PIR Ready VT76x7 Series With & Without Local Schedule & With Humidification & Dehumidification Strategy Terminal Equipment Controllers

Installation Guide

For Commercial HVAC Applications
September 2019 / 028-0229-05

CONTENTS

NOTICE

IMPORTANT NOTICE RELATED TO PRODUCT PART NUMBERS

For the latest model and part numbers, please refer to "VT8000 and VT7000 Series Room Controllers Catalog, version 10" (028-6100-08), which can be found on http://www.viconics.com/.

This document contains information on active and retired products. The latter are no longer sold by Viconics Technologies or its partners.

For additional information on 7000 Series Room Controllers and a list of replacement part numbers, please visit http://www.viconics.com/.

Failure to follow these instructions can result in confusion or order delays.

Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Before You Begin

Loss of Control

⚠ WARNING

LOSS OF CONTROL

- Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and over travel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of anticipated transmission delays or failures of the link.[1]
- Each implementation of equipment utilizing communication links must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

California Proposition 65

⚠ WARNING

CALIFORNIA PROPOSITION 65

This product can expose you to chemicals including Lead and Bisphenol A (BPA), which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

Failure to follow these instructions can result in birth defects or other reproductive harm.

Electrostatic Discharge

NOTICE

STATIC SENSITIVE COMPONENTS

Circuit boards and option cards can be damaged by static electricity. Observe the electrostatic precautions below when handling controller circuit boards or testing components.

Failure to follow these instructions can result in equipment damage.

Observe the following precautions for handling static-sensitive components:

- Keep static-producing material such as plastic, upholstery, and carpeting out of the immediate work area.
- Store static-sensitive components in protective packaging when they are not installed in the drive.
- When handling a static-sensitive component, wear a conductive wrist strap connected to the component or drive through a minimum of 1 megohm resistance.
- Avoid touching exposed conductors and components leads with skin or clothing.

[1] For additional information about anticipated transmission delays or failures of the link, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation and Maintenance of Solid State Control* or its equivalent.

Installation

NOTICE

INSTALLATION

- The system must be installed correctly by a qualified technician.
- If replacing an existing Room Controller, label wires before removal of Controller.
- Electronic controls are static sensitive devices. Discharge yourself correctly before manipulating and installing Room Controller.
- A short circuit or wrong wiring may permanently damage Room Controller or equipment.
- All Room Controllers are designed for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verification prior to shipping to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user/installer/electrical system designer to incorporate safety devices (such as relays, flow switch, thermal protections, etc.) and/or an alarm system to protect the entire system against such catastrophic failures. Tampering with the devices or unintended application of the devices will result in a void of warranty.
- This device must be installed to provide a separation distance of at least 8in (20cm) from all persons and must not be located or operating in conjunction with any other antenna or transmitter.
- Refer to the Room Controller User Interface Guide for information on how to configure the Room Controller.

Failure to follow these instructions can result in equipment damage.

Location

NOTICE

LOCATION

- Do not install on an exterior wall.
- Do not install behind a door.
- Do not install in areas with direct heat source.
- Do not install near any air discharge grill.
- Do not install in areas exposed to direct sunlight.
- Ensure Room Controller has sufficient natural air circulation.
- Ensure wall surface is flat and clean.
- Ensure external thermal sensor wirings are away from noisy electrical sources.
- Install 1.3 to 1.5 meter (52 to 60 inches) above the floor.
- Perform preventive maintenance on the damper and Variable Air Volume (VAV) box, according to the supplier documentation.

Failure to follow these instructions can result in equipment damage.

Cleaning the Room Controller

NOTICE

CLEANING THE ROOM CONTROLLER

- Use a soft, pre-moistened lint-free cloth for cleaning.
- Avoid getting moisture in openings.
- Do not spray anything directly on the Room Controller or use compressed air.
- Do not use caustic/corrosive products, ammonia, solvents or any cleaning product containing alcohol or grit.
- Never use tools directly on the touchscreen.
- Never use paint on the Room Controller.
- Do not drop or crush the Room Controller, or allow it to come into contact with liquids.
- Do not use a damaged device (such as one with a cracked screen).

Failure to comply with these recommendations will result in damage to the unit and void the manufacturer's warranty.

INSTALLATION

Remove the security screw on the bottom of Terminal Equipment Controller cover.

- Open unit by pulling on the bottom side of Terminal Equipment Controller (fig. 1).
- Remove wiring terminals from sticker.
- Please read the FCC ID and IC label installed in the cover upon removal of cover for the wireless products.

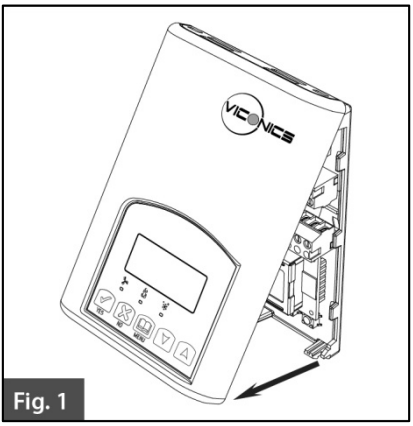


Fig. 1

Location

1. Should not be installed on an outside wall.
2. Must be installed away from any direct heat source.
3. Should not be installed near an air discharge grill.
4. Should not be affected by direct sun radiation.
5. Nothing should restrict vertical air circulation to the Terminal Equipment Controller.

Installation

1. Swing open the Terminal Equipment Controller PCB to the left by pressing the PCB locking tabs (fig. 2).
2. Pull out cables 6” out from the wall.
3. Wall surface must be flat and clean.
4. Insert cable in the central hole of the base.
5. Align the base and mark the location of the two mounting holes on the wall. Install proper side of base up.
6. Install anchors in the wall.
7. Insert screws in mounting holes on each side of the base (fig. 2).
8. Gently swing back the circuit board on the base and push on it until the tabs lock it.
9. Strip each wire 1/4 inch from end.
10. Insert each wire according to wiring diagram.

Location of PCB retaining tabs

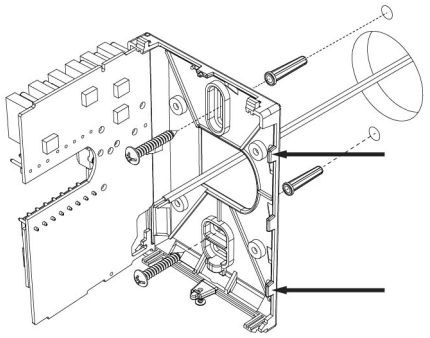


Fig. 2

Re-install terminal blocks

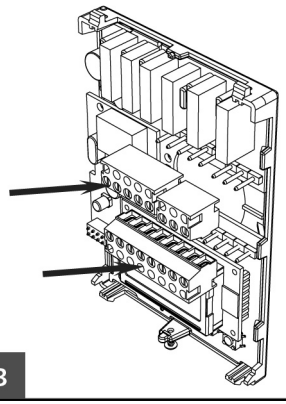


Fig. 3

11. Gently push excess wiring back into hole (fig. 3).
12. Re-Install wiring terminals in their correct locations (fig. 3).
13. Re-install the cover (top side first) and gently push extra wire length back into the hole in the wall.
14. Install security screw.

THEORY OF OPERATION

The VT7600 uses a Viconics proprietary adaptive logic algorithm to control the space temperature. This algorithm controls the heating / air conditioning system to minimize overshoot while still providing comfort. It provides exceptional accuracy due to its unique PI time proportioning control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based on/off Terminal Equipment Controllers.

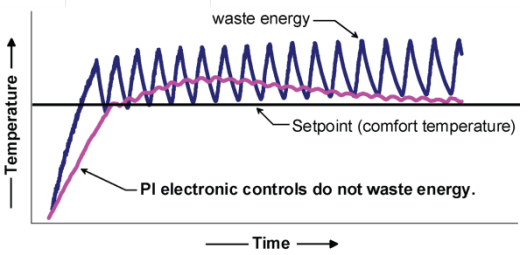


Fig.2 - On/Off mechanical control vs. PI electronic control.

Features overview

- 7 day schedule models, 2 or 4 events
- Gas/oil or electric system compatibility for all type of applications
- Internal RH sensor and remote RH input with humidification and dehumidification sequence of operation embedded
- Remote outdoor sensing capability for added flexibility
  - System mode lock out
  - Humidity setpoint reset
- High limit input to prevent over-humidification
- Lockable keypads for tamper proofing. No need for Terminal Equipment Controller guards
- Automatic frost protection to prevents costly freeze damage
- Anti short cycle and minimum on/off run time protection. Reduces wear and maximizes life span of mechanical equipment.
- Configurable digital input for added flexibility. The input can be configured as the following:

  - **None:** No function will be associated with the input
  - **Service:** a backlit flashing **Service** alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized. It can be tied in to the AC unit control card, which provides an alarm in case of malfunction.

- **Filter:** a backlit flashing **Filter** alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized. It can be tied to a differential pressure switch that monitor filters
- **Rem NSB:** remote NSB timer clock input. Will disable the internal scheduling of the Terminal Equipment Controller. The scheduling will now be set as per the digital input. The menu part related to scheduling is disabled and no longer accessible. It provides low cost setback operation via occupancy sensor or from a dry contact
- **RemOVR:** temporary occupancy contact. Disables all override menu function of the Terminal Equipment Controller. . The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode.
- With this function enabled it is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime) temporary occupancy time.
- **Fan lock:** used in conjunction with a local air flow sensor connected to the input. Locks out the Terminal Equipment Controller heating and cooling action and displays a local alarm if no air flow is detected 10 seconds after the fan (G terminal) is energized.

- Configurable smart fan operation saves energy during night mode
- Non volatile EEPROM memory prevents loss of parameters during power shortage
- Built in default profile set-up for easier start up and commissioning
- Configurable SPST output relay on scheduling models for lighting, exhaust fan or fresh air control
- 6 hour typical reserve time for clock in case of power loss
- Built in proportional humidity Terminal Equipment Controller
- Proportional humidity high limit when used with the analog input for supply humidity
- Automatic humidity setpoint reset when outside air temperature value is used.

MODEL CHART

Product Matrix Selector For The VT76X7 Series

Please refer to the following matrix when ordering controllers:

VT76 5 7 B 5500W

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
MODEL	PROGRAMMABILITY	ECONOMIZER / HUMIDITY CONTROL	APPLICATION	PIR OPTIONS	COMMUNICATION OPTIONS
	0 No local scheduling	0 No local scheduling	A 1H / 1C rooftop unit applications	50 PIR ready but PIR cover not included	B BACnet MS/TP
	5 With Local scheduling	2 With Local scheduling	B 2H / 2C rooftop unit applications	55 Factory assembled with PIR cover	E Echelon
		5 With economizer No local scheduling	H 3H / 2C heat pump applications		W Zigbee wireless
		6 With economizer Local scheduling			NONE Network Ready
		7 With Humidification / Dehumidification control			

EXAMPLE:

VT765 7 B 5000W

- Wireless communication
- Ready for PIR cover
- 2H/2C applications
- With humidity control
- With Scheduling

Please note, not all combinations and variants are available. Refer to the Viconics price list for a complete selection listing of all available models.

Network ready

- All Viconics VT76x7 series Terminal Equipment Controllers are designed for stand-alone (Network Ready) operation.
- They can be fully integrated into your choice of automation systems using the available communication adapter options.
- If required, stand-alone (Network Ready) Terminal Equipment Controllers can be field retrofitted with the following communication adapters:
  - VCM7607V5000B, Terminal Equipment Controller BACnet™ MS-TP® communication adapter
  - VCM7607V5000E, Terminal Equipment Controller Echelon™ LonTalk® communication adapter
  - VCM7000V5000W Terminal Equipment Controller wireless Zigbee™ communication adapter

TERMINAL, IDENTIFICATION AND FUNCTION

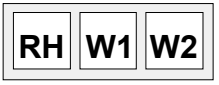
Wiring

Part Number	VT7657B5x00(X)	VT7607B5x00(X)
Schedule	Yes	No
Top left terminal block		
Y2	X	X
Y1	X	X
G	X	X
RC	X	X
C	X	X
Top right terminal block		
RH	X	X
W1	X	X
W2	X	X
Bottom terminal block		
HUM	X	X
AUX	X	X
DEHUM	X	X
DI	X	X
HS	X	X
SCOM	X	X
OS	X	X
HL	X	X

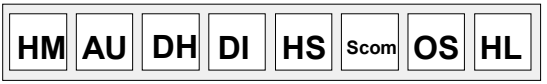
Screw terminal arrangement

5 pole left top connector

3 pole left top connector



8 pole bottom connector



Wiring notes:

Note 1: If the same power source is used for the heating stages, install jumper across RC & RH. Maximum current is 2.0 amps.

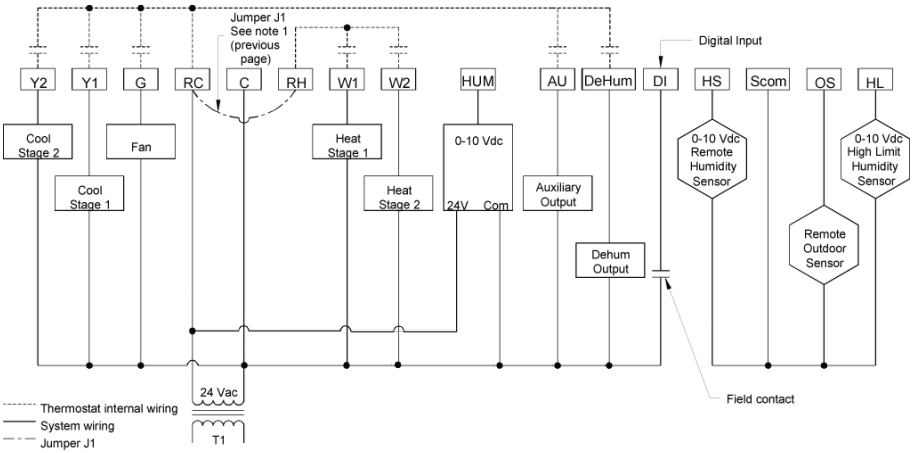
Note 2: If auxiliary output is used to toggle occupancy of the electronic control card inside the equipment, configure the relay parameter (Aux cont) to the N.O. setting. A second relay can be added for additional functionality of the occupancy output.

Note 3: Humidifier output uses a half bridge rectifier. Reference of the control signal is the common of the power supply of the Terminal Equipment Controller. (Terminal C)

Note 4: Electromechanical contacts are to be used with the digital inputs. Electronic triacs cannot be used as mean of switching for the input. The switched leg to the input for the input to activate is terminal C (common)

Note 5: The transformer of the unit provides power to the t Terminal Equipment Controller and the additional loads that will be wired to the Terminal Equipment Controller.

Typical Applications



Remote humidity sensor accessories

Model no.	Description
VH2020W1000	Wall mounted humidity sensor
VH2020D10000	Duct mounted humidity sensor

VH2020W1000

VH2020W1000, remote wall mounted room humidity sensor.
This sensor can be used for:

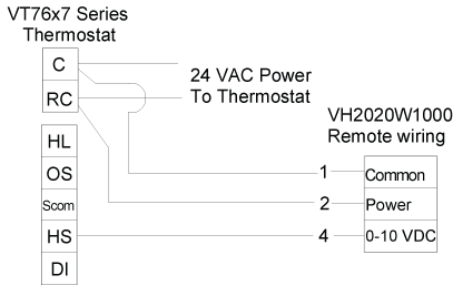
- Remote return or room air humidity sensing with the sensor mounted on the wall.

VH2020D1000, remote duct mounted humidity sensor c/w junction box.
This sensor can be used for:

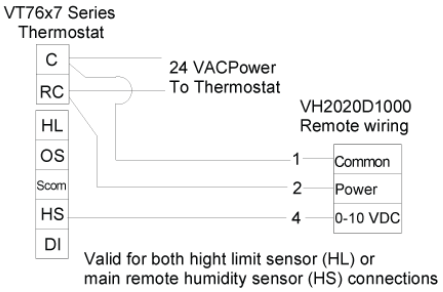
- Remote return air humidity sensing with the sensor mounted on the return air duct.
- Supply air humidity sensor used as high limit protection

VH2020W1000

Wiring example of remote room humidity sensor:

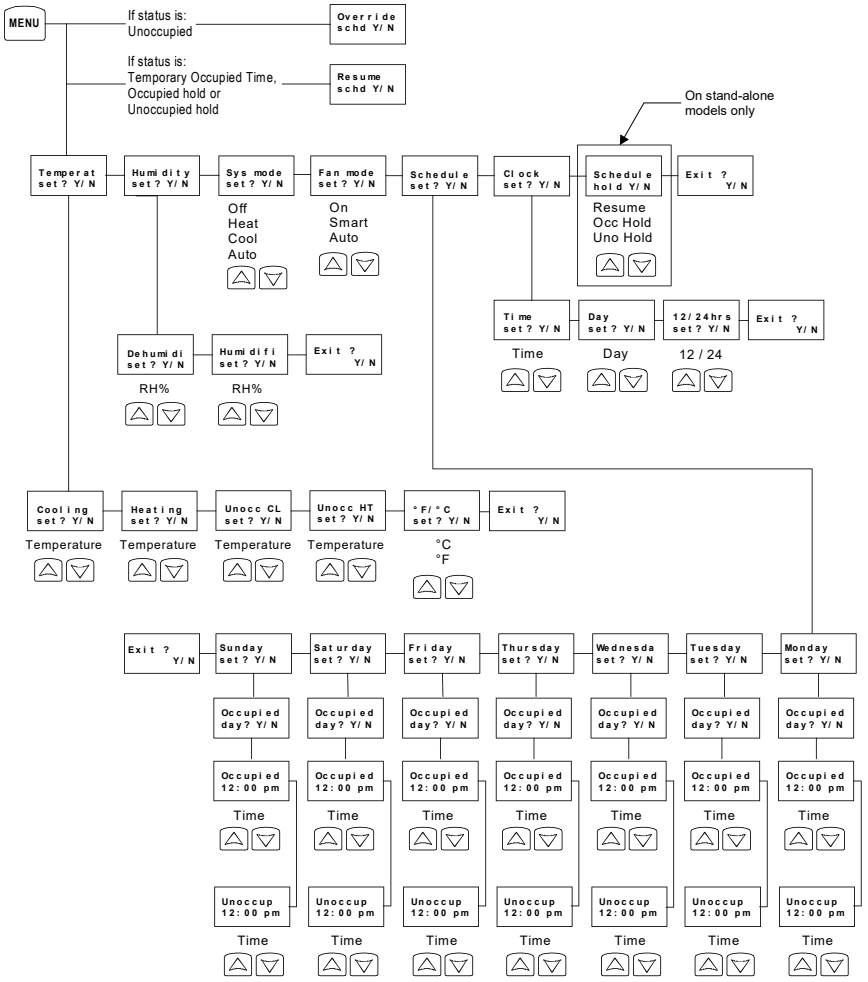


Wiring example of duct humidity sensor:



User menu flow chart:

NOTE: Prompts may not all be present depending on model selected



CONFIGURING AND STATUS DISPLAY INSTRUCTIONS

Status display

The Terminal Equipment Controller features a two-line, eight-character display. There is a low level backlight level that is always active and can only be seen at night.

When left unattended, the Terminal Equipment Controller has an auto scrolling display that shows the actual status of the system.

Each item is scrolled one by one with the back lighting in low level mode. Pressing any key will cause the back light to come on to high level.

Manual scroll of each menu item is achieved by pressing the Yes (scroll) key repetitively. The last item viewed will be shown on the display for 30 seconds before returning to automatic scrolling. Temperature is automatically updated when scrolling is held.

Sequence of auto-scroll status display:

ROOM TEMP & RH	CLOCK STATUS	SYSTEM MODE	SCHEDULE STATUS	OUTDOOR TEMPERATURE	ALARMS
x.x °C or °F XX % RH	Monday 12:00 AM	Sys mode auto	Occupied	Outdoor x.x °C or°F	Service
		Sys mode off	Occupied hold		Frost ON
		Sys mode heat	Unoccup		SetClock
		Sys mode cool			Filter
		Sys mode emergency			Fan lock

Outdoor air temperature

- Outdoor air temperature display is only enabled when outdoor air temperature sensor is connected.
- A maximum range status display of 50 °C (122 °F) indicates a shorted sensor. Associated functions, such as mode lockouts and economizer function are automatically disabled.
- A minimum range status -40 °C (-40 °F) is not displayed and indicates a opened sensor or a sensor not connected. Associated functions, such as mode lockouts are automatically disabled.

Alarms

- If alarms are detected, they will automatically be displayed at the end of the status display scroll.
- During an alarm message display, the back lit screen will light up at the same time as the message and shut off during the rest of the status display.
- Two alarms maximum can appear at any given time.
- The priority for the alarms is as follows:

Frost ON	Indicates that the heating is energized by the low limit frost protection room temperature setpoint 5.6 °C (42 °F)
SetClock	Indicates that the clock needs to be reset. There has been a power failure which has lasted longer than 6 hours
Service	Indicates that there is a service alarm as per one of the configurable digital input (DI1 or DI2)
Filter	Indicates that the filters are dirty as per one of the configurable digital input (DI1 or DI2)
Fan lock	Indicates that the heating and cooling action are locked out due to a defective fan operation

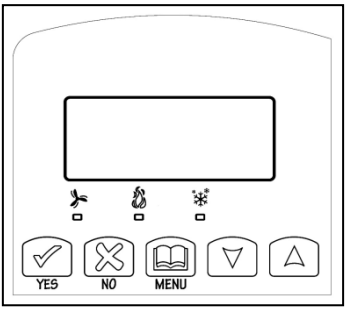
Three status LEDs on the Terminal Equipment Controller cover are used to indicate the status of the fan, a call for heat, or a call for cooling.

When any of the **fan** is **ON**, the **FAN LED will illuminate**	
When **heating** is **ON**, the **HEAT LED will illuminate**	
When **cooling** is **ON**, the **COOL LED will illuminate**	

LED operation	Heatpump models VT76xxH	Multistage and single stage models VT7600A, VT7652A, VT7600B & VT7652B	Multistage economizer models VT7605B & VT7656B
Fan LED on	When G Fan terminal operates	When G Fan terminal operates	When G Fan terminal operates
Heating LED on	When Y1 and / or W1 terminal(s) operate in heating mode	When W1 terminal operate in heating mode	When W1 terminal operate in heating mode
Cooling LED on	When Y1 terminal operate in cooling mode	When Y1 terminal operate in cooling mode	When Y1 terminal operate in cooling mode and or economizer output is in function

USER INTERFACE

User configuring instructions menu



The VT76x7 series of Terminal Equipment Controller feature an intuitive, menu-driven, back-lit LCD display that walks users through the configuring steps, making the configuring process extremely simple. This menu is typically accessed by the user to set the parameters such as temperature and time events, system mode, fan mode, etc.

It is possible to bring up the user menu at any time by depressing the MENU key. The status display automatically resumes after exiting the user-configuring menu.

If the user pauses at any given time during configuring, Auto Help text is displayed to help and guide the user through the usage and configuring of the Terminal Equipment Controller.

Ex.:	Press yes key to change cooling temperature setpoint Use the up or down arrow to adjust cooling setpoint

Local keypad interface

Each of the sections in the menu is accessed and configured using 5 keys on the Terminal Equipment Controller cover.
The priority for the alarms is as follows:

	The YES key is used to confirm a selection, to move onto the next menu item and to manually scroll through the displayed information.
	The NO key is used when you do not desire a parameter change, and to advance to the next menu item. Can also be used to toggle between heating and cooling setpoints.
	The MENU key is used to access the Main User Menu or exit the menu.
	The down arrow key is used to decrease temperature setpoint and to adjust the desired values when configuring the Terminal Equipment Controller.
	The up arrow key is used to increase temperature setpoint and to adjust the desired values when configuring the Terminal Equipment Controller.

When left unattended for 45 seconds, the display will resume automatic status display scrolling.

To turn on the back light, press any key on the front panel. The back lit display will turn off when the Terminal Equipment Controller is left unattended for 45 seconds

Sequence of user menu:

Override Resume	Temperature setpoints	Humidity setpoints	System mode setting	Fan mode setting	Schedules setting	Clock setting	Schedule hold
Override schd Y/N	**Temperat Set Y/N**	**Humidity Set Y/N**	**Sys mode set Y/N**	**Fan mode set Y/N**	**Schedule set Y/N**	**Clock set Y/N**	**Schedule hold Y/N**
Appears only in unoccupied mode							Appears only on stand-alone (Network Ready) models
Cancel ovrd Y/N							
Appears only in override mode							

Occupied setpoints adjustments

There is a default profile set in the Terminal Equipment Controller from the factory.

This enables the Terminal Equipment Controller to operate as a non-scheduling unit in day mode operation at start up.

Default temperature setpoints:
Occupied cooling setpoint = 24 °C (75 °F)
Occupied heating setpoint = 22 °C (72 °F)
Unoccupied cooling setpoint = 28 °C (82 °F)
Unoccupied heating setpoint = 18 °C (65 °F)
Fahrenheit scale
Setpoint type = permanent

Default modes:
System mode = Auto
Fan mode = Smart (for models with a communication module or scheduling network ready models) Fan mode = Auto (for non-scheduling network ready models)
Default schedules:
Monday through Sunday
Occupied time is: 12 00 AM
Unoccupied time is: 11:59 PM

There will be a 1 minute unoccupied period every night at 11:59 PM with this default configuration.

A) Override an unoccupied period

Override schd Y/N

This menu will appear only when the Terminal Equipment Controller is in unoccupied mode. The unoccupied mode is enabled either by the internal timer scheduling or by a remote NSB contact via DI1 or DI2.

If DI1 or DI2 is configured to operate as a remote temporary override contact, this menu will be disabled.

Answering yes to this prompt will cause the Terminal Equipment Controller to go into occupied mode for an amount of time equal to the parameter “TOccTime” (1 to 12 hours).

B) Resume regular scheduling

Cancel ovrd Y/N

This menu does not appear in regular operation. It will appear only when the Terminal Equipment Controller is in unoccupied override mode.

Answering “Yes” to this question will cause the Terminal Equipment Controller to resume the regular setpoints & scheduling.

C) Temperature setpoints

Permanent setpoint changes

Temperat set Y/N

This menu permits the adjustment of all permanent temperature setpoints (occupied and unoccupied) as well as the desired temperature units (°F or °C). Permanent setpoints are written to RAM and EEPROM.

Cooling setpoint Occupied mode		Heating setpoint Occupied mode		Cooling setpoint Unoccupied mode		Heating setpoint Unoccupied mode		°F or °C display setting	
Cooling set? Y/N	No next → Yes down ↓	Heating set? Y/N	No next → Yes down ↓	Unocc CL set? Y/N	No next → Yes down ↓	Unocc HT set? Y/N	No next → Yes down ↓	°F or °C set? Y/N	No next → Yes down ↓
Use ▲▼ keys to set value, Yes key to confirm									
Cooling 70.0 °F	Use ▲▼ To set value	Heating 68.00 °F	Use ▲▼ To set value	Unocc CL 80.0 °F	Use ▲▼ To set value	Unocc HT 60.0 °F	Use ▲▼ To set value	Units °F	Use ▲▼ To set value

Temporary setpoint changes

Temporary setpoints can be modified through the Up arrow key (▲) and the Down arrow keys (▼).
User will be prompted with the present mode (Heating or Cooling) of the Terminal Equipment Controller and its setpoint.
The Up (▲) arrow key will increment the setpoint by 0.5 degree (F or C).
The Down (▼) arrow key will decrement the setpoint by 0.5 degree (F or C).
Press the Yes key to accept the new setpoint.

Local changes to the heating or cooling setpoints made by the user directly using the up or down arrow are temporary.
They will remain effective for the duration specified by ToccTime.
Setpoints will revert back to their default value after internal timer ToccTime expires.
If a permanent change to the setpoints is required, use the **Temperat set ?** menu

D) Humidity setpoints

Humidity set Y/N

This menu permits the adjustment of humidification and dehumidification setpoints.

Dehumidification setpoint		Humidification setpoint	
Dehumidi set? Y/N	No next → Yes down ↓	Humidifi set? Y/N	No next → Yes down ↓
Use ▲▼ keys to set value, Yes key to confirm			
Dehumidi 70 %	Use ▲▼ To set value	Humidifi 50 %	Use ▲▼ To set value

To prevent overlap, a minimum fixed deadband of 5% RH will always prevail between the humidification and dehumidification setpoints. For example, if the humidification setpoint is 50% RH and the dehumidification setpoint is changed from 70% RH to 45% RH, the humidification setpoint will be modified to 45% RH by the Terminal Equipment Controller.

Humidification process

Humidification process will only be allowed when the Terminal Equipment Controller is in heating mode (System Mode = Heat or System Mode = Auto and effective mode at the Terminal Equipment Controller is heat). If there is a humidification demand and the fan is OFF, the fan is first turned ON and the humidifier output is then activated.
Other than having the RH setpoint, the following events can stop the humidification process at any time: RH sensor is out of range, System Mode is switched to Off or Cool and the System Mode = Auto but the room's effective mode changes from Heat to Cool

Dehumidification process

If (Dhu LCK) **Dehumidification Lockout Functions** is set to **On** (Enabled):

Dehumidification process will only be allowed when the Terminal Equipment Controller is in cooling mode (System Mode = Cool or System Mode = Auto and effective mode at the Terminal Equipment Controller is cool). If there is a dehumidification demand and the fan is OFF, the fan is first turned ON and the dehumidification output is then activated.

Other than having reach the dehumidification setpoint, the following events can stop the dehumidification process at any time:

- RH sensor is out of range
- System Mode is switched to Off, Heat or System Mode = Auto and effective mode at the Terminal Equipment Controller is Heat
- The room temp drops below the cooling setpoint minus the deadband value
- The Outside air temp is below the Dhu OALK parameter

If (Dhu LCK) **Dehumidification Lockout Functions** is set to **Off** (Disabled):

Other than having reach the dehumidification setpoint, the following events can stop the dehumidification process at any time:

- RH sensor is out of range
- System Mode is switched to Off
- The Outside air temp is below the Dhu OALK parameter

Dehumidification process is allowed when the Terminal Equipment Controller operates in all system modes except Off. If there is a dehumidification demand. If the fan is OFF, the fan is first turned ON and the dehumidification output is then activated.

There is NO active temperature lockout protection in this mode. If the dehumidification process causes the room temperature to rise or fall, the Terminal Equipment Controller will react by either activating the cooling or heating outputs based on its current system mode settings.

E) System mode setting

Sys mode set Y/N

This menu is accessed to set system mode operation
Use ▲▼ to set value, Yes key to confirm

Sys mode auto	**Automatic mode** Automatic changeover mode between heating and cooling operation
Sys mode cooling	**Cooling mode** Cooling operation mode only
Sys mode heating	**Heating mode** Heating operation mode only
Sys mode emergency	**Emergency heat mode** (heat pump models only) Forced auxiliary heat operation mode only
Sys mode off	**Off mode** Normal cooling or heating operation disabled If enabled in installer parameters, only the automatic heating frost protection at 50 °F (10 °C) is enabled

F) Fan mode setting

Fan mode set Y/N

This section of the menu is permits the setting of the fan mode operation.
Use ▲▼ to set value, Yes key to confirm

Fan mode On	**On fan mode** Fan is on continuously, even when system mode is OFF.
Fan mode Auto	**Automatic fan mode** Fan cycles on a call for heating or cooling for both occupied & unoccupied periods.
Fan mode Smart	**Smart fan mode** During occupied periods, fan is on continuously. In unoccupied mode, fan cycles on a call for heating or cooling. This selection is available on all models with a communication module, on all stand-alone (Network Ready) scheduling models or if DI1 or DI2 is set to RemNSB on stand-alone non-scheduling models.

G) Schedule set (2 events)
Scheduling can have 2 or 4 events per day. This is set in the configuration menu as per parameter (2/4event)

Schedule set Y/N

This section of the menu permits the user to set the whether 2 or 4 events is needed. Each day can be tailored to specific schedules if needed.

- 2 events can be scheduled per day.
- Occupied & unoccupied periods can be set for each day.

Monday timer Schedule set		Tuesday timer Schedule set		Wednesday timer Schedule set		Other days are identical
Monday set? Y/N	No next → Yes down ↓	Tuesday set? Y/N	No next → Yes down ↓	Wednesda set? Y/N	No next → Yes down ↓	Selects the day to be scheduled or modified
Yes key to access day scheduling, No key to jump to next day						
Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Yes = Daily schedules will be accessed No = Unoccupied mode all day
Yes key to access day scheduling, No key to jump to next day						
		Copy Y/N Previous	Yes next → No down ↓	Copy Y/N Previous	Yes next → No down ↓	Yes = Will copy previous day schedule No = Daily schedules will be accessed
Yes key to copy previous day, No key to set new time value for each day						
Occupied 00:00 AM	Use ▲▼ To set value	Occupied 00:00 AM	Use ▲▼ To set value	Occupied 00:00 AM	Use ▲▼ To set value	Sets Event # 1 Occupied time Will activate occupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Unoccup 00:00 AM	Use ▲▼ To set value	Unoccup 00:00 AM	Use ▲▼ To set value	Unoccup 00:00 AM	Use ▲▼ To set value	Sets Event # 2 Unoccupied time Will activate unoccupied setpoints

Use ▲▼ to set value, Yes key to confirm

Note: 12:00 PM = Noon
12:00 AM = Midnight

Typical examples of a 2 event office schedule

Ex. #1 Office building closed all weekend

Event	Period #1 - Event #1		Period #1 - Event #2		
	Occupied		Unoccupied		
Setpoint	Cool 72 °F	Heat 70 °F	Cool 80 °F	Heat 62 °F	Daily Occupancy
Monday	7.00 AM		6.00 PM		Day time only
Tuesday	7.00 AM		6.00 PM		Day time only
Wednesday	7.00 AM		6.00 PM		Day time only
Thursday	7.00 AM		6.00 PM		Day time only
Friday	7.00 AM		6.00 PM		Day time only
Saturday	12.00 PM *		12.00 PM *		Unoccupied
Sunday	12.00 PM *		12.00 PM *		Unoccupied

* Scheduling consecutive events to the same time will cause the Terminal Equipment Controller to choose the last event as the time at which it will set its schedule. In the above example, the Terminal Equipment Controller will control to the unoccupied set point until 7:00 AM Monday.

Ex. #2 Commercial building which is occupied all weekend

Event	Period #1 - Event #1		Period #1 - Event #2		
	Occupied		Unoccupied		
Setpoint	Cool 72 °F	Heat 70 °F	Cool 80 °F	Heat 62 °F	Daily Occupancy
Monday	8.00 AM		5.00 PM		Day time only
Tuesday	8.00 AM		5.00 PM		Day time only
Wednesday	8.00 AM		5.00 PM		Day time only
Thursday	8.00 AM		5.00 PM		Day time only
Friday	8.00 AM		5.00 PM		Day time only
Saturday	12.00 AM **		11.59 PM **		Occupied
Sunday	12.00 AM **		11.59 PM **		Occupied

** To schedule a day as occupied for 24 hours, set that day Occupied time to 12:00 AM and Unoccupied time to 11:59 PM There will be a 1 minute unoccupied period every night at 11:59 PM with this schedule configuration.

H) Schedule set (4 events)

Schedule set Y/N

This section of the menu permits the user to set the whether 2 or 4 events is needed. Each day can be tailored to specific schedules if needed.

- 4 events can be scheduled per day.
- Occupied & Unoccupied periods can be set for each day.
- Scheduling the 3 rd. & 4 th. events to the same time will cancel the last period.

Monday timer Schedule set		Tuesday timer Schedule set		Wednesday timer Schedule set		Other days are identical
Monday set? Y/N	No next → Yes down ↓	**Tuesday set? Y/N**	No next → Yes down ↓	**Wednesda set? Y/N**	No next → Yes down ↓	Selects the day to be scheduled or modified
Yes key to access day scheduling, No key to jump to next day						
Occupied Day? Y/N	No next → Yes down ↓	**Occupied Day? Y/N**	No next → Yes down ↓	**Occupied Day? Y/N**	No next → Yes down ↓	Yes = Daily schedules will be accessed No = Unoccupied mode all day
Yes key to access day scheduling, No key to jump to next day						
		Copy Y/N Previous	Yes next → No down ↓	**Copy Y/N Previous**	Yes next → No down ↓	Yes = Will copy previous day schedule No = Daily schedules will be accessed
Yes key to copy previous day, No key to set new time value for each day						
Occupied 00:00 AM	Use ▲▼ To set value	**Occupied 00:00 AM**	Use ▲▼ To set value	**Occupied 00:00 AM**	Use ▲▼ To set value	Sets Event # 1 Occupied time Will activate occupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Unoccup 00:00 AM	Use ▲▼ To set value	**Unoccup 00:00 AM**	Use ▲▼ To set value	**Unoccup 00:00 AM**	Use ▲▼ To set value	Sets Event # 2 Unoccupied time Will activate unoccupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Occupie2 00:00 AM	Use ▲▼ To set value	**Occupie2 00:00 AM**	Use ▲▼ To set value	**Occupie2 00:00 AM**	Use ▲▼ To set value	Sets Event # 3 Occupied time Will activate occupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Unoccup2 00:00 AM	Use ▲▼ To set value	**Unoccup2 00:00 AM**	Use ▲▼ To set value	**Unoccup2 00:00 AM**	Use ▲▼ To set value	Sets Event # 4 Unoccupied time Will activate unoccupied setpoints
Use ▲▼ to set value, Yes key to confirm						

Ex. #1 Four event retail establishment schedule

Event	Period 1 - Event 1		Period 1 - Event 2		Period 2 - Event 3		Period 2 - Event 4		
Setpoint	**Occupied**		**Unoccupied**		**Occupied**		**Unoccupied**		
	Cool 72 °F	**Heat** 70 °F	**Cool** 80 °F	**Heat** 62 °F	**Cool** 72 °F	**Heat** 70 °F	**Cool** 80 °F	**Heat** 62 °F	**Daily Occupancy**
Monday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Tuesday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Wednesday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Thursday	7.00 AM		5.00 PM		7.00 PM		10.30 PM		Day/evening time only
Friday	7.00 AM		5.00 PM		7.00 PM		10.30 PM		Day/evening time only
Saturday	12.00 PM *		12.00 PM *		12.00 PM *		12.00 PM *		Unoccupied
Sunday	12.00 PM *		12.00 PM *		12.00 PM *		12.00 PM *		Unoccupied

* Scheduling events to the same time will cancel the last period and leave the Terminal Equipment Controller in unoccupied mode

Ex. #2 Residential

Event	Period 1 - Event 1		Period 1 - Event 2		Period 2 - Event 3		Period 2 - Event 4		
Setpoint	**Occupied**		**Unoccupied**		**Occupied**		**Unoccupied**		
	Cool 72 °F	**Heat** 70 °F	**Cool** 80 °F	**Heat** 62 °F	**Cool** 72 °F	**Heat** 70 °F	**Cool** 80 °F	**Heat** 62 °F	**Daily Occupancy**
Monday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Tuesday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Wednesday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Thursday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Friday	6:00 AM		8:00 AM		4:00 PM		11:30 PM		Day/evening time only
Saturday	8:00 AM *		8:00 AM *		8:00 AM *		11:59 PM *		Day time only
Sunday	12:00 AM *		12:00 AM *		12:00 AM *		11:59 PM *		Occupied all day

* Scheduling consecutive events to the same time will cause the Terminal Equipment Controller to choose the last event as the time at which it will set its schedule. In the above example for Saturday, the Terminal Equipment Controller will control to the occupied set point from 8:00 AM until 11:59 PM. Since it is desired to be in occupied mode throughout the night, then it is necessary to schedule the first event on Sunday at 12:00 AM. The Terminal Equipment Controller will force a one minute unoccupied period for a one minute period (between 11:59 PM and 12:00 AM on Saturday)

I) Clock/Day Settings

Clock set Y/N

This section of the menu permits the user to set the time and day.

Time setting		Day setting		Time format setting	
Time set? Y/N	No next → Yes down ↓	**Day set? Y/N**	No next → Yes down ↓	**12/24hrs set? Y/N**	No = exit Yes down ↓
Time 0:00	Use ▲▼ To set value	**Day Monday**	Use ▲▼ To set value	**12/24hrs 12 hrs**	Use ▲▼ To set value

J) Schedule hold

Schedule hold Y/N

- This menu will only appear on stand-alone (Network Ready) Terminal Equipment Controller, i.e. without a BACnet™ / Echelon™ module.
- This section of the menu permits the user to set a permanent schedule hold, which bypasses the internal Terminal Equipment Controller scheduling.
- The permanent schedule hold function is typically used for non-scheduled events that extend for various periods of time.

- Enabling a permanent occupied or permanent unoccupied schedule hold will cancel any active override.
- The use of temporary setpoints during permanent hold is permitted. The duration of the temporary setpoint is as set per the TOccTime parameter. Ex. 3 hours

Use ▲▼ to set value, Yes key to confirm

Schedule resume	**Resume regular scheduling** cancels the permanent hold and re-enables the regular scheduling as set per internal scheduling or as per remote NSB via one of the DI's configured as remote NSB. This action can also by accomplished by using the Resume menu. Any temporary setpoint that are active will be left active for the duration of the period as set per the TOccTime parameter.
Schedule occ hold	**Hold permanent occupied** forces the Terminal Equipment Controller into a permanent occupied mode using the occupied setpoints. All timed scheduling functions are by-passed. The PERMANENT OCCUPIED status will appear in the automatic status scroll. To resume to regular scheduling, user must scroll to the Schedule Hold menu and select the Schedule resume option..
Schedule uno hold	**Hold permanent unoccupied** forces the Terminal Equipment Controller into a permanent unoccupied mode using the unoccupied setpoints. All timed scheduling functions are by-passed. The PERMANENT UNOCCUPIED status will appear in the automatic status scroll. To resume to regular scheduling, user must scroll to the Schedule Hold menu and select the Schedule resume option..

INSTALLER CONFIGURATION PARAMETER MENU

- Configuration can be done through the network or locally at the Terminal Equipment Controller.
- To enter configuration, press and hold the middle button "Menu" for 8 seconds
- If a password lockout is active, "Password" is prompted. Enter password value using the "up" and "down" arrows and press "Yes" to gain access to all configuration properties of the Terminal Equipment Controller. A wrong password entered will prevent local access to the configuration menu.
- Once in the configuration menu, press the "No" button repetitively to scroll between all the available parameters.
- When the desired parameter is displayed, press "Yes" to adjust it to the desired value using "up" and "down" arrows. Once set, press "Yes" to scroll to the next parameter.

CONFIGURATION PARAMETERS DEFAULT VALUE	SIGNIFICANCE AND ADJUSTMENTS
PswrdSet Configuration parameters menu access password Default value = **0** No password prompted	This parameter sets a password access to prevent unauthorized access to the configuration menu parameters. A default value of “0” will not prompt a password or lock the access to the configuration menu. Range is: 0 to 1000
Com Addr Terminal Equipment Terminal Equipment Controller networking address Default value = **254** Range is: 0 to 254	**Conditional parameter to BACnet™ MS-TP models (VT76xxX5x00B)** **Conditional parameter to Wireless models (VT76xxX5x00W)** This parameter will only appear when a BACnet™ or wireless network adapter is present. If the Terminal Equipment Controller is installed as a stand-alone (Network Ready) unit or with an Echelon™ adapter, this parameter will not be used or displayed -For BACnet™ MS-TP models, the valid range to is from 1 to 127. Default value of 254 disables BACnet™ communication for the Terminal Equipment Controller. For wireless models valid range is 0 to 254 with a maximum of 30 Terminal Equipment Controllers per VWG
PAN ID Personal Area Network Identification Default value = **0** Range is: 0 to 1000	**Conditional parameter to Wireless models (VT76xxX5x00W)** This parameter will only appear when a wireless network adapter is present. If the Terminal Equipment Controller is installed as a stand-alone (Network Ready) unit or with a BACnet™ or Echelon™ adapter, this parameter will not be used or displayed This parameter (Personal Area Network Identification) is used to link specific Terminal Equipment Controllers to a single specific Viconics wireless gateway (VWG) For every Terminal Equipment Controller reporting to a gateway (maximum of 30 Terminal Equipment Controllers per gateway), be sure you set the SAME PAN ID value both at the gateway and the Terminal Equipment Controller(s). The default value of 0 is NOT a valid PAN ID.

Channel Channel selection Default value = **10** Range is: **10 to 26**	**Conditional parameter to Wireless models (VT76xxX5x00W)** This parameter will only appear when a wireless network adapter is present. If the Terminal Equipment Controller is installed as a stand-alone (Network Ready) unit or with a BACnet™ or Echelon™ adapter, this parameter will not be used or displayed This parameter (Channel) is used to link specific Terminal Equipment Controllers to specific Viconics wireless gateway(s) (VWG) For every Terminal Equipment Controller reporting to a gateway (maximum of 30 Terminal Equipment Controllers per gateway), be sure you set the SAME channel value both at the gateway and the Terminal Equipment Controller(s). ***Viconics recommends using only the usage of channels 15 and 25 only*** The default value of 10 is ***NOT*** a valid channel. The valid range of available channel is from 11 to 26
Get From Terminal Equipment Controller Get From another device configuration utility Default value = **0** Range is: 0 to 254	**Conditional parameter to Wireless models VTR73xxX5x00W** Entering a MAC address enables an automatic routine that automatically fetches all the required configuration properties of the current device from another already configured device and copies the same required configured property values. If a value other than the default value of 255 is entered, user will then be prompted to exit the Configuration Menu thus leaving all other parameter configuration to be copied from the referenced Terminal Equipment Controller MAC address. Ex.: If you are currently configuring MAC12 and the settings matches exactly the settings of ZN MAC5, then enter 5 as the current parameter value. ▪ If the process is successful and all required configuration properties have been copied, the value will revert back to 255 ▪ If the process is *NOT* successful and all required configuration properties have NOT been copied (either the reference device is *NOT* the same model number or is offline or does not exists) the value will revert back to 254 to indicate the failure of the process **Leaving the Get From parameter to 255 means that every configuration parameters will be set manually.**
% RH disp Local RH Display Default value = **Off**	Enables the display of humidity below the room temperature on the display **On** = Display %RH **Off** = No display of %RH

DI 1 Digital input no.1 configuration Open contact input = function not energized Closed contact input = function energized Default Value = **None**	None, No function will be associated with the input Rem NSB, remote NSB timer clock input. Will disable the internal scheduling of the Terminal Equipment Controller. The scheduling will now be set as per the digital input. The time is still displayed as information, but the menu part related to scheduling is disabled and no longer accessible. Open contact = occupied setpoints Closed contacts = unoccupied setpoints RemOVR Temporary override remote contact. Disables all override menu function of the Terminal Equipment Controller. The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode. With this function enabled it is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime) temporary occupancy time. When Override is enabled, an Override status message will be displayed Filter, a back-lit flashing Filter alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized Service, a back-lit flashing Service alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized Fan lock, a back-lit flashing Fan lock alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is not energized. Used in conjunction with a local airflow sensor connected to the input. Locks out the Terminal Equipment Controller heating and cooling action if no airflow is detected 10 seconds after the fan (G terminal) is energized. Open contact = no airflow Closed contacts = airflow present
MenuScro Menu scroll Default value = **On =** Scroll active	Removes the scrolling display and only present the room temperature/humidity to the user. With this option enabled, no status is given of mode, schedule and outdoor temperature. **On = Scroll active** **Off = Scroll not active**

Lockout Keypad lockout levels Default value = **0 No lock**	0 = No lock 1 = Low level 2 = High level

USER KEY FUNCTIONS

LEVEL	Resume/ Override scheduling	Permanent Occupied and Unoccupied Setpoints	Temporary setpoints using arrows	System mode setting	Fan mode setting	Schedules setting	Clock setting	Permanent hold
0	🔓	🔓	🔓	🔓	🔓	🔓	🔓	🔓
1	🔓	🔒	🔓	🔒	🔒	🔒	🔓	🔒
2	🔒	🔒	🔒	🔒	🔒	🔒	🔓	🔒

Pwr del Power-up delay Default value = **10 seconds**	On initial power up of the Terminal Equipment Controller (each time 24 VAC power supply is removed & re-applied) there is a delay before any operation is authorized (fan, cooling or heating). This can be used to sequence start up multiple units / Terminal Equipment Controller in one location. **10 to 120 seconds**
Frost pr Frost protection enabled Default value = **Off**	**Off:** no room frost protection **On:** room frost protection enabled in all system mode at: 42 °F (5.6 °C) Frost protection is enabled even in system **Off** mode **Off or On** On **heat pump** models the system mode will be forced to EMERGENCY mode if frost protection is activated
Heat max Maximum heating setpoint limit Default value = **90 °F (32 °C)**	Maximum occupied & unoccupied heating setpoint adjustment. Heating setpoint range is: **40 to 90 °F (4.5 to 32.0 °C)**
Cool min Minimum cooling setpoint limit Default value = **54 °F (12 °C)**	Minimum occupied & unoccupied cooling setpoint adjustment. Cooling setpoint range is: **54 to 100 °F (12.0 to 37.5 °C)**

<table>
<tr>
<td>Pband
Proportional Band setting
Default value 2 = 2.0 °F (0.6 °C)</td>
<td>Adjust the proportional band used by the Terminal Equipment Controller PI control loop.

  Note that the default value of 2.0 °F (1.1 °C) gives satisfactory operation in most normal installation cases. The use of a superior proportional band different than the factory one is normally warranted in applications where the Terminal Equipment Controller location is problematic and leads to unwanted cycling of the unit. A typical example is a wall mounted unit where the Terminal Equipment Controller is installed between the return and supply air feeds and is directly influenced by the supply air stream of the unit.

<table>
<tr><th>Value</th><th>F scale Pband</th><th>C scale Pband</th></tr>
<tr><td>2</td><td>2 F</td><td>1.1 C</td></tr>
<tr><td>3</td><td>3 F</td><td>1.7 C</td></tr>
<tr><td>4</td><td>4 F</td><td>2.2 C</td></tr>
<tr><td>5</td><td>5 F</td><td>2.8 C</td></tr>
<tr><td>6</td><td>6 F</td><td>3.3 C</td></tr>
<tr><td>7</td><td>7 F</td><td>3.9 C</td></tr>
<tr><td>8</td><td>8 F</td><td>4.4 C</td></tr>
</table>
</td>
</tr>
<tr>
<td>Anticycle
Minimum on/off operation time for stages
Default value = 2 minutes</td>
<td>Minimum On/Off operation time of cooling & heating stages.

IMPORTANT, anti-short cycling can be set to 0 minutes for equipment that posses their own anti cycling timer. Do <u>not</u> use this value unless the equipment is equipped with such internal timer. Failure to do so can damage the equipment.
0, 1, 2, 3, 4 & 5 minutes

Anti-short cycling can be set to 0 minutes for equipment that posses their own anti cycling timer. Do not use that value unless the equipment is equipped with such internal timer. Failure to do so can damage the equipment.</td>
</tr>
</table>

Heat cph Heating stages cycles per hour Default value = **4 C.P.H.**	Will set the maximum number of heating stage cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turn ON and OFF in one hour. Note that a higher C.P.H will represent a higher accuracy of control at the expense of wearing mechanical components faster. **3, 4, 5, 6,7 & 8 C.P.H.** **For multi stage models, heat cph applies to W1 & W2** **For heat pump models, heat cph applies to W1 only (Emergency heat)**
Cool cph Cooling stages cycles per hour Default value = **4 C.P.H.**	Will set the maximum number of cooling stage cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turned on and off in one hour. Note that a higher C.P.H will represent a higher accuracy of control at the expense of wearing mechanical components faster. **3 or 4 C.P.H.** **For multi stage models, cool cph applies to Y1 & Y2** **For heat pump models, cool cph applies to Y1 & Y2 in cooling and heating independently of the reversing valve position**
Minimum deadband Default value = **2.0 °F (1.1 °C)**	Minimum deadband value between the heating and cooling setpoints. If modified, it will be applied only when any of the setpoints are modified. **2, 3 or 4 °F (1.0 to 2.0 °C)**
Fan cont Default value = **On**	Fan control in heating mode. When selecting **On**; the Terminal Equipment Controller in all cases will always control the fan (terminal G). Valid for On or Auto fan mode When selecting **Off**; the fan (terminal G), when heating stages (terminals W1 & W2) are solicited, will not be energized. The fan in this case will be controlled by the equipment fan limit control. Valid only for Auto fan mode. On fan mode will leave the fan always on. **On or Off** **For multi stage models, fan control applies to W1 & W2** **For heat pump models, fan control applies to W1 only (Emergency heat)**
Fan del Default value = **Off**	Fan delay extends fan operation by 60 seconds after the call for heating or cooling ends. Valid only for Auto fan mode. “On” fan mode will leave the fan always on. **Off or On**

TOccTime Default value = **3 hours**	Temporary occupancy time with occupied mode setpoints when override function is enabled When the Terminal Equipment Controller is in unoccupied mode, function is enabled with either the menu or DI1 or DI2 configured as remote override input. **0,1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 hours**
Cal RS Room air temperature sensor calibration Default value = **0.0 °F or °C**	Offset that can be added/subtracted to actual displayed room temperature **± 5.0 °F (± 2.5 °C)**
Cal OS Outside air temperature sensor calibration Default value = **0.0 °F or °C**	Offset that can be added/subtracted to actual displayed outside air temperature **± 5.0 °F (± 2.5 °C)**
H stage Number of heating stages. Applicable to 2 stage models only Default value = **2 stages**	Will revert the operation of 2 stages Terminal Equipment Controller to single stage operation only when the second heating step is not needed. **1 or 2 stages** **For heat pump models, H stage is limited to 1 stage only (W1 – Aux. Heat)**

C stage Number of cooling stages 2 stages model only Default value = **2 stages**	Will revert the operation of 2 stage Terminal Equipment Controller to single stage operation only when the second cooling step is not needed. **1 or 2 stages** **For heat pump models, HP stage selects the number of compressor stages**
H lock Outside air temperature heating lockout Default value = **120 °F (49 °C)**	Disables heating stage operation based on outdoor air temperature. Function will only be enabled if OS (outside air temperature sensor) is connected. **From -15 °F up to 120 °F (-26 °C up to 49 °C)**
C lock Outside air temperature mechanical cooling lockout. Default value = **-40 °F (-40 °C)**	Disables cooling stage operation based on outdoor air temperature. On economizer model, free cooling will not be disabled by this function. Function will only be enabled if OS (outside air temperature sensor) is connected. **From -40 °F up to 95 °F (-40 °C up to 35 °C)**
Unocc TM Unoccupied Timer value Default **0.5 hours**	Time delay between the moment where the Terminal Equipment Controller toggles from occupied to unoccupied after the last movement has been detected by the PIR. Range is: **0.5 to 24.0 hours** in 0.5 hour increments
2/4event Number of events configuration Default value = **2 event**	**2 events**, will set up scheduling for the following Event 1 is for Occupied setpoints Event 2 is for Unoccupied setpoints **4 events**, will set up scheduling for the following Event 1 is for Occupied setpoints Event 2 is for Unoccupied setpoints Event 3 is for Occupied setpoints Event 4 is for Unoccupied setpoints

<table>
<tr>
<td>Aux cont
Auxiliary contact configuration

Default value = N.O. normally open</td>
<td>This contact can be used to energize peripheral devices such as: lighting equipment, exhaust fans, economizers, etc.
This contact will operate in parallel with the internal occupied/unoccupied schedule of the Terminal Equipment Controller or the remote NSB contact if DI1 or DI2 is used.
When the system is in OFF mode, the contact will remain in its unoccupied status independently of the occupied / unoccupied schedule.

<table>
<tr><th>Configured</th><th>Contact occupied status</th><th>Contact unoccupied status</th></tr>
<tr><td>N.O.</td><td>Closed</td><td>Opened</td></tr>
<tr><td>N.C.</td><td>opened</td><td>Closed</td></tr>
</table>
</td>
</tr>
<tr>
<td>Prog rec
Progressive recovery enabled

Default value = Off

Progressive recovery is automatically disabled if DI 1 and / or DI 2 are configured remote NSB

For scheduling model only - VT7657B1000B</td>
<td>Off, = no progressive recovery
The occupied schedule time is the time at which the system will restart.

On, = progressive recovery active.
The occupied schedule time is the time at which the desired occupied temperature will be attained. The Terminal Equipment Controller will automatically optimize the equipment start time.

In any case, the latest a system will restart is 10 minutes prior to the occupied period time.</td>
</tr>
<tr>
<td>RH LT
Reset RH lower outside temperature setpoint
Default value = -20°F (-29°C)</td>
<td>Minimum outside air temperature for RH setpoint reset.
Only valid if an outdoor air sensor is connected at the Terminal Equipment Controller or a network value is transmitted to the Terminal Equipment Controller. See RH HT & RE Sp.
From –40°F up to 15°F (-40°C to –9.5°C)</td>
</tr>
</table>

RH HT Reset RH higher outside temperature setpoint Default value = **32°F (0°C)**	Maximum outdoor air temperature for RH setpoint reset. Only valid if an outdoor air sensor is connected at the Terminal Equipment Controller or a network value is transmitted to the Terminal Equipment Controller. See **RH LT** & **RE Sp** **From 20°F up to 55°F (-6.5°C to 13°C)**
HL SP RH High limit setpoint Default value = **85% RH**	High humidity limit in the supply. Only valid if a 0-10 VDC sensor is connected at the Terminal Equipment Controller – otherwise this feature is disabled automatically. **From 50% RH up to 90% RH**
Dhu OALK Dehumidification outside air temperature lockout Default value = **32°F (0°C)**	Outside air temperature under which the dehumidification sequence is disabled. Only valid if an outdoor air sensor is connected at the Terminal Equipment Controller or a network value is transmitted to the Terminal Equipment Controller. **From –40°F up to 122°F (-40°C to 50°C)**
Dhu LCK Dehumidification Lockout Functions Default value = **On**	Enables or disables the lockout functions for the dehumidification control process of the output. **On**: will restrict the dehumidification process based on the following: - System mode = Needs to be Cool or Auto (currently operating in cooling only) - Low ambient room temperature protection enabled **Off**: will not restrict the dehumidification process: - System mode = Needs to be Cool, Heat or Auto -There is no ambient room temperature protection enabled
DehuHyst Dehumidification Hysteresis Default value = **5% RH**	Dehumidification control hysteresis Used only if dehumidification sequence is enabled. **From 2% RH up to 20% RH**

RE SP Reset humidity setpoint Default value = **20% RH**	The RH setpoint will be reset from the user setpoint to this value when the RH LT outside air temperature value is reached. Only valid if an outdoor air sensor is connected at the Terminal Equipment Controller or a network value is transmitted to the Terminal Equipment Controller. See **RH LT** & **RE HT.** **From 10% RH up to 90% RH**
RH cal Humidity sensor calibration Default value = **0 %RH**	Offset that can be added/subtracted to actual displayed humidity by ± 15.0 %RH. This calibration applies to the internal humidity sensor if no remote humidity sensor is connected. This calibration applies to the remote humidity sensor when one is connected. **From –15% RH up to 15% RH**
Display HL Display the high limit sensor value	Used as diagnostic / service help to troubleshoot and diagnose sensor / humidifier operation

Note:
When the outside air sensor is not connected or is shorted, the Terminal Equipment Controller bypasses:

- The heating lockout
- The cooling lockout
- The dehumidification lockout
- The humidity setpoint reset

TROUBLESHOOTING GUIDE

Symptom	Possible Cause	Corrective Action
No display on the Terminal Equipment Controller	Absent or incorrect supply voltage	1. Check power supply voltage between C & RC to be from 19-30 VAC 2. Check for tripped fuse or circuit breaker
	Overloaded power transformer	Verify that the transformer used is powerful enough (enough VA's) to supply all controlled devices including the Terminal Equipment Controller
Keyboard menu does not access all functions	Keyboard locked	Change configuration parameter LOCKOUT to value "0" to access all levels of the menu
Temperature setpoints revert to original value after a certain time period	Temporary setpoint option selected	1. The Terminal Equipment Controller needs to be in Permanent setpoint mode for the new setpoint to be kept and memory and used all the time 2. Go to the Set temperature menu. 3. The last prompt is setpoint type. Set it to Permanent setpoint

Terminal Equipment Controller will not call for heating	Wrong mode selected	Select heating mode
	Terminal Equipment Controller in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the Terminal Equipment Controller Occupied heating setpoint
	Anti-cycle delay active	Wait, the anti-cycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	Heating lockout attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter H Lock to value 120 °F (49 °C) to by-pass lockout
	Wiring error	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RH & W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC & RH
Terminal Equipment Controller will not call for cooling	Wrong mode selected	Select cooling mode
	Terminal Equipment Controller in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the Terminal Equipment Controller Occupied cooling setpoint
	Anti-cycle delay active	Wait, the anti-cycling period will end and the equipment will start
	Cooling setpoint is satisfied	Lower the cooling setpoint
	Cooling lockout attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter C Lock to value -40 °F (-40 °C) to by-pass lockout
	Wiring error	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RC & Y1. The cooling should come ON. If it does not, verify wiring
The Terminal Equipment Controller will not turn on the fan	Wrong mode selected	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RC & G. The fan should come ON. If it does not, verify wiring
	Wiring error	
Digital display shows missing digits or erratic segments	Defective display	Replace Terminal Equipment Controller

Humidity reset

Humidity setpoint reset by outside air temperature

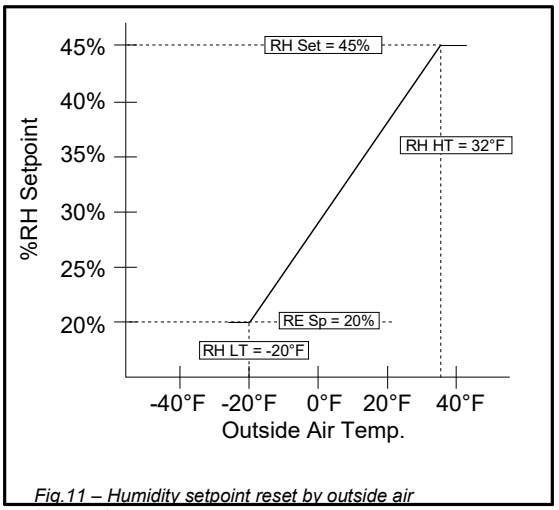


Fig.11 – Humidity setpoint reset by outside air

If an outdoor air sensor is connected at the Terminal Equipment Controller or a value is received from the network, it can be used to reset the humidity setpoint during the cold season to minimize condensation on windows and building structures.

When the outdoor temperature falls below the selected high temperature, parameter **RH HT** (32°F in the example Figure 8), the humidity setpoint will start to decrease. The lowest humidity setpoint will be reached at selected low temperature, parameter **RH LT** (-20°F).

The setpoint decrease from original setpoint to the lowest setpoint determined by the parameter **RE Sp**. In the example, Figure 8, **RE Sp** was set to 20%, therefore the humidity setpoint dropped from 45% to 20%.

If you don't want to use this feature, set the **RE Sp** parameter to 90% RH.

High limit humidity sensor

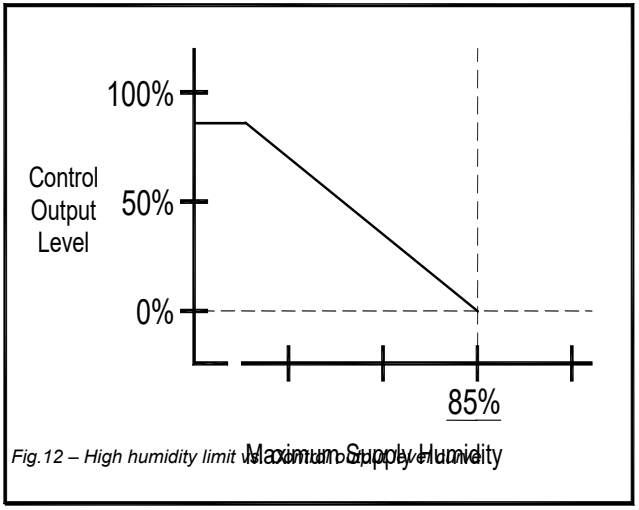


Fig.12 – High humidity limit via Maximum Supply Humidity

The VT76x7 series includes a high limit sequence. This allows the use of a remote 0 to 10 VDC humidity sensor to limit the humidity in the supply air. If no sensor is detected at the HL connector, this sequence is disabled at the Terminal Equipment Controller.

Note: this high limit function is not a safety device. For critical situations, provide installation with normal protections required to ensure a safe operation.

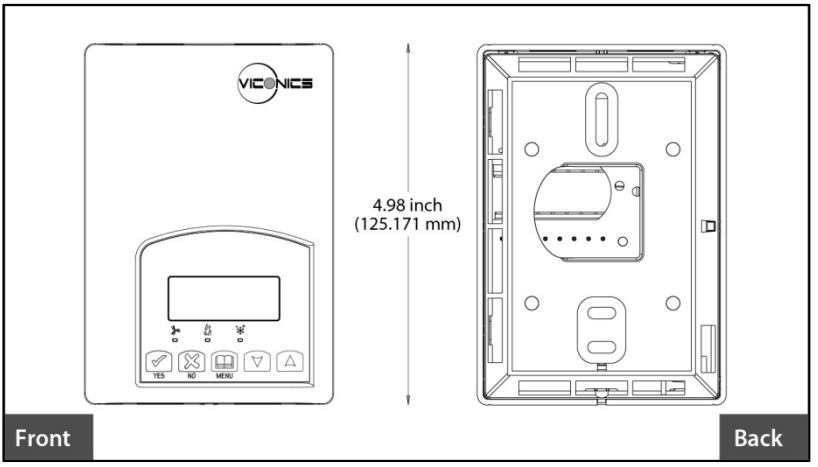
SPECIFICATIONS

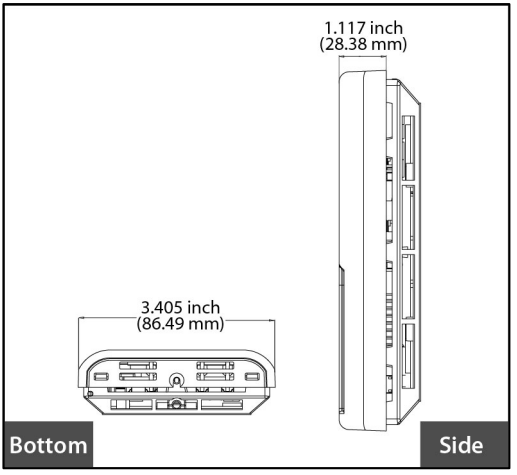
Terminal Equipment Controller power requirements:	19-30 VAC 50 or 60 Hz; 2 VA Class 2 RC to RH jumper 2.0 Amps 48 VA maximum
Operating conditions:	0 °C to 50 °C (32 °F to 122 °F) 0% to 95% R.H. non-condensing
Storage conditions:	-30 °C to 50 °C (-22 °F to 122 °F) 0% to 95% R.H. non-condensing
Temperature sensor:	Local 10 K NTC thermistor
Resolution:	± 0.1 °C (± 0.2 °F) Humidity ± 0.1%
Control accuracy:	± 0.5 ° C (± 0.9 °F) @ 21 °C (70 °F) typical calibrated ±5% RH from 20 to 0% RH at 50 to 90° F (10 to 32 °C)
Humidification setpoint:	10% RH to 90% RH
Dehumidification setpoint:	15% RH to 95% RH
Contact output rating:	Relay output: 30 VAC, 1 Amp. Maximum, 3 Amp. In-rush.
Humidification analog output rating:	Analog: 0 to10VDC into 2KΩ resistance min.
Humidification analog output accuracy	± 3% typical
Occ, Stand-By and Unocc cooling setpoint range:	12.0 to 37.5 °C (54 to 100 °F)
Occ, Stand-By and Unocc heating setpoint range:	4.5 °C to 32 °C (40 °F to 90 °F)
Room and outdoor air temperature display range:	-40 °C to 50 °C (-40 °F to 122 °F)
Proportional band for room temperature control:	Factory set, Cooling & Heating: 1.1°C (2°F)
Digital inputs:	Relay dry contact only across C terminal to D1
Analog high limit & remote humidity inputs:	Analog: 0 to10VDC into 2KΩ resistance min.
Wire gauge:	18 gauge maximum, 22 gauge
Approximate shipping weight:	0.75 lb (0.34 kg)
Agency Approvals all models:	**UL:** UL 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN XAPX (US) and XAPX7 (Canada) **Industry Canada:** ICES-003 (Canada)
Agency Approvals all models:	**FCC:** Compliant to CFR 47, Part 15, Subpart B, Class A (US) **CE :** EMC Directive 89/336/EEC (Europe Union) **C-Tick:** AS/NZS CISPR 22 Compliant (Australia / New Zealand) Supplier Code Number N10696
Agency Approvals Wireless models:	**FCC:** Compliant to: Part 15, Subpart C

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION

Please check with your local government for instruction on disposal of this product

DRAWING & DIMENSIONS





Viconics Technologies Inc.
7262 Marconi Street | Montreal | Quebec | Canada | H2R 2Z5
Tel.: (514) 313-8885 | **Toll free:** 1 (800) 563-5660
sales@viconics.com | **www.viconics.com**