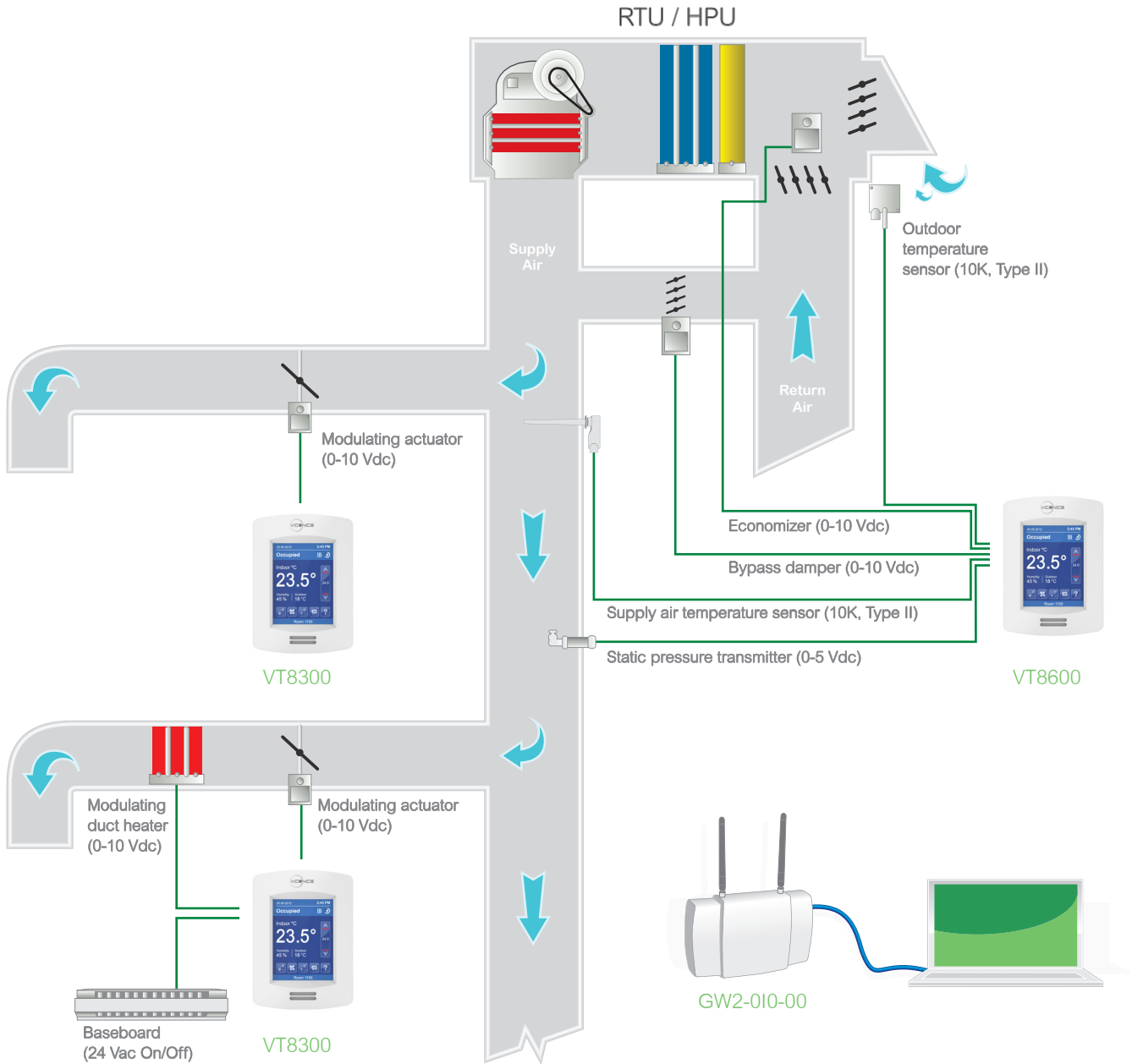


VVT Zoning

Application for Variable Volume and Temperature Control



INTRODUCTION

This application is for a pressure dependant VVT zoning system using one VT8600 Series Room Controller, for the heat pump or rooftop, multiple VT8300 Series Room Controllers (2-20) for the zones and one Gateway Multi-purpose Manager (MPM-GW).

The VT8600 can be set for 1C/1H, 2C/2H, modulating heat, economizer and CO₂, and will control the static pressure using a bypass damper or a VFD. This can be accomplished directly from the interface of the VT8600 Room Controller. It is also used to set the occupancy schedule, configurable on the Room Controllers HMI.

The VT8300 Series Room Controller can control a 0-10 Vdc modulating damper, a 0-10 Vdc duct heater and a baseboard. Added parameters include the following:

- damper Min_Pos
- damper Heat_Pos
- PI_Heat_Weight
- PI_Cool_Weight

In order to facilitate system balancing, it is possible to force all zone dampers to the fully open position for a specific time duration (between 1 and 240 minutes).

A built-in comfort feature will override the damper minimum position if the Room_Temperature deviates too far from setpoint. All configurations are done on the Room Controller.

The MPM-GW is used to calculate the highest zone PI_Heat & PI_Cool demands, transfer the Occupancy, System_Mode and to coordinate all ZigBee communication. The database includes one VT8600 Room Controller and 20 VT8300 Room Controllers according to the following:

- Integrator sets up the ZigBee network and then discovers the Room Controllers
- any unused Room Controllers should not be deleted
- other MPM-GW functionality such as trending, scheduling, and dashboards can be used

HARDWARE REQUIREMENTS

Qty	Part Number	Description
As required	VT8300	VT8300 Series Room Controller running FW version 1.4.2 or higher
1	VT8600	VT8600 Series Room Controller running FW version 1.4.2 or higher
1	GW2-010-00	MPM Gateway running FW version 2.19.1 or higher

SOFTWARE REQUIREMENTS

Filename	Version	Comment
SEZ8600-RTU-HPU_controller_R00.lua	1.0	For VT8600 RTU Room Controller*
SEZ8300-VVT_Zone_stat_R00.lua	1.0	For VT8300 Zone Room Controller*
SEZ8000_MPM_DB_R00.db	1.0	MPM-GW database*

* Refer the [VT8000 Uploader Tool](#) for instructions on how to upload a Lua Script to the VT8000 Series Room Controllers.

VT8600 SEQUENCE OF OPERATION

The VT8600 will control the RTU/HPU based on the “Highest Heating or Cooling demand” and the “Global Combined Cool & Heat demand” from the VT8300 Zone Room Controllers. If Cool and Heat demands are equal, the cooling demand takes precedence the heating demand. There is a 2-minute delay (adjustable) between Cool/Heat and Heat/Cool System_Mode change. The output for Static Pressure Control is direct acting (0-10 Vdc = 0-100%), which is ideal for VFD applications. For a bypass damper it is important to have the damper “open-to-bypass” at 0 Vdc and “closed” at 10 Vdc.

VT8300 SEQUENCE OF OPERATION

The VT8300 controls a modulating (0-10 Vdc) damper actuator, according to the VT8600 System_Mode. The Room Controller does not require a changeover temperature sensor, however it does controls a modulating (0-10Vdc) duct heater and an On/Off baseboard.

When the system is Unoccupied, pressing the Override key of a Zone Room Controller will only Override the Zone. To Override the RTU/HPU, the Override key of the VT8600 must be pressed.

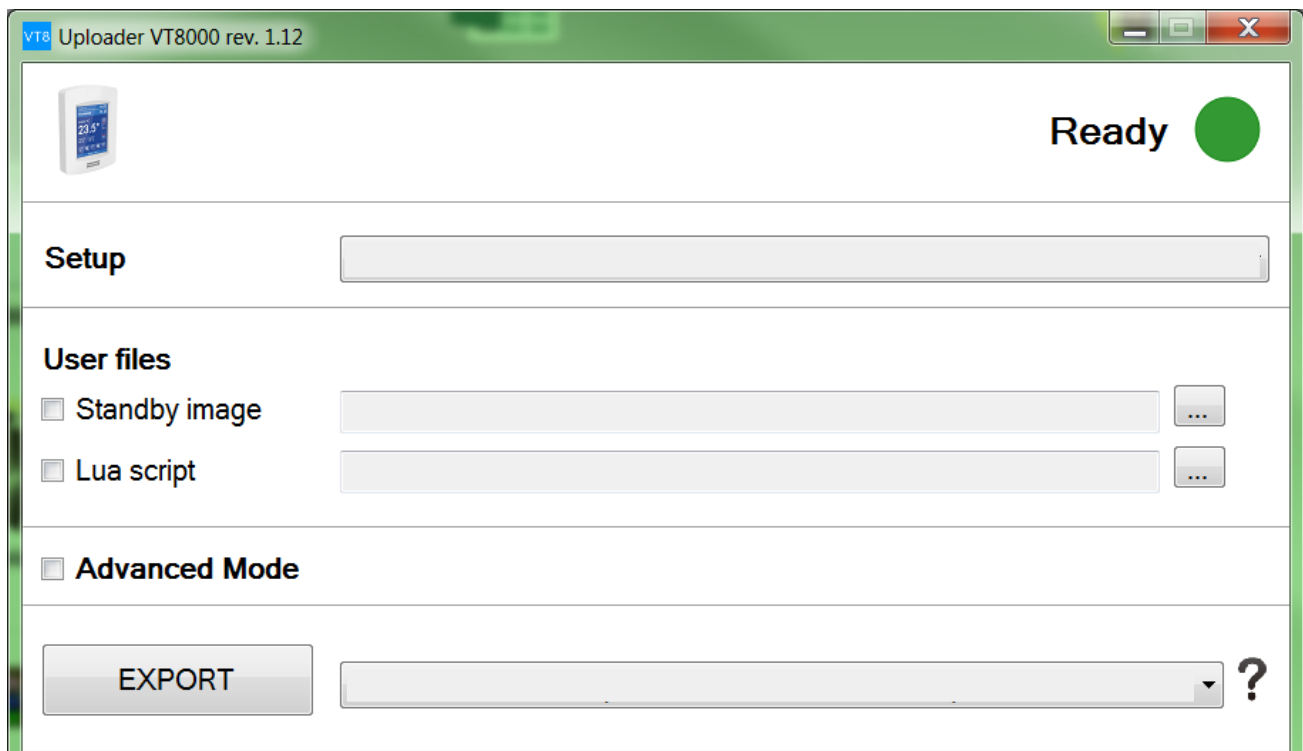
Information transferred from the VT8600 RTU/HPU controller to the VT8300 Zone Room Controllers is as follows:

- Occupied/Unoccupied command
- Heat or Cool system mode
- Damper Override, 100% open, for balancing purpose

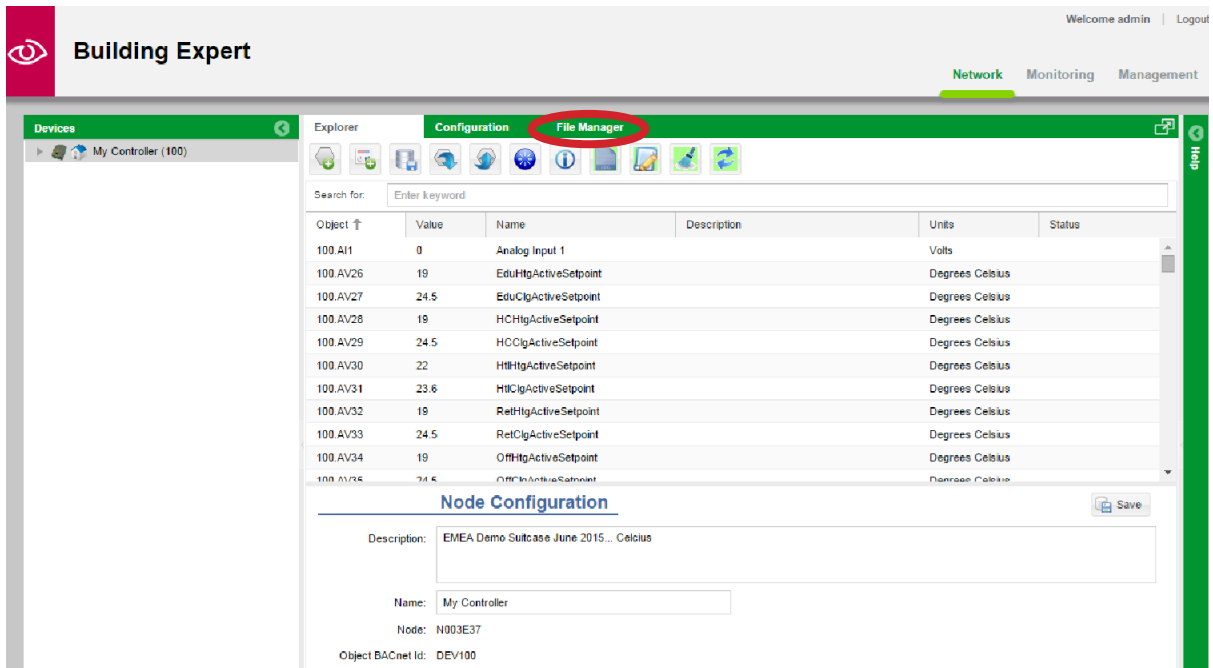
SETUP INSTRUCTIONS

1. Using Uploader Tool, upload two Lua scripts to each VT8300 Room Controller and each VT8600 Room Controller.

NOTE: it is essential to upload the Lua scripts in the correct sequence. Upload file 1 of 2 first and 2 of 2 last.



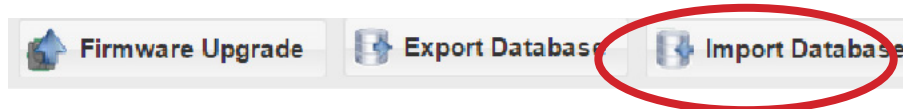
2. Login to MPM-GW using default IP 10.50.80.3.
3. Enter Username: admin
4. Enter Password: vtzoning.



The screenshot shows the Building Expert web interface. The top navigation bar includes "Welcome admin" and "Logout". The main menu has "Network", "Monitoring", and "Management". The "Configuration" menu is expanded, and the "File Manager" tab is highlighted with a red circle. Below the menu, there is a search bar and a table of objects. The table has columns for Object, Value, Name, Description, Units, and Status. Below the table is a "Node Configuration" section with a "Description" field containing "EMEA Demo Suitecase June 2015... Celsius", a "Name" field with "My Controller", and "Node: N003E37" and "Object BACnet Id: DEV100".

Object	Value	Name	Description	Units	Status
100 AI1	0	Analog Input 1		Volts	
100 AV26	19	EduHtgActiveSetpoint		Degrees Celsius	
100 AV27	24.5	EduClgActiveSetpoint		Degrees Celsius	
100 AV28	19	HCHtgActiveSetpoint		Degrees Celsius	
100 AV29	24.5	HCClgActiveSetpoint		Degrees Celsius	
100 AV30	22	HSHtgActiveSetpoint		Degrees Celsius	
100 AV31	23.6	HWClgActiveSetpoint		Degrees Celsius	
100 AV32	19	RetHtgActiveSetpoint		Degrees Celsius	
100 AV33	24.5	RetClgActiveSetpoint		Degrees Celsius	
100 AV34	19	OffHtgActiveSetpoint		Degrees Celsius	
100 AV35	24.5	OffClgActiveSetpoint		Degrees Celsius	

5. Click File Manager tab and then Import Database and import file SEZ8000_MPM_DB_V1_R00.db to MPM-GW.



6. Bind Room Controllers to MPM-GW in the following order:

- i). VT8600
- ii). VT8300 for first zone
- iii). VT8300 for second zone

NOTE: refer to Building Expert User guide to bind Room Controllers to MPM-GW on ZigBee network.

NOTE: do not delete any unused Room Controllers.

7. On VT8600 model, navigate to Lua screens to configure Room Controller.

NOTE: refer to VT8600 User Interface Guide for details.

8. Repeat step 5 for VT8300 model.

NOTE: refer to VT8300 User Interface Guide for details.

The screenshot displays the configuration interface for a SmartStruxure Controller. On the left, a 'Devices' list shows various room controllers, with 'SE8600UxB 1 (101)' highlighted. The main area is divided into 'Configuration' and 'File Manager' tabs. The 'Configuration' tab shows a table of objects and their values, including parameters like 'Occupied Cool Setpoint', 'Zone damper override', and fan/status indicators. Below this, the 'ZigBee Room Controller Configuration' screen is visible, featuring fields for Name, Model, Extended Node ID, Short Node ID, Application Version, Status, and Last Communication. A 'Bind' button is highlighted in the bottom right corner of the configuration screen.

Object	Value	Name	Description
101.AV10	24.5	room temperature	room temperature
101.AV11	22.7	Occupied Cool Setpoint	Occupied Cool Setpoint
101.AV12	0	Lua Parameter C (AV27)	Zone damper override to 100% for x minutes
101.AV13	0	Lua Parameter E (AV29)	RTU Heat/Cool Sequence
101.AV14	-100	Lua Parameter F (AV30)	Cool/Heat -100 to +100
101.BV1	1	G Fan Status	0 = Off, 1 = On
101.BV2	0	W1 Status	0 = Off, 1 = On
101.BV3	0	W2 Status	0 = Off, 1 = On
101.BV4	1	Y1 Status	0 = Off, 1 = On
101.BV5	1	Y2 Status	0 = Off, 1 = On
101.ZVC1		ZigBee Room Controller Config.	

ZigBee Room Controller Configuration

Description:

Name: Model: SE8600UxB

Extended Node ID (hex): COM Address: 78

Short Node ID (hex): D2AD Temperature Display Mode:

Application Version: 6

Status: Online

Last Communication: 2016-06-29 15:04:06

User Variables VT8600

Variable	Name	Description	Min	Max	Increment
AV25	Prs Spt(x100)	Static Pressure Setpoint (x100) in inch wc. EX: 35 = 0.35" wc	10 (0.1")	90 (1")	5 (0.05")
AV26	Prs Rng(x100)	Static Pressure Transmitter pressure range (x100). Ex:150 = 0~1.5" wc	100 (0-1")	500 (0-5")	25 (0.25")
AV27	Zn Dmpr Ovr(m)	Override all zone dampers to 100% open for defined minutes (1-240 minutes)	0	240	1
AV28	Pressure(x100)	Display Static Pressure reading (x100) so 0.35" w.c. will display as 35	N/A	N/A	N/A
AV29	Cool/Heat: 0/1	Used to transfer system mode to zone thermostats	N/A	N/A	N/A
AV30	HiDmd -100/100	Highest cool or heat demand from the zone thermostats	N/A	N/A	N/A

User Variables VT8300

Variable	Name	Description	Min	Max	Increment
AV25	Min Dmp Pos%	Minimum damper position in %	0	100	1
AV26	ReHeat Pos%	Damper position for the duct heater when the main system is in Cool mode	0	100	1
AV27	Heat PI Wei%	Factor applied on Heat demand, 100% = Real demand, 50% = ½ demand	0	100	1
AV28	Cool PI Wei%	Factor applied on Cool demand, 100% = Real demand, 50% = ½ demand	0	100	1
AV29	Cool/Heat: 0/1	System mode from VT8600 RTU-HPU controller	N/A	N/A	N/A
AV30	Dmnd -100/100	Cool & heat demand transferred to RTU-HPU controller	N/A	N/A	N/A

VT8300 Wiring Input and Output Terminals

Output	Description
BO1	N/A
BO2	Not used
BO3	Not used
BO4	Not used
BO8	Baseboard On/Off (24 Vac)
UO9	Not used
U10	Not used
U11	Duct heater SCR (0-10 Vdc)
U12	Zone damper actuator (0-10 Vdc)
U16	Not used
U17	Not used
U19	Not used
U20	Remote temperature sensor, (10K, Type 2)
U22	Not used
U23	Not used
U24	Not used






VT8600 Wiring Input and Output Terminals

Output	Description
BO1	Auxiliary contact
BO2	Y2 - Cool stage 2 / Compressor 2
BO3	Y1 - Cool stage 1 / Compressor 1
BO4	G - Fan
BO8	W1 - Heat stage 1 / Auxiliary Heat
UO9	W2 - Heat stage 2 / Reversing valve
U10	Economizer
U11	Modulating heat (0-10 Vdc)
U12	Bypass damper / VFD (0-10 Vdc)
U16	Not used
U17	Not used
U19	Not used / CO ₂
U20	Return air temperature sensor, (10K, Type 2)
U22	Supply air temperature sensor, (10K, Type 2)
U23	Outdoor temperature sensor, (10K, Type 2)
U24	Static Pressure Transmitter (0-5 Vdc)

*Refer to VT8300/VT8600 Installation Guide for complete wiring instructions.






VT8600 ROOM CONTROLLER CONFIGURATION

Always set parameters per application and system requirements found in the VT8600 User Interface Guide. Also, set parameters in thermostat page "3/3 Lua" as shown below.

3/3 Lua	
Prs Spt(x100)	0
Prs Rng(x100)	0
Zn Dmpr Ovr(m)	0
Pressure(x100)	0
Cool/Heat: 0/1	0
HiDmd -100/100	0
	
	
	

VT8300 ROOM CONTROLLER CONFIGURATION

Always set parameters per application and system requirements found in the VT8300 User Interface Guide. Also, set parameters in thermostat page "3/3 Lua" as shown below.

3/3 Lua	
Min Dmp Pos%	0
ReHeat Pos%	0
Heat PI Wei%	100
Cool PI Wei%	100
Cool/Heat: 0/1	0
Dmnd -100/100	0
	
	
	

MPM CONFIGURATION

The pre-configured database provided with this application contains all the necessary objects and devices for operation. The database must be loaded using the Import Database function of Building Expert. The following steps must be taken afterwards:

- 1- Create a Zigbee network.
- 2- Bind each device using the Bind device button in order to associate the ZigBee address to each device.

FEEDBACK AND REFERENCES

We value your feedback about your experience using this application in a real world environment, and invite you to send us your feedback and comments about your implementation to sales@viconics.com.