DRAFT

Installation Manual

Orion High Voltage Thermostat

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FCC and ISED (IC) statements

FCC (Federal Communications Commission) statements

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) these devices may not cause harmful interference, and

(2) these devices must accept any interference received, including interference that may cause undesired operation.

Important note: To maintain compliance with FCC´s RF exposure guidelines, this equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. Use only the supplied antenna.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

These transmitters must not be co-located or operating in conjunction with any other antennas or transmitters.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The concerned end product must be labeled to say 'Contains FCC ID: Y7V-683081118C1'.

The concerned end product must be labeled to say 'FCC ID: Y7V-TZENHV'.

ISED (IC) statements

These devices comply with Industry Canada licence-exempt RSS standard CAN ICES-3 (B)/NMB-3(B) B. Operation is subject to the following two conditions:

(1) these devices may not cause interference, and
(2) these devices must accept any interference, including interference that may cause undesired operation of the devices.

Les présents appareils sont conformes aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) les appareils ne doivent pas produire de brouillage, et
(2) l'utilisateur des appareils doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Important note: To comply with Industry Canada RF radiation exposure limits for general population, the antennas used for these transmitters must be installed such that a minimum separation distance of 20 cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.

Under Industry Canada regulations, these radio transmitters may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

These radio transmitters IC9514A-683081118C1 and IC9514A-TZENHV have been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with these devices.

Name/Model	Gain	Impedance
Inverted F-antenna	3.0 dBi	50 ohm

The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.

Le terme "IC" devant le numéro de certification signifie seulement que les specifications techniques Industrie Canada ont été respectées.

End product labeling

The radio module is labeled with its own IC Certification Number. If the IC Certification Number is not visible when a module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

'Contains IC: 9514A-683081118C1'

'IC: 9514A-TZENHV'

1. Introduction

Energy is a large cost for hotels, and EMS (*Energy Management System*) is a way of achieving energy savings in guest rooms. With the Orion EMS software option to Visionline it is possible to

- view the Orion EMS status of different rooms
- modify the configurable parameters for a room/group of rooms/entire property)
- provide alarm conditions
- provide energy savings reports
- provide preventative maintenance reports

This manual

- describes how to install the Orion EMS (*Energy Management System*) option and if applicable an Orion EMS client; see chapter 2
  - for the Orion EMS features to be shown in the Visionline software, it is necessary to install the *Orion EMS option*; follow the steps in section 2.1
  - if the Orion EMS features should also be available in a separate client where the operators do not see the "ordinary" Visionline items such as doors, follow the steps in section 2.2; this requires that the Orion EMS option has been installed in the Visionline software
- describes how to install the Orion EMS devices; chapter 3
- describes how to set up a thermostat profile; chapter 4
- describes how to commission the Orion EMS devices in an online network; chapter 5

Note: For daily operations when the system is in use, see *Daily use manual Orion High Voltage Thermostat*. In that document, more information about SysMon (*System Monitor*) features is also found. For more information about the Orion Service software, see *Quick reference guide Orion Service*.

A main task for Orion EMS is to determine whether or not a guest room is physically occupied. When a room is not occupied, Orion EMS controls the HVAC (*Heating Ventilation and Air Conditioning*) systems based on the configurable settings of the system. The items used together with Orion EMS are:

- digital thermostat *Orion High Voltage Thermostat*; in the rest of this document simply called 'thermostat'
- motion sensor
- ***Note:*** The thermostat has a built-in motion sensor, but in some cases (depending on the location of the *Orion High Voltage Thermostat* in the room) it can be necessary to use an external motion sensor in addition.
- door monitoring device; lock, switch
- gateway (the same as is used for online doors; requires the *Online* option which is also installed according to section 2.1)

Note: The gateway is not used in offline scenarios; see Appendix D for details.

Note: For each room number, it is possible to have

- one wired thermostat
- up to five motion sensors
- up to five door switches

Note: The best conditions for Orion EMS are obtained if also the locks are online and commissioned to the same online network as the thermostat and the motion sensor.

2. To install the software

2.1 To install a Visionline option

If the *Orion EMS option* (and *Online option*) has been ordered together withthe Visionline software, it is included in the license code and will be set in the software when the license code is entered. If the option(s) should be added to the system at a later occasion, when the license code has already been entered and system ID is therefore set, an option code is used instead. Several software options can be included in one option code. An operator with the authority to handle option codes must be logged on. Normally, options are set by the system manager or the distributor.

When ordering the option, the system code must be communicated to the ordering department:

1. Double click on **System settings** under the **Reports** tab in the navigation window of Visionline. **System settings** is available even if you are not logged on.
2. Communicate your system code to the order department; see order acknowledgement for phone number and e-mail address. The system code can also be entered in the *Ordering web page* when making the order.

To install an option:

1. Go to **Tools/Option code** in Visionline.
2. Enter the option code and click **Apply**

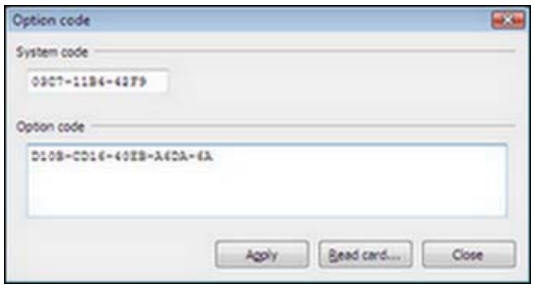


Figure 1

2.2 To install an Orion EMS client

If there should be a separate Orion EMS client (see chapter 1 for more information), this is installed according to the ReadMe file for the applicable operating system. The ReadMe files are found on the Orion EMS software CD.

2.2.1 To start an Orion EMS client

1. Click the **Start** button and go to **Programs/Orion EMS/Orion EMS**.
2. When requested, log on with the same user ID and password as for Visionline.

3. To install the Orion EMS devices

3.1 To install a thermostat

Important: This thermostat directly controls high voltage circuits and must be installed by a licensed electrician.

Important: All local codes must be followed when installing this thermostat. The thermostat will control a variety of HVAC systems and the installation will vary based on the type of system to which it is installed.

Figure 2

The master controller of the in-room system is the thermostat, shown in Figure 2. To the guest, this device appears and operates as a standard digital thermostat; however, this device also receives entry and exit information from the door lock or switch as well as motion detected information from the motion sensor. This information is used to determine the occupancy status of the room and implement energy savings strategy based on this information. The guest operates the thermostat, which communicates directly with the Visionline software/*Orion EMS* software and the devices within the room.

3.1.1 Step-by-step procedure

For a new thermostat, the following steps must be followed:

Figure 3: Service cable RJ12 to 3.5mm stereo jack (Art. No 205 999 008)

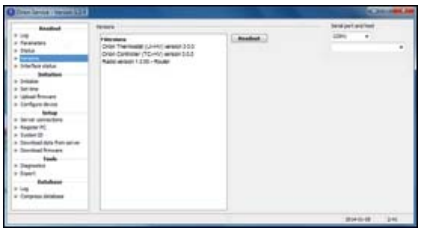


Figure 4

1. Make sure that the thermostat has got the latest available firmware:

   - Plug the service cable (see *Figure 3*) into the thermostat.

   - In *Orion Service* (see *Figure 4*): choose the **Versions** alternative and click the **Readout** button. See *Quick reference guide Orion Service* for more information about the software.

2. Mount the thermostat according to here.

3. Add the thermostat to the **Thermostats** list in Visionline; in the **Thermostat details** dialog you should also choose the profile to which the thermostat should belong. If no applicable thermostat profile exists in Visionline, create one according to chapter 4.

4. Initialize the thermostat with room number and also with parameters according to the chosen thermostat profile; follow the *Initialize* section in *Quick reference guide Orion Service*. ***Note:*** If one or more parameters of a thermostat profile are at a later occasion updated, these new parameters will automatically be sent to all concerned online thermostats. If the thermostats are not online, they are updated via the **Initialize** alternative in *Orion Service*.

5. Make external connections according to here.

6. If the thermostat should be online, set it up in the online network according to the chapter To commission the system.

3.1.2 Thermostat dimensions

Dimensions in mm (inches)

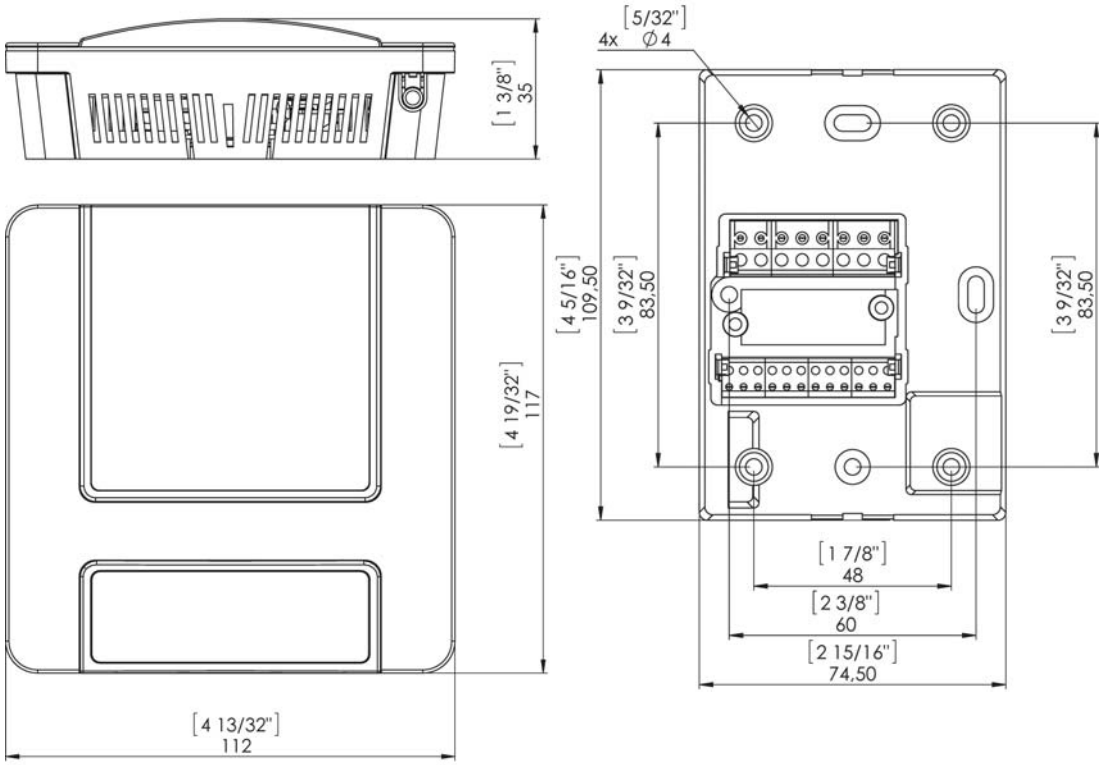


Figure 5

Note: This thermostat is an independently mounted control for surface mounting.

3.1.3 To mount a thermostat

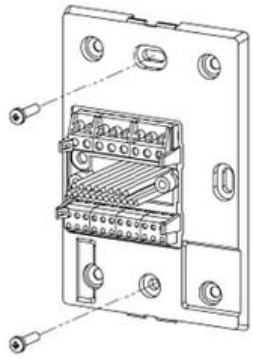


Figure 6

1a. If US single gang box is applicable: mount the wall bracket to the *US single gang box* according to *Figure 6*, using the two screws that are enclosed with the *US single gang box*.

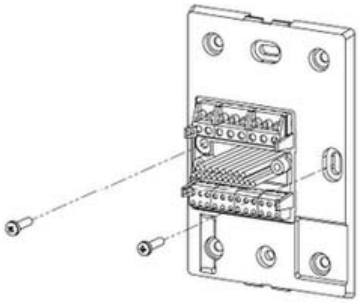


Figure 7

1b. If EU junction box is applicable: mount the wall bracket to the *EU junction box* according to *Figure 7*, using the two screws that are enclosed with the *EU junction box*.

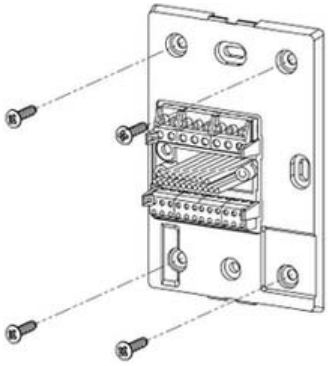


Figure 8

1c. If the fastening holes do not fit the installed junction box, or if no junction box is installed: use a *PZD-2* screw driver to mount the wall bracket with the four enclosed 3.5x25 screws.

2. Connect to the two terminal blocks according to here. ***Note:*** See a description of the different inputs and outputs in the sections Low voltage terminal block and High voltage terminal block.

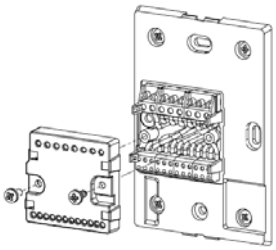


Figure 9

3. Use a *PZD-2* screw driver to fasten the cover for wall bracket with the two enclosed 3.5X9.5 screws.

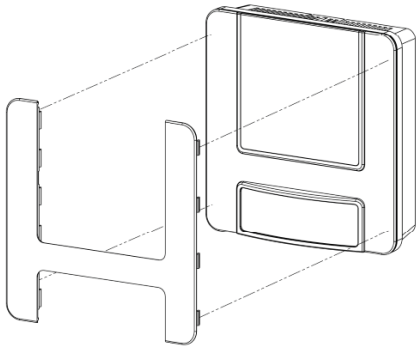


Figure 10

4. Snap the front plate onto the thermostat.

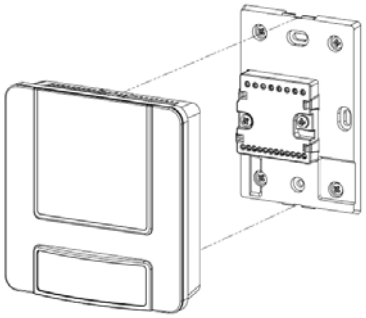


Figure 11

5. Snap the thermostat onto the wall bracket.

Figure 12

Figure 13

6. Push to lock the thermostat from the top and from the bottom.

3.1.4 To wire a thermostat (Orion High Voltage Thermostat)

The thermostat has got two terminal blocks for external connections; one for low voltage and one for high voltage. The different terminals are specified in *Figure 14* below. See details about the low voltage terminal block here and about the high voltage terminal block here.

For connection examples, click the links below:

Switch output
Proportional output
Extra input and wired door switch
Outputs N, L, RW, Y and W
Fan outputs

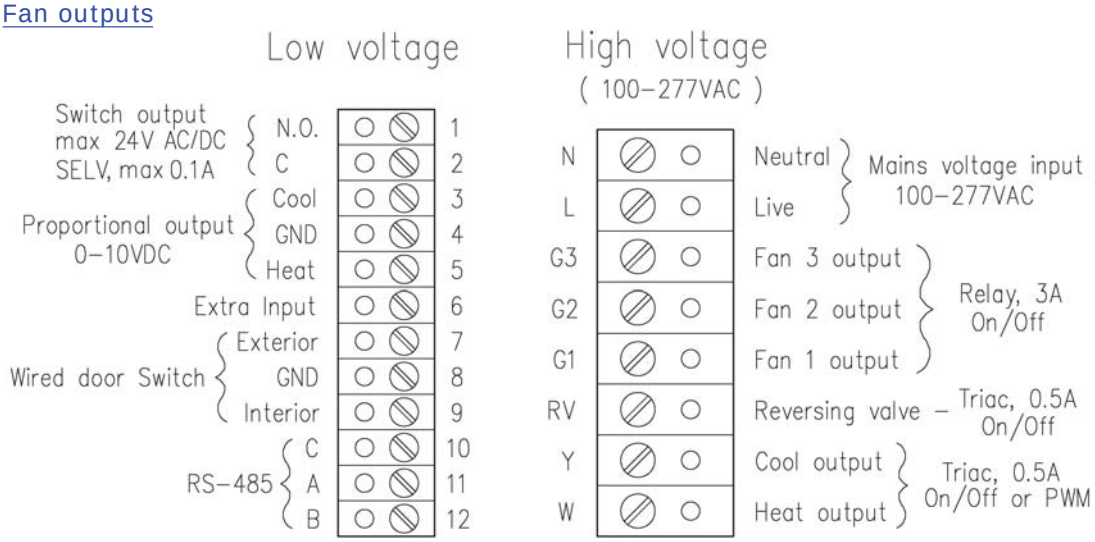


Figure 14

Important: The cabling is different for the two terminal blocks, due to different sizes of the blocks.
Low voltage cable: maximum cable cross section 1.0mm²
High voltage cable: maximum cable cross section 1.5mm²

3.1.4.1 Low voltage terminal block (12 pole; 3.5mm spacing)

Note: The parameters are set up in Visionline; see the section To set up a thermostat profile for details.

Note: For connection examples, click the links in the left column of Table 1 below.

Switch output	***Warning:*** The *switch output* must not be used to switch the mains voltage. • Max 24V AC/DC, SELV, max 0.1A • Potential free switch output • *Primary function:* contact closed when the room is occupied; can e.g. be used for giving a signal to a light control system ***Note:*** This is a switch output only; no voltages are output. • Alternative use of this output (e.g. use for intelligent switch and welcome scene) must be set up in Visionline.
Proportional output (0-10V)	• Outputs an analog voltage between 0V and 10V, where 0V is off and 10V is max on. ***Note:*** This is to control actuators with a 0-10V control input*. • *Cool:* output to a proportional cool actuator • *GND:* common reference for the heat and cool outputs • *Heat:* output to a proportional heat actuator *) Some actuators require other voltages, e.g. 2-10V or 0-5V.
Extra input	***Important:*** Do not apply any voltage. This is an input for a switch, connected between the input and the GND terminal. • *Primary function:* Used as input from a card switch or a wired motion sensor • *Alternative function:* Input for 2-pipe temperature sensor (hot/cold water); this sensor can either be a *bimetal switch* (open or closed depending on the temperature it senses) or a *1k NTC resistor* connected between this input and the GND terminal. The *1k NTC resistor* is a temperature-depending resistor, giving an analog value determined by the temperature it senses. ***Note:*** If the *2-pipe temperature sensor* is used, it is not possible to have a wired motion sensor.
Exterior door	***Important:*** Do not apply any voltage. This is an input for a switch, connected between the input and the GND terminal. • Used as input from a switch mounted on an exterior door or window; will turn the AC off when the door/window is open
Interior door	***Important:*** Do not apply any voltage. This is an input for a switch, connected between the input and the GND terminal. • Used as input from a switch mounted on an interior door; applicable when no VingCard online lock is installed
RS-485 (not in use)	• For communication with other equipment (e.g. light control equipment) using the RS-485 standard • A shielded twisted pair cable, made for this communication standard, must be used • *A* = non-inverting pin • *B* = inverting pin • *C* = common
	Table 1

3.1.4.2 High voltage terminal block (8 pole; 5.0mm spacing)

Note: The parameters are set up in Visionline; see the section To set up a thermostat profile for details.

Note: For connection examples, click the links in the left column of Table 2 below.

Mains voltage input	• Universal voltage input 100VAC-277VAC; 50/60Hz; rated impulse voltage 4kV • This is the voltage that is output on the high voltage terminals, but it is also used as power supply input for the thermostat internal circuits • *N* = Neutral • *L* = Live
Fan outputs	• Type 1.B action. Max load 3A (3FLA/18LRA) • Mains voltage output at - *G1:* Fan 1, when the fan is to be run at lowest speed - *G2:* Fan 2, when the fan is to be run at medium speed - *G3:* Fan 3, when the fan is to be run at high speed ***Note:*** For information about fan settings in Visionline, click here. ***Note:*** For information about live output, click here.
RV: Reversing valve	• Type 1 action. Max load 0.5A • *Primary function:* Used for switching between summer/winter (cold/hot water in the pipes of a 2-pipe system) • *Alternative functions (must be set up in Visionline):* - Mains voltage output when the room is occupied - Mains voltage output when the guest enters the room for the first time; welcome scene ***Note:*** These alternative functions can also be set up for G2. - Can be used as return (close) for floating valves ***Note:*** For information about live output, click here.
Y: Cool output	• Type 1 action. Max load 0.5A • Mains output for cool actuator • *Primary function:* Mains voltage output when the temperature is above the set temperature (plus deadband)
W: Heat output	• Type 1 action. Max load 0.5A • Mains output for heat actuator • *Primary function:* Mains voltage output when the temperature is below the set temperature (minus deadband)
	Table 2

3.1.4.3 Connection examples for switch output

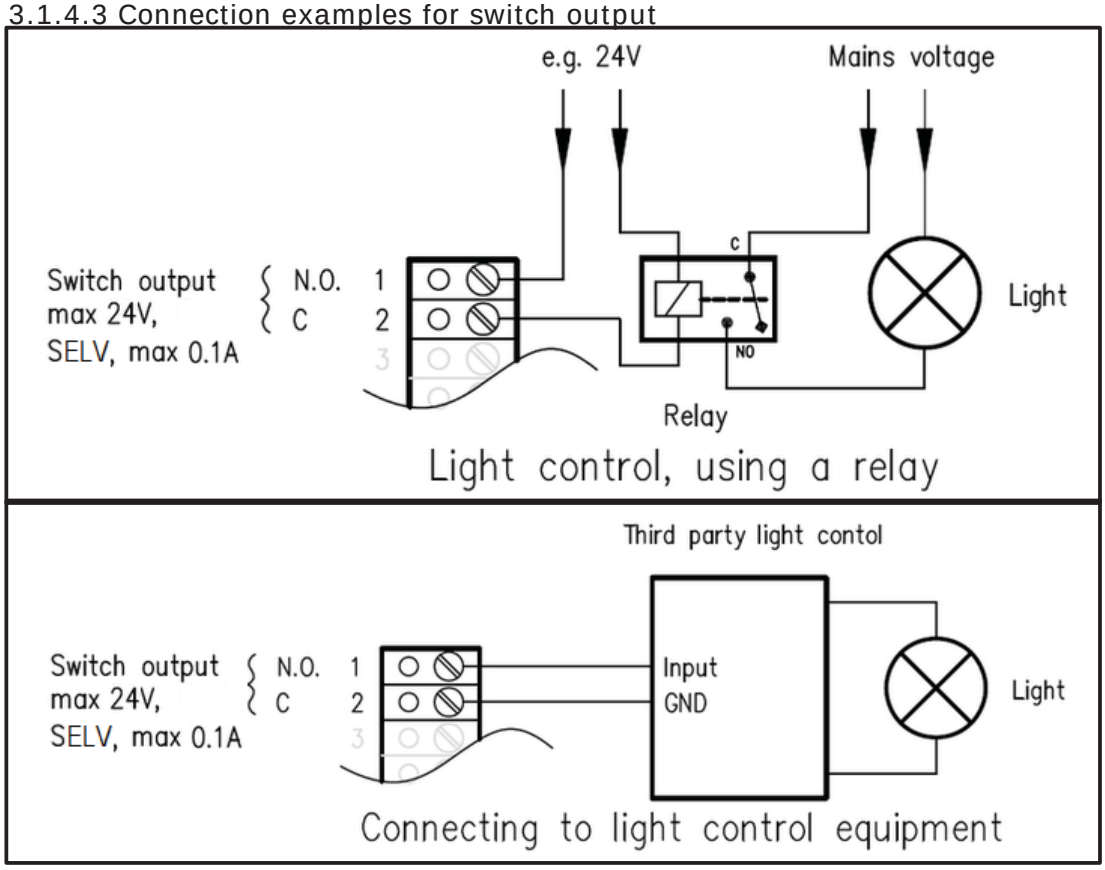


Figure 15

3.1.4.4 Connection example for proportional output

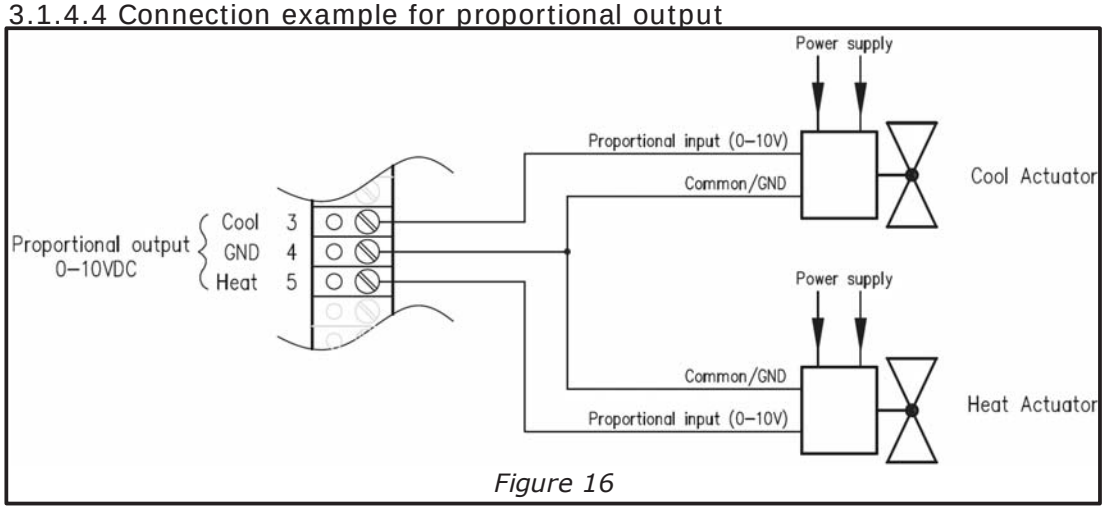


Figure 16

3.1.4.5 Connection examples for extra input

Note: NO (*normally open*)/NC (*normally closed*) in the below pictures refer to the state of the switch when the card is not inserted, or motion is not detected.

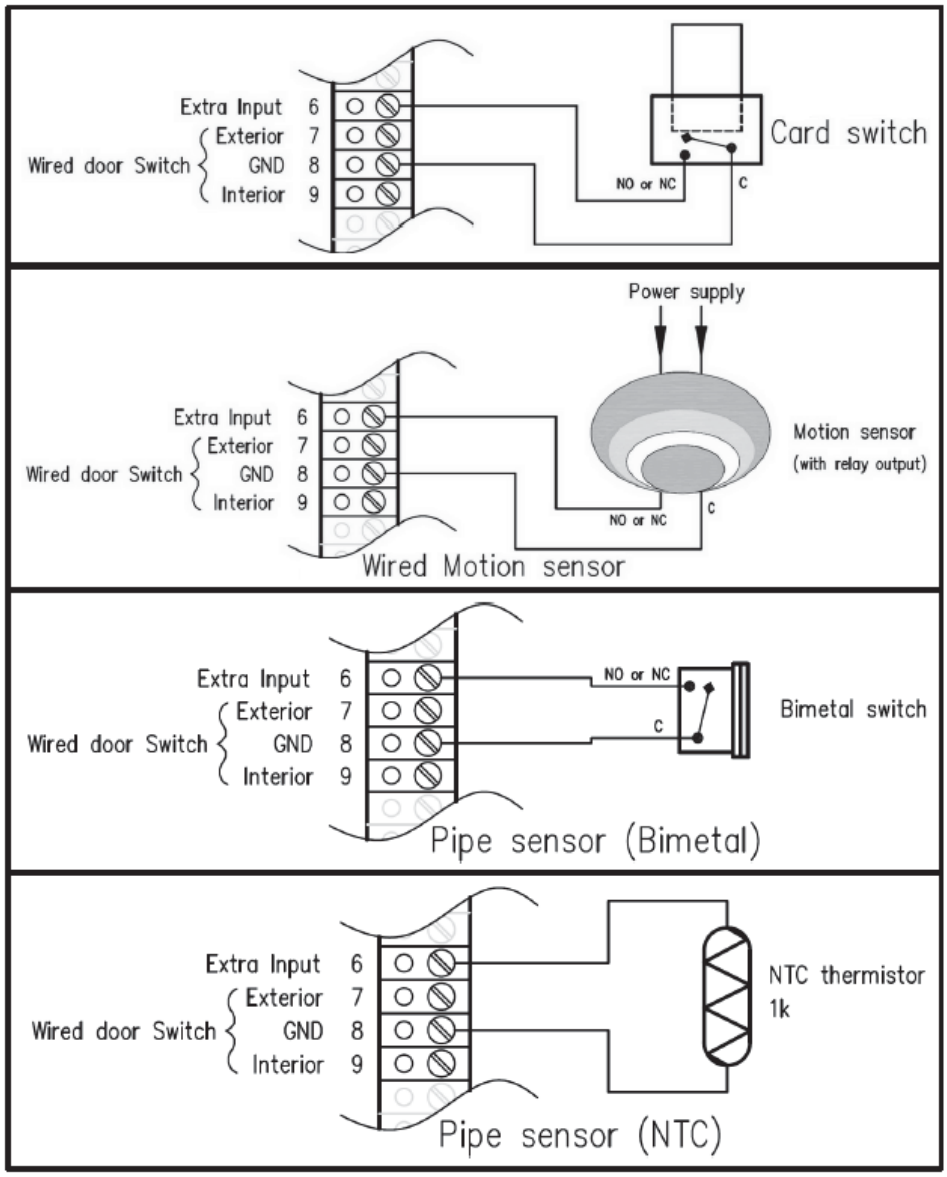


Figure 17

3.1.4.6 Connection examples for wired door switch

Note: NO (*normally open*)/NC (*normally closed*) refers to the state of the switch when the door or window is open.

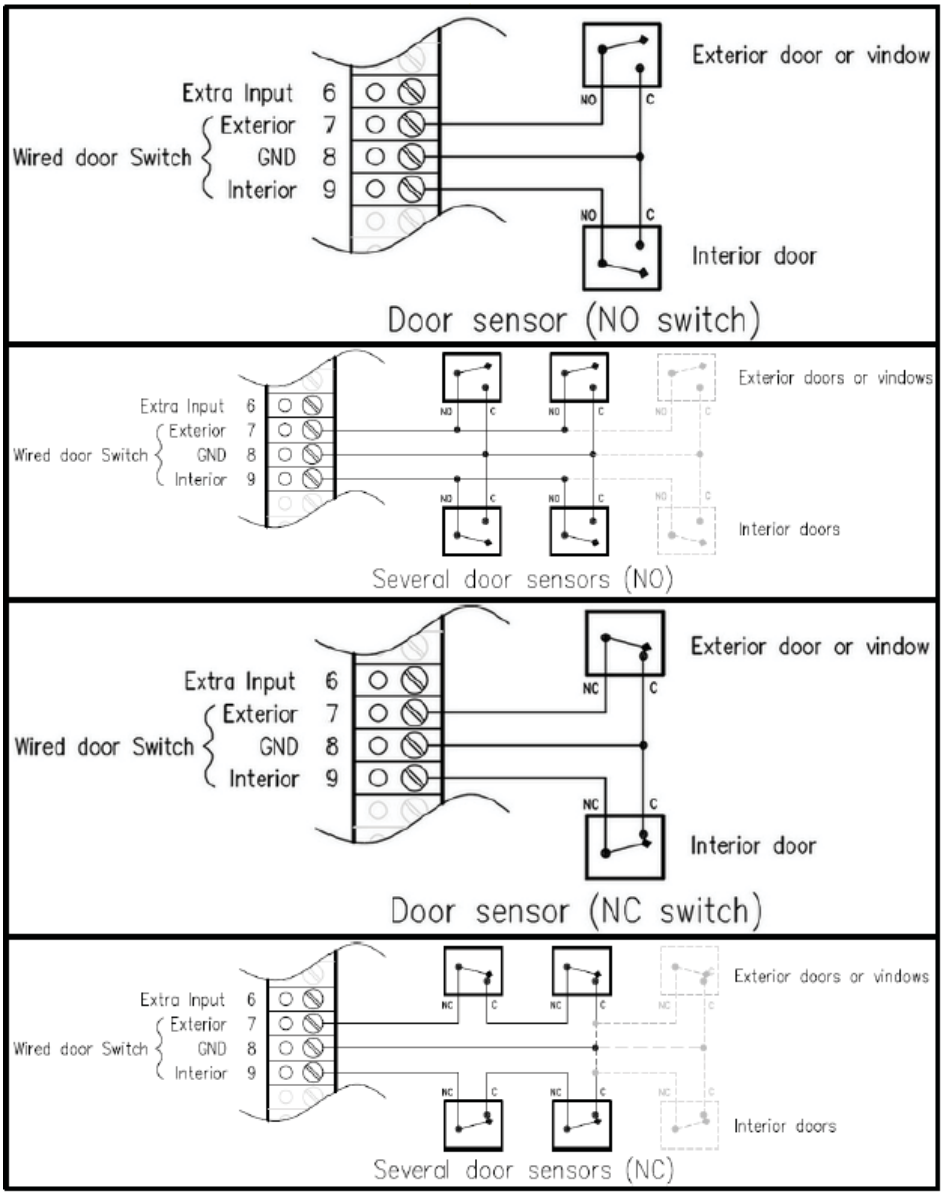


Figure 18

3.1.4.7 Connection examples for outputs N, L, RV, Y and W

In HVAC (*Heating Ventilation and Air Conditioning*) systems, a difference is often made between *2-pipe systems* and *4-pipe systems*.

In a *2-pipe system* there is one pipe in and one pipe out; both pipes either have cold water or hot water. If there is cold water in the pipes, the air conditioning can only be used for cooling. If there is hot water in the pipes, the air conditioning can only be used for heating. In most cases, cold/hot water in the pipes is changed twice a year (Spring/Autumn) through an actuator connected to the *cool output* on the thermostat.

In a 4-*pipe system* there are two pipes in and two pipes out; one set of pipes in/out has cold water and the other set of pipes in/out has hot water. The thermostat can choose whether cooling or heating is applicable by activating either the *cool output* or the *heat output* on the thermostat.

For a thermostat to know whether the water in a pipe is cold or hot, a *pipe temperature sensor* is used. There are two types of pipe temperature sensors; see details here.

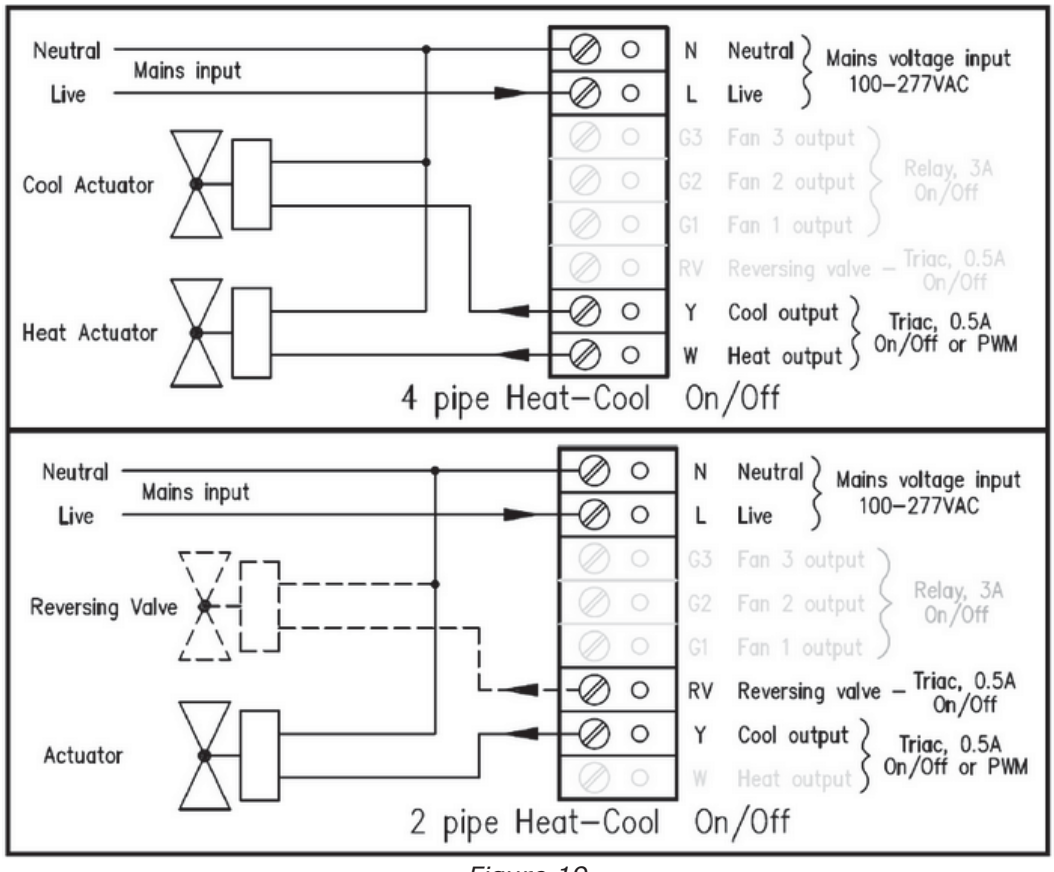


Figure 19

Other connection examples for the outputs N, L, RV, Y and W:

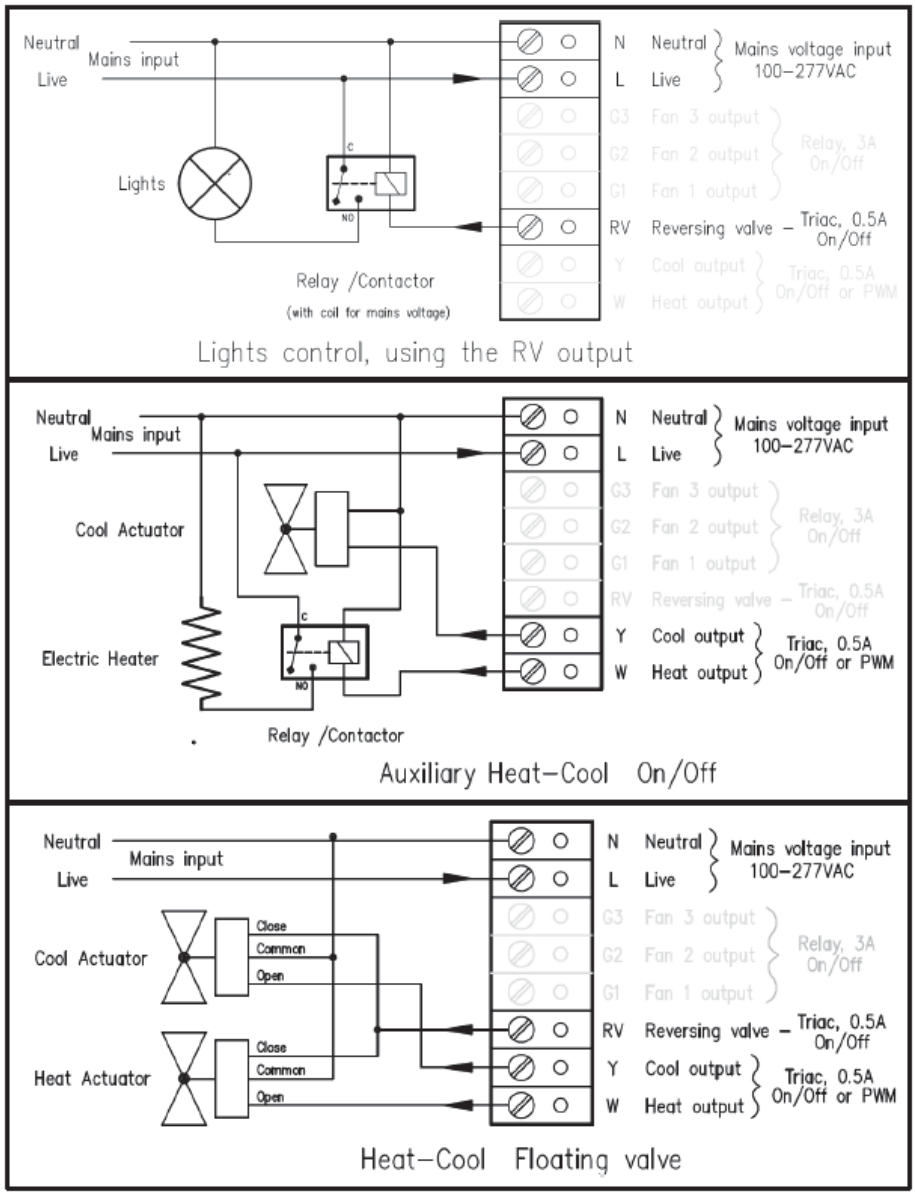


Figure 20

3.1.4.8 More about live output

All loads below each have two connections:

Fan 1 - Fan 3
W output (heat output)
Y output (cool output)
RV output

The thermostat is connected to 110 VAC or 230VAC. To be able to disconnect a load, one of the connections is broken by one of the two items below:

- relay (applicable for Fan 1 - Fan 3)
- tria (applicable for W output, Y output and RV output)

'Neutral' is connected to one of the load connections, while 'Live' is connected to the other connection; see Figure 21.

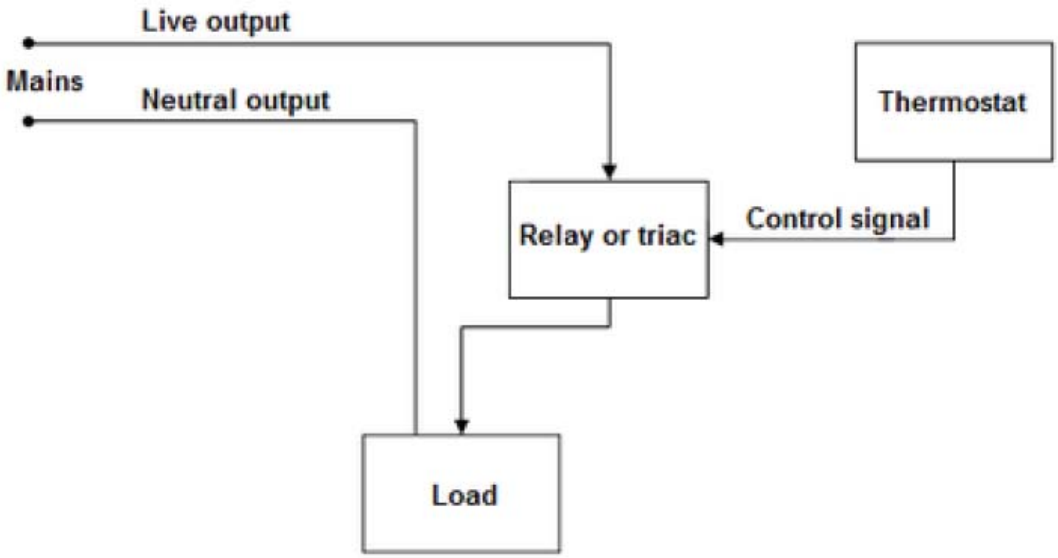
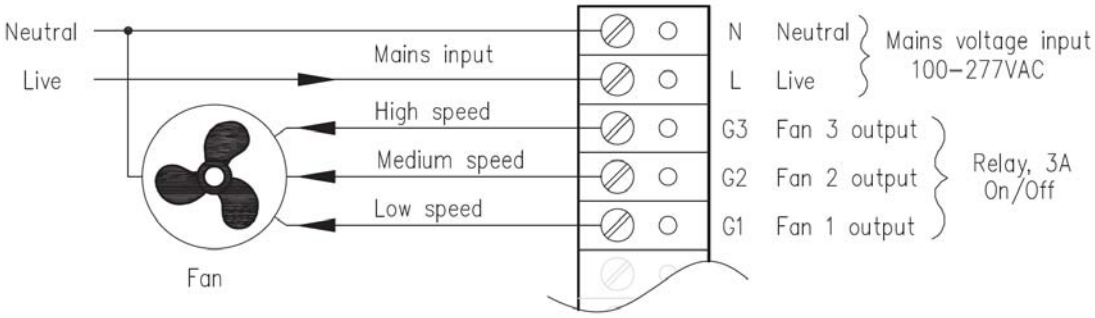


Figure 21

3.1.4.9 Connection examples for fan outputs



Connecting the fan

Figure 22

3.1.4.10 Connection example for floating valve

A floating valve has three connections:

- one for opening the valve (W for heating valve and Y for cooling valve)
- one for closing the valve (RV output)
- one for ground; COM (neutral)

One of the three connections is always fully closed. While one of the valves is activated, the valves open slowly during the desired time, and while deactivating the valves close slowly for the desired time.

Example:

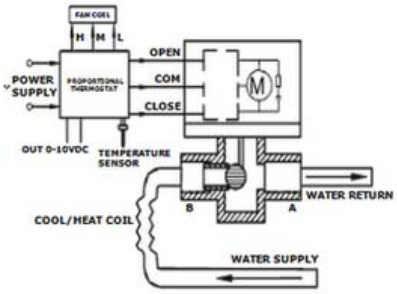


Figure 23

- When the thermostat is in *heating mode*, the *W output* is used for increasing the temperature and the *RV output* is used for decreasing the temperature.
- When the thermostat is in *cooling mode*, the *Y output* is used for decreasing the temperature and the *RV output* is used for increasing the temperature.

To control the floating valves, the below parameters must be configured in Visionline.

Note: Heating and cooling must be configured separately, under **HVAC/Heating** and **HVAC/ Cooling** respectively in Visionline. For information about the settings that can be made for floating valves, click here.

3.2 To install an RF door switch

If VingCard online locks are not applicable at the installation, an RF door switch can instead be used for monitoring the position of the door. The door switch is powered by 2 AA batteries and the kit also includes a magnet (see Figure 25) and two screws. The door switch can be mounted as it is or on a wall-mounted casing (see Figure 26) which is purchased separately.

Note: For best operation, the magnet should be installed maximum 10 mm (25/6'') from the reed switch which is located as in Figure 24.

Note: It is also possible to use a wired door switch without radio; click here for details.

3.2.1 RF door switch dimensions

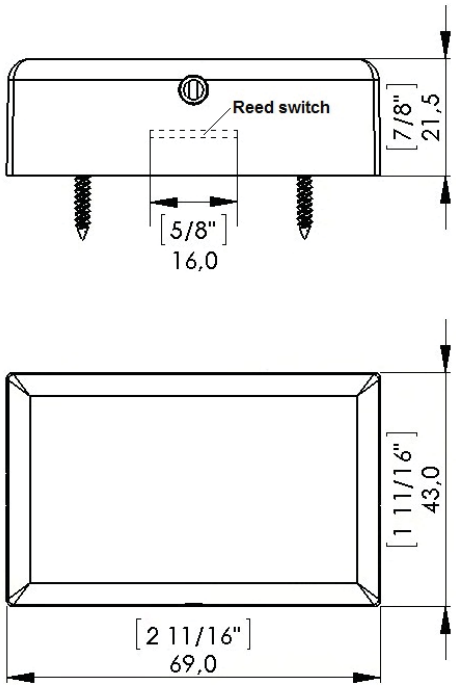


Figure 24

3.2.2 RF door switch magnet dimensions

Note: The magnet must be mounted maximum 10 mm (25/64'') from the door switch.

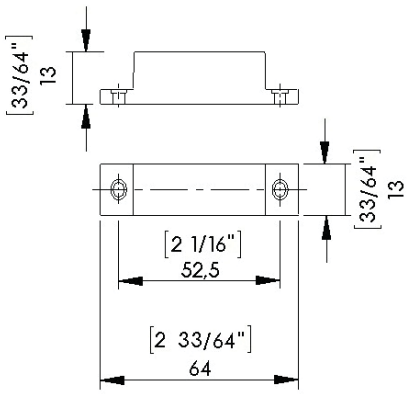


Figure 25

3.2.3 Wall-mounted casing

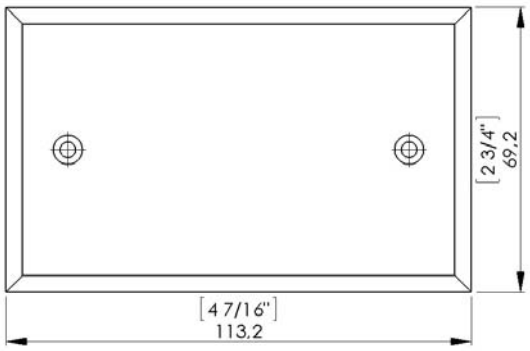


Figure 26

4. To set up a thermostat profile

Each thermostat which is set up in the **Thermostats** list of the Visionline software (see *Daily use manual Orion high voltage thermostat* for details about that list) must belong to a thermostat profile, e.g. a template with certain thermostat parameters. When a thermostat is first set up, it must be initialized with the thermostat profile parameters via the **Initialize** alternative in *Orion Service*; see *Quick reference guide Orion Service* for details.

Note: If one or more parameters of a thermostat profile are at a later occasion updated, these new parameters are automatically sent to all concerned online thermostats. If the thermostats are not online, they must be updated via the **Initialize** alternative in *Orion Service*.

1. Double click on **Thermostat profiles** under the **Lists** tab in the Visionline navigation window.
2. Click **Add** to add a new thermostat profile, or mark an existing profile and click **Properties**.
3. Go through the different alternatives in the left pane of the **Thermostat profile details** dialog; see details in sections *4.1-4.7*.
4. When all settings have been made, click **Save** and **Close** (or **Update** and **Close** if an existing profile was modified).

4.1 General

1. Enter **Name** and, if desired, **Description**.

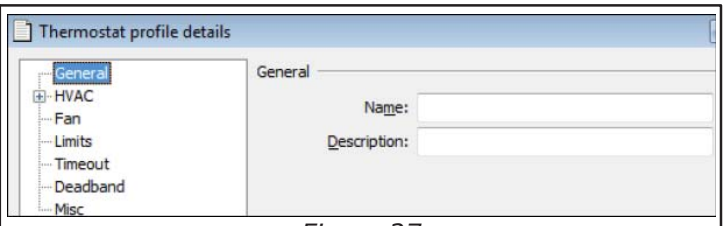


Figure 27

4.2 HVAC

1. At **Model**, choose 'High voltage'.
2. Under **Input configuration**, make the applicable choices under **Extra input**, **DSW ext. input** and **DSW int. input**; see Table 3 below.
3. Under **Extra input configuration**, make the applicable choice 'Not used', 'Wired motion sensor' or 'Pipe temperature sensor'; see Table 3 for details.

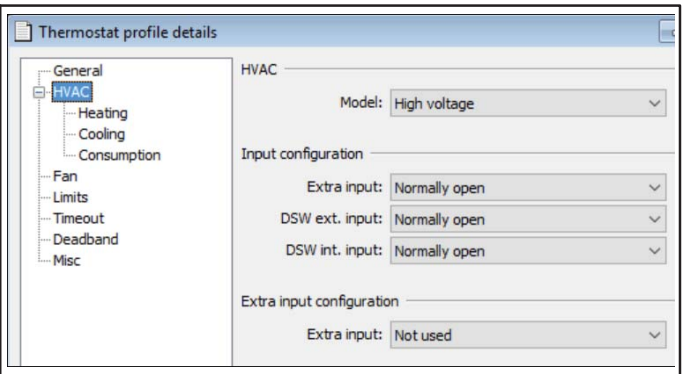


Figure 28

Parameter	Available choices	Default setting
Extra input	Normally open/normally closed	Normally open
DSW ext. input (door switch exterior input)	Normally open/normally closed	Normally open
DSW int. input (door switch interior input)	Normally open/normally closed	Normally open
Extra input	Not used/wired motion sensor/ pipe temperature sensor ***Note:*** If 'Wired motion sensor' is chosen, it is also possible to make a further choice 'Delay wired motion sensor'. This can be applicable in warm countries where there is a great difference in temperature inside and outside the room, to avoid that motion is triggered when someone opens the door, leaves the room and locks the door. The 'Delay wired motion sensor' parameter will also be applicable for the internal motion sensor.	Not used
		Table 3

4.2.1 Heating

1. Click the plus sign at **HVAC** in the left pane of the **Thermostat profile details** dialog and mark **Heating**.
2. In the drop-down-menu at **Type**, the following alternatives are available:
   - *n/a*; default
   - *4 pipe fan coil*
   - *Heat pump reversed valve (Type B)*
   - *2 pipe fan coil*
   - *2 pipe fan coil with automatic switching*
   - *Proportional*
   - *Floating valve*

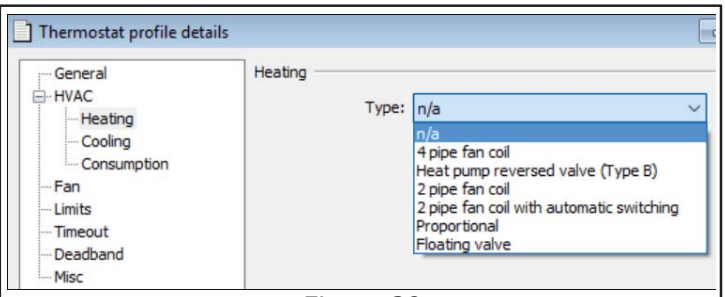


Figure 29

4.2.1.1 2-pipe fan coil with automatic switching

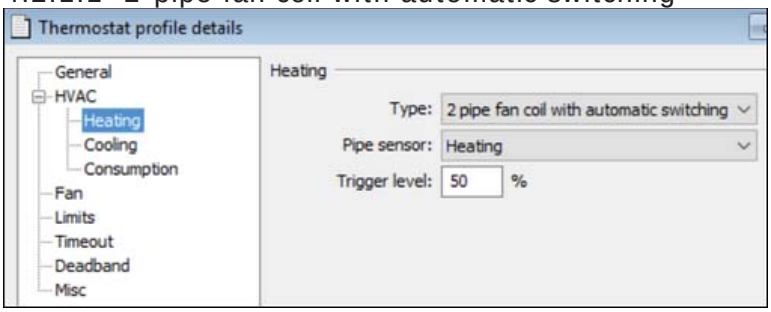


Figure 30

If '2-pipe fan coil with automatic switching' is chosen as HVAC type, the further alternatives **Pipe temperature sensor** and **Trigger level** are available.

- If the pipe temperature sensor is a *bimetal switch* (open or closed depending on the temperature it senses), choose for **Pipe temperature sensor** whether it should be 'Cooling' or 'Heating'.
- If the pipe temperature sensor is an *1k NTC resistor*, a **Trigger level** (in the range 0-100%) for switching between heat and cool should be chosen. When the temperature reaches the switch-over-temperature (default 3 ºF; this is chosen under the Deadband alternative in the **Thermostat profile details** dialog), it is checked whether the pipe temperature sensor has reached the trigger level so that the thermostat can change mode from heating to cooling or vice versa.

Note: When '2-pipe fan coil with automatic switching' is chosen as HVAC type, the cooling relay (Y) is the only relay that applies, forced by the thermostat.

4.2.1.2 Proportional

If 'Proportional' is chosen as HVAC type, the parameters shown in Figure 31 (which shows the default values) are applicable. For details about each parameter, see Table 4 below.

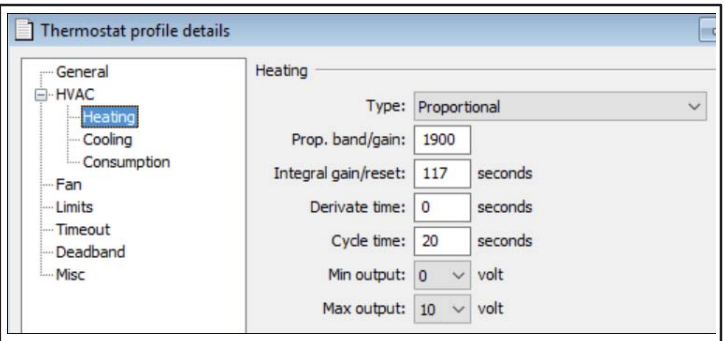


Figure 31

Parameter	Description
Prop. band/gain	The value at **Prop. band/gain** describes the regulator output of the HVAC system related to the difference between *measured temperature* and *set temperature*. ***Example:*** *Measured temperature = 23 ºC* *Set temperature = 20 ºC* *Gain = 1.9V* *The regulator will set 3x1.9V=5.7V on the output (if all default values are used).* *The range for the regular output value is 0-10V.*
Integral gain/reset	The **Integral gain/reset** describes to the HVAC system regulator what gain it can use when integrating the previous average temperature values, in order to settle the temperature around the desired set value.
Derivative time	The **Derivative time** describes to the HVAC system regulator what gain it can use when looking at the rate of the temperature change.
Cycle time	The **Cycle time** describes how fast the HVAC system regulator makes calculations for a new output.
Min output	At **Min output**, the minimum output voltage is chosen; can be 0V, 1V or 2V.
Max output	At **Max output**, the maximum output voltage is chosen; can be 5V or 10V.
	Table 4

4.2.1.3 Floating valve

If 'Floating valve' is chosen as HVAC type, the parameters shown in Figure 32 (which shows the default values) are applicable. For details about each parameter, see Table 5 below.

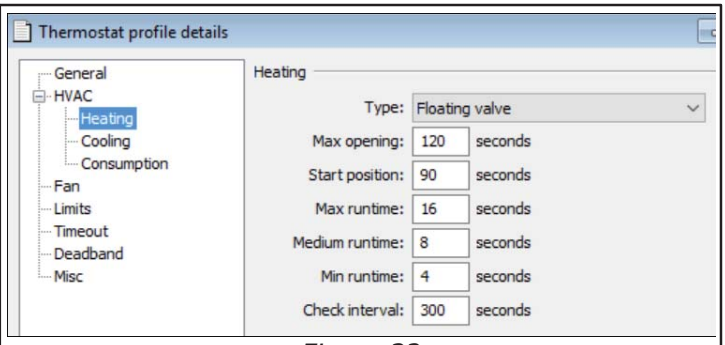


Figure 32

Parameter	Description
Max opening	**Max opening** states the maximum number of seconds required to fully open or fully close the floating valve.
Start position	The floating valve should typically move to a given position, so that the thermostat can try to close or open to decrease or increase the temperature. **Start position** states the number of seconds it takes to run the thermostat to the desired position of the floating valve.
Max runtime	There are three different values for runtime, i.e. how long the floating valve should operate related to the difference between measured temperature and setpoint: **Max runtime**, **Medium runtime** and **Min runtime**. Based on a calculation of the selected deadband and the temperature deviation from setpoint, the thermostat chooses an applicable valve throttle. ***Example 1:*** *If the temperature difference is 1 degree outside the thermostat deadband that has been set up in the dialog shown here, the floating valve is opened/closed according to 'Medium runtime'.* ***Example 2:*** *If the temperature difference is -3 degrees, the thermostat will use 'Max runtime' and run the floating valve for 16 seconds "back" to a new position 90s-16s = 74s.*
Medium runtime	
Min runtime	
Check interval	Check interval describes how often the regulator checks the real temperature against the setpoint.
	Table 5

4.2.2 Cooling

1. Click the plus sign at **HVAC** in the left pane of the **Thermostat profile details** dialog and mark **Heating**.
2. In the drop-down-menu at **Type**, the following alternatives are available:
   - *n/a*; default
   - *4 pipe fan coil*
   - *Heat pump reversed valve (Type O)*
   - *2 pipe fan coil*
   - *2 pipe fan coil with automatic switching*
   - *Proportional*
   - *Floating valve*

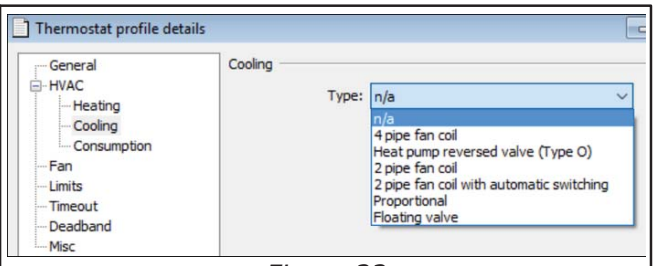


Figure 33

4.2.2.1 2-pipe fan coil with automatic switching

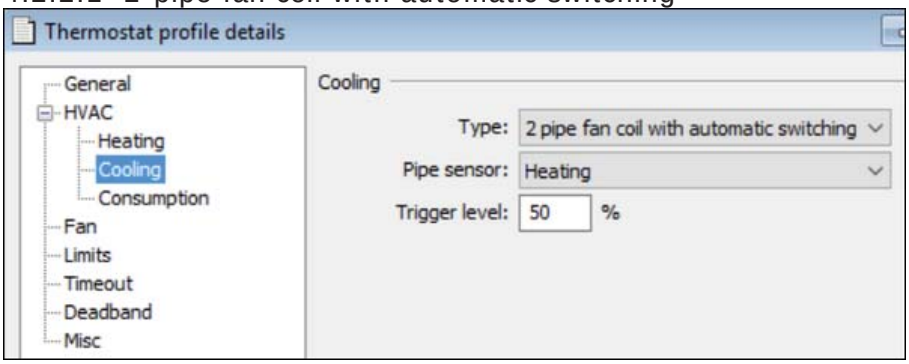


Figure 34

If '2-pipe fan coil with automatic switching' is chosen as HVAC type, the further alternatives **Pipe temperature sensor** and **Trigger level** are available.

- If the pipe temperature sensor is a *bimetal switch* (open or closed depending on the temperature it senses), choose for **Pipe temperature sensor** whether it should be 'Cooling' or 'Heating'.
- If the pipe temperature sensor is an *1k NTC resistor*, a **Trigger level** (in the range 0-100%) for switching between heat and cool should be chosen. When the temperature reaches the switch-over-temperature (default 3 ºF; this is chosen under the Deadband alternative in the **Thermostat profile details** dialog), it is checked whether the pipe temperature sensor has reached the trigger level so that the thermostat can change mode from heating to cooling or vice versa. ***Note:*** When '2-pipe fan coil with automatic switching' is chosen as HVAC type, the cooling relay (Y) is the only relay that applies, forced by the thermostat.

4.2.2.2 Proportional

If 'Proportional' is chosen as HVAC type, the parameters shown in Figure 35 (which shows the default values) are applicable. For details about each parameter, see Table 6 below.

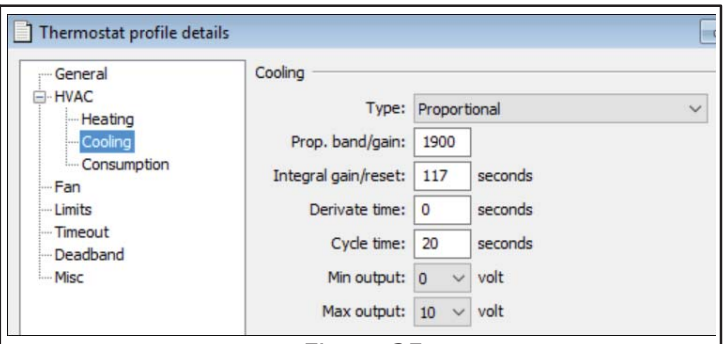


Figure 35

Parameter	Description
Prop. band/ gain	The value at **Prop. band/gain** describes the regulator output of the HVAC system related to the difference between *measured temperature* and *set temperature*. ***Example:*** *Measured temperature = 23 ºC* *Set temperature = 20 ºC* *Gain = 1.9V* *The regulator will set 3x1.9V=5.7V on the output (if all default values are used). The range for the regular output value is 0-10V.*
Integral gain/ reset	The **Integral gain/reset** describes to the HVAC system regulator what gain it can use when integrating the previous average temperature values, in order to settle the temperature around the desired set value.
Derivative time	The **Derivative time** describes to the HVAC system regulator what gain it can use when looking at the rate of the temperature change.
Cycle time	The **Cycle time** describes how fast the HVAC system regulator makes calculations for a new output.
Min output	At **Min output**, the minimum output voltage is chosen; can be 0V, 1V or 2V.
Max output	At **Max output**, the maximum output voltage is chosen; can be 5V or 10V.
	Table 6

4.2.2.3 Floating valve

If 'Floating valve' is chosen as HVAC type, the parameters shown in Figure 36 (which shows the default values) are applicable.
For details about each parameter, see Table 7 below.

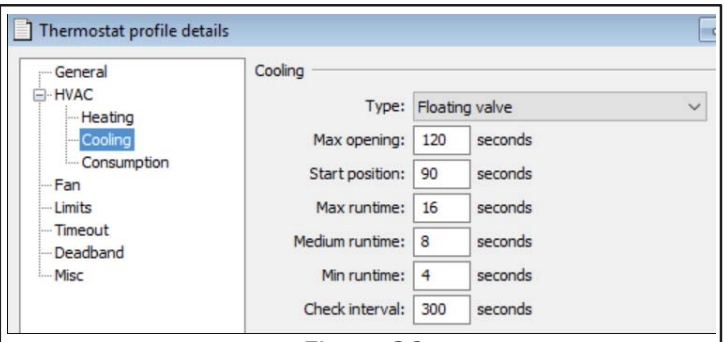


Figure 36

Parameter	Description
Max opening	**Max opening** states the maximum number of seconds required to fully open or fully close the floating valve.
Start position	The floating valve should typically move to a given position, so that the thermostat can try to close or open to decrease or increase the temperature. **Start position** states the number of seconds it takes to run the thermostat to the desired position of the floating valve.
Max runtime	There are three different values for runtime, i.e. how long the floating valve should operate related to the difference between measured temperature and setpoint: **Max runtime**, **Medium runtime** and **Min runtime**. Based on a calculation of the selected deadband and the temperature deviation from setpoint, the thermostat chooses an applicable valve throttle. ***Example 1:*** *If the temperature difference is 1 degree outside the thermostat deadband that has been set up in the dialog shown here, the floating valve is opened/closed according to 'Medium runtime'.* ***Example 2:*** *If the temperature difference is -3 degrees, the thermostat will use 'Max runtime' and run the floating valve for 16 seconds "back" to a new position 90s-16s = 74s.*
Medium runtime	
Min runtime	
Check interval	Check interval describes how often the regulator checks the real temperature against the setpoint.
	Table 7

4.2.3 Consumption

1. If the *Integrated Room Control dashboard* is applicable, values for estimated HVAC power consumption for the three cases 'Cooling', 'Heating' and 'Fan only' can be entered at **Estimated consumtion**; first expand **HVAC** in the left pane of the **Thermostat profile details** dialog and choose **Consumption**.

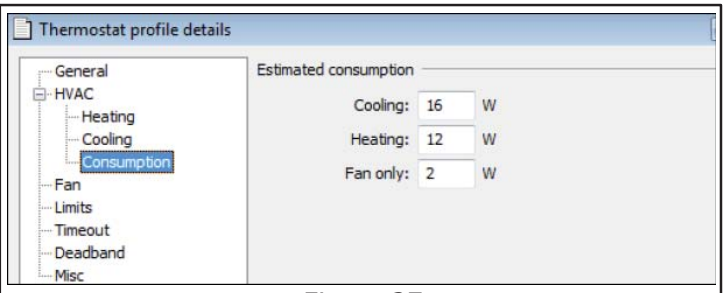


Figure 37

4.3 Fan

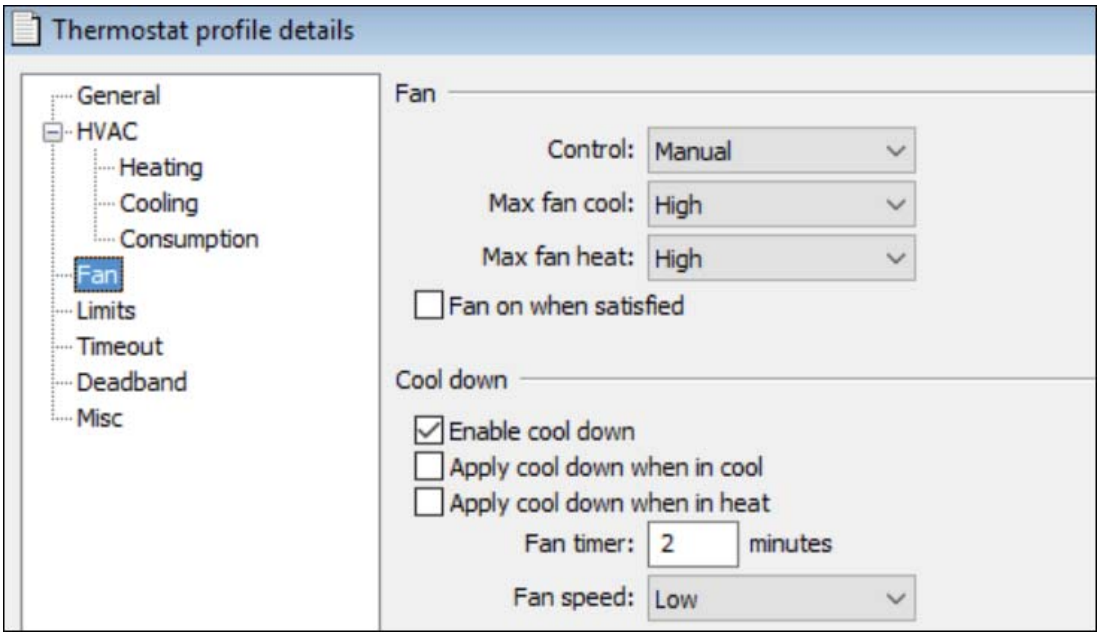


Figure 38

1. At **Control**, choose whether the control should be
   - *manual*; default
   - *auto*; this choice will disable the fan button of the thermostat

2. **Max fan cool** is the maximum setting that the customer can make via the thermostat. Choose between
   - *low*
   - *mid*
   - *high*; default

Note: The ability to control fan speeds depends on the capability of the air handler as some systems do not have three fan speeds.

3. **Max fan heat** is the maximum setting that the customer can make via the thermostat. Choose between
   - *low*
   - *mid*
   - *high*; default

Note: The ability to control fan speeds depends on the capability of the air handler as some systems do not have three fan speeds.

4. If applicable, mark the checkbox 'Fan on when satisfied'. This is applicable if the background sounds in the room should for guest comfort reasons not change.

Note: The 'Fan on when satisfied' function will only apply to an occupied room.

5. At **Cool down**, duration (**Fan time**) and **Fan speed** of the fan during cool down period can be chosen. It can also be chosen whether cool down should apply only when *in cool* or only when *in heat* (mark the applicable checkbox).

   Fan time; default is 2 minutes, can be in the range 1-10 minutes

   Fan speed; default is 'Low', can be *low*, *mid* or *high*.

4.4 Limits

Note: For more information about 'unoccupied' and 'unsold', see section *Basic EMS logic* in *Daily use manual Orion high voltage thermostat*.

1. At **Setback type**, choose
   - *static*; default (the *static setback* temperatures are configured in the system and do not change based on the guest settings)
   - *dynamic* (the *dynamic setback* temperatures are configured as a set number of degrees above or below the guest setting)

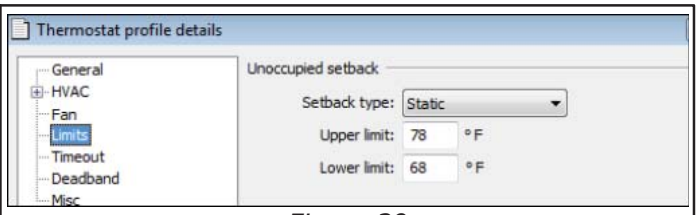


Figure 39

2. If 'Static' is chosen as **Setback type**: enter the applicable number of degrees at **Upper limit** (default is 78° F) and **Lower limit** (default is 68° F) for setback if a room is unoccupied.

1. If 'Dynamic' is chosen as **Setback type**: enter the applicable number of degrees offset at **Upper limit** (default is 4° F offset) and **Lower limit** (default is 4° F offset) for setback if a room is unoccupied.

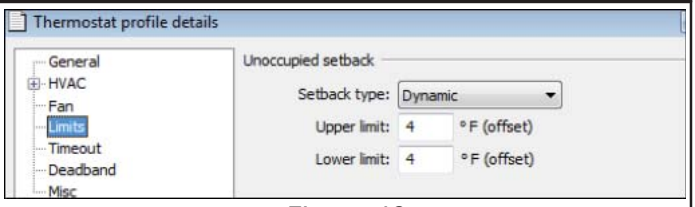


Figure 40

1. At **Unsold setback**, enter the applicable number of degrees as **Upper limit** (default is 84° F) and **Lower limit** (default is 64° F) for setback if a room is unsold.

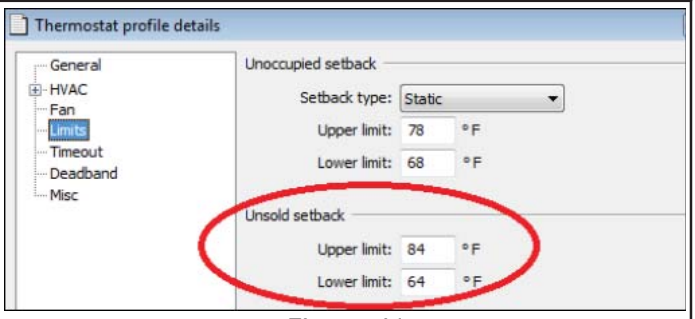


Figure 41

1. At **Occupied limits**, it is possible to limit the allowed temperature range when the room is occupied. If this is the case, mark the checkbox 'Use occupied limits' and enter the values for **Upper limit** (default is 84° F) and **Lower limit** (default is 68° F).

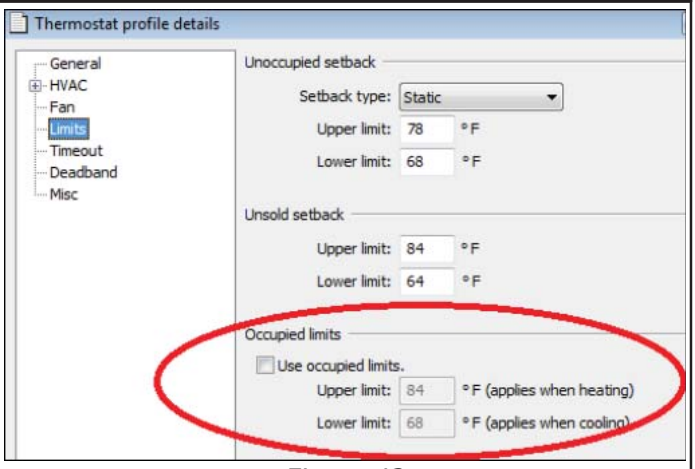


Figure 42

4.5 Timeout

1. At **Ext. door timeout**, choose between
   - *normal*; default
   - *short*; 20 seconds

2. At **Room not occupied**, enter the applicable number of minutes (default is 8) after which timeout should occur.

3. At **Room not sold**, enter the applicable number of hours (default is 16) after which an unoccupied room should enter the unsold mode. ***Note:*** If the PMS system sends a check-out command, the **Room not sold** parameter will be overridden and timeout will immediately take place.

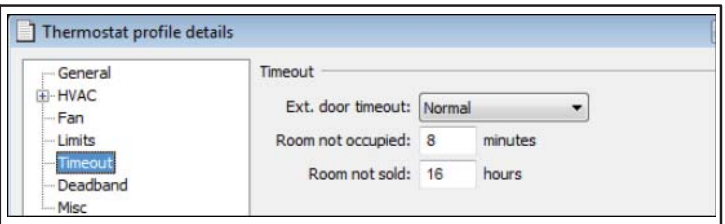


Figure 43

4.6 Deadband

1. At **Thermostat**, enter the applicable number of degrees; default is 2° F.
2. At **Heat/cool**, enter the applicable number of degrees; default is 3° F.

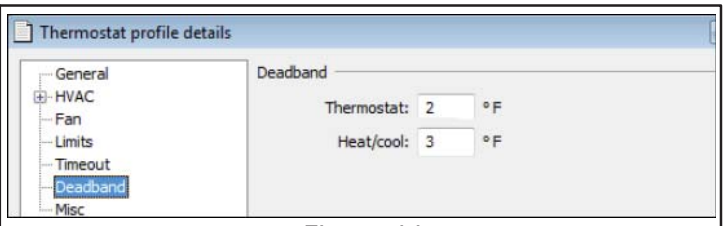


Figure 44

4.7 Misc

1. If the checkbox **Freeze guard** is marked (which is default), there will be an alarm and the HVAC will start heating if the temperature in any room with a thermostat goes below 39° F (4° C).

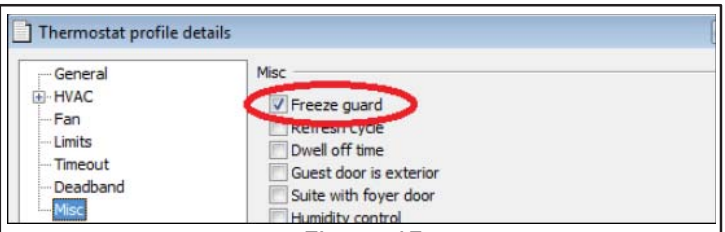


Figure 45

2. If the checkbox **Refresh cycle** is marked (default is unmarked), the Orion EMS system will in setback control run the A/C unit every 25 minutes for a period of 2 minutes to re-circulate the air in the room; only for cooling mode.

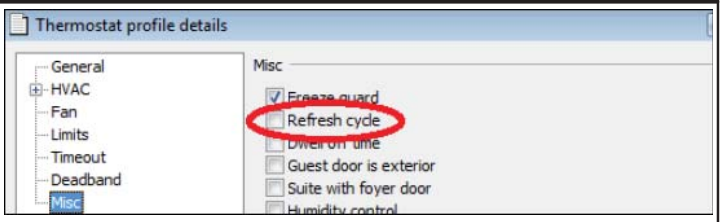


Figure 46

3. **Dwell off time** should normally be unmarked; see details here.

Figure 47

4. If the checkbox **Guest door is exterior** is marked (default is unmarked), the door to the room will be treated as an exterior door. If the door is opened, the HVAC will turn off either when the door has been open for 20 seconds (*short timeout*) or when the door has been open for the unoccupied timeout. This depends on whether short or normal has been chosen under the **Timeout** tab in the **Thermostat profile details** dialog.

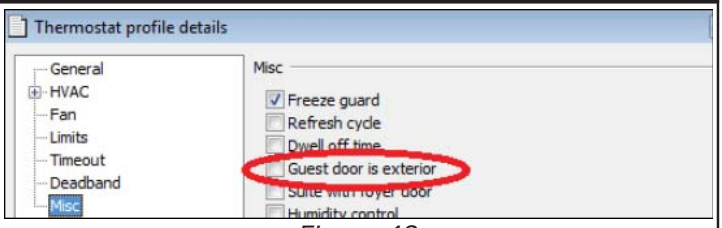


Figure 48

5. If the checkbox **Suite with foyer door** is marked (default is unmarked), the thermostat will in non-suite mode not react on the foyer door.
Note: This checkbox must be marked if a suite shall listen to the foyer door when in suite mode.

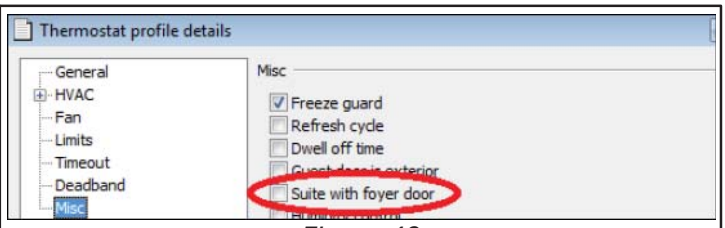


Figure 49

6. If the checkbox **Humidity control** is chosen (default is unmarked), the thermostat will implement control measures if the humidity in the room gets
too high.
Note: The control measures will only be implemented when the room is unoccupied or unsold.

Figure 50

7. If the checkbox **On exterior open, keep lights on** is marked (default is unmarked), the lights will be left on if the exterior door timeout has been triggered by
- the wired input for *exterior door open* on the thermostat
OR
- a non-wired door switch configured as *exterior*

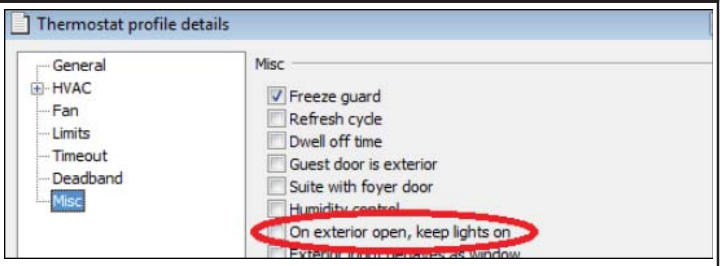


Figure 51

8. If the checkbox **Exterior input behaves as window** is marked (default is unmarked), the HVAC will be shut off after a configured time (*short* or *normal*), but the thermostat does not change the occupancy status. The exterior door timeout is triggered by the wired input for *exterior door open* (EX1) on the thermostat.

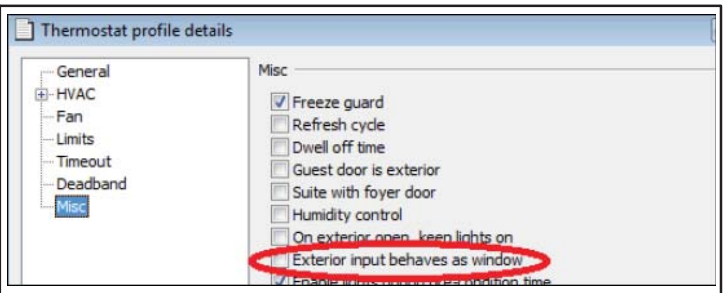


Figure 52

9. If the checkbox **Enable lights during pre-condition time** is marked (which is default), the lights are enabled according to the chosen intelligent switch setting during the pre-condition time.

Note: This parameter requires that the *Online option* has been set in Visionline.

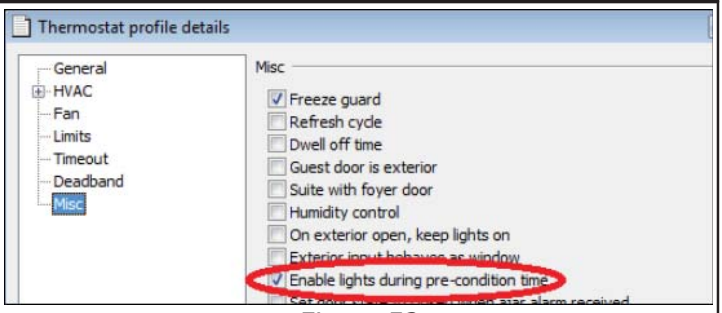


Figure 53

10. If the checkbox **Set door state to closed when door ajar alarm received** is marked (default is unmarked), the door state is set to closed once the *door ajar timeout* has been triggered. This allows the thermostat to go to occupied state even if the door is not physically closed. ***Note:*** This checkbox is applicable if you have a malfunctioning door switch.

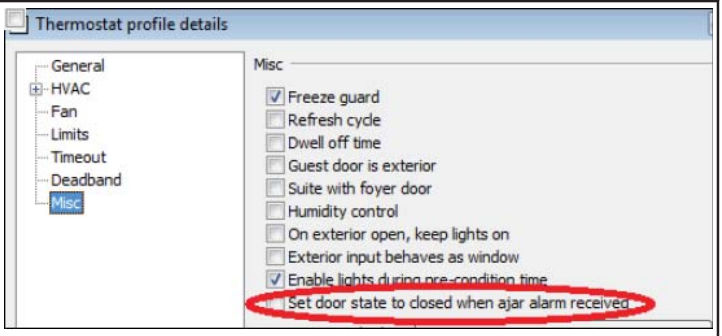


Figure 54

11. At **Temperature display**, choose between

- *room temperature*; default
- *set temperature*, i.e. the temperature which has been set on the thermostat by the guest

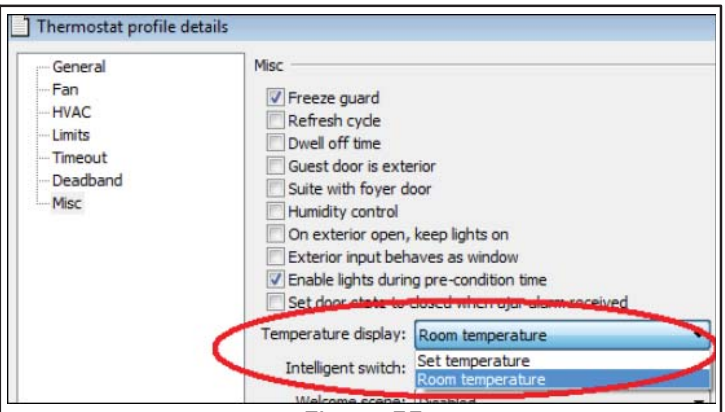


Figure 55

12. At **Intelligent switch**, choose between
    - *disabled*; default
    - *use RV output*
    - *use G2 output*

The intelligent switch is an output for lighting control which works according to the occupancy status.
If intelligent switch is applicable, normally 'Use RV output' should be marked unless the air handler is a heat pump.
In the latter case, mark 'Use G2 output' instead.

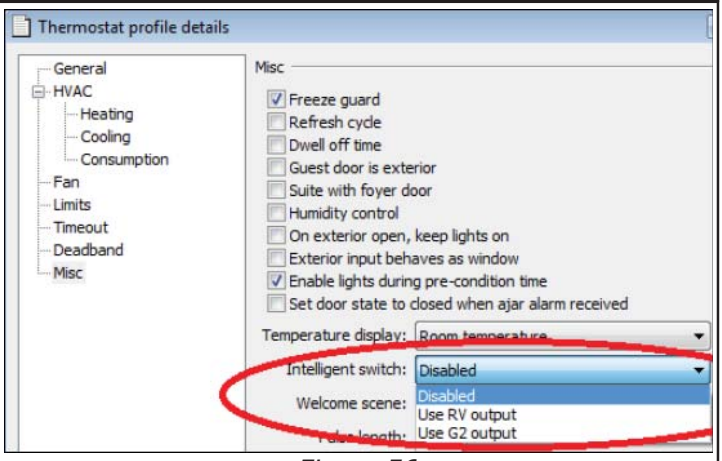


Figure 56

13. If desired, it is possible to have a **Welcome scene** which is activated when the occupancy state for a room changes from unsold to unoccupied. The available alternatives for welcome scene are (default is 'disabled'):
    - *disabled*
    - *use RV output*
    - *use G2 output*
14. At **Pulse length**, the welcome scene can be set up to have a pulse length:
    - 0 = welcome scene always off
    - chosen length in the interval 1-255 s

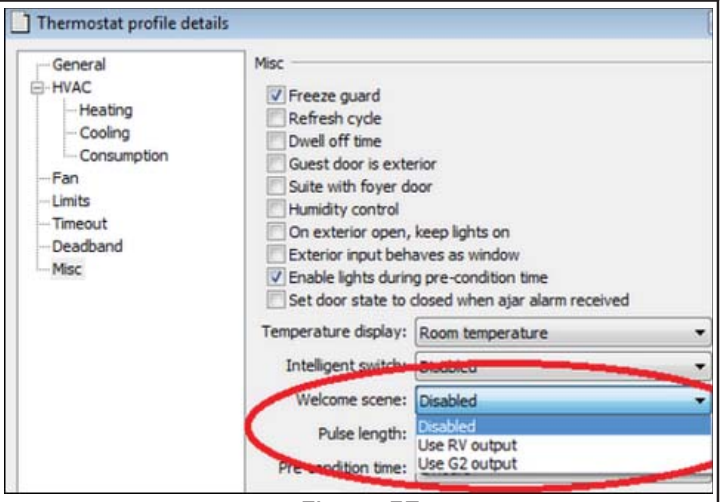


Figure 57

Figure 58

15. **Pre-condition time** is the number of hours the thermostat shall run at the default setpoint after check-in. If no entry has been done when this time expires, the unoccupied setback will be assumed.
The pre-condition time can be 1-12 hours or 'disabled' (default is 2 hours).

Note: This parameter requires that the *Online option* has been set in Visionline.

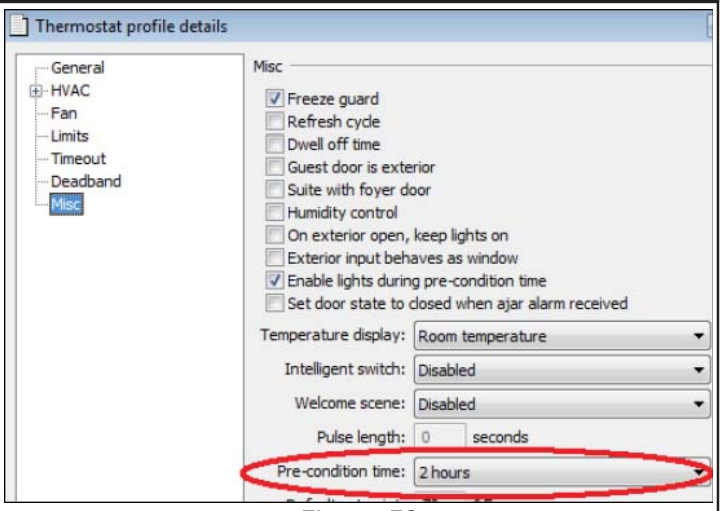


Figure 59

16. **Default set point** is the temperature which the thermostat is set to until a guest changes the temperature. The thermostat will also return to the **Default set point** after check-out.

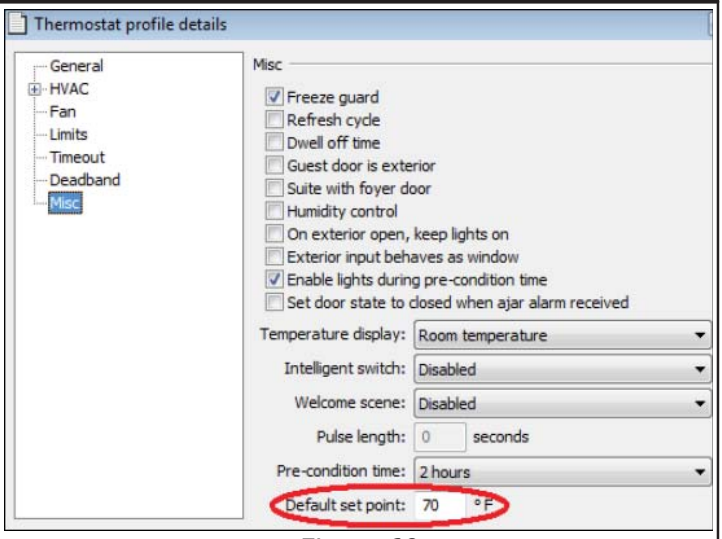


Figure 60

5. To commission the system

Before the devices can communicate, they must be joined to the online network. For detailed instructions and rules on this network, see *User manual Online option*.
Note: The online network, including gateway and router locations, must first be specified by a qualified technician. No online setup can be done until this step is completed.
Note: The online thermostat is equipped with the a ZigBee endnode with which can have either *router firmware* or *coordinator firmware*. The coordinator firmware is for offline scenarios when there is no connection to the server; see Appendix D for details about setting up the in-room network in that case.

The thermostat may be joined directly to a gateway, router, or another Orion EMS online thermostat as specified in the network layout. The thermostat is the primary device in the room, and the lock and motion sensor will be joined to this thermostat. When the steps in sections 5.1 and 5.2 have been performed, the in-room network is operational.
Note: To use the *Orion Service* software, connections to the application server must be made according to *Quick reference guide Orion Service*.

5.1 To join the thermostat to the network

1. To be able to join the thermostat to the gateway or router, it is first necessary to permit joining on the gateway or router. This is done in the *System Monitor*, SysMon; to open this, double click on **SysMon.exe** in the software installation folder and log on at **File/Log on**.
2. In SysMon, choose **View/Online Network** to see the online network. Right click on the designated gateway/ router in the **Online Network** tree and select **Permit Joining** in the right-click menu; see *Figure 61*.
3. When the gateway/router has been set in the permit joining mode, it is "open". It will remain in this status for approximately 15 minutes or until a forbid joining command is executed.
4. With the gateway/router open, plug the service cable in the service device into the thermostat.

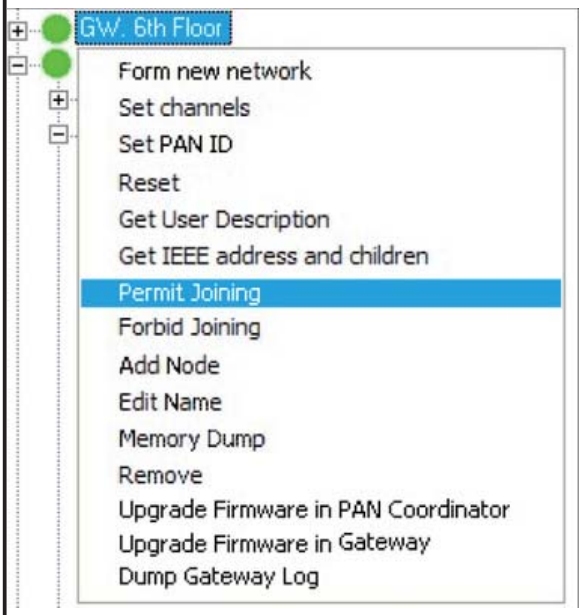


Figure 61

5. In the *Orion Service* software (go to **Start/Programs/Orion Service/ Orion Service**), choose **Configure device** in the left pane of the window. Let the tab **Thermostat** (default) be open and click the **Discovery** button; see *Figure 62*. The thermostat will connect to the open gateway/router.
6. To see if the thermostat was able to join the network, click the **Check status** button in the **Configure Device** section of *Orion Service*. If the joining was successful, the message 'Device is online' is shown.
7. With the thermostat joined to its gateway/router, right click on the gateway/router in SysMon and select **Forbid Joining**.

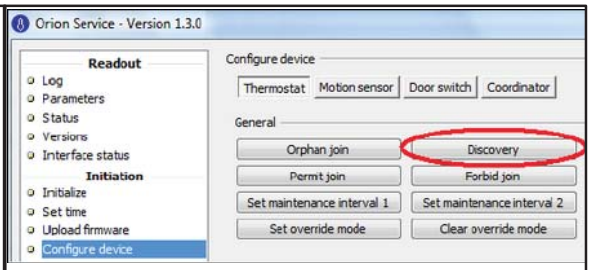


Figure 62

5.2 To join the in-room devices to the thermostat

1. Plug the service cable into the thermostat.
2. Click the **Permit Join** button in the **Configure device** section of Orion Service; see *Figure 63*.
   Note: The thermostat will remain open for 15 minutes or until a **Forbid Join** command is received.

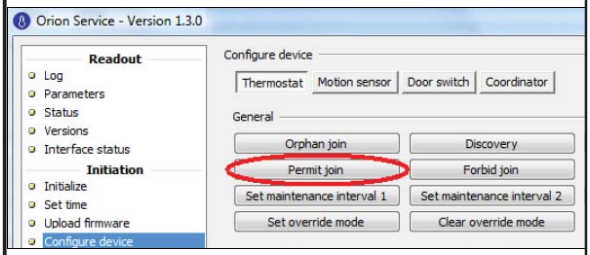


Figure 63

If external motion sensor is applicable, performs steps 3-6 (else go directly to step 7):

3. Once the thermostat has been opened for joining, plug the service cable into the motion sensor.
4. Choose the **Motion sensor** tab in the **Configure device** section of *Orion Service*.
5. Click the **Discovery** button; see *Figure 64*.

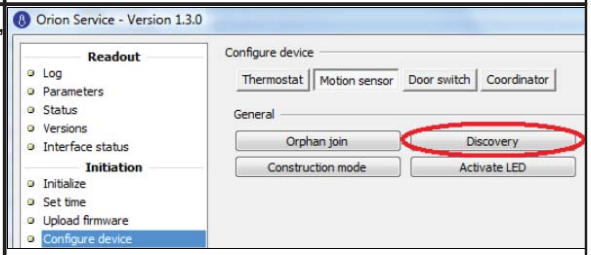


Figure 64

6. Wait a few seconds and then click the **Check status** button in the **Motion sensor** tab of **Configure device**; see *Figure 65*. If the device has joined successfully, the message 'Device is online' is shown. If that message is not displayed, wait a few more seconds and check the status again. If still offline, repeat the discovery process.

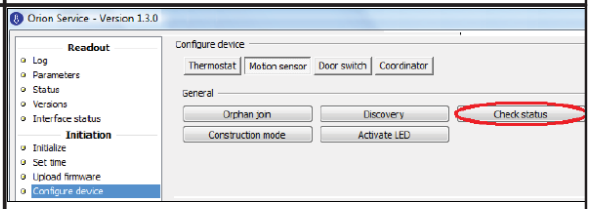


Figure 65

7. The lock is joined to the thermostat by using a *Discovery card**. Depending on lock model there will be a green flash and/or a chirp, indicating that the lock has been set into discovery mode. Wait a few seconds and then present the *Check Status card** at the lock. If the light flashes the green light only and/or a chirp
   is heard, the lock has successfully joined the network. If you instead see a green flash followed by red flashes, and/or a beep is heard, the lock has not joined. In this case, wait a few seconds and then try the *Check Status card* again. If still not successful, repeat the discovery process.
8. In order for the lock to send door events to the thermostats, EMI events must be enabled; this is done by presenting an *Enable EMI events card** at the lock.
9. If an RF door switch is applicable instead of a lock, repeat steps 3-5 with the RF door switch; in step 4, use the **Door switch** tab.

9. Once the devices have been joined, plug the service cable into the thermostat.
10. Choose the **Thermostat** tab of the **Configure device** section in *Orion Service*. Click the **Forbid Join** button; see *Figure 66*. Failure to perform this step will result in problems when setting up the network in nearby rooms.
11. Right click on the thermostat in the **Online network** tree in SysMon and choose **Get user description**. Make sure that the description says 'no' at 'Join permitted'.

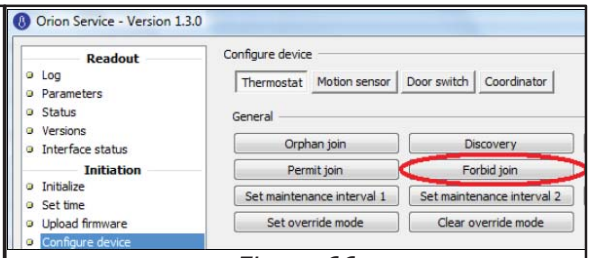


Figure 66

*) See *User manual Online option* for information about issuing these cards.

6. To check the installation

6.1 To check diagnostics

When a new thermostat has been set up according to this step-by-step procedure, the status of the thermostat should be checked in *Orion Service*:

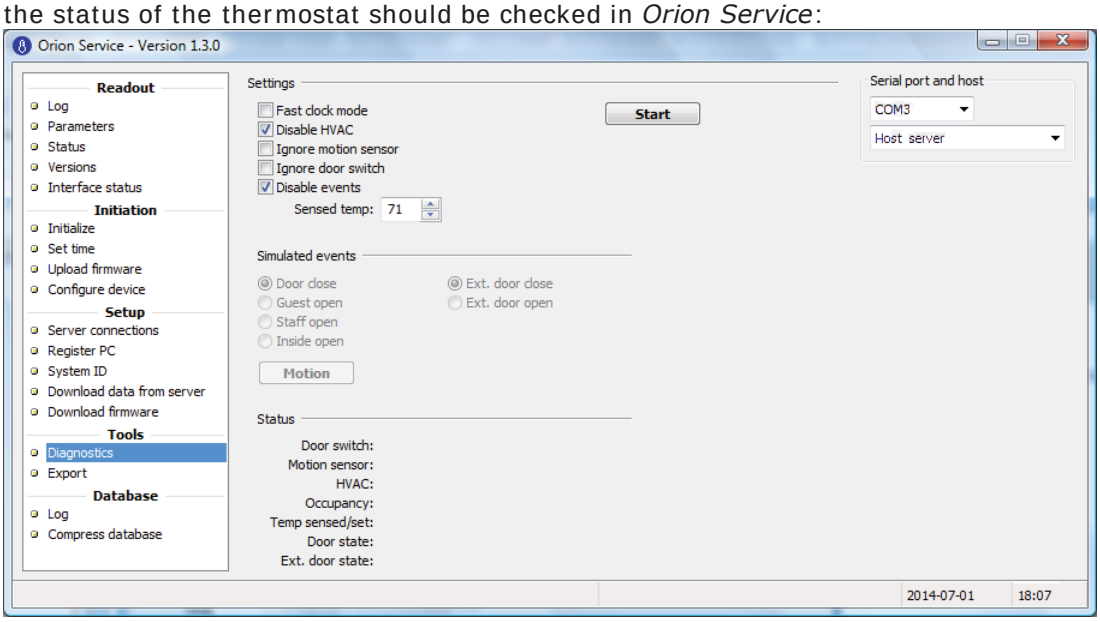


Figure 67

1. Choose **Diagnostics** in the left pane of the *Orion Service* window.
2. Connect the service cable to the thermostat and click the **Start** button in *Orion Service*.

Item	Status shown
Door switch	Yes/No
Motion sensor	Yes/No
HVAC	Fan speed
Occupancy	Unsold/unoccupied/occupied/unknown
Temp sensed/set	'Temp sensed' is the temperature in the room; 'temp set' is the temperature which the guest has set on the thermostat
Door state	Opened/closed
Ext. door state	Opened/closed for an external door (applicable if a door switch has been configured as 'external door')
	Table 8

Note: If exterior or interior door is left open for more than 2 minutes, the word 'DOOR' is shown in the thermostat display until the door is closed again.

6.2 To test the in-room devices

With the network successfully formed, it is now possible to test the devices to ensure proper functionality.

1. Open and close the door.
2. Engage and disengage the deadbolt.
3. Walk around the room to ensure a motion event.
4. Run an event log of the thermostat using the service device. To make this, plug insert the service cable into of the service device in the thermostat, choose the **Log** section under **Readout** in the left part of the Orion Service software window, choose the applicable **No. of events** and click the **Readout** button. Ensure that the door and motion events are logged as shown in the example in *Figure 68*.

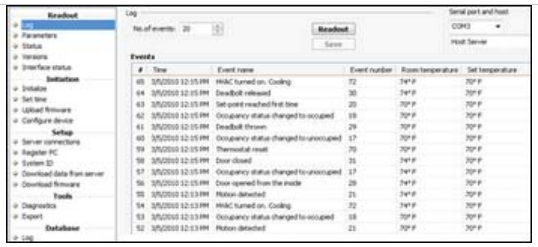


Figure 68

5. Run a status check by selecting the **Status** section in the left part of the Orion Service software window, making sure that the service cable is plugged into plugged into the thermostat and clicking the **Readout** button. Make sure that the motion sensor, lock and thermostat all say 'Offline: No'; see *Figure 69*.

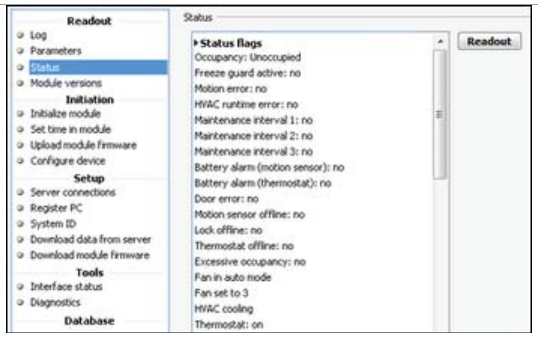


Figure 69

6. Test the range of the motion sensor. First, make sure that the door is open as this will ensure that the motion sensor is not deactivated by the thermostat.
7. Go to the **Configure device** section in the left part of the Orion Service software window and choose the **Motion sensor** tab. Make sure that the service cable is plugged into the motion sensor and click the **Activate LED** button; see *Figure 70*.

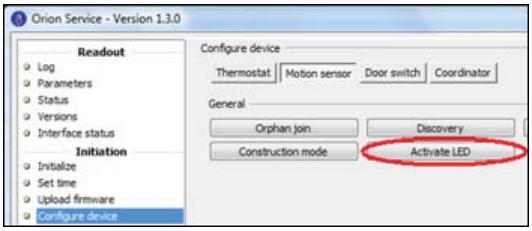


Figure 70

8. Walk around the room; the LED of the motion sensor will light up as motion is detected. Ensure that the range is sufficient to pick up motion in the room. The LED will be active for 10 minutes and then automatically turn off.
9. The system is now ready for use.
10. Choose the **Configure device** section in the left part of the Orion Service software window. Make sure that the service cable is plugged into the motion sensor and click the **Activate LED** button; see Figure 70.
11. Walk around the room; the LED of the motion sensor will light up as motion is detected. Ensure that the range is sufficient to pick up motion in the room. The LED will be active for 10 minutes and then automatically turn off. The system is now ready for use.
12. Test the range of the motion sensor. First, make sure that the door is open as this will ensure that the motion sensor is not deactivated by the thermostat. Choose the **Configure device** section in the left part of the Orion Service software window. Make sure that the service cable is plugged into the motion sensor and click the **Activate LED** button; see Figure 70. Walk around the room; the LED of the motion sensor will light up as motion is detected.
    Ensure that the range is sufficient to pick up motion in the room. The LED will be active for 10 minutes and then automatically turn off. The system is now ready for use.

Appendix A: Quick reference of technical data

Dimensions (WxHxD)	112 x 117 x 35 mm (4 13/32" x 4 19/32" x 1 3/8")
Mains voltage input	Universal voltage input 100VAC-277VAC; 50/60 Hz; rated impulse voltage 4kV
Switch input	Door switch - 1 exterior/1 interior
Multifunction input	Motion sensor/card switch/pipe temp sensor
High voltage outputs	- *G1* (Fan 1): Type 1.B action. Max load 3A (3FLA/18LRA) - *G2* (Fan 2): Type 1.B action. Max load 3A (3FLA/18LRA) - *G3* (Fan 3): Type 1.B action. Max load 3A (3FLA/18LRA) - RV (reversing valve): Type 1 action. Max load 0.5A - Y (cooling/compressor): Type 1 action. Max load 0.5A - W (heating): Type 1 action. Max load 0.5A
Low voltage outputs	- *Proportional 0-10V*; *heating* - *Proportional 0-10V*; *cooling* - *Switch output* (max 24V AC/DC, SELV, max 0.1A)
Temperature sensor	Integrated in thermostat
Temperature display	Configurable: *room temperature* (default) or *guest setting*
Temperature display range	2-digit display
Adjustable setpoint temperature range	17°C -32°C / 62°F - 90°F
Environment	Normal indoor environment - Pollution degree 2 Operating temperature range 0°C -55°C / 32°F - 130°F
Service device	*Orion Service* software and *service cable RJ12 to 3.5mm stereo jack*
Radio (RF) signals	ZigBee 2006 **Lock to thermostat:** • Door open - staff card • Door open - guest card • Door open from inside • Door closed • Deadbolt thrown/released **Thermostat to lock:** • Room occupied **Motion sensor to thermostat:** • Motion detected • Battery status **Thermostat to motion sensor:** • Turn off when the room is occupied and door is closed • Turn on when the door is opened again
Thermostat deadband	Configurable 1-3°F; default is 2°F
Heat/cool switching deadband	Configurable 2-4°F; default is 3°F
Freeze guard	39°F / 4°C
Refresh cycle	Optional
Humidity	Optional
Intelligent switch	Configurable: Disabled/use RV output/use G2 output; default is *disabled*
Room not occupied timer	Configurable 1-120 minutes; default is 8 minutes
Room not sold timer	Configurable 12-24 hours; default is 16 hours
	Table continued on next page

Compressor delay (dwell-off time)	Default is that the dwell-off time is off; it is only applicable when 'heat pump' is chosen as HVAC type. In the 'heat pump' case, the thermostat will automatically force the dwell-off time to be on - it is then 5 minutes and cannot be changed. The dwell-off time prevents short-cycling of the compressor.
Required Visionline version	1.15.0 or higher
Required Orion Service version	1.3.0 or higher for full functionality
	Table A1

Appendix B: Firmware upgrade

At delivery, the thermostat (and if applicable, the external motion sensor) contains the correct module firmware. However, if a firmware upgrade is needed at a later occasion, the *Orion Service* software and a *service cable RJ12 to 3.5mm stereo jack* is used. *Orion Service* contains the latest released firmwares at the time when *Orion Service* was released, so in most cases it is possible to direcly use the Upload firmware alternative in *Orion Service*; see *Quick reference guide Orion Service* for details. If however a later firmware than what is included in *Orion Service is* to be used, the firmware should first be saved on the Visionline server and then be downloaded from there to *Orion Service*.

Note: Upgrading the endnode firmware in the thermostat may take several minutes.

Note: If the firmware in thermostat controller and thermostat should be upgraded at the same time, it is recommended to start upgrading the thermostat controller first.

1. Check under **Upload firmware** in *Orion Service* what firmware that is included there; if no later firmware exists, follow the steps under **Upload firmware** in *Quick reference guide Orion Service*. The firmware upgrade is now ready. If you know that a later firmware version exists, instead follow steps 2-10 below.
2. Go to **Tools/Module firmware** in the Visionline software. The dialog to the right is shown.

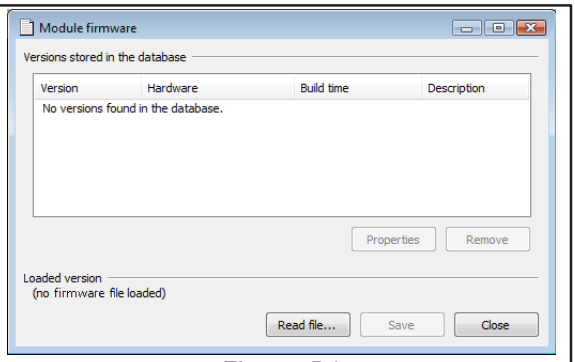


Figure B1

3. Click **Read file** and browse to the applicable module firmware file (tmf file).
4. Mark the tmf file and click **Open**. The tmf file will be read into the memory and the tmf version will appear at 'Loaded version' in the lower left corner of the **Module firmware** dialog.

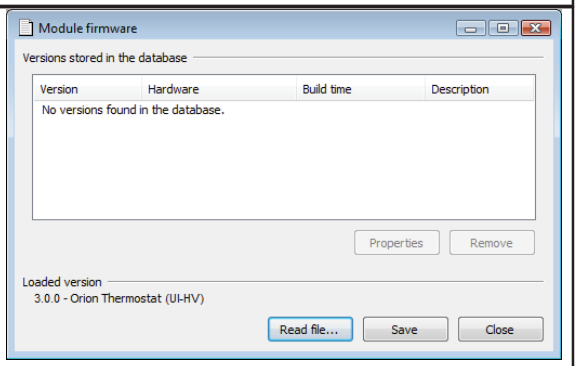


Figure B2

5. Click **Save** to store the tmf version in the database. The version will appear in the list below 'Versions stored in the database' in the **Module firmware** dialog.

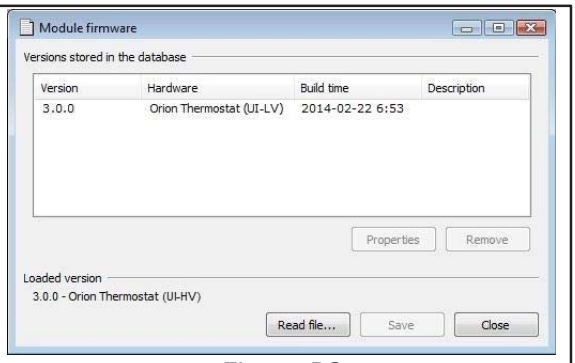


Figure B3

6. To enter an optional description for the tmf version, mark the version in the **Module firmware** dialog and click the **Properties** button. The **Additional note** dialog to the right is shown. Enter a description and click **OK**.

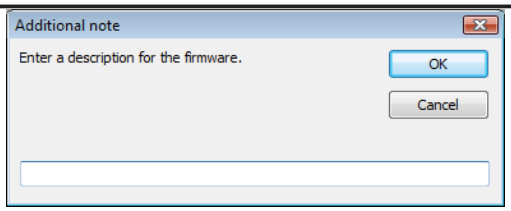


Figure B4

7. In the *Orion Service* software, choose **Download firmware**. Click **Query** to list the available module firmware versions on the Visionline server.
8. Mark the applicable firmware version and click **Download**.
9. If applicable, repeat *step 7* with other firmware that is to be uploaded.
10. Plug the service cable into the thermostat or motion sensor, depending on which module that is to be upgraded.

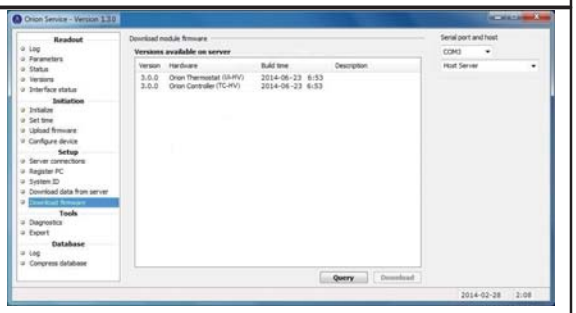


Figure B5

11. In the *Orion Service* software, choose **Upload firmware**. The firmware version(s) that have been downloaded according to *step 7* above will be shown. Mark the applicable firmware version and click **Upload**.

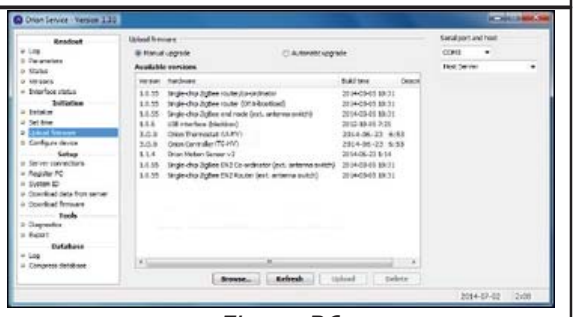


Figure B6

Appendix C: To set up a suite

Introduction

If two or more rooms should form a suite, all concerned thermostats must be connected as a suite and the thermostat in the *master room* (main room of the suite) or *master rooms* (if there are more than two rooms in the suite) must be initialized with suite settings. Follow the steps in chapter 5 to set up the online network, but
do not initialize the thermostat with suite settings at that point. There are three suite configurations:

- One foyer door leading to two rooms, each with one guest door; see details here
- Connected doors: two rooms connected by internal mechanical doors, no foyer door in front of the two guest doors; see details here
- One guest door leading to a suite of rooms (two or more rooms); see details here

To set up a suite with foyer door

One possible suite configuration is to have a foyer door, and behind the foyer door two rooms which form a suite. In the example shown in Figure C1, the suite contains the rooms 102 and 103; each room has one thermostat and one motion sensor. Room 102 is the master room of the suite, and hence the foyer lock 102-103 is connected to the thermostat in room 102 when the online network is set up.
Note: For more information about the suite functionality, click here. ***Note:*** The foyer door must be online; this is however not set up in the **Door details** dialog, instead the online type 'ZigBee' is automatically sent to the server with the first event from the door. ***Note:*** Only one of the thermostats, the master thermostat, is initialized with suite settings. The link between the two thermostats is set up in Orion Service.

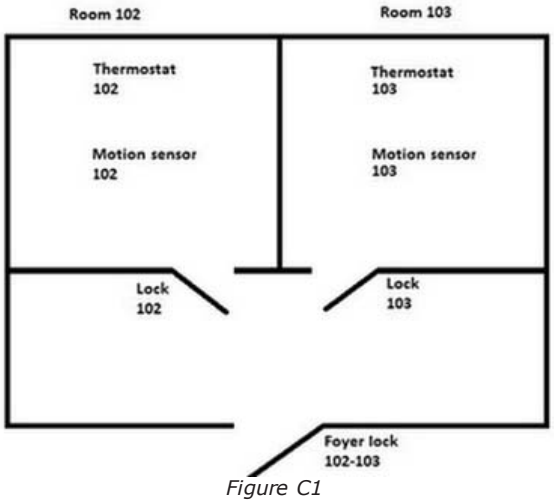


Figure C1

To enable 'suite with foyer door' in Visionline

Note: All concerned thermostats must be set up according to below, i.e. if the different thermostats in the suite belong to different thermostat profiles, make sure that the 'Suite with foyer door' checkbox is marked for each profile.

1. Double click on **Thermostat profiles** under the **Lists** tab.
2. In the **Thermostat profiles** dialog: click **Add** to add a new thermostat profile, or mark an existing thermostat profile and click **Properties**.
3. In the **Thermostat profile details** dialog, choose the **Misc** alternative in the left pane.
4. Mark 'Suite with foyer door'.
5. If it is a new thermostat profile, fill in all necessary information under the different alternatives in the left pane of the dialog.
6. Click **Save** and **Close**.

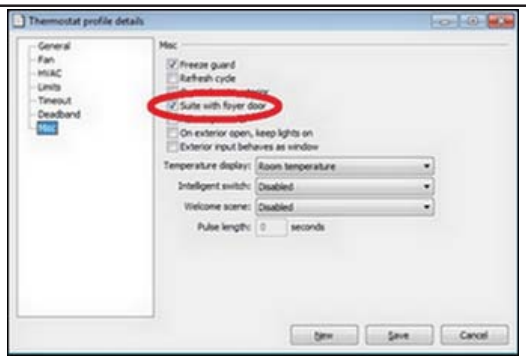


Figure C2

To set up the online network

The online network for the example in Figure C1 looks as in *Figure C3*. The two thermostats 102 and 103 must be set up under the same parent in the network, i.e. be set up in the same PAN (*personal area network*). To set up the network, follow the steps below:

1. Double click on **SysMon.exe** in the Visionline installation folder to open SysMon (*System Monitor*) which is used for managing the online network.
2. Log on to SysMon; go to **File/Log on** and enter user ID and password. At 'Operator card', choose the applicable card encoder and click **Enter**.
3. Go to **View/Online Network** to show the **Online Network** tree.
4. Install the gateway; see *User manual Online option* for details.
5. Initialize *thermostat 102* with 'normal parameter', i.e. all parameters except for those related to suite. To do this, use the **Initialize** alternative in Orion Service but leave the **Suite settings** empty. See *Quick reference guide Orion Service* for details about **Initialize**.
6. Connect *thermostat 102* to the gateway; see chapter 5 for details.
7. Connect *motion sensor 102* to thermostat 102; see chapter 5 for details.
8. Connect *lock 102* to *thermostat 102*; see chapter 5 for details.
9. Connect the foyer lock to *thermostat 102*; see chapter 5 for details.
10. Repeat *steps 5-8* for the devices in room 103.
11. Initialize *thermostat 102* with suite settings; click here for details.
12. Read out the thermostat status for *thermostats 102* and *103* respectively;

click here for details.

13. See the final **Online Network** tree in Figure C9.

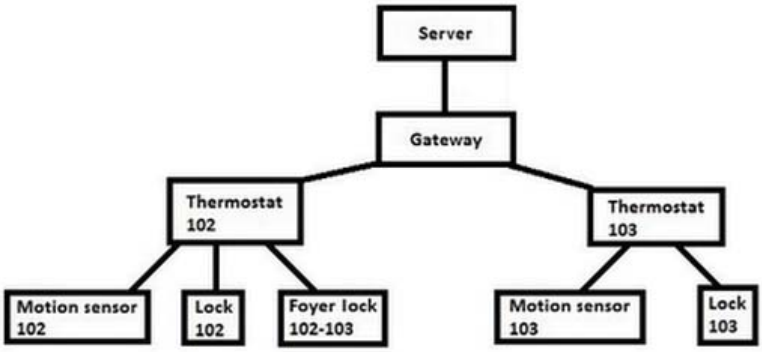


Figure C3

To initialize the master thermostat with suite settings

1. Choose **Initialize** in the left pane of the *Orion Service* window.
2. Connect the service cable to the thermostat in room 102.
3. Click the plus sign for the applicable door area (in this example 'Floor 1') and mark the *master room*, in this example 102.

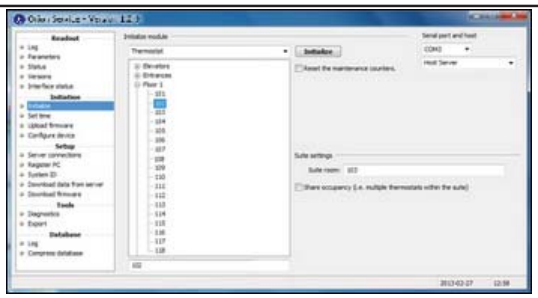


Figure C4

4. At **Suite settings**:
   - Enter the **Suite room** (*slave room*); in this example it is 103.
   - Leave the **Share occupancy** checkbox empty; this is only applicable when there is just one door to the entire suite; click here for more information about that configuration.

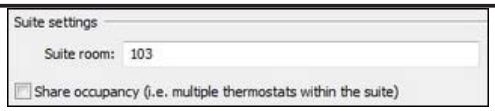


Figure C5

5. Click the **Initialize** button.
   Note: It is only the *master room* that is initialized with suite settings, so *steps 1-4* above are never performed for the *slave room*.

Figure C6

To read out the thermostat status

1. Choose **Status** in the left pane of the Orion Service window.
2. Connect the service cable to the thermostat.
3. Click the **Readout** button.

Example of suite status for *master room thermostat*:

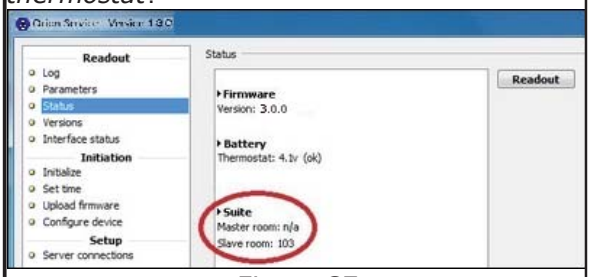


Figure C7

Example of suite status for *slave room thermostat*:

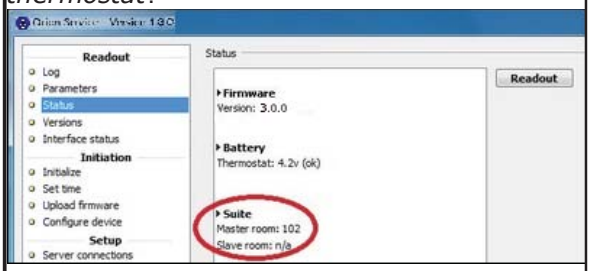


Figure C8

Online network tree

When steps 1-5 below have been performed, the **Online Network** tree in SysMon will typically look as in the example in *Figure C9*:

1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite.
2. Thermostats, motion sensors and guest room locks have been connected to the online network according to chapter 5.
3. The foyer lock has been connected to the master room thermostat according to chapter 5.
4. The master room thermostat has been initialized with suite settings according to here.
5. The status of the master room thermostat and of the slave room thermostat has been read out according to here.

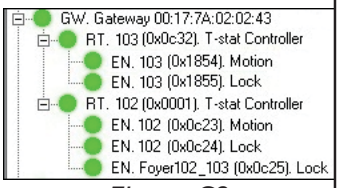


Figure C9

To set up a suite with two rooms (not foyer)

One possible suite configuration is to have two guest rooms connected by internal mechanical doors; no foyer door in front of the two guest doors. The connecting doors can be locked and the rooms be used separately, or the two rooms can be used as a suite with full access to both rooms. The thermostats in the two rooms share events when the two rooms are used as suite, and if the rooms are not used as a suite the events are handled independently.
Note: Only one of the thermostats, the master thermostat, is initialized with suite settings. Once initialized, the two thermostats are equal and share events as above. The link between the two thermostats is set up in Orion Service.

The two rooms can either be used separately or as a suite with the connecting doors unlocked. The connecting doors are mechanical doors that are unlocked with a key by staff, or by the guest with access to both rooms.

The Orion system must be connected to a server via a gateway in order for the thermostats in the two rooms to be able to communicate. The link between the two rooms is configured via Orion Service. The suite activation will be automatic if the requirements mentioned in the sections VingCard guest door locks and Other guest door locks than VingCard are met.
Note: If the doors A and B do not have VingCard locks, extra hardware must be installed on the connecting doors to have the suite functionality enabled; see details in section Other guest door locks than VingCard.

VingCard guest door locks

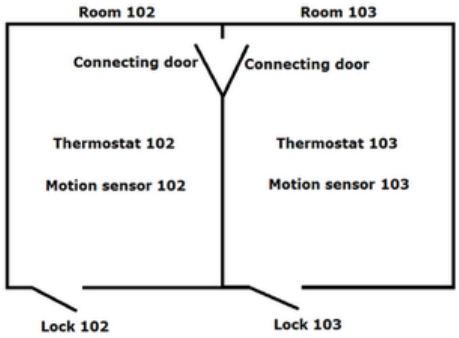


Figure C10

When a suite card is presented at one of the concerned VingCard locks (to either *lock 102* or *lock 103* in the example in *Figure C10*), the thermostat communicates with the other connected room to activate suite mode and share events. The suite will be active and events will be shared between the two thermostats, even if the connecting doors are closed. Upon check-out or if the suite card expires, the thermostat disables event sharing.

Visionline settings

1. Double click on **Thermostat profiles** under the **Lists** tab in the navigation window.
2. In the **Thermostat profiles** dialog: click **Add** to add a new thermostat profile, or mark an existing thermostat profile and click p**roperties**.
3. In the **Thermostat profile details** dialog, choose the **Misc** alternative in the left pane.
4. Make sure that the checkbox 'Suite with foyer door' is unmarked.
5. If it is a new thermostat profile, fill in all necessary information under the different alternatives in the left pane of the dialog.
6. Click **Save** and **Close**.

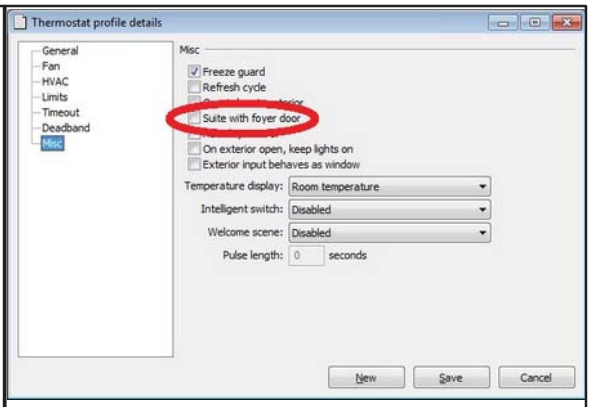


Figure C11

To set up the online network

The online network for the example in Figure C10 looks as in Figure C12. The two thermostats 102 and 103 must be set up under the same parent in the network, i.e. be set up in the same PAN (*personal area network*). To set up the network, follow the steps below:

1. Open SysMon (*System Monitor*) which is used for managing the online network; double click on **SysMon.exe** in the Visionline installation folder.
2. Log on to SysMon; go to **File/Log on** and enter user ID and password. At 'Operator card', choose the applicable card encoder and click **Enter**.
3. Go to **View/Online Network** to show the **Online Network** tree.
4. Install the gateway; see *User manual Online option* for details.
5. Initialize *thermostat 102* with 'normal parameters', i.e. all parameters except for those related to suite. To do this, use the **Initialize** alternative in Orion Service but leave the **Suite settings** empty. See *Daily use manual Orion EMS* for details about **Initialize**.
6. Connect *thermostat 102* to the gateway; see chapter 5 for details.
7. Connect *motion sensor 102* to *thermostat 102*; see chapter 5 for details.
8. Connect *lock 102* to *thermostat 102*; see chapter 5 for details.
9. Repeat *steps 5-8* for the devices in room 103.
10. Initialize *thermostat 102* with suite settings; click here for details.
11. Read out the thermostat status for *thermostat 102*; click here for details.
12. Read out the thermostat status for *thermostat 103*; click here for details.
13. See the final **Online Network** tree in Figure C16.

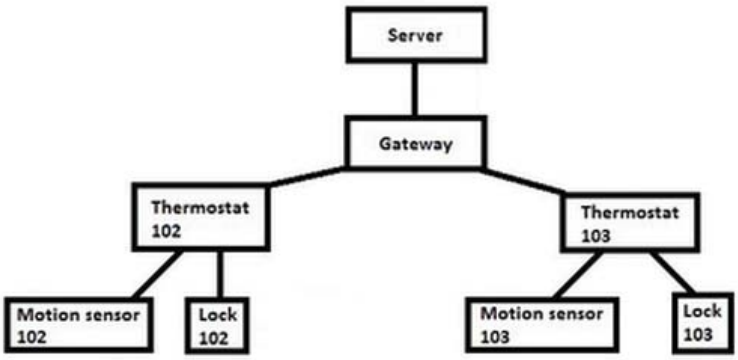


Figure C12

To initialize the master thermostat with suite settings

1. Choose **Initialize** in the left pane of the Orion Service window.
2. In this example, the *master thermostat* is in room 102 (*room A* in Figure C10). Connect the service cable to the thermostat in room 102.
3. Click the plus sign for the applicable door area(in this example 'Floor 1') and mark room 102.

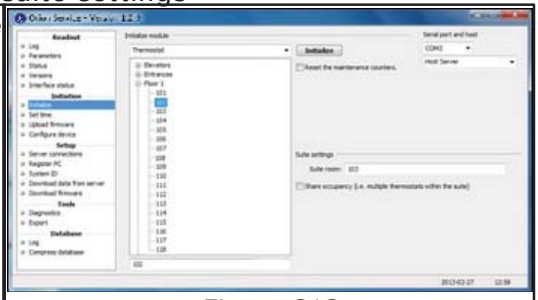


Figure C13

4. At **Suite settings**:
   - Enter the **Suite room** (*slave room*); in this example 103 (room B in Figure C10).
   - Leave the **Share occupancy** checkbox empty; this is only applicable when there is just one door to the entire suite; click here for more information about that configuration.

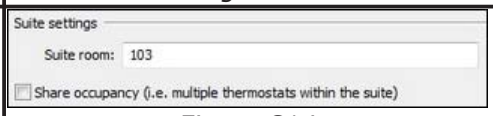


Figure C14

5. Click the **Initialize** button.
   Note: It is only the *master room* that is initialized with suite settings, so *steps 1-4* above are never performed for the *slave room*.

Figure C15

Online network tree

When steps 1-4 below have been performed, the **Online Network** tree in SysMon will typically look as in the example in *Figure C16*:

1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite.
2. Thermostats, motion sensors and guest room locks have been connected to the online network according to chapter 5.
3. The master room thermostat has been initialized with suite settings according to here.
4. The status of the master room thermostat and of the slave room thermostat has been read out according to here.

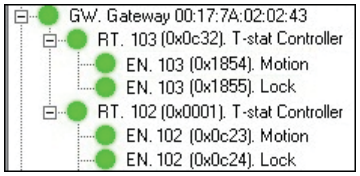


Figure C16

Other guest door locks than VingCard

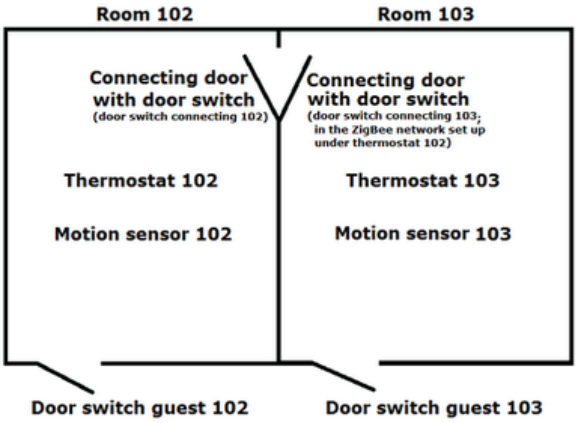


Figure C17

In the scenario when VingCard locks are not used, the two rooms (in the example in *Figure C17* they are called room 102 and room 103) each have two door switches set up as **Connecting door** under the master thermostat (in our example the thermostat in room 102). This will not disturb occupancy; the only trigger is suite activation. See *Quick reference guide Orion Service* for information on how to configure for **Connecting door**.

Note: For each room, one door switch is located at the guest door and one at the connecting door; see *Figure C17*.
Note: If there is only one connecting door between the two rooms, there should be three door switches set up under the master room; one door switch at the guest door and two door switches at the connecting door.

When the master thermostat reads both door switches as open, it will activate the suite by sending a message to the slave thermostat (thermostat 103 in *Figure C17*) and share events from that point. If one or both of the connecting doors are closed, the suite is deactivated. To set up a suite with two rooms when other locks than VingCard locks are use, follow the steps below:

1. Follow this section to make Visionline settings.
2. Follow this section below to set up the online network.
3. Follow this section to initialize the master thermostat with suite settings.
4. Follow this section below to configure the door switches.
5. Follow this section below regarding the online network tree.

To set up the online network

The online network for the example in Figure C17, i.e. if other locks than VingCard locks are used at the guest doors, looks as in *Figure C18*. The two thermostats 102 and 103 must be set up under the same parent in the network, i.e. be set up in the same PAN (*personal area network*). To set up the network, follow the steps below:

1. Open SysMon (*System Monitor*) which is used for managing the online network; double click on **SysMon.exe** in the Visionline installation folder.
2. Log on to SysMon; go to **File/Log on** and enter user ID and password. At 'Operator card', choose the applicable card encoder and click **Enter**.
3. Go to **View/Online Network** to show the **Online Network** tree.
4. Install the gateway; see *User manual Online option* for details.
5. Initialize thermostat 102 with 'normal parameters', i.e. all parameters except for those related to suite. To do this, use the **Initialize** alternative in Orion Service but leave the **Suite settings** empty. See *Daily use manual Orion EMS* for details about **Initialize**.
6. Connect *thermostat 102* to the gateway; see chapter 5 for details.
7. Connect *motion sensor 102* to thermostat 102; see chapter 5 for details.
8. Connect *door switch guest 102* (door switch at the guest door in room 102) to *thermostat 102*; see chapter 5 for details.
9. Connect *door switch connecting 102* (door switch at the connecting door in room 102) to *thermostat 102*; see chapter 5 for details.
10. Connect *door switch connecting 103* (door switch at the connecting door in room 102) to *thermostat 102*; see chapter 5 for details.
11. Repeat steps 5-7 for the devices in room 103.
12. Connect *door switch guest 103* (door switch at the guest door in room 103) to *thermostat 103*; see chapter 5 for details.
13. Initialize *thermostat 102* with suite settings; click here for details.
14. Read out the thermostat status for *thermostat 102*; click here for details.
15. Read out the thermostat status for *thermostat 103*; click here for details.
16. See the final **Online Network** tree in Figure C20.

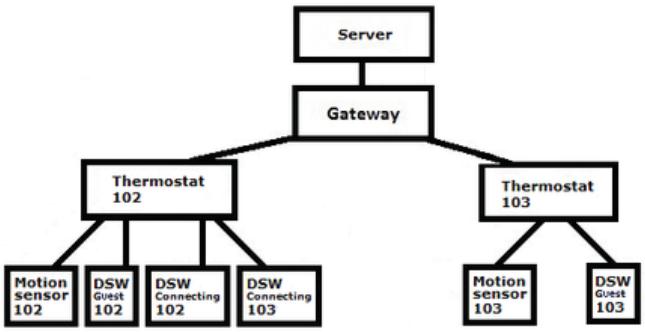


Figure C18

To configure the door switches

1. Choose **Configure device** in the left pane of the Orion Service window.
2. Choose **Door switch** in the upper part of the Orion Service window.
3. Plug the service cable into the door switch at the guest door in room 102.
4. Select **Connecting door** in the Orion Service window.
5. Repeat *steps 3-4* for:
   - the door switch at the connecting door in room 102
   - the door switch at the guest door in room 103
   - the door switch at the connecting door in room 103

Example of suite status for *master room thermostat*:

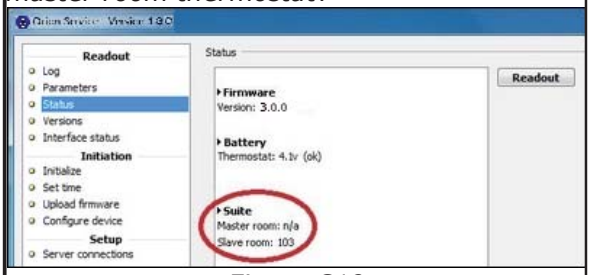


Figure C19

Online network tree

When steps 1-4 below have been performed, the **Online Network** tree in SysMon will typically look as in the example in *Figure C20*:

1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite.
2. Thermostats, motion sensors and door switches have been connected to the online network according to chapter 5.
3. The master room thermostat has been initialized with suite settings according to here.
4. The status of the master room thermostat and of the slave room thermostat has been read out according to here.

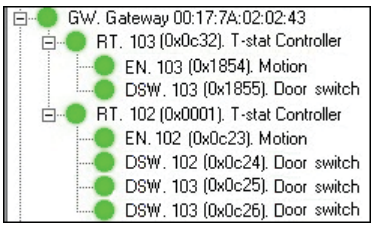


Figure C20

To set up a suite with one door only

One possible suite configuration is to have only one door to the entire suite. In the example shown in *Figure C21*, the suite contains the rooms 1021, 1022 and 1023; each room has one thermostat and one motion sensor. Room 1021 is the *master room* for room 1022 and room 1022 is the *master room* for room 1023. The lock 102 is connected to the thermostat in the first room, i.e. to *thermostat 1021*, when the online network is set up. ***Note:*** For more information about the suite functionality, see section More about how the suite works.

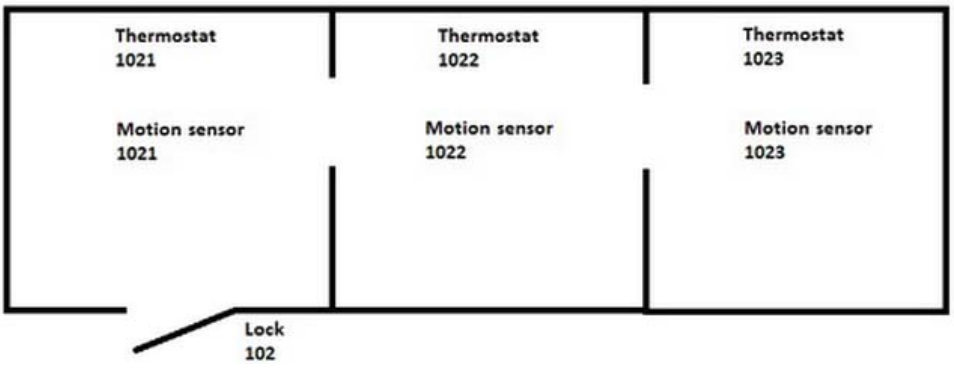


Figure C21

To set up the online network

The online network for the above example looks as in *Figure C22*. The three thermostats 1021, 1022 and 1023 must be set up under the same parent in the network, i.e. be set up in the same PAN (*personal area network*). To set up the network, follow the steps below:

1. Double click on **SysMon.exe** in the Visionline installation folder to open SysMon (*System Monitor*) which is used for managing the online network.
2. Log on to SysMon; go to **File/Log on** and enter user ID and password. At 'Operator card', choose the applicable card encoder and click **Enter**.
3. Go to **View/Online Network** to show the **Online Network** tree.
4. Install the gateway; see *User manual Online option* for details.
5. Initialize *thermostat 1021* with "regular parameters", i.e. all parameters except for those related to suite. To do this, use the **Initialize** alternative in Orion Service but leave the **Suite settings** empty. See *Daily use manual Orion EMS* for details about **Initialize**.
6. Connect *thermostat 1021* to the gateway; see chapter 5 for details.
7. Connect *motion sensor 1021* to *thermostat 1021*; see chapter 5 for details.
8. Connect *lock 102* to *thermostat 1021*; see chapter 5 for details.
9. Repeat steps 5-7 for the devices in rooms 1022 and 1023 respectively.
10. Initialize *thermostat 1021* with suite settings; click here for details.
11. Initialize *thermostat 1022* with suite settings; click here for details.
12. Read out the thermostat status for *thermostat 1021*; click here for details.
13. Read out the thermostat status for *thermostat 1022*; click here for details.
14. See Figure C32 for a picture of the final **Online Network** tree.

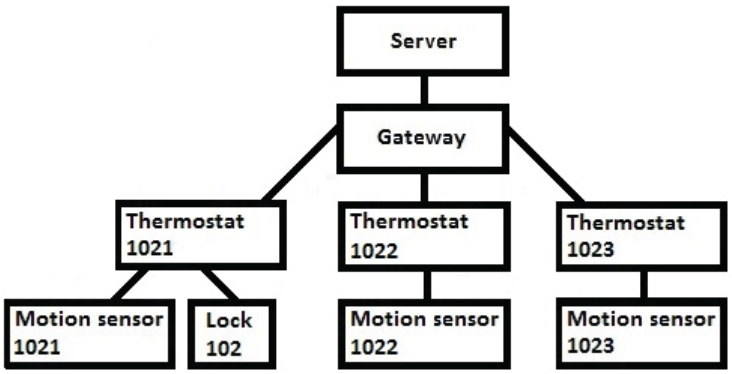


Figure C22

To initialize thermostats with suite settings

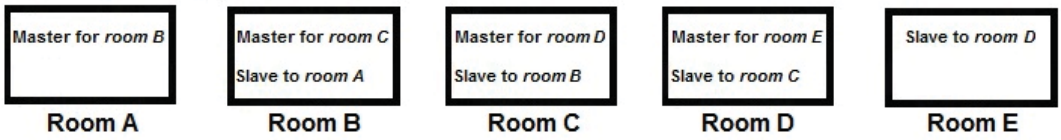
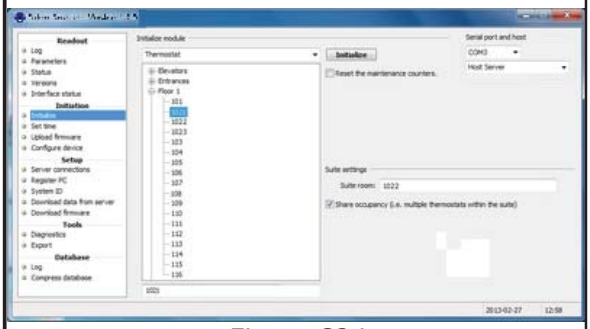
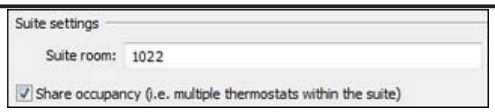


Figure C23

In the configuration with only one door to the entire suite, the thermostats are initialized in a chain. The principle is described in *Figure C23*; *room A* in the room chain is master for *room B*, which is in turn master for *room C* etc. This and this section describe the example from Figure C21, i.e. three rooms in a chain.

To initialize the thermostat in the first room of the suite

1. Choose **Initialize** in the left pane of the Orion Service window. 2. Click the plus sign for the applicable door area (in this example 'Floor 1') and mark the *master room*, in this example 1021.	 *Figure C24*
3. At **Suite settings**: - Enter the **Suite room** (*slave room*); in this example 1022. - Mark the **Share occupancy** checkbox.	 *Figure C25*
4. Click the **Initialize** button. ***Note:*** It is only the *master room* that is initialized with suite settings, so *steps 1-3* above are never performed for the *slave room*.	 *Figure C26*

To initialize the thermostat in the second room of the suite

1. Choose **Initialize** in the left pane of the Orion Service window.
2. Click the plus sign for the applicable door area (in this example 'Floor 1') and mark the *master room*, in this example 1022.

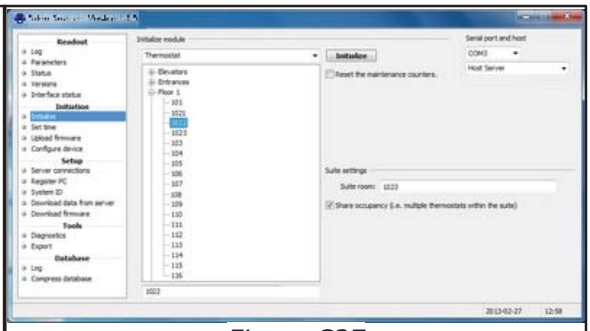


Figure C27

3. At **Suite settings**:
   - Enter the **Suite room** (*slave room*); in this example 1023.
   - Mark the **Share occupancy** checkbox.

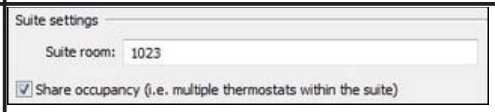


Figure C28

4. Click the **Initialize** button.
   Note: It is only the *master room* that is initialized with suite settings, so *steps 1-3* above are never performed for the *slave room*.

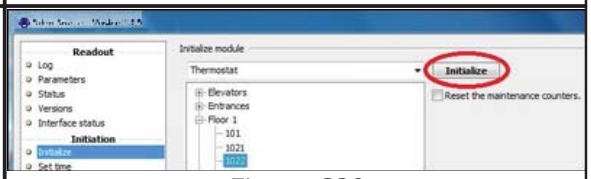


Figure C29

To read out the thermostat status

1. Choose **Status** in the left pane of the Orion Service window.
2. Connect the service cable to the thermostat.
3. Click the **Readout** button.

Example of suite status for the first thermostat in the chain:

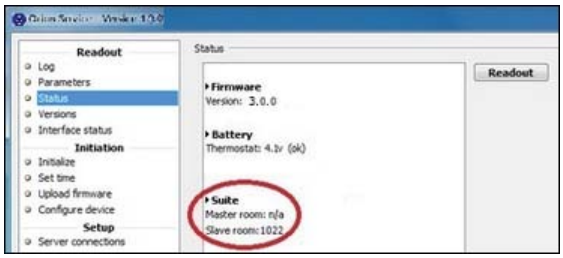


Figure C30

Example of suite status for the second thermostat in the chain:

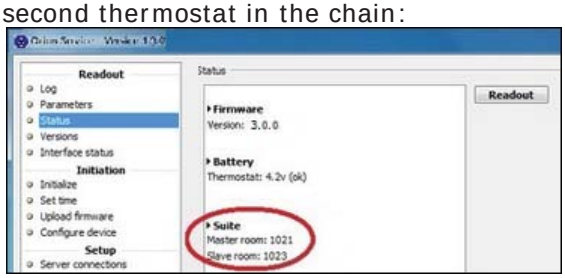


Figure C31

Online network tree

When steps 1-4 below have been performed, the online network tree in SysMon will typically look as in the example in *Figure C32*:

1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite.
2. Thermostats, motion sensors and the lock have been connected to the online network according to chapter 5.
3. All thermostats except for the last one in the chain (see Figure C23 for a description of the principle) have been initialized with suite settings according to this section.
4. The status of all master room thermostats have been read out according to this section.

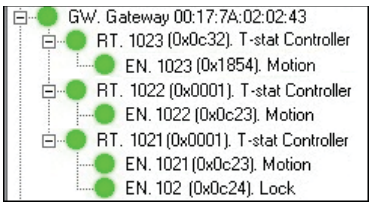


Figure C32

More about how the suite works

Note: Check-out is made separately from each room in the suite, i.e. check-out from the master room will not automatically check out all cards that are valid in the entire suite. If the check-out is made from PMS, it can however be made with one command, even if the concerned rooms must be defined separately in the PMS command.

Suite with foyer

Suite card

In the example described in this section, i.e. a foyer door with two guest rooms behind (see *Figure C33*), the suite guest will get a suite card which gives access to

- both rooms in the suite
- the foyer door, which should be closed when the guest arrives

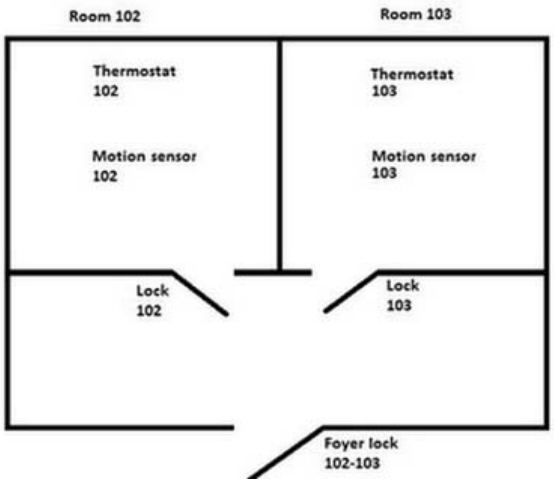


Figure C33

When the guest uses the suite card in the foyer door, the door will

- send information to the thermostat in the master room, i.e. in this example 102, that a suite card has been used in the foyer door and the thermostats should now share the state (*occupied* or *unoccupied*). When there is movement in any of the two guest rooms 102 or 103, the thermostat in the concerned room will send information to the thermostat in the other room that the state is changed to *occupied*.
- send information about when the suite card will expire; after this expiration time, the thermostats in rooms 102 and 103 will leave the suite mode.

Regular guest card

If the suite guests have checked out and a "regular guest" arrives, i.e. a guest which should only have access to one of the rooms in the former suite, the regular guest will get a guest card with access to

- the concerned guest room
- the foyer door

Since the guest room is no longer part of a suite, it does not matter if the foyer door is open or closed when the guest arrives. In both cases, the foyer door as well as the guest room door will send information to the thermostat in the concerned guest room that

- the room is rented as a single room and not as part of a suite
- the card is valid in the room to a certain date and time.

Note: The thermostats in rooms 102 and 103 will now only consider the door events for their "own" room and will not share the occupancy state with the thermostat in the other room.

Suite with one door only

For the suite configuration described in this section, i.e. with only one guest door leading to two or more rooms (see *Figure C34*), the rooms are a "permanent suite" and are never rented as separate, regular guest rooms. When the guest uses his suite card in the door, the door will send information to the first master thermostat in the chain, i.e. in this example to the thermostat in room 1021 (see *Figure C35*) that will share the occupancy state with the other thermostats.

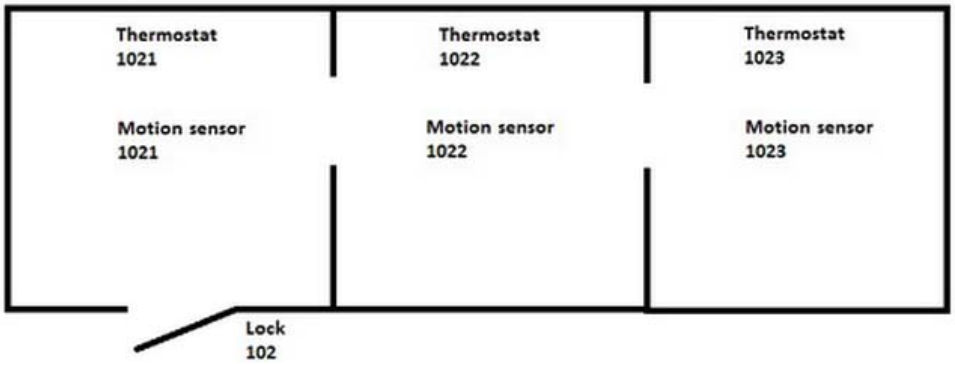


Figure C34

Figure C35

Appendix D: Configuration in offline scenarios

In Orion EMS offline scenarios, there is no connection to the Visionline server; each room can be seen as a PAN (*personal area network*) .

The firmware in the thermostat is a *coordinator firmware* instead of a *router firmware*.

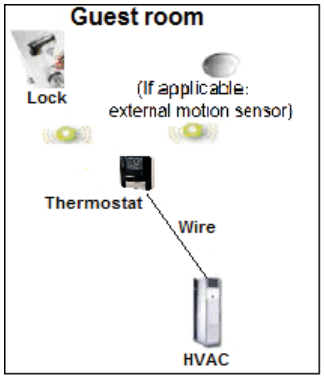


Figure D1

The RFID lock in the configuration pictures above must be prepared in two ways:

- it must be online with the in-room network
- EMI events must be enabled in the lock. This can be done either with an *Enable EMI events card* or via Lock Service; see the applicable one of sections *Enabling EMI events via card* and *Enabling EMI events via Lock Service*.

Note: The EMI events will be sent to the closest parent in the in-room network, since there is no connection to the Visionline server.

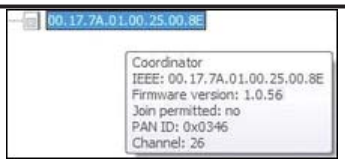
To add the lock to the in-room network

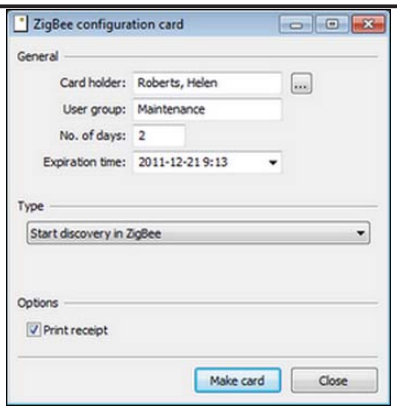
The in-room network is configured under the **Configure device** section in Orion Service.

Configuration	Description
Form new network	This configuration removes all nodes in the PAN and resets the coordinator.
Permit join	When this configuration is used, an in-room device (RF door switch, motion sensor or lock) can join the coordinator.
Forbid join	When the RF door switch, motion sensor or lock has joined the coordinator, this configuration should be used on the coordinator. ***Note:*** If the Forbid join command is for some reason forgotten, it will automatically be executed 15 minutes after the **Permit join** command was executed.
Set channels	Default is that all channels are ON (the '1' indicates ON); the best channel will automatically be chosen, so normally the **Set channels** command is not needed.
Get network	This configuration shows the in-room network. ***Note:*** When hovering with the cursor over an item in the network, the tooltip will show what type of item it is; e.g. 'Coordinator' as in the screenshot example above. The tooltip will also show e.g. IEEE address and firmware version.
	Table D1

1. Go to **Start/Programs/ Orion Service/Orion Service**.
2. Choose **Configure device** in the left pane of the Orion Service window.
3. Plug the service cable into the thermostat.
4. Choose the **Coordinator** tab.
5. Click **Form new network**.

Figure D2

6. Click the **Get network** button; the thermostat will appear in the window below **Get network**.	 *Figure D3*
7. Put the cursor on the thermostat in the Orion Service window; an information box, showing e.g. the thermostat channel, will appear. If the channel should be changed, click the applicable channel (in the picture example '26') and click the **Set channels** button. 8. Mark the thermostat and click the **Permit join** button.	 *Figure D4*
9. Right click on the thermostat and choose **Get user description**. Information about the thermostat will be shown; see picture to the right. Make sure that: - the channel is correct - it says 'yes'at 'Join permitted' ***Note:*** If it does not say 'yes' at 'Join permitted', click the **Permit join** button again.	 00.17.7A.01.00.25.00.8E Coordinator IEEE: 00.17.7A.01.00.25.00.8E Firmware version: 1.0.56 Join permitted: no PAN ID: 0x0346 Channel: 26 *Figure D5*
10. Plug the service cable into the motion sensor. 11. Choose the **Motion sensor** tab and click **Discovery**.	 *Figure D6*

12. Plug the service cable into the thermostat. 13. Choose the **Coordinator** tab and click **Get network**.	 *Figure D7*
14. Click the plus sign in front of the thermostat; the motion sensor will appear in the network tree. 15. Right click on the thermostat to make sure that is still says 'yes' at 'Join permitted'.	 *Figure D8*
16. Issue a *Discovery card* in Visionline: - Go to **Start/Programs/ VisiOnline/VisiOnline** and log on. - Double click on **ZigBee configuration** under the **Cards** tab in the navigation window. - Browse to choose a **Card holder** and enter **No. of days**. - At **Type**, choose 'Start discovery in ZigBee'. - If applicable, tick the checkbox 'Print receipt'. - Click **Make card** and present a card at the encoder. 17. Present the *Discovery card* at the lock.	 *Figure D9*
18. In Orion Service, **Configure device** section: click **Get network** under the **Coordinator** tab.	 *Figure D10*

19. Click the plus sign in front of the thermostat; the lock will appear in the network tree.
20. Mark the thermostat and click the **Forbid join** button.
21. Right click on the thermostat and choose **Get user description**. Make sure that the description says 'no' at 'Join permitted'.

Figure D11

Appendix E: To install an external motion sensor

Note: *Orion High Voltage Thermostat* has a built-in motion sensor, but in some cases (depending on thermostat location in the room) it can be applicable to also have an external motion sensor as the one described in this section.

The motion sensor is used to detect motion in the room and send this information via the ZigBee endnode to the to the room controller (thermostat). The device is designed to be ceiling or wall mounted and is powered by 3AA batteries.
No physical connections are required; thus making the installation simple.

Figure E1

The motion sensor is a battery operated device that may be installed on the ceiling or wall. The mounting bracket is installed with two screws as shown in *Figure E2*.

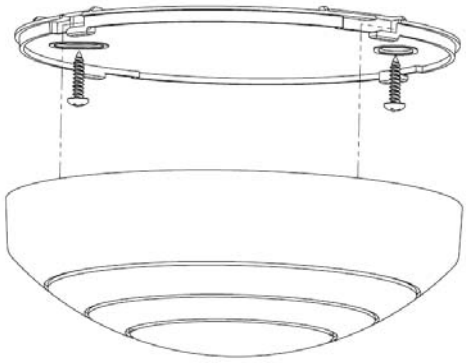


Figure E2

Quick reference of technical data

Dimensions	Ø: 120 mm (4 23/32)'' H: 44.2 mm (1 3/4)''
Input power	3 AA batteries (4.5 VDC)
Mounting	• Ceiling or wall surface mounting • Keyhole type for easy installation and battery relpacement access
Range	360 degrees/ 8 meters horizontal / 3 meters vertical
Messages transmitted	• Motion detected • Battery status
Diagnostics	Integrated LED only enabled for diagnostics
	Table E1

Motion sensor dimensions in mm (inches)

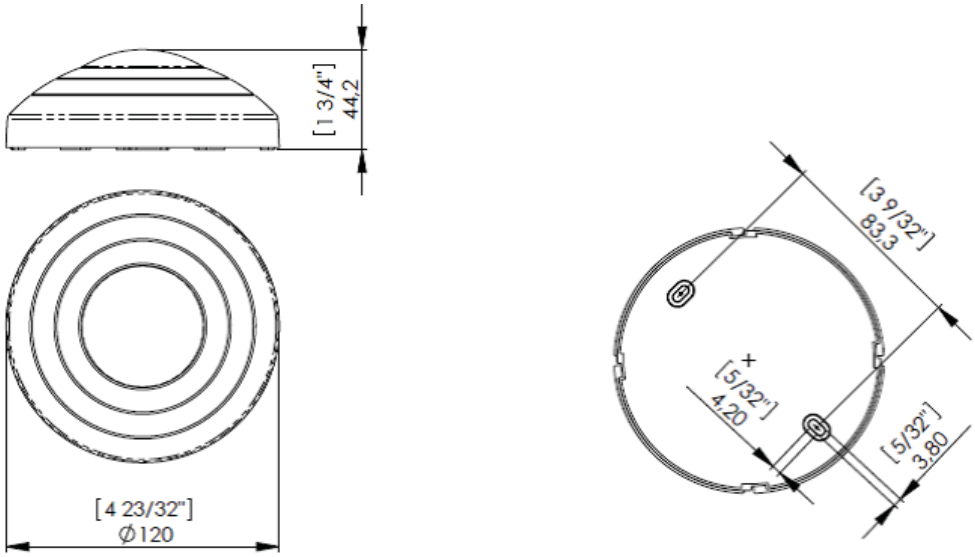


Figure E3

Motion sensor locations

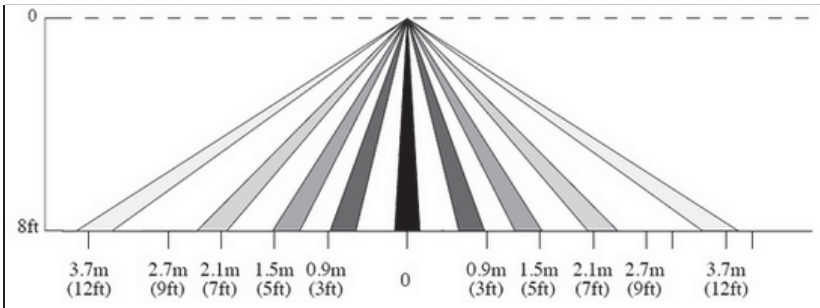


Figure E4

For optimal coverage, the motion sensor should be installed on the ceiling as close to the middle of the room as possible. When ceiling mounting is not feasible, either due to the construction or for the aesthetics of the room, the sensor may be placed on the wall. The location should be as high as possible and give as much coverage to the room as possible. *Figure E4* shows the range of the motion sensor when placed on the ceiling. This range is somewhat reduced when installed on the wall. The range shown is a general guideline, and the sensor is designed to cover an area of about 8m (26 feet) in diameter. To check the location, it is advisable to activate the motion LED using the service device and test the range of the motion sensor. This process will help to determine the best location of the sensor. See section To test the in-room devices for instructions on this process.

Appendix F: Read more

Document name	Document number
User manual Online option	66 3081 004
User manual Orion High Voltage Thermostat	66 8003 015

Revision history

Date	Change	By
August 19, 2010	Initial version	KG
November 15, 2010	'Configure device' in Orion Service modified	KG
July 5, 2011	• Information about thermostat controller added • Information about service indicators added • Appendix about Orion Service connections added • Appendix about configuration in offline scenarios added	KG
October 6, 2011	• Logotypes changed • Information about commissioning when thermostat controller is used has been added	KG
October 20, 2011	• Section about *Recommended wire specification* modified due to requirements for UL certification • Picture in section *Line to low voltage conversion* exchanged due to requirements for UL certification	KG
February 16, 2012	• Added reference to *Upgrading an RFID lock for an Orion EMS offline scenario* for information about what firmware to use in different configurations • Added information about RF door switch • Modified the section *Commissioning the system*; use the **Thermostat** tab also for battery thermostats • Added information to *Appendix D: Configuration in offline scenario:* - configuration pictures - how to enable and log EMI events in locks	KG
June 5, 2012	• Updated to match Orion Service 1.2.0	KG

July 5, 2012	• Info added to chapter *1 General* about the number of Orion EMS devices that each room number can have a certain number of Orion EMS devices	KG
September 13, 2012	• Clarified about V+ in section *3.3* • Clarified about V+ and signal inputs in section *4.1* • Added section *4.1.1* about RS-485 interface • Removed information about USB Xpress in *Appendix A*	KG
March 7, 2014	• Added information about suites	KG
February 19, 2016	• Layout updated • Added 'cool down' parameter	KG
October 12, 2016	• Modified maximum value of 'room not occupied timer' to 120 minutes	KG

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