

# HTC08 - HTC11

Relative Humidity and Temperature  
Transmitter



**ORDEL**



- Before using the device, please read the warnings below and this guide carefully. The accidents or damages resulting from not following the warnings included in this guide are under user's responsibility.
- This device is intended to be used by qualified personnel in industrial environments, do not use in houselike environments.
- Do not use the device at places where corrosive, flammable and explosive gases exist. Contact points may create electrical discharge and this may cause explosion or fire.
- Do not allow metal fragments or lead wire scraps or liquid matters to fall inside this device. Otherwise fire or electrical shock may happen.
- Take the necessary precautions in order to prevent accidents and damages that may result in case the device gets faulty.
- There is no fuse or switch that brings the device in power down state, these should be added to the system by the user.
- Sensor and signalling cables should not be routed close to the power cables or inductive load cables.
- Do not power up the device before the connections related with the device are performed in accordance with connection diagram.
- Do not power up the device before the connections related with the device are performed in accordance with the connection diagram. While the device is powered, do not touch on the terminals.
- Configuration settings at factory out should be changed according to the user's preferences. The accidents and damages resulting from incorrect configuration settings are under users' responsibility.
- Never disassemble, repair and modify the device. These should be carried out by authorized service.

<b>SECTION</b>	<b>Page:</b>
Uyarılar .....	2
Safety Precautions .....	3
Description of the Device .....	4
Preparations .....	5
Connection Diagram .....	6
Product Code .....	7
Technical Specifications .....	8
Display and Key Functions .....	10
Configuration .....	12
Configuration Page Parameters .....	14
Operator Page .....	18
Operator Page Parameters .....	19
Serial Communication .....	20

Model HTC08 devices are modular devices that have been designed to measure and control relative humidity, temperature and dew point. Complying international standards, reliability and user friendly usage features are the design principles of these devices. So that, they are ergonomic devices that can be used easily in many different industrial sectors.

- 2 Item 4 Digit Numeric Display**
- 4 Item LED Indicator**
- 2 Item Analog Input (0/4-20mA, 0/2-10V)**
- 2 Item Programmable Semiconductor Relay**
- RS485 Communication Unit**
- 100-240Vac Universal or 24Vac/dc Supply Voltage**
- 40°C...+120°C Sensor Temperature Range**
- Isolation between Input/Output Modules**
- Wall Type, Canal Type and Wired Assembly Options**
- 6 Different Protecting Filter Options**

- Temperature, Relative Humidity and Dew Point Measurement and Control**
- Two Point Calibration for Temperature and Relative Humidity**
- Adjustable Sensor Heating Function**
- Sensor Error Detection and Redirection**
- 4 Different Relay Functions for Control and Alarm**
- Standard MODBUS RTU Communication Protocol**
- Adjustable Scale for Analog Outputs**
- 1ms Sampling and 100ms Control Cycle**

Before using the device, please follow the instructions below according to the information in this guide.

- Before using the device, control supply voltage and input/output modules if they are appropriate or not by the help of product code
- First of all, connect device to power supply and by using the configuration page, configure the device.
- After configuring the device, adjust the relay set point and hysteresis value by using the operator page.
- Power down the device and according to the connection diagram, apply other connections.
- Prepare the system which will be controlled to be run and power up the system and the device.
- Check all the functions of the device for normal conditions.
- Control all functions of the device for normal usage.
- Finally, in order to prevent the unauthorized people to observe the system, make the necessary operation for security by entering the configuration page and return to the Process Screen.

***This user guide is prepared by following the instruction order above. How these operations are made are explained in detailed in related sections.***

01	02	03	04	05	06	07	08	09	10	11	12
Data B	Data A	GND	Rly 1	COM	Rly 2	Out 1	Out -	Out 2	NC	L +	N -
Communication Unit			Semi Conductor Relay Outputs			Analog Outputs			Supply Voltage		

Figure-1

HTC08 -  
HTC11 -

**Supply Voltage :** \_\_\_\_\_

0 = 100-240Vac (Universal)

1 = 24Vac/dc

**Communication Unit :** \_\_\_\_\_

0 = N/A

1 = RS485

2 = Wireless

**Analog Outputs :** \_\_\_\_\_

0 = N/A

1 = 0/4-20mA Current Output

2 = 0/2-10V Voltage Output

**Assembly Type :** \_\_\_\_\_

0 = Wall Type

1 = Canal Type

2 = Wired

**Sensor Bar Length :** \_\_\_\_\_

0 = 4 cm

1 = 10 cm

2 = 20 cm

3 = 30 cm

**Filter Type :** \_\_\_\_\_

0 = Plastic

1 = Sinterized Bronze

2 = Membrane

3 = Metal Grid

4 = Sinterized Stainless Steel

5 = PTFE

**Temperature Range :** \_\_\_\_\_

0 = 0 ... +60 °C

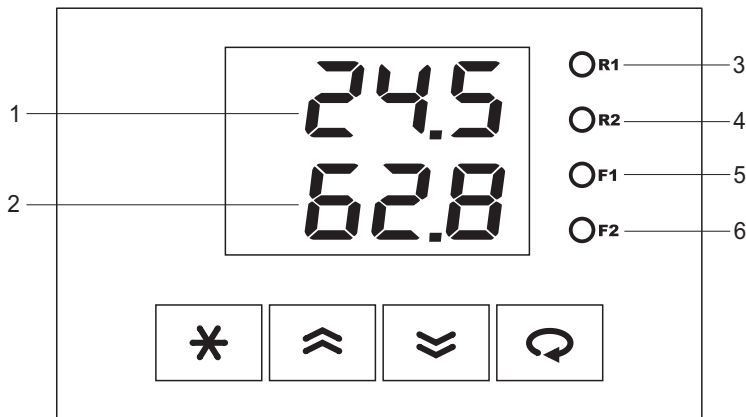
1 = -40 ... +60 °C

2 = -40 ... +120 °C

<b>Supply Voltage</b>	100-240Vac/dc : +%10 -%15	24Vac/dc : +%10 -%20	
<b>Power Consumption</b>	4W,6VA		
<b>Analog Outputs</b>	0/4-20mA (RL ≤ 500Ω)	0/2-10V (RL ≥ 1MΩ)	
<b>Semi-Conductor Relay</b>	250Vac, 80mA, NO Kontak		
<b>Measurement Range</b>	Humidity: 0 ... 100 %RH	Temperature: -40 ... +120 °C	
<b>Resolution</b>	Humidity: 0,1%RH	Temperature: 0,1°C	
<b>Accuracy</b>	Humidity: +/- 2 %RH (10%RH...90%RH) +/- 4 %RH (0%RH...100%RH)	Temperature: +/- 1°C ( -20°C ... +70°C ) +/- 2°C ( -40°C ... +120°C )	
<b>Repeatability</b>	Humidity: +/- 0,1%RH	Temperature: +/- 0,1°C	
<b>Sampling Period</b>	1s		
<b>Operation Temperature</b>	Device : -10°C ... +60°C	Sensor: -40°C...+120°C	
<b>Storage Temperature</b>	-20°C ... +70°C		
<b>Memory</b>	100 year, 100.000 renewals		
<b>Protection</b>	IP65		
<b>Dimensions</b>	Width : 115mm	Height : 95mm	Depth : 56mm
<b>Weight</b>	220gr		





**PROCESS-SCREEN:**

Just after powering up the device, after showing program version for 2 seconds, first display shows measured temperature value and second display shows the relative humidity or dew point according to user options. This screen is called **Process-Screen**. During normal operations, this screen is used.

1	<b>FIRST DISPLAY</b>	Measured temperature value or parameter name
2	<b>SECOND DISPLAY</b>	Measured relative humidity/dew point or parameter set value
3	<b>R1 LED</b>	It indicates when "Rly 1" semiconductor relay is energized.
4	<b>R2 LED</b>	It indicates when "Rly 2" semiconductor relay is energized.
5	<b>F1 LED</b>	Not available in this model
6	<b>F2 LED</b>	Not available in this model







## SYMBOLISATION OF ALPHABETICAL CHARACTERS

A	B	C	D	E	F	G	H	I	J	K	L	M
A	b	C	d	E	F	G	H	I	J	K	L	ñ
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
n	o	P	q	r	s	t	U	u	v	w	y	z

## ERROR MESSAGES

Err.1	Temperature sensor read error
Err.2	Humidity sensor read error
Err.3	Temperature sensor overflow error
Err.4	Humidity sensor overflow error
----	Process value is above the display scale.
----	Process value is below the display scale.

## KEY FUNCTIONS

	It is used to change the parameter option or parameter value.
	It is used to change the parameter option or parameter value.
	Next parameter
	Return to first page
 3s	Confirm button
 3s	Access the Process-Screen

NOTE: 3s means that this button should be pressed for 3 seconds.

Before using an unconfigured device, firstly power on the device and make configuration by following the instructions below:

### **Entering the configuration page and setting up parameters:**

- ◆ In order to enter the configuration page, press “[\*]” and “[<]” keys simultaneously and continuously until “C. f” message appears in “PV” display when device is energized.
- ◆ Set the security code by pressing “[>]” and “[<]” keys by setting the value of first display to configuration page security code when “C. f” message still appears in this display (Default factory setting of this security code is “0”).
- ◆ If the security code is not valid when you have pressed “[<]” key, Process-Screen is to be reverted, otherwise first parameter of the configuration page is accessed.
- ◆ First display shows the parameter name and second display shows the set value for parameter.
- ◆ Now, you can access other configuration parameters in order by pressing “[<]” key .
- ◆ In order to change preferences of parameter setting, use “[>]” and “[<]” keys, in order to step to the next parameter use “[<]” key. A short time press of “[\*]” key makes you to access the start of page, a long time press makes you to return the Process-Screen.
- ◆ Below, you can find a graphical representation of these instructions in **Figure-3**.

**Note:** In order to step through in configuration page with parameter numbers displayed, press “[\*]” and “[<]” keys simultaneously.

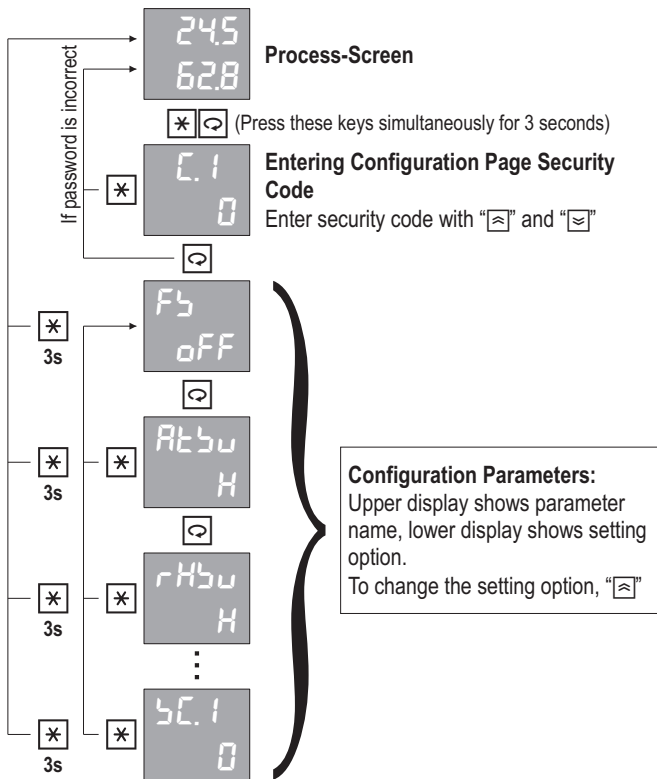

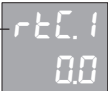












Figure-3


Detailed information about configuration page parameters can be found in the next section.

Par. 01		<p>In order to restore the settings to the factory default, this parameter should be set to "on" and "☐" key should be pressed for 3 seconds.</p> <p><i>Setting Preferences : oFF, on</i></p>
Par. 02		<p>While sensor is in a relative temperature below the operation value, set this parameter to temperature value and press "☐" for three seconds.</p> <p><i>Setting Range : 00 - 500</i> <span style="float: right;"><i>Unit : °C</i></span></p>
Par. 03		<p>While sensor is in a relative temperature below the operation value, set this parameter to temperature value and press "☐" for three seconds.</p> <p><i>Setting Range : 00 - 500</i> <span style="float: right;"><i>Unit : °C</i></span></p>
Par. 04		<p>While sensor is in a relative humidity value below the operation value, set this parameter to humidity value and press "☐" for three seconds.</p> <p><i>Setting Range : 00 - 1000</i> <span style="float: right;"><i>Unit : %</i></span></p>
Par. 05		<p>While sensor is in a relative humidity value below the operation value, set this parameter to humidity value and press "☐" for three seconds.</p> <p><i>Setting Range : 00 - 1000</i> <span style="float: right;"><i>Unit : %</i></span></p>
Par. 06		<p>If temperature sensor cannot be read, sets the default value for scale choosing high or low value.</p> <p><i>Setting Preferences : L = Alt Değer, H =Üst Değer</i></p>
Par. 07		<p>If humidity sensor cannot be read, sets the default value for scale choosing high or low value.</p> <p><i>Setting Preferences : L = Alt Değer, H =Üst Değer</i></p>
Par. 08		<p>It determines the time constant of digital filter that is applied to analog inputs. If this value is increased, reading stability increases but reading speed decreases.</p> <p><i>Setting Range : 1 - 100</i> <span style="float: right;"><i>Unit : sn</i></span></p>
Par. 09		<p>It is used to select the type of second parameter (This parameter determines the cscond display, relay and analog output)</p> <p><i>Setting Preferences : rH(Relative-Humidity) , dP(Dew Point)</i></p>

Par. 10  It determines the type of first analog output (Temperature Transmitter)  
*Setting Preferences* : Tablo-1

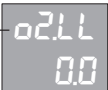
Par. 11  It determines the lower value of output scale when first analog output module is used as a temperature transmitter.  
*Setting Range* : -999.9 - 999.9 *Unit* : °C


Par. 12  It determines the higher value of output scale when first analog output module is used as a temperature transmitter.  
*Setting Range* : -999.9 - 999.9 *Unit* : °C

Par. 13  It determines the type of second analog output (Relative Humidity Transmitter)  
*Setting Preferences* : Tablo-1

Tablo-1	No	Analog Çıkış Tipi
0-20	0	0-20mA
20-0	1	20-0mA
4-20	2	4-20mA
20-4	3	20-4mA
0-10	4	0-10V
10-0	5	10-0V
2-10	6	2-10V
10-2	7	10-2V

**Warning:** In order to use first 4 options, this output should be selected as "0/4-20mA" and to use last 4 options, it should be selected as "0/2-10V"

Par. 14  It determines the lower value of output scale when second analog output module is used as a relative humidity transmitter.  
*Setting Range* : -999.9 - 999.9 *Unit* : %RH

Par. 15  It determines the higher value of output scale when second analog output module is used as a relative humidity transmitter.  
*Setting Range* : -999.9 - 999.9 *Unit* : %RH

Par. 16

r1F  
ULC

It determines the function of "Rly1" semiconductor relay output module.

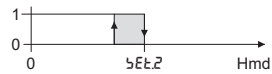
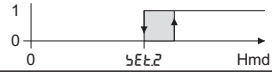
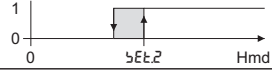
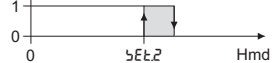
Setting Preferences : Tablo-2

Par. 17

r2F  
ULC

It determines the function of "Rly2" semiconductor relay output module.

Setting Preferences : Tablo-2

Table-2	Num	Relay Function	
OFF	0	N/A	
ULC	1	Upper Limit Control	
LLC	2	Lower Limit Control	
ULAR	3	Upper Limit Alarm	
LLA	4	Lower Limit Alarm	

**Note:** Hatched areas are hysteresis areas and hysteresis of each relay is determined with its "H5.2" parameter.

"1" in table means that related relay is powered on and "0" means powered

Par. 18

HEAT  
OFF

It is used to open or close sensor heater (If heater is open, it heats after the relative humidity value reaches the 5E5.3)

Setting Preferences : OFF = Kapalı , ON = Açık

Par. 19

Addr  
1

Serial communication address. This value should be unique for different devices connected to same line.

Setting Range : OFF(Kapalı) , 1 - 255

Par. 20



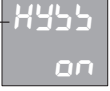


BAUD  
9.6

Serial communication baud rate value

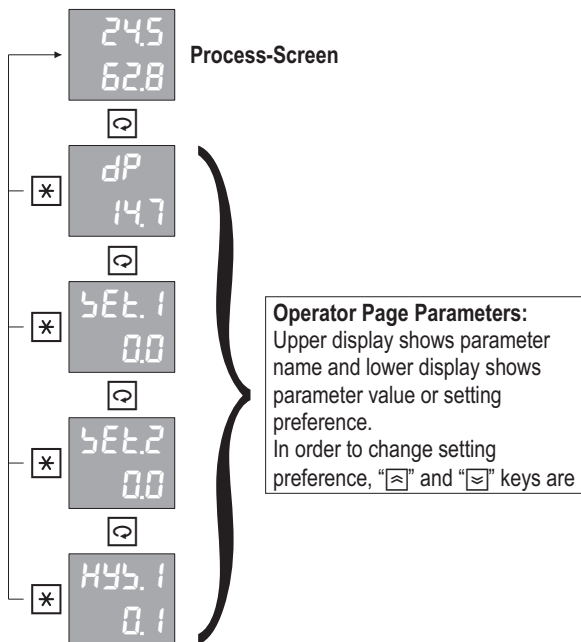
Setting Preferences : 9.6 , 19.2 , 38.4

Unit : Kbps



Par. 21		Serial communication parity type.	
		<i>Setting Preferences</i> : <i>nonE</i> (None) , <i>odd</i> (Odd) , <i>Evn</i> (Even)	
Par. 22		Permission for changing set values (bEt. 1, bEt. 2)	
		<i>Setting Preferences</i> : <i>oFF</i> (No) , <i>on</i> (Yes)	
Par. 23		Permission for changing hysteresis values (HYb. 1, HYb. 2)	
		<i>Setting Preferences</i> : <i>oFF</i> (Yok) , <i>on</i> (Var)	
Par. 24		While in operator parameters, it determines the automatic return time to Process-Screen.	
		<i>Setting Range</i> : <i>oFF</i> (N/A) , 1 - 25	<i>Unit</i> : s
Par. 25		It determines the security code for Configuration page.	
		<i>Setting Range</i> : 1999 - 9999	

Existing configuration determines which parameters will be used in operator page and only necessary parameters are displayed. These parameters which are determined in configuration are used in normal operation conditions. So, While in Process Screen, by pressing key " $\square$ " key, user can access these parameters in any time and by pressing the " $*$ " key, user returns to Process-Screen again. Setting permission of the changeable parameters can be set with the related parameters in configuration page. While in any parameter in operator page, if user does not press any key, Process-Level is to be returned after the time which is determined by "R-t" parameter, pass.



Detailed information about operator page parameters can be found in the next section.

dP 14.7	It shows the Dew-Point value. If "d2Pr" parameter is selected as "dP", this parameter becomes invisible.	Unit : °C
rH 62.8	It shows the Virtual Humidity value. If "d2Pr" parameter is selected as "rH", this parameter becomes invisible.	Unit : %
SEt.1 0.0	Set value of "Rly1" first semiconductor relay. If "r1F" parameter is selected as "oFF", this parameter becomes invisible.	Setting Range : -999.9 - 999.9 Unit : °C
SEt.2 0.0	Set value of "Rly2" first semiconductor relay. If "r2F" parameter is selected as "oFF", this parameter becomes invisible.	Setting Range : -999.9 - 999.9 Unit : %
SEt.3 0.0	Sensor heater set value. If "HEAL" parameter is selected as "oFF", this parameter becomes invisible.	Setting Range : -999.9 - 999.9 Unit : %
HY5.1 0.1	Hysteresis value of "Rly1" first semiconductor relay. If "r1F" parameter is selected as "oFF", this parameter becomes invisible.	Setting Range : 0.1 - 100.0 Unit : °C
HY5.2 0.1	Hysteresis value of "Rly2" first semiconductor relay. If "r2F" parameter is selected as "oFF", this parameter becomes invisible.	Setting Range : 0.1 - 100.0 Unit : %
HY53 0.1	Hysteresis value of sensor heater. If "HEAL" parameter is selected as "oFF", this parameter becomes invisible.	Setting Range : 0.1 - 100.0 Unit : %

Model HTC08 devices are designed to be communicated in slave mode with MODBUS RTU protocol. All parameters and registers can be accessed with this communication type. Parameters can be read or can be set to a value.

Serial communication is established with Half-Duplex RS485 line. 32 devices can be connected to one RS485 line.

The cable which is used in communication line should be a data cable that is compatible with Half-Duplex RS485 communication and this cable should be connected parallel to all devices as a single line. Both cable ends should be terminated with a appropriate resistance. A communication line which is appropriate for 9600 Bps data transmission speed can be up to 1000m.

Each device on serial communication line should have an unique address between 1 and 255 but all devices in this line should have same speed and parity type. Communication address, speed and parity type of these devices are determined with "Addr, bRÜd ve PrtÜ" parameters which are in configuration page.

Below, you can find information about functions which are supported by MODBUS RTU, parameter addresses and others in tables.

### **Supported Standard MODBUS RTU Functions:**

**Function 01** = Read Coils

**Function 03** = Read Holding Registers

**Function 05** = Write Single Coil

**Function 06** = Write Single Register

**Function 16** = Write Multiple Registers

### **BIT Type Parameters (COILS)**

Address	Explanation ( 1 / 0 )	Write
0	Status of "Rly1" semiconductor relay ( ON / OFF )	N/A
1	Status of "Rly2" semiconductor relay ( ON / OFF )	N/A
2	Sensor Heating Status ( Yes / N/A )	N/A
3	Tempertature Sensor Read Error ( Yes / No)	N/A
4	Humidity Sensor Read Error ( Yes / No)	N/A
5	Temperature sensor overflow error (Yes / No)	N/A
6	Humidity sensor overflow error (Yes / No)	N/A

### **REGISTER Type Parameters( REGISTERS)**

Address	Explanation	Range		Multiplier	Unit	Write
0	Measured temperature value			10	°C	N/A
1	Measured humidity value			10	%	N/A
2	Measured dew point value			10	°C	N/A
3	Set value of "Rly1" semiconductor relay	-1999	9999	10	°C	
4	Set value of "Rly2" semiconductor relay	-1999	9999	10	%	
5	Set value of sensor heater	-1999	9999	10	%	
6	Hysterisis value of "Rly1" semiconductor	1	1000	10	°C	
7	Hysterisis value of "Rly2" semiconductor	1	1000	10	%	
8	Hysterisis value of sensor heater	1	1000	10	%	

**Not:** Please contact to producer firm for the communication information about other parameters





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