

# RTO



## User guide

Version: RT0 M&S (master & slave)

Characteristics: Constant lighting, temperature regulation with a low inertia heating system. Building opening hour scheduler and presence detection.

05/2013



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All pertinent state, regional, and local safety regulations must be observed when installing and using this solution. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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## Safety information

### NOTICE

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



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



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

### **⚠ DANGER**

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

### **⚠ WARNING**

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

### **⚠ CAUTION**

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

### **NOTICE**

**NOTICE** is used to address practices not related to physical injury.

### PLEASE NOTE

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

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

### BEFORE YOU BEGIN

The products specified in this document have been tested under actual service conditions. Of course, your specific application requirements may be different from those assumed for this and any related examples described herein. In that case, you will have to adapt the information provided in this and related documents to your particular needs. To do so, you will need to consult the specific product documentation of the hardware and/or software components that you may add or substitute specified in this documentation and any examples that may be provided in this documentation. Pay particular attention and conform to any safety information, different electrical requirements and normative standards that would apply to your adaptation.

Only the user or integrator can be aware of all the conditions and factors present during installation and setup, operation, and maintenance of the machine or process, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used. When selecting automation and control equipment, and any other related equipment or software, for a particular application, the user or integrator must also consider any applicable local, regional or national standards and/or regulations.

## **At a Glance**

### **Document Scope**

This guide provides instructions for installing, setting up and commissioning the solution consisting in a heating management solution.

The instructions are presented in the order in which they are to be carried out. They supplement the assembly or installation documents supplied with each product provided in the solution.

This guide is intended for the personnel in charge of using the solution.

### **Validity Note**

This guide is dedicated to version 1 of the EcoXpert solution called "**RTO**". You can download it from our site: <https://ecoxpert.schneider-electric.com>

### **User Comments**

We welcome your comments about this guide.  
You can reach us by e-mail at [techcomm@schneiderelectric.com](mailto:techcomm@schneiderelectric.com).

## 1. Presentation

### 1.1 Overview

The solution manages lighting and heating in rooms in which the occupation is predictable, for examples classrooms, administrative buildings.

In the simplest configuration, the solution manages two rooms. It is possible to extend the number of room by adding slave controllers, each controlling two rooms.

The solution manages:

- Heating: temperature regulation around set points. Set points vary according to opening hours, effective presence in the room, and of course, heating period (from October to April for example).
- Lighting: ambient constant lighting controlled by a specific module in each room.

The solution includes:

- Weekly opening hours of the building.
- National day off.
- Bypasses for opening/closing the building and to extend the heating period.

## 1.2 Heating management principle

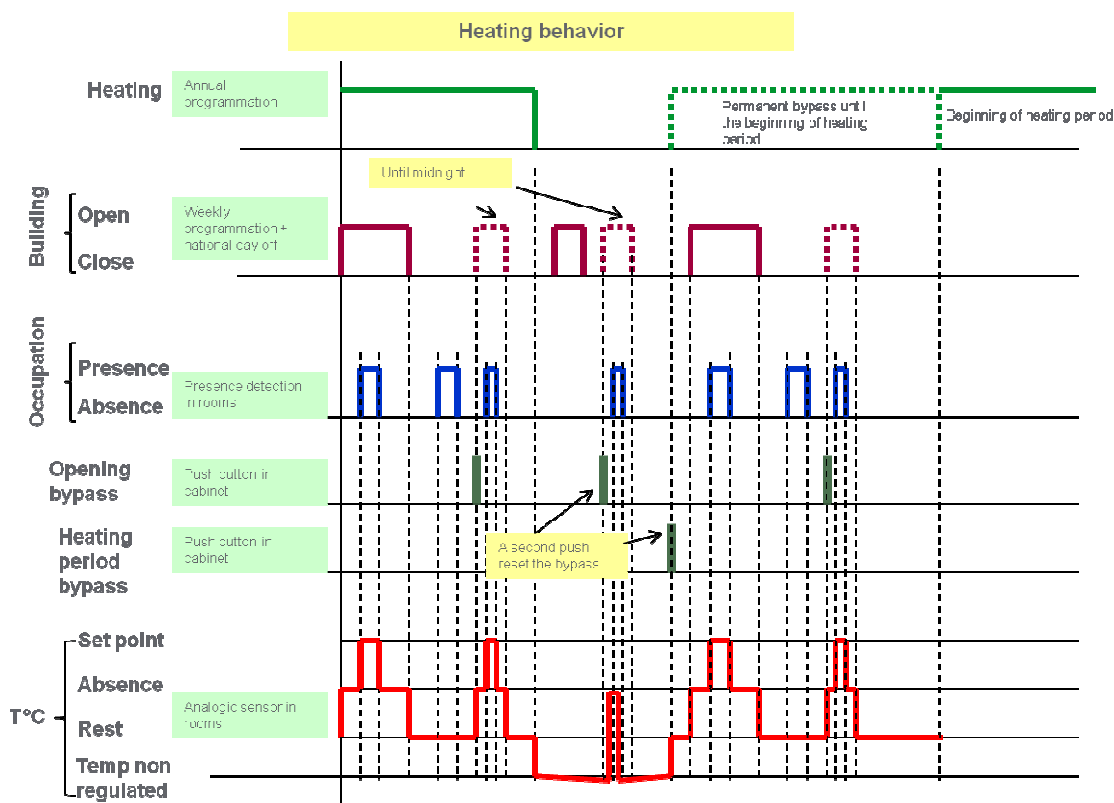
The solution manages heating according to two periods:

- Heating period: a minimum rest temperature is maintained in the building. When the building is open, the temperature set point is increased to an “absence” temperature, waiting for attendance. As soon as a presence is detected in the room, the temperature is increased again, to a comfort temperature.
- Non heating period: To overcome fresh day during the beginning of summer, the temperature is maintained to the “absence” temperature when presence is detected in the room during opening hours. Otherwise, the temperature is not regulated.

This behavior is appropriate with low inertia heating systems.

With two bypasses, users can adapt the heating behavior to their needs:

- Heating period bypass: If winter is precocious or the spring late, the heating period can not correspond. It is possible to extend or shorten this period.
- Opening hours bypass: It allows opening the building outside the programmed opening hours. It is canceled automatically at midnight or at a second switching of the bypass.



## 1.3 Lighting management principle

The system pilots the lighting in constant mode. According to the supply of natural light, the ambient lighting level is maintained by adjusting the intensity of the lights.

A presence detector is included in the module, which allows to be sure of the occupation of the rooms, and prevents oversights.

The system needs to be installed in the ceiling, the more in the center of the room. The coverage is about 4 meters at 360°.

#### **1.4 Failures management**

Be sure that the room is at the correct temperature before occupants arrive, or that a manual override of the heating system has not been forgotten, is also essential to maintain the comfort without wasting energy.

The solution can send alarm SMS to the building administrator so that he can take an action correctly. Three alarms can be sent:

- A PLC failure
- A low temperature according to a defined limit under which the room is considered too cold during the heating period
- A high temperature according to a defined limit above which the room is considered too hot when the heating system is activated. In this case, the heating system has been override.

These alarms are indicated on the front panel of the controller and an SMS is sent to the building administrator. Receivers are defined during the commissioning.

#### **1.5 Solution presentation**





*Heating bypass*



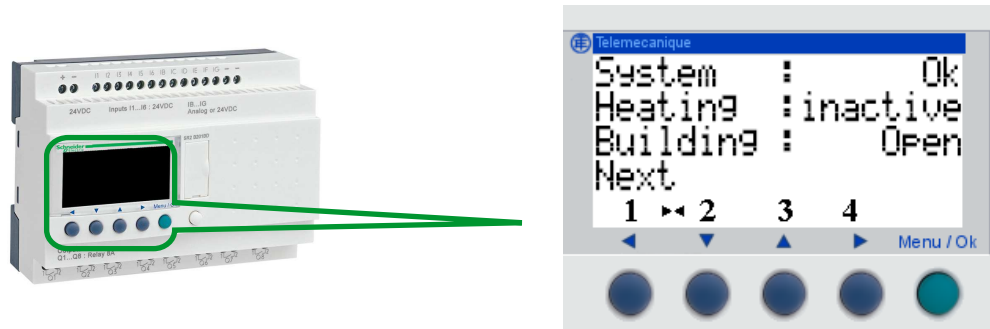
*Opening bypass*



*ZELIO Logic smart relay*

## 2. Solution Status

The solution status is displayed in real time on the Zelio Logic screen.



Indication on Zelio Logic smart relay	Display	Signification
<b>System</b>	Ok	The system works normally. There are no failures or alarms.
	Def.PLC	A PLC failure has been detected, which can be from the master or the slaves.
	Too cold	The alarm “temperature too cold” has been detected on the master or the slaves. The temperature is under the minimum limit during the heating period.
	Too hot	The alarm “temperature too hot” has been detected on the master or the slaves. The temperature is above the maximum limit while the heating system is turned on.
<b>Heating</b>	Active	The solution is in heating period. The temperature is maintained to a minimum even if the building is closed
	Inactive	The solution is not in heating period. The temperature is piloted only if a presence is detected in opening hours.
<b>Building</b>	Closed	The building is closed. There is no activity during this period.
	Open	The building is open. Rooms are put in utilization conditions.

### 3. Using the bypass

Either the Opening hours bypass, or the heating period bypass, on impulse on the right push button is enough to activate (or deactivate) the bypass.

#### 3.1 Heating bypass



This push-button activates or deactivates the heating bypass. If the heating period is activated, an impulse will deactivate this period, and we will be in a non-heating period, and inversely. This bypass is deactivated automatically if the status of the heating period changes. For example, if the bypass activates the heating period before it was supposed to happen, the bypass will be deactivated when the heating period was normally supposed to begin.

#### 3.2 Opening bypass



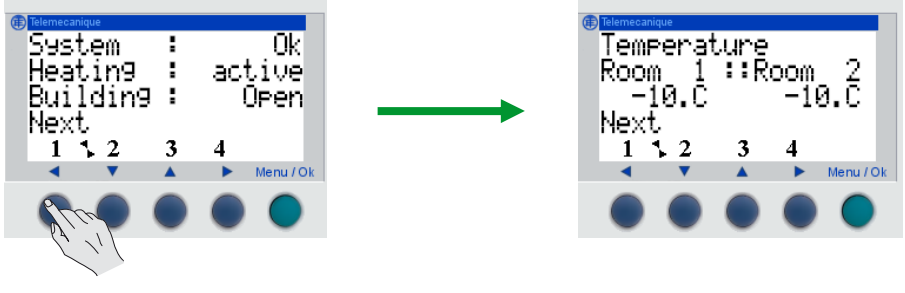
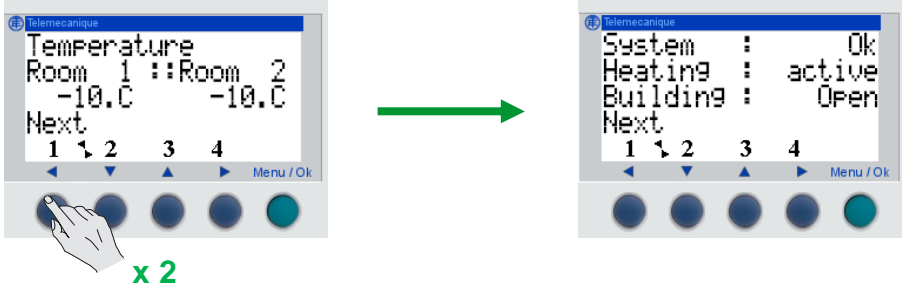
This push button can extend the opening hours of the building.

In case of impulse:

- If the building is open: opening hour is extended to the next impulse or to a limit time defined by the EcoXpert (midnight by default).
- If the building is closed: the building becomes open until the next impulse or to a limit time defined by the EcoXpert (midnight by default).

#### 4. Reading of the temperature value of the two rooms

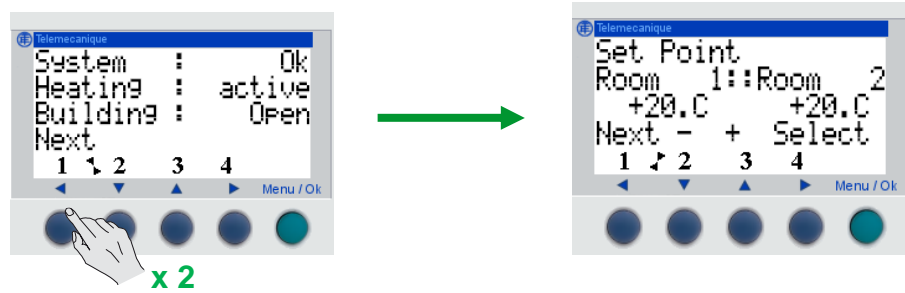
In order to check the temperature of the two rooms; it is possible, on each controller, to read them on the front panel.

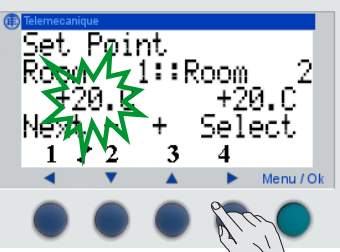

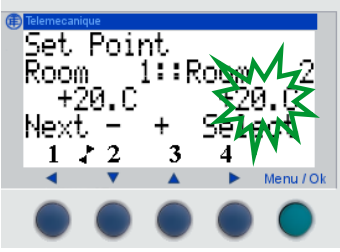
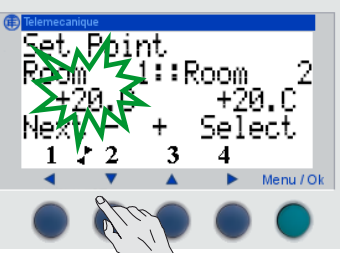

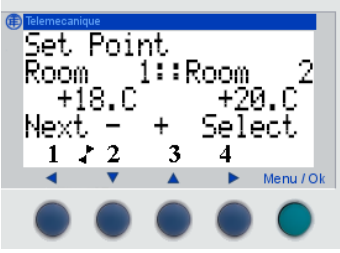
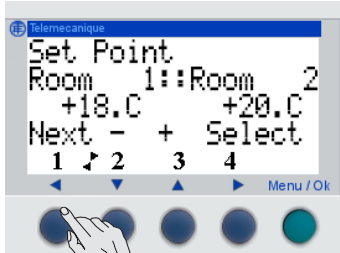

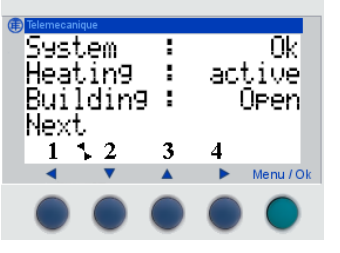
Step	Action
1	 <p>On the main screen, <b>press Next</b></p>
2	 <p>To go back to the main screen, <b>press two times Next</b></p>

#### 4.1 Daily temperature bypass on the two rooms

To increase user's comfort, it is possible to increase or decrease the temperature set point for the day. This modification will stay in the delta granted by the EcoXpert. At the end of the day (at the time defined by the bypass reset), this modification will be reset and the set point will come back to the original value defined in the parameters.

This bypass is made through the front panel of the control associated to the room concerned, whether it is master or slave.

Step	Action
1	 <p>On the main screen, <b>press two times Next</b></p>

Step	Action
2	   <p data-bbox="467 521 1406 580"><b>To select the value to modify, set point of the room 1 or 2, press <b>Select</b>.</b> The blinking value is the one which can be modified.</p>
3	   <p data-bbox="467 947 1302 974"><b>To modify the value, use the button – and + to achieve the desired value.</b></p>
4	   <p data-bbox="467 1341 1067 1368"><b>To valid and come back to the main screen, press <b>Next</b></b></p>

This bypass is active only for the day.

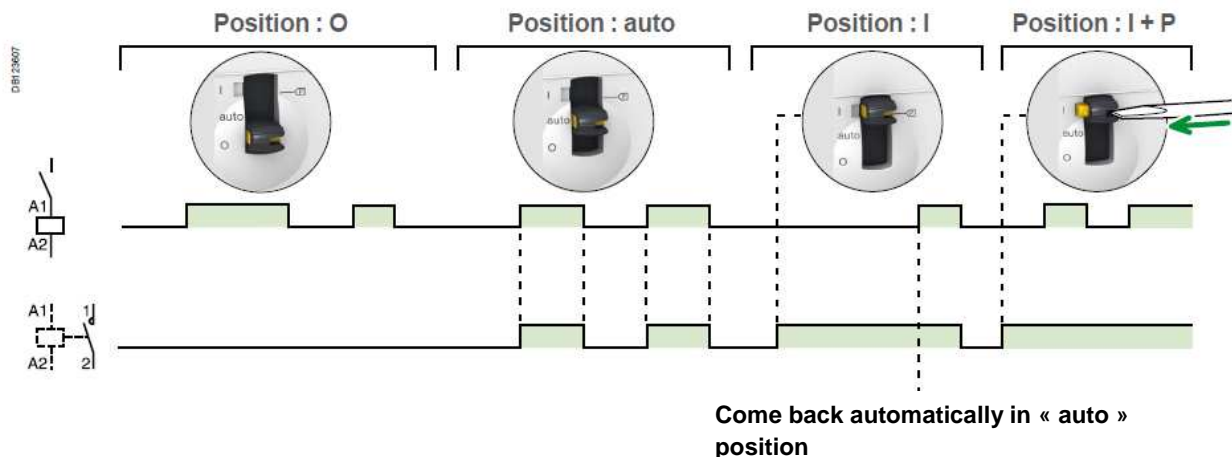
#### 4.2 Heating system bypass

Due to unforeseen or if special circumstances dictate it, it is possible to force the heating system via the manually-operated contactors.

Simply place the contactor in position I. A pulse on the coil returns it to the auto position.


If a permanent override is desired, you must lock the position by forcing out the yellow pin integrated into the pin (see diagram below)

### Manually-operated contactors



If the temperature goes above the hot threshold while the position I is engaged, the “Too Hot” alarm will be activated.

## 5. Setting through the front panel

Once the parameters have been set through the ECCT , it is possible to modify them via the front panel.

The setting procedure of different type of parameters is detailed in the implementation guide.

To modify each value, refer to the following block numbers:

Parameter	Block number for room 1	Block number for room 2
Annual days off	R00B222	
Weekly schedule	R00B223	
Bypass reset	R00B024	
Heating period	R00B015	
Temperature comfort set point	R00B027	R00B091
Set point delta	R00B032	R00B092
Rooms Closed set point (relative to the comfort set point)	R00B033	R00B093
Building closed set point (relative to the comfort set point)	R00B068	R00B094
Hot alarm threshold (for the “too hot” alarm)	R00B060	
Cold alarm threshold (for the “too cold” alarm)	R00B061	

**Please contact your EcoXpert for detail documentation about the ECCT and the procedure to set parameters through the front panel.**

## 6. What to Do in Case of a System Error

In rare cases, the Zelio Logic smart relay may not work properly.

Failures can be 3 types:

- The user may have stopped the Zelio Logic application. All Zelio Logic outputs are then switched off.
- It can be a bug of the program (no bugs identified at the present time). In this case, the smart relay is powered up but does not run properly the program.
- It can be an electronics failure inside the Zelio Logic smart relay (very rare situation).

**NOTE:**

Please, contact your EcoXpert installer for servicing your solution.



## 7. Maintaining the Solution

Your EcoXpert installer is certified to maintain your solution. He is able to:

- Change the time of the reset of the bypass,
- Change your temperature set points
- Change the delay admissible for the temperature bypass
- Adapt the behaviour of your solution to new needs.

Please, contact your EcoXpert installer for a safer operation.

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