» LCR Touch RS485 Modbus

Room operating panel

Thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

»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

» NOTES ON DISPOSAL

As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

» REMARKS TO ROOM SENSORS

Location and Accuracy of Room Sensors

The room sensor should be mounted in a suitable location for measuring accurate room temperature. The accuracy of the temperature measurement also depends directly on the temperature dynamics of the wall. It is important, that the back plate is completely flush to the wall so that there is sufficient circulation of air through the vents in the cover, otherwise, deviations in temperature measurement will occur due to uncontrolled air circulation. The temperature sensor should not be covered by furniture or other objects. Mounting next to doors (due to draught) or windows (due to colder outside wall) should be avoided.

Surface and Flush Mounting

The measuring result is influenced by the thermal characteristics of the wall. A solid concrete wall responds to thermal fluctuations within a room in a much slower than a light-weight structure wall. Room temperature sensors installed in flush-mounted boxes have a longer response time to thermal variations. In extreme cases they detect the radiant heat of the wall even if the air temperature in the room is lower for example. The quicker the dynamics of the wall (temperature acceptance of the wall) or the longer the selected inquiry interval of the temperature sensor is the smaller the deviations limited in time are.

» TECHNICAL DATA

Measuring value*s* (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 (max. 128 devices)		
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 mm²		
Ambient condition	-10..+50 °C, max. 95% rH non-condensing		
Mounting	flush mounted with standard EU box (Ø=60 mm)		

*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 my cause damage to it.

Therefore, pay attention to correct wiring.

Communication Modbus

Communication-section	1..247	Factory default: 32
Address 0	broadcast address	
Communication-Interface	RS485	
Communication-Protocol	Modbus-RTU	
Baud rate	9600 / 19200 / 38400 / 57600 / 115200 (optional)	Factory default: 19200bps
Parity	none / odd / even (optional)	Factory default: even
Data:	8 bit	
Stop bits	Parity even or odd, 1 stop bit / Parity none, 2 stop bits	

» PRODUCT TESTING AND CERTIFICATION
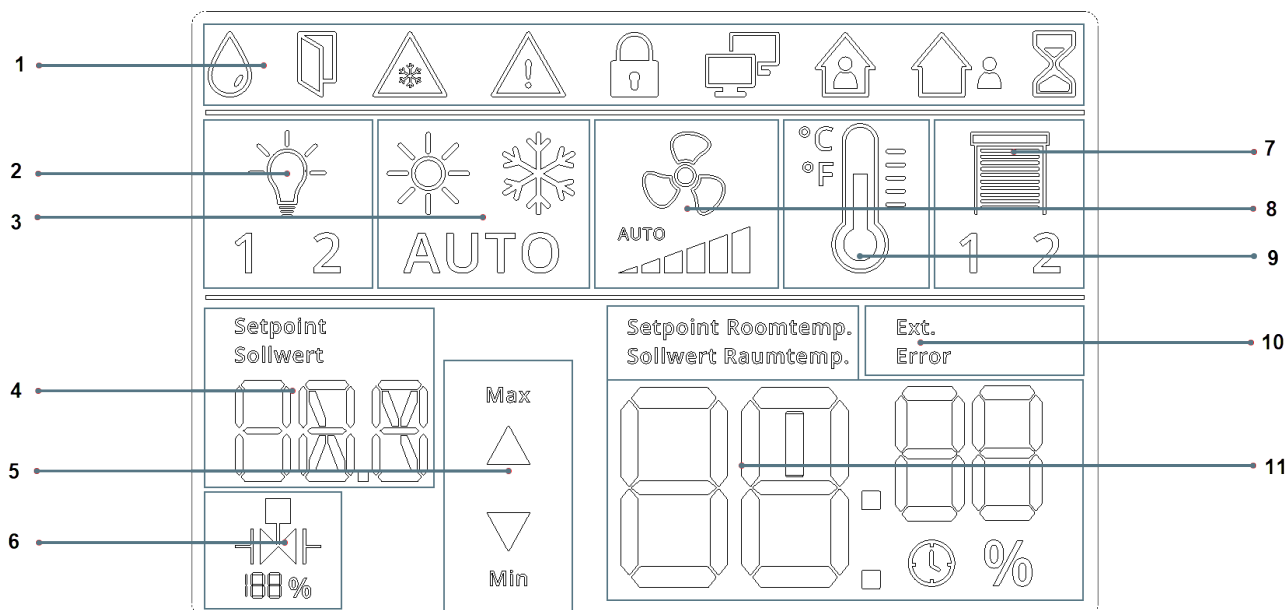
Declaration of conformity

The declaration of conformity of the products can be found on our website https://www.thermokon.de/.

» CONNECTION PLAN

Terminals 1-8 not available.
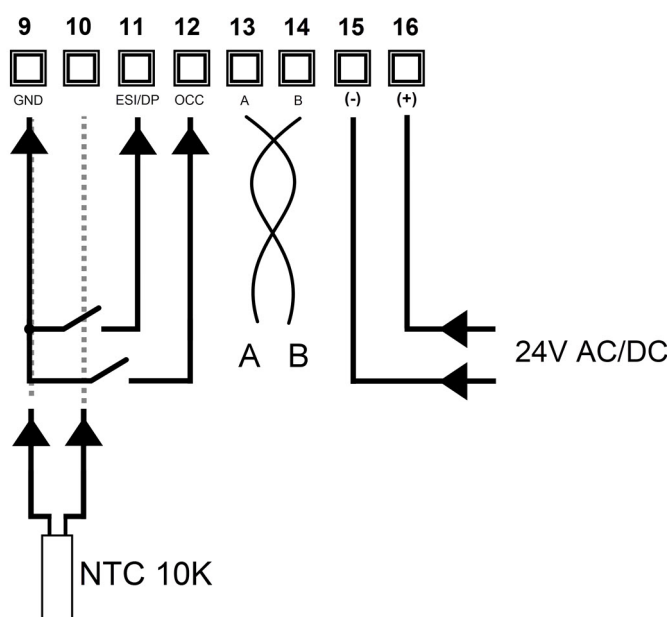
»DISPLAY PANEL

1 Header - Show symbols

2 Submenu - Switch lighting group (max. 2. groups)

3 Submenu - Switch operating mode display

4 Display setpoint

5 Display Change-over of various settings (up and down)

6 Display external manipulated variable (in %)

7 Submenu - Switch blind/shutter group (max. 2 groups)

8 Submenu - Display fan speed adjustment

9 Submenu - Setpoint display

10 show various error messages

11 Display room temperature / room humidity / time

»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 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 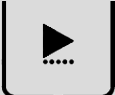as the device receives a valid DDC request addressed to the device, access to the menu is disabled. Without valid communication, access will be blocked after 60 minutes!

No.	Parameter	Description	factory default	Modbus address
1	Modbus address	ID.1- ID.247	32	10000
2	Baud rate	0: 9600 Bd		10001
		1: 19200 Bd		
		2: 38400 Bd	1 (19200 Bd)	
		3: 57600 Bd		
		4: 115200 Bd		
3	Parity	0:none，1:odd 2:even	2 (Even)	10002

»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.	After pressing the ECO button, the button lights up permanently in green. The ECO mode is now active.	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	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.	
Display OFF → Register 217, Operating mode = 2 "OFF". **Display ON →** Register 217, Operating mode = 0 "Active"	**ECO mode Active →** Register 217, Operating mode = 1 "ECO"	**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)		

»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	R/W		**Activate dew point symbol** • *Switching via Modbus or digital input (ESI)*	0: OFF | 1: Active	0
101	0x065	R/W		**Activate "Window open" symbol** • *Switching via Modbus or digital input (ESI)*	0: OFF | 1: Active	0
102	0x066	R/W		**Activate frost warning sign**	0: OFF | 1: Active	0
103	0x067	R/W		**Activate warning sign (e.g. for alarm)**	0: OFF | 1: Active	0
104	0x068	R/W		**Activate lock symbol**	0: OFF | 1: Active	0
105	0x069	R/W		**Activate display of communication symbol**	0: OFF | 1: Active	0
106	0x06A	R/W		**Room occupancy display** • *Switching via Modbus or digital input (OCC)*	0: Unoccupied 1: Occupied	0
107	0x06B	R/W		**Activating the hourglass**	0: OFF | 1: Active	0

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" *Repeated short keystrokes are stored until the next readout and totaled:* *1..2..3...* *For blind slat adjustment if necessary* 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 7: AUTO OFF 1: Level 1 8: Level 1 AUTO 2: Level 2 9: Level 2 AUTO 3: Level 3 10: Level 3 AUTO 4: Level 4 11: Level 4 AUTO 5: Level 5 12: Level 5 AUTO 6: Level 6 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	unt8	0	5	--	0
	216	0x0D8	**Control variable Controller** -1: not displayed 0..100: 0..100%	R/W	uint8	-1	100	%	0
Device	217	0x0D9	**Operating mode** 0: Active 1: ECO 2: OFF	R/W	int16	0	3	--	0: Active
Alarm	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** *bit coded*: 0000 0001 = 1 = Button OFF 0000 0010 = 2 = Button ECO 0000 0100 = 4 = Button UP 0000 1000 = 8 = Button Down	R	int8	0	255	15	20

			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**
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	**Humidty 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

»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.