

LCR Touch RS485 Modbus

Room operating panel

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

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» APPLICATION

Room control unit with room temperature measurement with touch surface for visualization of the measured values. The maintenance-free sensor creates the conditions for a pleasant indoor climate and well-being. Typical applications are schools, office buildings, hotels or cinemas. The self-explanatory operation offers all relevant functions for intelligent room automation.

» TYPES AVAILABLE

Room operating unit temperature + opt. humidity – active BUS

- LCR Touch Temp RS485 Modbus
- LCR Touch Temp_rH RS485 Modbus

» SECURITY ADVICE – CAUTION

The installation and assembly of electrical equipment should only be performed by authorized personnel.



The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

CAUTION! Risk of electric shock due to live components within the enclosure, especially devices with mains voltage supply (usually between 90..265 V).



Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

» PRODUCT TESTING AND CERTIFICATION



Declaration of conformity

The declaration of conformity of the products are available on our website
<https://www.thermokon.de/direct/en-gb/categories/lcr-touch>

» NOTES ON DISPOSAL



The crossed-out wheeled bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: www.thermokon.com

» MOUNTING ADVISE ROOM SENSORS

The Accuracy of the room sensors are influenced by the technical specifications as well as the positioning and the installation type.

During Assembly:

- Seal mounting box (if present).
- Installation type, air draught, heat source, radiation heat or direct sunlight can affect the measurement.
- Building material specific properties of the installation place (*brick-, concrete-, partition wall, cavity wall, ...*) can affect the measurement.

Assembly not recommendet in...

- Air draught (e.g.: close to windows / doors / fans ...)
- Near heating sources,
- Direct sunlight
- Niches / between furniture / ...

» TECHNICAL DATA

Measuring values (optional)	temperature, humidity optional, additional measuring values on request		
Network technology	RS485 Modbus, RTU, half-duplex, baud rate 4.800, 9.600, 19.200 or 38.400, parity: non (2 stopbits), even or odd (1 stopbit), RS485 bus load: ¼ unit load according to RS485 standard Fail-safe Biasing required. Follow the instructions in the Modbus standard (§3.4.6.)*		
Power supply*	24 V = (±20%) 24 V ~ (±20%) SELV		
Power consumption	3 W (24 V =)		
Measuring range temp.	0..+50 °C		
Measuring range humidity	0..100% rH non-condensing		
Accuracy temperature	±1 K (typ. at 21 °C)		
Accuracy humidity (type-dependent)	±2% between 10..90% rH (typ. at 21 °C)		
Inputs	terminal 10 input for external sensor NTC10K	terminal 11 – ESI DP input digital for floating contact, window contact, dew point sensor	terminal 12 - OCC input digital for floating contact, occupancy sensor, key card switch
Display	LCD 64x41 mm, white background lighting		
Enclosure	ABS, pure white, frame silver		
Protection	IP20 according to EN 60529		
Cable entry	rear entry		
Connection electrical	terminal block max. 1,5 mm ²		
Ambient condition	-10..+50 °C, max. 95% rH non-condensing		
Mounting	flush mounted with standard EU box (Ø=60 mm)		

*Modbus Standard https://modbus.org/docs/Modbus_over_serial_line_V1_02.pdf



*Power supply

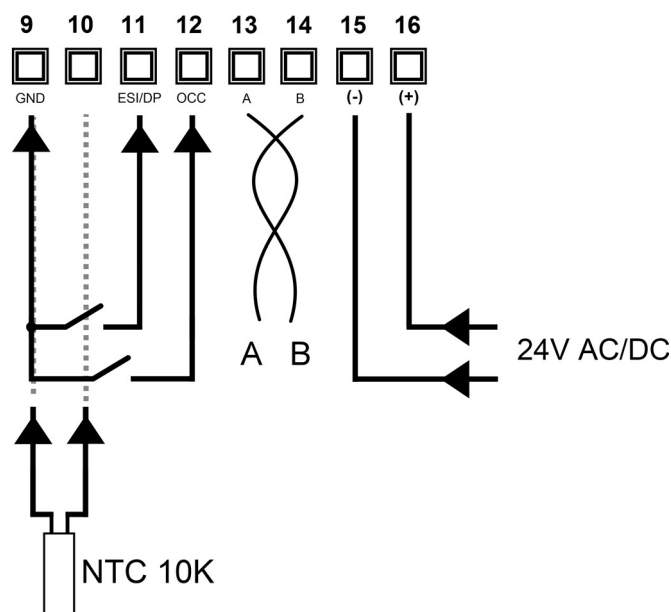
When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (=reference potential) are connected together (in-phase connection of field devices).

In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field may cause damage to it.

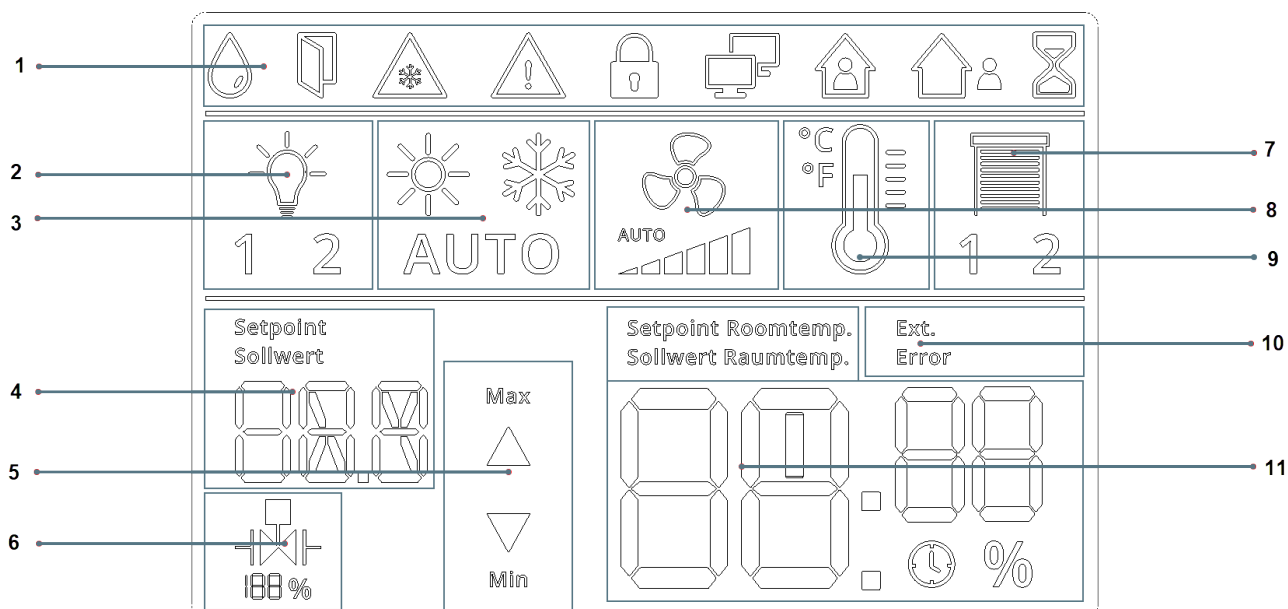
Therefore, pay attention to correct wiring.

» CONNECTION PLAN

Terminals 1-8 not available.



» DISPLAY PANEL



- | | |
|--|---|
| <p>1 Header - Show symbols</p> <p>2 Submenu - Switch lighting group (max. 2. groups)</p> <p>3 Submenu - Switch operating mode display</p> <p>4 Display setpoint</p> <p>5 Display Change-over of various settings (up and down)</p> <p>6 Display external manipulated variable (in %)</p> | <p>7 Submenu - Switch blind/shutter group (max. 2 groups)</p> <p>8 Submenu - Display fan speed adjustment</p> <p>9 Submenu - Setpoint display</p> <p>10 show various error messages</p> <p>11 Display room temperature / room humidity / time</p> |
|--|---|

» FUNCTION DESCRIPTION

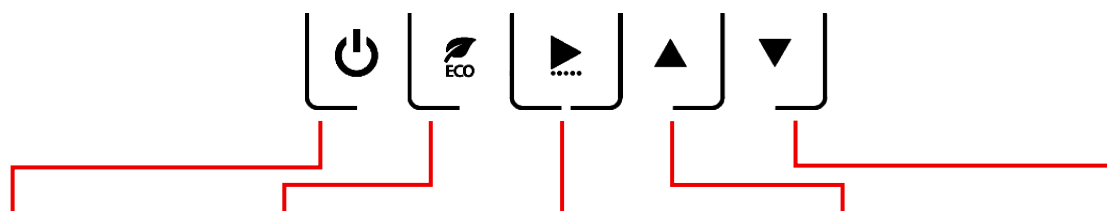
Parameter menu

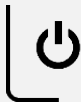
To access the parameter menu for the Modbus interface settings, hold down the Power key and the Down-Key ▼Taste for 3 seconds. The menu (arrow/right) button ► is used to scroll through the parameters. The up/down buttons are used to adjust the values.

The menu is enabled for the first 60 minutes after switching on the supply voltage as long as the device is not actively involved in Modbus communication. As soon as the device receives a valid DDC request addressed to the device, access to the menu is disabled. Without valid communication, access will be blocked after 60 minutes!

No.	Parameter	Description	factory default
1	Modbus address	ID.1- ID.247	32
2	Baud rate	0: 9600 Bd 1: 19200 Bd 2: 38400 Bd 3: 57600 Bd 4: 115200 Bd	1 (19200 Bd)
3	Parity	0:none, 1:odd 2:even	2 (Even)

» FUNCTION OF THE DEVICE BUTTONS



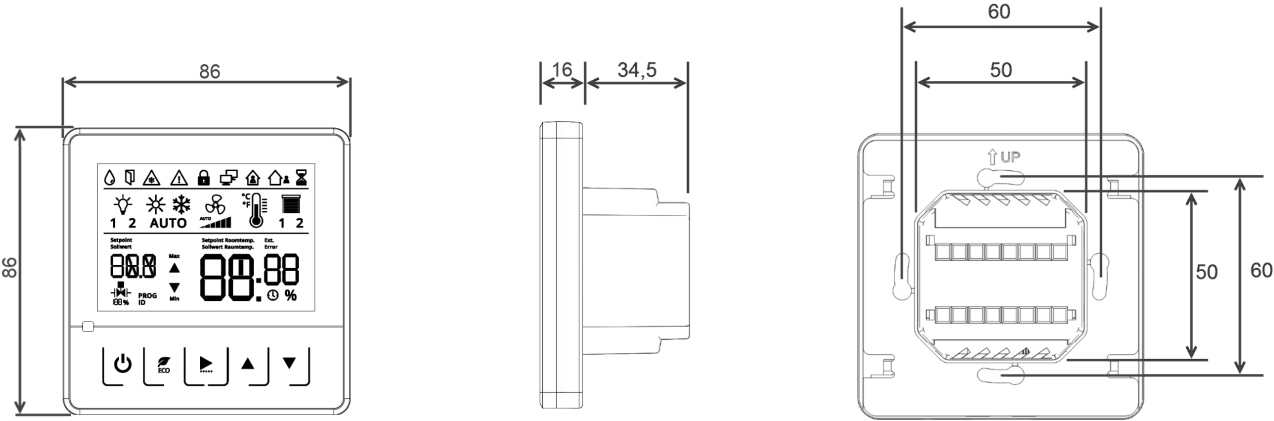
Power Button	ECO Button	Menu Button	Adjustment Button „UP“	Adjustment Button „DOWN“
 After pressing the Power key, the display is switched off. It is still possible to overwrite parameters or read out sensor values. Pressing any key again activates the display again. The room operating unit starts in "Active" mode. Display OFF → Register 217, Operating mode = 2 "OFF" (set on device, read only via modbus) Display ON → Register 217, Operating mode = 0 "Active"	 After pressing the ECO button, the button lights up permanently in green. The ECO mode is now active. ECO mode Active → Register 217, Operating mode = 1 "ECO"	 After pressing the menu key, the submenus, if activated, are called up. 5 different submenus can be activated. • Setpoint adjustment, • Blind/roller shutter control (up to 2 groups), • Switch/dim light (up to 2 groups) • Changing controller modes (Auto, Heating, Cooling) • Fan stage adjustment Activate setpoint adjustment Register 100 = 1 "ON" Activate shading groups Register 115 = 1..2 (depending on the number of groups) Activate light circuits Register 116 = 1..2 (depending on the number of circuits) Activate controller mode Register 121 = 1 "ON" Activate fan stages Register 120 = 1..6 (depending on number of fan stages)		 The keys are used for menu navigation as well as for adjusting/switching the individual parameters, e.g. for adjusting the setpoint, switching/dimming the light or adjusting the blinds/fan stage (in the respective submenu). In the respective submenus, only the buttons which can be operated light up.

»ACTIVATE SYMBOLS ON MAIN SCREEN (HEADER)

Display header Symbols Display (Coils)					
In the display of the room control unit, various symbols can be shown or hidden.					
If a digital input is configured to display the status of a window contact, dew point monitor or room occupancy, the corresponding symbolism cannot be overwritten by the higher-level controller.					
The following commands are supported:					
01 Read Coils (0x) 05 Write Single Coil 15 Write Multiple Coils					
Address	Access	Description	Value	default	
100	0x064	 Activate dew point symbol • Switching via Modbus or digital input (ESI)	0: OFF 1: Active	0	
101	0x065	 Activate "Window open" symbol • Switching via Modbus or digital input (ESI)	0: OFF 1: Active	0	
102	0x066	 Activate frost warning sign	0: OFF 1: Active	0	
103	0x067	 Activate warning sign (e.g. for alarm)	0: OFF 1: Active	0	
104	0x068	 Activate lock symbol	0: OFF 1: Active	0	
105	0x069	 Activate display of communication symbol	0: OFF 1: Active	0	
106	0x06A	 Room occupancy display • Switching via Modbus or digital input (OCC)	0: Unoccupied 1: Occupied	0	
107	0x06B	 Activating the hourglass	0: OFF 1: Active	0	

»MOUNTING ADVICE/ DIMENSIONS (MM)

For installing or maintenance, please make sure the power is disconnected. Fix the thermostat base plate to the wall through the four screw holes with distance between axes of 60 mm. Fasten base plate and front cover. Do not press the panel in order to protect LCD.



General Holding Register | Input Register

Register for current operation

The following commands are supported:

03 Read Holding Register (4x) | 06 Write Single Register | 16 Write Multiple Register

	Address		Description	Access	Data type	Min	Max	Unit	Default
Set point	200	0x0C8	Override base set point 0,1°C = 1	R/W	uint16	0	50	°C	22
	201	0x0C9	Effective set point	R	uint16	0	50	K	0
	202	0x0CA	Set point Offset	R/W	uint8	0	15	K	0
Sensors	203	0x0CB	internal temperature sensor	R	int16	0	50	°C	0
	204	0x0CC	external temperature sensor	R	int16	0	50	°C	0
	205	0x0CD	reserved						
	206	0x0CE	reserved						
	207	0x0CF	Humidity sensor	R	int16	0	100	% rH	0
Shading	208	0x0D0	Shading button 1 0: Not actuated 1++: Short keystroke "Up" 51++: Short key press "Down" <i>Repeated short keystrokes are stored until the next readout and totaled: 1..2..3...</i> <i>For blind slat adjustment if necessary</i> 112: Long keystroke "Up" 114: long keystroke "Down"	R	uint8	0	100	--	0
	209	0x0D1	Shading button 2 Function as in "Shading 1 button".	R	uint8	0	100	--	0
	210	0x0D2	reserved						
	211	0x0D3	reserved						
Light	212	0x0D4	Value Light Circuit 1	R/W	uint8	0	100	%	0
	213	0x0D5	Value Light Circuit 2	R/W	uint8	0	100	%	0
Fan	214	0x0D6	Fan stage 0: OFF 1: Level 1 2: Level 2 3: Level 3 4: Level 4 5: Level 5 6: Level 6 7: AUTO OFF 8: Level 1 AUTO 9: Level 2 AUTO 10: Level 3 AUTO 11: Level 4 AUTO 12: Level 5 AUTO 13: Level 6 AUTO	R/W	uint8	0	7	--	0
Controller symbols	215	0x0D7	Display symbols for controller mode 0: OFF 1: Heating AUTO 2: Heating 3: Cooling AUTO 4: Cooling 5: AUTO	R/W	uint8	0	5	--	0
	216	0x0D8	Control variable Controller -1: not displayed 0..100: 0..100%	R/W	uint8	-1	100	%	0
Device	217	0x0D9	Display Operating mode 0: ECO-Symbol inactive 1: ECO-Symbol active 2: Display turned OFF (configuration on device, read only via modbus)	0: R/W 1: R/W 2: R	int16	0	3	--	0: Active
	218	0x0DA	Alarm 0: OFF 1: Alarm with symbol 2: Alarm with flashing background 3: Alarm with flashing background and acoustic signal	R/W	uint8	0	3	--	0: OFF
Display	219	0x0DB	Time Hour	R/W	uint8	0	23	h	0
	220	0x0DC	Time Minute	R/W	uint8	0	59	min	0
Debug	221	0x0DE	Feedback Button <i>bit coded:</i> 0000 0001 = 1 = Button Down 0000 0010 = 2 = Button Up 0000 0100 = 4 = Button Menu 0000 1000 = 8 = Button ECO 0001 0000 = 16 = Button OFF	R	uint8	0	255		0

Configuration Holding Register									
Register for the configuration of the device									
Unterstützt werden folgende Befehle:									
03 Read Holding Register (4x) 06 Write Single Register 16 Write Multiple Register									
	Address		Description	Access	Data type	Min	Max	Unit	Default
Information	0	0x000	Device name: 0xFF13 = LCR Touch	R					
	1	0x001	Firmware Version (z.B.: 0v0102 = 1.2)	R					
Config. Set point	100	0x064	Setpoint display Menu 0: OFF 1: ON	R/W	uint16	0	1	--	1: ON
	101	0x065	Base set point Restart required after change 220=22,0°C	R/W	uint16	0	50	°C	22
	102	0x066	Stepwidth set point adjustment 5=0,5K	R/W	uint8	0	15	K	5: 0,5
	103	0x067	Set point adjustment 30=±3,0K	R/W	uint8	0	15	K	3: ±3K
Config. Sensor values	104	0x068	internal temperature sensor offset	R/W	int16	-15	+15	K	0
	105	0x069	external temperature sensor offset	R/W	in16	-15	+15	K	0
	106	0x06A	Unit temperature 0: °C (SI) 1: °F (IMP)	R/W	int16	0	1	--	0: °C (SI)
	107	0x06B	Humidity sensor offset	R/W	int16	-15	+15	%	0
	108	0x06C	reserved						
Config. Brightness LCD and Buttons Display/UI active ↓ Display/UI Standby ↓ Display/UI OFF	109	0x06D	Brightness button LEDs after/during interaction (Display/UI active)	R/W	uint8	0	100	%	100
	110	0x06E	Brightness LCD backlight after/during interaction (Display/UI active)	R/W	uint8	0	100	%	100
	111	0x06F	Brightness button LEDs (Display/UI Standby)	R/W	uint8	0	100	%	40
	112	0x070	Brightness LCD backlight (Display/UI Standby)	R/W	uint8	0	100	%	40
	113	0x071	Brightness button LEDs (Display/UI Ruhe)	R/W	uint8	0	100	%	10
	114	0x072	Brightness LCD backlight (Display/UI Ruhe)	R/W	uint8	0	100	%	0
Config. Shutters/ Blinds	115	0x073	Number of roller shutters/blind groups	R/W	uint16	0	2	Stk.	0
Config. Light	116	0x074	Number of light groups	R/W	uint8	0	2	Stk	0
	117	0x075	Light group 1 dimmable 0: NO 1: Yes	R/W	uint8	0	1	--	0: NO
	118	0x076	Light group 2 dimmable 0: No 1: Yes	R/W	uint8	0	1	--	0: No
	119	0x077	Stepwidth dimming	R/W	uint8	0	50	%	5: 5%
Config. Fan	120	0x078	Number of fan stages	R/W	uint8	0	6	--	5
Config. Submenu Controller- mode	121	0x079	Display submenu „controller mode“ "Menu for changeover heating/cooling/ AUTO". 0: OFF 1: ON	R/W	uint8	0	1	--	1: ON
	122	0x07A	Available controllermodes for change- over in the submenu 0: OFF 1: Only Heating 2: Only Cooling 3: All controller modes available	R/W	uint8	0	3	--	3: All

Config. digital inputs	123	0x07B	Input 1 ESI (clamp 11 – ESI) -1: Not used 0: Window contact (NC) 1: Window contact (NO) 2: Dew point (NO) 3: Dew point (NC)	R/W	in16	-1	3	--	-1
	124	0x07C	Input 2 OCC (clamp 12 – OCC) „Switching occupied/unoccupied“ -1: Not used 0: NO (Occupied) 1: NC (Occupied)	R/W	int16	-1	1	--	-1
Konfig. Key tone	125	0x07D	Key tone 0: OFF 1: ON	R/W	int16	0	1	--	1: ON
Config. Display main screen	126	0x07E	Fade-in time Submenu	R/W	uint8	0	255	s	3: 3s
	127	0x07F	Display Active after interaction for x seconds	R/W	uint8	0	255	s	20
	128	0x080	Display Standby after x seconds (after display active, after display standby → Display idle)	R/W	uint8	0	255	s	10
	129	0x081	Language 0: german 1: english	R/W	uint8	0	1	--	1: eng.
	130	0x082	Display value internal temperature 0: OFF 1: ON	R/W	uint8	0	1	--	1: ON
	131	0x083	Display value external temp. sensor 0: OFF 1: ON	R/W	uint8	0	1	--	0: OFF
	132	0x084	Display Setpoint 0: OFF 1: ON	R/W	uint8	0	1	--	0: OFF
	133	0x085	Display time 0: OFF 1: ON	R/W	uint8	0	1	--	0: OFF
	134	0x086	Display humidity (type-dependent) 0: OFF 1: ON	R/W	uint8	0	1	--	0: OFF
	135	0x087	reserved						
	136	0x088	reserved						
	137	0x089	Display value switching interval measuring values 0: OFF 1- 100: 1..100s	R/W	uint8	0	100	s	10: 10sec
Config. Time	138	0x08A	Time Format 0: 12h 1: 24h	R/W	uint8	0	1	--	0: OFF

Input Register

Status of the digital inputs

Unterstützt werden folgende Befehle:

02 Read Discrete Inputs (1x)

	Address		Description	Access	Min	Max	Unit	Default
Inputs	0	0x000	Input 1 (clamp 11 – ESI) 0: OFF (open) 1: ON (closed)	R	0	1	--	1
	1	0x001	Input 2 (clamp 12 – OCC) 0: OFF (open) 1: ON (closed)	R	0	1	--	1