

Models

STLD24A (fan & heat-cool)
STLD24B (fan & °F/°C)

Description

Connected directly to the CMMB Remote I/O Board via Modbus, the STLD24 Modbus LCD Thermostat provides internal and external temperature sensors, LCD display and operational commands without using up a BACnet address.

Features

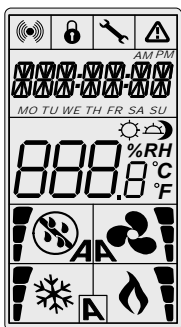
- Backlit LCD with simple icon and text driven menus
- Built-in temperature sensor
- External temperature sensor input (10 KΩ)
- Adjustable setpoints
- Selectable Fahrenheit or Celsius scale
- Set Modbus baud rate via thermostat menu (9600, 19200, 38400 or 57600 bps)
- Set Modbus address via thermostat menu or via DIP switch.



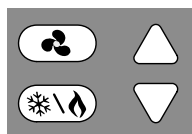
Technical Specifications

Specifications	STLD24A STLD24B
Inputs	1 Analog input (external temperature sensor 10Kohms)
Electrical Connection	4 or 5 wire cable
Setpoint Range	10°C to 40°C [50°F to 104°F]
External Sensor Range	-40°C to 100°C [-40°F to 212°F]
Control Accuracy	Temperature: ±0.4°C [0.8°F]
Power Supply	22 to 26 Vac 50/60Hz
Power Consumption	1 VA
Rated Impulse	330 V
Communication	Modbus RTU, 8 bits, 2 stop bits, no parity
Operating Temperature	0°C to 50°C [32°F to 122°F]
Storage & Transport Temperature	-30°C to 50°C [-22°F to 122°F]
Relative Humidity	5 to 95% non condensing
Housing Degree of Protection	IP 30 (EN 60529)
Weight	160 g. [0.36 lb]
Dimensions	<p>A = 2.85" (73mm) B = 4.85" (123mm) C = 1.00" (24mm) D = 2.36" (60mm) E = 3.27" (83mm)</p>

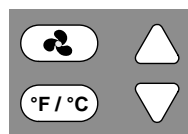
Interface



For standard operational commands and their related display, refer to the *Operational Mode* section on page 4. The display interface is also fully customizable. Upon receiving specific BACnet commands, the CMMB can send a Modbus command to the thermostat to display specified text and icons. Refer to the *Modbus Configuration* section on page 5 for more information.



Button configuration for Model: **STLD24A**

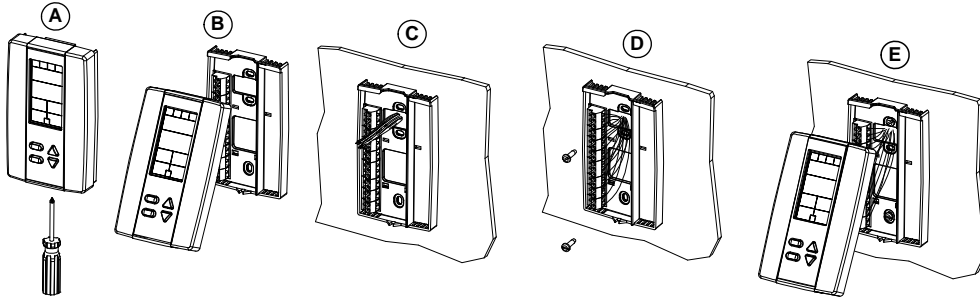


Button configuration for Model: **STLD24B**

Mounting Instructions

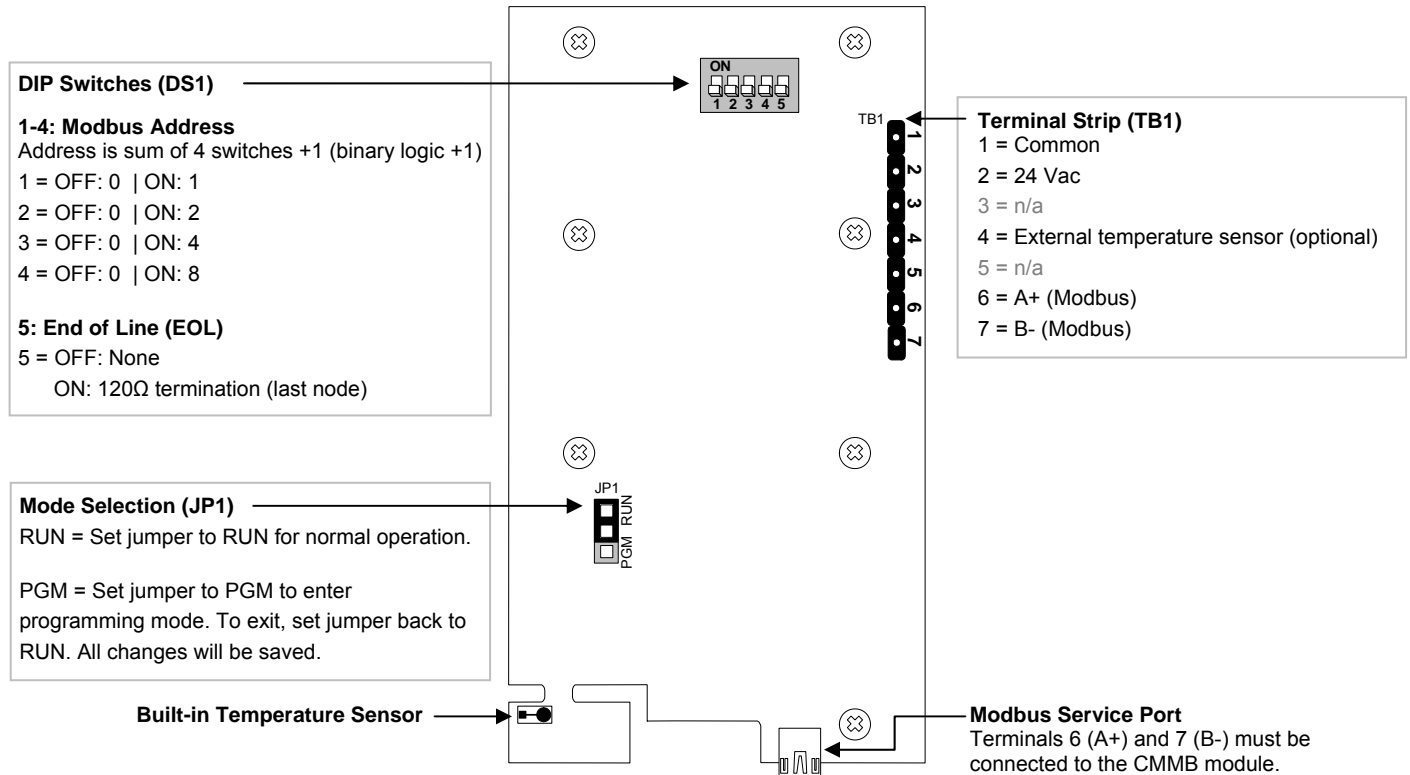
⚠ CAUTION: Remove power to avoid a risk of malfunction.

- Remove the captive screw that's holding the base and the front cover of the thermostat together.
- Lift the front cover of the thermostat to separate it from the base.
- Pull all wires through the holes in the base.
- Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.
- Mount the control module on the base and secure using the screw.



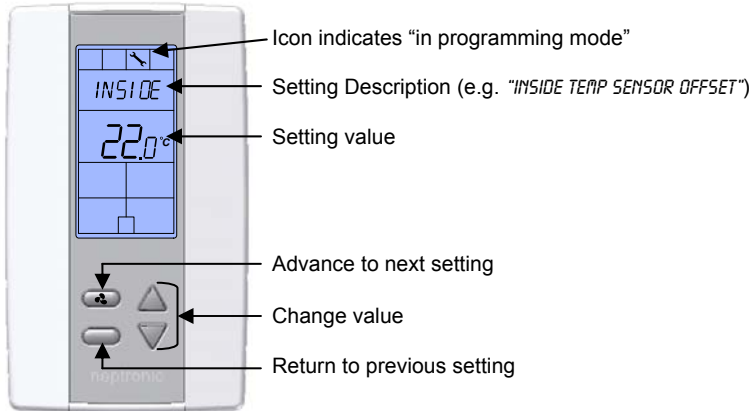
PCB Overview

i Once connected to the CMMB, ensure that the number of STLD24 thermostats is enabled via the CMMB BACnet network.



Programming Mode

i The Mode Selection jumper (JP1) must be in the “PGM” position. Refer to PCB Overview on page 2. To exit, set jumper back to the “RUN” position. All changes will be saved.



1. "INSIDE TEMP SENSOR OFFSET"



Default: Internal sensor's temperature reading.
Range: 10-40°C [50-104°F] | max. offset ± 5°C
Increment: 0.1°C [0.2°F]

Compare the displayed temperature reading with a known value from a thermometer. To offset or calibrate the sensor, use the arrows key to set the desired temperature reading. This is useful for thermostats installed in areas where the temperature read is slightly different than the room's actual temperature. For example, a thermostat placed right under the air diffuser.

2. "EXTERN TEMP SENSOR OFFSET"



Default: External sensor's temperature reading.
Range: 0-50°C [41-122°F] | max. offset ± 5°C
Increment: 0.1°C [0.2°F]

Compare the displayed temperature reading with a known value from a thermometer. To offset or calibrate the sensor, use the arrows key to set the desired temperature reading. This is useful for sensors installed in areas where the temperature read is slightly different than the room's actual temperature. The thermostat displays "ERROR" and the warning symbol if there's a short or the sensor is not connected.

3. "ADJUST MINIMUM USER SETPNT"



Default: 15°C [59°F]
Range: 10-40°C [50-104°F]
Increment: 0.5°C [1.0°F]

In operational mode, the user cannot lower the setpoint to below the value entered here. The minimum value is restricted by the maximum value set in Step 4.

4. "ADJUST MAXIMUM USER SETPNT"



Default: 30°C [86°F]
Range: 10-40°C [50-104°F]
Increment: 0.5°C [1.0°F]

In operational mode, the user cannot increase the setpoint to above the value entered here. The maximum value is restricted by the minimum value set in Step 3.

5. "ADJUST INTERN SETPNT"



Default: 22°C [72°F]
Range: 10-40°C [50-104°F]
Increment: 0.5°C [1.0°F]

Select the desired set point temperature. The user can also change this value (see *Operational Mode* on page 4). The setpoint value is restricted by the minimum user setpoint (Step 3) and maximum user setpoint (Step 4).

6. "DISPLAY INSIDE TEMP SENSOR"



Default: Yes
Range: Yes / No

This unit can display either the internal or external temperature. To display the internal temperature, select Yes and go to Step 8. To display the external temperature, select No and in the next step select Yes. If no is selected in both steps 6 and 7, the thermostat will not display any value.

7. "DISPLAY EXTERN TEMP SENSOR"



Default: No
Range: Yes / No

This unit can display either the internal or external temperature. To display the external temperature, select Yes. The "Display Inside Temp Sensor" must be set to No (see Step 6). If no is selected in both steps 6 and 7, the thermostat will not display any value.

8. "ADJUST COMPORT BAUDS RATE"



Default: 57.6
Range: 9.6 / 19.2 / 38.4 / 57.6 (values in kbps)

Select the desired Modbus baud rate for communication.

9. "SELECT MODBUS ADDRESS"



Default: 1
Range: 1-247
Increment: 1

To change this value via the programming menu, the Modbus Address DIP switches must all be in the "OFF" position (see PCB Overview on page 2). Otherwise, this step is read-only and will display the current address determined by the DIP switches.

Operational Mode



The Mode Selection jumper (JP1) must be in the "RUN" position. Refer to PCB Overview on page 2.

Power Up

Upon power up, the LCD illuminates and all segments appear for 2 seconds. The thermostat then displays its current version for 2 seconds.

LCD Backlight

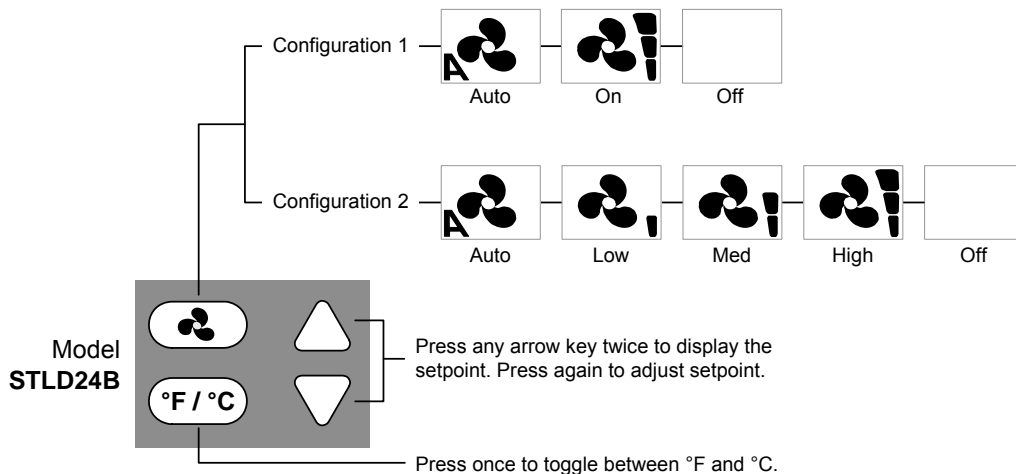
Pressing any key on the thermostat illuminates the LCD for 4 seconds.

Temperature Display

The thermostat can display the internal sensor temperature, the external sensor temperature, or none. This is defined by the selected settings in steps 6 and 7 on page 4. If " - - " is displayed, the temperature sensor is not connected or short circuited.

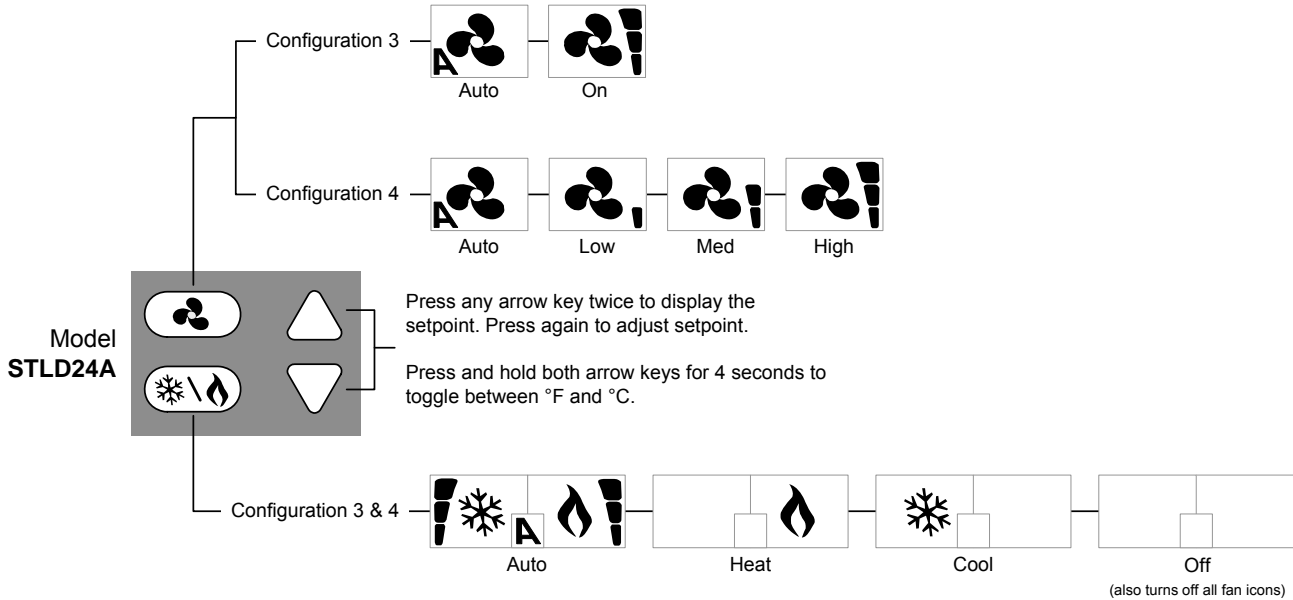
Operation (Model STLD24B)

Each thermostat can be configured to operate differently by selecting a configuration via Modbus. Refer to register 14 (E) in the Modbus Configuration section on page 5.



Operation (Model STLD24A)

Each thermostat can be configured to operate differently by selecting a configuration via Modbus. Refer to register 14 or E in the Modbus Configuration section on page 5.



Modbus Configuration

Modbus: RTU, 8 bits, 2 stop bits, no parity.
 Functions: 03 Read Holding Register, 06 Write Single Register, 16 Write Multiple Registers
 Error Codes: 02 illegal data address, 03 illegal value, 06 slave device busy
 Defaults: Address: 01 | Baud Rate: 57,600
 Read/Write: W?: writable register, w: writable, cx: writable under specific conditions, blank: read only.
 Factors: No real number in Modbus register, use factor to calculate real number. Factor could be 1, 10 or 100
 Register = Real number * Factor | Real number = Register / Factor.
 Registers: HB = High Byte | LB = Low Byte | 0000 0000 0000 0000 = b15 to b0

⚠ When writing a register that contains a bit string, if this one is writable (conditional or not), the write will always be accepted. Bits that are reserved or not writable will be ignored and will keep their actual state. Use READ-MODIFY-WRITE sequence.

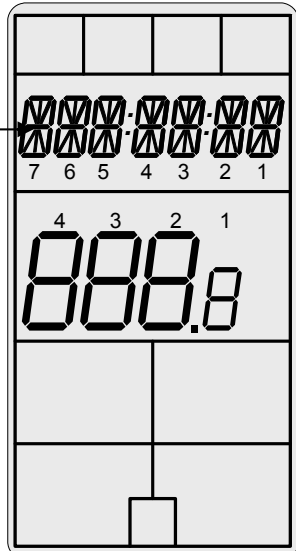
Register		Name	W?	Description	Notes	Default	
DEC	HEX					DEC	HB/LB
0	0	Mdbs_Add	w ¹	HB= Device ID LB= Modbus address	HB= 12 (STLD) LB= 1-247	3073	0C01
1	1	Mdbs_BaudRate	w	Baud rate of device Factor: / 100	Type: Unsigned, Factor: 0.01. Values: 9600, 19200, 38400, 57600	576	0240
2	2	Product_Version		Firmware version	For example: 101	-	-
3	3	System_Status_Config	w ²	HB: System configuration – Writable LB: System status – Read only	HB: System Configuration b8: Display internal temperature (°C or °F) (0: No, 1:Yes) b9: Display external temperature (°C or °F) (0: No, 1:Yes) b10-b15: Reserved for future use LB: System Status b0: Internal temperature sensor fault (0: Normal, 1: Fault) b1: Reserved for future use b2: Reserved for future use b3: External temperature sensor fault (0: Normal, 1: Fault) b4: Thermostat in programming mode b5-b7: Reserved for future use	256	0100
4	4	Intern.Temp		Internal temperature sensor reading Factor: x 100 °C	Type: Signed, Factor: 100. Unit: °C, Values: 0 – 50.00 °C	-	-
5	5	Temp.Setpoint	w	Temperature setpoint Factor: x 10 °C	Type: Signed, Factor: 10. Unit: °C, Values: range defined by Min/Max Setpoint	220	00DC

¹ Modbus address is writable via Modbus if all DIP switches are “OFF”.

² Low byte of register (LB) is masked. A write will not affect this part of register. Only high byte of register (HB) can be modified via Modbus (writable).

Register	Name		W?	Description	Notes	Default	
	DEC	HEX				DEC	HB/LB
6	6	Min.Temp.Setpoint	w	Minimum temperature setpoint Factor: x 10 °C	Type: Signed, Factor: 100. Unit: °C, Value: range 5.0 - Max Temp Setpoint	150	0096
7	7	Max.Temp.Setpoint	w	Maximum temperature setpoint Factor: x 10 °C	Type: Signed, Factor: 100, Unit: °C, Value: range Min Temp setpoint - 45.0 °C	300	012C
8	8	Intern.Temp.Offset	w	Internal temperature sensor offset Factor: x 100 °C	Type: Signed, Factor: 100, Unit: °C, Value: ± 5.00 °C	00	00
9	9	Reserved for future use					
10	A	Reserved for future use					
11	B	Reserved for future use					
12	C	Extern.Temp		External temperature sensor reading Factor: x 100 °C	Type: Signed, Factor: 100, Unit: °C, Value: 0 - 50.00 °C	-	-
13	D	Extern.Temp.Offset	w	External temperature sensor offset Factor: x 100 °C	Type: Signed, Factor: 100, Unit: °C, Value: ± 5.00 °C	00	00
14	E	ButtonStatus	w ³	HB: Button configuration – Writable LB : Button feedback – Read Only	HB: Button Configurations 1 to 4 (see page 4) 01: FAN (Auto, On Off), °C/°F [default] 02: FAN (Auto, Low, Med, Hi, Off), °C/°F 03: FAN (Auto, On), Flame/Flake (Auto, Heat, Cool, Off) 04: FAN (Auto, Low, Med, Hi), Flame/Flake (Auto, Heat, Cool, Off) 05: reserved for future use LB: Button Feedback (2 bits per button) 00= released, 01= H->L, 10= L->H, 11 = Pushed b0, b1: FAN (PB1) b2, b3: UP (PB2) b4, b5: DOWN (PB3) b6, b7: FCT 2 (PB4) Keeps 100 button actions in memory	256	0100
15	F	Let7_6 HB: Letter 7 LB: Letter 6	w			0	0000
16	10	Let5_4 HB: Letter 5 LB: Letter 4	w			0	0000
17	11	Let3_2 HB: Letter 3 LB: Letter 2	w			0	0000
18	12	Let1_ HB: Letter 1 LB: Not used	w			0	0000
19	13	Dig4_3 HB: Digit 4 LB: Digit 3	w			0	0000
20	14	Dig2_1 HB: Digit 2 LB: Digit 1	w			0	0000

Char	HEX [flash]*
A	41 [C1]
B	42 [C2]
C	43 [C3]
D	44 [C4]
E	45 [C5]
F	46 [C6]
G	47 [C7]
H	48 [C8]
I	49 [C9]
J	4A [CA]
K	4B [CB]
L	4C [CC]
M	4D [CD]
N	4E [CE]
O	4F [CF]
P	50 [D0]
Q	51 [D1]
R	52 [D2]
S	53 [D3]
T	54 [D4]
U	55 [D5]
V	56 [D6]
W	57 [D7]
X	58 [D8]
Y	59 [D9]
Z	5A [DA]
0	30 [B0]
1	31 [B1]
2	32 [B2]
3	33 [B3]
4	34 [B4]
5	35 [B5]
6	36 [B6]
7	37 [B7]
8	38 [B8]
9	39 [B9]
space	20

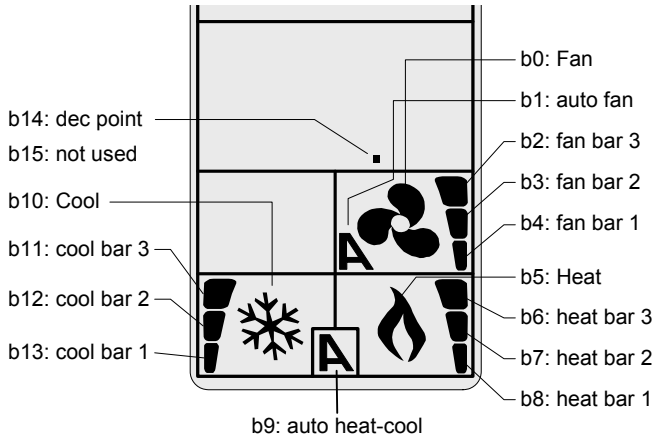
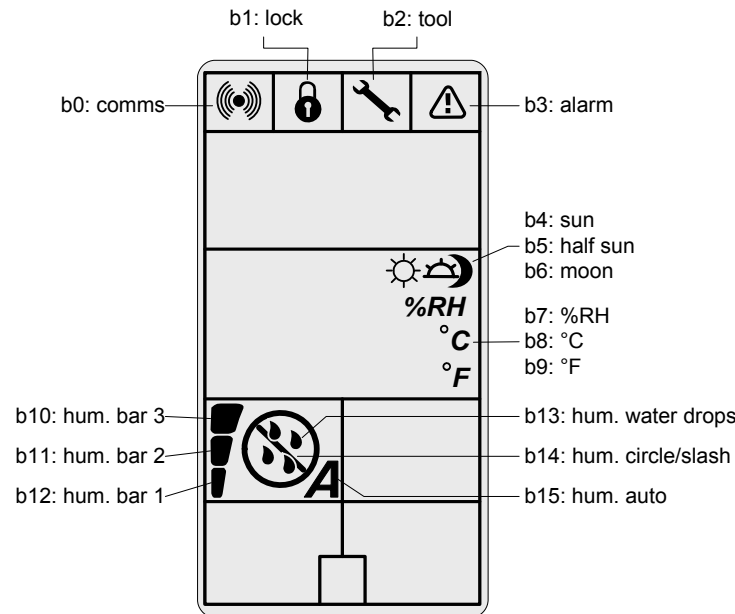
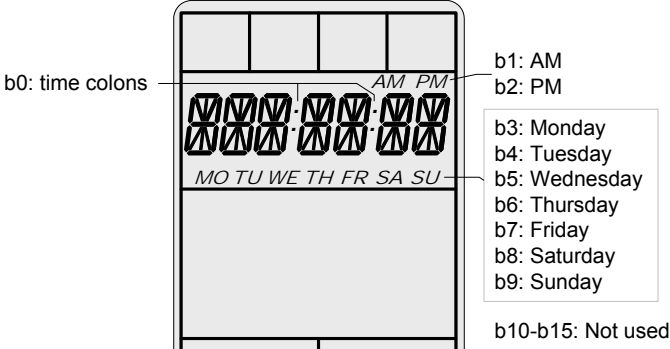


Char	Hex [flash]*
A	41 [C1]
b	62 [E2]
c	63 [E3]
C	43 [C3]
d	64 [E4]
E	45 [C5]
F	46 [C6]
g	67 [E7]
G	47 [C7]
h	68 [E8]
H	48 [C8]
I	49 [C9]
i	69 [E9]
L	4C [CC]
n	6E [EE]
o	6F [EF]
O	4F [CF]
P	50 [D0]
r	72 [F2]
S	53 [D3]
t	74 [F4]
U	55 [D5]
Y	59 [D9]
0	30 [B0]
1	31 [B1]
2	32 [B2]
3	33 [B3]
4	34 [B4]
5	35 [B5]
6	36 [B6]
7	37 [B7]
8	38 [B8]
9	39 [B9]
space	20
-	2D [AD]

* Enter the Hexadecimal value in brackets to flash the letter or digit.

**Digits only appear if the both internal and external temperature display is deactivated.

³ Low byte of register (LB) is masked. A write will not affect this part of register. Only high byte of register (HB) can be modified via Modbus (writable).

Register		Name	W?	Description	Notes	Default	
DEC	HEX					DEC	HEX
21		Icon1	w	16 status icons group 1 (0: OFF, 1: ON) 		0	0000
22	16	Icon1Blink	w	16 status icons group 1 for flashing. Use same binary values as Icon1. Set to 1, to flash icon.		0	0000
23	17	Icon2	w	16 status icons group 2 (0: OFF, 1: ON) 		0	0000
24	18	Icon2Blink	w	16 status icons group 2 for flashing. Use same binary values as Icon1. Set to 1, to flash icon.		0	0000
25	19	Icon3	w	16 status icons group 3 (0: OFF, 1: ON) 		0	0000
26	1A	Icon3Blink	w	16 status icons group 3 for flashing. Use same binary values as Icon1. Set to 1, to flash icon.		0	0000

Notes
