







AXS004_SW

THERMOSTAT

AXS004_SW

STC (Standby Touch Recovery) & AAB (Adjustable Automatic Backlight) Technology. We use high-end embedded technology to design innovative scenarios.









THERMOSTAT

General description

The AXS004_SW Thermostat is Calirom's room thermostat for the BMS solution. The thermostat is a wall mounted equipment. It can be installed in a European standard 3 module electric box.

The thermostat is not intended to control any high voltage fan-coil by itself. All the wirings are for low voltage only. The high voltage driver is part of the AXS004_MCM6R10 room controller and resides in the room's main electrical box.The thermostat has the Calirom's Room Bus RS485 half-duplex interface to communicate with the AXS004_MCM6R10 room controller module.

BY CALIROM

Features

The Thermostat is a wall mounted device with a standard 3 module-wide front panel, having a glass finishing. The image from below presents the standard front panel with all its graphical elements. The thermostat has 6 thermal regimes each with its own parameter set. Each regime can be configured to operate according to a particular room status. For each regime it is possible to set the LOW and HIGH temperature limit, the SET temperature what can either be a VALUE or an INTERVAL, the LOCKED status of the keyboard, and the MUTE option for the internal beeper.



1 - 4 digit, 7 segment LED display used to show the current or the set temperature and several other parameters.

2 - Ambient Light Sensor used for automatic light intensity adjustment of the display and the back-lights of the touch keys.

3 - Touch keypad consisting of 3 capacitive touch buttons for temperature setting, fan speed setting and ON/OFF setting of the unit.



Temperature Up (Touch button) Controls the temperature



Fan Speed (Touch Button) Controls Fan Speed



Temperature down (Touch Button) Controls the temperature





The Display

The LED display can either have RED or GREEN color and this option must be clarified before purchasing. The main purpose of the display is to show the actual (measured) and the set (target) temperature. Beside this basic display elements a number of other parameters are displayed on the display as described below:

Displayed Parameter	Format	Description
Measured Temperature	23.5°	The default display parameter is the measured temperature. The temperature is displayed in Celsius degrees.
Set Temperature	23.5°	The set temperature is displayed just during the setting and it differs from the above display in the way that the set temperature is flashing while the measured temperature is with solid intensity.
Set Temperature	INT	In case the thermostat is configured to use temperature interval instead of temperature value. In this case the set temperature cannot be adjusted. A minimum and maximum temperature interval is specified and the thermostat will try to keep the room temperature inside this interval.
Fan setting	FAN.0, FAN.1, FAN.2, FAN.3, FAN.A.	By touching the middle button for short time the fan setting changes from FAN.0 meaning that the FAN is turned off to the FAN.3 meaning the maximum speed. FAN.A means that the fan speed is automatically adjusted based on the temperature difference between the set and measured temperature.
Thermostat ON / OFF	On Off	By touching the middle button for longer time the thermostat will toggle on / off.
Window status	Open Close	If the room window is opened and the thermostat configured not to ignore the window status the open and close message will be displayed on this unit and if the window stays open for longer than 30 seconds the fan-coil unit will also be turned off.
Heating, cooling or nothing	Heat Cool None	Right after switching modes between heating, cooling or none of them, the corresponding message will be shortly displayed.
Internal errors	Er.nn	In case of some error detected by the thermostat the corresponding error number will be displayed. nn can be between 01 to 99 and in order to identify the error the Calirom Error list must be consulted.





The Ambient Light Sensor (ALS)

If the ambient light sensor is activated, the light intensity of the display as well as the light intensity of the backlight, illuminating the touch keypad, is adjusted considering the amount of light in the room. A diming threshold can be set such that below a certain ambient light intensity the elements on the thermostat starts fading out. A night threshold is defined such that once the lighting of the room drops below this value the thermostat enters in night mode, turning off completely both the display and the touch key backlights.

The Touch Keypad

The touch keypad consist of 3 touch buttons each with individual RGB backlight. The side touch keys are used to increase or decrease the set temperature. The middle touch key while pressed shortly will adjust the FAN Speed and with long-press it will toggle ON and OFF the Thermostat. A color code of the backlight indicate different situations for each key.

Backlight color	Significance
White	White is the default illumination for each backlight indicating that the touch key is enabled and ready to be used.
Yellow	Yellow is displayed to indicate that the touch keyboard is locked.
Blue	Blue is used to indicate touch in night event. In case the thermostat is in night mode and the user touches one of the keys. While in blue color the keyboard is not active but it will activate shortly (turning white). The touch in night is handy allowing the user to figure out the key to press but with no "shut in the dark" method.
Magenta	Magenta is displayed only on the side keys and it indicate that the corresponding key cannot be used because the Set temperature value can either not be further decreased or further increased.
Cyan	Cyan can be displayed shortly on each of the touch keys. This indicates that the corresponding touch button performs calibration. Touch calibrations should be quite seldom events happening not more than once a day.
Orange	If a touch key displays orange color than the calibration fails regularly and the key cannot be used. This is a hardware problem and the equipment has to be serviced.
Red	Red is displayed only on the central key and indicates that the thermostat is turned OFF. In this case the two side keys are turned off.
Tuned off	The corresponding button is disabled





Electrical characteristics

When using the module make sure you don't exceed any of the following ratings.

Element name	Connection type and Cable	Min / Max Ratings
DC Power Supply	Multithreaded, 2 wire, AWG 20-24, screw.	Voltage: 9.0 to 14 V, Current: max: 0.1 A @ 12V
Half duplex RS485 Room Connection	Multithreaded, 2 wire, AWG 20-24, screw.	Max 5V differential pairs (over 1 twisted pair)
Window Sensor	Multithreaded 2 wire, AWG 20-24, screw	Max. 5V Ground referenced.
SPDT Relay	Multithreaded up to 3 wire, AWG 20-24, screw.	Voltage: max 24V, Current: max 0.1A

Operating conditions

Characteristic	Min Max Ratings	
Humidity	5% to 80%	
Temperature	+0 C to +50 C (with no condensation)	

The module should be voided from direct contact with water or highly humid areas. The module can only be used for inside applications and without exceeding the above specifications.

Installation

In order to ensure proper operation of the thermostat a few aspects need to be considered while installing the equipment.

• Optimum height to place the thermostat is around 1.5 meter from the floor level. Maintain a clearance of at least 0.5 meter from any corner of the room.

• Avoid direct sunlight to reach the thermostat.

• Install the thermostat in a way to avoid any direct airflow coming from the fan coil or from any heating or cooling element from the room.





Wiring diagram

The AXS004-SW thermostat is designed to operate as a slave device of the AXS004_MCM6R10 room controller module. The thermostat do not have a direct interface with the Calirom's BMS server. All the communication with the server is done through the room controller module. The high voltage interface with the fan coil system is also part of the same room controller.

The thermostat can turn off the thermal control of the room once an open window is detected. The window status is monitored by the room controller module and it is forwarded to the thermostat. Optionally a second window sensor can be connected directly to the thermostat with the same aim. The thermostat has an on-board low voltage relay what can be used to drive a local heating plant.

The above image presents only the elements and details related to the thermostat operation. The sensor connections, room power aspects or RFID card reader and RFID card holder connections of the AXS004_MCM6R10 are ignored for readability. For detailed wiring please consult the AXS004_MCM6R10 datasheet.







Connector details

The AXS004_SW thermostat is equipped with a 10 pin, 3.5mm pitch socket. The type of the socket is 15EDGRC-3.5/10P from Degson Electronic. The recommended plug for this socket is 15EDGK-3.5/10P also from Degson Electronics.



Pin description for the 15EDGRC-3.5/10P socket

Pin	Signal Name	Description
1	Window Sensor	INPUT: a standard normal open (NO) window sensor can be installed between this pin and the ground (GND) plane of the DC rail. Once the sensor installed the sensor interface must be activated via software settings.
2	Not Used	DO NOT CONNECT: Reserved for future developments
3	Not Used	DO NOT CONNECT: Reserved for future developments
4	Relay NC	INPUT / OUTPUT: Relay normal closed (NC) terminal.
5	Relay Common	OUTPUT / INPUT: Relay common terminal.
6	Relay NO	INPUT / OUTPUT: Relay normal open (NO) terminal.
7	Room RS485 (A)	INPUT / OUTPUT: Main room bus communication channel. Used to connect with the AXS004_MCM6R10 room controller module.
8	Room RS485 (B)	INPUT / OUTPUT: Main room bus communication channel. Used to connect with the AXS004_MCM6R10 room controller module.
9	GND	SUPPLY: DC Rail ground input.
10	+12V	SUPPLY: DC Rail positive input





Mounting instruction







Mounting components dimensions





Wall mounting box



Electrical component





Regulatory Notices

Please note that this equipment is compliant for the following:

CE - COMPLIANCE TO EUROPEAN UNION (EU)

This equipment complies with the rules, of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union as specified in the above directive(s) per the provisions of the following standards: IEC/EN 61326-1 Product Standard, IEC/EN 61010-1 Safety Standard.

WEEE - DIRECTIVE OF THE EUROPEAN UNION (EU)

This equipment and its packaging carry the waste of electrical and electronic equipment (WEEE) label, in compliance with European Union (EU) Directive 2002/96/EC, governing the disposal and recycling of electrical and electronic equipment in the European community.



THERMOSTAT



Find us at:

www.calirom.ro office@calirom.ro tel: 0364 228 055



