

Operating Instruction Radio Receiver SRC-ADO-BCS

Version 2.00, 14.07.2006

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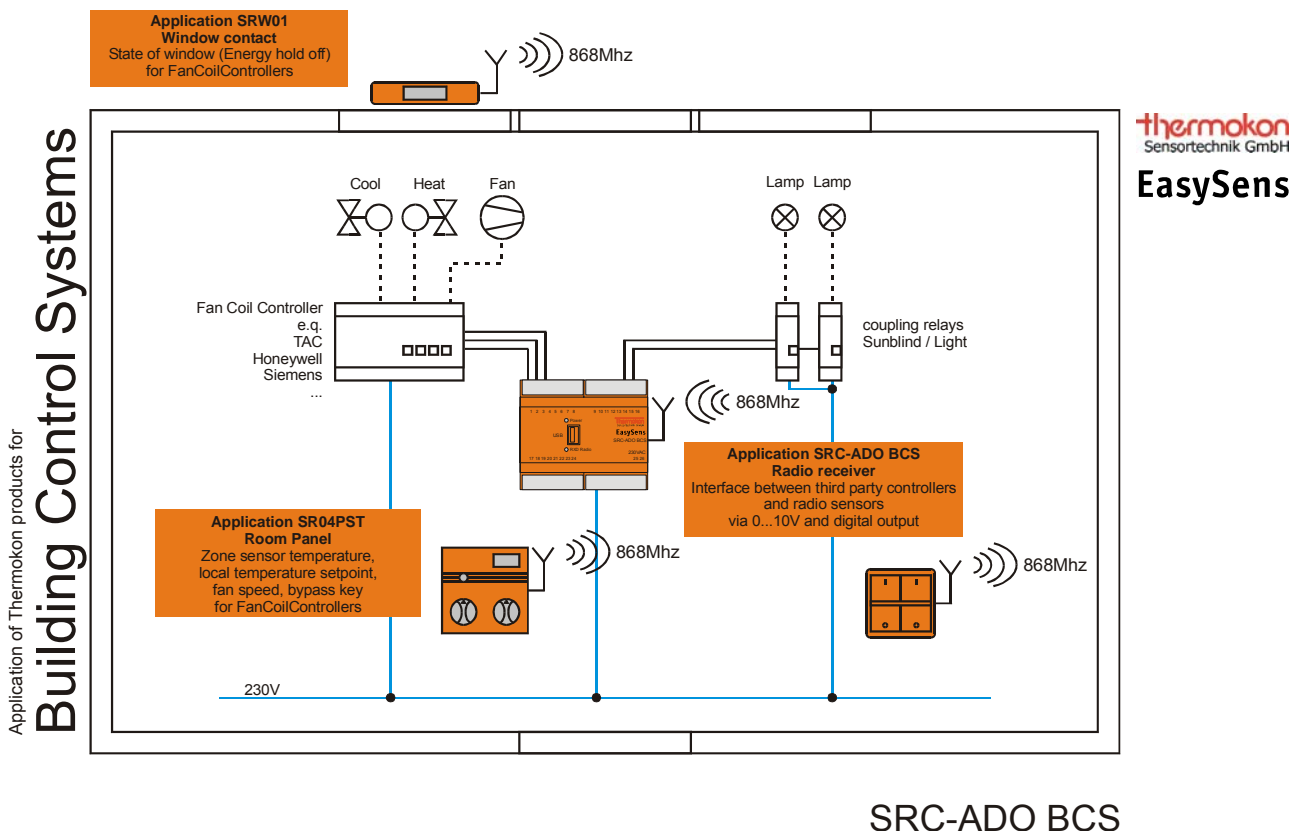
1 Introduction

1.1 Product Overview

The SRC-ADO-BCS is designed for receiving und processing telegrams of Thermokon radio sensors of the EasySens product line as well as of other devices transmitting measuring values according to the EnOcean standard. The measuring values of the sensors can be allocated to analog (0-10V) and/or digital outputs. (For applications, please see picture 1-1).

A CD with the PC configuration software is supplied along with the receiver. The software provided, enables the configuration of the outputs, the learning-in of sensors to the receiver and diagnosis possibilities. The connection between PC and receiver is made via an USB interface (1.1 and 2.0).

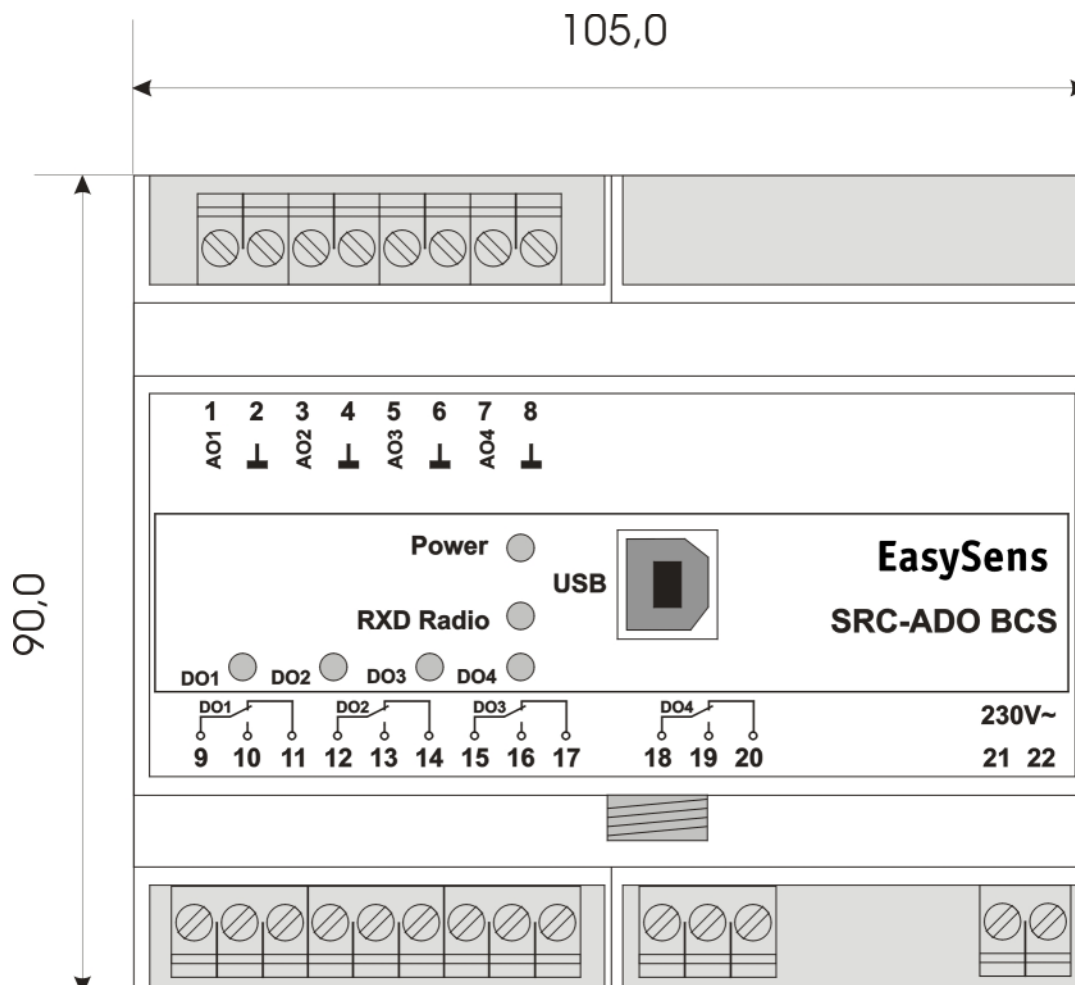
For the operation of the receiver, an external 868MHz antenna with a FME-female connection is needed, additionally. The antenna can be ordered separately as an accessory in different connecting lengths (2,5m/10m/20m).



Picture 1-1: Schematic Assembly

1.2 Product Specification

Product:	Receiver for up to 15 radio sensors according to the EnOcean- Standard
Interface:	USB 1.1 and USB 2.0 compatible
Power Supply:	230V AC 50/60Hz
Typical Range:	30m in buildings with antenna
CE-Conformity:	89/336/EEG Electromagnetic compatibility R&TTE 1999/5/EC Radio and Telecommunications Terminal Equipment Directive
Standards: EN 61000	EN 61000-6-2: 2001 EN 61000-6-3: 2001 ETSI EN 301 489-3 V.1.4.1 EN 61000-3-2: 2000 EN 61000-3-3: 1995 + A1
Ambient temperature:	0...60°C
Rel. humidity:	0...75%rF, not condensed
Storage temperature:	-20...70°C



2 Installation

2.1 Hardware Installation

For detailed information on installation and mounting, please see the product data sheet SRC-ADO-BCS.

2.2 Software Installation

For the installation of the wireless receiver the configuration software and the driver are needed. They are on the attached CD. Please note, that you require administrator rights on your PC for both the installation and the running of the programmes.

2.2.1 Automatic Installation Of Drivers

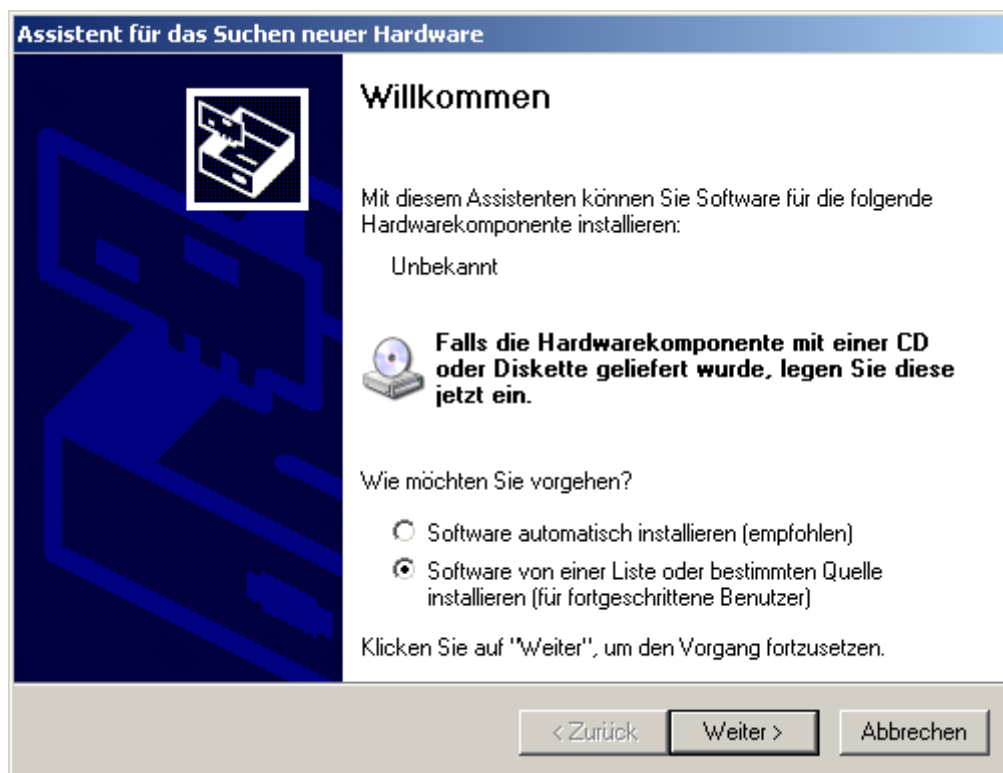
Install the configuration software SRC-ADO-BCS and follow the screen instructions. Software and driver are installed automatically. Connect the SRC-ADO-BCS to the PC by an USB cable. Follow the instructions. The SRC-ADO-BCS is ready for operation now and can be configured via the software.

After an successful installation, you can start the configuration software via the Start Menu\Programme\Thermokon.

Supported operating systems: Windows9x; WindowsNT; WindowsMe; Windows2000; WindowsXP; WindowsServer

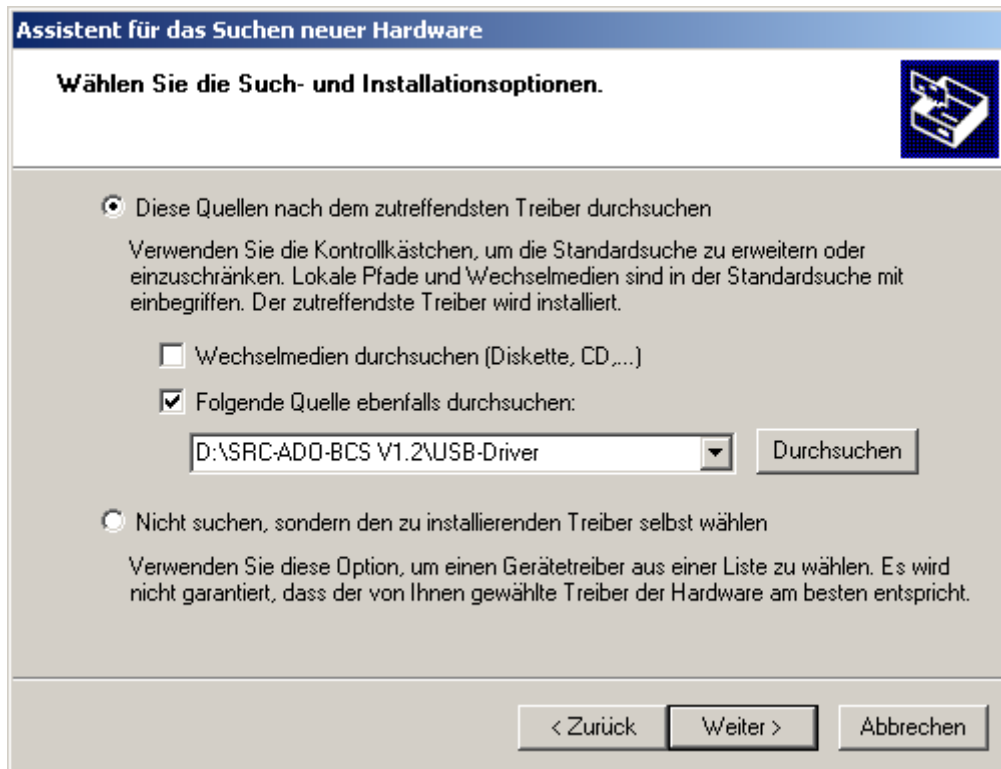
2.2.2 Manual Installation Of Drivers

It is possible to install the drivers manually without having installed the configuration software first. Connect the SRC-ADO-BCS to the PC by an USB cable. In the window "Assistant for searching of new hardware" you select "Install software from a list or a certain source".



Picture 2-1: Hardware Assistant

The required drivers for the SRC-ADO-BCS are in the directory USB-Driver on the attached CD.



Picture 2-2: Select Installation Source

Please continue the installation.



Picture 2-3: Windows-Logo-Test

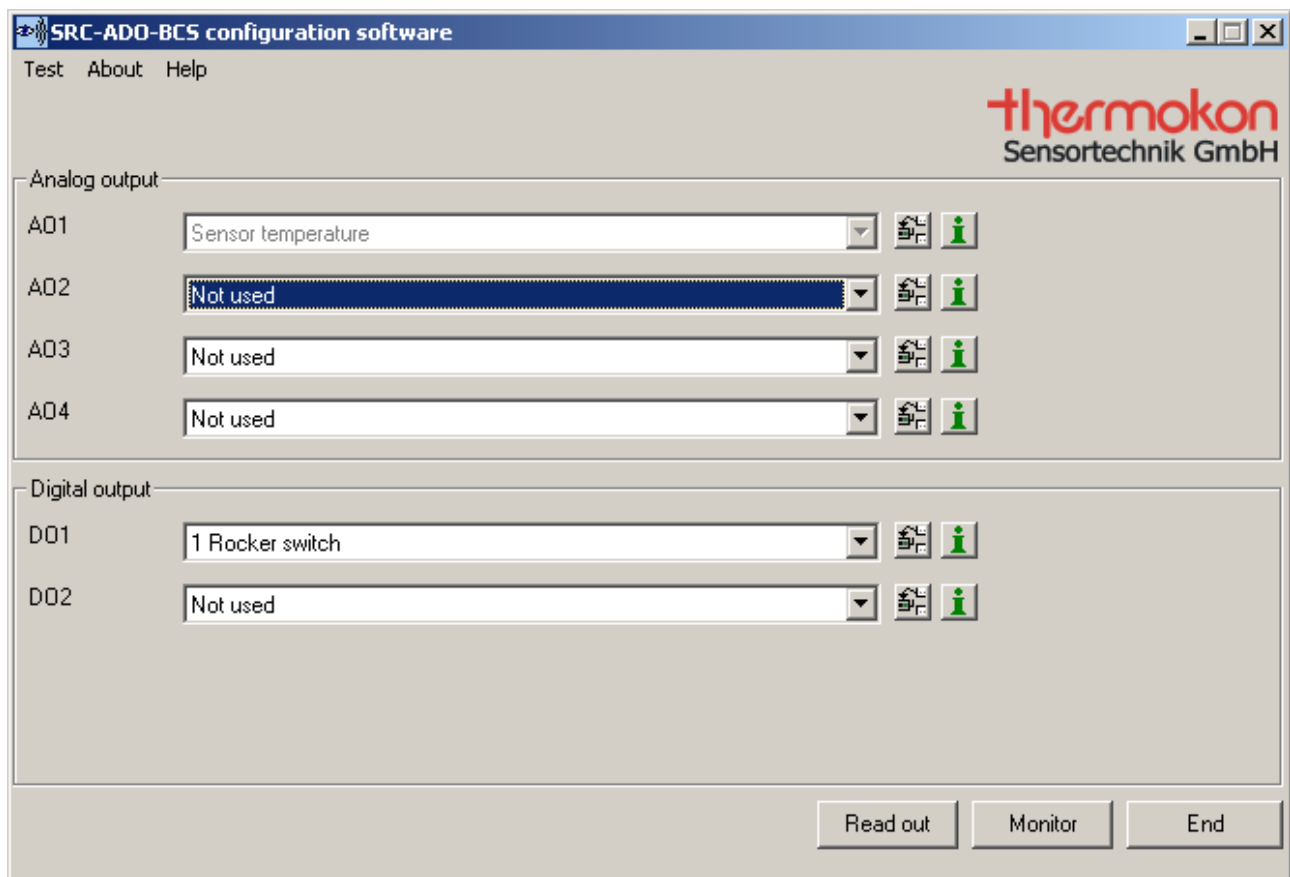


Picture 2-4: Installation of Hardware Completed

3 Configuration of Receiver

3.1 Software Specification

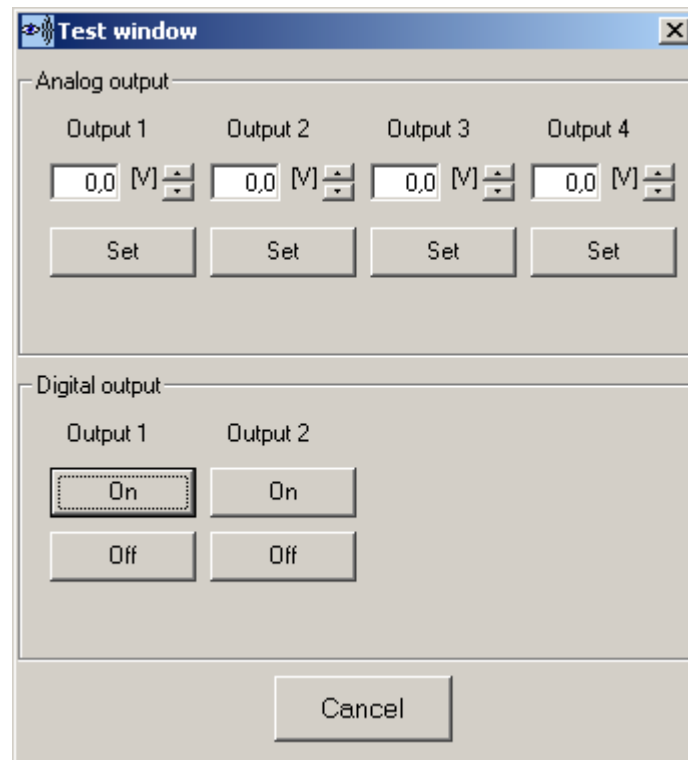
The software is designed for the configuration of analog and digital outputs. In addition, the respective current status can be inquired via the info buttons. Picture 3-1 shows the start window which is displayed after the program start.



Picture 3-1: Start Window

3.2 Menu

The menu consists of the fields „Test“, „Via“ and „Help“. In the menu „Test“ values can be manually allocated to the outputs (0-10 V level with analog outputs and „On“ or „OFF“ status with digital outputs, picture 3-2). By means of the buttons „Setting“, „On“ and „OFF“ the outputs are set instantly. Sensors already learned-in and adjustments of the outputs are ignored during the test mode. After having ended the test mode, the output remains in the same status until it is set by a radio telegram.

**Picture 3-2: Test Window**

In the menu „Via“ manufacturer's and product information are found. A help for the programme can be called-off via the menu „Help“.


3.3 Start Window

In the start window (picture 3-1) the currently configured outputs are shown. If special sensors are allocated to an output, the output is marked in grey and cannot be changed. Only if no sensors are allocated to an output, the same can be changed. Different functions, such as „Heating/Cooling PI-Controller AO1/AO2“ require two outputs. If such a function is used, the second output is marked in grey and cannot be changed


By means of the info button  the current status of the output can be found.

An overview of the sensors connected can be called-off via the button „Monitor“.

By pressing the button “Read Out“ the device is read out again.

If a function was selected for one output, the same must be configured. Therefore, please change in the parameter / sensor windows via the button  „configure output“.

3.4 Monitor

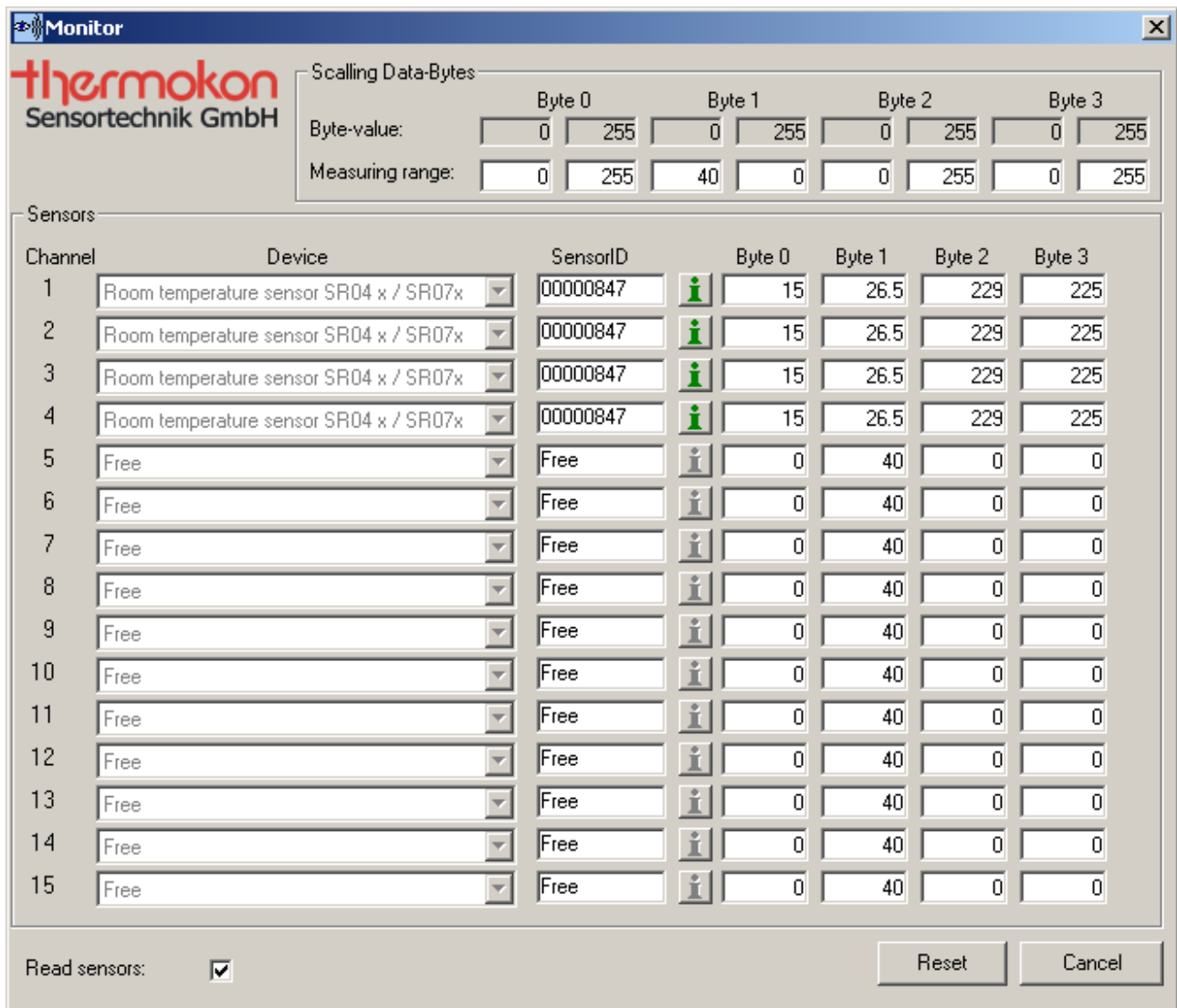
In the window "Monitor" all sensors connected are displayed. Via the info button  the current status of the sensor can be shown. In the field "Scaling of Data Byte" a scaling for the respective data bytes can be put in. This serves a better display of the sensor data in the window "Monitor".

Example.:Scale e.g. the measuring range from 40°C to 0°C for a room temperature sensor SR04.

The load of the single data bytes and the measuring range of the sensor can be found in the product data sheet of the sensor manufacturer.

By the button "Reset" all sensors connected to the device can be deleted.

If a hook mark is set with "Read out of Sensors", all sensors are read out and the data are shown in the configuration software. If a scaling is put in, the data bytes are scaled.


















thermokon
Sensortechnik GmbH

Scaling Data-Bytes:

	Byte 0		Byte 1		Byte 2		Byte 3	
Byte-value:	0	255	0	255	0	255	0	255
Measuring range:	0	255	40	0	0	255	0	255

Sensors

Channel	Device	SensorID		Byte 0	Byte 1	Byte 2	Byte 3
1	Room temperature sensor SR04 x / SR07x	00000847		15	26.5	229	225
2	Room temperature sensor SR04 x / SR07x	00000847		15	26.5	229	225
3	Room temperature sensor SR04 x / SR07x	00000847		15	26.5	229	225
4	Room temperature sensor SR04 x / SR07x	00000847		15	26.5	229	225
5	Free	Free		0	40	0	0
6	Free	Free		0	40	0	0
7	Free	Free		0	40	0	0
8	Free	Free		0	40	0	0
9	Free	Free		0	40	0	0
10	Free	Free		0	40	0	0
11	Free	Free		0	40	0	0
12	Free	Free		0	40	0	0
13	Free	Free		0	40	0	0
14	Free	Free		0	40	0	0
15	Free	Free		0	40	0	0

Read sensors: ☒

Reset Cancel

Picture 3-3: Monitor

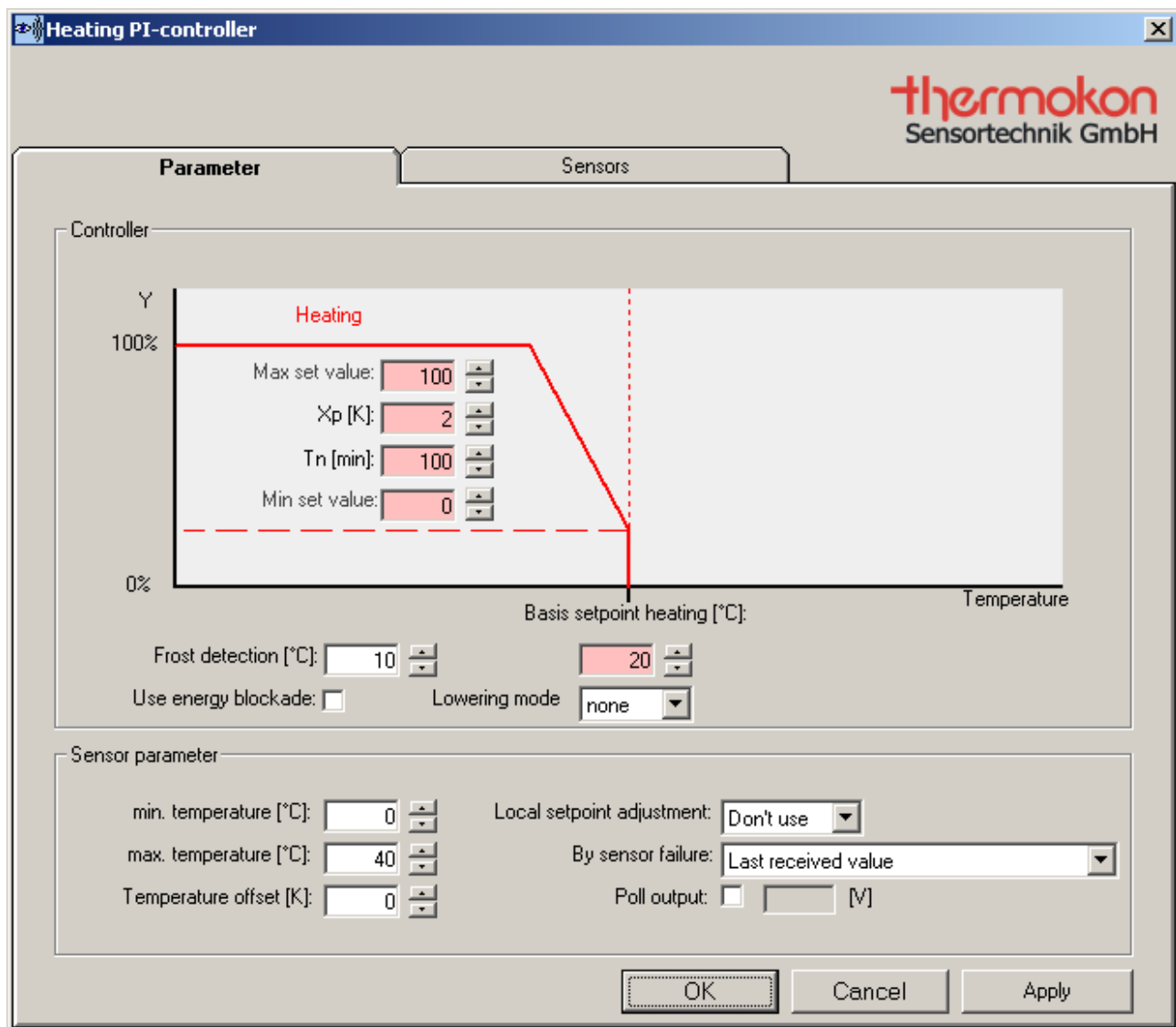
4 Configuration of Outputs

The window consists of the rider „Parameter“ for adjusting different parameters and the rider „Sensors“ for the learning-in and allocation of sensors to the outputs (picture 4-1).

4.1 Register Card Parameter

The register card parameter is designed for the parameterization of the output. The output functions have different parameters for the configuration, which will be explained in the following:

Parameter changes are transmitted by actuation of the „Ok“ button or by means of the „taking-over“ button.



Picture 4-1: Heating PI-Controller

4.1.1 Analog Outputs

4.1.1.1 Heating PI-Controller

In the output function „Heating PI-Controller“ a sensor can directly control an analog output by a proportional actuator.

PI-Controller

The output can be limited upwards (Max) and downwards (Min) by means of the two fields control variables.

The field „Xp“ is designed for the adjustment of the proportional range. If the same is set to 0, the proportional range is deactivated. Xp can be adjusted from 0-20 K.

In the field „Tn“ (Tn = action time of the integral range) the range is adjusted from 0-255 min. If the integral range is set to 0, the same is deactivated. The base set point can be changed in the corresponding field. By every new telegram the output will be new calculated. If a sensor doesn't send a telegram for a time > 90 min, when output is set to the defined value in „By sensor failure“.

Energy Stop

If the energy stop should be used, the same must be activated. By means of the activated energy stop, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. It is possible to allocate several window contacts to one control circuit. They are logically circuit linked, i.e. all window contacts must be closed. Even with an opened window, the controller switches to 100%, if the value falls below the anti-freeze temperature.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode „Comfort“ to the operating mode „Lowering“. Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list „local set point adjustment“. It is possible to adjust a range from -3/+3 K and -5 / +5 K.

Monitoring Time of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field „sensor failure“. The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

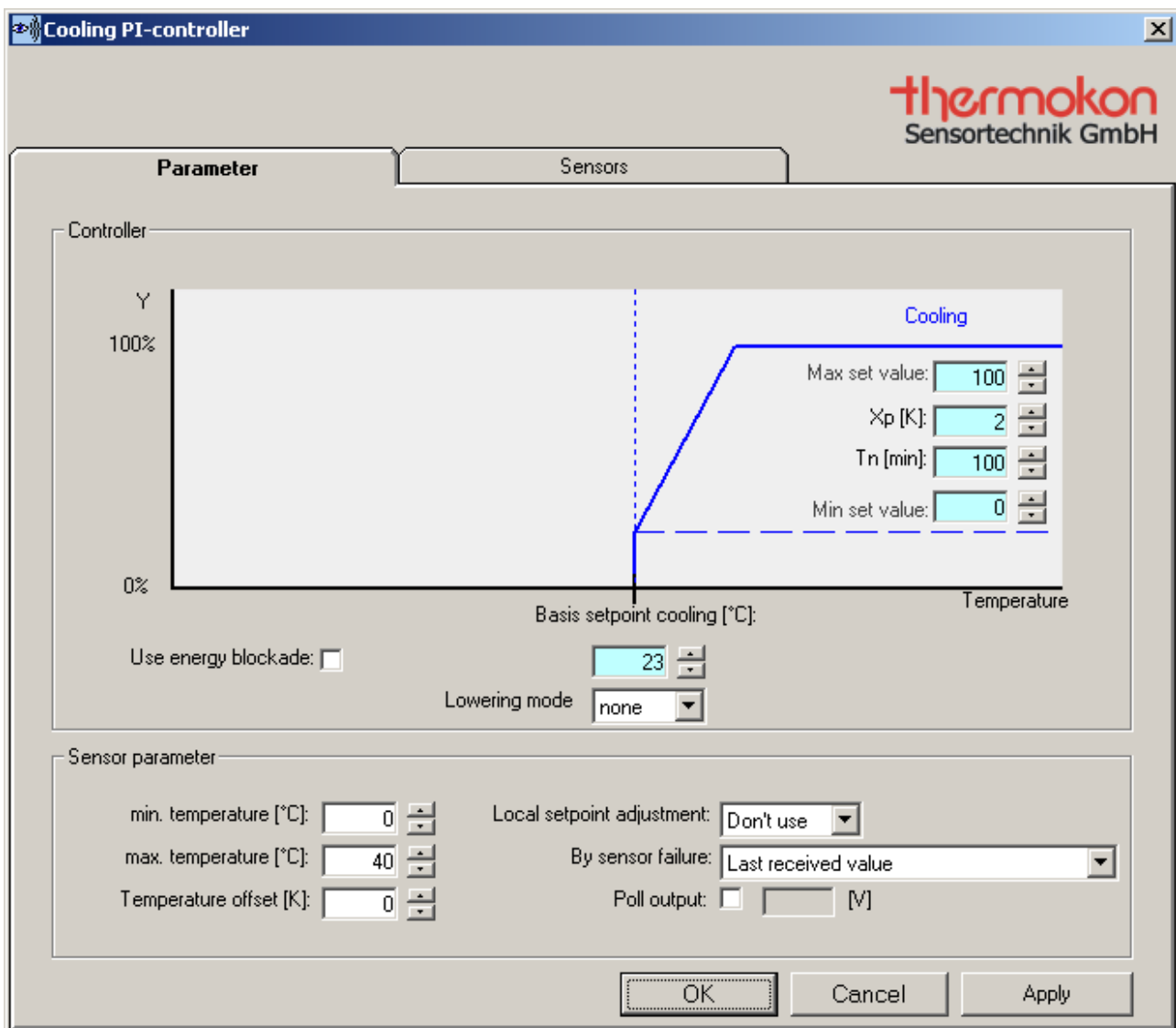
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, either 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.1.2 Cooling PI-Controller

In the output function „Cooling PI-Controller“, a sensor can directly control an analog output by means of a proportional actuator (picture 4-2).



Picture 4-2: Cooling PI-Controller

PI-Controller

The output can be limited upwards (Max) and downwards (Min) by means of the two fields control variables.

The field „Xp“ is designed for the adjustment of the proportional range. If the same is set to 0, the proportional range is deactivated. Xp can be adjusted from 0-20 K.

In the field „Tn“ (Tn = action time of integral range) the range is adjusted from 0-225 min. If the integral range is set to 0, the same is deactivated. The base set point can be changed in the corresponding field. By every new telegram the output will be new calculated. If a sensor doesn't send a telegram for a time > 90 min, when output is set to the defined value in „By sensor failure“.

Energy Stop

If the energy stop should be used, the same must be activated. By means of the activated energy stop, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. It is possible to allocate several window contacts to one control circuit. They are logically circuit linked, i.e. all window contacts must be closed.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode “Comfort“ to the operating mode “Lowering“. Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list “local set point adjustment“. It is possible to adjust a range from -3/+3 K and -5 / +5 K.

Monitoring Time of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure“. The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

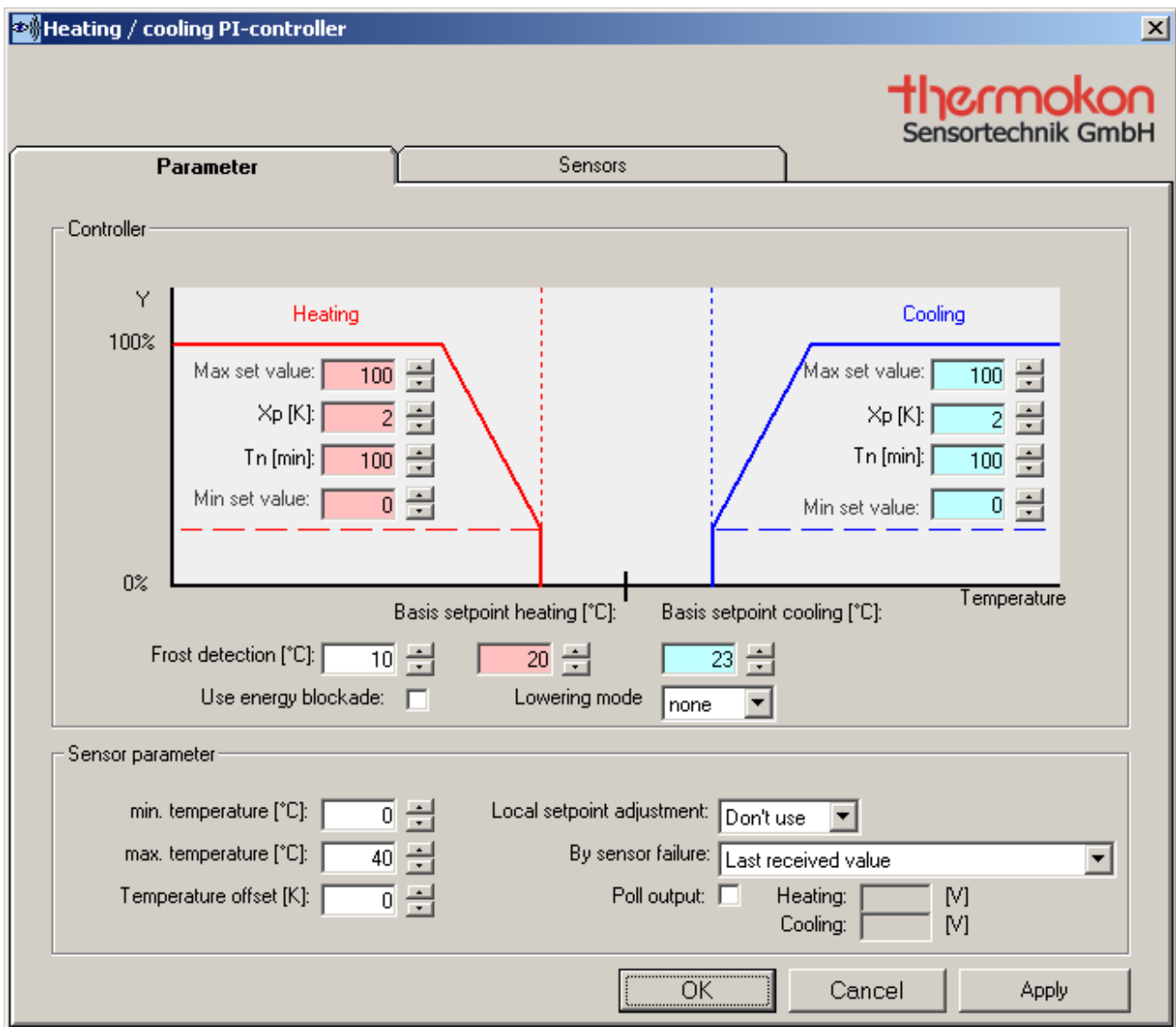
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, either 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.1.2 Heating / Cooling PI-Controller

In the output function „Heating / Cooling PI-Controller“ a sensor can directly control an analog output by a proportional actuator (picture 4-3). This is made by means of a sequence. Heating and cooling affect two separate outputs. The function „Heating / Cooling PI-Controller“ is only possible with the outputs AO1 and AO3. The outputs AO2 and AO4 are automatically occupied by cooling whereas AO1 and AO3 are occupied by heating.



Picture 4-3: Heating / Cooling PI-Controller

PI-Controller

The output can be limited upwards (Max) and downwards (Min) by means of the two fields control variables.

The field „Xp“ is designed for the adjustment of the proportional range. If the same is set to 0, the proportional range is deactivated. Xp can be adjusted from 0-20 K.

In the field „Tn“ (Tn = action time of integral range) the range is adjusted from 0-225 min. If the integral range is set to 0, the same is deactivated. The base set point can be changed in the corresponding field. By every new telegram the output will be new calculated. If a sensor doesn't send a telegram for a time > 90 min, when output is set to the defined value in „By sensor failure“.

Energy Stop

If the energy stop should be used, the same must be activated. By means of the activated energy stop, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. It is possible to allocate several window contacts to one control circuit. They are logically circuit linked, i.e. all window contacts must be closed. Even with an opened window, the controller switches to 100%, if the value falls below the anti-freeze temperature.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode “Comfort” to the operating mode “Lowering”. Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list “local set point adjustment”. It is possible to adjust a range from -3/+3 K and -5 / +5 K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure”. The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

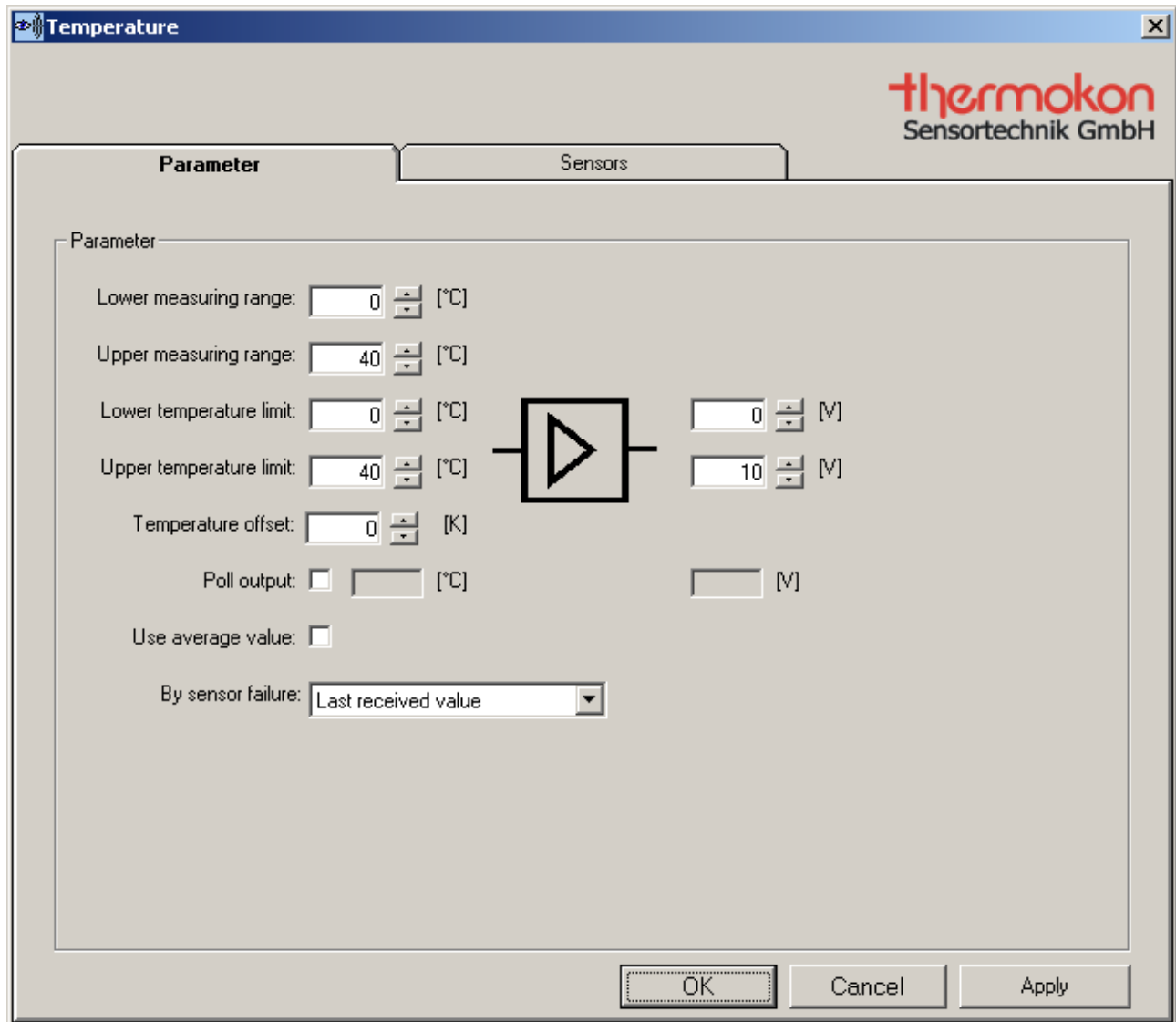
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, either 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.1.3 Sensor Temperature

In the output function „Sensor Temperature“ the measured temperature is output to an analog output (0-10V) (picture 4-2).



Picture 4-4: Sensor Temperature

Scaling Output Quantity

Enter the measuring range in the fields „lower sensor measuring range“ and „upper sensor measuring range“.

The temperature can be scaled by a temperature limit.

Example SR65:

Lower sensor measuring range: -20°C and upper sensor measuring range: 60°C

Lower temperature limit: 20°C and upper temperature limit: 40°C

Temperature: 20°C -> Output: 0V

Temperature: 30°C -> Output: 5

Temperature: 50°C -> Output: 10V

The analog output can be adjusted between 0-10V.

Example:

The fixed input range of the controller 0-50°C corresponds to 0-10V. Then, the output can be allocated to the temperature 0-40°C 0-8V.

Offset

By the field „Offset“ an offset for the output can be input.

Averaging

If an average value of several sensors should be made up, the hook must be activated.

Now, further sensors can be learned-in, accordingly. If the hook is deactivated again, and several sensors were selected, all sensors selected are deactivated and a new sensor can be chosen now.

The average value is made for all sensors, which are marked by a hook in the register card “Sensors”.

Attention:

When making an average value, all sensors must have the same measuring range.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure”. The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

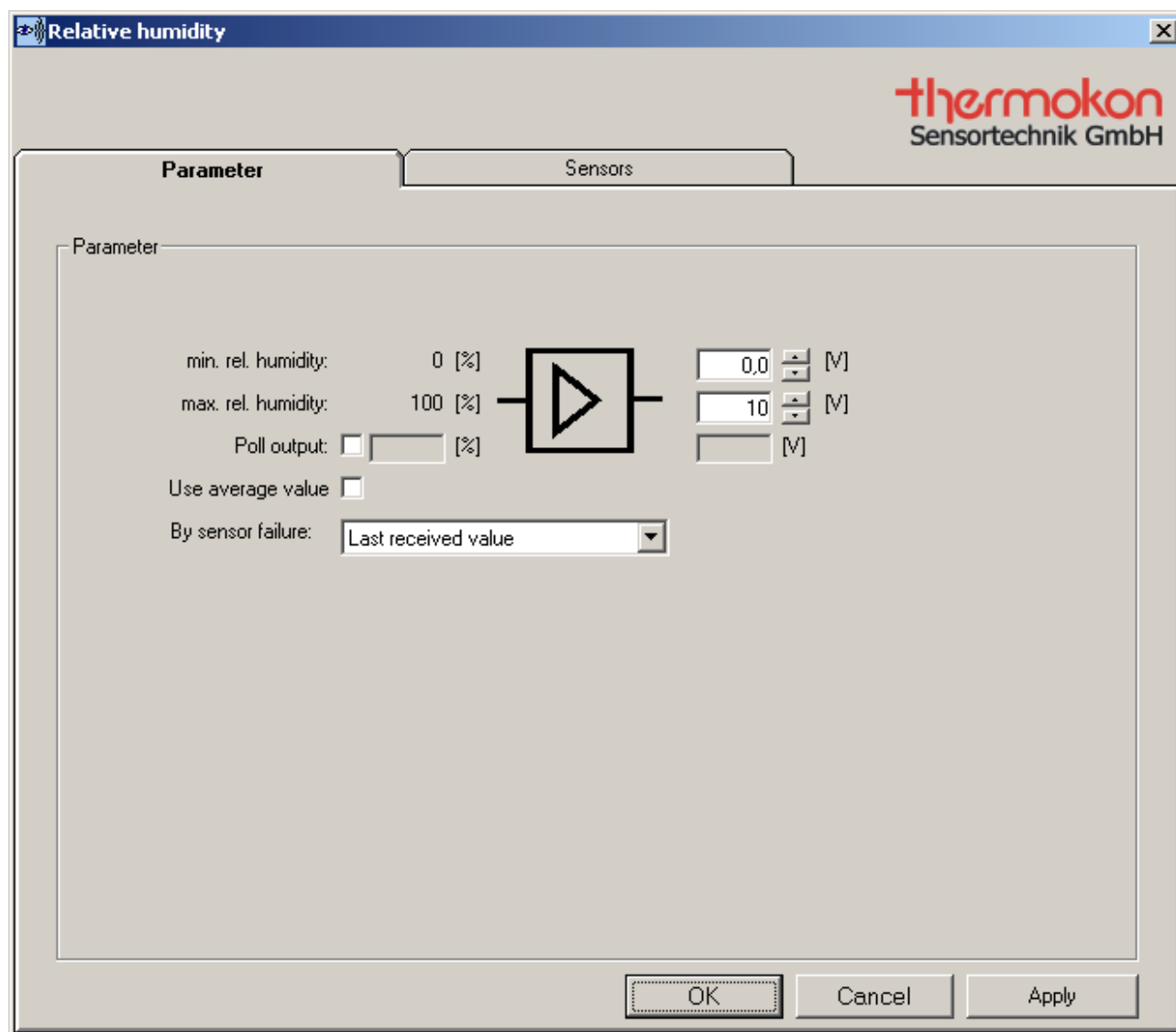
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 15 sensors with an average value and to allocate them to the output.

4.1.1.4 Sensor Relative Humidity

In the output function „Sensor relative humidity“ the relative humidity measured is output to an analog output (0-10 V) (Picture 4-5).



Picture 4-5: Sensor Relative Humidity

Scaling of Output Quantity

The analog output can be adjusted from 0-10V.

Averaging

If an average value of several sensors should be made up, the hook must be activated.

Now, further sensors can be learned-in, accordingly. If the hook is deactivated again, and several sensors were selected, all sensors selected are deactivated and a new sensor can be chosen now.

The average value is made for all sensors, which are marked by a hook in the register card "Sensors".

Attention:

When making an average value, all sensors must have the same measuring range.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

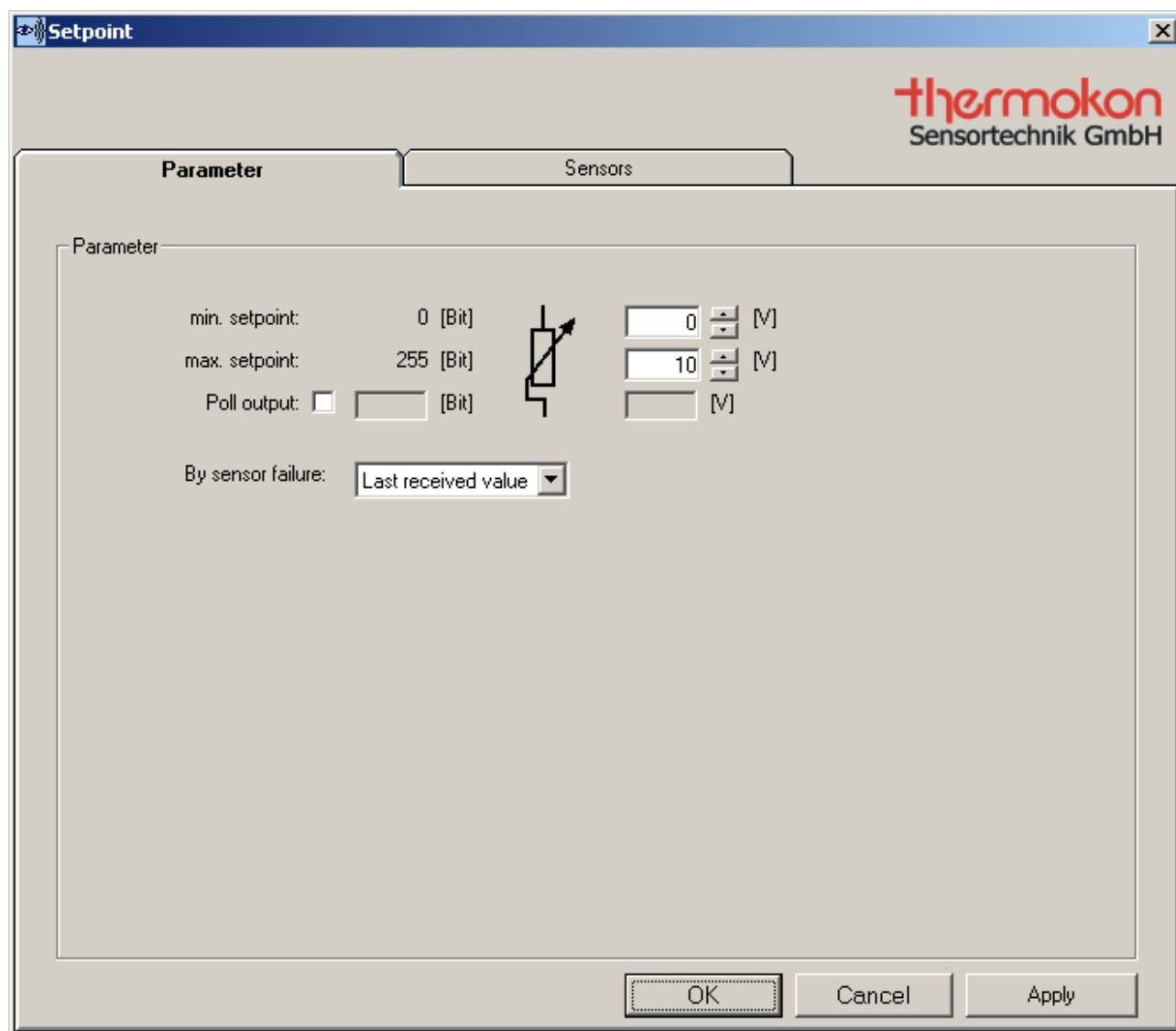
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 15 sensors with an average value and to allocate them to the output.

4.1.1.5 Sensor Set Point

In the output function “Sensor set point” the adjusted set point is output to an analog output (0-10V) (picture 4-6).



Picture 4-6: Sensor Set Point

Scaling of Output Quantity

The analog output can be adjusted from 0-10 V.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

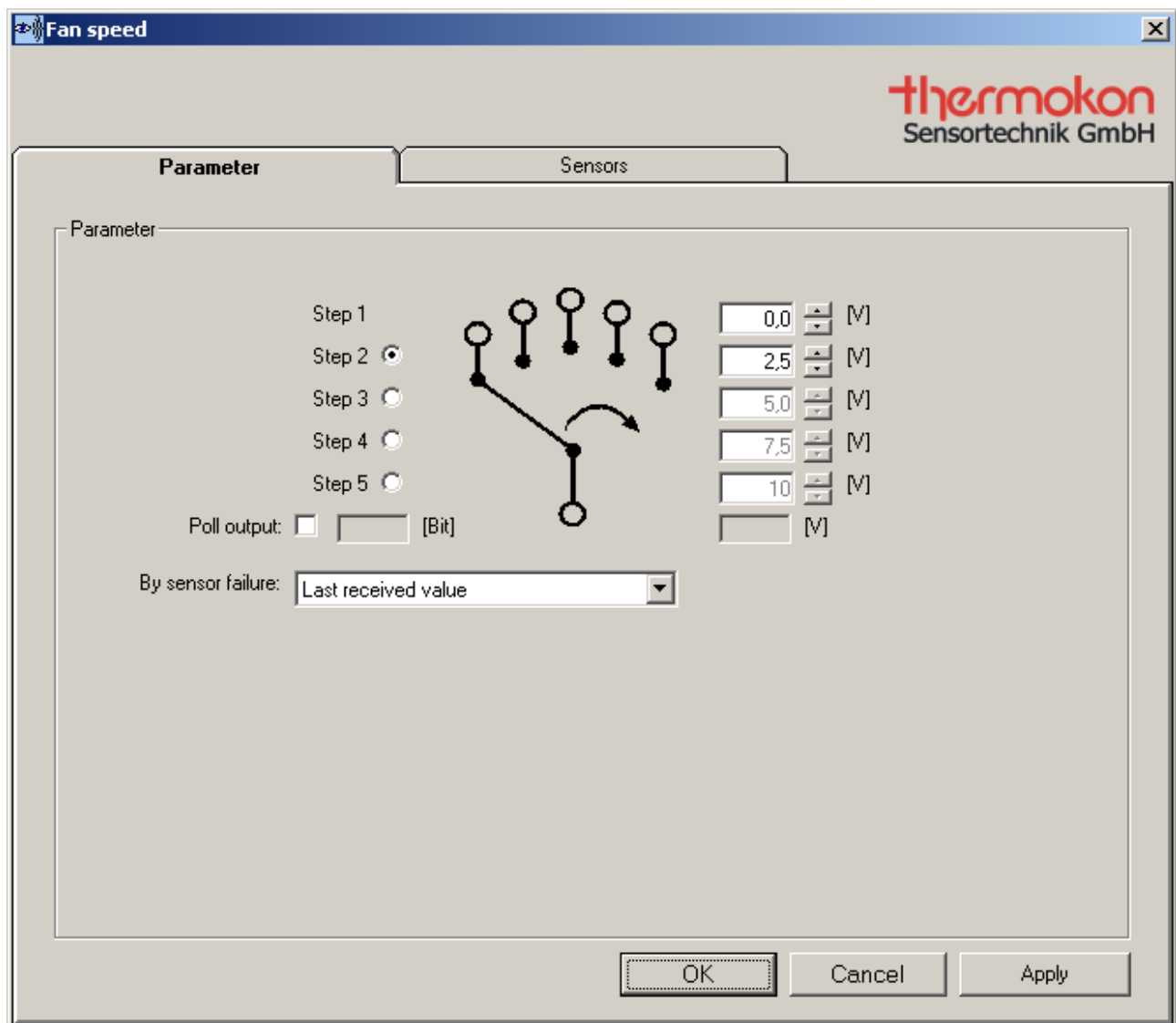
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and to allocate it to the output.

4.1.1.6 Sensor Fan Stage

In the output function „Sensor Fan Stage“ the adjusted fan stage is output to an analog output (0-10V) (picture 4-7).



Picture 4-7: Sensor Fan Stage

Scaling Output Variable

It is possible to select up to 5 stages and to adjust an analog output of 0-10V with the respective stages.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

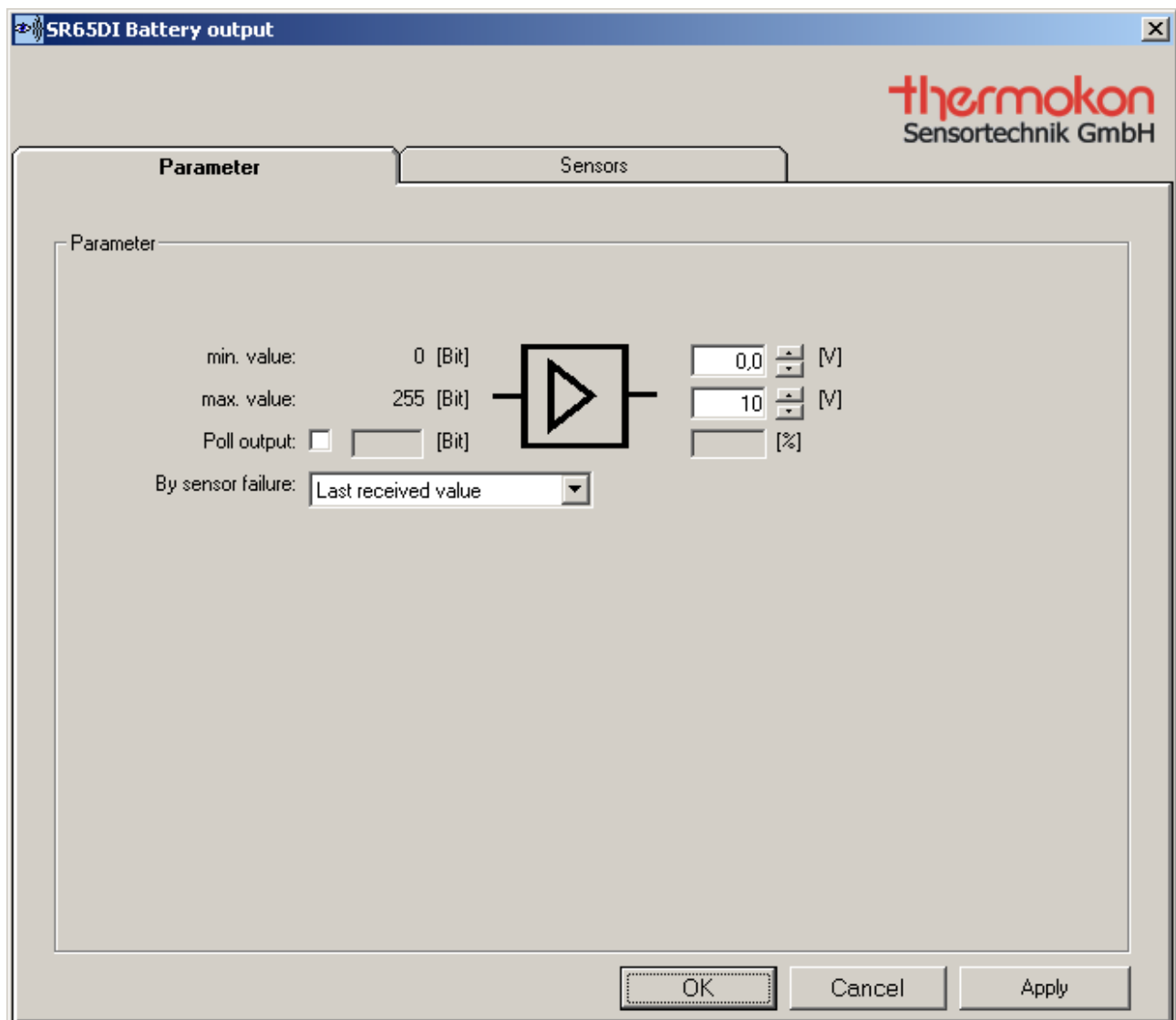
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and to allocate it to the output.

4.1.1.7 Sensor SR65DI

In the output function „Sensor SR65DI“ the battery voltage measured by the sensor SR65DI is output to an analog output (0-10V) (picture 4-8).



Picture 4-8: Sensor SR65DI

Scaling of Output Quantity

The analog output can be adjusted from 0-10 V.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure”. The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

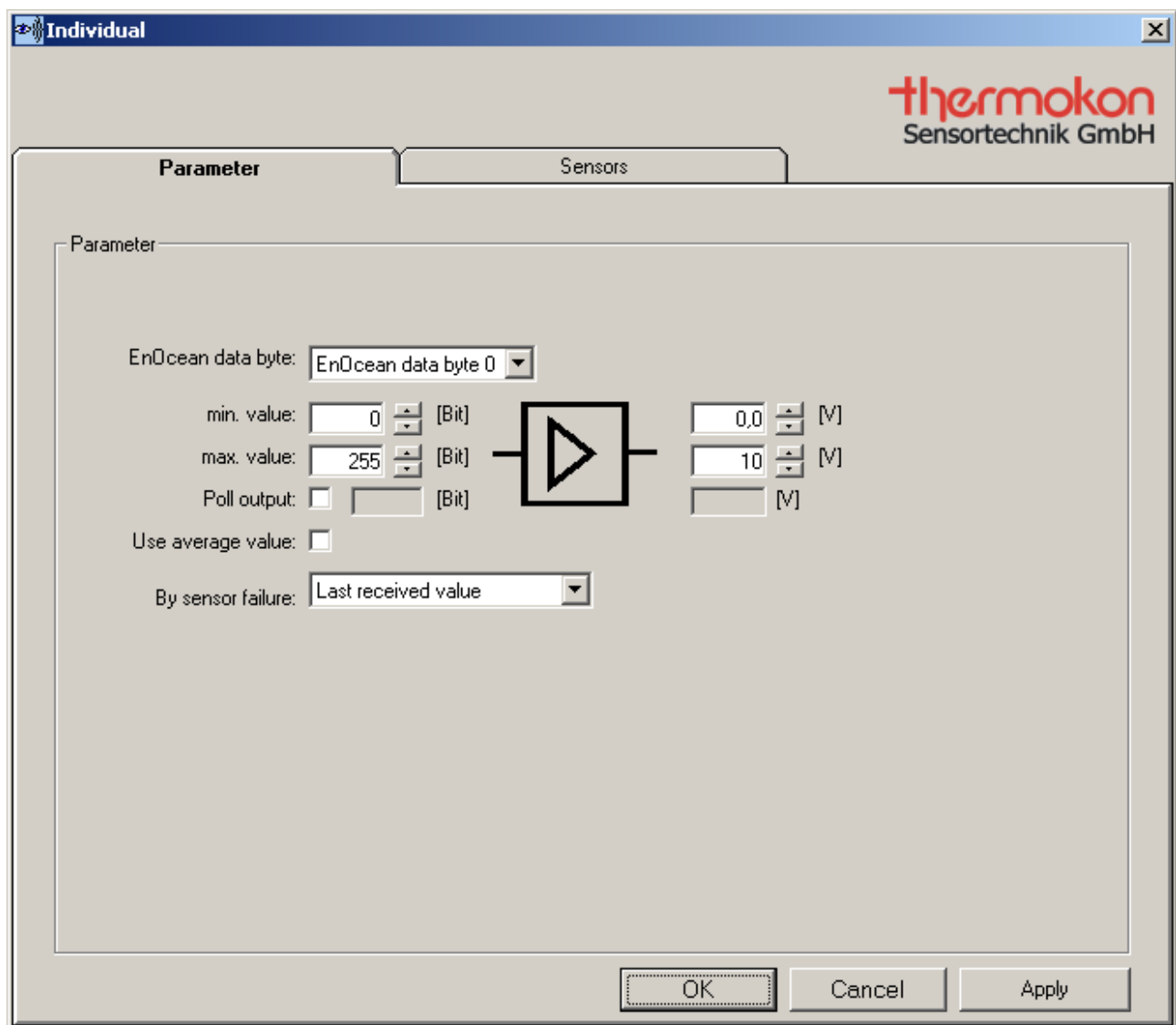
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and to allocate it to the output.

4.1.1.8 Individual Sensor

In the output function “Individual Sensor” an EnOcean data byte of the sensor is output to an analog output (0-10V) (picture 4-9).



Picture 4-9: Individual Sensor

Scaling of Output Quantity

In the field EnOcean data byte the data byte can be selected. For the function of the data byte, please refer to the product data sheet of the manufacturer. The input range can be adjusted from 0-255 bit. The analog output can be adjusted from 0-10 V.

Average Value

If an average value of several sensors should be made up, the hook must be activated.

Now, further sensors can be learned-in, accordingly. If the hook is deactivated again, and several sensors were selected, all sensors selected are deactivated and a new sensor can be chosen now.

The average value is made for all sensors, which are marked by a hook in the register card "Sensors".

Attention:

When making an average value, all sensors must have the same measuring range.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

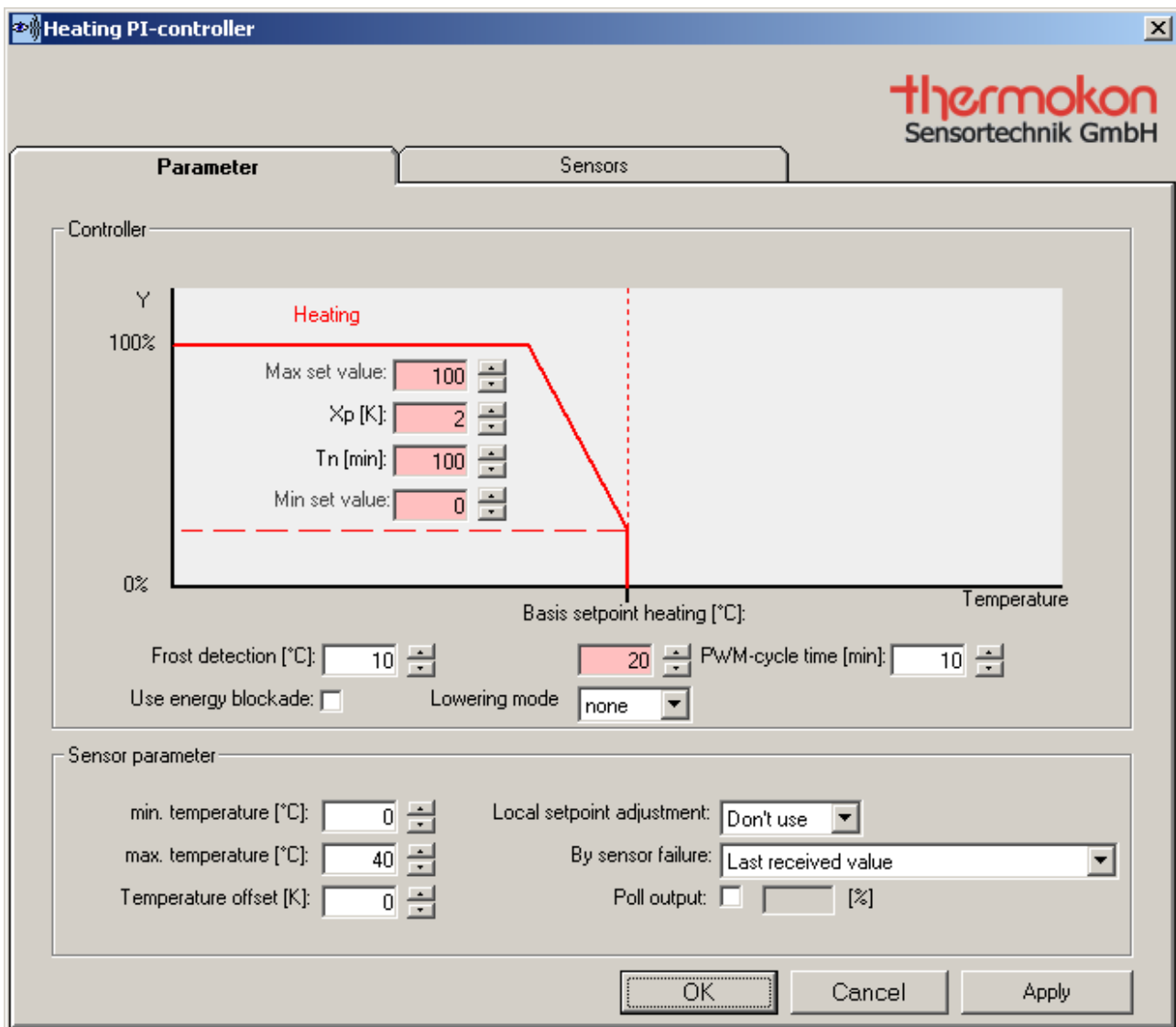
It is possible to select 15 sensors with an average value and to allocate them to the output

4.1.2 Digital Outputs

In the following, the functions of the digital outputs are described.

4.1.2.1 Heating PI-Controller

In the output function „Heating PI-Controller“ a sensor can directly control a thermionic two-point actuator (picture 4-10). The control variable of the controller is converted in a PWM – Puls-Pause-Modulation. That is to say, with a control variable of 50% and a cycle of 10 min, the actuator is open for 5 min and closed for 5 min.



Picture 4-10: Heating PI-Controller

PI-Controller

The output can be limited upwards (Max) and downwards (Min) by means of the two fields control variables.

The field „Xp“ is designed for the adjustment of the proportional range. If the same is set to 0, the proportional range is deactivated. Xp can be adjusted from 0-20 K.

In the field „Tn“ (Tn = action time of integral range) the range from 0-255 min is deactivated. The base set point can be changed in the corresponding field.

In the field PWM Cycle the cycle time of the PWM-Controller can be input (0-255 min).

Energy Stop

If the energy stop should be used, the same must be activated. By means of the activated energy stop, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. It is possible to allocate several window contacts to one control circuit. They are logically circuit linked, i.e. all window contacts must be closed. Even with an opened window, the controller switches to 100%, if the value falls below the anti-freeze temperature.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode “Comfort“ to the operating mode “Lowering“. Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list “local set point adjustment“. It is possible to adjust a range from $-3/+3$ K and $-5 / +5$ K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure“. The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

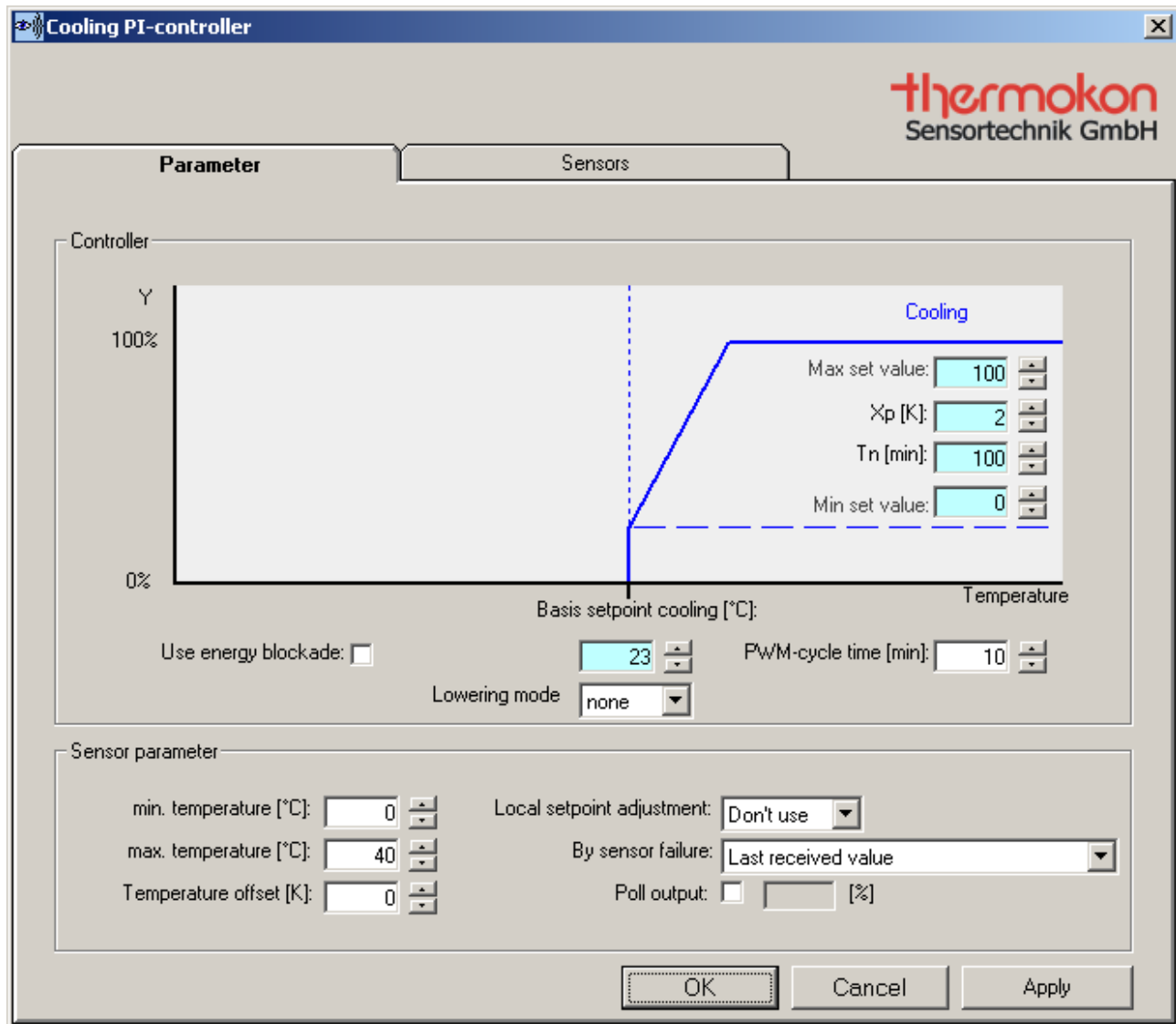
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.2.2 Cooling PI-Controller

In the output function „Cooling PI-Controller“ a sensor can directly control a thermionic two-point actuator (picture 4-11). The control variable of the controller is converted in a PWM – Puls-Pause-Modulation. That is to say, that with a control variable of 50% and a cycle of 10 min, the actuator is opened for 5 min and closed for 5 min.



Picture 4-11: Cooling PI-Controller

PI-Controller

The output can be limited upwards (Max) and downwards (Min) by means of the two fields control variables.

The field „Xp“ is designed for the adjustment of the proportional range. If the same is set to 0, the proportional range is deactivated. Xp can be adjusted from 0-20 K.

In the field „Tn“ (Tn = action time of integral range) the range from 0-255 min is deactivated. The base set point can be changed in the corresponding field.

In the field PWM-Cycle the cycle time of the PWM-controller can be input (0-255 min).

Energy Stop

If the energy stop should be used, the same must be activated. By means of the activated energy stop, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. It is possible to allocate several window contacts to one control circuit. They are logically circuit linked, i.e. all window contacts must be closed. Even with an opened window, the controller switches to 100%, if the value falls below the anti-freeze temperature.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode "Comfort" to the operating mode "Lowering". Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list "local set point adjustment". It is possible to adjust a range from $-3/+3$ K and $-5 / +5$ K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

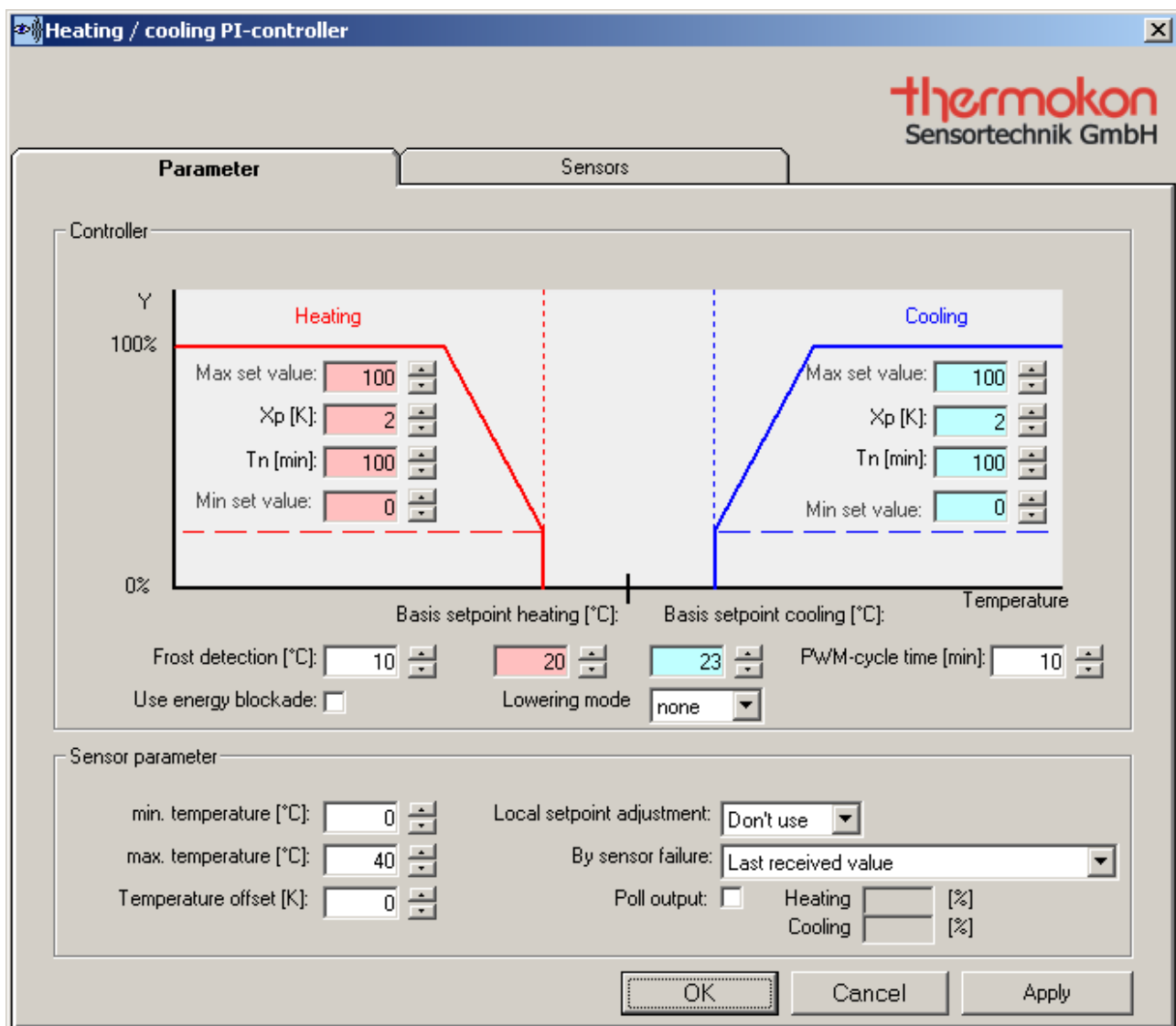
It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.2.3 Heating / Cooling PI-Controller

In the output function „Heating / Cooling PI-Controller“ a sensor can directly control a thermionic two-point actuator (picture 4-12). The control variable of the controller is converted in a PWM – Puls-Pause-Modulation. That is to say, with a control variable of 50% and a cycle of 10 min, the actuator is opened for 5 min and closed for 5 min.

The control is made by a sequence. Heating and cooling affect two separate outputs.

The function “Heating/Cooling PI-Controller” is only possible with the outputs DO1 and DO3. The outputs DO2 and DO4 are automatically occupied by cooling, whereas the outputs DO1 and DO3 are occupied by heating.



Picture 4-12: Heating / Cooling PWM-Controller

PI-Controller

The output can be limited upwards (Max) and downwards (Min) by means of the two fields control variables.

The field „Xp“ is designed for the adjustment of the proportional range. If the same is set to 0, the proportional range is deactivated. Xp can be adjusted from 0-20 K.

In the field „Tn“ (Tn = action time of integral range) the range from 0-255 min is deactivated. The base set point can be changed in the corresponding field.

In the field PWM-Cycle the cycle time of the PWM-controller can be input (0-255 min).

Energy Stop

If the energy stop should be used, the same must be activated. By means of the activated energy stop, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. It is possible to allocate several window contacts to one control circuit. They are logically circuit linked, i.e. all window contacts must be closed. Even with an opened window, the controller switches to 100%, if the value falls below the anti-freeze temperature.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode “Comfort“ to the operating mode “Lowering“. Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list “local set point adjustment“. It is possible to adjust a range from -3/+3 K and -5 / +5 K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure“. The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

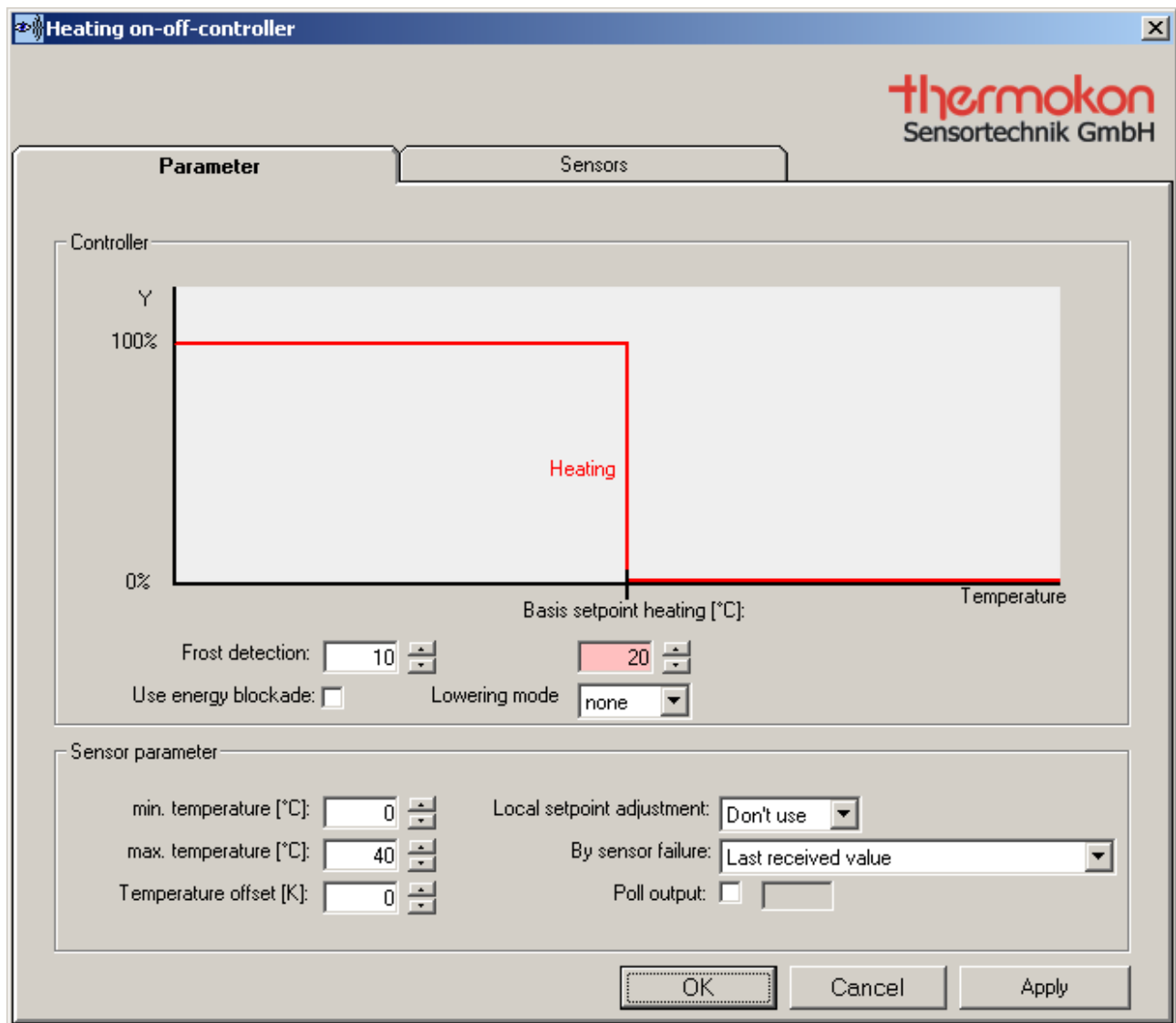
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.2.4 Heating Two-Point Controller

In the output function „Heating Two-Point Controller“, a sensor can directly switch a thermionic actuator. If the set point is under-run, the actuator is switched-on. If the set point is exceeded, the actuator is switched-off (picture 4-13). A radio transmitter sends a telegram at a minimal time of 120 sec, thus no switching hysteresis is needed for the controller.



Picture 4-13: Heating Two-Point Controller

Adjustments of the Two-Point Controller

The basic set point can be changed in the corresponding field. With any newly received telegram the output quantity will be calculated again. If a sensor does not send a telegram for a time > 90 min, the output is adjusted to a defined value (see field "Sensor Failure").

Energy Stop

If the energy stop is used, it must be activated. If the energy stop is activated, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. With several window contacts, allocated to the control, all window contacts must be closed, so that the controller can change over to the normal mode, again.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode "Comfort" to the operating mode "Lowering". Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list "local set point adjustment". It is possible to adjust a range from $-3/+3$ K and $-5 / +5$ K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

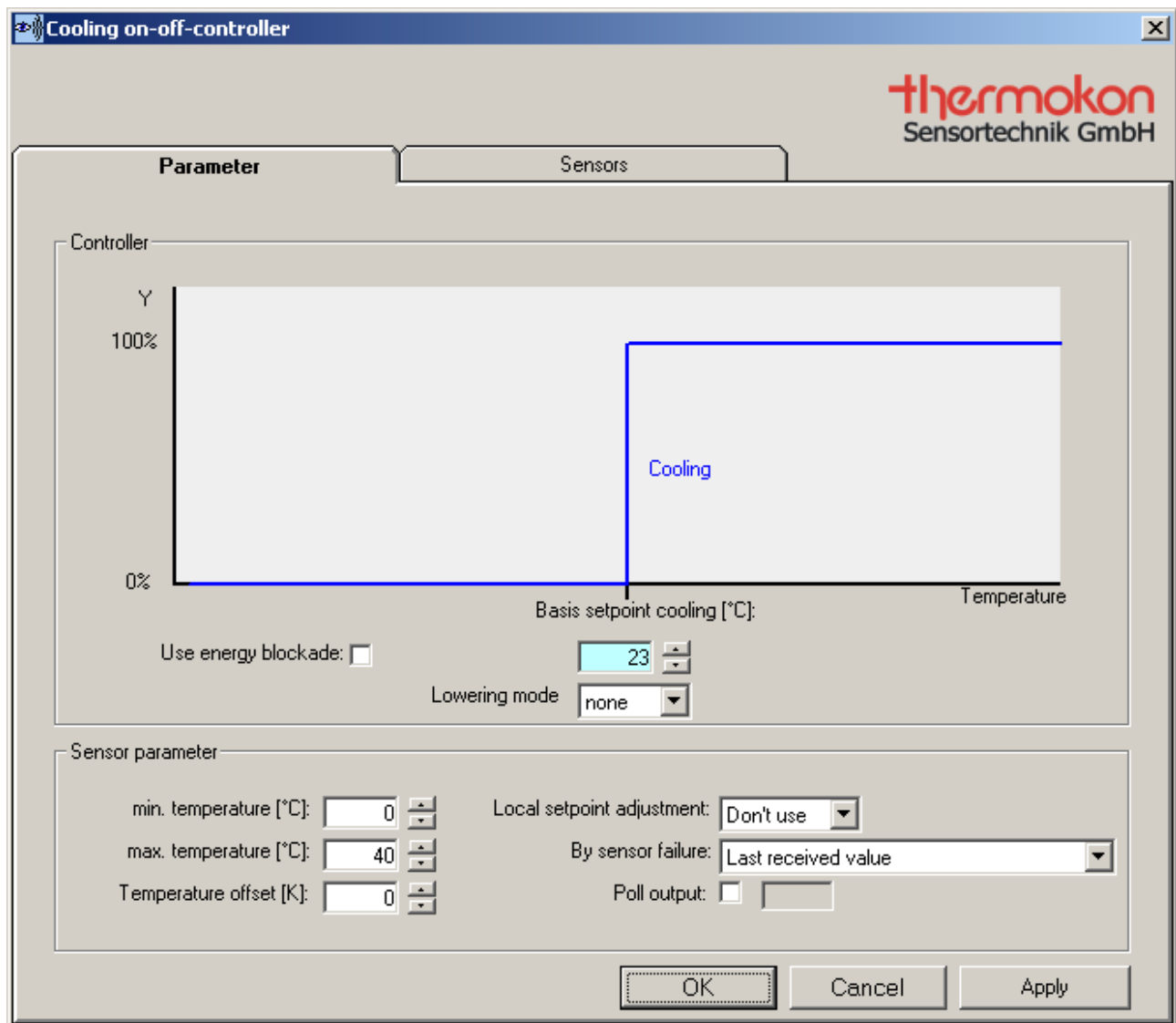
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, 1 SR65 DI or up to 14 occupancy sensors can be allocated.

4.1.2.5 Cooling Two-Point Controller

In the output function „Cooling Two-Point Controller“, a sensor can directly switch a thermionic actuator. If the set point is under-run, the actuator is switched-off. If the set point is exceeded, the actuator is switched-on (picture 4-14). A radio transmitter sends a telegram at a minimal time of 120 sec, thus no switching hysteresis is needed for the controller.



Picture 4-14: Cooling Two-Point Controller

Adjustments of Two-Point Controller

The basic set point can be changed in the corresponding field. With any newly received telegram the output quantity will be calculated again. If a sensor does not send a telegram for a time > 90 min, the output is adjusted to a defined value (see field "Sensor Failure").

Energy Stop

If the energy stop is used, it must be activated. If the energy stop is activated, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. With several window contacts, allocated to the control, all window contacts must be closed, so that the controller can change over to the normal mode, again.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode "Comfort" to the operating mode "Lowering". Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list "local set point adjustment". It is possible to adjust a range from $-3/+3$ K and $-5 / +5$ K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, 1 SR65 DI or up to 14 occupancy sensors can be allocated.

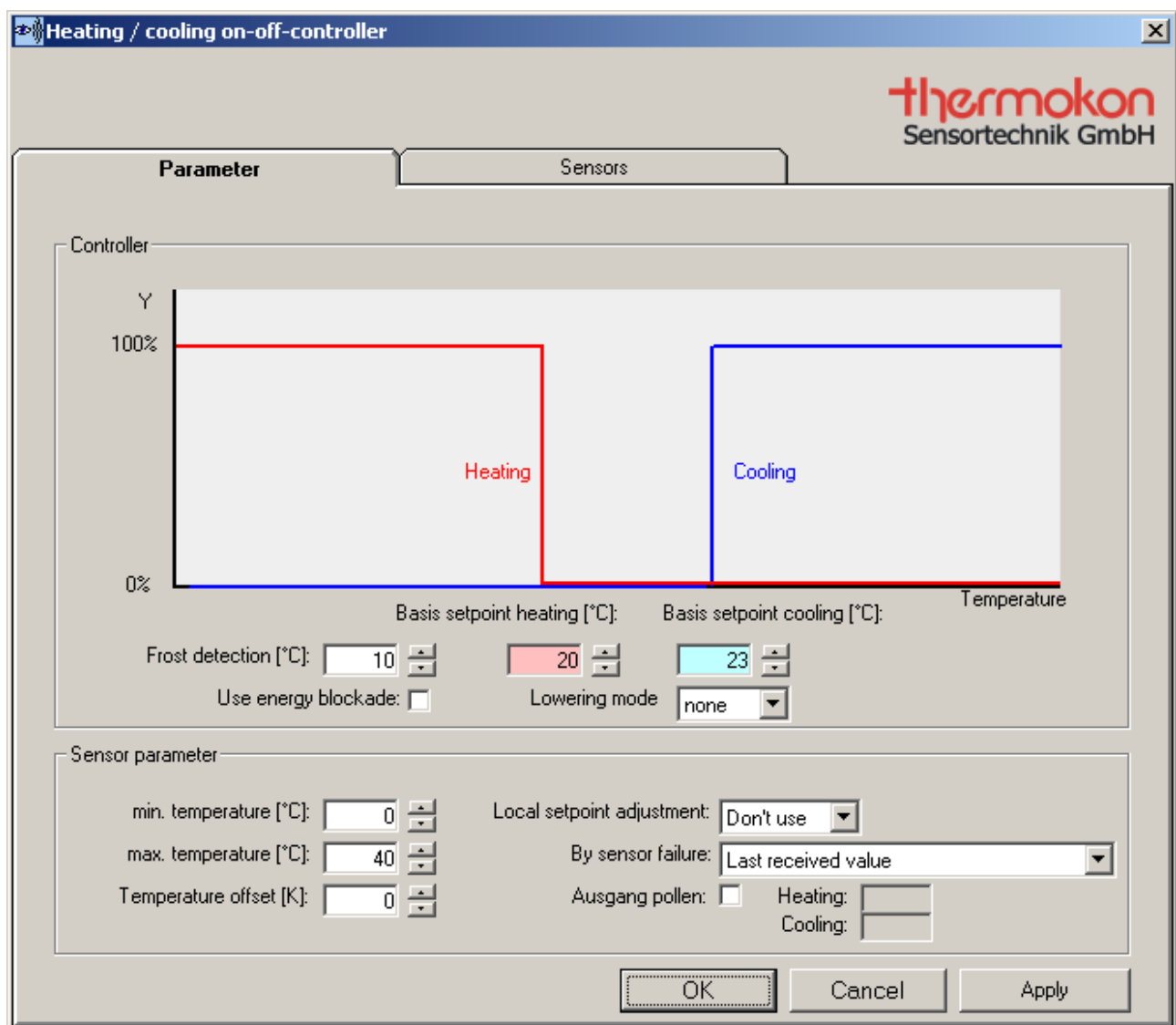
4.1.2.6 Heating / Cooling Two-Point Controller

In the output function „Heating / Cooling Two-Point Controller“ a sensor can directly switch a thermionic two-point actuator (picture 4-12).

If the set point is exceeded respectively under-run, the actuator is switched-on. If the set point is under-run respectively exceeded, the actuator is switched-off (picture 4-15).

The control is made by a sequence. Heating and cooling affect two separate outputs.

The function “Heating/Cooling Two-Point-Controller” is only possible with the outputs DO1 and DO3. The outputs DO2 and DO4 are automatically occupied by cooling, whereas the outputs DO1 and DO3 are occupied by heating. A radio transmitter sends a telegram at a minimal time of 120 sec, so no switching hysteresis is needed for the controller.



Picture 4-15: Heating / Cooling Two-Point Controller

Adjustments of the Two-Point Controller

The basic set point can be changed in the corresponding field. With any newly received telegram the output quantity will be calculated again. If a sensor does not send a telegram for a time > 90 min, the output is adjusted to a defined value (see field "Sensor Failure").

Energy Stop

If the energy stop is used, it must be activated. If the energy stop is activated, the window contacts affect the control. That is to say, if a window was opened, the control variable is set to the minimum control variable. If the window contact is closed, the control goes on working normally. With several window contacts, allocated to the control, all window contacts must be closed, so that the controller can change over to the normal mode, again.

Lowering for Night Operation

When using a slide switch (room sensor SR04P MS) or an additional digital input module (SR65DI) or occupancy sensors (PIR 360° EnOcean, occupancy sensors are logical OR-circuit linked) it is possible to toggle the actuator by a radio signal from the operating mode "Comfort" to the operating mode "Lowering". Possible lowering temperatures are None, 2 K, 4 K, 6 K, 8 K.

Measuring Range Temperature Sensor

In the sensor parameters, the measuring range of the sensors must be stated. Thus, the corresponding values must be entered in „min. temperature“ and „max. temperature“.

Via the field „Offset“ an offset for the sensor can be entered. If the corresponding sensor has a set point adjuster, the range can be selected in the selection list "local set point adjustment". It is possible to adjust a range from -3/+3 K and -5 / +5 K.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor or a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a sensor / window contact is sending again after a failure, the output goes on working normally.

Output Polling

In the field „output polling“, the current status of the output can be displayed by activation of the hook.

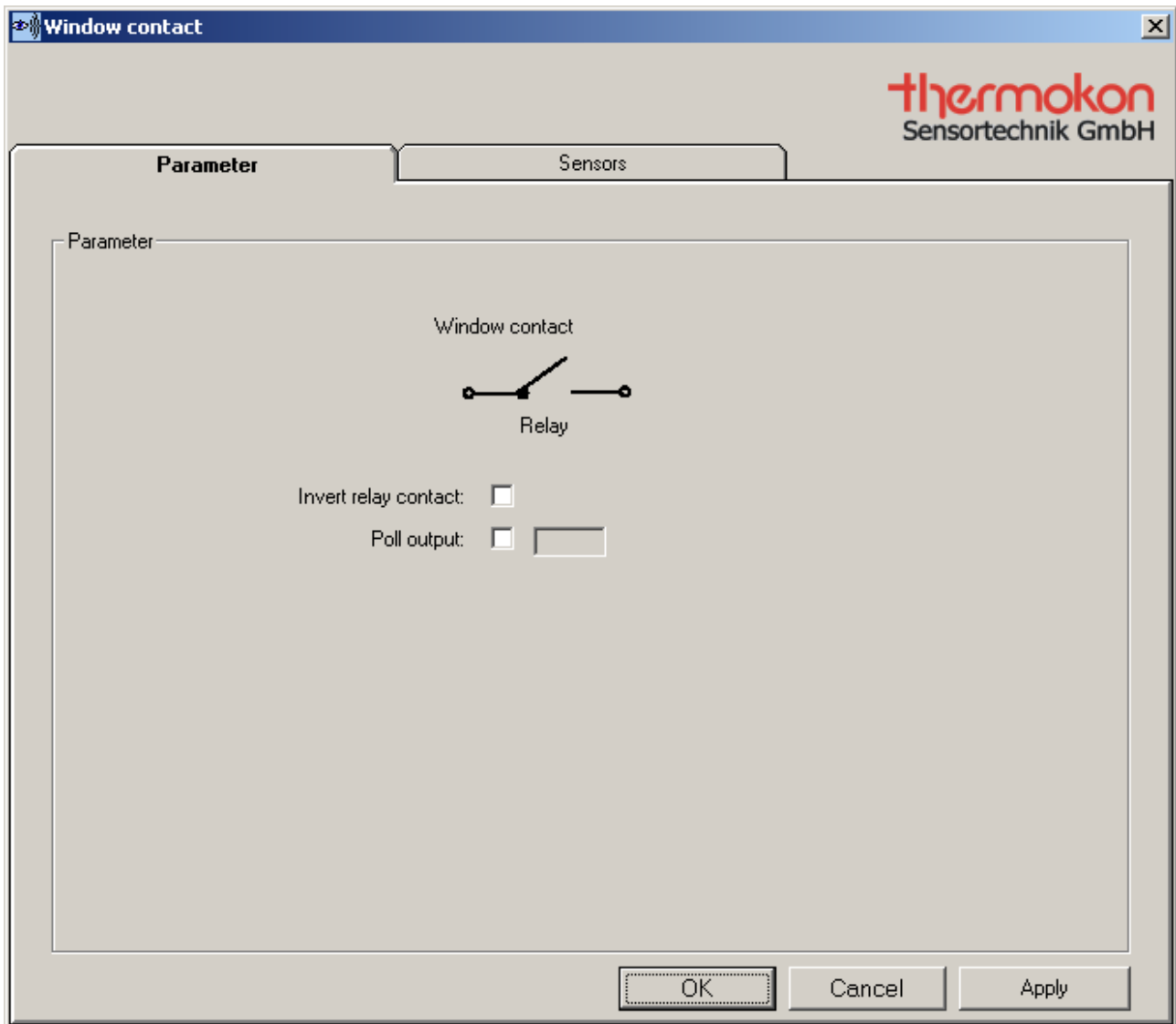
Number of Sensors

It is possible to select 1 sensor and up to 14 window contacts and to allocate them to the output. When using the lowering function for night operation, 1 SR65 DI or up to 14 occupancy sensors can be allocated.

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4.1.2.7 Pilot Relais / Window Contact

In the output function „Pilot Relay / Window Contact“ a sensor can switch the digital output (On – Off) (picture 4-16).



Picture 4-16: Pilot Relais

Scaling Output Variable

The relay contact can be inverted by activating the hook.

Several pilot relays can be learned-in. The contacts are logical AND circuit linked. That is to say, all contacts must be closed, so that the relays can change to their status again.

Monitoring Times of Sensors

The monitoring time of a window contact amounts to 90 min. If a window contact fails, the same is ignored after 90 min and does not affect the control any more. If a window contact is sending again after a failure, the output goes on working normally.

Output Polling

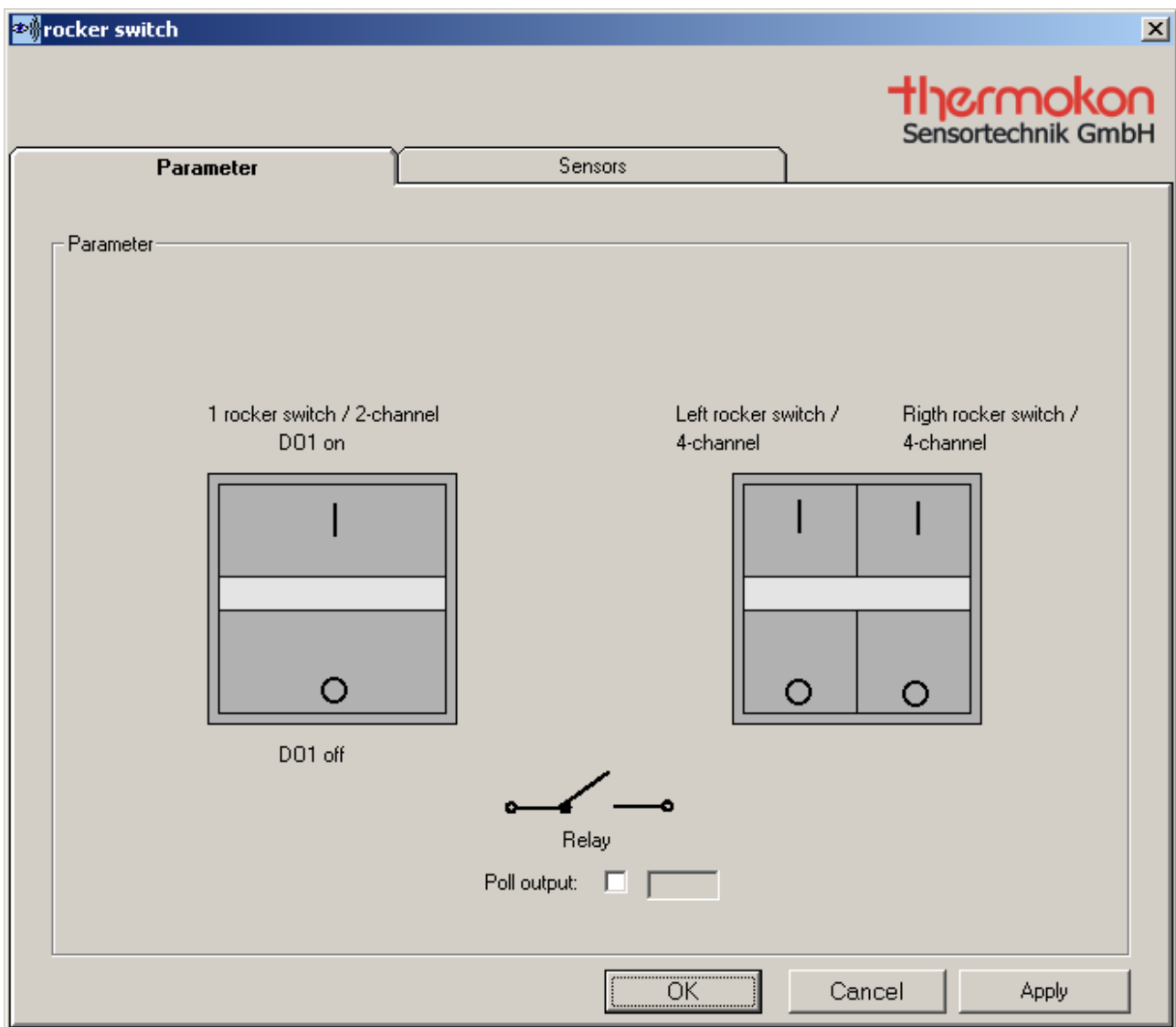
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select up to 15 window contacts and to allocate them the an output.

4.1.2.8 Switch 1 Rocker

In the output function “Switch 1 Rocker“ a switch can switch the digital output (On – Off) (Picutre 4-17).



Picture 4-17: 2-Channel Button

Output Polling

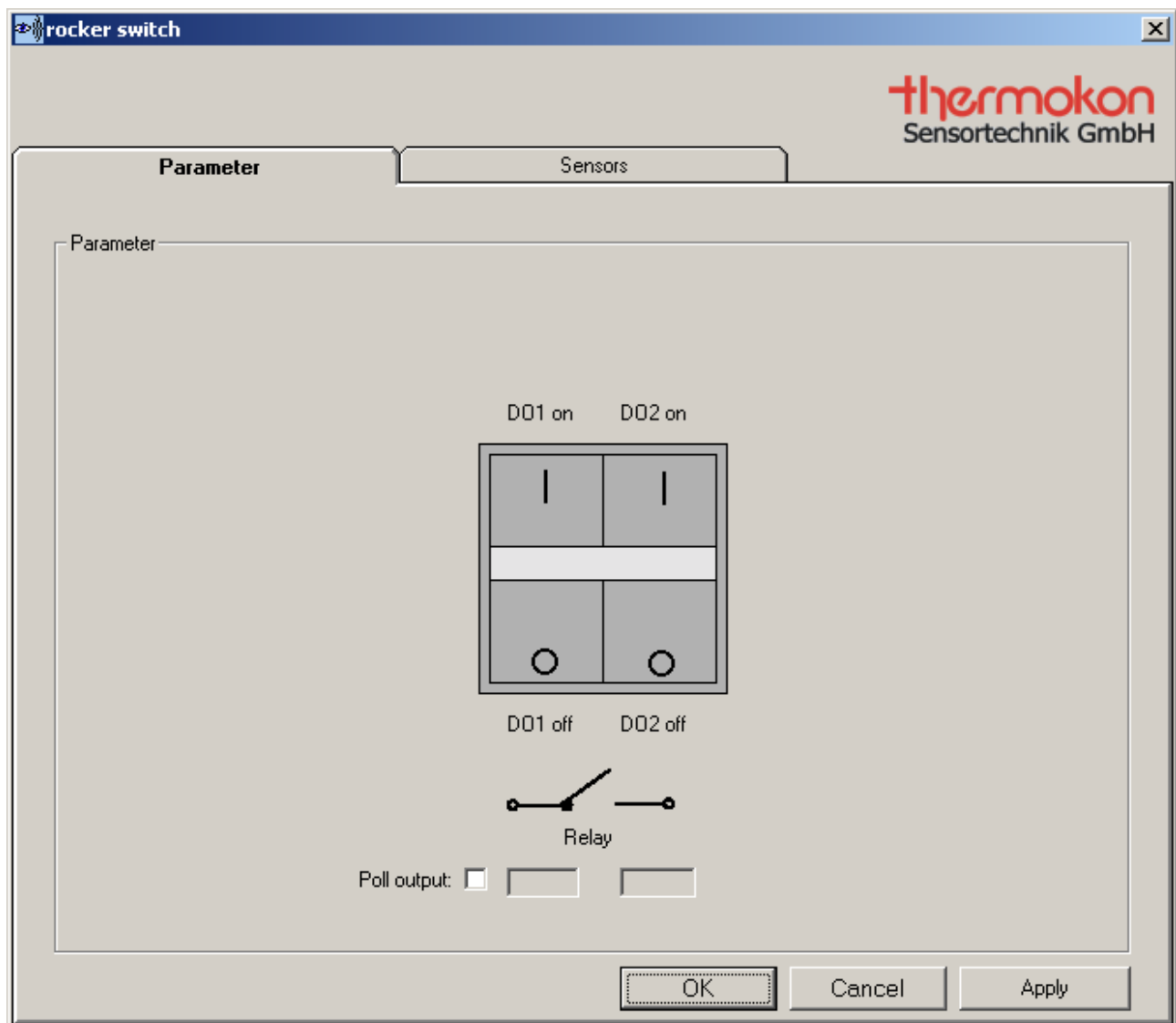
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select up to 15 window contacts and to allocate them the an output

4.1.2.9 Switch 2 Rocker / 4-Channel

In the output function „Switch 2 Rocker / 4-Channel“ a 4-channel key (switch with 2 rockers) can switch two digital outputs (On - Off) (Picture 4-18). The 4-channel key affects 2 outputs. The first output switches the left rocker and the second output the right rocker. The function 4-channel key is only possible with the output DO1 respectively DO3.



Picture 4-18: 4-Channel Button

Output Polling

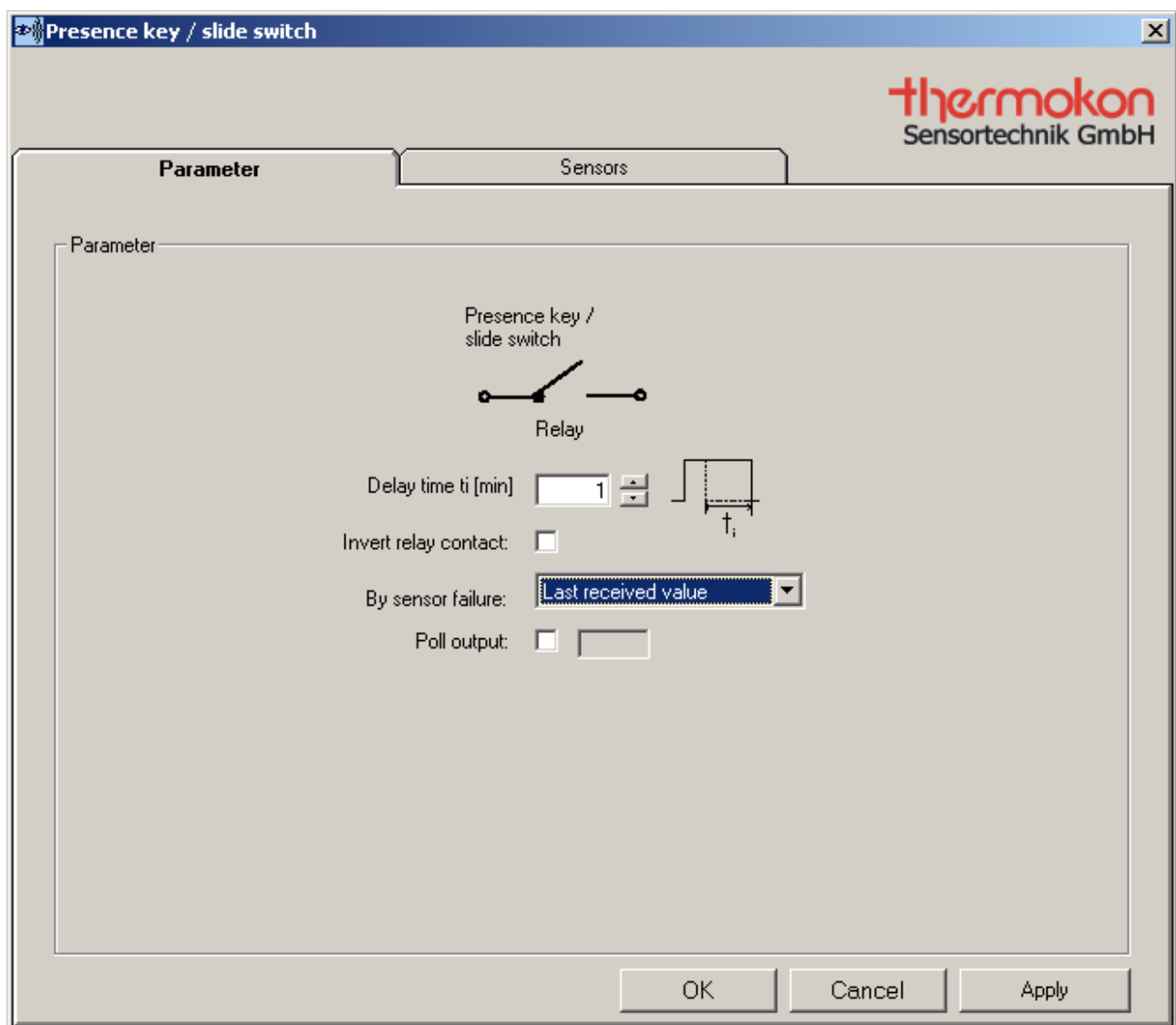
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select up to 15 4-channel keys and to allocate them the an output.

4.1.2.10 Presence Key / Sliding Switch

In the output function „Presence Key / Sliding Switch“ a presence key / sliding switch can switch a digital output (On- Off) (picture 4-19).



Picture 4-19: Presence Key / Sliding Switch

Impulse Time

Switching-off delay in minutes (0-255).

Scaling Output Variable

The relay contact can be inverted by activation of the hook.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

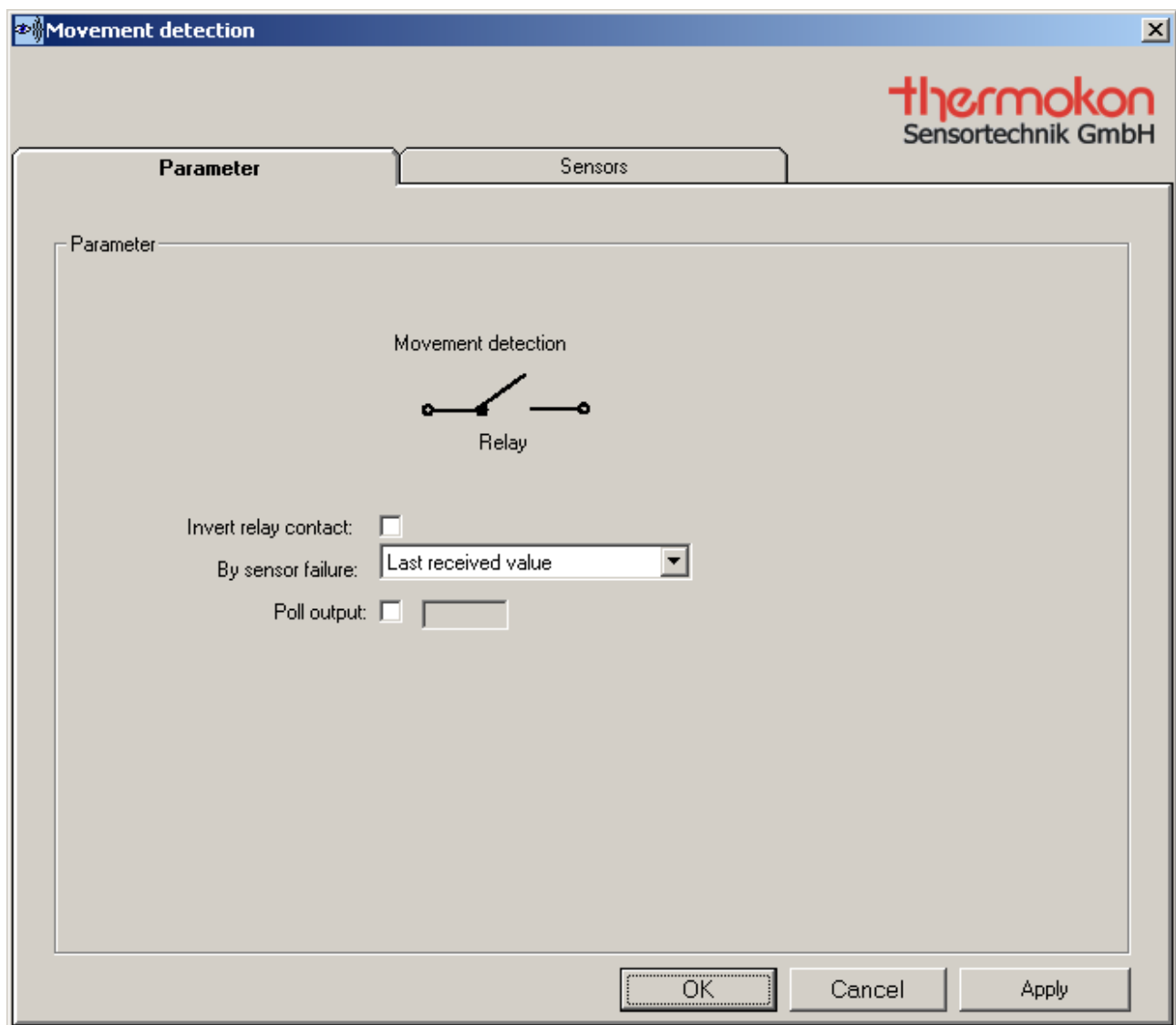
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and to allocate it to the output.

4.1.2.11 Movement

In the output function „Movement“ an occupancy sensor can switch an digital output (On-Off) (picture 4-20).



Picture 4-20: Movement

Scaling Output Variables

The relay contact can be inverted by activation of the hook. Several occupancy sensors can be learned-in. The contacts are logical AND circuit linked, i.e. all contacts must be closed, so that the relay can change over to its status again.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

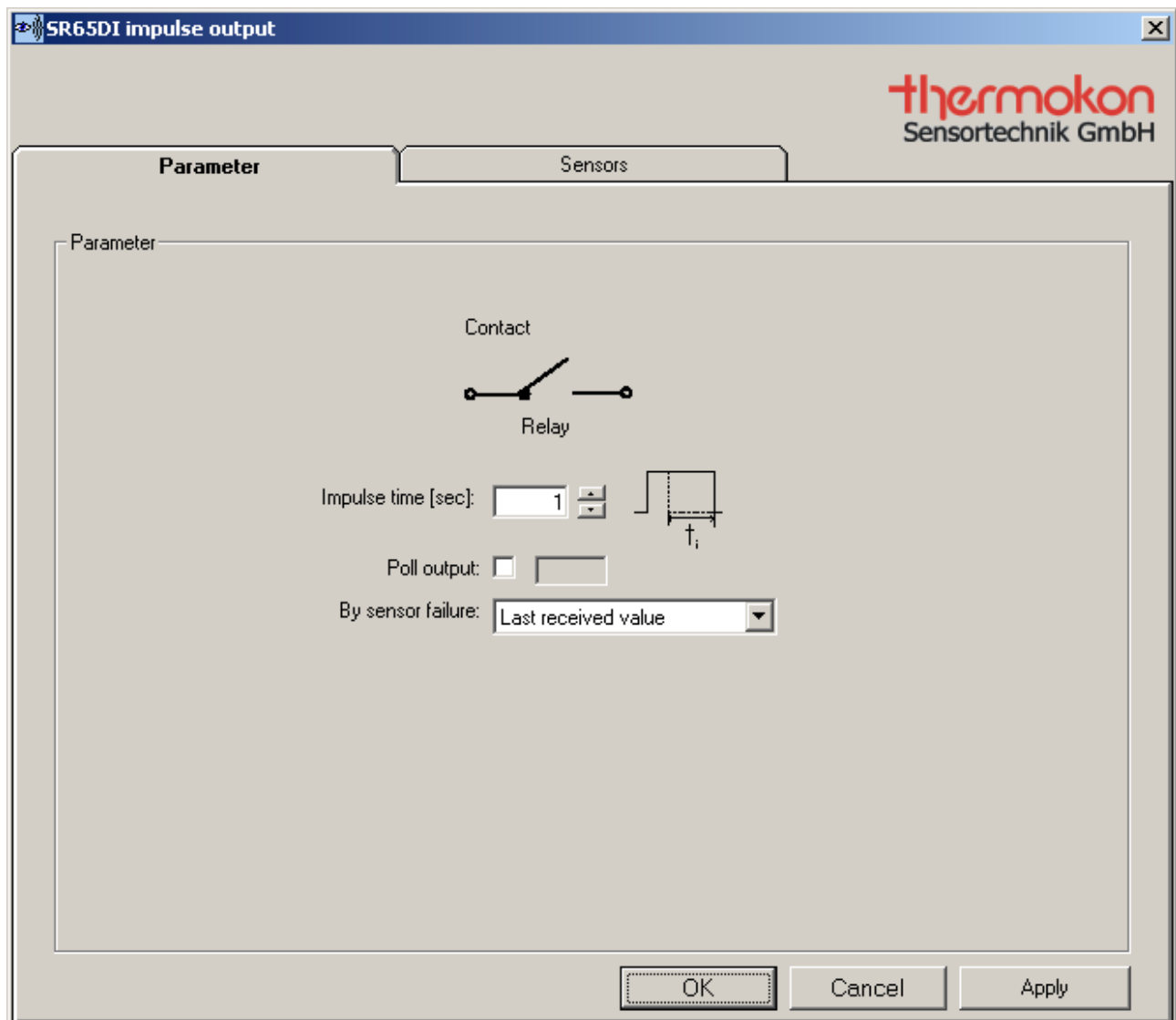
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select up to 15 occupancy sensors and to allocate them to the output.

4.1.2.12 Sensor SR65DI DO

In the output function „SR65DI DO“ a SR65DI sensor can switch a digital output (On-Off) (picture 4-21) which is used for counting impulses

**Picture 4-21: SR65DI DO**

Impulse Time

The impulse time shows how long a relay should be switched.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field "sensor failure". The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

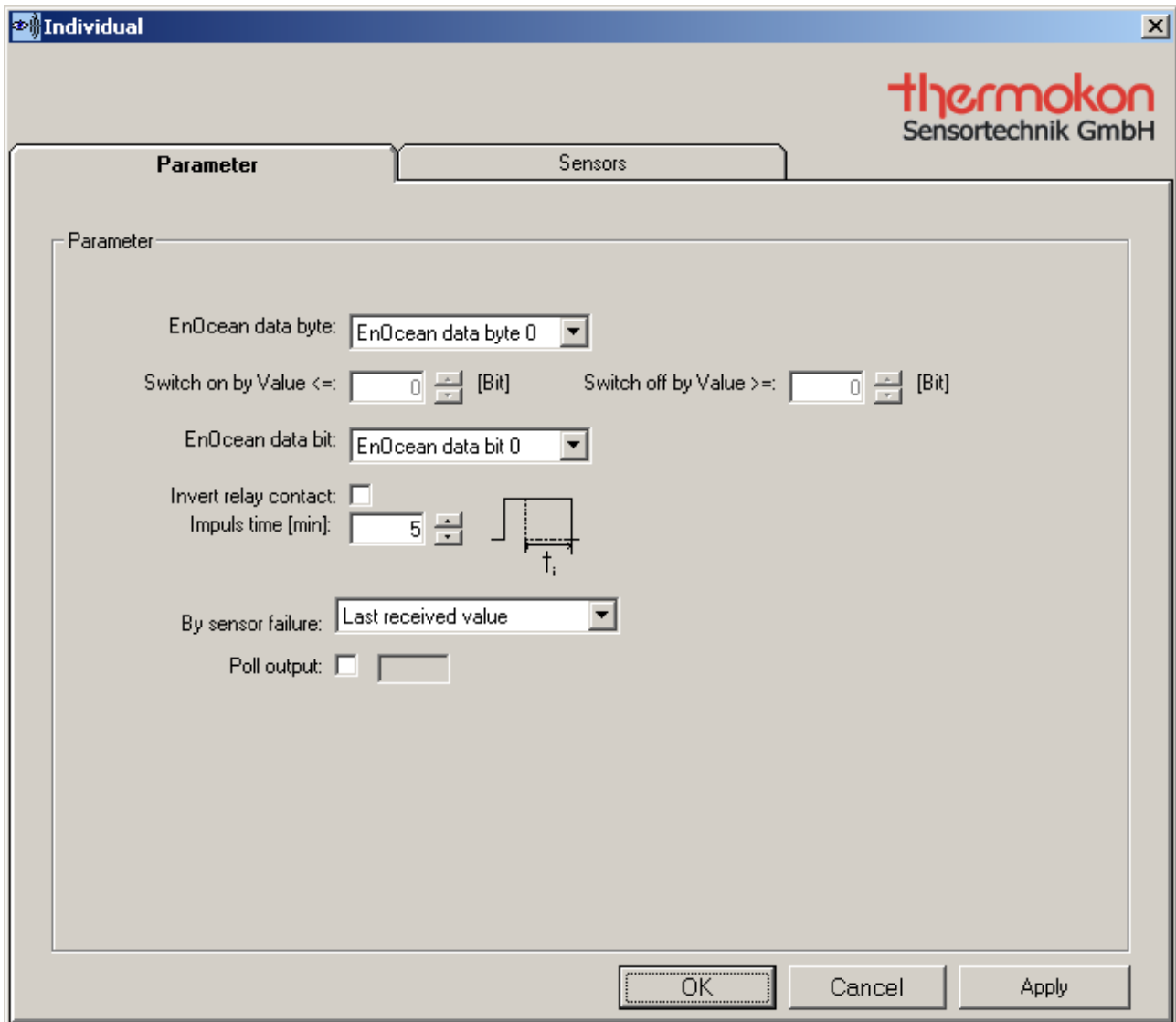
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and to allocate the same to the output.

4.1.2.13 Individual

In the output function “Individual” an EnOcean data byte of a sensor can switch a digital output (On – Off) (picture 4-22).



Picture 4-22: Individual

Scaling of Output Quantity

When selecting the “EnOcean-data byte 0” the data bits which should switch the output can be selected. With the “EnOcean-data bytes 1-3” thresholds can be input between the which the output should switch. Note:

If the impulse time becomes > 0 , the switching-off value is not considered.

By setting a hook with “invert relais contact” the output is inverted.

Monitoring Times of Sensors

If a sensor fails, a defined value can be allocated to the output. The value can be adjusted via the field “sensor failure”. The monitoring time of a sensor amounts to 90 min. If a sensor is sending again after a failure, the output goes on working normally.

Output Polling

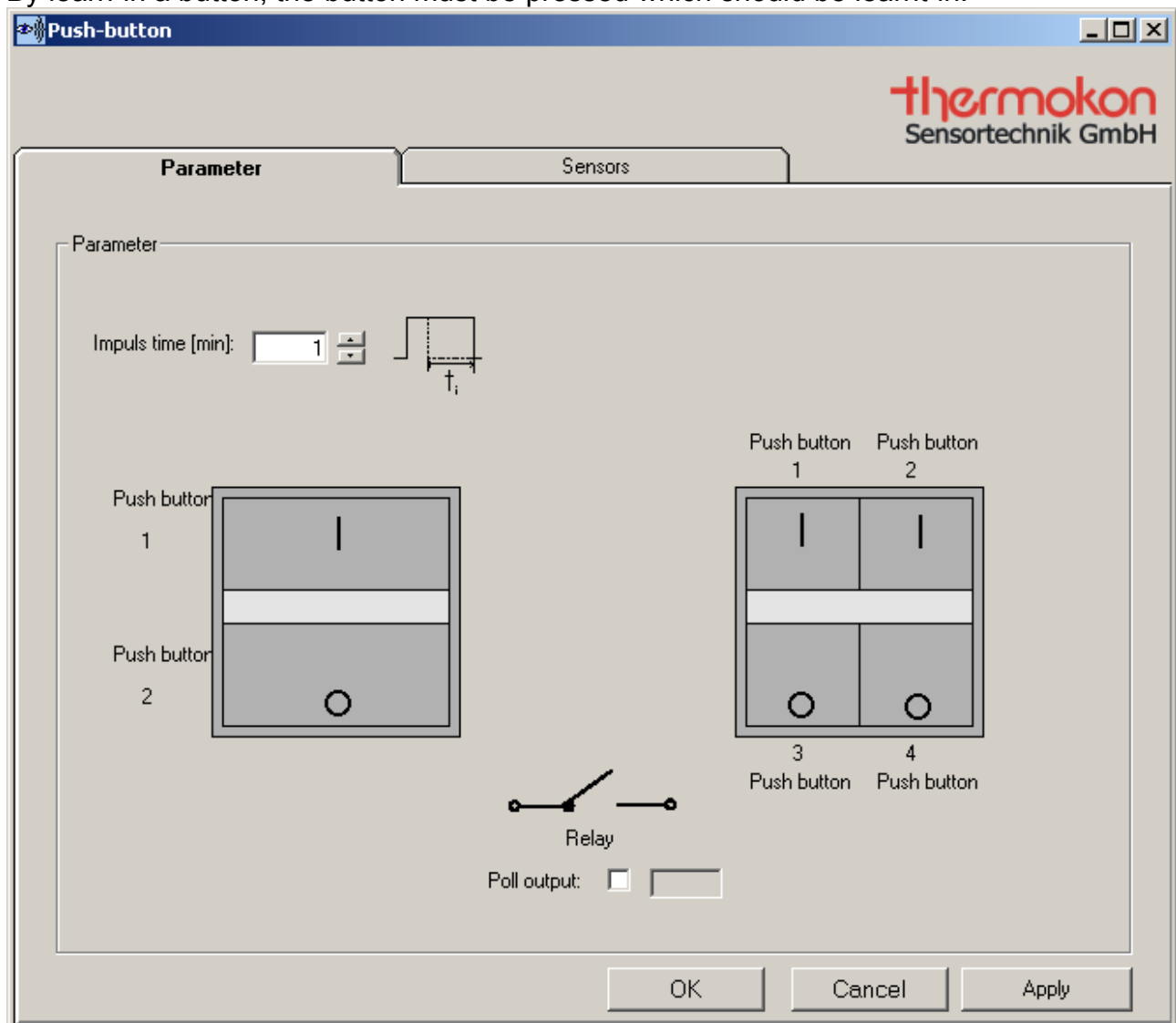
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select 1 sensor and to allocate the same to the output.

4.1.2.14 Buttons

In the output function “Button“ a button can switch a digital output (On – Off) (Picture 4-23). By learn-in a button, the button must be pressed which should be learnt-in.



Picture 4-23: Button

Impulse Time

Switching-off delay in minutes (0-255).

Output Polling

In the field “Output Polling“ the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select up to 15 buttons and to allocate them to an output.

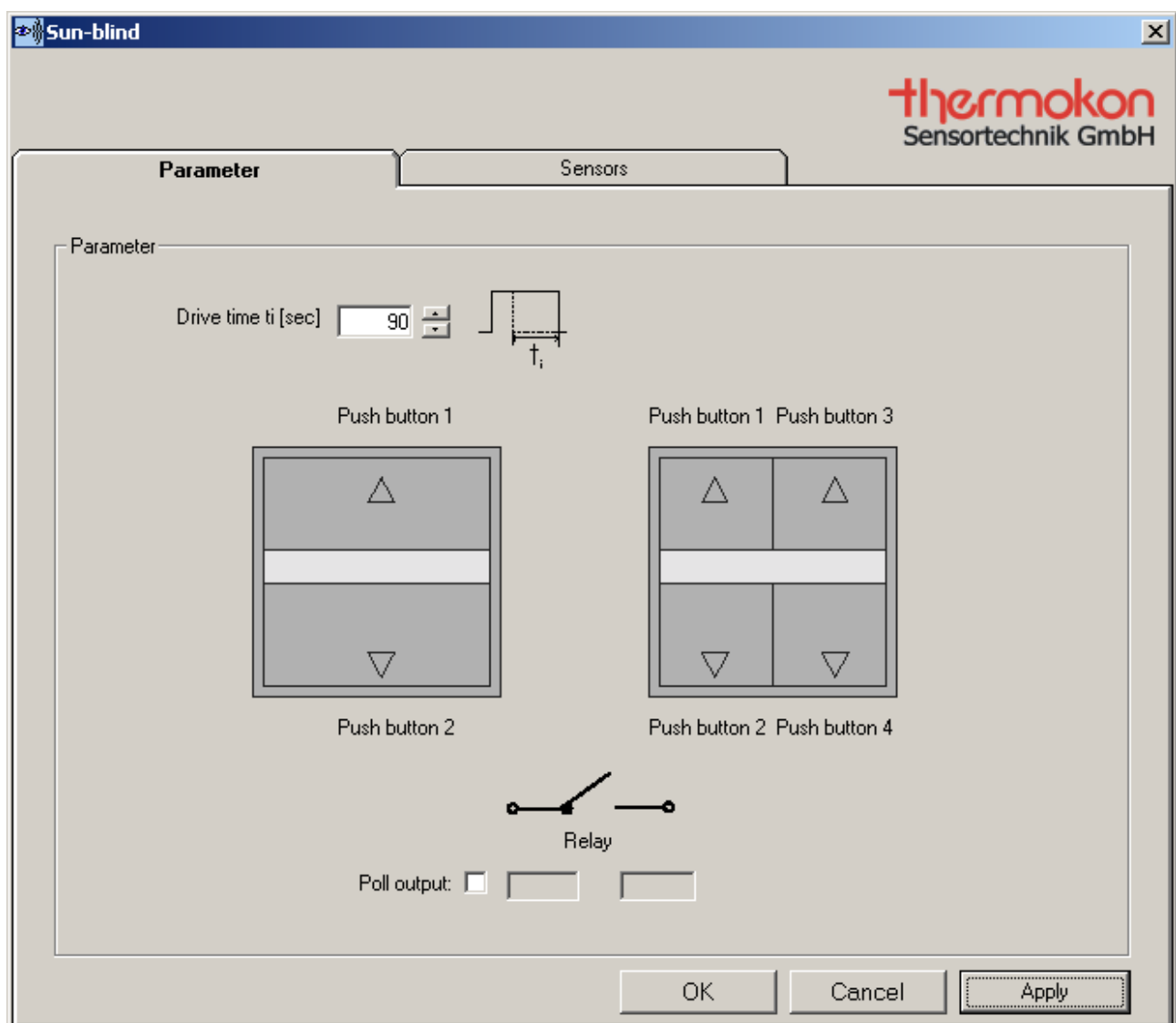
4.1.2.15 Sun-blind

In the output function “Sun-blind“ a button can switch a sun-blind up and down (Picture 4-24: Sun-blind). The function sun-blind is only possible with the output DO1 respectively DO3. The outputs DO2 respectively DO 4 are used for sun-blind function automatically.

A rocker acts on two 2 relay outputs. The button (▲) affects the output DO1 respectively DO3. The button (▼) acts on the output DO2 respectively DO4. With regard to the software, the outputs are disabled against each other.

When learning-in a 4-channel key (2 rockers), one button of the rocker, that shall act on the output, must be pressed.

After a button of the rocker is pressed for more than 1 second, the automatic run is activated. The automatic run is deactivated after the expiration of the adjusted delay time or after pressing a button of the rocker.



Picture 4-24: Sun-blind

Drive time

Turn-on time of the blind motors in the automatic run in seconds (0-255).

Output Polling

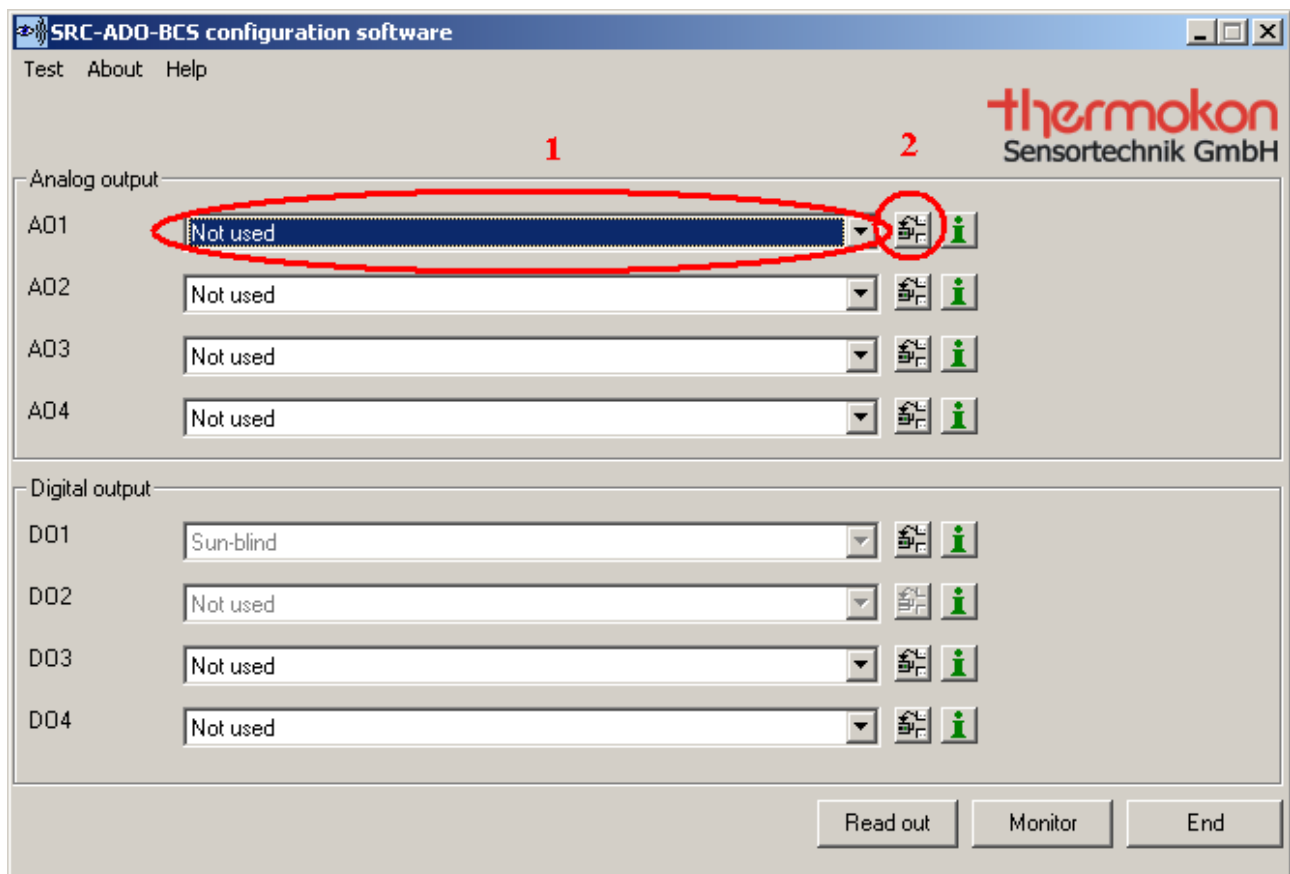
In the field „output polling“, the current status of the output can be displayed by activation of the hook.

Number of Sensors

It is possible to select up to 15 4-channel keys and to allocate them the an output.

4.2 Deleting an output

For deleting an output no sensor should be allocated to the output. In register card sensors should be no hook by chosen. For deleting an output chose in main menu “Not used” (1). Then use button “sensor configuration” (2). (Picture 4-25: Deleting Output).



Picture 4-25: Deleting Output

4.3 Register Card Sensors

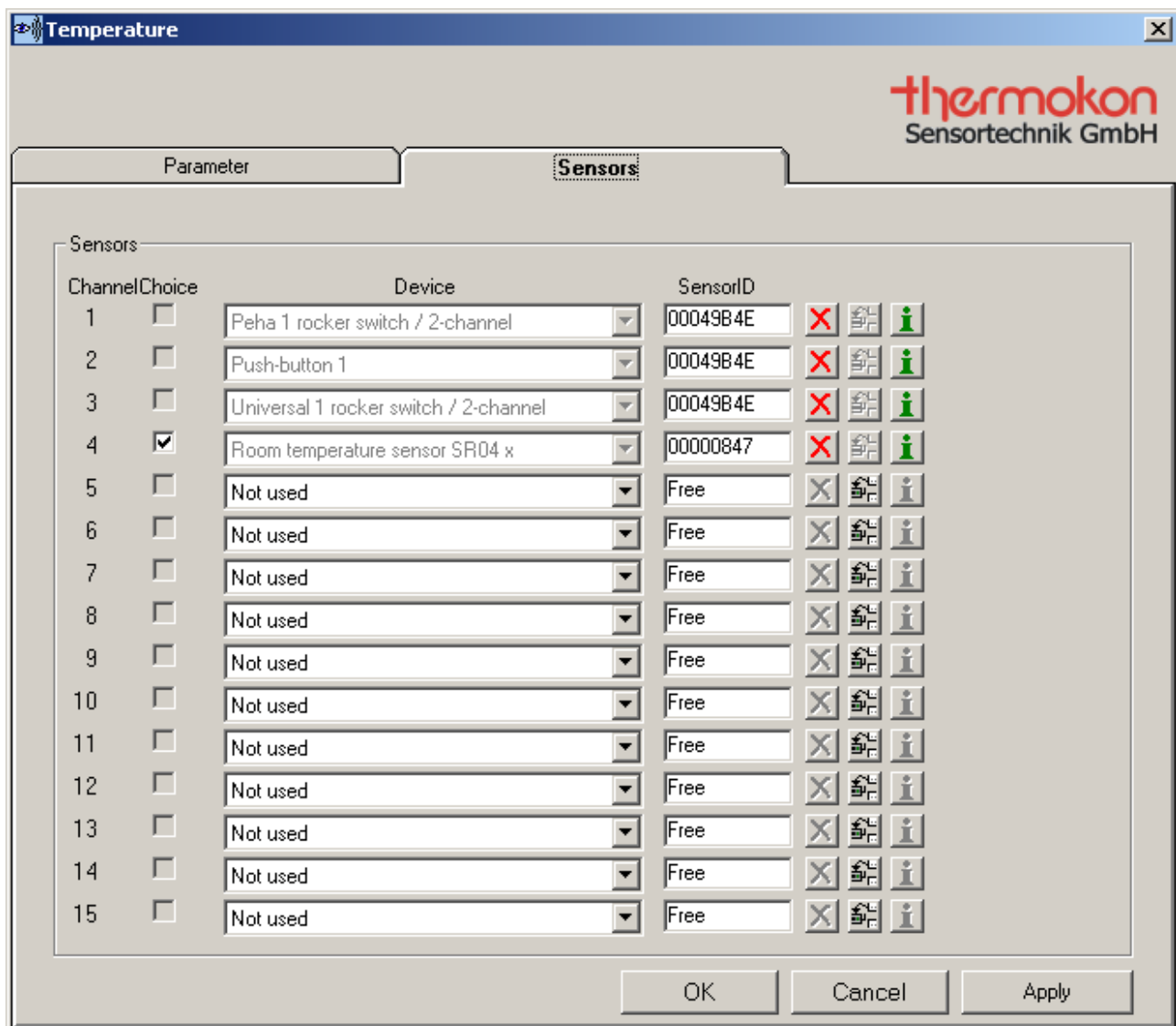
In the register card „Sensors“ sensors can be learned-in and allocated to the output. At maximum, 15 sensors can be learned-in and allocated to the output by a hook with „selection“.

Attention:

When allocating several sensors to one output, the sensors must have the same measuring range.

4.3.1 Device Types

Depending on the outputs, different device types can be learned-in. For example it is not possible to learn-in a key to an analog output.



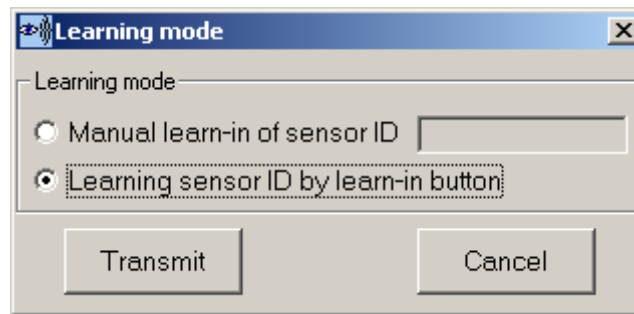
ChannelChoice	Device	SensorID			
<input type="checkbox"/>	Peha 1 rocker switch / 2-channel	00049B4E	X	☒	👤
<input type="checkbox"/>	Push-button 1	00049B4E	X	☒	👤
<input type="checkbox"/>	Universal 1 rocker switch / 2-channel	00049B4E	X	☒	👤
<input checked="" type="checkbox"/>	Room temperature sensor SR04 x	00000847	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤
<input type="checkbox"/>	Not used	Free	X	☒	👤

OK Cancel Apply

Picture 4-26: Sensors

4.3.2 Learning-In

For learning-in a sensor, the „SensorID learn-in“ –button must be actuated. The learning-in window is displayed (picture 4-24) when a device type was selected.




Picture 4-27: Learning-In Window

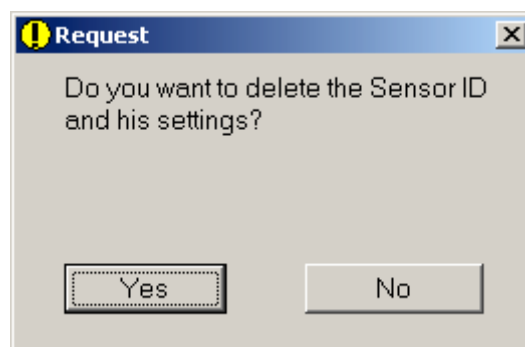
If the SensorID of the sensor is known, the same can be entered manually. Otherwise an sensor can be learned-in via the learning-in button. For learning-in of keys, any rocker must be actuated for the learning-in process. A manual input of the sensor ID for the buttons is not possible.

With the calculation of an average value, several sensors can be selected. Otherwise, only one.

By means of a hook in the selection field of the rider „Sensor“ a sensor is allocated to the output. If **no** hook is set, the same does not affect the output.

4.3.3 Clearing of Sensors

For clearing a sensor, the button  „Erase SensorID “ must be actuated. The clearing window appears (picture 4-25).




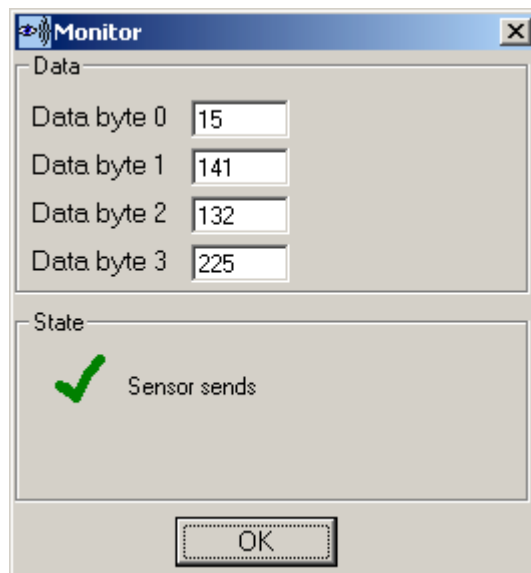
Picutre 4-28: Clearing Window

If the inquiry is confirmed, the sensor will be deleted.

All sensors can be deleted in one go in the window “monitor” (must be called-off in the main window).

4.3.4 Info

By means of the info button  (picture 4-26) the data bytes of the sensor are displayed.



Picture 4-29: Monitor

For the precise meaning of the individual data bytes, please see the product data sheet of the sensor manufacturer.

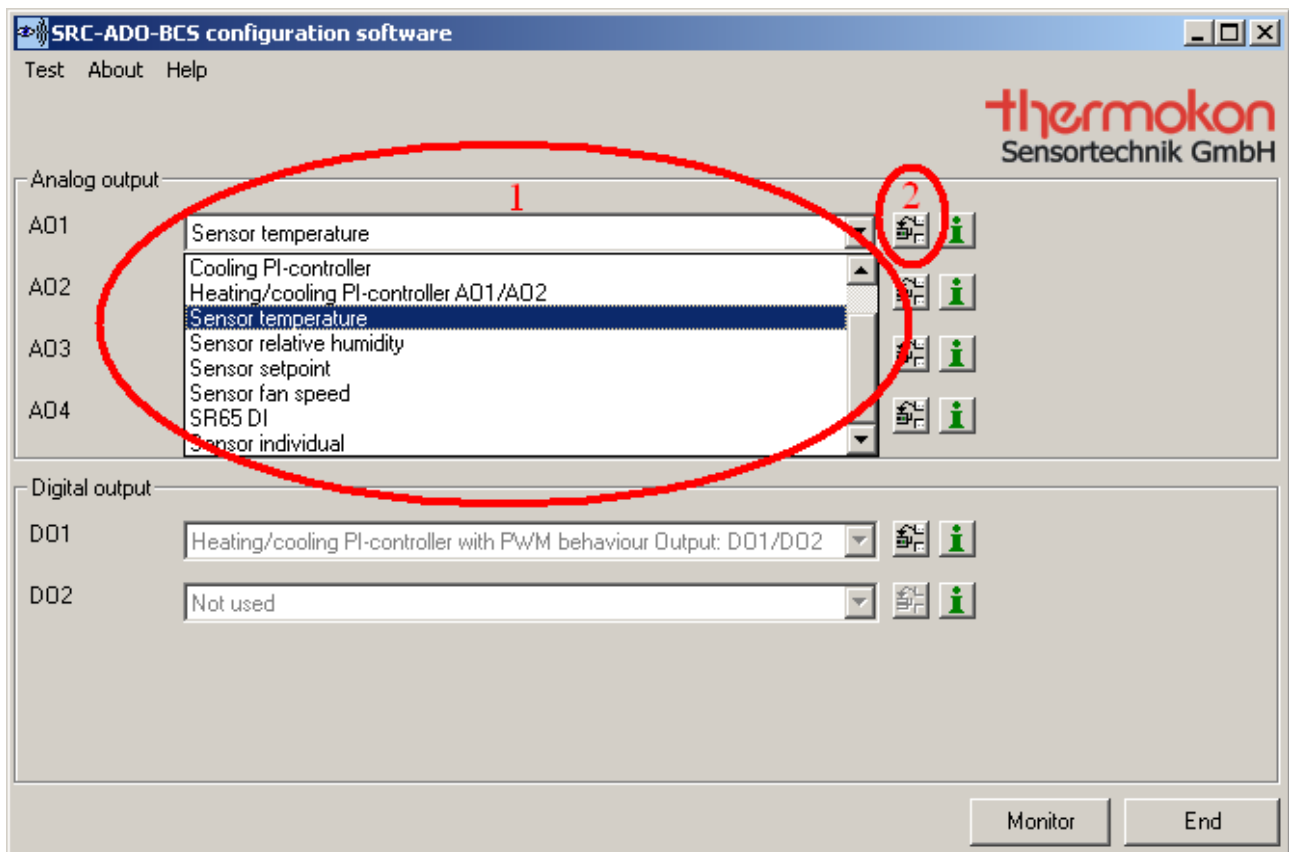
4.3.5 Selection

By means of the hook in the field „selection“, the sensor is allocated to the output. If no hook is set, the sensor does not affect the output.

5 Configuration Examples

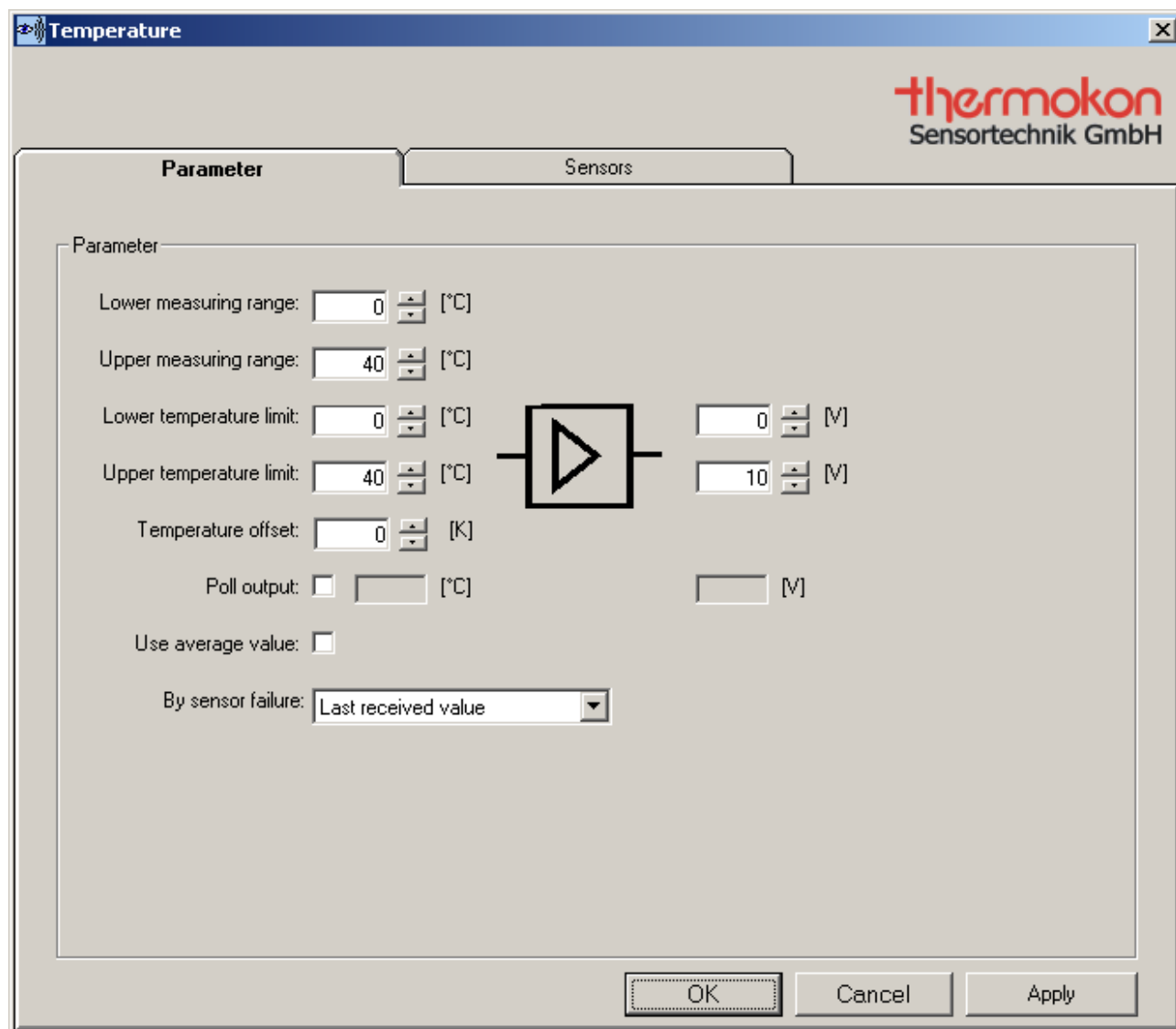
5.1 Sensor Temperature on AO1

Select the requested function, here „Sensor Temperature AO1“, in the output function list(1).



Picture 5-1: Selection Sensor Temperature AO1

The output must be configured and a sensor must be allocated to the output. Therefore, actuate the button “configure output” (2).

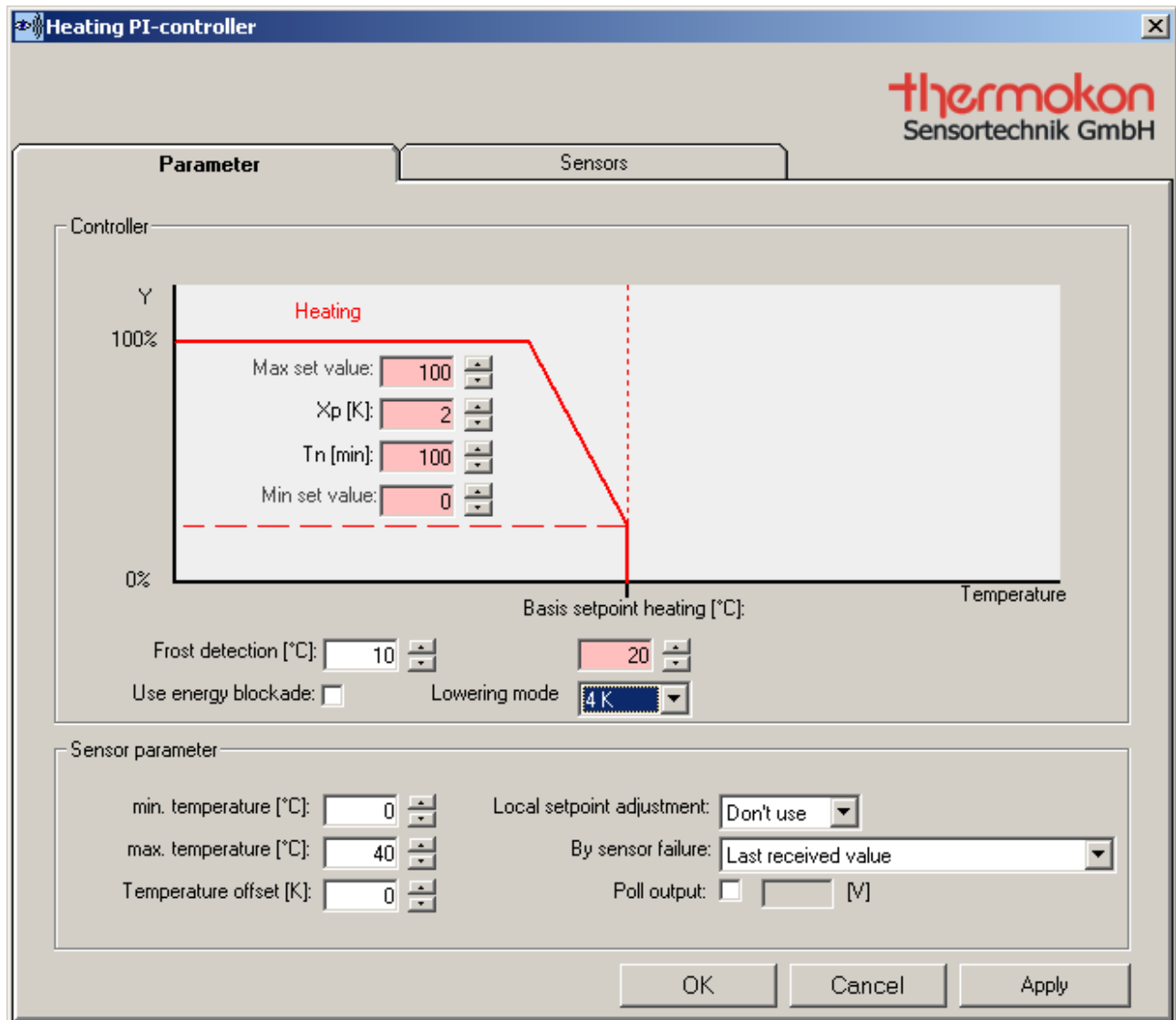
**Picture5-2: Parameter**

In the parameter “rider” a scaling of the sensor is possible.

If no parameters should be amended, it can be changed in the rider “sensors”.

5.2 Control: Heating-PI on AO2

In order to build up a control circuit, the requested function must be allocated to the output. Afterwards, change into the parameter window and adjust the required function.



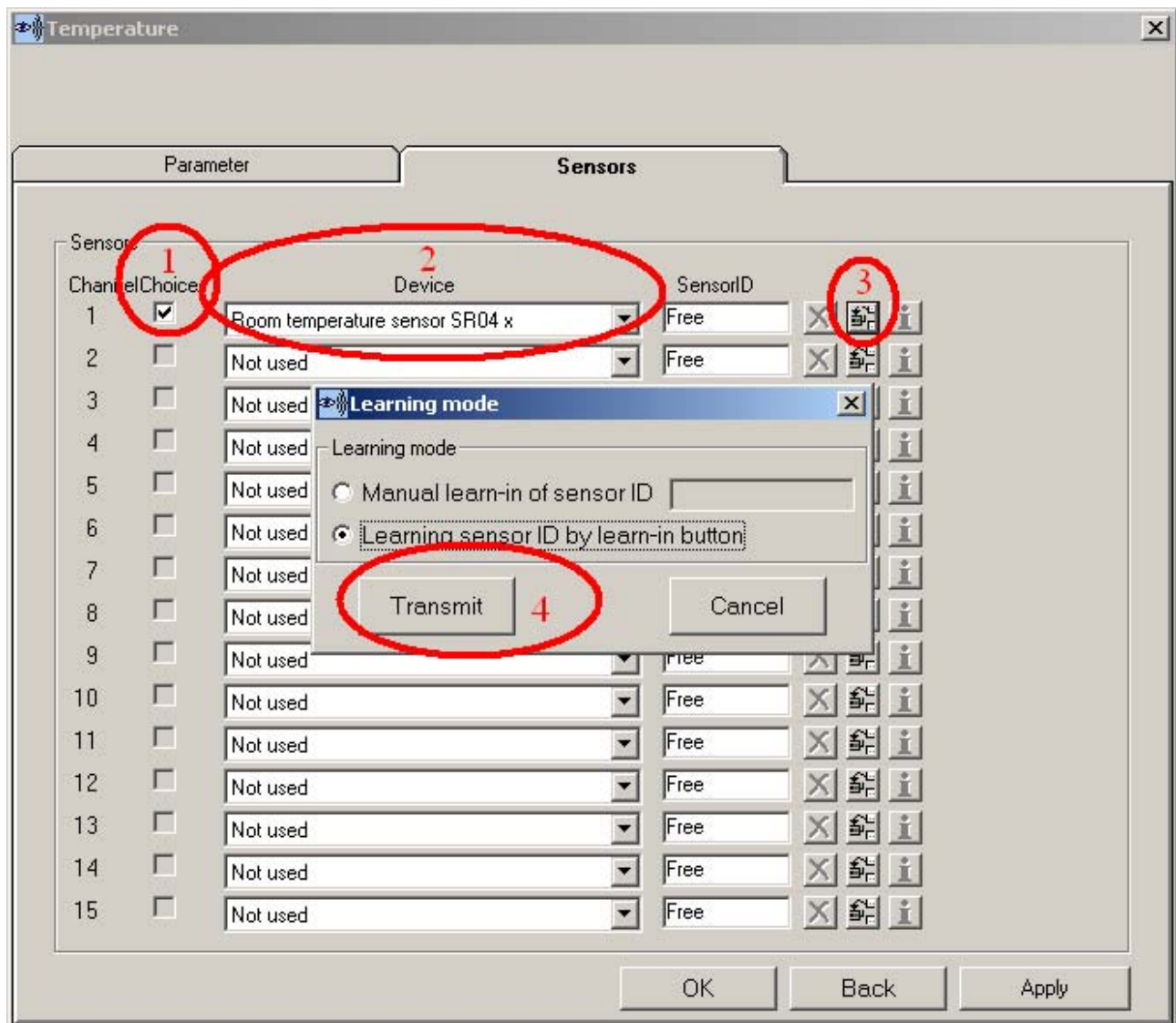
Picture 5-3: Heating PI on AO2

A local set point relocation of $\pm 3\text{K}$ was selected. That is to say, the set point can be adjusted from $17 - 23^\circ\text{C}$. The energy stop function was chosen, so that window contacts can be allocated to the output. If a window is opened, the control variable amounts to 0% as long as the anti-freeze limit is achieved.

If the anti-freeze is under-run, the control variable is 100%. Moreover a lowering for night operation of 4K was chosen.

5.3 Learning-In of Sensors

After the parameters of the output are set, sensors must be allocated to the output. A sensor is allocated to the output by setting a hook in the field “selection”. It is only possible to allocate suitable sensors to the output. Thus, it is not possible to allocate a key to a temperature output.



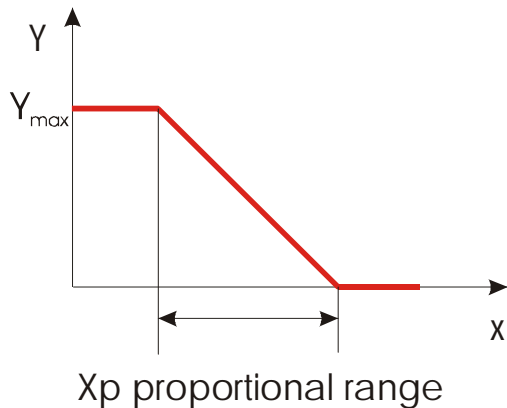
Picture 5-4: Learning-in of Sensors

Select the device type (2) and actuate the button „learning-in of sensors“ (3). Now the window “learning-in of sensors” appears and a sensor can be learned-in, accordingly (4).

6 Controller Adjustment

In this chapter some controller definitions are listed.

6.1 Xp Proportional Range



X_p is the proportional range between controller difference and control variable (difference between actual value and set point).

Conversion from gain X_p to the proportionality constant k_r :

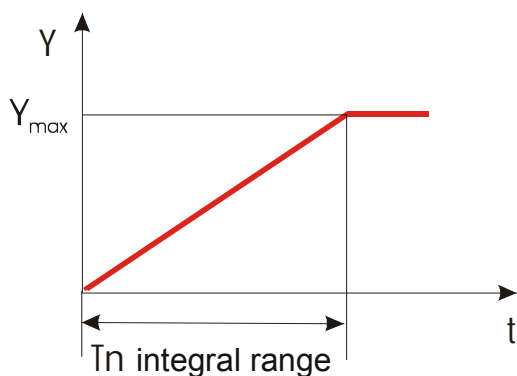
$$k_r = \frac{Y_h}{X_p} \quad \text{example: } X_p = 2K; k_r = \frac{100\%}{2K}; k_r = 50 \frac{\%}{K}$$

x temperature

Y_h control variable

k_r proportionality constant

6.2 Tn Integral Time



Tn describes the integral range. The integral range is the time which an I-controller needs to achieve the same control variable change, which is effected instantly by a PI-controller due to its P-part.

6.3 Typical Controller Settings

Hot water heating:	Xp=5K / Tn=150min
Underfloor heating:	Xp=5K / Tn=240min
Electric heating:	Xp=4K / Tn=90min
Fan heating:	Xp=4K / Tn=90min

7 Version Change

The extended functions in the Version 1.4 runs up the SRC-ADO-BCS hardwareversion (HV) 1.4.

Version 1.4

- Renaming of the button functions in the switch
- Configuration Temperature
 - Scaling of temperature
 - Offset-input for temperature
- Configuration Switch
 - A rocker of a 4-channel key can be learned-in individually into switch 1 rocker.
- Button
 - New button functions
 - Switching-on of digital output by pressing one button and switching-off of the digital output when letting off the button.
 - Adjustable switching-off delay in minutes (0-255)

The extended functionality of version 1.6 only runs from the SRC-ADO-BCS hardware version (HV) 1.5.

Version 1.5

- Controlled lowering for night operation possible
- Switching-off delay for presence key / slide switch

Version 2.0

- Sun-blind function