3.5.1 Motion sensor dimensions in mm (inches)
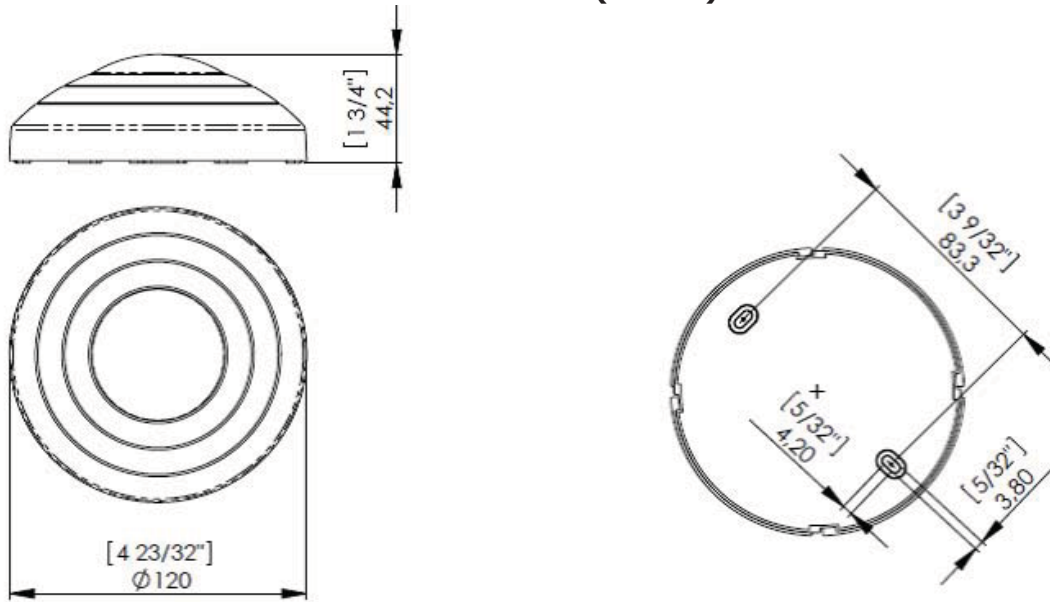

Figure 82
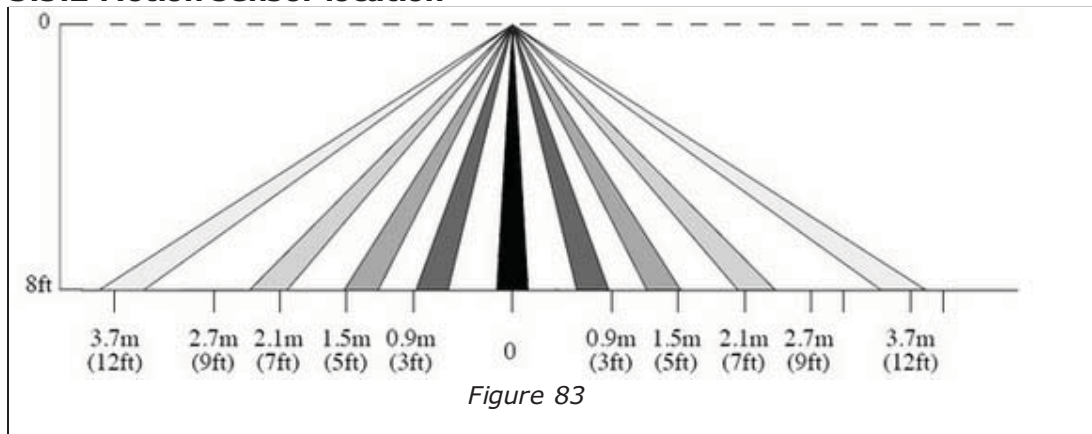
3.5.2 Motion sensor location

Figure 83

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 83 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.

3.6 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 85) and two screws. The door switch can be mounted as it is or on a wall-mounted casing (see Figure 86) 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 84.

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

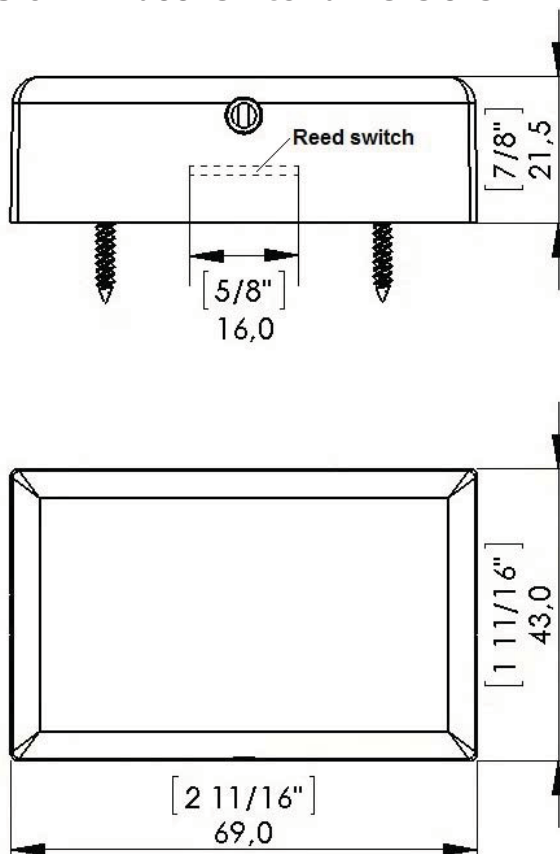### 3.6.1 RF door switch dimensions

Figure 84

3.6.2 RF door switch magnet dimensions

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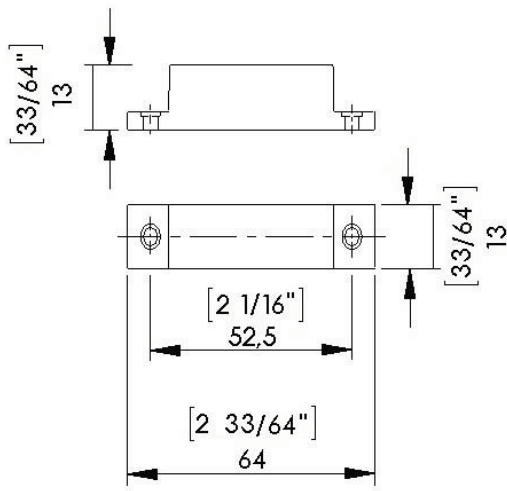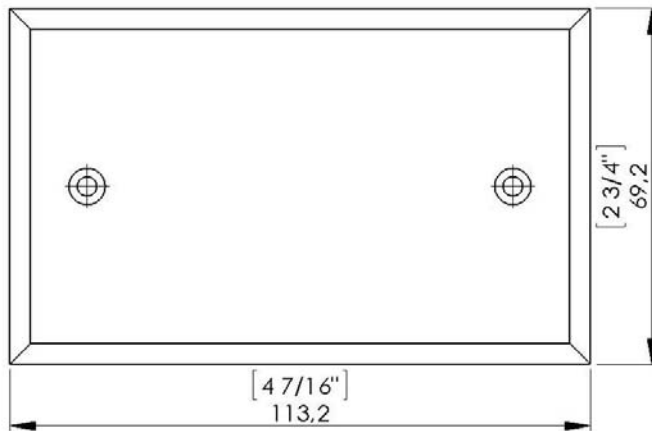

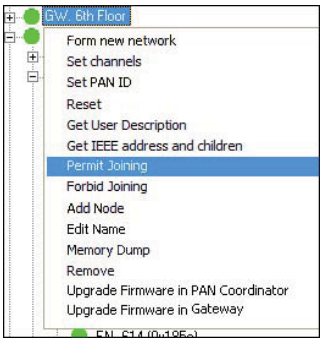*Figure 85*

3.6.3 Wall-mounted casing

Figure 86

4. 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.

4.1 To commission when thermostat controller is not used

4.1.1 To join the thermostat controller to the network

1. In the **Online Network** window of SysMon, right click on the applicable gateway/router and select **Permit Joining**. The gateway/router is now 'open'. It will remain in this status for approximately 15 minutes or until a *forbid join* command is executed. 2. With the gateway/router open, plug the service cable into the thermostat controller.	 *Figure 87*
3. In the Orion Service software (**Start/Programs/Orion Service/ Orion Service**), choose **Configure device** in the left part of the window. Let the tab **Thermostat** (default) be open and click the **Discovery** button. The thermostat controller will connect to the open gateway/router.	 *Figure 88*
4. To see if the thermostat controller 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. 5. With the thermostat controller joined to its gateway/router, right click on the gateway/router in SysMon and select **Forbid Joining**.	

4.1.2 To join the in-room devices to the thermostat controller

The next step is to join the *in-room devices*, e.g. thermostats, motion sensors and locks (or RF door switches, if this is applicable). ***Note:*** When the thermostat controller is applicable, the thermostat has an *endnode firmware*. The thermostat controller has either a *router firmware* or a *coordinator firmware*, depending on scenario. 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.

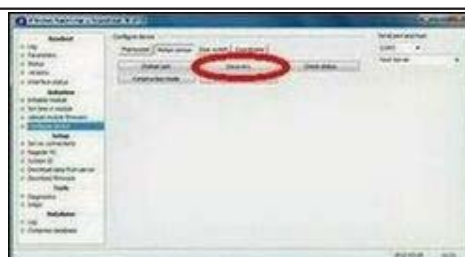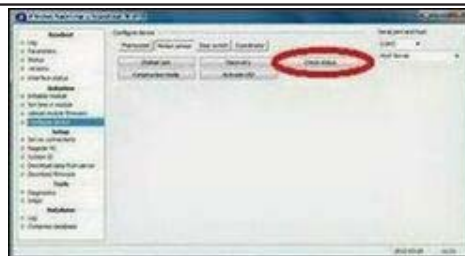|	
1. Plug the service cable into the thermostat controller. 2. Click the **Permit Join** button in the **Configure device** section (**Thermostat** tab) of Orion Service. ***Note:*** The thermostat controller will remain open for 15 minutes or until a *forbid join* command is received.	 *Figure 89*
3. Once the thermostat controller has been opened for joining, plug the service cable into the applicable in-room device. Choose the **Motion sensor** tab in the **Configure device** section of Orion Service; click the **Discovery** button.	 *Figure 90*
4. Wait a few seconds and then click the **Check status** button. 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 the device is still offline, repeat the discovery process.	 *Figure 91*
5. Join the lock and present an *Enable EMI events card** at the lock. 6. 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. 7. Click the **Forbid join** button under the **Thermostat** tab in the **Configure device** section of Orion Service. 8. Test the in-room devices; see details.	 *Figure 92*

*) See *User manual Online option* for information about issuing the card.

4.2 To commission when thermostat controller is not used

The Orion EMS 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. This device 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 4.2.1 and 4.2.2 have been performed, the in-room network is operational. ***Note:*** To use the *Orion Service* software which is mentioned in step 4 below, connections to the application server must be made according *Quick reference guide Orion Service*.

4.2.1 To join the thermostat to the network

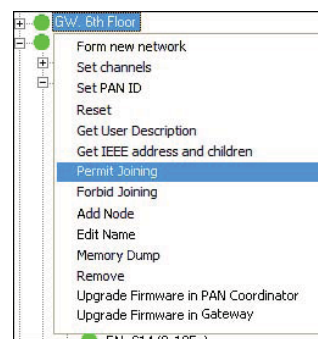|	
1. To be able to join the thermostat to the gateway or router, it is first necessary to permit joining on the gateway or router. This is done in the *System Monitor*, SysMon; to open this, double click on SysMon.exe in the software installation folder and log on at **File/Log on**. 2. In SysMon, choose **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 93. 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 93*
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 94. 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 94*

4.2.2 To join the in-room devices to the thermostat

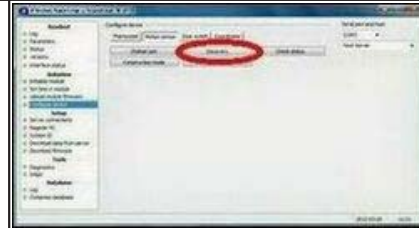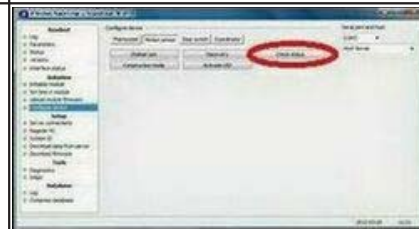|	
1. Plug the service cable into the thermostat. 2. Click the **Permit Join** button in the **Configure device** section of Orion Service; see Figure 95. **Note:** The thermostat will remain open for 15 minutes or until a **Forbid Join** command is received.	 *Figure 95*
3. Once the thermostat has been 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. Click the **Discovery** button; see Figure 96.	 *Figure 96*
5. Wait a few seconds and then click the **Check status** button in the **Motion sensor** tab of **Configure device**; see Figure 97. 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 97*

6. 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. 7. 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. 8. 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 98. 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 98*

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

5. To check the installation

5.1 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*:
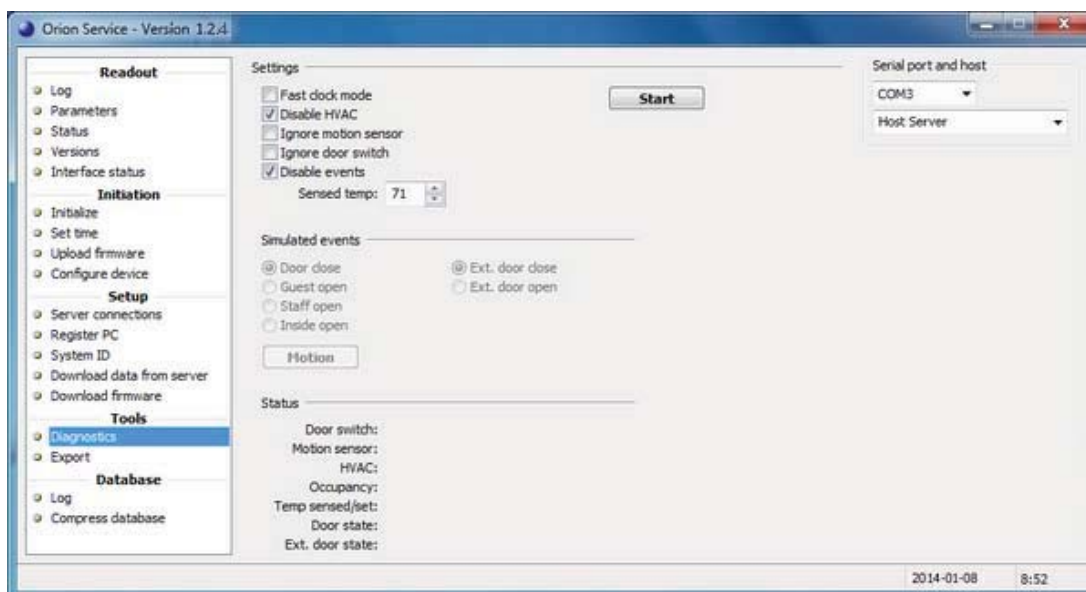

Figure 99

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 6

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.

5.2 To test the in-room devices

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

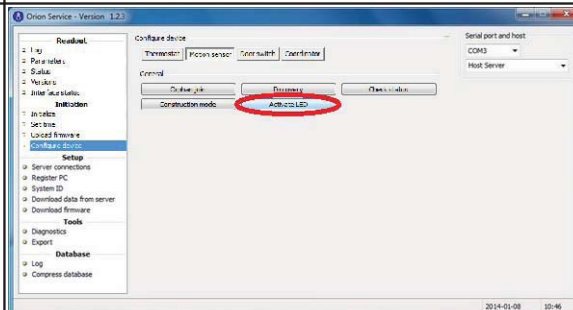|	
1. Open and close the door. 2. Engage and disengage the deadbolt. 3. Walk around the room to ensure a motion event. 4. Run an event log of the thermostat using the service device. To make this, plug insert the service cable into of the service device in the thermostat, choose the **Log** section under **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 100.	 *Figure 100*
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 101.	 *Figure 101*
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 102.	 *Figure 102*

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 102.

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 102. 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

Thermostat (common)

Note: The technical data in Table A1 are common for _Orion Thermostat-Zen-HV_ and _Orion Thermostat-Original-LV_. For _Orion Thermostat-Zen-HV_ specific data, see Table A2 and for _Orion Thermostat-Original-LV_ specific data, see Table A3.

Temperature display	Configurable: _room temperature (default)_ or _guest setting_
Temperature display range	2-digit display
Setpoint/operating temperature range	18-32 °F / 65-90 °C
Recommended operating temperature	50-122 °F / 10-70 °C
Temperature sensor	Integrated in thermostat
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
Heat/cool switching	Configurable to allow or disallow auto changeover of heat/cool
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 1-30 minutes; default is 8 minutes
Room not sold timer	Configurable 12-24 hours; default is 16 hours
Compressor delay (dwell-off time)	5 minutes. The dwell-off time prevents short-cycling of the compressor; this parameter cannot be changed
	Table A1

Appendix A

Orion Thermostat-Zen-HV

Dimensions (WxHxD)	112 x 117 x 35 mm (4 13/32" x 4 19/32" x 1 3/8")
Input voltage	100-277VAC; 50/60 Hz
Switch input	Door switch - 1 exterior/1 interior
Multifunction input	Motion sensor/card switch/pipe temp sensor
High voltage outputs	- W/W2 (heating; max 0.5A) - Y/W2 (cooling/compressor; max 0.5A) - RV (reversing valve; max 0.5A) - G1 (Fan 1; max 3A) - G2 (Fan 2; max 3A) - G3 (Fan 3; max 3A)
Low voltage outputs	- Proportional 0-10V; heating - Proportional 0-10V; cooling - Relay output (max 30V AC/DC, max 100mA)
Temperature sensor	Integrated in thermostat
Material	ABS
Required VISIONLINE version	1.14.0 or higher
Required Orion Service version	1.2.5 or higher
	Table A2

Appendix A

Orion Thermostat-Original-LV

Dimensions (WxHxD)	87.5 x 132 x 36.3 mm (3 7/16" x 5 3/16" x 1 7/16")
Input voltage	12-24 V AC 15-24 V DC
V+ Output logic	Follows the input voltage (AC rectified) VDC relative to GND Input voltage level
Outputs	W/W2 – Heating Y/W2 – Cooling / compressor G1 – Fan 1 G2 – Fan 2 G3 – Fan 3 RV – Reversing valve
Inputs	Door switch – 1 exterior / 1 interior Motion sensor/card switch I/O Service connector (programming)
Temperature sensor (stored in the thermostat even if the thermostat controller is used)	Integrated in thermostat *Option:* remote temperature sensor that connects directly to the thermostat controller integrated in thermostat
Refresh cycle	Optional
Humidity	Optional
Intelligent switch	Configurable: Disabled/use RV output/use G2 output; default is disabled
	Table A3

Appendix A

Motion sensor

Dimensions	Ø: 120mm (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 replacement access
Range	360 degrees / 8 meters horizontal / 3 meters vertical
Messages transmitted	• Motion detected
	• Battery status
Diagnostics	Integrated LED only enabled for diagnostics
	Table A4

Appendix B: Firmware upgrade

At delivery, the thermostat and the motion sensor contain the correct module firmware. However, if a firmware upgrade is needed at a later occasion, the service device with Orion Service is used. There are two ways to download the module firmware to Orion Service:

- The first method is to save the module firmware on the VISIONLINE server, and then download it from there to Orion Service
- The second method is to upload the module firmware from e.g. a USB memory

Note: Upgrading the end node firmware in the thermostat may take several minutes.
Note: If thermostat controller is applicable, and the firmware in this as well as in the thermostat should be upgraded at the same time, it is recommended to start upgrading the thermostat controller first.

To first save the firmware on the VISIONLINE server and then download it from there to Orion Service:

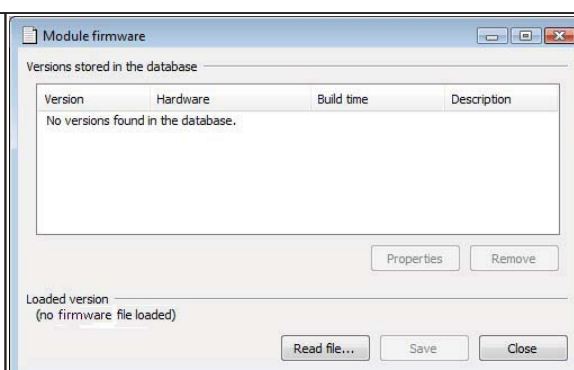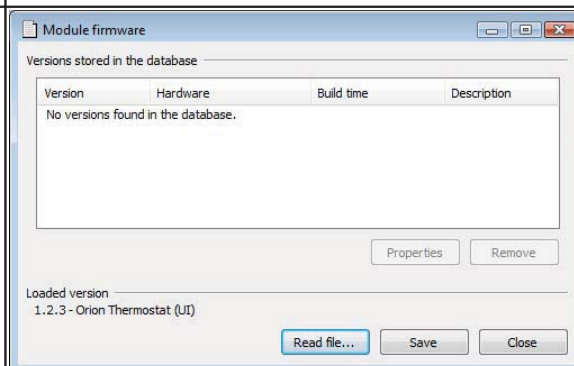|	
1. Go to **Tools/Module firmware** in the VISIONLINE software. The dialog to the right is shown.	*Figure B1*
2. Click **Read file** and browse to the applicable module firmware file (tmf file). 3. Mark the tmf file and click **Open**. The tmf file will be read into the memory and the tmf version will appear at 'Loaded version' in the lower left corner of the **Module firmware** dialog.	*Figure B2*

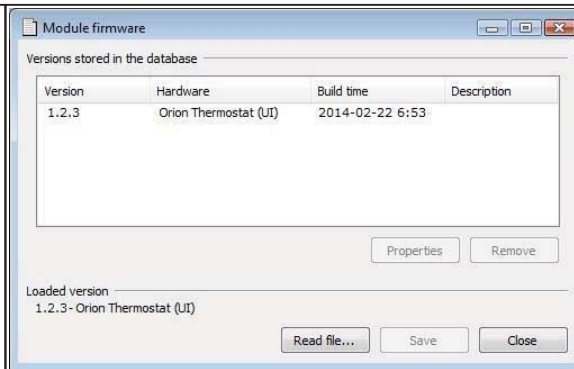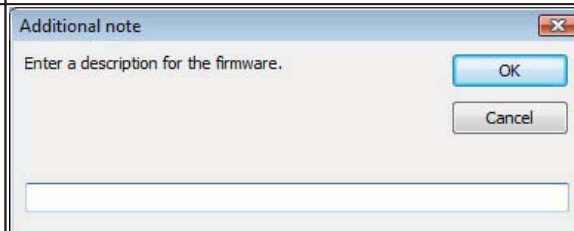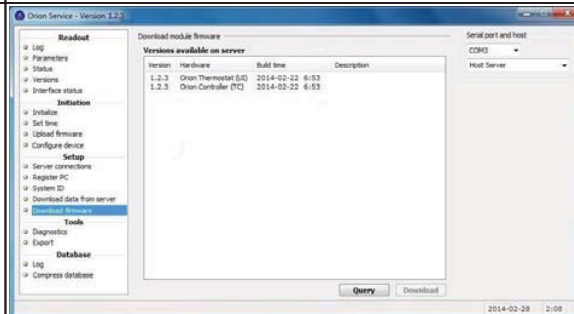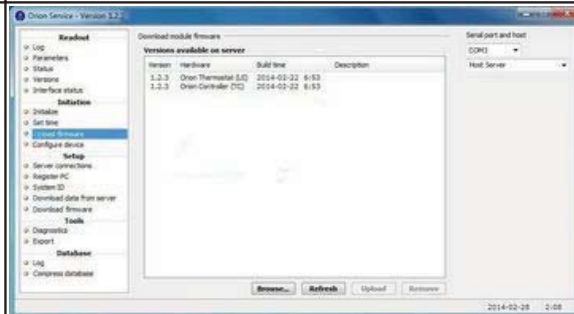|	
4. Click **Save** to store the tmf version in the database. The version will appear in the list below 'Versions stored in the database' in the **Module firmware** dialog.	 *Figure B3*
5. To enter an optional description for the tmf version, mark the version in the **Module firmware** dialog and click the **Properties** button. The **Additional note** dialog to the right is shown. Enter a description and click **OK**.	 *Figure B4*
6. In the Orion Service software, choose **Download firmware**. Click **Query** to list the available module firmware versions on the VISIONLINE server. 7. Mark the applicable firmware version and click **Download**. 8. If applicable, repeat step 7 with other firmware that is to be uploaded. 9. Plug the service cable into the thermostat or motion sensor, depending on which module that is to be upgraded.	 *Figure B5*
10. 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*

To upload the module firmware directly from a USB memory etc:

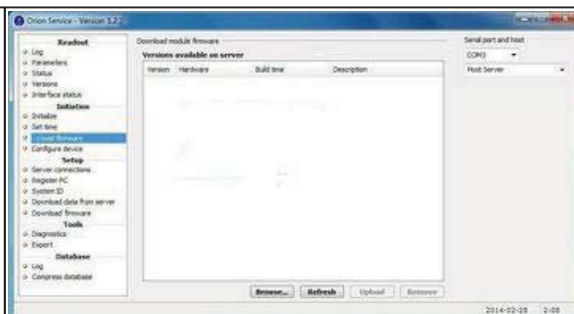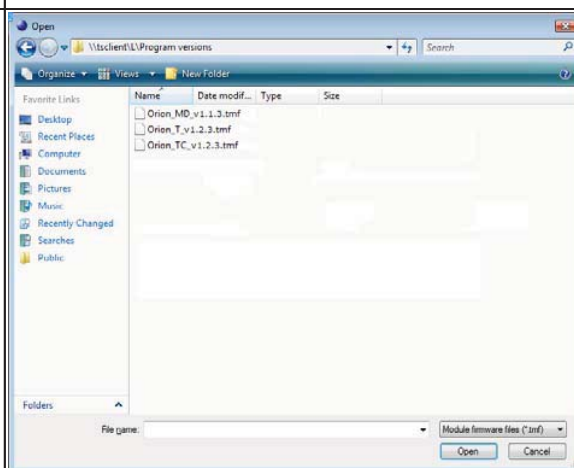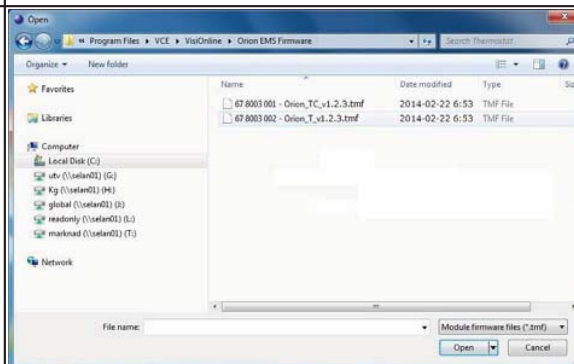|	
1. In the Orion Service software, choose **Upload firmware**.	*Figure B7*
2. Click **Browse** and browse to where the applicable firmware file is located. Mark the file and click **Open**.	*Figure B8*
	Figure B9

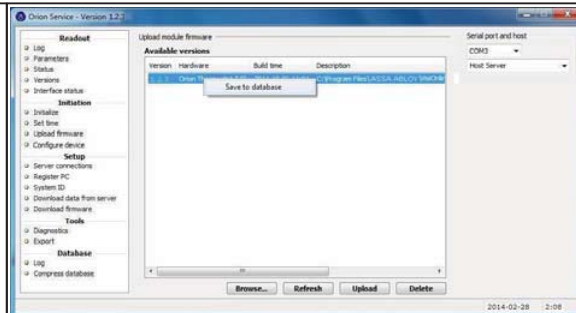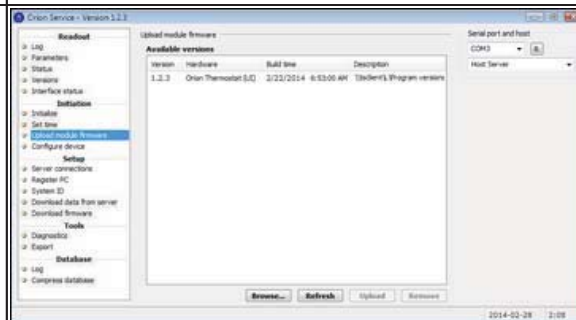|	
3. To save the firmware file to the database, right click on it and choose **Save to database**.	 *Figure B10*
4. The chosen file will appear in the **Upload module firmware** dialog. Mark it and click **Upload**.	 *Figure B11*
5. Down to the left in the **Lock Service** window, it will be shown how far the save process has reached. When the firmware has been successfully saved, there will be an alert about this.	 *Figure B12* *Figure B13*

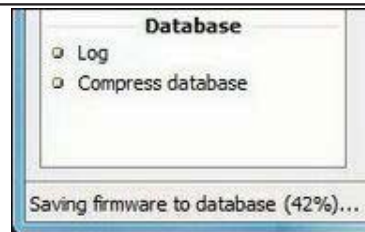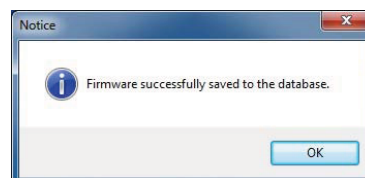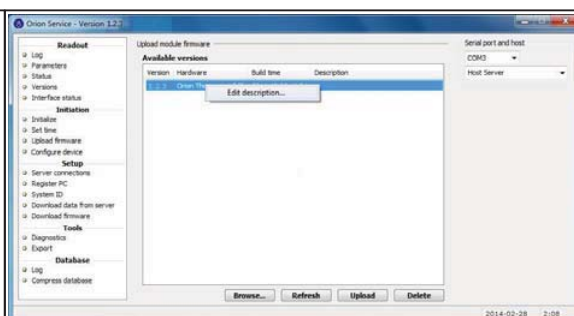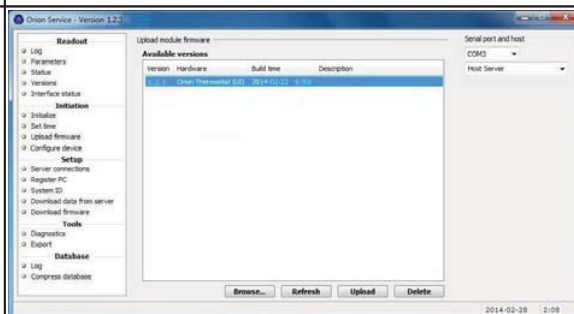|	
6. To add/edit the description for the firmware, right click on the firmware when it has been saved to the database and choose **Edit description**.	 *Figure B14*
7. Write the applicable description and click **Enter**.	 *Figure B15*
8. To upload new module firmware to the lock, select module version in the **Available versions** list and click the **Upload** button.	 *Figure B16*

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 4 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

Note: *Thermostat controller firmware* of version 1.1.6 or higher is required. For 'connected doors' functionality (see details here), thermostat controller firmware of version 2.1.3 or higher is required.

Note: *Orion Service* of version 1.2.1 or higher is required. For 'connected doors' functionality, Orion Service of version 1.2.3 or higher is required.

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 11, 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.
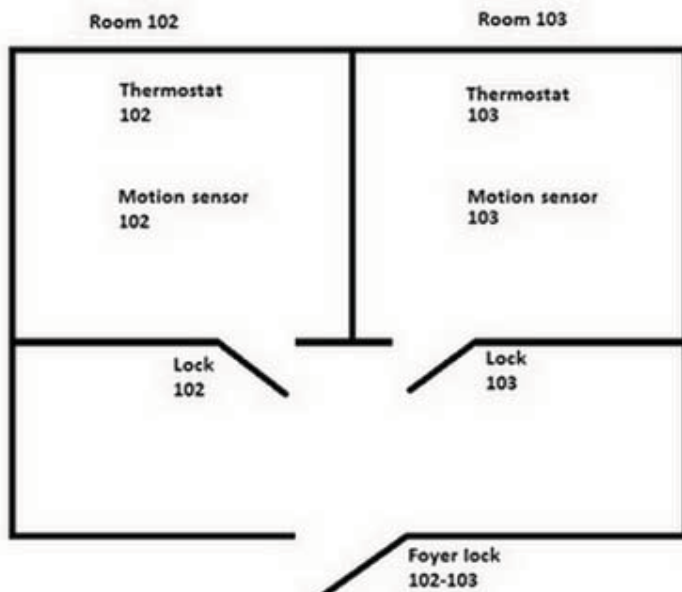
Figure C1

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.

<table>
<tr>
<td>
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**.
</td>
<td>

Figure C2
</td>
</tr>
</table>

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. 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 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 4 for details.
7. Connect *motion sensor 102* to thermostat 102; see chapter 4 for details.
8. Connect *lock 102* to thermostat 102; see chapter 4 for details.
9. Connect the foyer lock to *thermostat 102*; see chapter 4 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 *thermostat 102*; click here for details.
13. Read out the thermostat status for *thermostat 103*; click here for details.
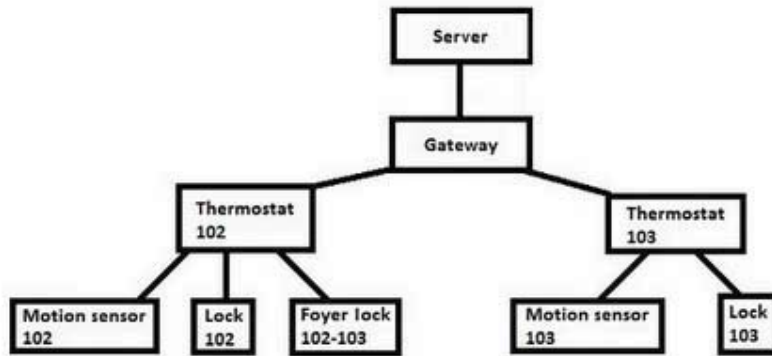14. See the final **Online Network** tree in Figure C9.

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

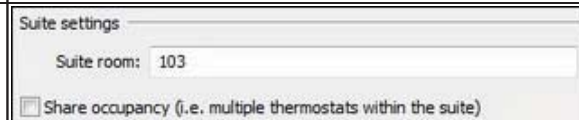|	
1. Choose **Status** in the left pane of the Orion Service window. 2. Connect the service cable to the thermostat. 3. Click the **Readout** button.	Example of suite status for *master room thermostat*: *Figure C7* Example of suite status for *slave room thermostat*: *Figure C8*

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:

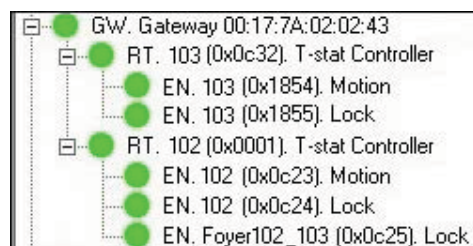|	
1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite. 2. Thermostats, motion sensors and guest room locks have been connected to the online network according to chapter 4. 3. The foyer lock has been connected to the master room thermostat according to chapter 4. 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.
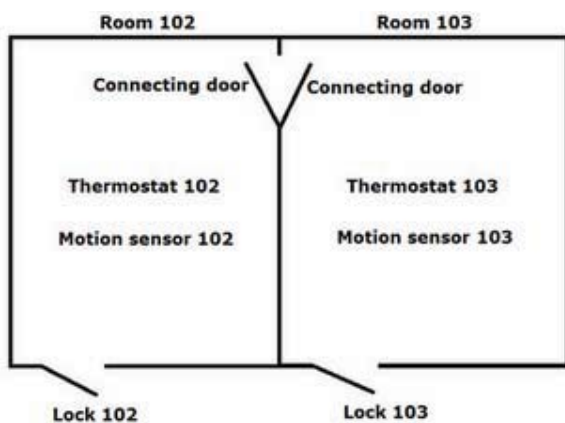
Note: Only one of the thermostats, the master thermostat, is initialized with suite settings. Once initialized, the two thermostats are equal and share events as above. The link between the two thermostats is set up in Orion Service.

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

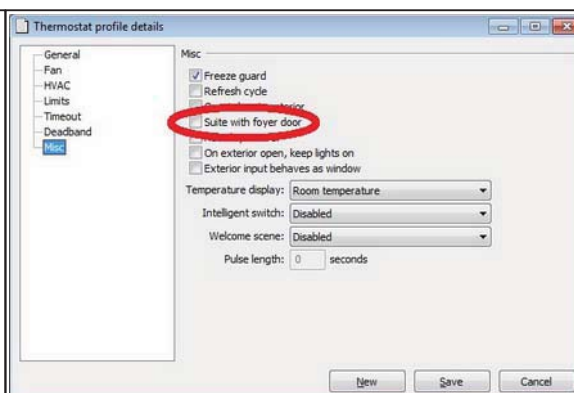|	
1. Double click on **Thermostat profiles** under the **Lists** tab in the navigation window. 2. In the **Thermostat profiles** dialog: click **Add** to add a new thermostat profile, or mark an existing thermostat profile and click **Properties**. 3. In the **Thermostat profile details** dialog, choose 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 *Quick reference guide Orion Service* for details about **Initialize**.
6. Connect *thermostat 102* to the gateway; see chapter 4 for details.
7. Connect *motion sensor 102* to *thermostat 102*; see chapter 4 for details.
8. Connect *lock 102* to *thermostat 102*; see chapter 4 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
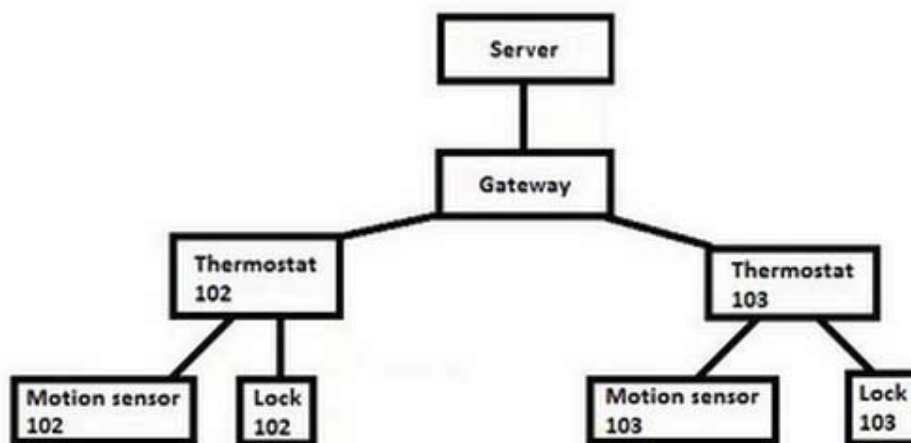
To initialize the master thermostat with suite settings

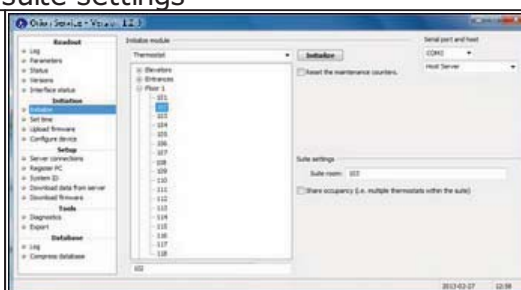|	
1. Choose **Initialize** in the left pane of the Orion Service window. 2. In this example, the *master thermostat* is in room 102 (*room A* in Figure C10). Connect the service cable to the thermostat in room 102. 3. Click the plus sign for the applicable door area (in this example 'Floor 1') and mark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

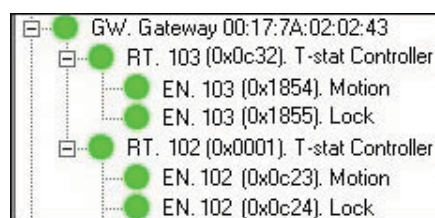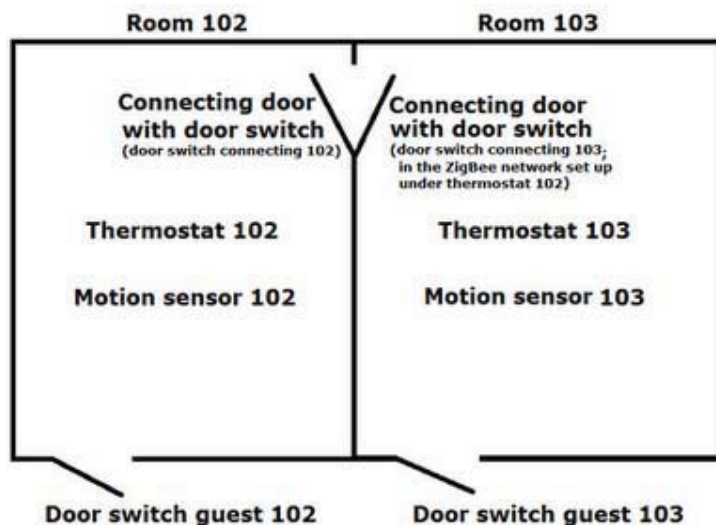|	
The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite. 1. Thermostats, motion sensors and guest room locks have been connected to the online network according to chapter 4. 2. The master room thermostat has been initialized with suite settings according to here. 3. 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 27 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 27.
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 27) 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 *Quick reference guide Orion Service* for details about **Initialize**.
6. Connect *thermostat 102* to the gateway; see chapter 4 for details.
7. Connect *motion sensor 102* to thermostat 102; see chapter 4 for details.
8. Connect *door switch guest 102* (door switch at the guest door in room 102) to *thermostat 102*; see chapter 4 for details.
9. Connect *door switch connecting 102* (door switch at the connecting door in room 102) to *thermostat 102*; see chapter 4 for details.
10. Connect *door switch connecting 103* (door switch at the connecting door in room 102) to *thermostat 102*; see chapter 4 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 4 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.
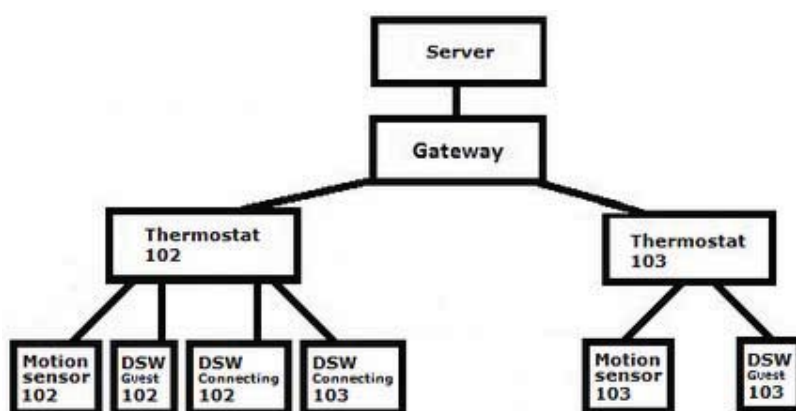16. See the final **Online Network** tree in Figure C20.

Figure C18

To configure the door switches

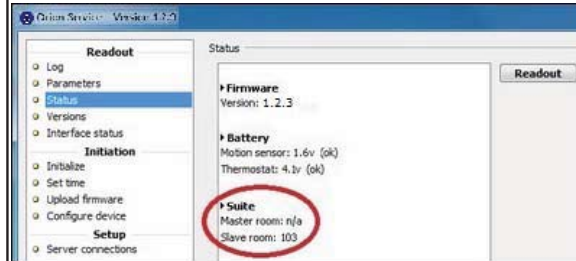| 1. Choose **Configure device** in the left pane of the Orion Service window. 2. Choose **Door switch** in the upper part of the Orion Service window. 3. Plug the service cable into the door switch at the guest door in room 102. 4. Select **Connecting door** in the Orion Service window. 5. Repeat steps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

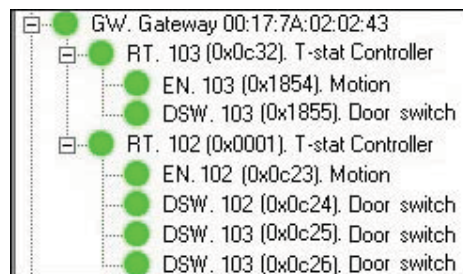| 1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite. 2. Thermostats, motion sensors and door switches have been connected to the online network according to chapter 4. 3. The master room thermostat has been initialized with suite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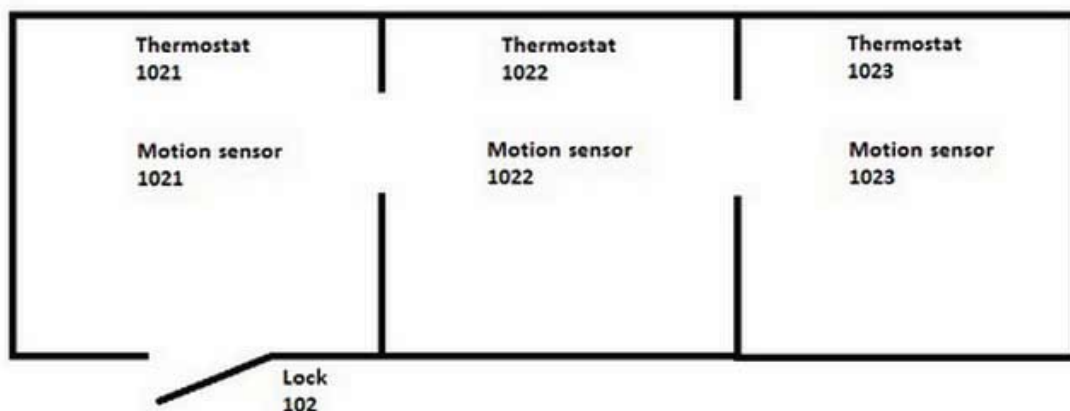

Figure C21

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. 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 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 *Quick reference guide Orion Service* for details about **Initialize**.
6. Connect thermostat 1021 to the gateway; see chapter 4 for details.
7. Connect motion sensor 1021 to thermostat 1021; see chapter 4 for details.
8. Connect lock 102 to thermostat 1021; see chapter 4 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.
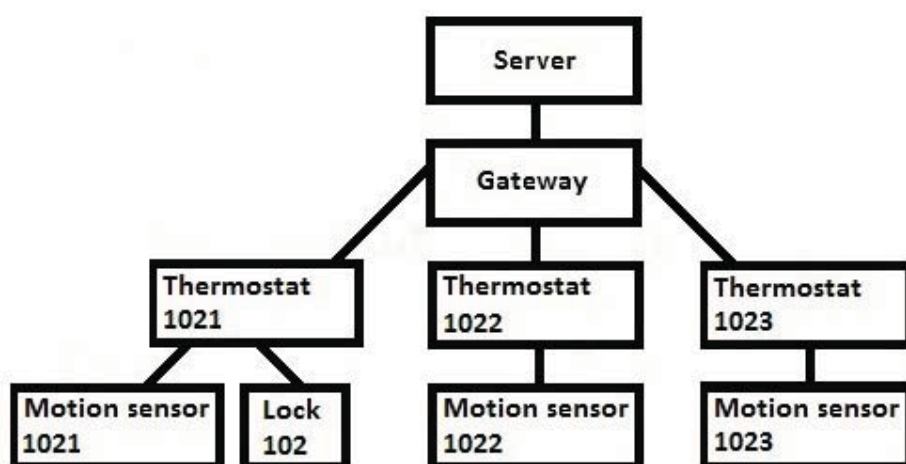14. See Figure C32 for a picture of the final **Online Network** tree.

Figure C22

To initialize thermostats with suite settings

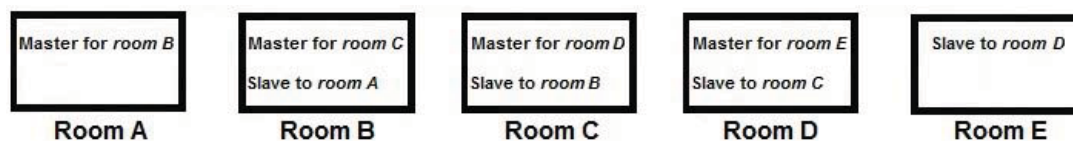| Room A	Room B	Room C	Room D	Room E
Master for *room B*	Master for *room C* Slave to *room A*	Master for *room D* Slave to *room B*	Master for *room E* Slave to *room C*	Slave to *room D*

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

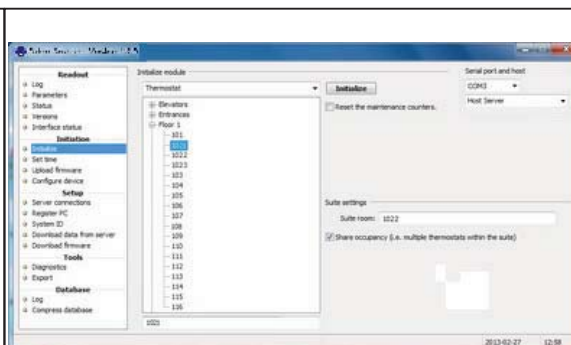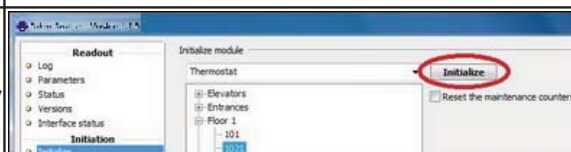|	
1. Choose **Initialize** in the left pane of the Orion Service window. 2. Click the plus sign for the applicable door area (in this example 'Floor 1') and mark the *master room*, in this example 1021.	*Figure C24*

3. At **Suite settings**:
  - Enter the **Suite room** (*slave room*); in this example 1022.
  - Mark the **Share occupancy** checkbox.
	Suite settings
	Suite room: 1022
	☑ Share occupancy (i.e. multiple thermostats within the suite)
	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

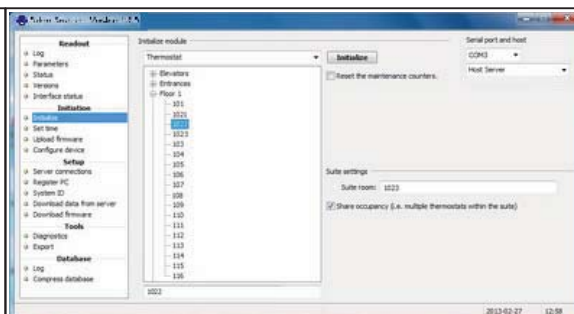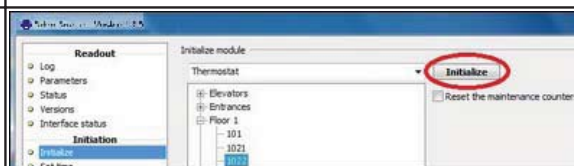|	
1. Choose **Initialize** in the left pane of the Orion Service window. 2. Click the plus sign for the applicable door area (in this example 'Floor 1') and mark the *master room*, in this example 1022.	 *Figure C27*

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: 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:

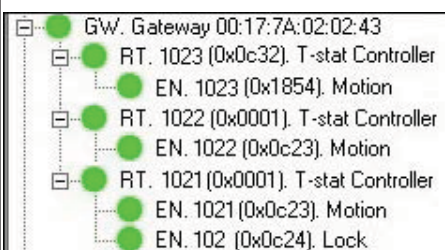|	
1. The thermostats have been initialized with "regular parameters", i.e. all parameters except for those related to suite. 2. Thermostats, motion sensors and the lock have been connected to the online network according to chapter 4. 3. All thermostats except for the last one in the chain (see Figure 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
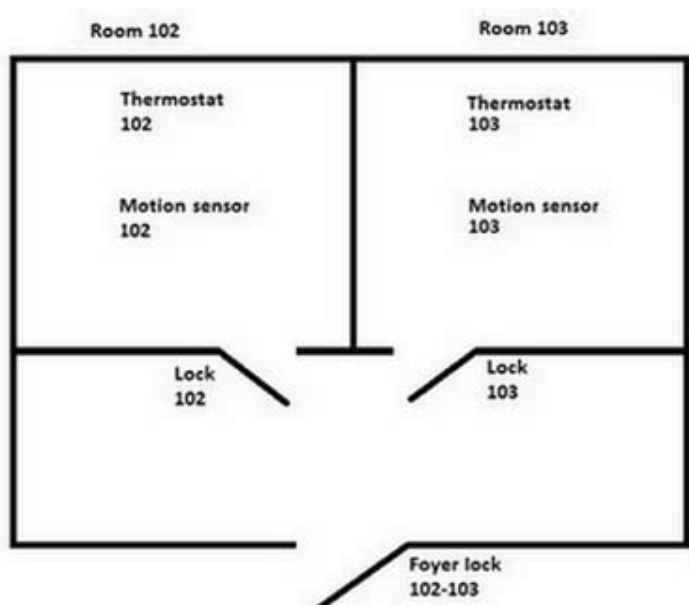- the foyer door, which should be closed when the guest arrives

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.
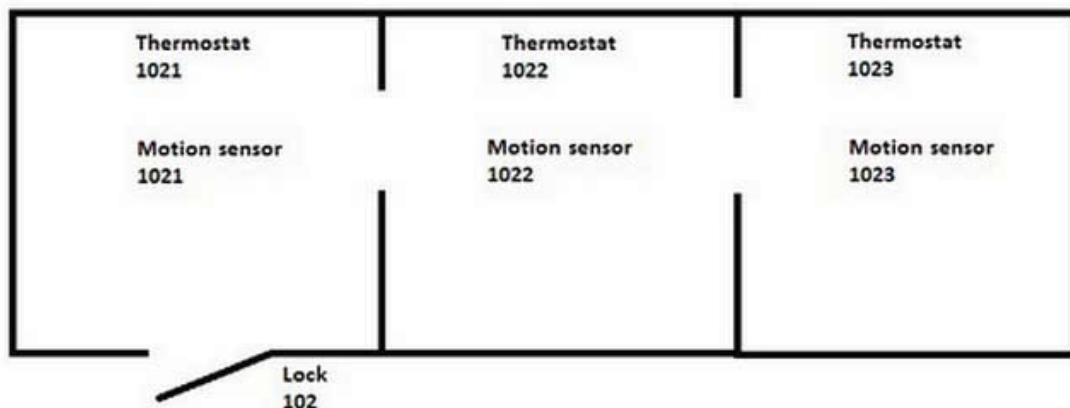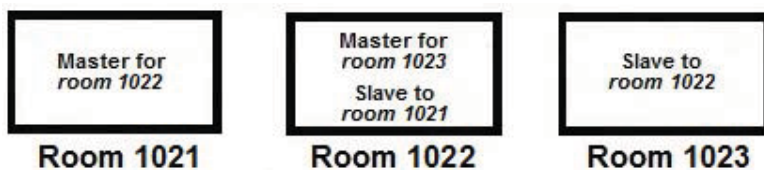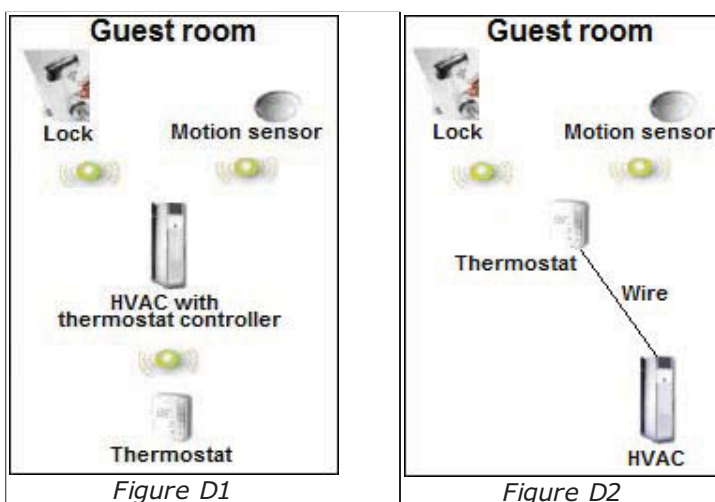

Figure C34

Figure C35

Appendix D: Configuration in offline scenarios

In Orion EMS offline scenarios, there is no connection to the VISIONLINE server. Either a *wired thermostat*[1] or a *thermostat controller* and a *battery thermostat*[2] is used. Each room can be seen as a PAN (*personal area network*) which is controlled by its wired thermostat or its thermostat controller, depending on what scenario that is applicable.

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

Note: Figure D1 is only applicable for *Orion Thermostat-Original-LV*. Figure D2 is applicable for *Orion Thermostat-Zen-HV* as well as for *Orion Thermostat-Original-LV*, even if the picture shows an *Orion Thermostat-Original-LV*.

Figure D1   Figure D2

The RFID lock in the configuration pictures above must be prepared in two ways:
- it must be online with the in-room network; see the applicable one of sections *Scenario with wired thermostat* and *Scenario with battery thermostat*.
- 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.

[1] *Orion Thermostat-Zen-HV* or *Orion Thermostat-Original-LV*

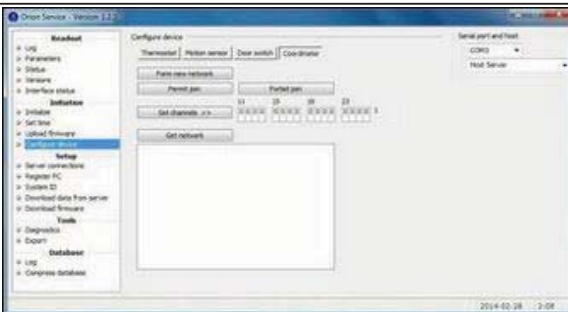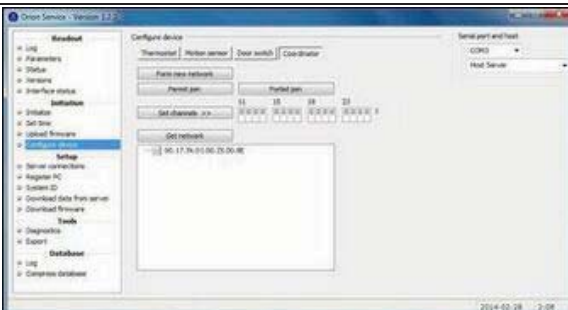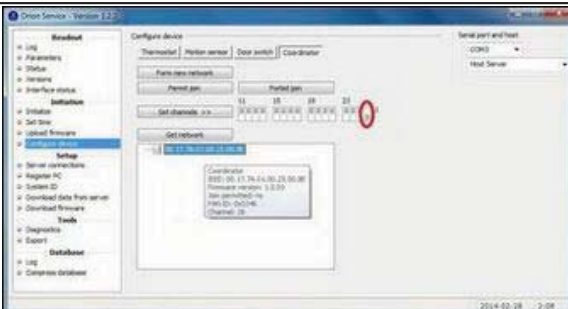[2] Only applicable for *Orion Thermostat-Original-LV*

DRAFT 66 8003 002-11

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.

Scenario with wired thermostat

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 D3*
6. Click the **Get network** button; the thermostat will appear in the window below **Get network**.	*Figure D4*
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 D5*
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.	Coordinator IEEE: 00.17.7A.01.00.25.00.8E Firmware version: 1.0.55 Join permitted: no PAN ID: 0x0346 Channel: 26 *Figure D6*

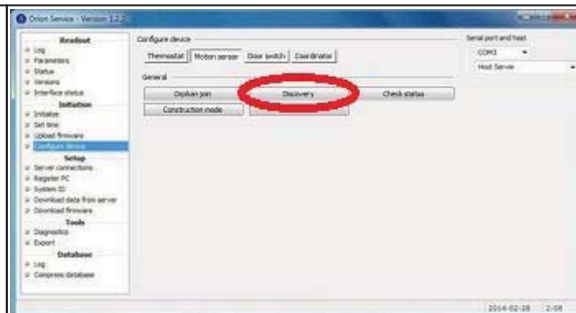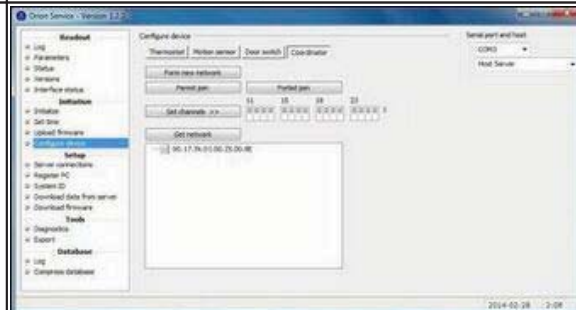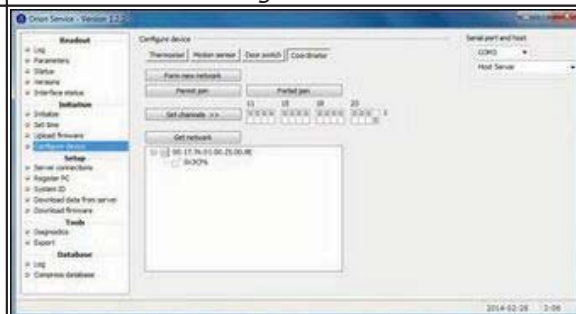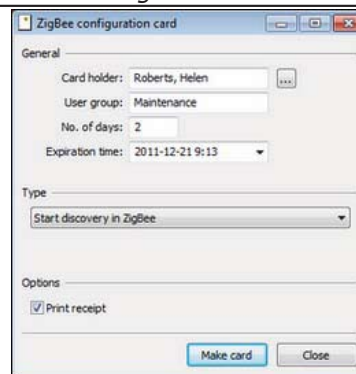|	
10. Plug the service cable into the motion sensor. 11. Choose the **Motion sensor** tab and click **Discovery**.	 *Figure D7*
12. Plug the service cable into the thermostat. 13. Choose the **Coordinator** tab and click **Get network**.	 *Figure D8*
14. Click the plus sign in front of the thermostat; 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 D9*
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 D10*

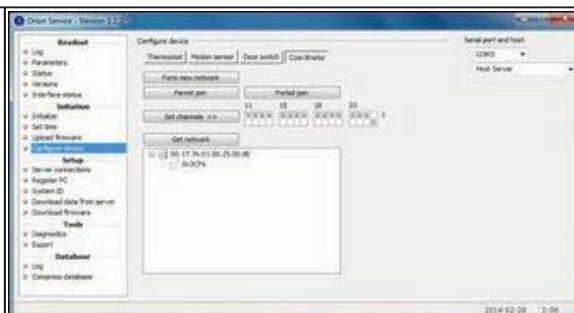|		
18.	In Orion Service, **Configure device** section: click **Get network** under the **Coordinator** tab.	 *Figure D11*
19. 20. 21.	Click the plus sign in front of the thermostat; the lock will appear in the network tree. Mark the thermostat and click the **Forbid join** button. Right click on the thermostat and choose **Get user description**. Make sure that the description says 'no' at 'Join permitted'.	 *Figure D12*

Scenario with thermostat controller and battery thermostat

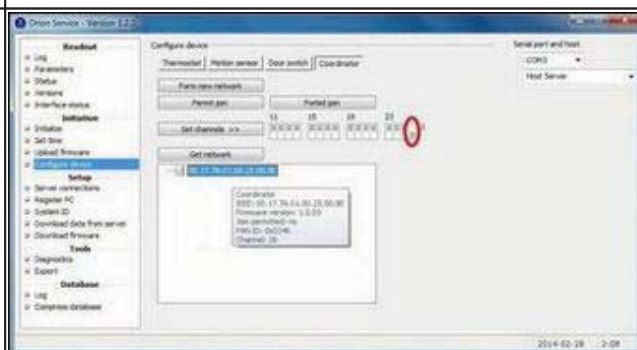|	
1. Go to **Start/Programs/ Orion Service/Orion Service**. 2. Choose **Configure device** in the left pane of the Orion Service window. 3. Plug the service cable into the thermostat. 4. Choose the **Coordinator** tab. 5. Click **Form new network**.	 *Figure D13*
6. Click the **Get network** button; the thermostat will appear in the window below **Get network**.	 *Figure D14*
7. Put the cursor on the thermostat controller in the Orion Service window; an information box, showing e.g. the channel for the thermostat controller, 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 controller and click **Permit join**.	 *Figure D15*

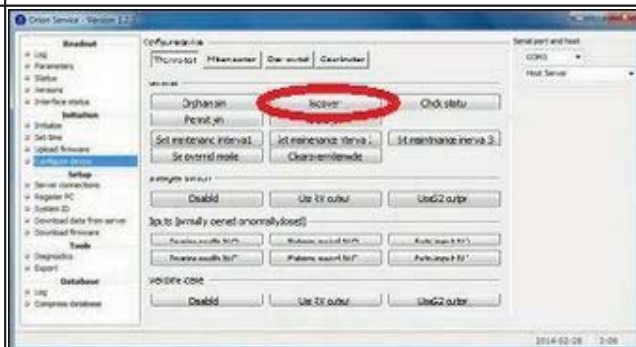|		
9.	Right click on the thermostat controller and choose **Get user description**. Information about the thermostat controller will be shown; see picture to the right. Make sure that - the channel is correct - it says 'yes' at 'Join permitted' ***Note:*** If it does not say 'yes' at 'Join permitted', click the **Permit join** button again.	Coordinator IEEE: 00.17.7A.01.00.25.00.8E Firmware version: 1.0.55 Join permitted: no PAN ID: 0x0346 Channel: 26 *Figure D16*
10. 11.	Plug the service cable into the battery thermostat. Choose the **Thermostat** tab and click the **Discovery** button.	*Figure D17*
12. 13.	Plug the service cable into the thermostat controller. Choose the **Coordinator** tab and click **Get network**.	*Figure D18*

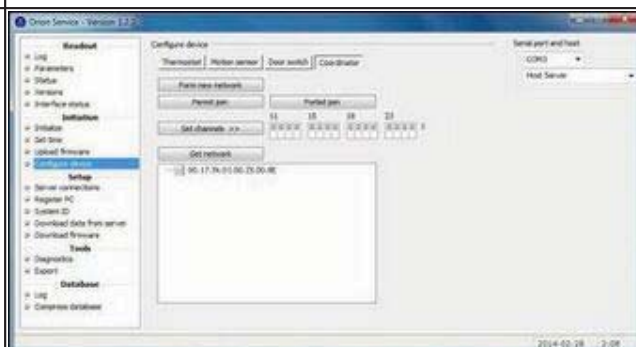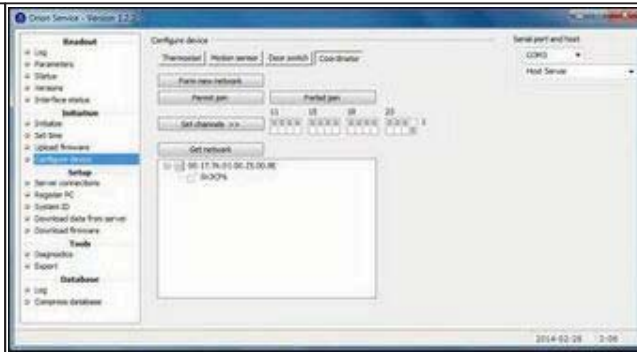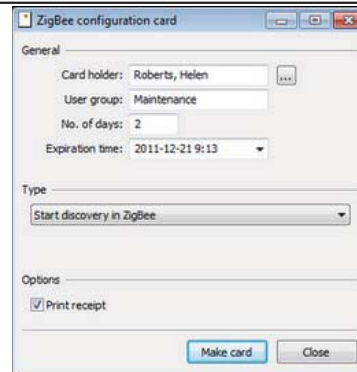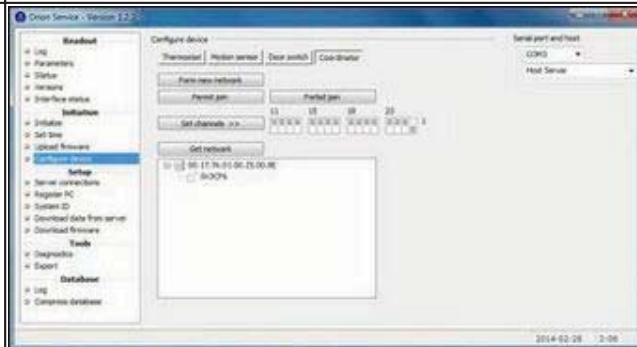|	
14. Click the plus sign in front of the thermostat controller; the battery thermostat will appear in the network tree. 15. Right click on the thermostat controller to make sure that it still says 'yes' at 'Join permitted'.	 *Figure D19*

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 the applicable **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 D20

18. In Orion Service, **Configure device** section: click **Get network** under the **Coordinator** tab.	 *Figure D21*

19. Click the plus sign in front of the thermostat controller; the lock will appear in the network tree. 20. Follow the procedure in steps 8-14 and 18-19 to add the motion sensor to the in-room network.	 *Figure D22*
21. Mark the thermostat controller in the Orion Service window and click the **Forbid join** button. 22. Right click on the thermostat controller and choose **Get user description**. Make sure that the description says 'no' at 'Join permitted'.	 *Figure D23*

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
June 27, 2014	• Added information about *Orion Thermostat-Zen-HV*	KG

Asia / Pacific:
E-mail: apac@vingcardelsafe.com
Phone: +65 6305 7670

Europe / Middle East / Africa:
E-mail: emea@vingcardelsafe.com
Phone: +47 69 24 50 00

Latin America:
E-mail: lam@vingcardelsafe.com
Phone: +52 55 36 40 12 00

North America:
E-mail: northamerica@vingcardelsafe.com
Phone: +1 972 907 2273