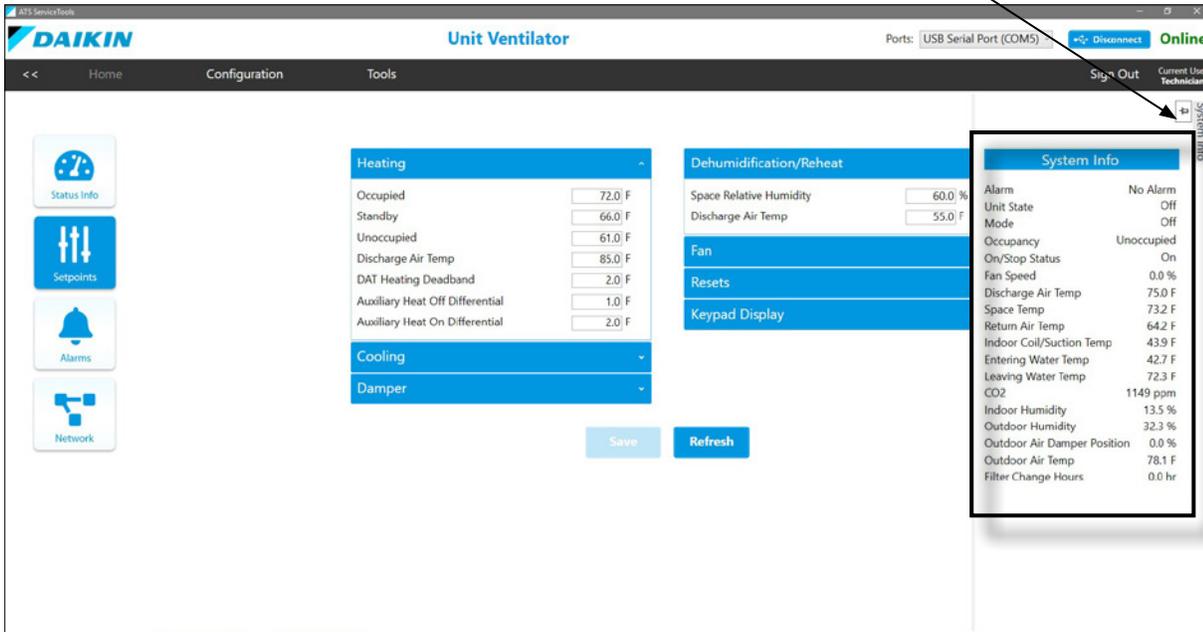
The screenshot shows the 'Unit Ventilator' configuration interface. The top navigation bar includes 'Home', 'Configuration', and 'Tools'. The main content area is divided into sections for 'Heating', 'Cooling', and 'Damper'. The 'Heating' section is expanded, showing parameters like 'Occupied' (72.0 F), 'Standby' (66.0 F), 'Unoccupied' (61.0 F), 'Discharge Air Temp' (85.0 F), 'DAT Heating Deadband' (2.0 F), 'Auxiliary Heat Off Differential' (1.0 F), and 'Auxiliary Heat On Differential' (2.0 F). The 'Cooling' section is also expanded, showing 'Space Relative Humidity' (60.0 %) and 'Discharge Air Temp' (55.0 F). Below the configuration panels are 'Save' and 'Refresh' buttons. A 'System Info' sidebar is visible on the right.

Callouts and annotations:

- Hover over each field to view min/max values
- Click System Info to expand a quick view of select unit status parameters. Note that this is not available on every page. Status is displayed only if the sensor is installed or parameter is applicable to the unit configuration
- Click here to access menu setpoints
- Press Save when finished making changes
- Press Refresh to revert back to previously unsaved values

Figure 11: System Info Quick View

Expand the System Info bar to see status of select unit status parameters. Click the pin icon and the menu remains fixed on this screen. Click the pin again and the menu minimizes.



Adjusting Setpoints

A number of the control setpoint outputs appear in other ServiceTools screens. However, the Setpoints menus are the only location where inputs can actually be adjusted and saved.

NOTE: Analog inputs commanded from the BAS network override the local sensor inputs.

If there is an error, the Save button is disabled (grayed out) and a Tool-tip appears when hovering over the Save button that states “Set Point Value Error - Modify set point or click Refresh to use previous value.” You may notice that the Effective and Setpoint values change based on the dependency among the internal setpoint calculations. However, they are prevented from exceeding their allowable ranges.

Because sensor types vary, not all of the options shown on this page may be supported.

DOAS WSHP units ship in the unoccupied mode by default. This is done to prevent the unit from running without a certified HVAC technician on-site prior to operation. To enter the occupied mode and allow the unit to run, the occupancy command must be changed to either Auto or Occupied. This is done by changing KyOccManCmd from the LUI keypad display or by changing Occupancy Manual Command from this page.

Table 5: Setpoint Details

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Unit - DOAS WSHP							
Compressor Startup Delay		x	0	0	60	seconds	After controller power-up, this is the amount of time that is added to the compressor minimum off time before the compressor is allowed to run. If this value is left at the default of 0, the controller generates a random value between 0 and 60 seconds.
Remote Setpoint Adjust		x	Differential	-	-	-	The room temperature setpoint value, which can be either: <ul style="list-style-type: none"> Absolute (ABS): fixed range of 55° - 95°F. Also referred to as long-range sensor Differential (DIFF): shift setpoint values up or down by 5°. Also referred to as short-range sensor Note that the UV room sensor setpoint adjust can be changed from Absolute to Differential via the Configuration → Miscellaneous Setpoints page.
Min State Transition Time		x	3	1	5	minutes	The minimum amount of time that the unit must remain in a given state before a stage change can occur.
Local Bypass Time		x	120	0	480	minutes	Sets the period of time the unit is allowed to continue operating when the tenant override button is pressed during an unoccupied period. Applies to units with an optional wall-mounted room temperature sensor with timed override button.
Heating - UV							
Occupied	x		70	50	82	°F	Mode-dependent setpoint inputs for each occupancy state.
Standby	x		66	50	82	°F	
Unoccupied	x		61	50	82	°F	
Discharge Air Temp	x		85	-40	212	°F	Discharge air temperature (DAT) heating setpoint. In the heating mode, the controller uses the controller, electric heat or hot water valve to maintain this setpoint.
DAT Heating Deadband	x		2	1	5	°F	Discharge air temperature heating deadband. This value sets the range (deadband) around the DAT setpoint. Within this deadband, the controller only enables heating if the DAT < DAT Heating - ½ DAT db.
Auxiliary Heat Off Differential	x		1	1	10	°F	Auxiliary heating is activated when the control temperature < Effective Heating Setpoint - AuxHtOnDiff, and when all other heating is at 100%.
Auxiliary Heat On Differential	x		2	1	10	°F	Auxiliary heating is deactivated when the control temperature > Effective Heating Setpoint - AuxHtOnDiff + AuxHtOffDiff.
Cooling - UV							
Occupied	x		73	61	86	°F	Mode-dependent setpoint inputs for each occupancy state.
Standby	x		77	61	86	°F	
Unoccupied	x		82	61	86	°F	
Discharge Air Temp	x		60	-40	212	°F	Discharge air temperature (DAT) cooling setpoint. In the cooling mode, the controller uses the controller, chilled water valve, and economizer to maintain this setpoint.
DAT Cooling Deadband	x		2	1	5	°F	Discharge air temperature cooling deadband. This value sets the range (deadband) around the DAT setpoint. Within this deadband, the controller only enables cooling if the DAT > DAT Cooling + ½ DAT db.

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Heating and Cooling - DOAS WSHP							
Desired cooling setpoints vary depending on cooling strategy (economy vs precision cooling). The MicroTech DOAS WSHP Operation and Installation Manuals (Reference Documents) provide additional information.							
OAT Cooling		x	80	65	80	°F	The outside air temperature (OAT) cooling setpoint. This value determines when the unit is in cooling mode. When in cooling mode, compressor staging is based on the leaving coil temperature (LCT).
OAT Heating		x	55	55	70	°F	The outside air temperature (OAT) heating setpoint. This value determines when the unit is in heating mode. When in heating mode, compressor staging is based on the discharge air temperature (DAT).
Dewpoint		x	65	45	75	°F	Enables the unit to enter the dewpoint mode (i.e. remove excess humidity from the air) when the dewpoint is above this setpoint.
LCT Cooling		x	70	40	80	°F	Sets the leaving coil temperature (LCT) setpoint. This value controls compressor staging when the unit is in cooling mode. Used only with economy cooling.
DAT Dehumid		x	70	40	80	°F	Sets the discharge air temperature reheat setpoint. This value controls the hot gas reheat (HGR) modulation valve when the unit is in dehumidification mode.
DAT Heating		x	70	55	80	°F	Sets the discharge air temperature (DAT) heating setpoint. This value controls compressor staging when the unit is in heating mode. Also used to modulate the electronic expansion valve (EEV) and hot gas reheat (HGR) valve to attain higher accuracy.
DAT High Limit		x	110	80	135	°F	Sets the discharge air temperature (DAT) maximum setpoint. An alarm is generated when the DAT is above this setpoint. This value initiates compressor stage-down. Compressors shut off at stage 0 (when the unit reaches the DAT low limit setpoint).
Damper - UV							
The minimum damper values depend on the speed at which the fan is running. If the unit has an optional CO ₂ sensor installed and Space CO ₂ control is enabled, the minimum damper position is equal to the outdoor air damper minimum position regardless of fan speed.							
Outdoor Air Min Position (High/CO ₂)	x		20	0	100	%	Outdoor air damper minimum position. The minimum damper position if the supply fan is at high speed, or regardless of fan speed if there is an optional CO ₂ sensor installed and space CO ₂ control is enabled.
Outdoor Air Min Position (Med)	x		25	0	100	%	Outdoor air damper minimum position medium speed. The minimum damper position if the supply fan is at medium speed and space CO ₂ control is disabled.
Outdoor Air Min Position (Low)	x		30	0	100	%	Outdoor air damper minimum position low speed. The minimum damper position if the supply fan is at low speed and space CO ₂ control is disabled.
Outdoor Air Max Position	x		100	0	100	%	Outdoor air maximum damper position.
Space CO ₂	x		1200	0	2000	ppm	Space CO ₂ high limit setpoint. If a CO ₂ sensor is installed, and space CO ₂ control is enabled, the unit adjusts the outdoor air damper position to maintain this setpoint while never going below the OAMin Pos value.
Econ IA/OA Temp Diff	x		2	0	70	°F	Economizer outdoor/indoor air temperature differential setpoint is used when Diff Temp is selected as the Economizer Method. The OAT must be less than or equal to the space temperature minus this differential for the economizer to be available.
Outdoor Enthalpy	x		29	5	50	BTU	Economizer enthalpy setpoint. The outdoor air enthalpy setpoint used on units with an outdoor air humidity sensor and when Out Enth is selected as the Economizer Method. The calculated outdoor enthalpy must be less than or equal to this setpoint for the economizer to be available.
Econ IA/OA Enthalpy Diff	x		1	0	10	BTU	Economizer outdoor/indoor air temperature differential setpoint is used when Enthalpy Comp is selected as the Economizer Method. The outdoor enthalpy must be less than or equal to the space enthalpy minus this differential for the economizer to be available.

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
OAT Economizer Lockout	x		68	-40	80	°F	Low outdoor air temperature economizer lockout setpoint. When the outdoor air temperature drops below this setpoint, the economizer is not available.
Outdoor Air Temp Lockout Enable	x		Disable	-	-	-	Enables the outdoor air lockout function, which causes the unit to force the outdoor air damper closed when the outdoor air temperature drops below the outdoor air lockout setpoint.
Damper Low OAT Lockout	x		36	25	45	°F	Outdoor air low lockout setpoint. When OA lockout has been enabled, the outdoor air damper is forced closed and the controller cooling is disabled when the OAT drops below this setpoint. The outdoor air damper is not allowed to resume normal operation until the OAT rises above this setpoint plus a 1°F differential. Emergency override and night purge can override and open the outdoor air damper.
Compressor - DOAS WSHP							
Low Suction Line Temp		x	28 (Water)	0	50	°F	The suction refrigerant temperature (SRT) low limit setpoint value. An alarm is generated when the SRT is below this setpoint. This value reflects the water loop type that is configured for the unit (water or glycol). This setpoint should only be adjusted by a qualified technician after consulting Daikin ATS Technical Response.
			6.5 (Glycol)				
Low Suction Line Temp Diff		x	8	2	15	°F	The temperature differential value that generates an alarm when either: 1. The unit is configured for a water loop and the suction refrigerant temperature (SRT) is below the low SRT setpoint (28°F) OR 2. The unit is configured for glycol and the SRT is below the low SRT setpoint (6.5°F) This indicates that a potential freeze condition can occur. The alarm clears automatically when the suction refrigerant temperature exceeds the setpoint by 4°F. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset.
Compressor Minimum On Time		x	180	60	600	seconds	The minimum amount of time the compressor must run before it can be turned off.
Compressor Minimum Off Time		x	300	300	600	seconds	The minimum amount of time the compressor must be off before it can be started again.
Outside Air - DOAS WSHP							
OA Lockout Enable		x	Disable	-	-	-	Enables the outdoor air lockout function. When enabled, the unit forces the outdoor air damper closed when the outdoor air temperature drops below the outdoor air lockout setpoint.
OAT High Lockout		x	115	80	120	°F	Outdoor air high lockout setpoint. When OA lockout has been enabled, the outdoor air damper is forced closed and the controller cooling is disabled when the OAT rises above this setpoint. The outdoor air damper is not allowed to resume normal operation until the OAT drops below this setpoint plus a 1°F differential.
OAT Low Lockout		x	-20	-20	20	°F	Outdoor air low lockout setpoint. When OA lockout has been enabled, the outdoor air damper is forced closed and the controller cooling is disabled when the OAT drops below this setpoint. The outdoor air damper is not allowed to resume normal operation until the OAT rises above this setpoint plus a 1°F differential. Emergency override and night purge can override and open the outdoor air damper.
OAD Damper Timer to Open		x	10	1	300	sec	The amount of time that is allowed for the air damper door to open.
Water - DOAS WSHP							
Heating EWT Lockout		x	30 (Water)	10	212	°F	Disables heating when the entering water temperature drops below this setpoint. This value reflects the water loop type that is configured for the unit (water or glycol).
			15 (Glycol)	0	70		

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Dehumidification/Reheat - UV							
Space Relative Humidity	x		60	10	100	%	Indoor (space) relative humidity sensor input value. Applies to units with some form of reheat, a space relative humidity sensor is installed, and enabled, and dehumidification enabled. In this configuration, the unit enters dehumidification mode if the space relative humidity rises above this setpoint. Note that the unit prioritizes heating or cooling above dehumidification.
Discharge Air Temp	x		55	-40	212	°F	Discharge air temperature setpoint for the reheat mode. Used when no reheat reset is enabled.
Fan - UV							
Dirty Filter Alarm	x		Disable	-	-	-	Enables the filter change alarm function.
Clear Dirty Filter Alarm	x		None	-	-	-	Reset filter alarm input.
Filter Change Hours	x		700	50	2000	hours	Configures the number of fan run hours before the filter change alarm indicates that the filter needs to be replaced.
Fan - DOAS WSHP							
Reset Min CO2		x	400	0	5000	ppm	The fan is set to the minimum speed when the space CO ₂ is at or below this setpoint. Applies only to VAV units with fan speed control strategy configured for CO ₂ .
Reset Max CO2		x	2000	0	5000	ppm	The fan is set to the maximum speed when the space CO ₂ is at or above this setpoint. Applies only to VAV units with fan speed control strategy configured for CO ₂ .
Building Static Press		x	0.1	-.25	.25	inches	The effective building static pressure sensor (BSP) setpoint. Applies only to units configured for BSP fan control.
Duct Static Press		x	1	0	3	inches	The effective duct static pressure (DSP) sensor setpoint.
Reset Change Filter Alarm		x	None	-	-	-	Reset filter alarm input.
Filter Change Hours		x	700	50	2000	hours	Configures the number of fan run hours before the filter change alarm indicates that the filter needs to be replaced.
Expansion Valve - DOAS WSHP							
High SSH Limit		x	50	-	-	°F	When the calculated suction superheat value rises above this setpoint, an alarm is generated and the compressors shut down. This value is read-only.
Low SSH Limit		x	2	-	-	°F	When the calculated suction superheat value is below this setpoint, an alarm is generated and the compressors shut down. This value is read-only.
Resets - UV							
The Resets menu provides access to parameters that support reset features for indoor fan speed and discharge air temperature setpoints in reheat mode. These inputs shift the DAT setpoint up or down based on another value such as the space temperature or outside air temperature.							
Cooling DAT Reset Select	x		None	-	-	-	Selects the method used to determine the discharge air temperature reset cooling mode setpoint. Selecting anything other than None enables this functionality based on the following options: <ul style="list-style-type: none"> • Network = Value supplied by the BAS • Space = Space temperature • Return = Return temperature • OAT = Outdoor air temperature • Cntrl Df = Based on the differential between the control temperature and the effective cooling setpoint
Min Cooling DAT	x		55	40	100	°F	Sets the minimum cooling discharge air temperature allowed when unit is in cooling mode and the reset is enabled.
Max Cooling DAT	x		65	40	100	°F	Maximum cooling discharge air temperature allowed when unit is in cooling mode and the reset is enabled.
Min Cooling Control Temp	x		75	-40	212	°F	Minimum discharge air temperature control value. When the control temperature is less than or equal to Min Cooling Control Temp, the DAT Cooling value is equal to Max DAT.

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Max Cooling Control Temp	x		78	-40	212	°F	Maximum discharge air temperature control value. When the control temperature is equal to or greater than Max Cooling Control Temp, the DAT Cooling value is equal to MinDAT.
Min Cooling Differential	x		5	1	20	°F	Minimum cooling control temperature differential value. When the control temperature is less than or equal to the Effective Cooling Setpoint plus the Min Cooling Differential, the DAT cooling setpoint is equal to Min Cooling DAT.
Max Cooling Differential	x		0	0	10	°F	Maximum cooling control temperature differential value. When the control temperature is greater than or equal to the Effective Cooling Setpoint plus the Max Cooling Differential, the DAT Cooling setpoint is equal to Max Cooling DAT.
Heating DAT Reset Select	x		None	-	-	-	Selects the method used to determine the discharge air temperature reset heating mode setpoint. Selecting anything other than None enables this functionality based on the following options: <ul style="list-style-type: none"> • Network = Value supplied by the BAS • Space = Space temperature • Return = Return temperature • OAT = Outdoor air temperature • Cntrl Df = Based on the differential between the control temperature and the effective heating setpoint
Min Heating DAT	x		80	40	140	°F	Minimum heating discharge air temperature allowed when unit is in heating mode and the reset is enabled.
Max Heating DAT	x		120	40	140	°F	Maximum heating discharge air temperature allowed when unit is in heating mode and the reset is enabled.
Min Heating Control Temp	x		67	-40	212	°F	Minimum discharge air temperature control value. When the control temperature is less than or equal to MnDAT Ctrl, the DAT Heating value is equal to Min DAT.
Max Heating Control Temp	x		70	-40	212	°F	Maximum discharge air temperature control value. When the control temperature is equal to or greater than MxDAT Ctrl, the DAT Heating value is equal to Max DAT.
Min Heating Differential	x		5	1	20	°F	Minimum heating control temperature differential value. When the control temperature is less than or equal to the Effective Heating Setpoint minus the Min Heating Differential, the DAT heating setpoint is equal to Min Heating DAT.
Max Heating Differential	x		0	0	10	°F	Maximum heating control temperature differential value. When the control temperature is greater than or equal to the Effective Heating Setpoint minus the Max Heating Differential, the DAT Heating setpoint is equal to Max Heating DAT.
Reheat DAT Reset Select	x		None	-	-	-	Selects the method used to determine the discharge air temperature reset reheat mode setpoint. Selecting anything other than None enables this functionality based on the following options: <ul style="list-style-type: none"> • Network = Value supplied by the BAS • Space = Space temperature • Return = Return temperature
Min Reheat DAT	x		50	40	100	°F	Minimum discharge air temperature setpoint for Reheat mode. When DAT reheat reset is enabled, this is the DAT reheat setpoint value when the selected reheat control temperature is greater than or equal to the Max DAT Reheat Control Temp.
Max Reheat DAT	x		60	40	100	°F	Maximum discharge air temperature setpoint for Reheat mode. When DAT reheat reset is enabled, this is the DAT reheat setpoint value when the selected reheat control temperature is less than or equal to the Min DAT Reheat Control Temp.
Min Reheat Control Temp	x		70	40	100	°F	Minimum control temperature for Discharge Air Temperature Reset in Reheat mode. The DAT reheat setpoint is Max Reheat DAT when the selected reheat control temperature is less than or equal to this value. Applies when DAT reheat reset is enabled.

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Max Reheat Control Temp	x		75	40	100	°F	Maximum control temperature for Discharge Air Temperature Reset in Reheat mode. The DAT reheat setpoint is Min Reheat DAT when the selected reheat control temperature is greater than or equal to this value. Applies when DAT reheat reset is enabled.
Fan Speed Reset Select	x		Sngl DAT	-	-	-	Sets the Indoor fan speed control strategy when the fan is in Auto mode. Applies to the following options: <ul style="list-style-type: none"> • Sngl DAT (Single Zone VAV) • CO₂ • AI Input (Analog input voltage)
Min Fan Speed	x		20	10	100	%	Sets the fan speed to this value when the CO ₂ ppm reading is less than or equal to ResetMinCO2. Applies when Fan Reset Select is CO ₂ and one of the analog inputs is configured for CO ₂ .
Max Fan Speed	x		100	20	100	%	Sets the fan speed to this value when the CO ₂ ppm reading is greater than or equal to ResetMaxCO2. Applies when Fan Reset Select is CO ₂ and one of the analog inputs is configured for CO ₂ .
AI Voltage Min	x		0	0	10	volts	Sets the voltage level at which the controller commands the fan speed to the ResetMinUnits value when Fan Reset is AI_Input and one of the analog inputs is configured for Reset Volts.
AI Voltage Max	x		10	0	10	volts	Sets the voltage level at which the controller commands the fan speed to the ResetMaxUnits value when Fan Reset is AI_Input and one of the analog inputs is configured for Reset Volts.
AI Units Min	x		0	0	100	%	Sets the fan speed to which the controller commands when the reset voltage input is at the ResetMinVolts level. Applies when Fan Reset is AI_Input and one of the analog inputs is configured for Reset Volts.
AI Units Max	x		100	0	100	%	Sets the fan speed control when the reset voltage input is at the ResetMaxVolts level. Applies when Fan Reset is AI_Input and one of the analog inputs is configured for Reset Volts.
Resets - DOAS WSHP							
DAT Cooling		x	None	-	-	-	Selects the method used to determine the discharge air temperature reset cooling mode setpoint. Selecting anything other than None enables this functionality based on the following options: <ul style="list-style-type: none"> • Network = Value supplied by the BAS • Space = Space temperature • Outside Air Temp = Outside air temperature • AiReset = Field-supplied 0-10 vdc analog input
DAT Heating		x	None	-	-	-	Selects the method used to determine the discharge air temperature reset heating mode setpoint. Selecting anything other than None enables this functionality based on the following options: <ul style="list-style-type: none"> • Network = Value supplied by the BAS • Space = Space temperature • Outside Air Temp = Outside air temperature • AiReset = Field-supplied 0-10 vdc analog input
Cooling Max DAT		x	70	60	70	°F	Maximum cooling discharge air temperature allowed when unit is in cooling mode and the reset is enabled.
Cooling Min DAT		x	60	50	60	°F	Minimum cooling discharge air temperature allowed when unit is in cooling mode and the reset is enabled.
Heating Max DAT		x	70	70	90	°F	Maximum heating discharge air temperature allowed when unit is in heating mode and the reset is enabled.
Heating Min DAT		x	60	60	80	°F	Minimum heating discharge air temperature allowed when unit is in heating mode and the reset is enabled.

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Cooling Max OAT		x	90	80	100	°F	Maximum outside air temperature (OAT) cooling control value. When the OAT is equal to or greater than the Cooling Max OAT, the DAT Cooling setpoint is equal to Cooling Min DAT.
Cooling Min OAT		x	70	60	80	°F	Minimum outside air temperature (OAT) cooling control value. When the OAT is equal to or less than the Cooling Min OAT, the DAT Cooling setpoint is equal to Max Cooling DAT.
Heating Max OAT		x	60	50	70	°F	Maximum outside air temperature (OAT) heating control value. When the OAT is equal to or greater than the Heating Max OAT, the DAT Heating setpoint is equal to Heating Min DAT.
Resets - DOAS WSHP							
Heating Min OAT		x	50	30	50	°F	Minimum outside air temperature (OAT) heating control value. When the OAT is equal to or less than the Heating Min OAT, the DAT Heating setpoint is equal to Heating Max DAT.
Cooling Max Space Temp		x	75	70	80	°F	Maximum discharge air temperature (DAT) cooling control value. When the control temperature is equal to or greater than the Cooling Max Space Temp, the DAT cooling value is equal to the minimum DAT.
Cooling Min Space Temp		x	70	65	75	°F	Minimum discharge air temperature cooling control value. When the control temperature is less than or equal to the Cooling Min Space Temp, the DAT cooling value is equal to the maximum DAT.
Heating Max Space Temp		x	70	65	75	°F	Maximum discharge air temperature heating control value. When the control temperature is equal to or greater than the Heating Max Space Temp, the DAT heating value is equal to the minimum DAT.
Heating Min Space Temp		x	65	60	70	°F	Minimum discharge air temperature heating control value. When the control temperature is less than or equal to the Heating Max Space Temp, the DAT heating value is equal to the maximum DAT.
DAT Ai Cool/Heat Max		x	10	5	10	volts	Maximum discharge air temperature (DAT) cooling analog input voltage value. When the analog input voltage is equal to or greater than the DAT Ai Cool/Heat Max value, the DAT cooling/heating value is equal to the maximum DAT.
DAT Ai Cool/Heat Min		x	0	0	2	volts	Minimum discharge air temperature (DAT) cooling analog input voltage value. When the analog input voltage is equal to or less than the DAT Ai Cool/Heat Min value, the DAT cooling/heating value is equal to the minimum DAT.
DAT Cooling Source		x	0	-	-	°F	The DAT cooling control value that determines the DAT reset setpoint.
DAT Heating Source		x	0	-	-	°F	The DAT heating control value that determines the DAT reset setpoint.

Table 5: Setpoint Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Keypad Display							
The following parameters are adjustable from the LUI keypad display. They are also adjustable with ServiceTools to assist with unit start-up and troubleshooting. Press Save and then Refresh to send the new configuration to the unit controller. Once this happens, the new settings appear in the LUI, ServiceTools, and the BAS.							
System Mode Command	x	x	Auto	-	-	-	The current unit mode input value (heat, cool, fan only, etc.) Note that System Mode Command drop-down menu options vary depending on unit type (UV or DOAS WSHP).
Occupancy Manual Command	x	x	Auto	-	-	-	Occupancy override that can be set from the LUI keypad display or from a BAS network command.
Keypad Setpoint Command	x	x	Auto	-	-	-	Overrides the occupancy mode automatically set by the unit controller. Puts the unit into constant occupied, unoccupied, bypass, or standby mode until this setpoint is returned to Auto mode.
Dehumidification	x	x	Enable	-	-	-	Disables the dehumidification mode.
Energy Hold Off	x		Normal	-	-	-	Enables the unit to enter the energy hold off mode. Energy hold off prevents the unit from heating and cooling, thus allowing it to protect the space from temperature extremes. When energy hold off is enabled, heating is not provided unless the space temperature exceeds the emergency heat setpoint. With the exception of free cooling, it does not allow for cooling operation.
Manual Fan Speed	x		Auto	-	-	-	Allows you to manually set the fan speed to low, medium or high speed; also allows user to control automatically. Changes are not reset when cycling power to the controller.
Language		x	English	-	-	-	Selects the desired language to appear on the LUI keypad display menu. English is currently the only available option.
Units of Measure	x	x	Imperial	-	-	-	Changes the units of measure for temperature setpoints. Note that switching the default of Imperial (English) to SI (Metric) changes the temperature values for the affected properties in the BACnet portion of the unit controller application.

Network

The Network screen (Figure 12) is where BACnet and LONWORKS addressing parameters are configured (Table 6). Setting these basic parameters establishes communication between the unit controller and the BAS.

Changes made from ServiceTools effect any values currently being monitored and controlled by the BAS. It is recommended that the system manager is made aware of any updates to local setpoints as the new values may conflict with network configuration. Similarly, subsequent changes made from the BAS override those previously made from ServiceTools. In other words, the last value(s) written to the unit controller, regardless of where the changes were made (ServiceTools, BAS, or LUI keypad display), take precedent and replace prior settings.

NOTE: *If the controller's configuration parameters (BACnet baud rate, in particular) are not set correctly prior to BAS connection, network communication can be disrupted or lost for this and other devices residing on the same trunk.*

Additional parameters can be set from the Tools » Network I/O page with correct user access. Exercise caution when writing to or modifying displayed settings. The corresponding output may override local settings.

At this time, LONWORKS is only available for UV applications, as shown in Figure 12. BACnet is supported for both UV and DOAS WSHP units.

Figure 12: Network Screen

The screenshot shows the 'Unit Ventilator' configuration interface. At the top, it displays 'Ports: USB Serial Port (COM5)', 'Disconnect', and 'Online' status. The navigation bar includes 'Home', 'Configuration', and 'Tools'. The main content area is divided into two sections: 'BACnet' and 'LONWORKS'. The 'BACnet' section includes fields for Unit Location, Device Name (MTUC_UV_3101120), Device Instance (3101120), MAC Address (120), Max Masters (127), Max Info Frames (1), Baud Rate (38400), and Measurement Type (Imperial). The 'LONWORKS' section includes Send Heartbeat (5.0 sec), Receive Heartbeat (10.0 sec), and Minimum Timeout (30.0 sec). Below these sections are 'Save' and 'Refresh' buttons. Two callout boxes provide instructions: 'Press Save when finished making changes' and 'Press Refresh to revert back to previously unsaved values'.

Table 6: Network Details

Menu Item	Unit Ventilator	DOAS WSHP	BACnet Object Type/Instance Number	BACnet Object Name	Default Value	Range	Description
BACnet							
Unit Location	x	x	DEV:2	Location	Location	20 Characters	Text string used to describe the physical location of the unit. The location can be set through the BAS, ServiceTools software, or LUI keypad display.
Device Name	x	x	DEV:4	Object_Name	DevName	32 Characters	Text string used to define the BACnet device name. The device object name can be set from the BAS, ServiceTools software, or LUI keypad display.
Device Instance	x	x	DEV:3	Object_Identifier	3101000	0 to 4194303	Unique instance number or object-identifier assigned by integrator. The device instance number can be set from the BAS, ServiceTools software, or LUI keypad display. See BACnet MAC Address (AV:411) and BACnet Minimum Instance Number (AV:412) for the objects used to configure the Device Name. See the respective Network Protocol Information Document (Reference Documents) for details.
MAC Address ¹	x	x	AV:411	MacAddress	120	0 to 127	MS/TP Address of the device (i.e. unit controller). Each device on a BACnet MS/TP trunk must have a unique MAC Address.
MaxMasters ¹	x	x	DEV:6	Max_Master	127	2 to 127	MaxMasters should be set to the highest address of a MS/TP master on the network segment. The default value is 127 for maximum compatibility. Setting this to the highest address of the MS/TP master device on the network reduces the MS/TP token traffic and decreases the response time of the unit controller. MaxMasters can be set from the BAS, ServiceTools software, or LUI keypad display.
Max Info Frames	x	x	NA	Max_Info_Frames	1	1 to 5	Reflects the maximum number of information frames that the node (unit controller, in this case) may send before it has to pass the token. This parameter cannot be changed.
Baud Rate ¹	x	x	DEV:5	BaudRate	38400	9600 19200 38400 76800	Set the baud rate to match the speed of the BACnet network. Speeds above 38400 should be avoided unless the network wiring has been tested and verified to meet the required speed. The baud rate can be set from the BAS, ServiceTools software, or LUI keypad display.
Measurement Type	x	x	MSV:15	Units	English	Imperial (English) or SI (Metric)	English: Use English units of measure (Deg F, psi, GPM) Metric: Use metric units of measure (Deg C, kPa, liter/sec)
LONWORKS - UV Only							
Menu Item	Unit Ventilator	DOAS WSHP	Lonworks Variable Name	SNVT/UNVT (SNVT/UNVT Index)	Default Value	Range	Description
Send Heartbeat	x		nciSndHrtBt	SCPTmaxSendT (22)	0 seconds (disabled)	0 to 3276 seconds	If the network has not sent a network variable output (nvo) within this amount of time, then the network value is manually transmitted. The value of 0 disables this feature.
Receive Heartbeat	x		nciRcvHrtBt	SCPTmaxRcvTime (48)	0 seconds (disabled)	0 to 3276 seconds	If an network variable input (nvi) value has not been received within this amount of time, the present value reverts back to the network default. The value of 0 disables this feature.
Minimum Timeout	x		nciMinOutTm	SCPTminSendTime (24)	0 seconds	0 to 3276 seconds	Defines the minimum amount of time that must pass before a LONWORKS network variable output (nvo) can be sent. It limits network traffic when output network variables are frequently changing. The value of 0 disables the timer.

¹ Parameter is required for minimum network configuration. Verify this has been set correctly before connecting to the BAS.

Refer to the UV or DOAS WSHP MicroTech Unit Controller Protocol Information Document for detailed network integration information ([Reference Documents](#)). Otherwise, contact the Daikin Applied Controls Customer Support group at 866-462-7829 or Controls@daikinapplied.com.

Configuration

Use the Configuration screen (Figure 13) to verify that the software application is configured to match your unit options. You can also make any changes to the original unit configuration after initial startup or after replacing a controller board in the field.

To simplify the field-installation process, units ship from the factory configured as ordered. However, some settings are unknown at the factory and need to be defined during the setup process. Other settings require configuration due to hardware changes in the field, like replacing or adding a sensor, actuator, etc. Factory-installed unit controllers ship with the latest software application and are pre-configured to enable the hardware options selected for each unit.

The adjustable parameters (Table 7) vary depending on the permissions allowed for each user type. The Configuration screen is available for Technician-level users only.

NOTE: *Configuring multiple inputs for the same function triggers a Configuration alarm.*

CAUTION

Binary Inputs 5-8 are 0 vdc dry contacts. Do not connect an external relay or other 24 VAC device (ex. a high pressure sensor or freestat sensor) to these inputs.

Figure 13: Configuration Screen

The screenshot shows the 'Unit Ventilator' configuration interface. The top navigation bar includes 'Home', 'Configuration', 'Tools', and 'Alarms'. A warning message is displayed: 'Warning: Do not connect 24VAC to Digital Inputs 5-8'. The main area is divided into two columns of settings, each with a dropdown menu to expand. The left column includes 'Unit' settings like Compressor Type (Air Cool), Valve Type (2-Pos Heat), Pipe Configuration (2-Pipe), Face & Bypass Damper Enable (Enable), Electric Heat (0), Fan Cycling (Continuous), Split System (Non Split), Economizer Control (Diff Temp), Fan Reset (Sngl DAT), Demand Controlled Ventilation (Disable), Dehumidification (Null), Trend Rate (None), and Control Temp Source (RAT). The right column includes 'Sensor Installation' settings for Space Temp, Outdoor Air Temp, Leaving Water Temp, Condensate Overflow, Indoor Humidity, Outdoor Humidity, and Return Air, all set to 'Installed'. Below these are sections for 'Fan', 'Digital Output Polarity', and 'Optional'. At the bottom are 'Save' and 'Refresh' buttons. Two callout boxes below the screenshot provide instructions: 'Press Save when finished making changes' and 'Press Refresh to revert back to previously unsaved values'.

Table 7: Configuration Details

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ²	Description
Unit				
Compressor Type	x		None	Configures the application for the type of compressor installed on the unit. <ul style="list-style-type: none"> • None = no compressor • Air Cool = 2-stage cooling only • ASHP = 2-stage air source heat pump • WSHP = 2-stage water source heat pump
Valve Type	x		2-Pos Heat	Configures the application for the type of valve installed on the unit. <ul style="list-style-type: none"> • 2-Pos Heat = 2-position heating only • 2-Pos Cool = 2-position cooling only • 2-Pos Heat/Cool = 2-position heating and cooling changeover • Mod Heat = modulating heating only • Mod Cool = modulating cooling only • Mod Heat/Cool = modulating heating and cooling changeover
Pipe Configuration	x		2-Pipe	Sets the number of pipes for units with water valves.
Face & Bypass Damper Enable	x		Enable	Allows face and bypass damper to function.
Electric Heat	x		0	Sets the number of electric heat stages (0 or 3 only).
Fan Cycling	x		Continuous	When in the occupied mode, this determines if the fan is going to turn off or remain at low speed when there is no demand for heating or cooling.
Split System	x		Non Split	Indicates if the unit has a split condensing section.
Economizer Control	x		Diff Temp	Selects the economizer changeover configuration. <ul style="list-style-type: none"> • Diff Temp = basic indoor/outdoor temperature comparison • Out Enthalpy = advanced outdoor enthalpy monitoring • Enthalpy Comp = leading edge indoor/outdoor enthalpy comparison
Fan Reset	x		Sngl DAT	Selects the indoor air fan control strategy. Sngl DAT (single discharge air temperature) is the only option currently supported.
Demand Controlled Ventilation	x		Disable	Enables demand control ventilation mode. This mode is used to monitor CO ₂ for outdoor air damper minimum position control.
Dehumidification	x		Null	Enables the unit to enter dehumidification mode if configured properly
Trend Rate	x	x	None	Determines the rate at which trending-supported parameters are recorded. Data is captured in a .csv file type and saved to an external SD card. See the MicroTech DOAS WSHP Unit Controller OM 1308 or MicroTech UV Unit Controller OM 1280 for more information about trending. <ul style="list-style-type: none"> • None = no trend data recorded • Occupy Change = trend data recorded when unit transitions from an occupied to unoccupied mode, or vice versa • 1 Min = trend data recorded once every 60 seconds • 10 Min = trend data recorded once every 10 minutes • Hourly = trend data recorded once per hour • Daily = if not specified, trend data is recorded automatically once every 24 hours
Control Temp Source	x		RAT	Selects the control temperature source from either a space, return air sensor, or the average temperature using both sensor inputs. <ul style="list-style-type: none"> • Space = control provided by the space temperature sensor. This value defaults to the hard-wired temperature sensor input unless it is overridden by the network • RAT = control provided by the return air temperature sensor • Average = control based on the average of both the space and RAT sensor inputs
Unit Size		x	800	Selects unit size from one of these options: <ul style="list-style-type: none"> • 800 CFM • 1200 CFM • 1600 CFM • 2400 CFM Unit size is used in determining fan speed for constant-speed fan control.
Preheat		x	None	Selects the preheat method for the unit (hydronic or electric).
Loop Type		x	Water	Configures the heat pump water loop type for water or glycol.
Cooling Method		x	Economy	Configures the unit for economy cooling, precision cooling, or dehumidification. <ul style="list-style-type: none"> • Economy = cooling is controlled to meet DAT using the leaving coil temperature (LCT) setpoint • Precision = cooling is controlled using the modulating hot gas reheat valve (MHGR) to control to the DAT setpoint • Dehum = the unit is always in dehumidification mode when cooling is required
Fan - UV				
Fan On In Unocc	x		Off	Enables the fan to run while the unit is in the unoccupied mode. <ul style="list-style-type: none"> • When set to Off, the fan is not running while in unoccupied mode if the control temperature is between the unoccupied heating/cooling setpoints. • When set to On, the fan runs at low speed in unoccupied mode if the control temperature is between the unoccupied heating/cooling setpoints.

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Minimum Value	Maximum Value	Units	Description
Indoor Fan	x		3-Fix	-	-	-	Selects the indoor fan type. Options are: <ul style="list-style-type: none"> • 3-Fix = configuration uses three binary outputs to control high, medium, and low speed fan operation • ECM = for future use • PWM = configuration uses a fully variable signal to control the fan speed • PWM 3-Fix = configuration uses one of three discreet PWM signals to control low, medium, and high speed fan operation of an ECM fan
Breakpoint Low	x		5	5	100	%	The three setpoints used to establish the fan output percentage. Applies to 3-Fix and 3-FixPWM fans where control can modulate among low, medium, and high speeds.
Breakpoint Medium	x		75	5	100	%	
Breakpoint High	x		95	5	100	%	
Unit Ventilators with PWM (pulse width modulating) indoor fan types may be configured to use three PWM signals (low, medium, high) for staged fan operation with ECM efficiency.							
PWM Low	x		75	50	80	%	The % speed for a PWM low fixed-speed fan.
PWM Medium	x		90	70	90	%	The % speed for a PWM medium fixed-speed fan.
PWM High	x		100	80	100	%	The % speed for a PWM high fixed-speed fan.
Fan - DOAS WSHP							
AFCM		x	1000	0	5000	cfm	Configures the cfm setpoint used to determine the PWM (pulse width modulating) fan output for constant speed fans. Actual cubic feet per minute (ACFM) is a unit of volumetric flow. It is the actual volume of air delivery relative to the current PWM fan inlet conditions.
System Static Pressure		x	1	-0.5	5	inches	Configures the static pressure. This value is used to determine the fan speed.
Fan Extend		x	0	-15	15	%	Adjusts fan output so that CFM calculated by the application matches the measured CFM. Applies to constant-speed fans only.
Elevation		x	750	0	65535	feet	Configures the elevation (feet above sea level) of the unit's physical location. Elevation is one of the parameters used to calculate the effective dewpoint.
Fan Configuration		x	Single Torque	-	-	-	Configures the fan control strategy to one of the following fan motor and blower type selections. Applies only to constant-speed fans. <ul style="list-style-type: none"> • Single Torque = configures the fan motor type to constant torque, single blower • Single CFM = configures the fan motor type to constant CFM, single blower (for future use) • Dual Torque = configures the fan motor to constant torque, dual blower • Dual CFM = configures the fan motor to constant CFM, dual blower (for future use) These are configured at the factory and should only be changed after consulting ATS Technical Support.
Blower Type		x	Single	-	-	-	Displays the fan blower type configured for the unit.
Fan Motor Type		x	CFM	-	-	-	Displays the fan motor type configured for the unit.
Fan Control Method		x	Constant	-	-	-	Configures the fan speed control strategy to one of the following methods: <ul style="list-style-type: none"> • Constant = constant speed fan • DSP = duct static pressure* • BSP = building static pressure* • CO2 (CO₂)* • AI_Reset = external analog input voltage reset* • Network = BACnet BAS *Applies when the correct sensor is installed and functioning properly.

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Config Parameter ¹	Description
Inputs - UV¹					
<p>The following section describes all configurable analog and binary inputs available for the unit controller. The defaults shown reflect the factory-installed sensor for each input. Should you replace a sensor, change sensor type, or replace the unit controller, the input must be configured from the options provided in the drop-down menu. The appropriate sensor must be installed before configuration. If no sensor is installed, the input defaults to None. Note that sensors and inputs vary by unit type (UV or DOAS WSHP). Offsets are configurable from the LUI keypad display or ServiceTools software with valid user level access. Inputs cannot be modified by Guest users. Additionally:</p> <p>1. Configuring multiple inputs for the same function triggers a Configuration alarm. 2. It is strongly recommended that all unit hardware is verified before any changes are made on this page. 3. The high pressure safety input needs to be physically interlocked with compressor output to prevent compressor operation during high compressor conditions.</p>					
Analog In 10	x		Entering Water Temp	CfgAnIn10	10k Type II sensor input. It is factory-wired and configured for the following options: <ul style="list-style-type: none"> • None • EWT (Entering Water Temperature) (Default) • Outdoor Coil Temp • Indoor Coil Temp The following BACnet network overrides are available: <ul style="list-style-type: none"> • Entering Water Temp: EWT (AI:3) • Indoor Coil Temp: CompSuctionTemp (AI:6)
Analog In 12	x		Indoor Coil Temp	CfgAnIn12	10k Type II sensor input. It is factory-wired and configured for the following options: <ul style="list-style-type: none"> • None • Entering Water Temp • Outdoor Coil Temp • Indoor Coil Temp (Default) The following BACnet network overrides are available: <ul style="list-style-type: none"> • Entering Water Temp: EWT (AI:3) • Indoor Coil Temp: CompSuctionTemp (AI:6)
Analog In 14	x		CO2	CfgAnIn14	0-10 vdc sensor input. It is factory-wired and configured for the following options: <ul style="list-style-type: none"> • None • CO₂ (Default) • Reset Volts The following BACnet network override is available: <ul style="list-style-type: none"> • SpaceCO2 (AI:12)
With the exception of Digital Inputs 3 and 4, the UV Digital Inputs below default to the factory configuration for that input. However, any input listed in the Configuration Parameters column can be field-configured for other uses (as shown in the drop-down menu next to each input). See notes after Digital Input 8 for additional descriptions.					
When adjusting the controller's internal schedule, it is generally recommended that digital inputs are not set to Unoccupied as this may cause a conflict.					
Digital Input 1	x		High Pressure	biHighPressure	24 VAC sensor input. <ul style="list-style-type: none"> • High Pressure (required safety switch) • Disabled (if no sensor installed)
Digital Input 2	x		Freeze Stat	biFreezeStat	24 VAC sensor input. <ul style="list-style-type: none"> • Freeze Stat (if sensor installed) • None (if no sensor installed)
Digital Input 3	x		None	-	24 VAC input. Not used.
Digital Input 4	x		None	-	24 VAC input. Not used.
Digital Input 5	x		Boilerless EH	biBoilerLessEH	Closed to ground (0 vdc) dry contact input.
Digital Input 6	x		Vent Lockout	biVentLockout	Closed to ground (0 vdc) dry contact input.
Digital Input 7	x		Unoccupied	biUnoccupied	Closed to ground (0 vdc) dry contact input
Digital Input 8	x		Shutdown	biShutdown	Closed to ground (0 vdc) dry contact input.
NOTES: <ul style="list-style-type: none"> • High Pressure (biHighPressure) = The high pressure switch located on the refrigerant discharge line. The high pressure safety input may need to be interlocked with compressor outputs. • Freeze Stat (biFreezeStat) = Hydronic water coil freeze fault sensor used to protect the coil from freezing. • Damper End 1 (biDamperEnd1) = 24 VAC sensor input. Reverseable parameter. • Damper End 2 (biDamperEnd2) = 24 VAC sensor input. Reverseable parameter. • Boilerless Electric Heat (biBoilerLessEH) = When configured, it disables compressor heating when boilerless electric heat is enabled. • Vent Lockout (biVentLockout) = When configured, it forces the outdoor air damper closed when vent lockout is enabled. • Unoccupied (biUnoccupied) = Input used to configure the unit to an unoccupied mode. Used in conjunction with other inputs to set the unit into occupied/unoccupied modes. • Shutdown (biShutdown) = Commands the unit to an emergency stop state. • Dehum (biDehumid) = 24 VAC input. • Exhaust Interlock (biExhaustInterlock) = Configures the outdoor air damper minimum position when exhaust interlock is enabled. 					

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Config Parameter ³	Description
Inputs - DOAS WSHP¹					
DI 4 Polarity		x	Direct	CfgRevBI4	Closed to ground (0 vdc) dry contact input. Configures the polarity for DI4 from direct to reverse-acting.
Analog Input 4		x	Space Temp	SpcTmpTO	10k type II sensor input. It is factory-wired and configured for the following options: <ul style="list-style-type: none"> None Space temperature (Default) LWT (leaving water temperature) The following BACnet network overrides are available: <ul style="list-style-type: none"> LocalSpaceTemp (AI:1) LWT (AI:2)
				LWT	
Analog Input 14		x	None	aiDSP	0-10 vdc sensor input. It is factory-wired and configured for the following options: <ul style="list-style-type: none"> Duct static pressure (DSP) Building static pressure (BSP) CO₂ AI Reset sensor The following BACnet network overrides are available <ul style="list-style-type: none"> BldgStatPress (AI:20) LocalCO2 (AI:12)
				aiBSP	
				aiCO2	
Analog Input 16		x	None	HumIn	0-10 vdc sensor input. It is factory-wired and configured for the following options: <ul style="list-style-type: none"> Indoor humidity Outside air flow (cfm)
				OAFflow	
Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Description	
Digital Outputs - UV					
<p>The UV unit controller supports a set of 14 digital output (DO) parameters that are configured based on the options described below. Outputs are not accessible for Guest users. Certain digital outputs can be selected as direct or reverse-acting, as indicated. Each output also has a corresponding override. Overrides can be commanded from ServiceTools or the LUI keypad display with valid user level access.</p> <p>DO1-DO5 default to the configuration shown. The remaining DOs can be selected from the drop-down menu next to each one.</p> <p>Additional I/O parameters are supported by the unit controller but not accessible from ServiceTools. Refer to MicroTech UV Controller OM 1280 for all parameters available from the LUI keypad display (www.DaikinApplied.com) and the user-level permissions.</p> <p>Also note the following:</p> <ol style="list-style-type: none"> Before enabling compressor operation on air-source units, make sure the outdoor fan Digital Output (DO) and the correct indoor fan (DO1, DO2 or DO3) are configured and are on. Before testing electric heat stages 1,2 or 3, make sure the correct indoor fan (DO1, DO2, or DO3) is configured and is on. It is also recommended that compressors are turned off before electric heat is enabled. 					
Digital Output 1	x		Fan Low	Configures the 24 VAC output for a PWM low fixed-speed fan. This output must be energized before the PWM signal to control the fan. Applies to applications with ECM fans controlled by a PWM signal.	
Digital Output 2	x		Fan Med	Configures the 24 VAC output for a PWM medium fixed-speed fan. This output must be energized before the PWM signal to control the fan. Applies to applications with ECM fans controlled by a PWM signal.	
Digital Output 3	x		Fan High	Configures the 24 VAC output for a PWM high fixed-speed fan. This output must be energized before the PWM signal to control the fan. Applies to applications with ECM fans controlled by a PWM signal.	
Digital Output 4	x		Hot Water EOC	Configures the 24 VAC output for the hot water end of cycle valve used with 4-pipe heating, 2-pipe heating and 2-pipe cooling/heating changeover configurations.	
Digital Output 5	x		Fault Output	Configures the 24 VAC output signal used to indicate an alarm condition. The output is energized when there is a fault alarm or problem (displayed as Fault Problem) alarm. A problem alarm disables the output but does not shut down the unit. A fault alarm disables the output and forces the unit to shut down This output is reverse-acting. Refer to the Alarm Output in the Digital Output Polarity menu.	
Digital Output 6	x		None	See following NOTES for descriptions.	
Digital Output 7					
Digital Output 8					
Digital Output 9					
Digital Output 10					
Digital Output 11					
Digital Output 12					
Digital Output 13					
Digital Output 14					

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Config Parameter ³			Description
NOTES:							
The following outputs are also configurable from the LUI keypad display or ServiceTools:							
<ul style="list-style-type: none"> Reversing Valve = (boReversingValve) 24 VAC hot water end-of-cycle (EOC) valve or reversing valve output signal is functional. Outside Fan = (boOutdoorFan) 24 VAC output for the outdoor condenser fan. Exhaust Fan = (boExhaustFan) 24 VAC output for the exhaust fan. Pump/Isolation Valve = (boPump) 24 VAC output for the pump/isolation valve. Electric Heat 1 = (boElectricHeat1) 24 VAC output for stage 1 electric heat. Electric Heat 2 = (boElectricHeat2) 24 VAC output for stage 2 electric heat. Electric Heat 3 = (boElectricHeat3) 24 VAC output for stage 3 electric heat. Compressor 1 = (boCompressor1) 24 VAC compressor 1 output signal. For compressor 1, both the indoor and outdoor fans should both be running. For WSHPs, water flow is needed before turning on the compressor (the outdoor fan is not applicable). Compressor 2 = (boCompressor1) 24 VAC output for compressor 2. The compressor 1 output must be energized for the compressor 2 output to affect compressor operation. Drain Pan Heater = (boDrainPanHeater) 24 VAC output for the drain pan heater. Cool Water EOC = (boColdWaterEOC) 24 VAC output signal for the two position chilled water valve. ECM Enable = (boECMEnable) 24 VAC output signal to enable ECM supply fan operation. Aux Heat = (boAuxHeat) 24 VAC output signal to enable or disable auxiliary heat. 							
Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Minimum Value	Maximum Value	Units	Description
Analog Outputs - UV							
Min OA Damper Voltage	x		2	0	10	volts	Voltage signal sent by the controller that commands the OA damper to 0% open.
Max OA Damper Voltage	x		6				Voltage signal sent by the controller that commands the OA damper to 100% open.
Min F&B Damper Voltage	x		2				Voltage signal sent by the controller that commands the face and bypass damper to full bypass.
Max F&B Damper Voltage	x		6				Voltage signal sent by the controller that commands the face and bypass damper to full face. Note that this analog output is factory set to 8 VDC for vertical unit configurations.
CW Valve Closed Voltage	x		2				Voltage signal sent by the controller that commands the chilled water valve to 0% open.
CW Valve Open Voltage	x		10				Voltage signal sent by the controller that commands the chilled water valve to 100% open.
HW Valve Closed Voltage	x		2				Voltage signal sent by the controller that commands the hot water valve to 0% open. Note that this analog output is factory set to 10 for normally open hot water valves.
HW Valve Open Voltage	x		10				Voltage signal sent by the controller that commands the hot water valve to 100% open. Note that this analog output is factory set to 2 for normally open hot water valves.
Outputs - DOAS WSHP							
Digital Output 5		x	Fault Problem	-	-	-	Configures the 0-10 vdc output (boFaultOut) for alarm type. The output is energized when there is a fault alarm or problem (displayed as Fault Problem) alarm. A problem alarm disables the output but does not shut down the unit. A fault alarm disables the output and forces the unit to shut down This output is reverse-acting. Refer to the Alarm Output in the Digital Output Polarity menu.
Digital Output 13		x	PreHeat	--	-	-	Configures the 0-10 vdc output (boPreHeat) for preheat. When the unit is configured for preheat, and is in heating mode, preheat can be used if the unit is unable to maintain a DAT to satisfy the setpoint. This output is reverse-acting. When preheat is configured for electric heat, the digital output must be configured as Direct. This activates the output, enabling the PID loop to control the analog signal. Refer to the PreHeat output in the Digital Output Polarity menu.
Energy Recovery Alarm		x	Problem	-	-	-	Configures the 0-10 vdc digital output (EngyRecCfg) for the energy recovery alarm as either a problem or fault alarm. A problem alarm disables the energy recovery output but does not shut down the unit. A fault alarm disables the energy recovery output and forces the unit to shut down normally.

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Minimum Value	Maximum Value	Units	Description
Min Preheat Voltage		x	2	0	10	volts	Voltage signal sent by the controller that commands the preheat output (PreheatOutputVoltage) to 0%. Note that this digital output should be field configured to 10 for normally open hot water valves.
Max Preheat Voltage		x	10	0	10	volts	Voltage signal sent by the controller that commands the preheat output (PreheatOutputVoltage) to 100%. Note that this digital output should be field configured to 2 for normally open hot water valves.

Digital Output Polarity

A select group of digital (or binary) outputs allow you to change, or reverse, the polarity of the valve associated with the device. This gives the ability for a normally-open valve to remain open when de-energized. Hot water end of cycle valves, for example, are normally-open valves (i.e. reverse-acting). This means that they are closed when energized. The water valve outputs can be reversed so that they can instead open upon energizing. This page is not accessible for Guest users. Unless previously configured, the corresponding binary output for the hardware itself defaults to direct polarity.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ²	Description
Digital Output Polarity - UV				
Damper End (For Future Use)	x		Direct	Configures the face and bypass damper output signal (used in conjunction with 1 or 2 two position end of cycle (EOC) valves) from normally closed (Direct) to normally open (Reversed) in order to activate the face and bypass damper. This may be necessary after field installation or replacement so the control signal matches the valve type.
Hot Water End of Cycle	x		Reversed	Configures the two-position hot water end of cycle (EOC) valve output signal from normally open (Reversed) to normally closed (Direct). This may be necessary after field installation or replacement so the control signal matches the valve type.
Chilled Water End of Cycle	x		Direct	Configures the two-position chilled water end of cycle valve output signal from normally closed (Direct) to normally open (Reversed) in order to activate the chilled water EOC valve. This may be necessary after field installation or replacement so the control signal matches the valve type.
Drain Pan Heater	x		Direct	Configures the drain pan heater output signal from a normally closed (Direct) to normally open (Reversed) in order to activate the drain pan heater. This may be necessary after the field installation or replacement so the control signal matches the heater type.
Auxiliary Heat	x		Direct	Configures the auxiliary heat output signal from normally closed (Direct) to normally open (Reversed) in order to activate the auxiliary heater. This may be necessary after the field installation or replacement so the control signal matches the heater type.
Alarm Output	x		Direct	Configures the fault alarm output signal from normally closed (Direct) to normally open (Reversed). The alarm output is energized in either a fault condition (default) or in a fault/problem condition, and is de-energized when not in alarm.

Digital Output Polarity - DOAS WSHP

Alarm Output		x	Direct	Configures the fault alarm output signal from normally closed (Direct) to normally open (Reversed). The alarm output is energized in either a fault condition (default) or in a fault/problem condition, and is de-energized when not in alarm.
Energy Recovery		x	Direct	Configures the energy recovery problem alarm or fault alarm output signal from normally closed (Direct) to normally open (Reversed).
Damper		x	Direct	Configures the outdoor air (OA) damper output signal from normally closed (Direct) to normally open (Reversed). When the output is energized, the damper is opened. When the output is de-energized, the damper closes.
Preheat		x	Direct	Configures the output for preheat from normally closed (Direct) to normally open (Reversed). When configured for electric heat, the digital output must be configured as Direct. Otherwise, an alarm is activated. Preheat can be used if the unit is unable to maintain a DAT to satisfy the setpoint when the unit is in heating mode. If the preheat output is at 100% and the DAT setpoint still cannot be achieved, an alarm is generated.

If one or more sensors are connected to the appropriate terminal(s) on the unit controller, you can enable the unit controller to use the sensors for monitoring and control purposes by selecting Installed from the drop-down box next to the sensor (or sensors).

Note that an alarm is displayed in ServiceTools in the event that the sensor has been set to Installed but the sensor is not physically connected to the unit controller or if the sensor has failed for some reason.

Refer to the appropriate MicroTech Unit Controller Installation Manual's unit schematic for proper sensor location and installation instructions. (www.DaikinApplied.com).

Sensor Installation

Space Temp	x	x	Not Installed	Enables the space temperature sensor, if installed or replaced in the field.
Outdoor Air Temp	x		Installed	Enables the outdoor air temperature (OAT) sensor, if installed or replaced in the field. Configuration from ServiceTools is available for UV only.
Leaving Water Temp	x	x	Installed	Enables the leaving water temperature sensor (LWT) if installed or replaced in the field.
Indoor Humidity	x	x	Installed	Enables the indoor relative humidity sensor, if installed or replaced in the field.
Condensate Overflow	x		Installed	Enables the condensate overflow sensor, if installed or replaced in the field. Configuration from ServiceTools is available for UV only.
Outdoor Humidity	x		Installed	Enables the outdoor relative humidity sensor, if installed or replaced in the field. Configuration from ServiceTools is available for UV only.
Return Air	x		Installed	Enables the room/return air temperature (RAT) sensor, if installed or replaced in the field. Configuration from ServiceTools is available for UV only.

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value ²	Description			
Entering Water Temp		x	Installed	Enables the entering water temperature (EWT) sensor, if installed or replaced in the field. Configuration from ServiceTools is available for DOAS WSHP only.			
DSP/BSP/CO2/AI Reset		x	Installed	Enables the sensor when analog input 14 has been configured for one of the available sensor inputs (DOAS WSHP only): <ul style="list-style-type: none"> • Duct static pressure (DSP) • Building static pressure (BSP) • CO₂ • AI Reset sensor 			
Freeze Stat		x	Installed	Enables the freeze stat sensor, if installed or replaced in the field. Configuration from ServiceTools is available for DOAS WSHP only.			
Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Minimum Value	Maximum Value	Units	Description
Optional - UV							
Setpoint Method	x		Advanced	-	-	-	Determines the control strategy used for calculating the heating or cooling setpoints (effective setpoint) Currently, only the Advanced method is supported, and this value should not be changed from its default. The Advanced method relies on the unit controller application to determine the occupied, standby, and unoccupied setpoint calculations.
Remote Setpoint Adjust Type	x		Absolute	-	-	-	Defines the setpoint adjustment method used by the remote room sensor, if installed and configured correctly. <ul style="list-style-type: none"> • ABS (absolute) = 55° to 95°F adjustment • DIFF (differential) = +/-5°F adjustment
Remote Setpoint Adjust	x		Installed	-	-	-	Configures the room sensor to control the temperature setpoint adjustment.
Remote System Mode	x		Installed	-	-	-	Configures the room sensor to control the system mode.
Remote Fan Speed	x		Installed	-	-	-	Configures the room sensor to control the fan speed.
Low Suction Line Setpoint	x		28	0	50	°F	Configures the setpoint used to determine when the compressor low suction line temperature alarm becomes active, and when the unit enters and exits defrost. Applies to both water and glycol loop units.
Supplemental Heat Enable	x		Enable	-	-	-	Enables electric heat to supplement the primary heat.
Compressor Heating Lockout EWT	x		30	10	212	°F	Configures the controller to disable compressor heating when the effective entering water temperature is below this value. Applies only to WSHP unit configurations.
Exhaust Fan Enable OAD Pos	x		12	0	100	%	Configures the outdoor air damper position, above which point the exhaust fan output is energized.
Emergency Heat Enable	x		Enable	-	-	-	Allows the unit controller to enter an emergency heat state if the control temperature drops below the emergency heat setpoint.
Optional - UV							
Emergency Heat Setpoint	x		54	0	70	-	Configures the emergency heating setpoint. The unit enters the emergency heat state if the control temperature is below this setpoint and emergency heat is enabled.
Emergency Heat in Shutdown	x		Disable	-	-	-	Enables emergency heating when the unit is in shutdown mode. Note that Emergency Heat Enable must also be set to Enable.
Air Tempering	x		Disable	-	-	-	Enables air tempering mode functionality. Once enabled, air tempering activates under the following conditions: <ul style="list-style-type: none"> • The space temperature is between the effective heating and effective cooling setpoints • The unit is in either occupied or bypass mode (not unoccupied) The unit controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint minus the air tempering differential, heating is enabled order to reheat the discharge air to the occupied heating setpoint.

Table 7: Configuration Details, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default ²	Minimum Value	Maximum Value	Units	Description
Air Tempering Differential	x		5	2	20	°F	The unit controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint minus this parameter, heating is enabled in order to satisfy the occupied heating setpoint and maintain the proper space temperature. Air tempering is activated under the following conditions: <ul style="list-style-type: none"> • Air tempering mode is enabled • The unit state is fan-only • The unit is in either occupied or bypass mode
Dehumidification Type	x		Active	-	-	-	Selects the method used for dehumidification. <ul style="list-style-type: none"> • Active Dehumidification = cools the air and then uses an available heat source (hot water or electric) to maintain the discharge air temperature reheat setpoint • Passive dehumidification = cools the air but does not reheat
Night Purge Time	x		15	1	60	minutes	Configures the amount of time the unit should remain in the night purge mode. During night purge, the outdoor air damper remains open and the fan is forced to 100% regardless of occupancy.

¹The space temperature sensor includes a tenant override button. When the tenant override button is pressed and not active, the parameter *aiSpaceTemp* is used for control. When the unit is not in tenant override, space temperature control defaults to *hardwareSpaceTemp*, which must maintain its previous value for up to 30 seconds.

²The default values are based on unit type selected. These are the defaults the application uses when first downloaded into a new controller.

³Configurable I/O parameter name used by the LUI keypad display.

Alarms

The Alarms screen is where unit alarms are displayed and also cleared. (Figure 14 and NOTE).

The alarms are listed by the highest priority active alarm. Up to 32 alarms are recorded in the alarm history. When more than 32 alarms have occurred, the last (oldest) is automatically removed from the log and does not appear in the alarm history.

There are three types of alarms:

1. Automatic clearing
2. Manual clearing
3. Manual clearing if alarm has been activated three times within a seven-day period

Active Alarms

To clear all active alarms:

1. First verify that the source of the alarm has been corrected (for example, having an incorrect/unsupported sensor installed or a faulty sensor).
2. Click the Clear Alarms button to remove all active alarms.

NOTE: Once the alarm has been cleared, it moves to the alarm history.

Alarm History

Often times a number of erroneous alarms are generated during unit start-up or maintenance. These nuisance-type alarms get stored in the alarm history and then appear in ServiceTools or the LUI keypad display. Clearing the alarm history removes the nuisance alarms.

1. Clear Alarm History button to remove the alarm cache that has been generated.

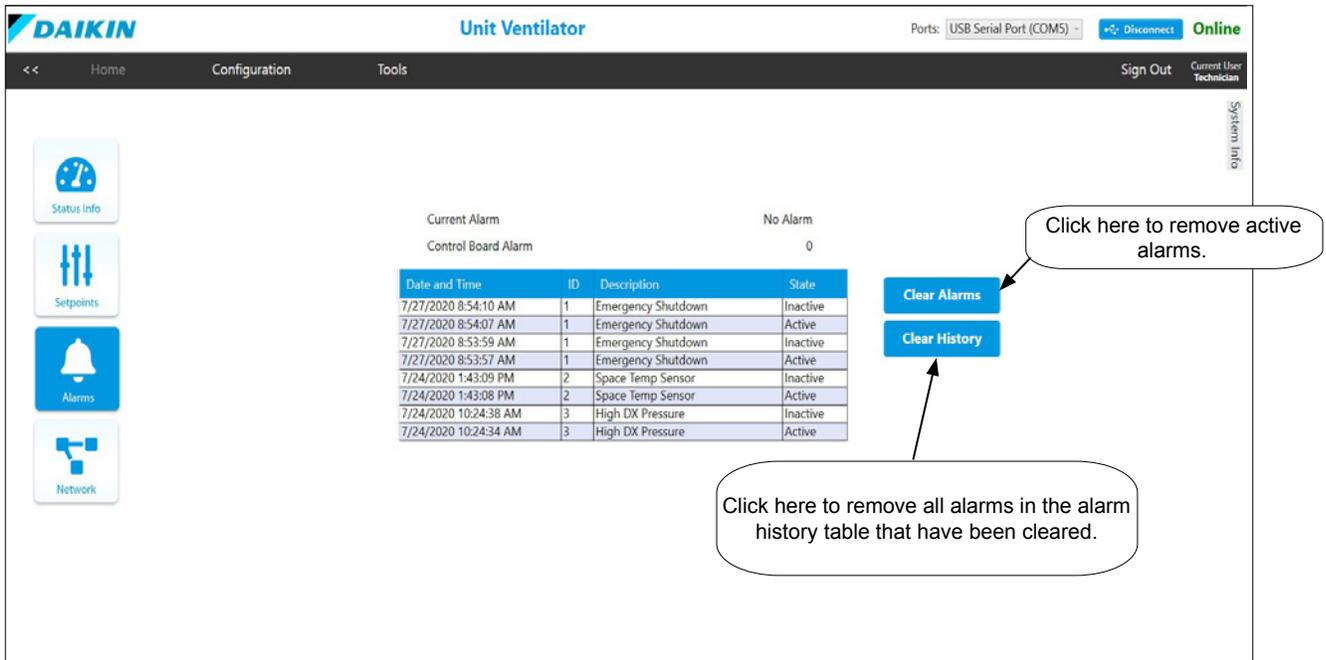
NOTE: Once the alarms have been cleared, there is no way to refresh or retrieve them.

Alarms Screen Details

Field/Label	Description
Current Alarm	Displays the highest priority active alarm.
Control Board Alarm	Indicates that the unit controller has failed.
Date and Time	Indicates the day and time that the event (i.e. alarm active or inactive) occurred.
ID	Alarm number. This is the unique number assigned to each type of alarm. It is <i>not</i> the same as alarm priority.
Description	Displays the type of alarm
State	Displays whether alarm is currently active or inactive.

Refer to MicroTech UV Controller, OM 1280 or MicroTech Controls for SmartSource DOAS WSHP Unit Controller, OM 1308 for more information. Additional BAS-supported alarms are found in the MicroTech UV Controller Network Integration Guide, ED 19110 (BACnet and LonWORKS) or MicroTech DOAS WSHP Controller Network Integration Guide, ED 19118 (BACnet only) (www.DaikinApplied.com).

Figure 14: Alarms Screen



Using Tools

The Tools page has many useful elements to complete the unit configuration and set-up process (Figure 15 and Figure 16). It is also where you can find advanced features to check that setpoints are responding correctly to changes, import

the unit configuration file, fine-tune PI loop settings, change default offsets, and configure additional parameters for BAS communication. The Manual Override menu is available (not grayed out) for Technician-level users only.

Figure 15: Tools Screen

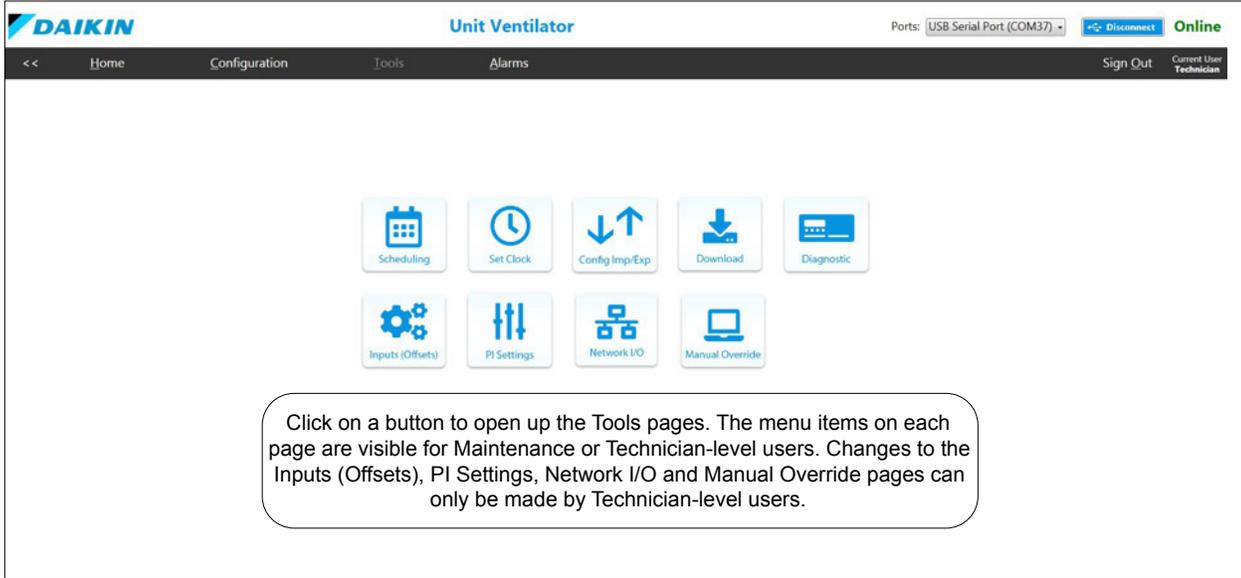
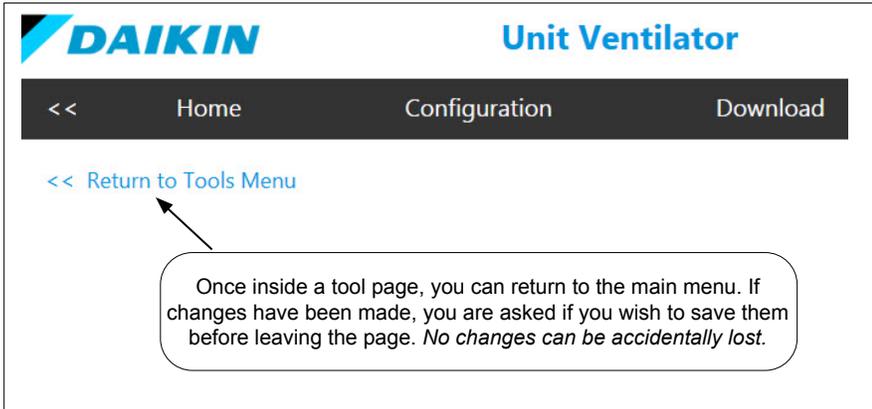


Figure 16: Tools Navigation



Occupancy Schedule

Use the Occupancy Scheduler to set the unit occupancy (occupied or unoccupied) for each day of the week. The unit controller defaults to a 24/7 occupied state, so this is where you can modify each day when there are no occupants in the space (Figure 17). Occupancy periods are set using the slider bar next to each day of the week. At the bottom of the page is a slider bar to set a default (or fixed) holiday schedule, if desired.

Primary Occupancy

Primary occupancy is from 12:00 AM to 11:59 PM and can be adjusted in 15-minute increments as follows:

1. Click and press down on the right side of the slider box. Shift the box to the right, along the bar. The time of day is shown below the bar.
2. Click and hold the left side of the slider bar to set the daily occupancy start time. Repeat for each day.
3. Press Save.

When adjusting the controller's internal schedule, it is generally recommended that binary inputs are not set to unoccupied as this may cause a conflict.

Secondary Occupancy

It is also possible to set an additional occupancy period each day. Secondary occupancy only allows you to configure a range of time that is outside of the primary occupancy, avoiding

a potential overlap in occupied/unoccupied periods. This only applies if the unit has also been changed to unoccupied at some point in the day.

Similar to the main daily schedule, the secondary occupancy period (right column) is from 12:00 AM to 11:59 PM and is adjusted in 15-minute increments. To set a second daily schedule:

1. Activate the slider bar by clicking the Enable check box to the right of each day.
2. Follow steps 1-3 as you did previously and save changes.

NOTE: The unit remains in an occupied state during the midnight transition, if scheduled. Although not always the case, the secondary occupancy feature is most likely used in this scenario.

Example: The space needs to be occupied from 11:00 PM (Mon) to 3:00 AM (Tue). Primary occupancy has already been set for 6:00 AM to 5:00 PM on those days. In this example, you would click on Enable next to Monday's Secondary Occupancy column, shift the slider bar to start at 11:00 PM through 11:59 PM on Monday and then click Enable next to Tuesday's Secondary Occupancy column. Finally, shift the slider from 12:00 AM through 3:00 AM.

Figure 17: Occupancy Schedule Screen

The screenshot shows the 'Occupancy Schedule' screen in the DAIKIN Unit Ventilator interface. The interface includes a top navigation bar with 'Home', 'Configuration', 'Tools', and 'Alarms'. The main content area displays a table for scheduling occupancy periods for each day of the week. The 'Occupancy Period' column shows sliders for each day, with Monday's period set from 6:00 AM to 6:00 PM. The 'Secondary Occupancy Period' column has an 'Enable' checkbox for each day. A 'Save' button is located at the bottom right. Callouts provide instructions on how to adjust the sliders and enable the secondary occupancy.

Day	Occupancy Period	Secondary Occupancy Period	Enable
Sunday	12:00 AM - 12:00 AM		<input type="checkbox"/>
Monday	6:00 AM - 6:00 PM		<input type="checkbox"/>
Tuesday	12:00 AM - 12:00 AM		<input type="checkbox"/>
Wednesday	12:00 AM - 12:00 AM		<input type="checkbox"/>
Thursday	12:00 AM - 12:00 AM		<input type="checkbox"/>
Friday	12:00 AM - 12:00 AM		<input type="checkbox"/>
Saturday	12:00 AM - 12:00 AM		<input type="checkbox"/>
Holidays	12:00 AM - 12:00 AM		<input type="checkbox"/>

Callout 1: Press down on the right and left columns of this box and slide it to the desired hours/minutes. In this example, Monday has been set from 6:00 AM to 6:00 PM

Callout 2: Check this box to open the time bar as shown here. Use the slider to set occupancy during a time period outside of primary hours

Callout 3: Press Save when finished making changes

Holiday Schedule

Up to 16 holidays can be configured from the Holiday Schedule page (Figure 18). Dates are fixed (based on the current year's calendar) and require annual adjustment. A single holiday schedule is available. This means that the occupancy hours defined for the first holiday are used for all the other days designated as a holiday. This is how to add a holiday(s):

1. At the bottom of the Occupancy Schedule page, (Figure 17), adjust the times under the Occupancy Period column to enable the Holiday time schedule.
2. Select the Enable check box to the right of Holidays. Enable is used for the Secondary Occupancy Period (the same as the days of the week).
3. From the Holiday Schedule page (Figure 18), press the Add Holiday button. This activates the calendar icon where you can choose the date for each holiday.

4. Open the calendar and choose the day. You can also enter the date manually.
5. Select Start and Duration of the holiday. This becomes the default for all remaining holiday (daily) Enabled becomes default.

NOTE: Record the name or description of each holiday as it is entered. This is helpful should the holiday schedule change in the future. The record itself must be kept in an external location, outside of the ServiceTools application.

To delete a holiday, remove the check from Enabled box and then press Save.

Figure 18: Holiday Schedule Screen

The screenshot shows the 'Holiday Schedule' interface. At the top, there's a navigation bar with 'Home', 'Configuration', 'Tools', and 'Alarms'. Below that, there's a 'Return to Tools Menu' link. The main content area has an 'Add Holiday' button and a table with the following data:

Holiday	Start	Duration	Enabled
Holiday 1	1/1/2020	1 Days	Enable
Holiday 2	5/25/2020	1 Days	Enable
Holiday 3	7/3/2020	1 Days	Enable
Holiday 4	9/7/2020	1 Days	Enable
Holiday 5	11/26/2020	2 Days	Enable
Holiday 6	12/24/2020	2 Days	Enable

Below the table are 'Save' and 'Refresh' buttons. Two callout boxes provide instructions: 'Press Save when finished making changes.' and 'Press Refresh to revert back to previously unsaved values.'

Set Clock and Daylight Savings Time

The unit controller relies on an internal clock to set occupancy schedules, time stamp alarms, and for data tracking. The unit controller does not ship with the internal clock configured for the current day and time. Use the Set Clock page (Figure 19) to enter the current time information so that the internal clock functions properly.

NOTE: Remove the tab on the unit controller battery, if it has not already been removed, so that the internal clock settings are retained.

Set Clock

Use the up and down arrows to set the current hour and minutes. The hour field is in military time (0-23 hrs). Click the calendar icon in the Date box to choose the current day of the month for the current calendar year.

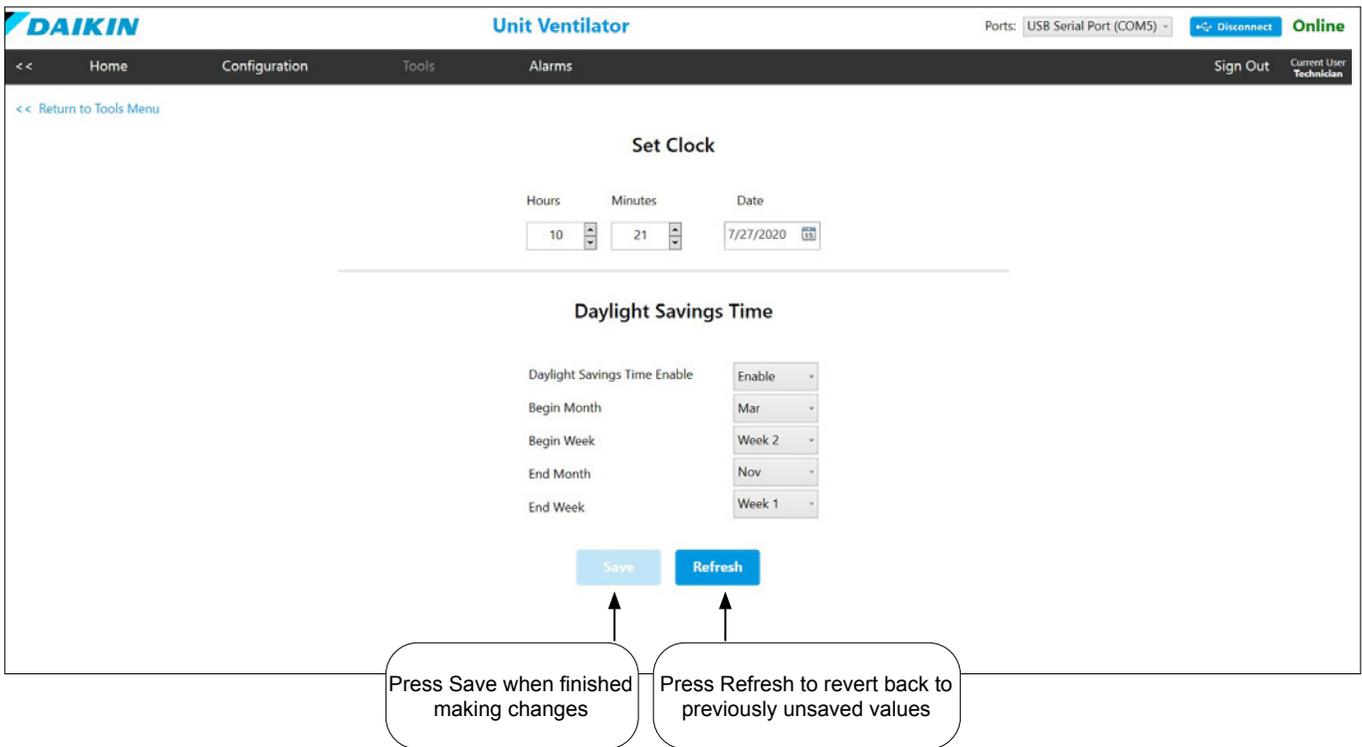
Set Daylight Savings Time

From the Daylight Savings Time section of this screen, you can see that daylight savings time defaults to starting the second week of March and ending the first week of November. To make changes, refer to the menu options below and make your selections. Click Save when finished.

NOTE: Date and time settings only need to be configured once, except if the unit controller battery is removed or replaced in the field.

Field	Description
Begin Month	Sets the month in which daylight savings time begins
Begin Week	Sets the week of the Begin Month that daylight savings time begins. This is always on a Sunday at 2:00 AM
End Month	Sets the month in which daylight savings time ends
End Week	Sets the week of the End Month that daylight savings time ends. This is always on a Sunday at 2:00 AM

Figure 19: Set Clock Screen



Configuration File Import/Export

ServiceTools can be used to download two file types:

1. The MicroTech UV or DOAS WSHP unit configuration (as described here)
2. The unit controller application. Refer to the Tools ► Download menu for access. The next section (Application File Download) provides downloading instructions

The Config Imp/Exp page (Figure 20) is where you can save a configuration file from one unit controller for upload into another unit (one at a time).

The Configuration Import/Export page provides a way to save and restore a unit controller configuration (.csv) file. The unit ships with the configuration file loaded into the MicroTech controller, but can be changed or transferred to other controllers in the field. This is useful when the same configuration is used for multiple units.

For quick reference:

- Save = Backup file
- Restore = Import file

While both file types are accessible from ServiceTools, the configuration file requires a separate download from the application firmware.

The save and restore options work as follows:

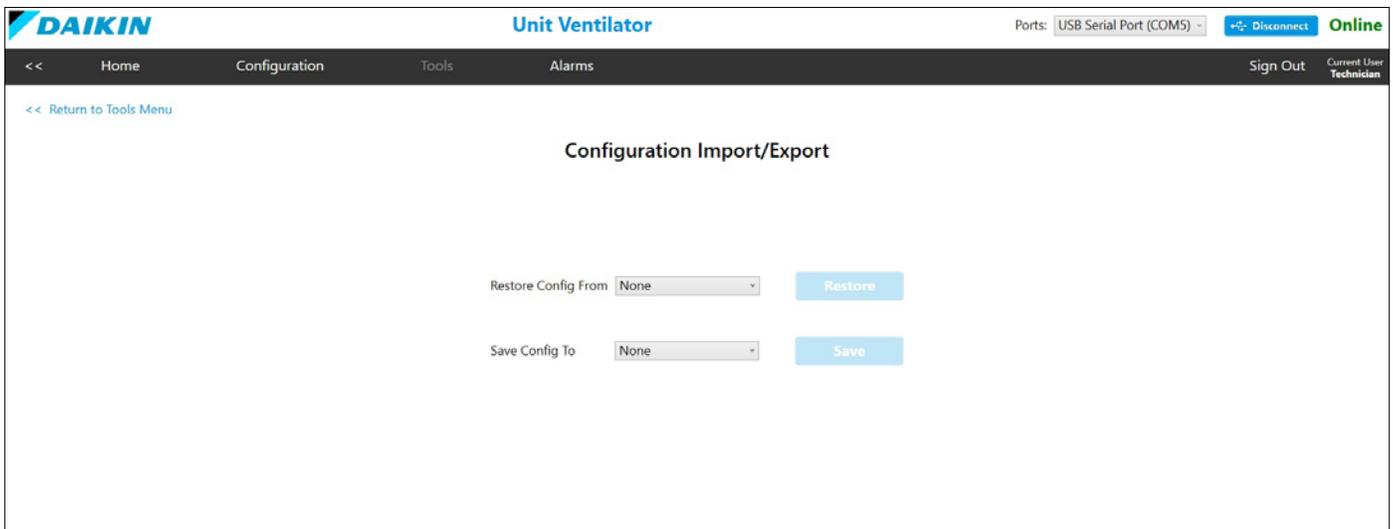
Field	Description
Restore Config From	Once the configuration file has been saved, it can be imported to other unit controllers that share the same configuration. Restore = import.
Save Config To	Saves the current parameter settings to the desired location. Factory Default option cannot be modified or saved. The rest of the options in the table below allow changes to be saved.

The ability to save and restore the unit configuration is not available for Guest-level users.

The following options allow you to choose the location of the existing configuration file you wish to restore and/or save:

Restore File Options	Description and Important Notes
None	
Factory Default	Restores the configuration file from the on-board memory designated for the factory (as shipped) default configuration.
User Default	Restores the configuration file from the on-board memory designated for the user's custom configuration. This option is not available from the Save Config To menu.
SD Card	Restores all configuration parameters loaded on the SD card, including the BACnet addressing information. Note that every device on the BACnet trunk must have a unique BACnet address. The first step of the two-part download process takes less than a minute. During this step, changes are applied to the unit controller application. ServiceTools displays a "Restored" message and then begins the second step of the auto-download process. This part requires up to an additional 20 minutes, at which time the changes are automatically saved to the controller's permanent memory. <i>Do not remove power from the unit controller for at least 30 minutes when restoring from an SD Card.</i> This option is available from the Save Config To menu.
SD Card (No BACnet)	Restores the configuration parameters loaded on the SD card. However, it does NOT save any of the BACnet addressing information. The first step of the two-part download process takes less than a minute. During this step, changes are applied to the unit controller application. ServiceTools displays a "Restored" message and then begins the second step of the auto-download process. This part requires up to an additional 20 minutes, at which time the changes are automatically saved to the controller's permanent memory. <i>Do not remove power from the unit controller for at least 30 minutes when restoring from an SD Card.</i> This option is not available from the Save Config To menu.
PC File	This option allows you to name the file, determine the location, and enable the unit controller to automatically save the file. This option is available from the Save Config To menu.

Figure 20: Import and Save Unit Configuration File



Application File Download

The Download page (Figure 21) is where you can download and import the unit controller application. Similar to the configuration file, the application can be uploaded to a single unit or to multiple units (one at a time).

An application download must be performed whenever:

- An updated application has been provided by Daikin Applied.
- The application has become corrupt or the unit controller is not operating as expected.

The ability to download an application is not available for Guest-level users.

WARNING

The unit controller must be in an Off state before performing the download process to avoid potential damage to the unit.

Follow these steps to download the unit controller application:

1. Confirm the location of the application file:
 - a. Click the Browse button to search for the firmware file.
 - b. If the application file has yet to be downloaded to the laptop, navigate to www.daikinapplied.com/resources/application-software to download the latest application file to your laptop.
 - c. Save the file to the hard drive.
4. Verify that the unit controller is properly connected to the

laptop. See [Installation and Setup](#) section.

5. Double-click the file or select it and click Open.

CAUTION

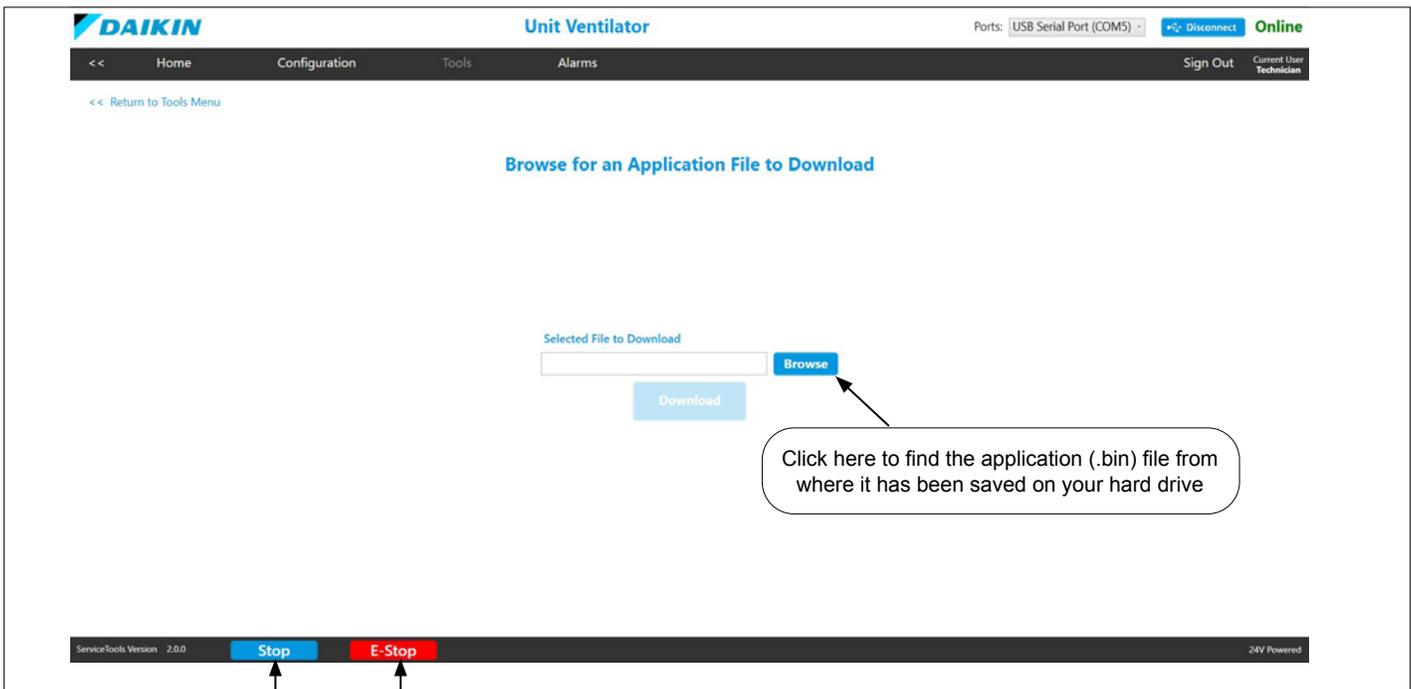
Performing a download overwrites existing application.

6. When the file appears in the white box, press the Download button.
7. If the unit controller is not already in the Off state prior to downloading, the pop-up message shown in Figure 22 appears. The unit can be put into the Off state by pressing the Stop button at the bottom of the pop-up message or by pressing the blue Stop button at the bottom of the Download page (Figure 21).

NOTE: Downloading takes up to four minutes. The status bar appears, indicating progress (Figure 23). If it does not appear, this means the download is not occurring as it should. The status bar then disappears when the download is complete.

ServiceTools opens directly to the Download screen if no application is loaded on the unit controller. Signing in is not required for download if no application is loaded. In this case, it is not possible to access the other ServiceTools menu screens (Select Device, Home, Alarms or Sign In) from the Download page. Once the application has been downloaded, access to the other screens is restored.

Figure 21: Application Download



Press the blue Stop button to initiate a normal (recommended) unit shutdown process. Press the E-Stop button to initiate an immediate (forced) unit shutdown. Note that using E-Stop generates an Emergency Shutdown alarm. Initiating a forced shutdown should only be used after first consulting Daikin ATS Technical Respose.

Figure 22: Application Download Pop-up Message

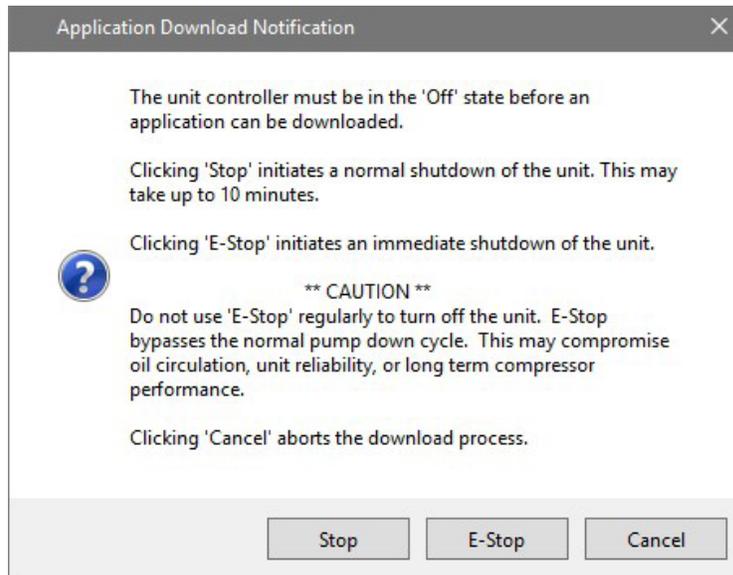
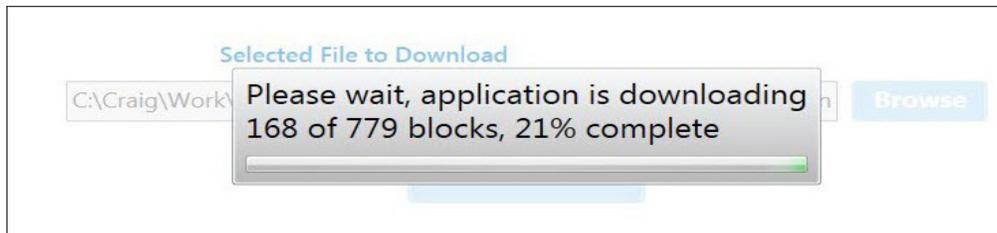


Figure 23: Downloading Status



Diagnostics

Use the Diagnostic page (Figure 24) to access more advanced unit controller settings and certain settings that are not available from other ServiceTools screens. It is intended for custom configuration of parameters unique to the job site operation or other environmental conditions.

Diagnostics can also be helpful for troubleshooting these advanced setpoints.

This page requires Technician-level access in order to make changes. Maintenance-level users can make changes as well, but with limited access to settings. Table 8 describes the Diagnostics menu items.

Figure 24: Diagnostic Screen (Unit Ventilator Shown)

The screenshot shows the 'Diagnostic' screen for a 'Unit Ventilator'. The interface includes a top navigation bar with 'Home', 'Configuration', 'Tools', and 'Alarms'. A status bar at the top right shows 'Ports: USB Serial Port (COM5)', 'Disconnect', and 'Online'. The main content area is titled 'Diagnostic' and contains several expandable sections: 'Heating & Cooling', 'Compressor', 'Dehumidification', and 'Defrost'. Each section lists various parameters with input fields. Below the settings are 'Save' and 'Refresh' buttons. A 'System Info' link is located on the right side. Callouts provide instructions: 'Click System Info to expand a quick view of current unit settings', 'Press Save when finished making changes', and 'Press Refresh to revert back to previously unsaved values'.

Section	Parameter	Value	
Heating & Cooling	Economizer DAT Low Limit	50.0 F	
	Mechanical DAT Low Limit	45.0 F	
	DAT Low Limit Alarm Time	3 min	
	DAT High Limit	125.0 F	
	Low OAT to Open EOC Valve	34.0 F	
	Occupied Off Differential	1.0 F	
	Unoccupied Off Differential	1.0 F	
	Cooling Stage Time	3 min	
	Heating Stage Time	3 min	
	Electric Heating Stage Time	60 sec	
	Minimum Stage Time	3 min	
	Compressor	Motorized Valve Time	30 sec
		Min On Time	180 sec
Min Off Time		360 sec	
Cooling OAT Lockout		63.5 F	
Heating OAT Lockout		30.0 F	
Reversing Valve Delay Time		5 sec	
Low Suct Line Protection Diff		4.0 F	
Startup Delay Time		300 sec	
Random Start Time		300 sec	
Fan			
	Water		
	Damper		
Run Timer			

Table 8: Diagnostics Details

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Heating and Cooling - UV							
Economizer DAT Low Limit	x		50	45	65	°F	The discharge air temperature (DAT) cooling low limit setpoint for economizer cooling or fan only mode.
Mechanical DAT Low Limit	x		45	35	65	°F	The discharge air temperature (DAT) cooling low limit setpoint for hydronic or compressor cooling.
DAT Low Limit Alarm Time	x		3	1	10	minutes	Sets the amount of time before the discharge air temperature (DAT) low limit alarm activates. Alarm indicates that the DAT is below the minimum DisAirEconLowLim setpoint.
DAT High Limit	x		125	80	135	°F	The discharge air temperature (DAT) high limit setpoint.
Low OAT to Open EOC Valve	x		34	20	36	°F	Setpoint that forces the end of cycle (EOC) valve open when the outdoor air temperature (OAT) drops below this setpoint and the face and bypass damper is in the full bypass position. This prevents coil freeze-up.
Occupied Off Differential	x		1	1	10	°F	Sets the cooling and heating effective off setpoints when the unit is in the occupied, bypass, or standby mode. <ul style="list-style-type: none"> The cooling off setpoint is equal to the effective setpoint minus this value The heating off setpoint is equal to the effective setpoint plus this value
Unoccupied Off Differential	x		1	1	10	°F	Sets cooling and heating effective off setpoints when the unit is in the unoccupied mode. <ul style="list-style-type: none"> The cooling off setpoint is equal to the effective setpoint minus this value The heating off setpoint is equal to the effective setpoint plus this value
Cooling Stage Time	x		3	1	10	minutes	The minimum amount of time that the cooling stage is active before a stage change can occur.
Heating Stage Time	x		3	1	5	minutes	The minimum amount of time that the heating stage is active before a stage change can occur.
Electric Heating Stage Time	x		60	1	120	seconds	The minimum amount of time that the electric heat stage is active before a stage change can occur. Up to three stages of electric heat are available. Applies when the unit is configured for more than one stage of electric heat.
Minimum Stage Time	x		3	1	5	minutes	The minimum amount of time that the unit must remain in a heating, cooling, or dehumidification state.
Dehumidification - UV							
Low Temp Setpoint	x		55	35	65	°F	Allows dehumidification when the control temperature is above this setpoint.
Stage Down Setpoint	x		32	20	40	°F	Activates the dehumidification stage-down process when the indoor air coil temperature (aiIndoorCoilTemp) is less than or equal to this setpoint.
Passive Face & Bypass Damper Max	x		50	0	100	%	The maximum position (% open) of the face and bypass damper.
Initial Dehumidification Fan Speed	x		50	10	100	%	The fan speed when the unit first enters the dehumidification state.
Defrost - UV							
Indoor Fan Off Setpoint	x		90	30	110	°F	During defrost, the indoor fan turns off when the indoor air coil temperature reaches this setpoint. As long as the indoor air coil temperature remains below the indoor fan off setpoint, the fan continues to run at the same speed it was running before defrost started.
Outdoor Air Coil Temp Setpoint	x		32	30	40	°F	The unit enters defrost mode when the outdoor air coil temperature sensor is below this setpoint. Applies only to air source heat pump units.
Low Refrig Temp Differential	x		20	5	40	°F	This value is added to the selected low suction line temperature protection setpoint to determine when the compressor low suction line temperature alarm is no longer active, and when the unit enters and exits defrost. Applies to both water and glycol loop units.

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Compressor - UV							
Motorized Valve Time	x		30	0	60	seconds	The amount of time allowed after the pump/motorized valve output energizes before the compressor can be energized.
Min On Time	x		180	60	600	seconds	The minimum period of time the compressor must remain on before it is allowed to turn off again.
Min Off Time	x		360	300	600	seconds	The minimum period of time the compressor must remain off before it is allowed to turn on again.
Cooling OAT Lockout	x		63.5	45	80	°F	Prevents compressor cooling when the outdoor air temperature drops below this setpoint. Applies only to air source heat pump units.
Heating OAT Lockout	x		30	10	212	°F	Disables compressor heating when the outdoor air temperature setpoint is below this value. Applies only to air source heat pump units.
Reversing Valve Delay Time	x		5	60	30	seconds	The compressor reversing valve is considered to be at position this many seconds after the reversing valve command is issued.
Low Suct Line Protection Diff	x		4	1	8	°F	This value is added to the selected low suction line temperature protection setpoint (nciLowTempProt) to determine the setting at which the alarm becomes inactive. The alarm setpoint is fixed at 28°F.
Startup Delay Time	x		360	300	600	seconds	The minimum amount of time a compressor must remain off after being powered up. Used in conjunction with the random start time delay described below.
Random Start Time	x		0	300	600	seconds	To prevent compressor cycling and all compressors from starting up together after loss of power, the required minimum on/off time default is 600 seconds plus the random restart of 0 to 60 seconds. This may cause the compressor time delay to be longer than the startup delay time as indicated above. The unit controller automatically generates its own random start time if the default setting is not changed.
Fan - UV							
Speed Changes per Hour	x		10	1	60	-	The number of fan speed changes allowed each hour. Applies to 3-speed indoor fans.
Off Delay	x		4	0	10	seconds	When configured for fan cycling, this is the period of time the fan continues to run before going off.
Electric Heat Min Fan On Time	x		60	0	240	seconds	The minimum amount of time the fan must remain running when the unit is in electric heat mode.
Water - UV							
EWT Out of Range Alarm Delay	x		5	1	10	seconds	The amount of time that the entering water is allowed to flow before going into alarm if the entering water temperature is not suitable for heating or cooling.
EWT Differential	x		5	0	10	°F	The minimum differential required between the control temperature and the effective entering water temperature. This allows the unit to enter hydronic heating or cooling.
Entering Water Flow Timer	x		120	0	600	seconds	The amount of time that the entering water is allowed to flow before determining that hydronic heating or cooling is unavailable.
Min Pump On Time	x		30	0	120	seconds	The amount of time the pump output is to be energized required before the compressor is energized.
EWT Retry Time	x		120	20	120	minutes	The amount of time allowed after the entering water temperature (EWT) has been determined unsuitable for heating or cooling before the unit attempts to enter hydronic heating or cooling again. The retry timer works in conjunction with the flow timer to make sure that the EWT is hot enough for hydronic heating or cool enough for hydronic cooling. Applies only to 2 pipe heating/cooling change-over units.

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Damper - UV							
Low Limit OAD Min Time	x		3	1	10	minutes	The amount of time the outdoor air damper is to remain at minimum position before entering the reheat low limit state.
Face & Bypass Min Position	x		0	0	100	%	The minimum position of the face and bypass (F&BP) damper.
Exhaust Interlock OAD Min Position	x		100	0	100	%	The minimum outdoor air damper position when the exhaust interlock is active.
OAD Close Delay	x		30	0	60	seconds	The amount of time before the outdoor damper closes after the supply fan turns off.
Run Timer - UV							
Compressor Run Time	x		0	0	300000	hours	The total compressor run time. Read-only.
Compressor Run Time Reset	x		None	-	-	-	Resets the total compressor run time hours.
Fan Run Time	x		0	0	30000	hours	The total compressor run time. Read-only.
Fan Run Time Reset	x		None	-	-	-	Resets the total fan run time hours.
Unit - DOAS WSHP							
Prev1MSM		x	Powerup	-	-	-	The unit state prior to its current state.
Prev2MSM		x	Powerup	-	-	-	The unit state prior to Prev1MSM.
Prev3MSM		x	Powerup	-	-	-	The unit state prior to Prev2MSM.
Prev4 MSM		x	Powerup	-	-	-	The unit state prior to Prev3MSM.
Unit Min Off Time		x	5	0	300	seconds	The minimum amount of time that the compressors must remain off after the unit is shut down.
Application Defaults		x	No Change	-	-	-	Sets all configuration parameters back to application defaults. Consult Daikin ATS Technical Response before proceeding.
Save Config Params		x	None	-	-	-	Indicates that all configuration parameters are being saved to non-volatile memory.
Calculated PWM		x	0	-	-	%	Supply fan signal calculated by the unit controller application. Read-only.
Or Reset Delay		x	1800	0	3000	seconds	After an override has been applied, this sets the amount of time before all overrides are cleared and the unit can resume to normal operation. The timer resets every time an override is applied.
Calc CFM		x	0	-	-	cfm	The calculated CFM value. Used to determine supply fan ramp up. Read-only.
Min CFM		x	0	-	-	cfm	The CFM low limit value. Used in conjunction with calculated CFM to determine supply fan ramp up. Read-only.
Alarm Check Delay		x	720	0	1200	seconds	The 12-minute alarm delay timer. After unit start-up, this is the amount of time where certain alarm conditions are ignored.
Lockout Time		x	0	0	65535	seconds	The amount of time that the unit is locked out from heating or cooling due to outdoor air temperature.
Config File Numb		x	0	0	999	number	The unique identifier used in each file name when saving configuration parameters to the SD card.
Low Line Voltage		x	0	0	4095	counts	Line voltage (VAC) to the unit controller.
Man Alarm Override Tm		x	0			seconds	The amount of time that passes once an alarm has been manually commanded. The timer resets every time an alarm is manually commanded.
SD Status		x	Good	-	-	-	The status of the SD card from the following options: <ul style="list-style-type: none"> • Good = The SD card is ready to receive data • Fail = An SD card error has occurred • No mount = The SD card is not properly connected to the drive. The SD card may not be available, or is not a compatible format
Tenant Override Reset Alarm		x	None	-	-	-	The status of the alarm reset signal provided by an optional tenant override input.
Setpoint Shift		x	0	-5	5	°F	Not available
Int Sched		x	Unoccupied	-	-	-	The current occupancy mode provided by the controller's internal schedule.

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Alarm Enables		x	2147483647	-	-	-	Not available
Alarm Output		x	2147483647	-	-	-	Not available
Min Chg Over Delta		x	5	5	10	°F	The minimum difference between the OAT Cooling and OAT heating setpoints.
Max Chg Over Delta		x	25	20	25	°F	The maximum difference between the OAT Cooling and OAT heating setpoints.
Timer Resets		x	None	-	-	-	Clears the fan and compressor run times and starts. This is used when a compressor or fan has been replaced in the field. Options include: <ul style="list-style-type: none"> • Reset Comp 1 = Resets the runtime and starts for compressor 1 • Reset Comp 2 = Resets the runtime and starts for compressor 2 • Reset Fan = Resets the runtime for the supply fan • All = Resets both compressor runtime and starts and also supply fan runtime hours
Hot Gas Reheat - DOAS WSHP							
Proportional Error		x	0	-	-	-	The contribution to the hot gas reheat signal provided by the proportional part of the PID calculation. See PID Loop Settings .
Integral Error		x	0	-	-	-	The contribution to the hot gas reheat signal provided by the integral part of the PID calculation. See PID Loop Settings .
Derivative Error		x	0	-	-	-	The contribution to the hot gas reheat signal provided by the derivative part of the PID calculation. See PID Loop Settings .
Proportional Gain		x	5	-	-	-	The PID loop proportional gain value used to control the modulating hot gas reheat valve. See PID Loop Settings .
Integral Gain		x	0.33	-	-	-	The PID loop integral gain value used to control the modulating hot gas reheat valve. See PID Loop Settings .
Derivative Gain		x	100	-	-	-	The PID loop derivative gain value used to control the modulating hot gas reheat valve. See PID Loop Settings .
Min Process Value		x	-3000	0	-3000	-	The minimum accumulated process value used for PID control of the modulating hot gas reheat valve. See PID Loop Settings .
Max Process Value		x	120	0	3000	-	The maximum accumulated process value used for PID control of the modulating hot gas reheat valve. See PID Loop Settings .
Accumulated Process Value		x	0	-20000	20000	-	The total accumulated process value used for PID loop used for control of the modulating hot gas reheat valve. It must be within the min/max accumulation value range. See PID Loop Settings .
Correction Process Value		x	0	-20000	20000	-	PID loop correction value process variable used for control of the modulating hot gas reheat valve. See PID Loop Settings .
Manual Mode		x	0	-	-	-	Indicates if the modulating hot gas reheat valve is in manual override.
Vacuum Mode - DOAS WSHP							
<p>The vacuum mode is used by the DOAS WSHP to recharge the system. At times, air becomes trapped in the system and it becomes necessary to remove that trapped air from the system. Doing this improves system performance.</p> <p>Note that the vacuum mode should be used only when necessary. It is recommended that you contact Daikin ATS Technical Response prior to configuring the unit for this mode. Before proceeding, the unit must be in an Off state, and the EEV and HGR valves both open to 50%.</p>							
Vacuum Mode Enable		x	Disable	-	-	-	Enables the vacuum mode, which modulates the EEV and HGR valves into 50% position in order to pull (vacuum) the air out during system recharge.
Vacuum Mode Timer		x	30	-	-	seconds	Countdown timer for opening the EEV and HGR valves. Applies when Vacuum Mode is enabled, and the control mode and MSM are OFF. When the timer reaches 0 from the default of 30 seconds, the vacuum mode is enabled.

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Miscellaneous - DOAS WSHP							
Startup Timer		x	0			seconds	The amount of time after power is applied to the controller and when the unit initializes. The delay timer allows for fan stabilization upon initial unit start-up.
Brownout Voltage		x	2775	0	4095	counts	Input value (in ADC counts) from the unit controller for the incoming line voltage. This value is used to determine if a brownout or overvoltage condition exists.
Heat Cool Setup - DOAS WSHP							
DAT Cooling Deadband		x	7	1	15	°F	The deadband around the discharge air temperature (DAT) setpoint. This is the operating range used by the hot gas reheat (HGR) valve when the unit is in either precision cooling or dehumidification mode.
DAT Heating Deadband		x	7	1	15	°F	The deadband around the discharge air temperature (DAT) setpoint. This is the operating range used for compressor staging when the unit is in heating mode.
LCT Dehumid Deadband		x	7	1	15	°F	The deadband around the leaving coil temperature (LCT) setpoint. This is the operating range used for compressor staging when the unit is in dehumidification mode.
DAT Dehumid Deadband		x	2	0	10	°F	The deadband around the discharge air temperature (DAT) setpoint. This is the operating range used by the hot gas reheat (HGR) valve when the unit is in either precision cooling or dehumidification mode.
LCT Cooling (Stage 1)		x	65	33	75	°F	Sets the stage 1 leaving coil temperature (LCT) setpoint used when the unit is in either cooling or dehumidification mode.
DAT Heating (Stage 1)		x	70	55	110	°F	Sets the stage 1 discharge air temperature (DAT) setpoint used when the unit is in heating mode.
LCT Low Limit		x	32	30	40	°F	The minimum leaving coil temperature (LCT) setpoint that can be used by the controller.
LCT Dehumid Deadband (Stage 1)		x	7	0	15	°F	The deadband around the leaving coil temperature (LCT) setpoint when the unit is in stage 1.
Compressor - DOAS WSHP							
Compr 1 Run Time		x	0	0	300000	hours	The total compressor 1 run time hours.
Compr 2 Run Time		x	0	0	300000	hours	The total compressor 2 run time hours.
Saturated Evap Temp		x	0	-	-	°F	The calculated refrigerant saturation temperature for the evaporator.
Comp On Timer		x	0	-	-	hours	The amount of time that the compressor has been on since it last started.
Comp Off Timer		x	0	-	-	hours	The amount of time that the compressor has been off since it last stopped.
Pump On Timer		x	15	-	-	seconds	The amount of time that the compressor pump has been on since it last started.
Pump Cmd		x	None	-	-	-	Status of the pump request/isolation valve output.
Saturated Cond Temp		x	0	-	-	°F	The calculated refrigerant saturation temperature for the condenser.
Defrost Timer		x	60	0	300	seconds	The amount of time that the unit is allowed to remain in the defrost mode before exiting.
Reversing Valve Cmd		x	0	-	-	-	Intended position of the reversing valve based on heating/cooling demand.
Reversing Valve Status		x	0	-	-	-	Status of the reversing valve output. It matches the Reversing Valve Cmd value once all appropriate timers have expired.
Standby		x	0	-	-	seconds	The amount of time that the unit must remain at the current stage before staging up or down.
C1 Min On Timer		x	0	-	-	seconds	The amount of time remaining before the compressor 1 minimum on time expires.
C2 Min On Timer		x	0	-	-	seconds	The amount of time remaining before the compressor 2 minimum on time expires.
C1 Min Off Timer		x	0	-	-	seconds	The amount of time remaining before the compressor 1 minimum off time expires.
C2 Min Off Timer		x	0	-	-	seconds	The amount of time remaining before the compressor 2 minimum off time expires.

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Comp 1 Starts		x	0	0	300000	-	The total number of compressor 1 starts.
Comp 2 Starts		x	0	0	300000	-	The total number of compressor 2 starts.
Suction Refrig Press Avg		x	0	-	-	psi	For internal use only.
High Condenser Temp		x	130	100	140	°F	The high temperature setpoint that determines when a condenser saturation alarm is generated. Alarm occurs when the condenser saturation temperature is higher than this setpoint for 60 consecutive seconds. The alarm automatically clears when the condenser saturated temperature is 10°F below this setpoint.
Low Condenser Temp		x	50	30	70	°F	The low temperature setpoint that determines when a condenser saturation alarm is generated. The alarm occurs when the condenser saturation temperature is lower than this setpoint for 10 consecutive minutes. Alarm initiates a normal shutdown of the unit. It automatically clears when the condenser saturated temperature is 5°F above this setpoint.
High Evaporator Temp		x	65	50	80	°F	The high temperature setpoint that determines when an evaporator saturation alarm is generated. Alarm is generated after the evaporator saturated temperature is higher than this setpoint for five consecutive minutes. If the unit is in compressor stage 1 when this occurs, the alarm forces the unit into compressor stage 2. Alarm automatically clears when the evaporator temperature is below this setpoint.
Low Evaporator Temp		x	5	0	20	°F	The low temperature setpoint that determines when an evaporator saturation alarm is generated. The alarm occurs when the evaporator saturated temperature is lower than this setpoint for 60 consecutive seconds. Alarm initiates a normal shutdown of the unit. It automatically clears when the evaporator saturated temperature is 5°F above this setpoint.
Min Pump On Time		x	30	0	20	seconds	This is the minimum amount of time that the pump must be on before the compressors can turn on. The pump request timer is used when heating or cooling is needed. It delays compressor operation by this amount of time to allow adequate supply water flow.
Max Suction Refrig Temp		x	90	70	110	°F	The unit exits the defrost mode when the suction refrigerant temperature is above this setpoint.
Max Discharge Refrig Temp		x	225	50	250	°F	The maximum discharge refrigerant temperature (DRT) setpoint that determines when a high DRT alarm is generated. The alarm occurs when the effective DRT is above the DRT setpoint high limit for longer than ten minutes or when the DRT is above 250°F. This causes the unit to immediately shut down. The alarm initiates a normal compressor shutdown. The alarm is cleared when the DRT drops below the setpoint value by 10°F. It requires a manual reset via ServiceTools, the network, or the LUI keypad display.
Compressor Shutdown Press		x	20	0	100	psi	The suction refrigerant pressure setpoint at which the compressor(s) shut off during a normal shutdown sequence. Shutdown occurs when the suction pressure is below this value.
Electronic Expansion Valve - DOAS WSHP							
Enable		x	-	-	-	-	Indicates if the electronic expansion valve operation is enabled.
Press Differential Threshold		x	1.6	0	5	-	For internal use only.
Calculated Press Ratio		x	-	-	-	-	For internal use only.
Proportional Error		x	-	-	-	-	The contribution to the electronic expansion valve signal provided by the proportional part of the PID calculation. See PID Loop Settings .
Integral Error		x	-	-	-	-	The contribution to the electronic expansion valve signal provided by the integral part of the PID calculation. See PID Loop Settings .
Derivative Error		x	-	-	-	-	The contribution to the electronic expansion valve signal provided by the derivative part of the PID calculation. See PID Loop Settings .

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Electronic Expansion Valve - DOAS WSHP							
Proportional Gain		x	5	0	1000	-	The PID loop proportional gain value used to control the electronic expansion valve. See PID Loop Settings .
Integral Gain		x	0.33	0	100	-	The PID loop integral gain value used to control the electronic expansion valve. See PID Loop Settings .
Derivative Gain		x	100	0	500	-	The PID loop derivative gain value used to control the electronic expansion valve. See PID Loop Settings .
Min Process Value		x	-14000	0	300000	hours	The minimum accumulated process value used for PID control of the electronic expansion valve. See PID Loop Settings .
Max Process Value		x	4500	0	5000	hours	The maximum accumulated process value used for PID control of the electronic expansion valve. See PID Loop Settings .
Accumulated Process Value		x	0	-20000	20000	-	The total accumulated process value used for PID loop control of the electronic expansion valve. It must be within the min/max accumulation value range. See PID Loop Settings .
Correction Process Value		x	0	-20000	20000	-	PID loop correction value process variable used for control of the electronic expansion valve. See PID Loop Settings .
Manual Mode		x	0	-	-	-	Indicates if the electronic expansion valve is in manual override. For internal use only.
Fan Points							
Fan Run Time		x	0	0	300000	hours	Configures the total fan run time. This parameter is used to reset the current run time hours back to zero hours after a new fan has been added or replaced.
Force PWM		x	0	1	101	%	Forces the PWM fan to the desired speed. For internal use only.

Table 8: Diagnostics, Con't.

Menu Item	Unit Ventilator	DOAS WSHP	Default Value	Description
Factory Configuration				
This section is intended to be a helpful reference for technicians to confirm that the correct configuration is loaded in the unit, and to verify that field modifications are correct before uploading the configuration to other units. It is recommended that you contact Daikin ATS Technical Response (TechResponseATS@daikinapplied.com or (315) 282-6434), for assistance before proceeding. You must click both the Save and Refresh buttons so that changes take effect. You can also switch to another screen and then return to this one to verify that the unit configuration has been updated. Requires at least Maintenance-level permission.				
Factory Config Str Cmd		x	None	ServiceTools can be used to display the unit code string values currently loaded in the controller or to make changes and display the new values. The two options include: Parameter to String = Creates an alphanumeric code string based on the values coming from the controller String to Parameter = Parses the values in the code string values that have been entered using ServiceTools and writes those values to the unit controller application
Product Category		x	W	W = WSHP
Model Type		x	GO	GO = DOAS
Configuration		x	V	V = Vertical H = Horizontal ¹
Unit Size		x	800	800 CFM 1200 CFM 1600 CFM 2400 CFM 3000 ¹ 3500 ¹ 4800 ¹
Voltage		x	F	F = 208-230/60/3 K = 460-60-3 L = See note ¹
Design Series (Vintage)		x	1	Revision / Design Series 1
Entering/Discharge Air		x	RF	FF = Front Return / Upblast Front Discharge ¹ FR = Front Return / Upblast Rear Discharge ¹ FT = Front Return / Top Horizontal Discharge ¹ RS = Right Hand Return / Straight Discharge ¹ RE = Right Hand Entering / End Discharge ¹ RF = Rear Entering / Upblast Front Discharge
Water Coil Type		x	B	B = Braized plate heat exchanger
Control Option 1		x	B	B = Standard controller with BACnet L = Standard controller with LonWorks module ¹ C = BACnet + wireless ¹ M = LonWorks + wireless ¹
Fan Motor Option		x	Single Torque	Single (not available on 2400 CFM units) Single CFM ¹ Dual (not available on 800 CFM units) Dual CFM ¹
Sound Package		x	B	B = Base package S = Sound package D = Doublewall panels ¹ T = Doublewall panels with sound package ¹
Preheat Options		x	00	00 = Preheat ready HH = Right-hand hydronic pre-heat coil, field piped HL = Left-hand hydronic pre-heat coil, field piped ¹
Filters and Racks		x	4	2 = Merv 8 in 2" frame with duct flange 4 = Merv 13 in 4" frame with duct flange 0 = No filter with duct flange
Piping Options		x	0	0 = None (read-only)
Not Used		x	0	NA (read-only)
Control Option 2		x	0	0 = None C = Outdoor Air CFM sensor ¹
Standard or Special		x	S	S = Standard X = Special
Transformer		x	75	75 = 75 VA transformer
Corrosion Protection		x	0	0 = None C = Corrosion protection
Disconnect Switch		x	0	0 = None D = Disconnect switch
Extended Warranty		x	Y	Y = None V = 1 Year Extended Compressor Only Parts W = 1 Year Extended Refrigerant Circuit Parts E = 1 Year Extended Complete Unit Parts C = 4 Year Extended Compressor Only Parts R = 4 Year Extended Refrigerant Circuit Parts P = 4 Year Extended Complete Unit Parts L = First Year Labor Allowance T = 4 Year Extended Complete Unit Parts Warranty with Labor Allowance

¹Code option displays in the drop-down menu but is not currently available.

Inputs (Offsets)

The Inputs (Offsets) tool is intended for technicians who are calibrating sensors during unit start-up and commissioning. If the sensor is not displaying the expected value, or if you need to adjust sensor accuracy, it may be necessary to add an offset to the physical reading from the sensor. This page is where you can make these adjustments. The sensor inputs available for calibration vary somewhat depending on unit type. See [Figure 25](#).

Contact Daikin ATS Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434 for troubleshooting or technical support before performing the calibration process.

NOTE: The correct sensor must be installed and functioning properly before inputs can be changed.

Descriptions of Values

System value: The current reading, or output, from the unit-installed sensor. The system value for each sensor is displayed next to each input.

Expected value: The desired sensor output.

Counts: Any non-zero number added manually (this can be done with ServiceTools or LUI keypad display) as an offset to the current system value.

- The input range for all sensor counts on this page is -1000 to 1000 for UV and -200 to 200 for DOAS WSHPs.
- All counts default to 0. This indicates an uncalibrated sensor reading. Once a count has been entered and saved, the field changes to reflect that offset value.

Calibration Process

Compare the actual sensor value on left to another sensor. If the system value displayed in ServiceTools is not as expected, enter a non-zero value and click Save. All new input values will refresh after a few seconds; reflecting the new calibration offset. Repeat as necessary until the input measurement matches the second (third-party or other calibrated) sensor.

A sensor is properly calibrated when the system value shown is the same as the expected value (i.e. reading from a second, calibrated sensor).

NOTE: Corresponding offsets are also adjustable from the LUI keypad display.

Figure 25: Inputs (Offsets) Screen (Unit Ventilator Shown)

This is the current reading (system value) from the unit sensor. To calibrate, add a count in the field to the right, press Save, and compare the new system value to the expected value from a calibrated sensor.

Inputs (Offsets)					
Setpoint Adjust	70.0 F	<input type="text" value="0"/>	Entering Water Temp	42.5 F	<input type="text" value="0"/>
System Mode	942 ct	<input type="text" value="0"/>	Indoor Coil Temp	43.7 F	<input type="text" value="0"/>
Fan Speed	42 ct	<input type="text" value="0"/>	Leaving Water Temp	72.2 F	<input type="text" value="0"/>
Space Temp	73.1 F	<input type="text" value="0"/>	Condensate Overflow	4088 ct	<input type="text" value="0"/>
Indoor Humidity	13.4 %	<input type="text" value="0"/>	CO2	1148 ppm	<input type="text" value="0"/>
Outdoor Humidity	32.4 %	<input type="text" value="0"/>	Outdoor Airflow	3301 CFM	<input type="text" value="0"/>
Discharge Air Temp	75.0 F	<input type="text" value="0"/>	Head Pressure	239.8 PSI	<input type="text" value="0"/>
Return Air Temp	64.1 F	<input type="text" value="0"/>	Line Voltage	2945 ct	<input type="text" value="0"/>
Outside Air Temp	78.1 F	<input type="text" value="0"/>			

Save Refresh

Press Save when finished making changes to view new sensor values

Press Refresh to revert back to previously unsaved values

Click System Info to expand a quick view of current unit settings

PID Settings

The unit controller relies on PID loop control to maintain certain setpoints. Technician-level users have access to these parameters from the [PI Settings](#) page (Figure 26). Descriptions of the PID-adjustable parameters are provided in [Table 9](#).

Before making changes, it may be helpful to first review the next section ([Overview of PID Loop Control](#)) as it describes how PID loop strategy is implemented by the UV and DOAS unit applications.

Figure 26: PI Settings Screen

The screenshot displays the 'PI Settings' interface for a 'Unit Ventilator'. The interface is organized into two main columns: 'Heating' and 'Fan'. Each column contains several adjustable parameters with input fields and dropdown menus. Below these columns are two buttons: 'Save' and 'Refresh'. Two callout boxes with arrows point to these buttons, providing instructions: 'Press Save when finished making changes' and 'Press Refresh to revert back to previously unsaved values'. The top of the screen shows the 'DAIKIN' logo, 'Unit Ventilator' title, connection status 'Ports: USB Serial Port (COM5)', and 'Online' status. A navigation bar at the top includes 'Home', 'Configuration', 'Tools', and 'Alarms' tabs, along with 'Sign Out' and 'Current User: Technician'.

Parameter	Value
Emergency Heat Setpoint	40.0
Emergency Heat Enable	Enable
Heating Proportional Gain	0.50
Heating Integral Gain	0.02
Heating Min Position	0.0 %
Heating Max Position	100.0 %
Heating Max Delta Temp	5.0 F
Electric Heat Proportional Gain	8.0
Electric Heat Integral Gain	0.5
CO2 Proportional Gain	0.1
CO2 Integral Gain	0.01
Single Zone Max Delta Temp	5.0 F
Single Zone Min Fan Speed	5 %
Single Zone Max Fan Speed	100 %
Single Zone Proportional Gain	0.10
Single Zone Integral Gain	0.01

Overview of PID Loop Control

The adjustable parameters associated with the Proportional – Integral (PID) control loop are:

Kp = Proportional gain
 Ki = Integral gain factor
 Kd = Derivative gain

When the unit is properly sized for the space, the default settings for these parameters provide the best control action for all the various operating conditions. However, you may need to fine-tune the system for maximum performance (response time) using the proportional and integral gain settings. In the event of a field issue, these parameters must be set back to the original default settings.

In general, these gain factors work in the following way: The overall demand in a PID loop system is made up of three distinct parts — the proportional, integral, and derivative. Each of these parts is calculated and then multiplied by its corresponding gain factor. These gain factors are the setup variables you can access from the PI Settings menu. By making a gain factor larger, you increase its overall influence on system demand. Once each PID component is multiplied by its gain factor, all three terms are added together to determine the overall demand percentage.

Terminology

Proportional Gain (Kp): Or proportional action, causes the controlled output to change in proportion to the magnitude of the present error amount. Error is the difference between the sensors present value and the set point. When the Kp setting is too low, the process variable (PV) response will change too slowly. When the Kp setting is too high, the process variable response will excessively overshoot and possibly oscillate around the setpoint (SP). If faster system response is desired, increase the Kp setting. Make small, incremental adjustments to the proportional gain setting to avoid system instability.

Integral Gain (Ki): Or integral action, accumulates the error amounts and causes the controlled output to approach the setpoint over time in an attempt to eliminate any system offset. The higher the integral (Ki) setting, the more the integral effects the process under control. When the Ki setting is too high, the process variable (PV) oscillates around the setpoint. When the Ki setting is too low, the process variable does not reach the setpoint.

Derivative Gain (Kd): Or derivative action, accounts for the rate of change of the error and causes the controlled output to react more or less quickly depending on the rate. The inverse of the rate of change in the error is used so that when the rate of change is small, the derivative output is larger, speeding up the system response time. The higher the derivative (Kd) setting, the more the derivative effects the process variable (PV) under control. When the Kd setting is too high, small amounts of random noise can cause the system to over correct increasing wear on the devices. When the Ki setting is too low, the process variable may not be able to react as quickly as desired.

NOTE: The Kd portion of PID loop control applies only to DOAS WSHPs.

- **Control Variable (CV):** The parameter that is controlled is the Control Variable (CV).
- **Process Variable (PV):** The parameter that reacts to a Control Variable change is the Process Variable (PV). It is the measured analog input reading.
- **Setpoint (SP):** Desired target value.
- **Error:** Value is calculated one of two ways depending on the PI blocks fixed action type.
- **Direct Acting PI (Cooling):** Error = PV – SP
- **Reverse Acting PI (Heating):** Error = SP – PV
- **Sum of Errors:** Summation of all past errors. To prevent integral wind-up, the integral error summation is suspended when PI output reaches 100%.

Output Formula

$$(Kp * Error) + (Ki * Sum of Error) + (Kd * (1/Change in Error))$$

Table 9: PI Settings Details

Parameter	Unit Ventilator	DOAS WSHP	Default Value ¹	Minimum Value	Maximum Value	Units	Description
Heating - UV							
Emergency Heat Setpoint	x		54	0	70	°F	The emergency heating setpoint is used to determine when the unit can enter the emergency heat state. This happens when the control temperature is below the emergency heat setpoint and emergency heat is enabled.
Emergency Heat Enable	x		Enable	-	-	-	Disables the unit from entering the emergency heat state.
Heating Proportional Gain	x		0.5	0	255	-	The proportional gain value of the PI loop configuration used to control the modulating hot water valve function.
Heating Integral Gain	x		0.02	0	255	-	The integral gain value of the PI loop configuration used to control the modulating hot water valve function.
Heating Min Position	x		0	0	100	%	The modulating hydronic hot water valve minimum position.
Heating Max Position	x		100	10	100	%	The modulating hydronic hot water valve maximum position.
Heating Max Delta Temp	x		5	1	10	°F	The value used to determine the hydronic hot water valve position. It reflects the difference between the discharge air temperature and discharge air setpoint that causes the valve to open to 100%.
Electric Heat Proportional Gain	x		8	0	255	-	The proportional gain value of the PI loop configuration used to control electric heat function.
Electric Heat Integral Gain	x		0.5	0	255	-	The integral gain value of the PI loop configuration used to control electric heat function.
Cooling - UV							
Cooling Proportional Gain	x		0.5	0	255	-	The proportional gain value of the loop configuration used to control modulating hydronic chilled water valve function.
Cooling Integral Gain	x		0.02	0	255	-	The integral gain value of the PI loop configuration used to control the modulating hydronic chilled water valve function.
Cooling Min Position	x		0	0	100	%	The modulating hydronic chilled water valve minimum position when the difference between the discharge air temperature and the discharge air chilled setpoint equals 0.
Cooling Max Position	x		100	10	100	%	The modulating hydronic chilled water valve maximum position.
Cooling Max Delta Temp	x		5	0	10	°F	The value used to determine the hydronic chilled water valve position. It reflects the difference between the discharge air temperature and discharge air setpoint that causes the valve to open 100%.
Fan - UV							
CO ₂ Proportional Gain	x		0.1	0	255	-	The proportional gain value of the PI loop configuration used to control the outside air damper for CO ₂ /demand control ventilation.
CO ₂ Integral Gain	x		0.01	0	255	-	The integral gain value of the PI loop configuration used to control the outside air damper for CO ₂ /demand control ventilation.
Single Zone Max Delta Temp	x		5	1	10	-	This value determines the fan output for single-zone VAV units. It reflects the difference between the control temperature and the effective setpoint that triggers maximum fan output.
Single Zone Min Fan Speed	x		5	0	100	%	Reflects the minimum fan speed for single-zone VAV units.
Single Zone Max Fan Speed	x		100	0	100	%	Reflects the maximum fan speed for single-zone VAV units.
Single Zone Proportional Gain	x		0.1	0	255	-	The proportional gain value of the loop configuration used for fan control function of single-zone VAV units.
Single Zone Integral Gain	x		0.01	0	255	-	The integral gain value of the PI loop configuration used for fan control function of single-zone VAV units.
Dampers - UV							
Face & Bypass Proportional Gain	x		10	0	255	-	The proportional gain (Kp) value of the PI loop configuration used to control the face and bypass damper function.
Face & Bypass Integral Gain	x		1	0	255	-	The integral gain (Ki) value of the PI loop configuration used to control the face and bypass damper function.
OA Damper Proportional Gain	x		2	0	255	-	The proportional gain value of the PI loop configuration used to control the low limit outdoor damper position when the unit is in low limit.
OA Damper Integral Gain	x		0.2	0	255	-	The integral gain value of the PI loop configuration used to control the control the low limit outdoor damper position when the unit is in low limit.

Table 9: PI Settings, Con't.

Parameter	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Economizer - UV							
Economizer Proportional Gain	x		1	0	255	-	The proportional gain value of the PI loop configuration used to control the outdoor damper position when the unit is in economizer mode and free cooling is available.
Economizer Integral Gain	x		0.1	0	255	-	The integral gain value of the PI loop configuration used to control the outdoor damper position when the unit is in economizer mode and free cooling is available.
Hot Gas Reheat Valve - DOAS WSHP							
Proportional Gain		x	5	0	1000	-	The proportional gain value of the PI loop configuration used to control the pressure switch to turn off/on water to the unit in hot gas reheat mode.
Integral Gain		x	0.33	0	1000	-	The integral gain value of the PI loop configuration used to control the pressure switch to turn off/on water to the unit in hot gas reheat mode.
Derivative Gain		x	100	0	1000	-	The derivative gain value of the PI loop configuration used to control the pressure switch to turn off/on water to the unit in hot gas reheat mode.
Building Static Pressure - DOAS WSHP							
Proportional Gain		x	1	0	255	-	The proportional gain value of the PI loop configuration used to control the building static pressure (BSP) when the unit is configured for BSP fan control.
Integral Gain		x	0.5	0	255	-	The integral gain value of the PI loop configuration used to control the building static pressure (BSP) when the unit is configured for BSP fan control.
Duct Static Pressure - DOAS WSHP							
Proportional Gain		x	1	0	255	-	The proportional gain value of the PI loop configuration used to control the duct static pressure (DSP) when the unit is configured for DSP fan control.
Integral Gain		x	0.5	0	255	-	The integral gain value of the PI loop configuration used to control the duct static pressure (DSP) when the unit is configured for DSP fan control.

¹The default values are based on unit type selected. These are the defaults the application uses when first downloaded into a new controller.

Network Communication Inputs

The Network Inputs page (Figure 27) allows access to selected I/O provided by the controller that can be configured for BAS communication.

Before proceeding, be aware that ServiceTools is not intended to replace a BAS. However, the user interface can be an efficient way to set some of the most common network-supported values for use by the controller (Table 10).

In general, the options available are the most important sensor inputs and configuration settings required during initial unit start-up and commissioning. Changes to this page require Technician-level access. Sensors must be installed, configured and functioning as expected before the respective menu item is enabled (see Configuration).

Changes made in ServiceTools overrides the last values saved from either the LUI keypad display or the BAS.

Figure 27: Network I/O Screen

Press Reset to return to a null/invalid value, which causes the value to be ignored

The screenshot shows the 'Network Inputs' configuration page in the DAIKIN ServiceTools interface. The page is titled 'Unit Ventilator' and shows a 'Ports: USB Serial Port (COM5)' dropdown, a 'Disconnect' button, and an 'Online' status indicator. The navigation bar includes 'Home', 'Configuration', 'Tools', and 'Alarms'. The main content area lists 20 network input parameters, each with a dropdown menu and a 'Reset' button. The parameters are:

Network Setpoint	- F	Reset	Space CO2	- ppm	Reset
DAT Cooling Setpoint	- F	Reset	Entering Water Temp (EWT)	- F	Reset
DAT Heating Setpoint	- F	Reset	DAT Reheat Set Point	- F	Reset
Set Point Offset	- F	Reset	Application Mode	Invalid	
Fan Speed	- %	Reset	Occupancy Sensor	Null	
Occupy Cool Setpoint Shift	- F	Reset	Occupancy Manual Command	Null	
Standby Cool Setpoint Shift	- F	Reset	Energy Hold Off	Null	
Occupy Heat Setpoint Shift	- F	Reset	Emergency Override	Invalid	
Standby Heat Setpoint Shift	- F	Reset	Reset Filter	None	
Min Outdoor Air Damper Pos	- %	Reset	Auxiliary Heat Enable	Null	
Space Temp	- F	Reset	Economizer Enable	Null	
Outdoor Air Temp (OAT)	- F	Reset	Compressor Enable	Null	
Outdoor Relative Humidity	- %	Reset	Occupancy Schedule	Null	
Space Relative Humidity	- %	Reset			

At the bottom of the screen are two buttons: 'Save' and 'Refresh'. Callouts explain their functions:

- Press Save when finished making changes
- Press Refresh to revert back to previously unsaved values

Table 10: Network I/O Details

Parameter	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Network Setpoint	x		- ¹	-40	212	°F	Configures the network reference setpoint in occupied, unoccupied, standby, and bypass modes. It determines the effective temperature setpoint when provided with a valid input. ²
		x	- ¹	-40	212	°F	Configures the discharge air temperature (DAT) setpoint value when provided with a valid input. Not used.
DAT Cooling Setpoint	x		- ¹	-40	212	°F	Configures the network DAT cooling setpoint value when provided with a valid input. ²
DAT Heating Setpoint	x		- ¹	-40	212	°F	Configures the network DAT heating setpoint value when provided with a valid input. ²
DAT Reset		x	- ¹	40	90	°F	Configures the DAT reset setpoint value. ² Applies when the cooling reset select and heating reset select setpoint values are within the valid range and are configured for network control.
Set Point Offset	x		- ¹	-3	3	°F	Configures the temperature setpoint offset input. Shifts the occupied and standby effective setpoints via the network. The unoccupied effective setpoints are not affected.
Fan Speed	x	x	- ¹	0	100	%	Configures the fan speed override network input value. ²
Occupy Cool Setpoint Shift	x		- ¹	-18	18	°F	Configures the network input for the occupied cooling setpoint shift value. Shifts the effective setpoint via the network.
Standby Cool Setpoint Shift	x		- ¹	-18	18	°F	Configures the network input for the standby cooling setpoint shift value. Shifts the effective setpoint via the network.
Occupy Heat Setpoint Shift	x		- ¹	-18	18	°F	Configures the network input for the occupied heating setpoint shift value. Shifts the effective setpoint via the network.
Standby Heat Setpoint Shift	x		- ¹	-18	18	°F	Configures the network input for the standby heating setpoint shift value. Shifts the effective setpoint via the network.
Min Outdoor Air Damper Pos	x		- ¹	0	100	%	Configures the network minimum outdoor air damper position. It overrides the minimum damper position set by the fan speed or the effective space CO ₂ value.
Space Temp	x		- ¹	-14	122	°F	Configures the space temperature setpoint value from the network in lieu of a local temperature sensor. ²
		x	- ¹	-40	212	°F	
Outdoor Air Temp (OAT)	x	x	- ¹	-40	212	°F	Configures the space temperature value from the network in lieu of a local temperature sensor. A valid network input overrides the local sensor input. ²
Outdoor Relative Humidity	x	x	- ¹	0	100	%	Configures the network outdoor relative humidity input. It is used to set the effective outdoor humidity value. ²
Indoor/ Space Relative Humidity	x	x	- ¹	0	100	%	Configures the network indoor relative humidity input. It is used to set the effective outdoor humidity value. ²
Space CO ₂	x		- ¹	0	2000	ppm	Configures the network space CO ₂ input. It is used to set the effective space CO ₂ value. ²
		x	- ¹	0	5000	ppm	
Entering Water Temp (EWT)	x	x	- ¹	-40	212	°F	Provides the entering water temperature (EWT) value to the network. ²
DAT Reheat Setpoint	x		- ¹	-40	212	°F	Configures the network discharge air temperature setpoint when the unit is in reheat/dehumidification mode. ²
Application Mode	x	x	Invalid	-	-	-	Configures the network command that sets the operating mode of the unit. The application mode does not "force" the unit into any state. However, it does disable certain unit operations. Applies when the local LUI keypad display is configured for Auto or is invalid. ²
Occupancy Sensor	x	x	Null	-	-	-	Configures the network command used to indicate the presence of occupants in the space (motion detection). ²
Occupancy Manual Command	x	x	Null	-	-	-	Configures the network command to override the effective occupancy output. ²
Energy Hold Off	x		Null	-	-	-	Configures the network command to enable the unit to enter the energy hold off mode. Energy hold off prevents the unit from heating and cooling, thus allowing it to protect the space from temperature extremes. When energy hold off is enabled, heating is not provided unless the space temperature exceeds the emergency heat setpoint. With the exception of free cooling, it does not allow for cooling operation.

Table 10: Network I/O, Con't.

Parameter	Unit Ventilator	DOAS WSHP	Default Value	Minimum Value	Maximum Value	Units	Description
Emergency Override	x		Invalid	-	-	-	Configures the network to command the unit into an emergency (non-normal) mode. Overrides the local emergency mode if configured from the LUI keypad display. ²
Reset Filter	x	x	None	-	-	-	Enables the network to clear the change filter alarm.
Auxiliary Heat Enable	x		Null	-	-	-	Enables the network to command auxiliary heat. ²
Economizer Enable	x		Null	-	-	-	Enables or disables economizer operation. Overrides the local economizer enable if configured from the LUI keypad display. ²
Compressor Enable	x	x	Null	-	-	-	Disables compressor heating and cooling from the network. A Null value indicates the compressor(s) is enabled. ²
Occupancy Schedule	x	x	Null	-	-	-	Enables the network to command the unit into different occupancy modes. ²
Heat/Cool State		x	None	-	-	-	Enables the network command to set the unit mode of operation from the room sensor. Applies if sensor is installed and configured correctly.

¹The null value indicates that a sensor is not installed, the sensor is unreliable, or when the unit controller is not using a value within the acceptable range.

²The network override reverts back to its default value (Null/Invalid) upon unit controller reboot.

Manual Override

The Manual Override page is where you can put the hardware into a startup mode to manually override individual outputs. This is helpful when verifying wiring during unit installation, service, or for performing advanced troubleshooting.

An override is independent of the unit controller application. It does not lose the original value.

An override reset delay provides a 30-minute countdown timer that is set whenever an output is overridden. When the timer expires, override control is relinquished and the value automatically returns to its default. The reset delay is an added safety feature in the event an override is not released.

NOTE: Overrides can only be made using ServiceTools, and requires Technician-level access.

UV Overrides

There is an override for each digital, analog, and PWM output (Figure 29) supported by the UV application. This includes individual fan speeds, reversing valve control (on or off), pump control, electric heat, and controller operation.

DOAS WSHP Overrides

There is an override for each digital, analog, and PWM output (Figure 30) supported by the DOAS WSHP application. This includes HGR and reversing valves, preheat, energy recovery, and damper control. Certain outputs such as EEV and compressor control do not support the manual override option. These outputs are displayed, but are read-only. This

is because of the risk for potential damage to the unit or end devices.

Once the Manual Override button is pressed from the Tools menu, a caution message appears (Figure 28). Select Yes to proceed to the Manual Override main menu.

NOTE: Proceed with caution before implementing any overrides. The unit controller does not have safeties to prevent potential unit damage.

Figure 28: Caution - Overriding Outputs



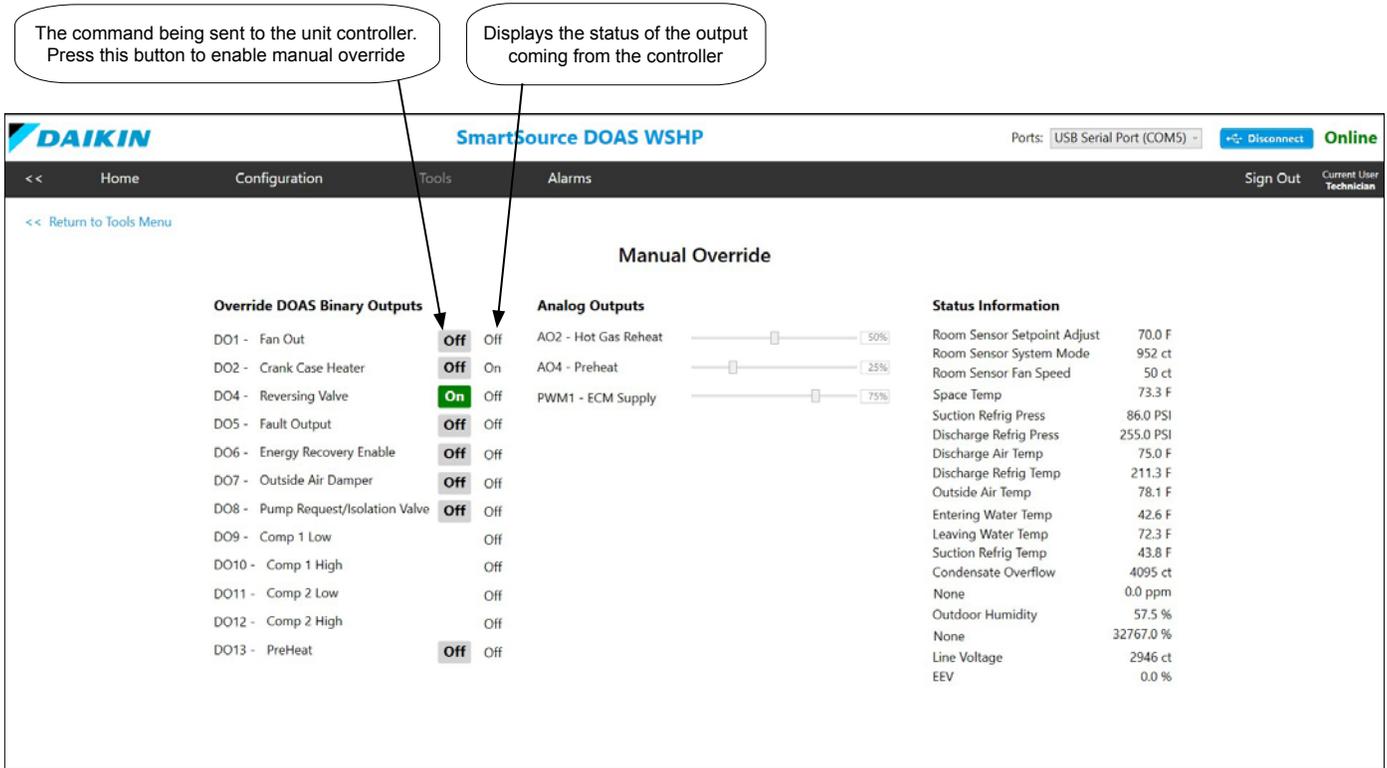
Figure 29: Manual Override Screen - Unit Ventilator

This is the command being sent to the unit controller. Pressing this button enables manual override.

This displays the status of the output coming from the controller.

Override Binary Outputs		Analog Outputs		Input Status Information	
DO1 - Fan Low	Off	OA Damper	0%	Discharge Air Temp	57.5 F
DO2 - Fan Med	Off	FB Damper	0%	Return Air Temp	61.5 F
DO3 - Fan High	Off	Cooling Valve	0%	Outdoor Air Temp	51.6 F
DO4 - Hot Water EOC	Off	Heating Valve	0%	Outdoor Air Coil	32767.0 F
DO5 - Fault Output	Off	Ecm Supply	0%	Lvg Water Temp	45.4 F
DO6 - None	Off	Ecm Cond Fan	0%	Indoor Air Coil	51.0 F
DO7 - None	Off			Cond Overflow	4088 ct
DO8 - None	Off			CO2 Counts	924 ppm
DO9 - None	Off			Setpoint Adjust	32767.0 F
DO10 - None	Off			RS System Mode	4095 ct
DO11 - None	Off			RS Fan Speed	4095 ct
DO12 - None	Off			Space Temp	32767.0 F
DO13 - None	Off			Indoor Humidity	31.5 %
DO14 - None	Off			Outdoor Humidity	59.7 %
				Line Voltage	2905 ct

Figure 30: Manual Override Screen (DOAS WSHP Shown)



Override Outputs

Outputs are commanded to “Off” by default. All manual overrides are removed once you leave this page and the unit controller returns to normal operation. To command each output:

Binary Outputs

1. Click the gray Off button next to the desired output (this is the command being sent to the unit controller.)
The button turns green and the output automatically changes to an On status. This confirms the output has been overridden.
2. Verify the On status in the column to the right (this displays the status of the output coming from the unit controller.)

NOTE: Before enabling controller operation on air-source UV units, make sure outdoor fan (DO6) and the correct indoor fan (DO1, DO2 or DO3) are On.

Analog Outputs

1. Select the slider bar next to the desired analog output. Allow a few moments for a response.
2. Shift the slider bar to the right. This commands the output to the desired value, based a range of 0-100%.
3. The box to the right of each output has a label that defaults to 0%. Verify that this % value changes based on the slider position. This is the command being sent from the controller to the end device.

NOTE: For UVs, DO1 Fan Low must be energized for the ECM Supply Fan output to affect fan operation.

Input Status Information

Displays the current status of all sensor inputs to the unit controller. The input status provides live feedback from the unit controller as a result of overrides being made to the outputs. It is used to monitor the effects of the commanded outputs on the overall system.

NOTE: The value displays None if sensor is not installed or configured.

Refer to the Configuration section, [Table 7: Configuration Details](#) for descriptions of all digital and analog outputs that support manual override. Note that outputs for the UV and DOAS WSHP are listed separately.

Troubleshooting and Support

USB Connection Errors

- Verify that the unit is turned on and that the USB cable is properly connected.
- Confirm that the cable being used is USB Type A Male to Type A Male.
- Open up the Device Manager. Verify that the USB port where the device is connected is being identified by Windows under Ports (COM and LPT).
- If this port is not being detected by Windows, restart your laptop and check again.
- If the port is still not being detected, reinstall ServiceTools and make sure the steps to extract and install the FTDI drivers are being followed during the installation process.

Confirm Power

Verify power source. The controller can receive power from either the 24 VAC on-board supply (if the unit is running) or when connected to a laptop with ServiceTools.

FTDI Conflicts

Occasional errors can occur if a device connected to a USB port also has the name "FTDI". If this is discovered on a laptop, unplug all other USB devices and restart the laptop.

Network Issues

Be very cautious about using the Network, and especially the Network I/O, pages. The Network I/O screen is used to simulate writing values from the network to the device. However, using this to run a simulation and not resetting the values to defaults when done could cause issues with I/O on the device and/or issues with the network.

Unit Controller LED Activity

Table 11 describes the active LEDs on the unit controller and their behavior under different conditions. See Figure 31 - Figure 33 for communication and download status with LED activity.

Table 11: Description of LED Activity

Condition	Expected LED Sequence	Notes
Power-up	Four LEDs are busy for approximately two seconds Heartbeat = blinking rapidly for approximately five seconds and then enters pattern.	This sequence occurs immediately after connecting the USB cable from unit controller to the laptop.
Downloading unit controller application software	PWR = steady green Heartbeat = blinking blue (0.5 sec on / 0.5 sec off) approximately once per second TX = rapid blinking yellow if not connected to BACnet. Varied blinking rate if connected to BACnet	
No application code or bootloader has been loaded	PWR = steady green Heartbeat = dim blue	See Figure 31

Figure 31: No Application Loaded



Figure 32: Application Loaded but no Bootloader

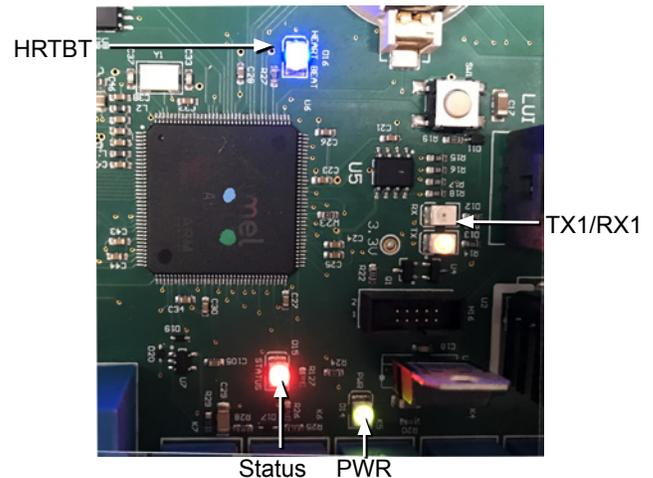
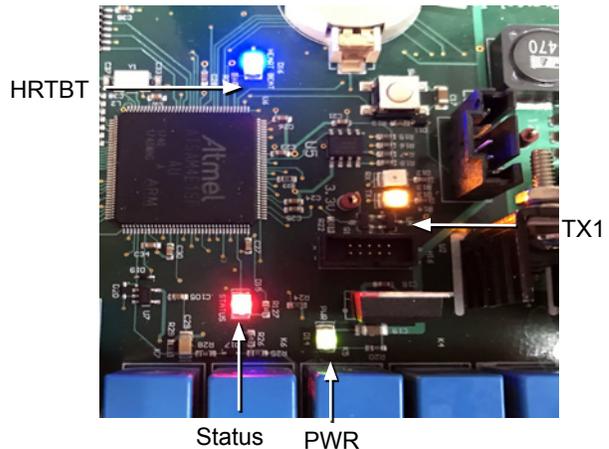


Figure 33: Wrong Application Loaded



Technical Support

For ServiceTools installation and use, unit operation and unit controller support, contact Daikin Applied Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434.



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