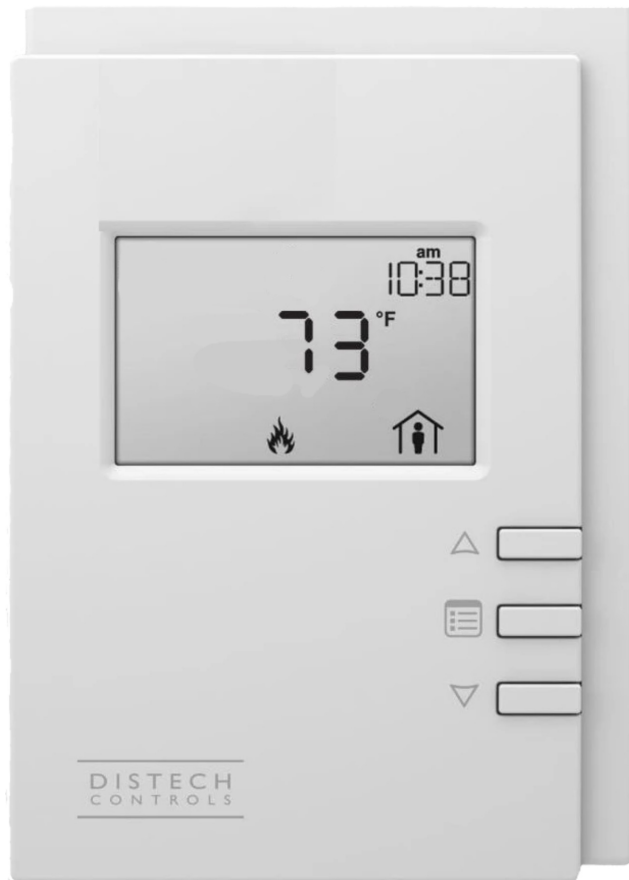


UC-3 *HTLV* User Guide



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WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.

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

A Note About Custom Designs

AbsolutAire often builds equipment with special features as requested by the customer. This manual only covers standard features and does not include any changes made for special feature requests by the customer.



Table of Contents

A Note About Custom Designs	1
Introduction	3
Operation	3
Schedule	5
Menu Tree	7
Main Display	7
Quick Access	7
Set Points	7
Status	7
Schedule	8
Alarms	9
Config	10
Advanced Menu	10
Network Integration	11

Images

Warning	1
HMI Screen Information	3
Sensor Alarm Display	4

Tables

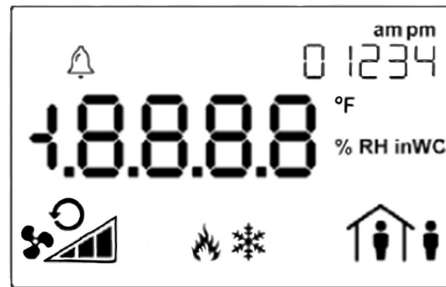
Network Points List	12
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Introduction

The Smart-View User Interface (UI) for the UC-3 HTLV Control System displays the information necessary to operate and diagnose the Heating and Ventilating Unit.

This is connected to the controller via a CAT-5E cable with a maximum length of 600 feet.



HMI Screen Information

At the top left corner of the display there is a bell symbol. This is the system alarm indicator. If an alarm is present in the unit this indicator will blink. If no alarm is present this indicator will not be visible. At the top right of the display is instructions for turning the unit on/off as well as menu/sub-menu options names. When navigating the menu, the menu title will be displayed here. Across the center of the display is the data with the units of measure. The system is capable of displaying up to 4 decimal places. At the bottom left is the fan status. In the bottom center is the mode of operation and at the bottom right is the occupancy status.

Three buttons are available for operation (see cover page). The center button allows you to access the menu and scroll through the menu items. The up/down buttons are used to change values.

Operation

The system displays the current Space Temperature when idle. The menu is separated into sub-menus for ease of use, and only the options the unit is equipped with will be displayed. When navigating the menu blinking items are set points that can be changed, while non-blinking items are status objects which can be viewed only.



To turn the unit on or off, press the “up arrow” to access the Fan Command. Use the “up arrow” to select the desired option, then press the center button “menu” to return to the main display.

To change set points such as temperature or building pressure, press the “menu” button until you see “SET POINTS” in the top right of the screen. Press the “up arrow” to enter this sub-menu. Your first choice will be “mode”. Use the up arrow to select “heat or vent” (unless the unit has air conditioning, in which case the choices will be “heat/cool/air”). When you have made your choice, press the “menu” button to move to the next menu item, which will be the Occupied Set Point. Again, use the “up/down” arrow buttons to make your entry and press “menu” when finished. Continue scrolling through the Set Points sub-menu until all of your desired settings are completed. When scrolling the menu and you see the option “BACK” in the top right, pressing the “up arrow” will take you to the previous menu.

Scrolling through the “STATUS” sub-menu will allow you to view the status of all of the unit sensors and burner operation. This is useful for checking unit operation or outdoor conditions.

The “ALARMS” menu will only be displayed if there is a system alarm, as indicated by the blinking alarm bell on the display. When an alarm is present, scrolling through this sub-menu will allow you to view the alarm(s) in “plain English” enumerated text. This is useful for diagnosing the unit in the event of a problem.



Sensor Alarm Display



The “SCHEDULE” will be described later. This is a 7-day occupancy schedule used for the purpose of temperature or operation changes during unoccupied times.

The “CONFIG” menu is where the primary operating set points for the unit are set such as the minimum and maximum allowable discharge temperatures, as well as other items. Again, use the “menu” button to scroll through the sub-menu and the “up/down” buttons to edit your selection.

Schedule

The programmable 7-day occupancy schedule has the ability to set occupied and unoccupied times for a standard week, as well as five individually programmable special events which will override the weekly schedule.

The special event programming monitors the current year, as well as the month being programmed, to prevent invalid days from being programmed as a special event (for example April 31st or February 30th). The system also monitors for leap years so February can have either 28 or 29 days programmed.

Occupancy status is indicated by the occupancy icon in the lower right corner of the HMI screen. A steady icon indicates the system is following the standard 7-day schedule, while a blinking icon indicates the system is following a day programmed as a special event.

To program the 7-day schedule, press the “menu” button until “SCHEDULE” appears in the top right of the display. Press the “up arrow” to enter the schedule.

The first section is the “WEEKLY SCHEDULE”. Press the “up arrow” to enter the weekly schedule. Select the “DAY OF WEEK” to be programmed, with Monday being Day 1. Press “menu” to navigate to “OCC HOUR”. Use the up/down arrows to select the occupied hour, in 24-hour format, and press “menu” to confirm. Press “menu” again to navigate to “OCC MINUTE” and use the up/down arrows to select the occupied minute and press “menu” to confirm. Continue to set the “UNOC HOUR” and “UNOC MINUTE” for this day, then select the next day to program. Leaving the hours and minutes set to “0” for a day will leave that day un-programmed and the system will assume an occupied status for that day.

When finished with the WEEKLY SCHEDULE select “BACK” to return to the menu and program SPECIAL EVENTS if desired.



Special events are used to override the weekly schedule and either keep a facility occupied for an event such as inventory or an important meeting, or to keep a facility unoccupied on a holiday when the building will remain empty.

To program special events, press the “menu” button until “SCHEDULE” appears in the top right of the display. Press the “up arrow” to enter the schedule.

Press “menu” until “SPECIAL EVENTS” appears in the top right of the display. Press the “up arrow” to enter the special event programming menu.

Special events are programmed based on the month and day of the month you wish to program as a special event. Leaving a month and day set to “0” will leave that event un-programmed.

The first option will be the “EVENT NUMBER”. Select the event desired event number (1 - 5) and press “menu” to navigate to “EVENT MONTH”. Select the desired month (1 - 12) and press “menu” to confirm. Press “menu” to navigate to “EVENT DAY”. Select the desired day of the month (1 - 28/29/30/31 as allowed) and press “menu” to confirm.

Press “menu” to navigate to “OCC HOUR”. Select the occupied hour/minutes as well as the unoccupied hours/minutes in the same fashion as programming the weekly schedule.

When finished, either select the next event number to be programmed, or select “BACK” to return to the previous menu.

To remove a special event, set the event month and day to “0”.

Once the schedule is set, the unit will follow the occupied and unoccupied temperature set points for each day as well as any special events.



Menu Tree

When viewing menu tree options, the standard convention is:

Point Name (as listed on the HMI) [**BACnet ID**] **R** or **R/W** (read only or read/write).

Example:

Space Temp [AV33] R

Main Display

Space Temp [AV33] R – Current space temperature at the User Interface (or remote space temperature sensor if equipped).

Quick Access

Fan Command [MSV51] R/W – This is accessed by pressing the “up arrow” from the main screen and is used to turn the unit ON and OFF. The unit will cycle on and off to maintain space temperature by supplying the temperature of air defined in the CONFIG menu.

Set Points

Mode [MSV53] R/W – This is the mode of operation. Select “Heat” or “Vent” as desired (if the unit has cooling installed the choices will be “Heat/Cool/Air”)

Occ Set Point [AV51] R/W – Occupied Heat Set Point.

Unoc Set Point [AV52] R/W – Unoccupied Heat Set Point (only available if the unit has scheduling as an option).

Burner Reset [MSV54] R/W – Burner reset command for use during a burner lockout alarm. This is an “on/_on_” toggle selectable via the “up arrow” button.

Status

Space Temp [AV33] R – Current space temperature at the User Interface (or remote space temperature sensor if equipped).

Outside Temp [AV34] R – Current outside air temperature.

Discharge Temp [AV35] R – Current discharge air temperature.

Heat Command [AV32] R – Current command (0% - 100%) issued to the burner for heat.



Schedule (only visible if the unit has scheduling)

Manual Occupancy - Allows the ability to force Occupied or Unoccupied modes, or to have the system follow the programmed schedule.

Weekly Schedule

Day of Week – Schedule day to be programmed.

Occ Hour – Occupied hour to be programmed. This is the hour (in 24 hour format) that the unit will assume occupied status.

Occ Minute – Occupied minute to be programmed. This is the minute of the hour the unit will assume occupied status.

Unoc Hour – Unoccupied hour to be programmed. This is the hour (in 24 hour format) that the unit will assume unoccupied status.

Unoc Minute – Unoccupied minute to be programmed. This is the minute of the hour the unit will assume unoccupied status.

Special Events

Event Number - The schedule supports up to five special events. This is the event number to be programmed

Event Month - Month of the year the special event is in.

Event Day - Day of the month the special event is on.

Occ Hour – Occupied hour for the special event. This is the hour (in 24 hour format) that the unit will assume occupied status.

Occ Minute – Occupied minute for the special event. This is the minute of the hour the unit will assume occupied status.

Unoc Hour – Unoccupied hour for the special event. This is the hour (in 24 hour format) that the unit will assume unoccupied status.

Unoc Minute – Unoccupied minute for the special event. This is the minute of the hour the unit will assume unoccupied status.



Alarms (alarm menu is only visible if an alarm is present)

Space Sensor [MSV8] R – Space sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring.

Outside Sensor [MSV9] R – Outside sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring.

Discharge Sensor [MSV10] R – Discharge sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring.

Burner Lockout [MSV12] R – Burner lockout alarm status. Indicates the burner failed to light when requested. Enumerated “normal/lockout”.

Low Temp Alarm [MSV14] R – Low temperature lockout alarm. This is an indication that the unit was discharging air colder than the “Low Temp Alarm” setting in the “Config” menu for greater than “Low Temp Time” minutes. Check the burner for proper operation.

Dirty Filter [MSV13] R – Dirty filter indication (only available if the unit has dirty filter monitoring as an option).

Motor Alarm [MSV11] R – Motor not responding alarm status. This indicates the unit was enabled and the supply fan motor failed to start within two minutes. Check VFD or overload (as available), OA damper limit switch and wiring, and power.

Burner Response [MSV6] R - Indicates the burner was commanded to light and the controller did not receive confirmation.

Burner Watchdog [MSV7] R - Indicates the burner did not reach the requested discharge temperature within 5 minutes. Possible problem with gas pressure or gas valves.

Hardware Override [MSV1 - MSV5] R - Indicates a hardware point was overridden by the building management system. As all control points are available to the network, overrides are unnecessary. Remove the override to clear the alarm.



Config

Heat Lockout [AV59] R/W – Heating mild weather stat setting. When the outside or mixed air temperature is above this setting the burner will be automatically disabled (only available if the unit has mild weather stat as an option).

Control Deadband [AV58] R/W - Space temperature deadband for cycle on/off control.

Discharge Set Pt [AV53] R/W - Discharge temperature set point for heating mode.

Min Discharge [AV54] R/W – The units minimum allowable discharge temperature.

Max Discharge [AV55] R/W – The units maximum allowable discharge temperature.

Low Temp Set Pt [AV56] R/W – If the unit discharges air below this temperature set point for “Low Temp Time” minutes it will shut down and close the isolation dampers (Only available if LTL is available).

Low Temp Minutes [AV57] R/W – The time delay (in minutes) for the “Low Temp Alarm” (Only available if LTL is available).

Advanced Menu (Press and hold “menu” button for 5 seconds to enter)

Date Time

Year – Set the real time clock year.

Date – Set the real time clock date.

Time – Set the real time clock time.



Network Integration

The controller in this unit can easily be integrated into a BACnet MS/TP Building Management System. The controller will automatically detect the baud rate of the network it is connected to after a power cycle, and will automatically begin communications.

The MAC Address is set via the dip switches on the front of the controller. When shipped, each unit will have a factory default MAC address with multiple units for the same project having incremented MAC addresses. The dip switches are numbered 1 through 8, with 1 being the LSB. The numbering is standard binary format (switches 1 and 3 ON equals an address of 5).

The Network Instance Number (device instance) is automatically configured based on the MAC Address setting. The network instance number will always be $3640+(\text{MAC Address})$. For example, if the MAC address is set to 25 the network instance number would be 364025. In the event of a duplicate instance number on the network, simply change the MAC address to change the instance number.

The following page has a complete listing of the BACnet points with their descriptions.



Point	Name	Description	Writeable	Facets
Hardware Input 1	Discharge Temp Sensor	Discharge Air Temperature Sensor.	NO	Unit: degrees-Fahrenheit
Hardware Input 2	Outside Temp Sensor	Outside Air Temperature Sensor.	NO	Unit: degrees-Fahrenheit
Hardware Input 3	Hardware Input 3	Unused Hardware Point	NO	Unit: degrees-Fahrenheit
Hardware Input 4	Remote Space Sensor	Remote Space Sensor	NO	Unit: degrees-Fahrenheit
Hardware Input 5	Hardware Input 5	Unused Hardware Point	NO	
Hardware Input 6	DirtyFilterSwitch	Dirty Filter Switch.	NO	Boolean (LOCKOUT;NORMAL)
Hardware Input 7	Hardware Input 7	Unused Hardware Point	NO	
Hardware Input 8	Fan ON Contact	Fan Running Status	NO	Boolean (ON;OFF)
Hardware Input 9	Heat ON Contact	Heat On Status	NO	Boolean (ON;OFF)
Hardware Input 10	Burner Lockout Contact	Burner Lockout Status	NO	Boolean (LOCKOUT;NORMAL)
Hardware Input 11	Hardware Input 11	Unused Hardware Point	NO	
Hardware Input 12	Hardware Input 12	Unused Hardware Point	NO	
Hardware Output 1	Unit Enable Relay	Unit Enable Relay [DO NOT WRITE]	NO	Boolean (ENABLE;OFF)
Hardware Output 2	Hardware Output 2	Unused Hardware Point	NO	
Hardware Output 3	Heat Enable Relay	Heat Enable Relay [DO NOT WRITE]	NO	Boolean (ENABLE;OFF)
Hardware Output 4	Common Alarm Relay	Common Alarm Relay [DO NOT WRITE]	NO	Boolean (ALARM;NORMAL)
Hardware Output 5	Burner Reset Relay	Burner Reset Relay [DO NOT WRITE]	NO	Boolean (RESET;NORMAL)
Hardware Output 6	Hardware Output 6	Unused Hardware Point	NO	
Hardware Output 7	Hardware Output 7	Unused Hardware Point	NO	
Hardware Output 8	Hardware Output 8	Unused Hardware Point	NO	
Hardware Output 9	Hardware Output 9	Unused Hardware Point	NO	
Hardware Output 10	Hardware Output 10	Unused Hardware Point	NO	
Hardware Output 11	Hardware Output 11	Unused Hardware Point	NO	
Hardware Output 12	Heat Command	Heat Command Percent [DO NOT WRITE]	NO	Unit: percent
Analog Value 1	DesignTempRise	Configuration Value - Unit Design Temp Rise [DO NOT WRITE]	NO	Unit: degrees-Fahrenheit
Analog Value 32	CurrentBurnerCommand	Current burner command percentage [DO NOT WRITE]	NO	Unit: percent
Analog Value 33	CurrentSpaceTemperature	Current space temperature [DO NOT WRITE]	NO	Unit: degrees-Fahrenheit
Analog Value 34	CurrentOutsideTemperature	Current outside temperature [DO NOT WRITE]	NO	Unit: degrees-Fahrenheit
Analog Value 35	CurrentDischargeTemperature	Current discharge temperature [DO NOT WRITE]	NO	Unit: degrees-Fahrenheit
Analog Value 51	OccupiedSpaceSetPoint	Occupied space temperature set point	YES	Unit: degrees-Fahrenheit
Analog Value 52	UnoccupiedSpaceSetPoint	Unoccupied space temperature set point	YES	Unit: degrees-Fahrenheit
Analog Value 53	DischargeTempSetPoint	Discharge temperature set point	YES	Unit: degrees-Fahrenheit
Analog Value 54	MinimumDischargeTemp	Minimum allowable discharge temperature	YES	Unit: degrees-Fahrenheit
Analog Value 55	MaximumDischargeTemp	Maximum allowable discharge temperature	YES	Unit: degrees-Fahrenheit
Analog Value 56	LowTempAlarmSetPoint	Low Temperature Alarm set point	YES	Unit: degrees-Fahrenheit
Analog Value 57	LowTempAlarmDelayMinutes	Low Temperature Alarm delay minutes	YES	Unit: minutes
Analog Value 58	network_ControlDeadband	Space Temperature Control Deadband	YES	Unit: degrees-Fahrenheit
Analog Value 59	network_HeatLockout	Heat Lockout Set Point	YES	Unit: degrees-Fahrenheit
Binary Value 1	Space Sensor Type	Configuration Value - Space Sensor Type [DO NOT WRITE]	NO	Boolean (REMOTE WIRED;HMI SENSOR)
Binary Value 2	ScheduleAvailable	Configuration Value - Schedule Availability [DO NOT WRITE]	NO	Boolean (YES;NO)
Binary Value 3	LTL_Available	Configuration Value - Low Temp Alarm Available [DO NOT WRITE]	NO	Boolean (YES;NO)
Binary Value 4	HeatLockoutAvailable	Configuration Value - Heat Lockout Available [DO NOT WRITE]	NO	Boolean (YES;NO)
Multi State Value 1	Override Output 1	Hardware Output 1 Network Override Alarm - Remove Override	NO	Enum: ALARM / NORMAL
Multi State Value 2	Override Output 3	Hardware Output 3 Network Override Alarm - Remove Override	NO	Enum: ALARM / NORMAL
Multi State Value 3	Override Output 4	Hardware Output 4 Network Override Alarm - Remove Override	NO	Enum: ALARM / NORMAL
Multi State Value 4	Override Output 5	Hardware Output 5 Network Override Alarm - Remove Override	NO	Enum: ALARM / NORMAL
Multi State Value 5	Override Output 12	Hardware Output 12 Network Override Alarm - Remove Override	NO	Enum: ALARM / NORMAL
Multi State Value 6	BurnerNotRespondingAlarm	Burner Not Responding Alarm	NO	Enum: ALARM / NORMAL
Multi State Value 7	BurnerWatchdogAlarm	Burner Watchdog Alarm	NO	Enum: ALARM / NORMAL
Multi State Value 8	SpaceTempSensorAlarm	Space temperature sensor alarm.	NO	Enum: SensorReliability
Multi State Value 9	OutsideTempSensorAlarm	Outside temperature sensor alarm.	NO	Enum: SensorReliability
Multi State Value 10	DischargeTempSensorAlarm	Discharge temperature sensor alarm.	NO	Enum: SensorReliability
Multi State Value 11	MotorNotRespondingAlarm	Motor not responding alarm.	NO	Enum: ALARM / NORMAL
Multi State Value 12	BurnerLockoutAlarm	Burner lockout alarm.	NO	Enum: LOCKOUT / NORMAL
Multi State Value 13	DirtyFilterAlarm	Dirty filter alarm.	NO	Enum: DIRTY / CLEAN
Multi State Value 14	LowTempLockoutAlarm	Low temperature lockout alarm.	NO	Enum: ALARM / NORMAL
Multi State Value 15	CurrentBurnerStatus	Current burner status.	NO	Enum: ENABLE / OFF
Multi State Value 51	NetworkUnitEnable	Unit Enable (1=OFF/2=ON) [USE THIS POINT TO ENABLE UNIT]	YES	Enum: ON / OFF
Multi State Value 52	NetworkOccupancy	Occupancy Command (1=Occupied/2=Unoccupied/3=Follow Schedule)	YES	Enum: Occupancy
Multi State Value 53	HVAC_Mode	HVAC Mode (1=Vent/2=Heat)	YES	Enum: HVAC_Mode
Multi State Value 54	BurnerReset	Burner Reset Command (Change 1 to 2 or 2 to 1)	YES	Enum: BurnerReset



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