VT8300 Series Installation Guide
24 Vac Low Voltage

Commercial and Hotel/Lodging HVAC Fan Coil Applications

CONTENTS

VICONICS
Beyond Comfort

INSTALLATION

Preparation

- Remove the security screw on the bottom of the Terminal Equipment Controller cover.
- Open unit by pulling on bottom side of the Terminal Equipment Controller (Fig. 1).
- Read FCC ID and IC label installed in cover before installing any wireless product.
- Ensure correct side of base faces up.

Location

1. Do not install on outside wall.
2. Do not install in areas with direct heat source.
3. Do no install near any air discharge grill.
4. Do not install in areas exposed to direct sunlight.
5. Ensure Controller has sufficient air circulation.
6. Ensure wall surface is flat and clean.

Installation

1. Pull cables 15 cm (6") out from wall.
2. Align base and mark location of two mounting holes on wall.
3. Install anchors in wall.
4. Insert cable in central hole of base.
5. Insert screws in mounting holes on each side of base.
6. Strip each wire 1/4" (0.6 cm) from end.
7. Insert each wire according to wiring chart (next page).
8. Gently push excess wiring back into hole.
9. Gently align cover to top of base and snap in place from bottom.
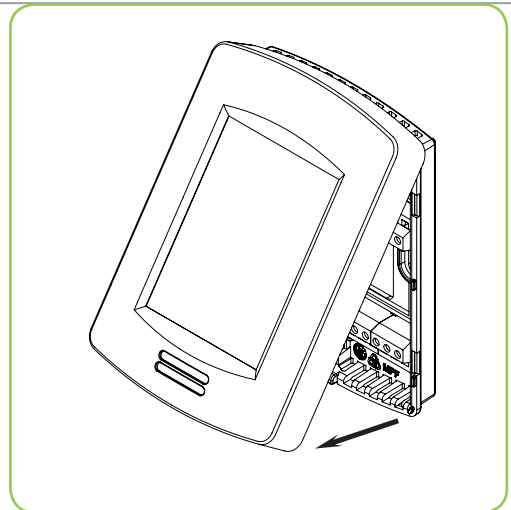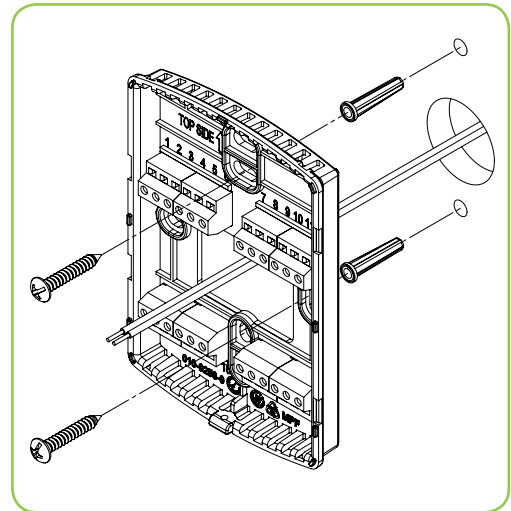10. Install security screw.

Figure-1   Open the cover

Figure-2   Install the base

Figure-3   Reinstall cover

⚠
- If replacing an existing Line Voltage FCU Controller, label wires before removal of Controller.
- Electronic controls are static sensitive devices. Discharge yourself correctly before manipulating and installing Controller.
- A short circuit or wrong wiring may permanently damage Controller or equipment.
- All VT8300 ® series controls are designed for use as operating controls only and are not safety devices. Tampering with the devices or unintended application of the devices will result in a void of warranty.
- This transmitter must be installed to provide a separation distance of at least 4in (20cm) from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.
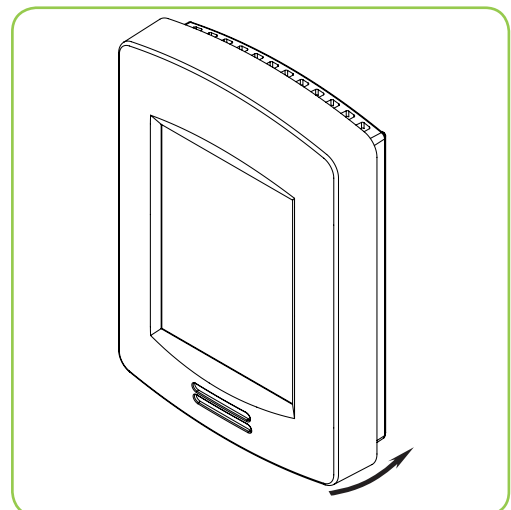
CONFIGURABLE BI/UI UNIVERSAL INPUTS OVERVIEW

Universal input #16 can be configured for the following binary functions:

1. **(None)**: No function will be associated with the input

2. **(Rem NSB)**: remote NSB timer clock input. The scheduling will now be set as per the binary input. It provides low cost setback operation via a dry contact.

   Contact opened = Occupied

   Contact closed = Unoccupied

3. **(Motion NO) and (Motion NC)**: Advanced PIR occupancy functions using a normally open (NO) or normally closed (NC) remote PIR motion sensor. Occupancy mode is now set as per applied PIR function and configuration. Application information and examples are available on document: APP-PIR-SE8xxx. This document will provide the installers and system designers with detailed examples on applications, parameter configuration information, sequence of operation, troubleshooting and diagnostic help required for the proper usage of the onboard PIR sensor.

4. **(Window) EMS**: Forces the system to disable any current heating or cooling action by the Terminal Equipment Controller. The mode stays the same and the current setpoints are the same occupied setpoints. Only the outputs are disabled. There is a Door/Window alarm displayed on the Terminal Equipment Controller to indicate to the local tenant that the door/window needs to be closed for cooling or heating to resume. Use NC contact.

   Contact opened = System disabled with local Window alarm

   Contact closed = System enabled

Universal input #17 can be configured for the following binary functions:

1. **(None)**: No function will be associated with the input

2. **(Door Dry) Door contact & Motion detector**: This configuration is only functional if binary input #1 is set to Motion NO or Motion NC or an onboard PIR sensor is used. With this sequence enabled, the occupancy is now dictated through those 2 inputs. Any motion detected will set the zone to occupied status. The zone will remain permanently in occupied mode until the door contact switch opens momentarily. The Terminal Equipment Controller will then go in stand-by mode. If more movements are detected, the occupied mode will resume. While the door is opened, any movements detected by the remote PIR sensor or the onboard PIR sensor will be ignored. Use a Normally Closed contact switching device.

   Contact opened = Door opened

   Contact closed = Door closed

3. **(RemOVR)**: temporary occupancy remote override contact. This function disables the central button override function on 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. It is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime)

temporary occupancy time.

4. **(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

   Contact opened = No alarm

   Contact closed = Alarm displayed

5. **(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.

   Contact opened = No alarm

   Contact closed = Alarm displayed

Universal input #19 can be configured for the following functions:

1. **(None)**: No function will be associated with the input
2. **(COC/NH) Change over dry contact. Normally Heat**: Used for hot / cold air / water change over switching in 2 pipe systems.

   Contact closed = Cold air/water present

   Contact opened = Hot air/water present

   Only used and valid if system is setup as 2.0. Parameter (Out1Conf) set as 2.0.

3. **(COC/NC) Change over dry contact. Normally Cool**: Used for hot / cold air / water change over switching in 2 pipe systems.

   Contact closed = Hot air/water present

   Contact opened = Cold air/water present

   Only used and valid if system is setup as 2.0. Parameter (Out1Conf) set as 2.0.

4. **(COS) Change over analog sensor**: Used for hot / cold air / water change over switching in 2 pipe systems.

   Only used and valid if system is setup as 2.0. Parameter (Out1Conf) set as 2.0.

   If temperature is > 77 °F = Hot air / water present

   If temperature is < 75 °F = Cold air / water present
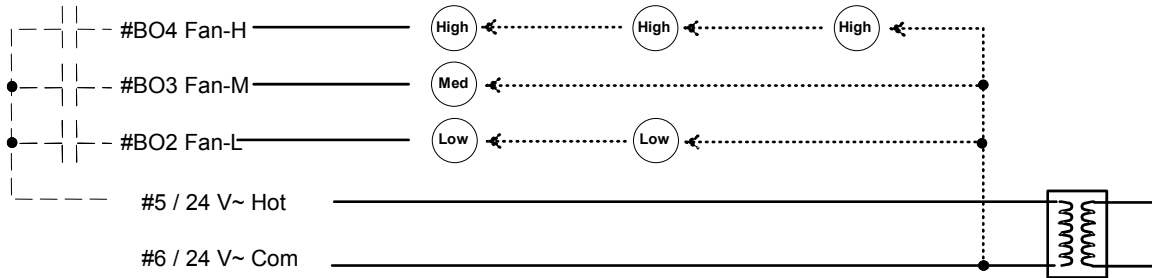
TERMINAL IDENTIFICATION & FUNCTION

Terminal identification

SE83xxU Description / Application	Used in applications		
	2 & 4 Pipe **Control Type = On/Off**	**2 & 4 Pipe** **Control Type = Floating**	**2 & 4 Pipe** **Control Type = Analog**
Internal Temperature	**X**	**X**	**X**
Internal Humidity	Model Dependent	Model Dependent	Model Dependent
1- BO1	*Not used*	*Not used*	*Not used*
2- BO2	Fan-L	Fan-L	Fan-L
3- BO3	Fan-M	Fan-M	Fan-M
4- BO4	Fan-H	Fan-H	Fan-H
5- RC / 24 V~ Hot	24 V~ Hot	24 V~ Hot	24 V~ Hot
6- C / 24 V~ Com	24 V~ Com	24 V~ Com	24 V~ Com
7- RH	Aux Heat	Aux Heat	Aux Heat
8- BO8	Aux Heat	Aux Heat	Aux Heat
9- UO9	Normally Close Cool Valve	Close Cool Valve	*Not used*
10- UO10	Normally Close Heat Valve	Close Heat Valve	*Not used*
11- UO11	Normally Open Cool Valve	Open Cool Valve	Analog Heat valve
12- UO12	Normally Open Heat Valve	Open Heat Valve	Analog Cool Valve
13- RS485 +	BACnet MS-TP +	BACnet MS-TP +	BACnet MS-TP +
14- RS485 -	BACnet MS-TP -	BACnet MS-TP -	BACnet MS-TP -
15- RS485 Ref	BACnet MS-TP Ref	BACnet MS-TP Ref	BACnet MS-TP Ref
16- UI16	UI16 Function	UI16 Function	UI16 Function
17- UI17	UI17 Function	UI17 Function	UI17 Function
18 Scom	Scom	Scom	Scom
19- UI19	UI19 Function	UI19 Function	UI19 Function
20- UI20	Remote Room Sensor	Remote Room Sensor	Remote Room Sensor
21 Scom	Scom	Scom	Scom
22- UI22	Remote Supply Sensor	Remote Supply Sensor	Remote Supply Sensor
23- UI23	*Not used*	*Not used*	*Not used*
24- UI24	*Not used*	*Not used*	*Not used*

Wiring

Power & Fan (All models)

- **24 V~ transformer relay**

3 speed   2 speed   Single speed

#BO4 Fan-H — High ← High ← High ←
#BO3 Fan-M — Med ←
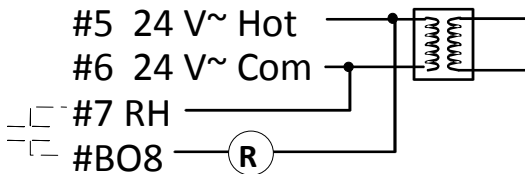#BO2 Fan-L — Low ← Low ←
#5 / 24 V~ Hot
#6 / 24 V~ Com

BO8 Auxiliary output wiring

- Dry contact to end device 24 V~ maximum

#5 24 V~ Hot
#6 24 V~ Com
#7 RH
#BO8

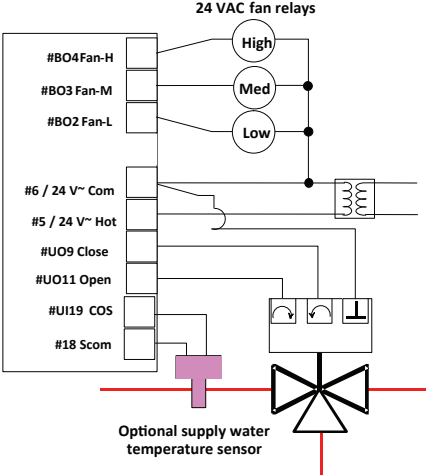R

- 24 VAC power to relay

#5 24 V~ Hot
#6 24 V~ Com
#7 RH
#BO8 — R
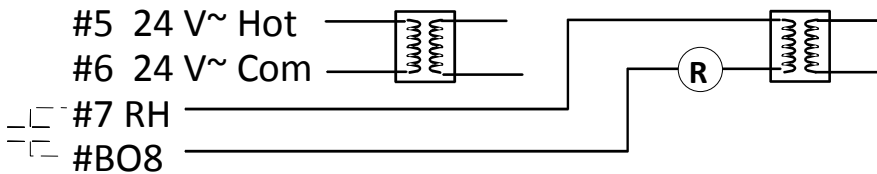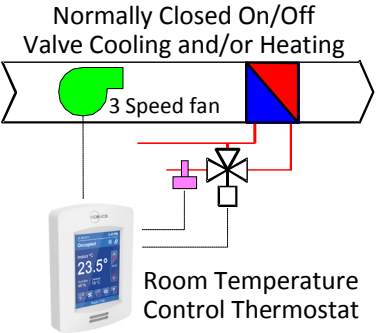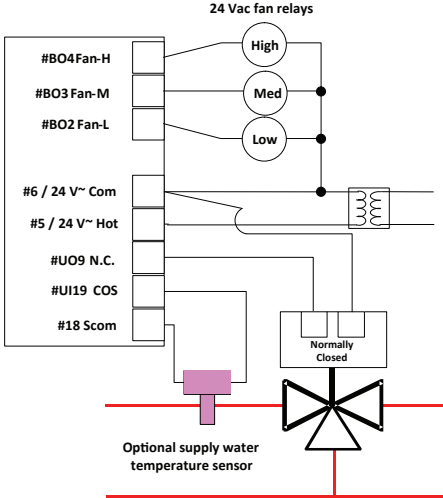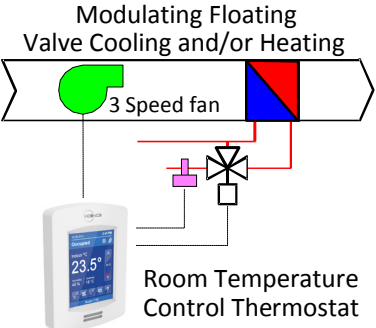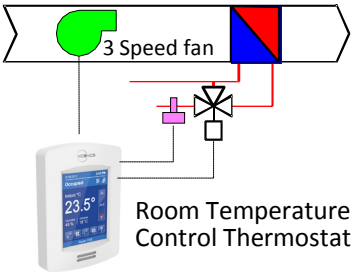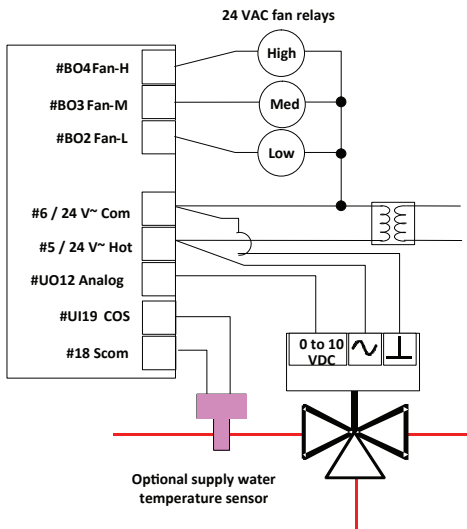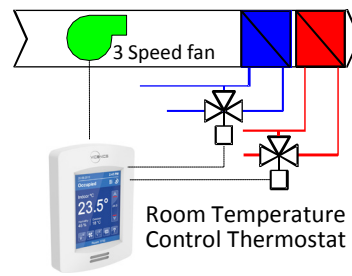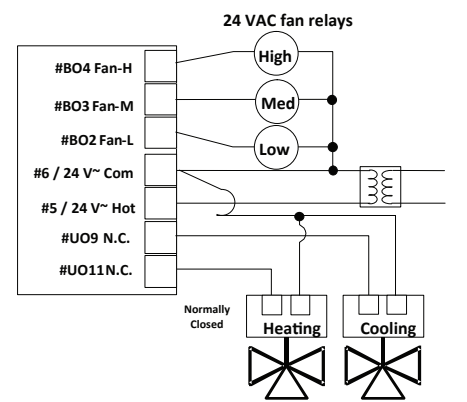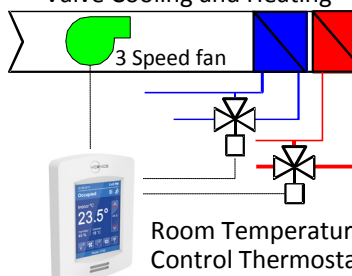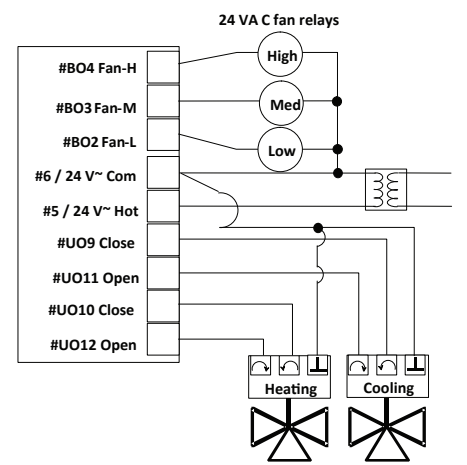
Main outputs wiring

2 Pipe Applications	4 Pipe Applications
Control type = On-Off	
#5 / 24 V~ Hot #6 / 24 V~ Com Heating / Cooling valve #UO11 NO #UO9 NC OR 24 VAC Com	#5 / 24 V~ Hot #6 / 24 V~ Com #UO12 NO #UO10 NC OR → 24 Vac Com → Heating valve #UO11 NO #UO9 NC OR → 24 Vac Com → Cooling valve
Floating control	
#5 / 24 V~ Hot #6 / 24 V~ Com Heating / Cooling valve #UO11 #UO9 Open Com Close	#5 / 24 V~ Hot #6 / 24 V~ Com #UO12 #UO10 → Open Com Close → Heating valve #UO11 #UO9 → Open Com Close → Cooling valve
Analog control	
#5 / 24 V~ Hot #6 / 24 V~ Com Heating / Cooling valve #UO12 → Com 24 VAC 0-10 VDC	#5 / 24 V~ Hot #6 / 24 V~ Com #UO11 → Com 24 VAC 0-10 VDC → Heating valve #UO12 → Com 24 VAC 0-10 VDC → Cooling valve

TYPICAL APPLICATIONS

Schematic	Wiring	Settings
2 pipe system cooling and/or heating **Control type = On / Off**		

Normally Closed On/Off Valve Cooling and/or Heating

3 Speed fan

Room Temperature Control Thermostat

24 Vac fan relays

High — Med — Low

#BO4Fan-H
#BO3 Fan-M
#BO2 Fan-L
#6 / 24 V~ Com
#5 / 24 V~ Hot
#UO9 N.C.
#UI19 COS
#18 Scom

Normally Closed

Optional supply water temperature sensor

Mandatory
- Pipe no = 2 pipes
- CntrltTyp = On/Off
- Fan Menu = 0 (L-M-H)
- FL time = N/A

If **cooling only** set::
- SeqOpera = 0 Cooling only

If **heating only** set:
- SeqOpera = 1 Heating only

If **heat / cool auto-changeover** with a local water temperature sensor set:
- SeqOpera = 0 Cooling only
- UI3 = COS

---

2 pipe system cooling and/or heating
Control type = Floating

Modulating Floating Valve Cooling and/or Heating

3 Speed fan

Room Temperature Control Thermostat

24 VAC fan relays

High — Med — Low

#BO4Fan-H
#BO3 Fan-M
#BO2 Fan-L
#6 / 24 V~ Com
#5 / 24 V~ Hot
#UO9 Close
#UO11 Open
#UI19 COS
#18 Scom

Optional supply water temperature sensor

Mandatory
- Pipe no = 2 pipes
- CntrltTyp = Floating
- Fan Menu = 0 (L-M-H)
- FL time = as per actuator

If **cooling only** set:
- SeqOpera = 0 Cooling only

If **heating only** set:
- SeqOpera = 1 Heating only

If **heat / cool auto-changeover** with a local water temperature sensor set:
- SeqOpera = 0 Cooling only
- UI3 = COS

Schematic	Wiring	Settings

2 pipe system cooling and/or heating
Control type = Analog

Modulating Analog Valve Cooling and/or Heating

3 Speed fan

Room Temperature Control Thermostat

23.5°

24 VAC fan relays

#BO4 Fan-H — High
#BO3 Fan-M — Med
#BO2 Fan-L — Low

#6 / 24 V~ Com
#5 / 24 V~ Hot
#UO12 Analog
#UI19 COS
#18 Scom

0 to 10 VDC

Optional supply water temperature sensor

Mandatory
- Pipe no = 2 pipes
- CntrltTyp = Analog
- Fan Menu = 0 (L-M-H)
- RA/DA = as per actuator

If **cooling only** set:
- SeqOpera = 0 Cooling only

If **heating only** set:
- SeqOpera = 1 Heating only

If **heat / cool auto-changeover** with a local water temperature sensor set:
- SeqOpera = 0 Cooling only
- UI3 = COS

4 pipe system cooling and heating
Control type = On / Off

Normally Closed On/Off Valve Cooling and Heating

3 Speed fan

Room Temperature Control Thermostat

23.5°

24 VAC fan relays

#BO4 Fan-H — High
#BO3 Fan-M — Med
#BO2 Fan-L — Low
#6 / 24 V~ Com
#5 / 24 V~ Hot
#UO9 N.C.
#UO11 N.C.

Normally Closed   Heating   Cooling

Mandatory
- Pipe no = 4 pipes
- CntrltTyp = On/Off
- Fan Menu = 0 (L-M-H)
- SeqOpera = 4 Cool/Heat

4 pipe system cooling and heating
Control type = Floating

Modulating Floating Valve Cooling and Heating

3 Speed fan

Room Temperature Control Thermostat

23.5°

24 VA C fan relays

#BO4 Fan-H — High
#BO3 Fan-M — Med
#BO2 Fan-L — Low
#6 / 24 V~ Com
#5 / 24 V~ Hot
#UO9 Close
#UO11 Open
#UO10 Close
#UO12 Open

Heating   Cooling

Mandatory
- Pipe no = 4 pipes
- CntrltTyp = Floating
- Fan Menu = 0 (L-M-H)
- FL time = as per actuator
- SeqOpera = 4 Cool/Heat

Schematic	Wiring	Settings

4 pipe system cooling and heating
Control type = Analog

Modulating Analog Valve Cooling and Heating

3 Speed fan

Room Temperature Control Thermostat

23.5°

24 VAC fan relays

- #BO4 Fan-H — High
- #BO3 Fan-M — Med
- #BO2 Fan-L — Low
- #6 / 24 V~ Com
- #5 / 24 V~ Hot
- #UO12 Analog
- #UO11 Analog

0 to 10 VDC Heating | 0 to 10 VDC Cooling

Mandatory
- Pipe no = 4 pipes
- CntrltTyp = Analog
- Fan Menu = 0 (L-M-H)
- RA/DA = as per actuator
- SeqOpera = 4 Cool/Heat

2 pipe system cooling or heating with reheat
Control type = Floating

Modulating Floating Valve Cooling and/or Heating

3 Speed fan

Electric Reheat

Room Temperature Control Thermostat

23.5°

- #BO8
- #7 RH
- #BO4 Fan-H — High
- #BO3 Fan-M — Med
- #BO2 Fan-L — Low

24 VAC fan relays

- #6 / 24 V~ Com
- #5 / 24 V~ Hot
- #UO9 Close
- #UO11 Open
- #UI19 COS
- #18 Scom

Optional supply water temperature sensor

Mandatory
- Pipe no = 2 pipes
- CntrltTyp = Floating
- Fan Menu = 0 (L-M-H)
- FL time = as per actuator
- SeqOpera = 2 Cool/Reheat
- UI3 = COS

REMOTE SENSOR ACCESSORIES

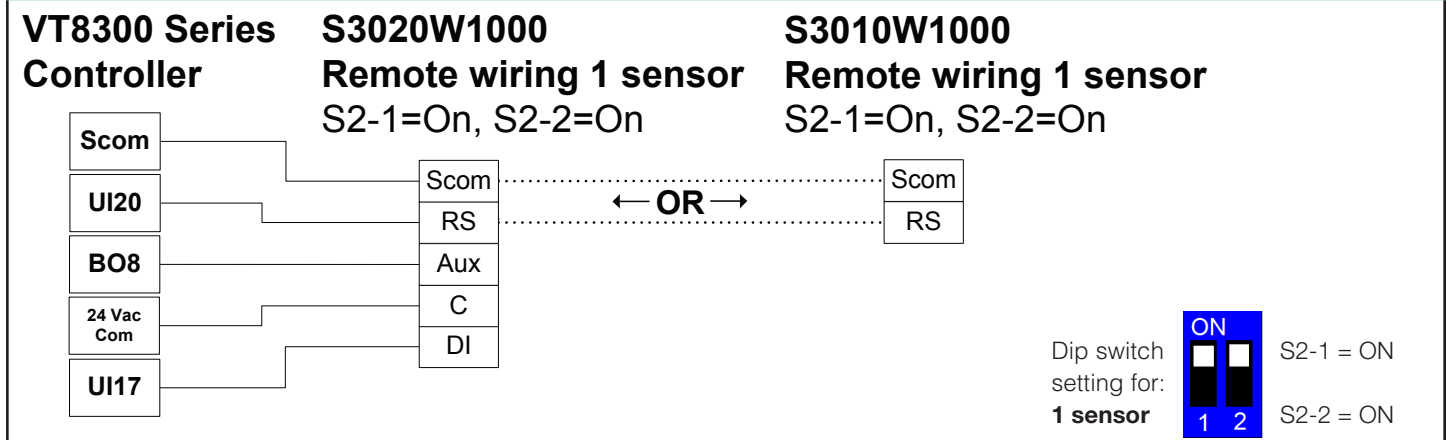| Model no.	Description
S3010W1000	Wall mounted temperature sensor
S3020W1000	Wall mounted temperature sensor with override button and occupancy status LED
S2060A1000	Averaging temperature sensor
S2000D1000	Duct mounted temperature sensor

Note:

If one or multiple sensor(s) is/are connected into the RS terminal, the internal temperature sensor is automatically disabled. Disconnecting the sensor(s) in RS terminal will re-activate the internal sensor.

Remote mount temperature sensors inputs use 10K type 2 NTC thermistors.

Features:
• Each sensor can be configured for various averaging combinations
• Optional occupancy led
• Optional override key

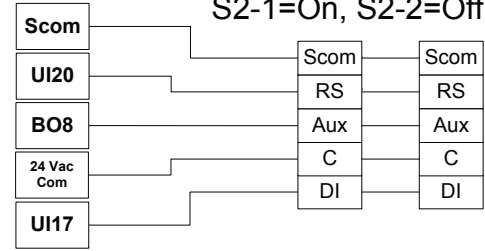**Wiring example of single remote room sensor:**

VT8300 Series Controller

S3020W1000 Remote wiring 1 sensor S2-1=On, S2-2=On

S3010W1000 Remote wiring 1 sensor S2-1=On, S2-2=On

Dip switch setting for: **1 sensor**

ON
S2-1 = ON
S2-2 = ON

Wiring examples of 2 remote room sensors for averaging applications:

VT8300 Series Controller   **1 x S3010W1000 and 1 x S3020W1000 Remote wiring 2 sensors**
S2-1=On, S2-2=Off

| Scom |
| UI20 |
| BO8 |
| 24 Vac Com |
| UI17 |

Scom		Scom
RS		RS
Aux		
C		
DI		
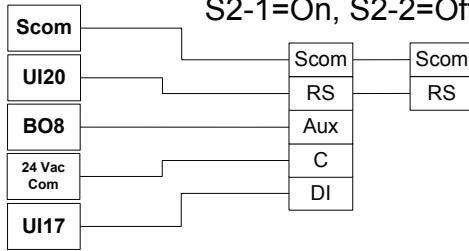
VT8300 Series Controller   **2 x S3020W1000 Remote wiring 2 sensors**
S2-1=On, S2-2=Off

| Scom |
| UI20 |
| BO8 |
| 24 Vac Com |
| UI17 |

Scom		Scom
RS		RS
Aux		Aux
C		C
DI		DI

VT8300 Series Controller   **2 x S3010W1000 Remote wiring 2 sensors**
S2-1=On, S2-2=Off

| Scom |
| UI20 |

| Scom | | Scom |
| RS | | RS |
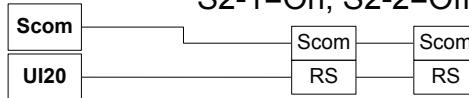
Notes for averaging applications:

- S3010W1000 and S3020W1000 can be mixed matched.
- S3010W1000 and S3020W1000 are to be wired in parallel.
- Respect the dip switch setting in each remote sensor.

Dip switch setting for:
2 sensors
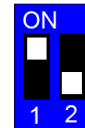
ON
1 2
S2-1 = ON
S2-2 = OFF

Wiring examples of 3 remote room sensors for averaging applications:

VT8300 Series Controller   **2 x S3010W1000 and 1 x S3020W1000 Remote wiring 3 sensors**
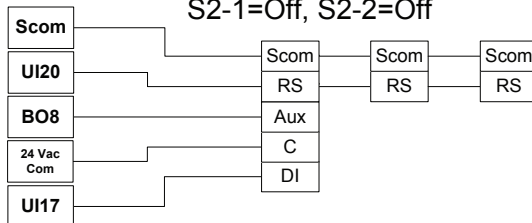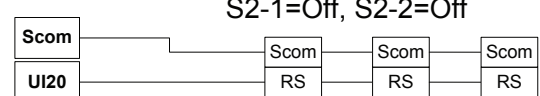S2-1=Off, S2-2=Off

| Scom |
| UI20 |
| BO8 |
| 24 Vac Com |
| UI17 |

Scom		Scom		Scom
RS		RS		RS
Aux				
C				
DI				

VT8300 Series Controller   **3 x S3010W1000 Remote wiring 3 sensors**
S2-1=Off, S2-2=Off

| Scom |
| UI20 |

| Scom | | Scom | | Scom |
| RS | | RS | | RS |

Dip switch setting for:
3 sensors

ON
1 2
S2-1 = OFF
S2-2 = OFF

Temperature vs. resistance chart for 10 Kohm NTC thermistor (R25°C = 10KΩ±3%, B25/85°C = 3975K±1.5%)

°C	°F	Kohm	°C	°F	Kohm	°C	°F	Kohm	°C	°F	Kohm	°C	°F	Kohm
-40	-40	324.3197	-20	-4	94.5149	0	32	32.1910	20	68	12.4601	40	104	5.3467
-35	-31	234.4009	-15	5	71.2430	5	41	25.1119	25	77	10.0000	45	113	4.3881
-30	-22	171.3474	-10	14	54.1988	10	50	19.7390	30	86	8.0694	50	122	3.6202
-25	-13	126.6109	-5	23	41.5956	15	59	15.6286	35	95	6.5499	55	131	3.0016

HOME SCREEN DISPLAY

Hospitality User Interface Shown

Date — 26.09.2012

Occupancy Status — Occupied

Indoor Temperature — Indoor °C 23.5°

Indoor Humidity — Humidity 45 %

Outdoor Temperature — Outdoor 18 °C

System Mode

Short Network Message — Room 1705

Time — 2:43 PM

System Status

Fan Status

Up Arrow Increase Temperature Setpoint

Actual Setpoint — 24.0

Down Arrow Decrease Temperature Setpoint

Help

Language Selection

Fan Mode

Temperature Units

Note: User HMI is configurable and allows display functions such as Date, Time, Humidity, Outdoor Temperature, Setpoint, and others to be enabled or disabled by setting various parameters.

HOW TO ENTER SET-UP SCREEN
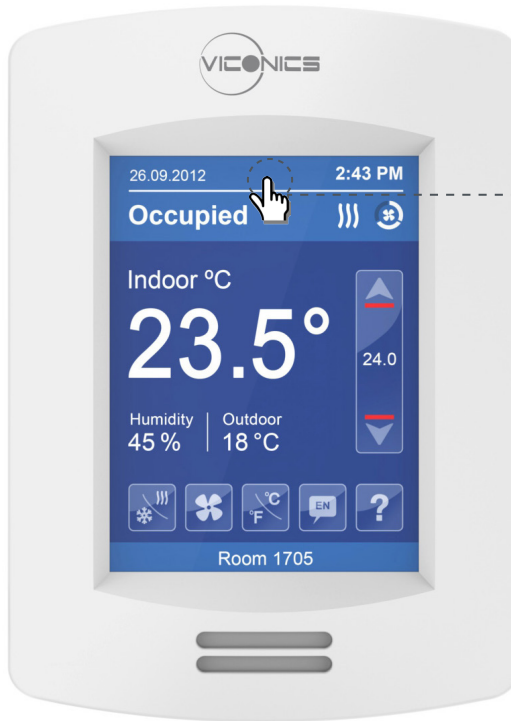
Touch and hold this point for 3 seconds to enter set-up mode

Note: If a configuration/installer password is activated to prevent unauthorised access to the configuration menu parameters, a password entry prompt shows to prevent access to device configuration components.

For more information on using and configuring the functions of the HMI, refer to the following document:
**VT8300 Series
Terminal Equipment Controller
User Interface Guide**

SET-UP SCREEN DISPLAY
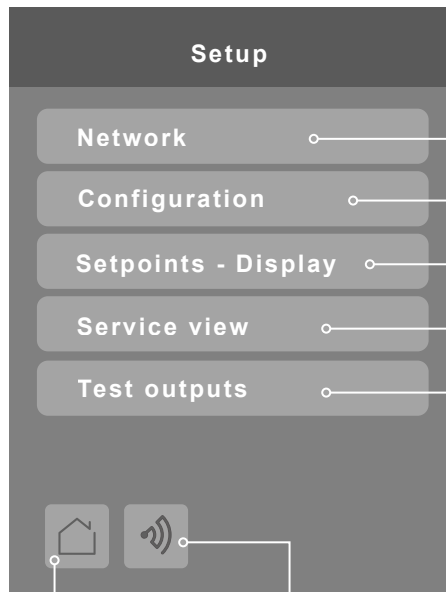
Note: The "Network" button does not show if no BACnet® or ZigBee® card is installed.

Setup

Network — Enter BACnet® & ZigBee® network settings

Configuration — Enter parameter configuration menu

Setpoints - Display — Enter setpoint & display settings

Service view — Enter status and service view

Test outputs — Enter output testing mode

Return to home screen

Discover Mode The Controller becomes discoverable on the wireless ZigBee® network for 1 minute (this button is hidden if ZigBee® settings are not configured)

General Note:

Adjustable parameter

Non-adjustable parameter