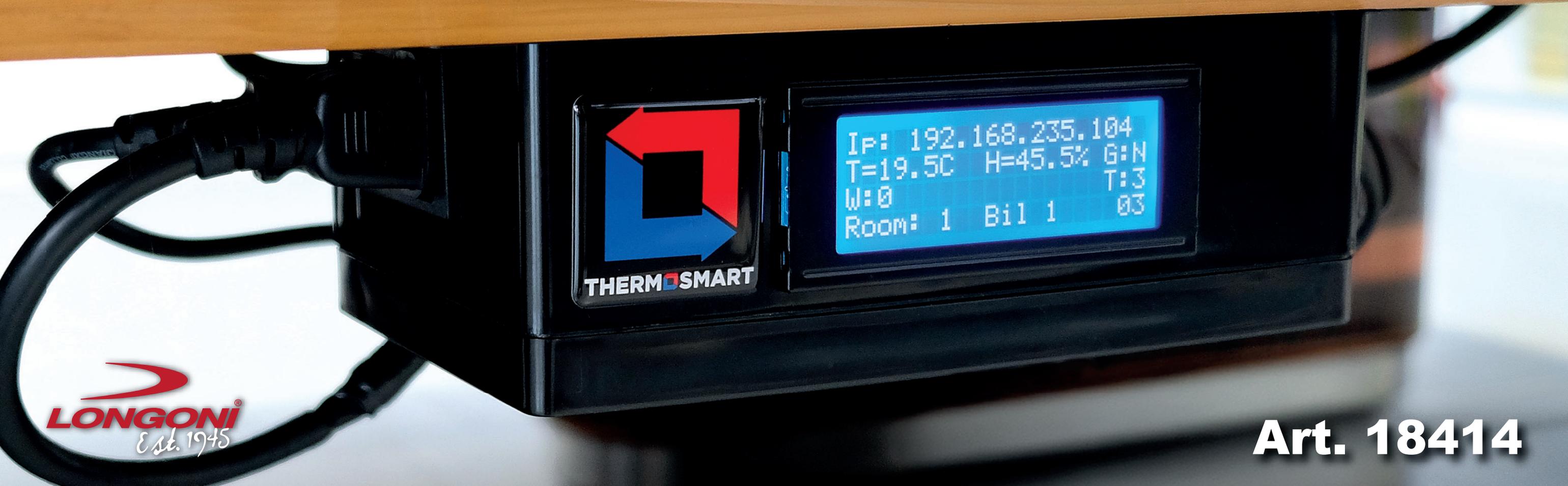


# THERMOSMART

The Longoni programmable thermohygrostat for billiard tables

Installation guide for “Easy” and “Pro” models



# Thermosmart Technical Manual

## Quick Installation Guide “Easy” Setup

This technical manual offers a comprehensive guide to installing, configuring, and using the Thermosmart system for managing temperature and humidity on billiard tables. Inside, you'll find details about hardware components, step-by-step 'Easy' installation instructions, and default settings to help ensure your billiard table performs at its best in a variety of environments.

# Thermosmart System Components



## Main Control Unit

The Thermosmart central unit combines the system's main display and controls. It features a reset button for restarting the system and a display switch to manage the information shown.

The Thermosmart system is a cutting-edge solution for controlling the environment around your pool table. Built with high-quality materials and rigorously tested, its components deliver precise readings and reliable performance over time. Thanks to its modular design, Thermosmart can be installed on any pool table model, adapting perfectly to the unique needs of your space..

## Sensors and Connections

- Temperature probe: insert into the slate of the pool table for highly accurate readings
- Humidity probe: equipped with a 3-meter cable, place between the slate and cloth or near the temperature probe
- 220V power cable: supplies power to the system
- Inline socket: connects to the pool table's heating element (1.5-meter cable)
- Cable clamps: securely fasten the probes in place

All components are designed for easy yet effective installation, ensuring continuous and precise monitoring of your pool table's conditions.

# Thermosmart "Easy" Installation Guide

**Thermosmart has been designed for simple installation, even by those without technical expertise. The "Easy" mode offers quick setup, so the system runs smoothly and independently—no additional adjustments needed.**



## Power Connection

Plug the incoming cable into a standard 220V outlet to power your Thermosmart system.



## Billiard Table Connection

Connect the output cable, equipped with a plug, to the pool table heating system.



## Temperature Sensor Placement

Insert the temperature sensor into the designated hole in the pool table slate.



## Humidity Sensor Placement

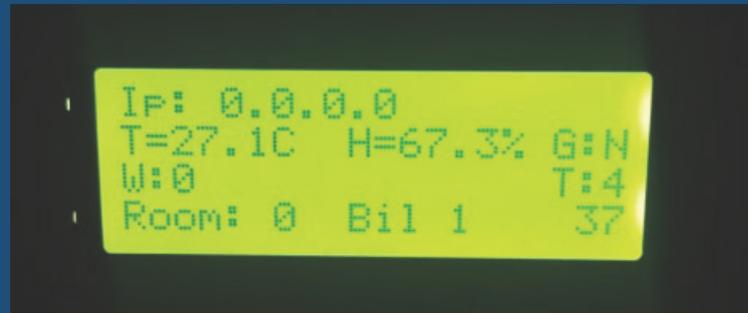
Place the humidity sensor underneath the slate, with the sensor almost touching the surface.



After these easy steps, Thermosmart will start working on its own. No WiFi connection is needed for the "Easy" setup. The system will automatically manage the billiard table's temperature and humidity across the four preset time slots, switching between "Standby" and "State on" modes as set by default.

The installation is designed to be quick and straightforward, so your system will be up and running in just a few minutes. The cables are long enough to make it easy to position the control unit and sensors wherever you need, so there's no hassle during setup. Be sure to place the sensors correctly to ensure accurate readings and smooth system performance.

# “Easy” Mode Display Screen



Thermosmart’s “Easy” mode lets you fully operate the system without needing a WiFi connection. Even though the display shows 0.0.0.0 for the IP address, all other features work perfectly and are clearly shown on the unit’s screen.

Parameter	Description
T	Current temperature measured by the probe placed in the slate, shown in degrees Celsius
H	Humidity level detected by the sensor located just beneath the slate
G	Gap N/Y: shows if the system is currently in an active time slot (G:N), or between time slots (G:Y)
W	Watts used during active heating; displays W:0 when heating is off
Room: 0	Shows that the router selector is set to position 0
Bil 1	Shows that the billiard selector is set to position 1
Seconds Counter (37)	This number cycles from 1 to 59, changing about every second while the system is running. If it stops, the system isn’t active and needs to be restarted using the reset button

The display gives you all the details needed to check that the system is working properly in real-time. If the seconds counter stops, signaling a problem, just press the reset button to reboot Thermosmart and return to normal operation. This simple but complete interface makes it easy for anyone, even those new to the system, to keep track of its status and the billiard’s environmental conditions.

# How Thermosmart Works in "Easy" Mode

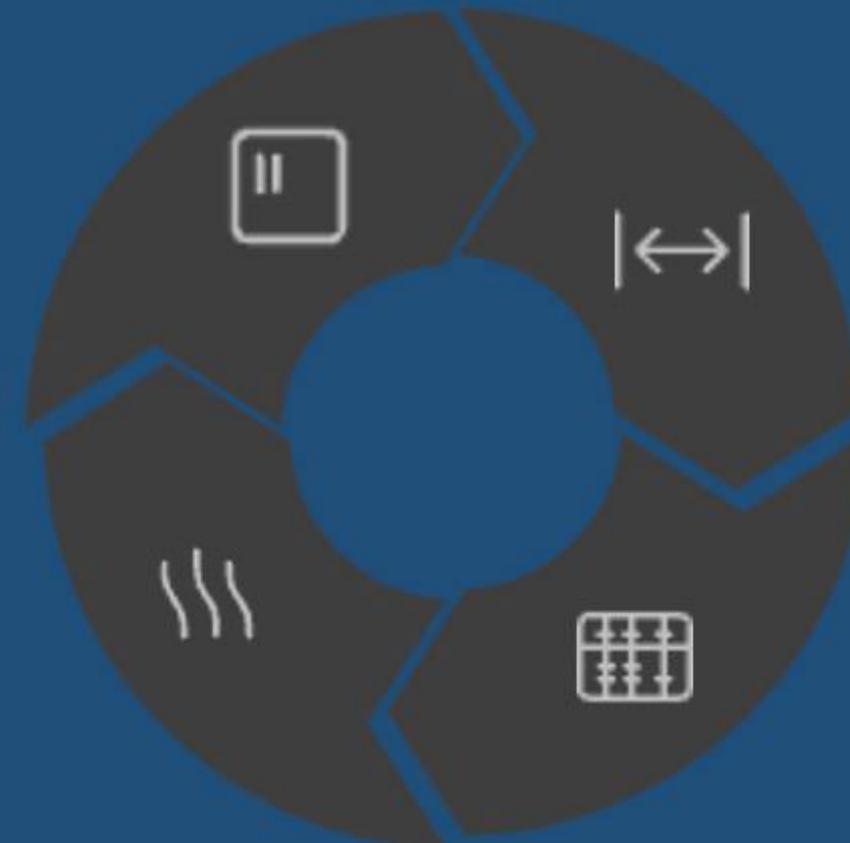
The Thermosmart system uses an advanced algorithm to ensure your pool table is always in top condition. Its smart logic is designed to keep the slate at the perfect temperature, taking humidity levels into account.

## Data Collection

The system reads temperature and humidity data from sensors inside the table thousands of times every second.

## Heating Adjustment

The heating is switched on or off based on the outcome of the analysis.



## Analysis and Comparison

The collected data is checked against the system's preset parameters for each scheduled time slot.

## Formula Application

The system uses the formula  $T = t \text{ min}$  if  $H < h \text{ max}$  to determine the next step.

The system's formula works like this: the temperature  $T$  measured by the sensor must be at least equal to the minimum temperature ( $t \text{ min}$ ) as long as the detected humidity  $H$  is below the maximum allowed humidity ( $h \text{ max}$ ). In other words:

- If the measured humidity is below the set maximum ( $h \text{ max}$ ), the system keeps the billiard table at the minimum programmed temperature ( $t \text{ min}$ ).
- If the humidity goes above the maximum programmed value ( $h \text{ max}$ ), the system raises the temperature up to the maximum set level ( $t \text{ max}$ ) to offset the extra moisture.

This method ensures the table never drops below the minimum temperature needed for optimal play, and automatically combats high humidity by increasing the heat as required. The system runs independently, cycling through the scheduled time slots and constantly adjusting the heating based on the measured environmental conditions.

# Default Timer Settings and Environmental Parameters

The Thermosmart system comes preset with four time slots (T1, T2, T3, T4) that automatically manage temperature and humidity throughout the day. Each slot features tailored settings to ensure optimal playing conditions at different times.

Timer1 On	
Hours	Minutes
8	0

Timer1 Off	
Hours	Minutes
10	45

Timer 1 (T1) 8:00 AM – 10:45 AM

t min 25°C

t max 27°C

h max 48%

This is the first time slot of the day, usually set for the morning hours. During this period, the system maintains a moderate temperature to get the billiard table ready for the day's activities, with humidity control suited for typical morning conditions.

Timer2 On	
Hours	Minutes
11	0

Timer2 Off	
Hours	Minutes
13	45

Timer 2 (T2) 11:00 AM – 1:45 PM

t min 27°C

t max 30°C

h max 43%

Second time slot. During this period, the system slightly raises both the minimum and maximum temperatures to provide optimal playing conditions as traffic increases, while also protecting materials from thermal stress.

Timer3 On	
Hours	Minutes
14	0

Timer3 Off	
Hours	Minutes
19	45

Timer 3 (T3) 2:00 PM – 7:45 PM

t min 31°C

t max 34°C

h max 37%

Third time slot, generally set for peak usage hours. Here, the system keeps temperatures ideal for play, with even stricter humidity control, taking into account the higher number of people and its effect on the environment.

Timer4 On	
Hours	Minutes
20	0

Timer4 Off	
Hours	Minutes
1	0

Timer 4 (T4) 8:00 PM – 1:00 AM

t min 30°C

t max 32°C

h max 40%

Fourth time slot, typically set for nighttime or closing hours. During this phase, the system lowers both minimum and maximum temperatures to save energy, while still maintaining acceptable conditions to protect the table's quality, even during downtime. After timer 4 ends, the system enters standby mode until timer 1 starts again at 8:00 AM.

For each time slot, the system manages three key parameters: minimum temperature (t min), maximum temperature (t max), and maximum humidity (h max). These settings have been fine-tuned based on in-depth research into ideal billiard playing conditions, ensuring top performance in a variety of environments. The default configurations are designed to balance game quality, table preservation, and energy efficiency.

# Thermosmart Technical Manual

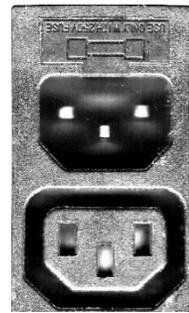
## “Pro” Installation Guide

- Thermosmart is highly adaptable, allowing you to customize a wide range of settings to meet even the most demanding requirements.
- By following the 'Pro' installation steps, users gain complete control over Thermosmart's features, making it possible to program each unit individually. This helps optimize energy use, extend the lifespan of components (like cloth and rails), and at the same time ensures consistent playing conditions across all time slots and pool tables.

# Thermosmart PRO Technical Manual



220V  
power cord



Portable connector  
for billiard heater  
(cable length: 1.5  
m).



Reset button and  
display switch



Temperature probe for  
installation in slate



Cable clamp  
Sensors



3-meter  
humidity  
sensor cable,  
to be placed  
next to the  
temperature  
probe, nearly  
touching the  
slate under  
the pool table

# Power Supply

- Unscrew the four screws on the Thermosmart cover and connect a power/data cable to the USB port on the side of the box, near the cable exit for the sensors
- Connect the cable to your PC or a smartphone
- **Warning:** Once the cover is removed, power the Thermosmart only through the USB port.
- The 220 V electrical circuit is isolated, but for your safety, it's best to power the device only after the cover has been securely closed. First, connect the output cable to the plug that goes to the heating system, and only then plug the power cord into the outlet.
- Always have a qualified technician perform these procedures.

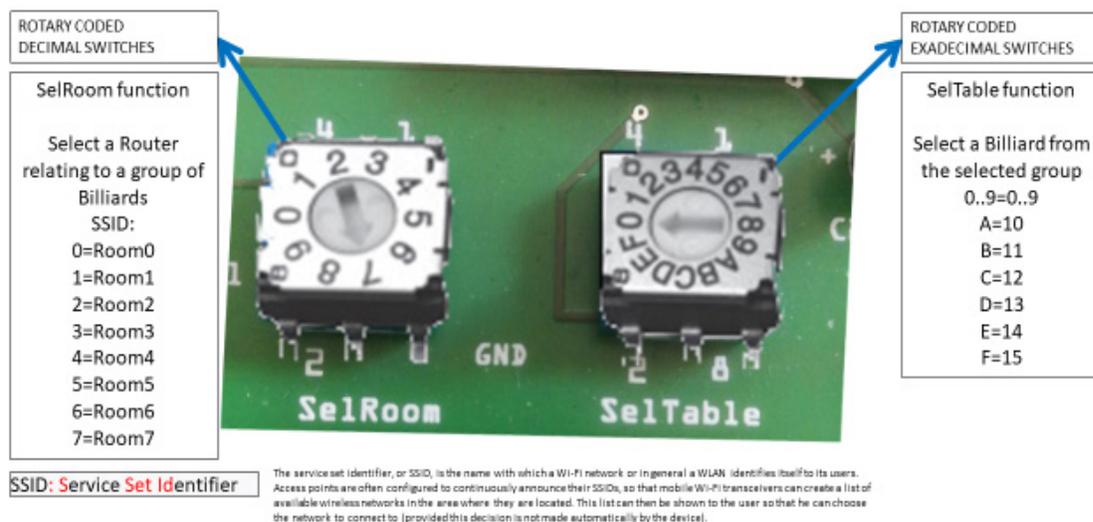
# Setting the «sel Room» and «sel Table» selectors

Both selectors will be set to position '0'

When the «sel Room» selector is set to position «0», Thermosmart will try to connect via Wi-Fi to a router that has **SSID: Room0** and **password: biliardo**.

This default setting cannot be changed. When you turn the selector to positions 1 through 7, the selected position will be shown automatically on the display (**Room**). For each position, you can link the router of your choice. Usually, it's enough to set each Thermosmart selector to position 1 and connect it to your router, following the steps outlined in this manual.

Router selector and billiard table selector



When you turn the 'sel table' selector to positions 1 through F, the selected position will be shown on the display based on the diagram beside it. This selector assigns each Thermosmart the matching billiard number, which will be visible on the **display (Bill)** and the **Home Page (Billiard)**.

# Accessing the Com Port Menu (Wired Connection)

- You can use the USB port to reach the Com port menu and connect directly to Thermosmart with a cable.
- To enable this feature, simply download a dedicated program to your computer (like Arduino IDE, PuTTY, or similar software), or use a specialized app on your smartphone (such as Serial USB Terminal or an equivalent).
- Once you're connected, just type 'menu' into the command line to see a list of all available options.

```
--- Menu ---  
Commands Com available:  
op1 - Connect HotSpot  
op2 - Sytem info  
op3 - SetWiFiData  
op4 - Set mains voltage  
op5 - Set Time from Pc  
op6 - Reset Time and Energy Consumption Counters  
op7 - Reset Billiard powered days Counter  
op8 - Hum calibration  
op9 - Temp calibration  
op10 - Change Sel Lan/Bil On/Off  
op11 - Restart ESP  
op12 - ScanWiFi  
op15 - Billiards extension On/Off
```

Scorrimento automatico  Visualizza orario Entrambi (NL & CR) 115200 baud Ripulisci l'output

«Available Com Commands»

# The “OP” options in the Com port menu, including OP1 “Connect HotSpot”

- Once the menu appears, you can perform the available actions by entering “OP1,” “OP2,” “OP3,” and so on, depending on what you want to do.
- OP1 lets you connect the Thermosmart to WiFi using a HotSpot.

```
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off
Inserisci l'SSID:
```

↑  
When you enter OP1, the system will prompt you to enter the HotSpot SSID



```
--- Menu ---
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off
Inserisci l'SSID:
Input string =Longoni
newSSID=Longoni
ssid=Longoni
```

↑  
After typing the SSID, for example (Longoni), press Enter. The SSID you entered will be shown and you'll be asked to enter the password



```
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off
Inserisci l'SSID:
Input string =Longoni
newSSID=Longoni
ssid=Longoni
-----
Inserisci la Password:
Input string =biliardo
password=biliardo
-----
SSID Longoni
Connecting to WiFi
Failed to connect to WiFi after 15 attempts
```

↑  
After entering the password, for example (biliardo), press Enter. Thermosmart will try to connect to the HotSpot using the information you provided. If the connection fails as shown, please try again and make sure the HotSpot is enabled.

# HotSpot Connection Enabled

Once the HotSpot connection is active, you'll see an IP address both on your device's screen (computer or smartphone) and on the ThermoSmart display. Simply enter the displayed IP address into any web browser (like Google Chrome, Edge, Mozilla, etc.) to access the ThermoSmart web page via http.



```
SSID Longoni
Connecting to WiFi
Connected to the WiFi network
IP address:
192.168.76.84
handleRestartLcd chiamata
Ip= 192.168.76.84
```

IP Address



17/06/2025 Tuesday	11:57:30 <a href="#">Light On</a>	Control On T2	 0 W
28.56 Ref_ 30.00	48.99 Ref_ 43.00	Kg 8 CO2 EMISSIONS	<a href="#">Save Energy&amp;Work</a>
<a href="#">Setup</a>	<b>Billiard :</b> 1	<b>Energy used Wh:</b> 15.690	<b>Work Minutes:</b> 1.569

**Important:** The HotSpot connection **does not** save the credentials entered (SSID and PASSWORD) to the ThermoSmart's memory. Once the session ends, you'll need to repeat the setup with the same credentials or choose new ones.

# OP2 “System Info”

- OP 2 is a direct command that doesn't require any input. Just type “OP2” on the command line and system information will instantly appear.
- Some details relate to the processor's factory specifications.
- Others show the default settings.
- You'll also see whether certain data is stored in the Thermosmart's memory.
- The most important info is displayed on the side.

```
-----Timer1 schedule-----
Timer1Hon  =8
Timer1Mon  =0
Timer1Hoff =10
Timer1Moff =45
-----Timer2 schedule-----
Timer2Hon  =11
Timer2Mon  =0
Timer2Hoff =13
Timer2Moff =45
-----Timer3 schedule-----
Timer3Hon  =14
Timer3Mon  =0
Timer3Hoff =19
Timer3Moff =45
-----Timer4 schedule-----
Timer4Hon  =20
Timer4Mon  =0
Timer4Hoff =1
Timer4Moff =0
```

↑  
Default times for all  
4 timers.

Both  
Settings  
You can update the  
timer schedules and  
temperature/  
humidity settings  
anytime from the  
setup web page.  
Your new choices  
will be saved and  
shown instead of  
the default values.

```
---Temp & Hum Timer1---
Temp_min_T1 25.00
Temp_max_T1 27.00
Hum_min_T1  0.00
Hum_max_T1  48.00
---Temp & Hum Timer2---
Temp_min_T2 27.00
Temp_max_T2 30.00
Hum_min_T2  0.00
Hum_max_T2  43.00
---Temp & Hum Timer3---
Temp_min_T3 31.00
Temp_max_T3 34.00
Hum_min_T3  0.00
Hum_max_T3  37.00
---Temp & Hum Timer4---
Temp_min_T4 30.00
Temp_max_T4 32.00
Hum_min_T4  0.00
Hum_max_T4  40.00
```

↑  
Min/Max Temperature  
Settings  
Default Max Humidity  
for All 4 Timers

# OP2 "System info" system preferences overview

Preferences are non-volatile memory cells where ThermoSmart stores information.

Some data is saved automatically:

energy usage/**WatthTimer** – heating phase duration/**Worktimer** – system operating days/**Dayson** Other settings can be

saved manually by the operator:

Sel enabled 'OP10' – SelBilPlus 'OP15' – Hum/TempOffset 'OP8/9' – Mains Voltage 'OP4' – Router 1-7 'OP3'

Data stored automatically or by user input can be deleted or changed by the operator at any time.

```
-----Various Prefs-----
AppVer=          ThermoSmart_V1
IPAddress=       192.168.76.84
Sel enabled
SelBilPlus=     0
TempOffset stored= 0.00
HumOffset  stored= 0.00
```

```
-----Prefs Routers-----
Router0 Room0   password biliardo
Router1 N/A     password N/A
Router2 N/A     password N/A
Router3 N/A     password N/A
Router4 N/A     password N/A
Router5 N/A     password N/A
Router6 N/A     password N/A
Router7 N/A     password N/A
```

```
-----Prefs DaysON Vr Wh WorkT-----
Mains Voltage 220
DaysOn        1
WorkTimer1 minutes 0
WatthTimer1 minutes 0
WorkTimer2 minutes 0
WatthTimer2 minutes 0
WorkTimer3 minutes 0
WatthTimer3 minutes 0
WorkTimer4 minutes 0
WatthTimer4 minutes 0
```

# OP3 “SetWiFiData”: Save, delete, and view your router credentials

With OP3, you can easily enter your router credentials to connect to WiFi.

Type OP3 in the command line to open a submenu with four options:

**set get list del**

The submenu shows the 'Command Guide' to help you enter the right commands for your chosen operation

```
Command Guide:
SET <id 0-7> <SSID> <PASSWORD> - Store a WiFi network
GET <id 0-7>                    - Reads a specific network
LIST                             - Show all stored networks
DEL <id 0-7>                     - Clear a specific network

menu to exit
choose operation
```

# SET GET LIST DEL

- To save (**SET**) your router credentials, just follow the instructions in the submenu.
- Type the following in the command line:

(**set** space **1-7** space **SSID** space **password**) then press **Enter**

- Example of saving your router credentials in slot **1** under “sel Room” using SSID ‘**Longoni**’ and password ‘**biliardo**’
- After pressing Enter, a message will appear confirming your credentials have been saved.

```
COM7
set 1 Longoni biliardo
-----
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off
setWiFiDataCom chiamata

Command Guide:
SET <id 0-7> <SSID> <PASSWORD> - Store a WiFi network
GET <id 0-7> - Reads a specific network
LIST - Show all stored networks
DEL <id 0-7> - Clear a specific network

menu to exit
choose operation

-----
menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto set 1 Longoni biliardo
Longoni
biliardo
Credentials saved!
```

# SET GET LIST DEL

- To view (**GET**) the credentials stored in a specific slot (**1-7**) of the “sel Room” selector, just follow the instructions shown in the submenu.
- Type the command on the line.

(**get** “space”**1-7**) then press **Enter**

Example of displaying router credentials in slot **1** of “sel Room”

After pressing Enter, your previously saved credentials will appear

```
COM7
get 1|

menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto set 1 Longoni biliardo
Longoni
biliardo
Credentials saved!
setWiFiDataCom chiamata

Command Guide:
SET <id 0-7> <SSID> <PASSWORD> - Store a WiFi network
GET <id 0-7> - Reads a specific network
LIST - Show all stored networks
DEL <id 0-7> - Clear a specific network

menu to exit
choose operation

menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto get 1
Router1: SSID: Longoni, PASSWORD: biliardo
```

# SET GET LIST DEL

- To view (**LIST**) all the positions (from 1 to 7) of the “sel Room” selector where router credentials have been saved, just follow the instructions in submenu
- Type the following at the command line

**list** then hit **Enter**

After pressing Enter, the router credentials for locations where you previously used the **SET** command will be displayed.

Locations in “sel Room” without any saved credentials won’t appear. In this example, only position 1 in “sel Room” has credentials stored.

```
COM7
list
LIST - Show all stored networks
DEL <id 0-7> - Clear a specific network

menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto get 1
Router1: SSID: Longoni, PASSWORD: biliardo
setWiFiDataCom chiamata

Command Guide:
SET <id 0-7> <SSID> <PASSWORD> - Store a WiFi network
GET <id 0-7> - Reads a specific network
LIST - Show all stored networks
DEL <id 0-7> - Clear a specific network

menu to exit
choose operation

menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto list
Router1: SSID: Longoni, PASSWORD: biliardo
```

# SET GET LIST DEL

- To delete (**DEL**) saved credentials from a specific (**1-7**) slot on the “sel Room” selector, just follow the instructions shown in submenu

Enter the following command line: (**del** “space” **1-7**) then press **Enter**

Once you hit enter, the router credentials for the selected “sel Room” slot will be deleted.

In this example, the credentials for position 1 of “sel Room” — **Longoni** with password **biliardo** — have been removed.

```
COM7
del 1
DEL <id 0-7> - Clear a specific network

menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto list
Router1: SSID: Longoni, PASSWORD: biliardo
Days stored 2handleRestartLcd chiamata
setWiFiDataCom chiamata

Command Guide:
SET <id 0-7> <SSID> <PASSWORD> - Store a WiFi network
GET <id 0-7> - Reads a specific network
LIST - Show all stored networks
DEL <id 0-7> - Clear a specific network

menu to exit
choose operation
```

```
menu to exit
choose operationprocessCommandCom chiamato
Comando ricevuto del 1
Credentials removed!
```

# OP4: Set Main Voltage

- OP4 lets you save the voltage currently running in your electrical network, so you can accurately track the power consumption for each billiard table equipped with Thermosmart.
- By default, the voltage is set to 220 V, but the actual value in your network may vary by up to 10% from the standard 230 V, as specified by the utility provider.
- Before adjusting the OP4 settings, it's recommended to check the voltage in your network using your meter or a dedicated measuring device.

Once you've checked the voltage in your electrical network, type **OP4** at the command prompt and press **Enter**.

The system will prompt you to enter the desired value, then press **Enter** again.

In this example, the value 230 V was entered and will be displayed immediately after you press **Enter**. The saved value will be displayed in OP2 'system info' and as a tooltip on the Home Page

```
COM7
op4

--- Menu ---
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off

SetVrete called
Insert mains voltage #1:

SetVrete called
Insert mains voltage #1: Input voltage= 230
```

# OP5 “Set Time from PC”

## OP6 “Reset Time and Energy Usage Counters” OP7 “Reset Days Powered Counter”

- OP5, OP6, and OP7 are instant commands. The system doesn't need any extra input—just type the command (OP5, OP6, or OP7) directly in the command line and it'll run right away.
- When you enter **OP5** and hit **Enter**, Thermosmart will automatically set the date and time from the connected PC. The new settings will appear immediately on the Home Page and in the setup section.
- (**Note**) Double-check that the data (**time / day / month / year**) was saved correctly. Sometimes the PC doesn't provide accurate info, so if you spot any errors, update them on the setup web page.
- When you enter **OP6** and press **Enter**, Thermosmart will clear all stored power usage and heating times from Preferences—these stats will no longer be shown in OP2 "System Info" or on the Home Page.
- When you enter **OP7** and press **Enter**, Thermosmart will reset the "**Days ON**" counter, which tracks how many days it's been running. This info will be cleared from OP2 "System Info" and from the tooltip on the Home Page, then the counter restarts at 1 (**Days ON 1**).

# OP8 “Humidity Calibration” OP9 “Temperature Calibration”

- OP8 - 9 are input commands similar to OP4 “set main voltage”
- With these two commands, you can apply a correction offset to the humidity and temperature readings taken by the sensors, which are displayed at the same time on the Thermosmart screen, the Home Page, and the setup webpage.
- The sensors included with Thermosmart are top-notch—highly accurate and sensitive, even to tiny decimal changes. They come factory-calibrated, with a stated tolerance of +/- 2%. Because of this, you might notice a difference of up to 4% in the humidity or temperature readings between two or more Thermosmart devices, and in some cases, the difference could be a bit higher.
- Using OP8 - 9 lets you standardize sensor calibration across all Thermosmart devices for more precise readings, helping adjust for any humidity and temperature differences between tables based on their location, airflow, how many people are around, air conditioning, and other factors.
- Over time, the sensors may lose calibration, but with OP8 and OP9 you can restore them to full working order without having to replace them, saving on expensive costs.

# OP8 “Humidity Calibration”

- To adjust the humidity sensor's calibration, type **OP8** in the command line and press **Enter**.
- The system will then prompt you to enter the desired offset value, using either a plus or minus sign.
- Type the correction value into the command line and press Enter again.
- For example, entering +10 will apply a +10 offset, as shown in the system's response.
- After you've set the offset, running OP8 again will display the current sensor reading along with the previously applied offset.
- **IMPORTANT:** The correction values you enter **always** refer to the actual reading from the sensor. To reset the previously entered offset, simply repeat the OP8 command and enter '0' as the offset value.

```
COM7
op8|
--- Menu ---
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off

enter the offset Hum value with the sign

Input HumOffset 10.00

Humidity read= 66.96 Offset read= 10.00
enter the offset Hum value with the sign
```

# OP9 “Temperature Calibration”

- To apply a correction offset to the temperature probe, type **OP9** at the command prompt and press **Enter**
- The system will prompt you to enter the desired offset value, including the +/- sign
- Type the correction value in the command line, then press **Enter**
- In this example, +10 was entered, as shown in the system’s response
- After you’ve entered the offset, running OP8 again will display the actual reading from the probe along with the offset previously applied.
- **IMPORTANT** The correction values you enter are **always** based on the actual value read by the probe. If you want to reset the previously entered offset, repeat OP8 and enter ‘0’ as the offset.

```
COM7
op9|
--- Menu ---
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off

Temperature read= 27.19 Offset read= 0.00
enter the offset Temp value with the sign

enter the offset Temp value with the sign
Input TempOffset 10.00

Temperature read= 27.19 Offset read= 10.00
enter the offset Temp value with the sign
```

# OP10: Turn Sel Lan/Bil On or Off

- **OP10** is a direct command that doesn't require any input. Just type OP10 and hit enter, and the system will immediately enable (on) or disable (off) the related feature.
- As we saw earlier (see Slide 4), one of the first steps is to set the "sel Room" and "sel Table" selectors to your desired positions. As you move the selectors, the display will update to show their current positions as read by the Thermosmart.
- By entering OP10 at the command line, you can enable or disable this feature.
- By default, this feature is enabled.
- In the image shown, the "sel Room" selector is set to position **6**, while the "sel Table" selector is set to position **1**.



# OP11 “Restart ESP”

- OP11 is a direct command that doesn't require any input.
- Type **OP11** and press **Enter** on the command line to reset or restart Thermosmart's operation.
- This function does not delete any set parameters, but allows you to restart the system if it becomes unresponsive.
- You can also restart the Thermosmart directly by pressing the reset button located on the side of the box, near the display's on/off switch.

# OP 12: “ScanWiFi”

- OP12 is a direct command operation, no input needed, but it's unique.
- Under normal conditions, Thermosmart operates as a server, providing its built-in services to all connected devices.
- When you enable the OP12 function, Thermosmart temporarily switches from server mode to client mode, running a WiFi scan to detect available network connections.
- Type **OP12** in the command line and press **Enter**
- Right after you hit enter, Thermosmart will scan for WiFi networks and show a list of available connections along with their signal strength (**dBm**) on the com port display.
- Once the scan is complete, Thermosmart will automatically restart and restore its functionality based on your previous settings.

```
Q Scanning WiFi networks in progress...
1. SSID: TIM-69937092 | RSSI: -70 dBm
2. SSID: TIM-86867941 | RSSI: -71 dBm
3. SSID: Wind3 HUB-772BAA | RSSI: -90 dBm
4. SSID: WINDTRE-073B70 | RSSI: -91 dBm
ets Jun  8 2016 00:22:57
```

```
Connecting to WiFi
Connected to the WiFi network
IP address:
192.168.76.84
handleRestartLcd chiamata
Ip= 192.168.76.84
```

# OP13 “Billiard Extension On/Off”

- OP13 is a direct command operation with no input required.
- It enables or disables a function in the same way as OP10.
- The purpose of OP13 is to assign higher values to each position on the “sel Table” selector.
- This function becomes necessary in sports centers with more than 15 billiard tables where Thermosmart devices are being installed.
- The “sel Table” selector only has 16 available positions (actually 15, since the first slot is ‘0’— unless you want to label a table as ‘0’!). So, if a sports center has more than 15 tables, it can’t assign Thermosmart devices to each table with unique numbers.
- By entering **OP12** in the command line and pressing enter, each selector position will automatically be read with an added value of +16.
- For example, position ‘0’ will now be read as ‘16’, position ‘1’ as ‘17’, ‘2’ as ‘18’, and so on up to ‘31’.
- If you need to manage more than 31 billiard tables, you can request and enable an additional extension.

# WiFi Connection and the Telnet Menu

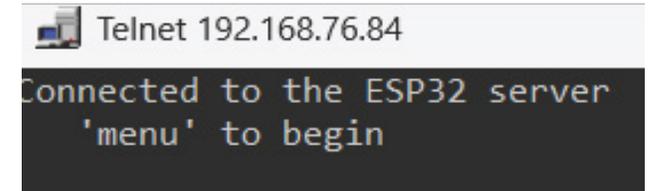
- While all operations from the COM port menu require a wired connection via USB, you can access a similar—though not identical—menu over WiFi: the Telnet menu.
- To access the Telnet menu on Windows, you'll first need to enable the Telnet program on your computer (it's often enabled by default).
- For macOS, you can install it using Homebrew (`brew install telnet`).
- On Linux, Telnet is usually preinstalled, or you can add it with your package manager (for example: `sudo apt install telnet` on Debian/Ubuntu).
- On your smartphone, you can download a dedicated app (like Terminal Telnet Client or similar)
- **Important** Before accessing the Telnet menu, make sure both your Thermosmart device and your PC or smartphone are connected to the same WiFi network

# Telnet Menu Access

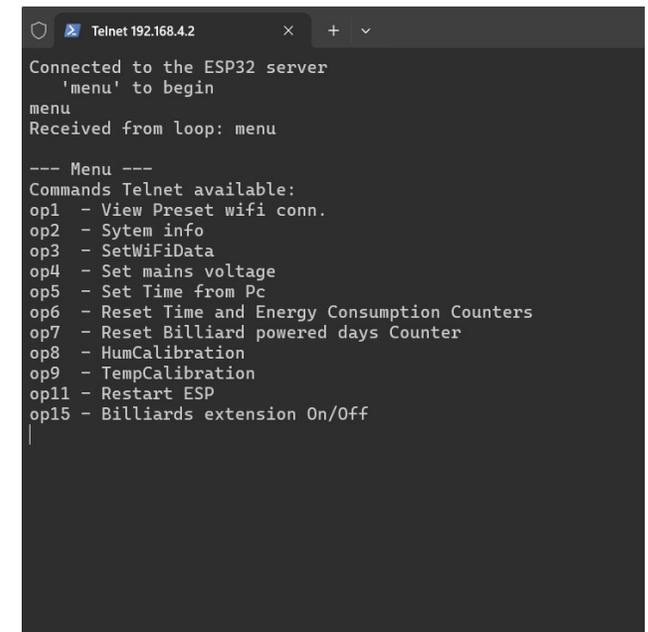
- Open the Windows Command Prompt from the Start menu
- Type **telnet**, add a space, then enter the IP address shown on the Thermosmart display, and press **Enter**
- Once the command is sent, a confirmation screen will pop up showing «**menu to begin**».
- Now, type **menu** and then **enter** to proceed.



```
Prompt dei comandi
Microsoft Windows [Versione 10.0.17134.1]
(c) Microsoft Corporation. Tutti i diritti sono riservati.
C:\Windows\system32\cmd.exe
```



```
Telnet 192.168.76.84
Connected to the ESP32 server
'menu' to begin
```



```
Telnet 192.168.4.2
Connected to the ESP32 server
'menu' to begin
menu
Received from loop: menu

--- Menu ---
Commands Telnet available:
op1 - View Preset wifi conn.
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - HumCalibration
op9 - TempCalibration
op11 - Restart ESP
op15 - Billiards extension On/Off
```

# Differences Between the Telnet Menu and the Com Port Menu

Basically, the menus are **almost** identical.

The only real difference is in OP1: in the telnet menu, you can view the default WIFI settings (SSID and password).

In the COM port menu, you can connect to a hotspot by entering your preferred credentials, no matter what position the selector (sel Room) is in. **These credentials will not** be saved in the **preferences**, so when Thermosmart restarts, they'll be erased.

The COM port menu also includes:

OP10, which lets you lock out the selectors from being read by Thermosmart. When this feature is enabled, turning the selectors won't change the display or show their positions.

OP12 lets you scan for available Wi-Fi networks you can connect Thermosmart to.

```
Connected to the ESP32 server
'menu' to begin
menu
Received from loop: menu

--- Menu ---
Commands Telnet available:
op1 - View Preset wifi conn.
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - HumCalibration
op9 - TempCalibration
op11 - Restart ESP
op15 - Billiards extension On/Off
```

```
--- Menu ---
Commands Com available:
op1 - Connect HotSpot
op2 - Sytem info
op3 - SetWiFiData
op4 - Set mains voltage
op5 - Set Time from Pc
op6 - Reset Time and Energy Consumption Counters
op7 - Reset Billiard powered days Counter
op8 - Hum calibration
op9 - Temp calibration
op10 - Change Sel Lan/Bil On/Off
op11 - Restart ESP
op12 - ScanWiFi
op15 - Billiards extension On/Off
```

Scorrimento automatico  Visualizza orario Entrambi (NL & CR) 115200 baud Ripulisci l'output

The steps for each OP are exactly the same

# WiFi Connection Access to Web Pages «Home Page» «setup»

- To connect your PC or smartphone to Thermosmart via WiFi, first make sure your device is on the same WiFi network as Thermosmart.
- Open any web browser (Google Chrome, Mozilla Firefox, Microsoft Edge, etc.)
- Type in the IP address shown on your Thermosmart display

# Home Page: Active

Date and time

Thermosmart operating during schedule T4

Heating element on standby until target temperature is reached

Temperature and humidity readings from billiard table sensors, plus reference values (Ref)

CO2 amount generated by total kWh consumption

Button to save usage data and active minutes asynchronously

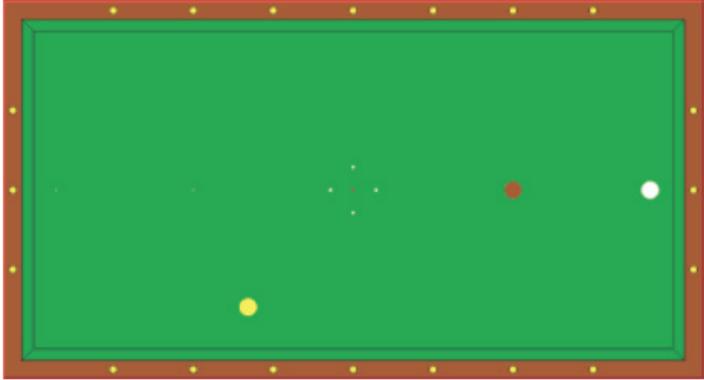
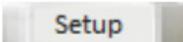
Total minutes heating has been on since initial use

Setup button—go to Setup page

Pool table status: Monitored

Total energy used (Wh) since first activation

# Home Page: Active Status

18/06/2025 Wednesday	<u>21:04:38</u> <u>Light On</u>	Control On T4	 0 W
 			
 -2.50 Ref_ 32.00	 68.35 Ref_ 40.00	 Kg 0	<a href="#">Save Energy&amp;Work</a>
	<b>Billiard :</b> <b>1</b>	 <b>Energy used Wh:</b>	 <b>Work Minutes:</b> <b>301</b>

When the resistance is shown in red, it means the ThermoSmart is actively heating. In the example above, the ThermoSmart displays a power consumption of "0 W" because it isn't actually connected to the billiard table's power supply. Normally, when the resistance is red, you'll see the actual wattage being drawn by the billiard table's heating element in real time. If you see a situation like the one shown here, double-check that the power connection is properly set up, or use the indicated tooltip to see if an incorrect voltage of '0' has been entered by mistake.

# Main Menu

## System Off

Non sicuro 192.168.70.64

18/06/2025 Wednesday	20:28:20 <u>Light On</u>	Attention!!! Control Off T4	 0 W
 			
 36.63 Ref_ 32.00	 63.64 Ref_ 40.00	 Kg 0	<a href="#">Save Energy&amp;Work</a>
<input type="button" value="Setup"/>	<b>Billiard :</b> <b>1</b>	 <b>Energy used Wh:</b>	<b>Work Minutes:</b>  <b>301</b>

The system is currently set to “OFF,” so temperature and humidity control are paused. To turn everything back on, go to the setup page and press the green **ON**

# Setup Page State On Scheduling Time Slots

All arrows shown on the setup page work as buttons—click any arrow to adjust its value. The **green** arrows pointing right decrease values; the **red** arrows pointing left increase values.

To set up new time slots, simply click your desired buttons and then save your new schedule by clicking

«Save Timers Parameters»

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME		
<b>Timer1 On</b>		<b>Timer2 On</b>		<b>Timer3 On</b>		<b>Timer4 On</b>		
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	
8	0	11	0	14	0	20	0	
←	→	←	→	←	→	←	→	
<b>Timer1 Off</b>		<b>Timer2 Off</b>		<b>Timer3 Off</b>		<b>Timer4 Off</b>		
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	
10	45	13	45	19	45	1	0	
←	→	←	→	←	→	←	→	
<a href="#">Save Timers Parameters</a>								
Temp Min	Temperature	Temp Max	T/H Timer			Humidity	Hum Max	
30.00	25.62	32.00	4			68.89	40.00	
←	→	←	→			←	→	
<a href="#">Saves temperature and humidity time slot settings</a>								
Day	Month	Year	WeekDay	Hours	Min	Second		
18	6	2025	3	21	23	17		
←	→	←	→	←	→	←		→
<b>ON</b>	<b>OFF</b>	<a href="#">Save Time Setting</a>		<b>Control On</b>				

The **Timers 1,2,3,4 On**  
Show when each timer starts  
**Timers 1,2,3,4 Off**  
Show when each timer ends

**WARNING** This system is designed to prevent scheduling errors, such as overlapping time slots.

For instance, if you want to change the end time of **timer 3Off** from 7:45 PM to 8:45 PM by clicking the red Hours 19 button to move it to 8:00 PM, the system won't allow it since it would overlap with timer 4, which starts at 8:00 PM. To make this change, first adjust the start time of timer 4 (from 8:00 PM to 9:00 or 10:00 PM, etc.), then set the end of **Timer3Off** to 8:45 PM. For proper operation,

«**Timer 4 On**» **must** begin **before 12:00 AM**

# Setup Page: State Enabled

## GAPs Between Time Slots

On the highlighted "Setup Page," you'll see there's a 15-minute break between the end and start of two timers. These "GAP" intervals can be shortened to as little as 5 minutes, but you'll always need to include them in every schedule. "GAP" intervals are crucial, as they allow the system to calculate usage and save the results in your preferences.

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
<b>Timer1 On</b>		<b>Timer2 On</b>		<b>Timer3 On</b>		<b>Timer4 On</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
8	0	11	0	14	0	20	0
<b>Timer1 Off</b>		<b>Timer2 Off</b>		<b>Timer3 Off</b>		<b>Timer4 Off</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
10	45	13	45	19	45	1	0
<b>Save Timers Parameters</b>							
Temp Min	Temperature	Temp Max	T/H Timer		Humidity	Hum Max	
30.00	25.62	32.00	4		68.89	40.00	
<b>Saves temperature and humidity time slot settings</b>							
Day	Month	Year	WeekDay	Hours	Min	Second	
18	6	2025	3	21	23	17	
<input type="checkbox"/> ON	<input type="checkbox"/> OFF	Save Time Setting _____ Control On					

# Setup Page: State On

## Programming Minimum/Maximum Temperature and Maximum Humidity Settings

To set the minimum and maximum temperature and maximum humidity values, first press the red **OFF** button. The system will pause and you'll be able to choose the timer.

Choose the **T/H Timer** you want to save new settings for. In the illustration, the T/H Timer is set to position 4; just click the **green arrow** to move to timer 3, 2, or 1. With each timer selected, the system will show the corresponding min/max temperature and max humidity values. Once you finish programming, press the **Saves temperature and humidity time slot settings** button to store your new settings, then resume Thermosmart operation by clicking the green **ON** button.

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
<b>Timer1 On</b>		<b>Timer2 On</b>		<b>Timer3 On</b>		<b>Timer4 On</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
8	0	11	0	14	0	20	0
←	→	←	→	←	→	←	→
<b>Timer1 Off</b>		<b>Timer2 Off</b>		<b>Timer3 Off</b>		<b>Timer4 Off</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
10	45	13	45	19	45	1	0
←	→	←	→	←	→	←	→
<b>Save Timers Parameters</b>							
Temp Min	Temperature	Temp Max	T/H Timer			Humidity	Hum Max
30.00	25.62	32.00	4			68.89	40.00
←	→	←	→			←	→
<b>Saves temperature and humidity time slot settings</b>							
Day	Month	Year	WeekDay	Hours	Min	Second	
18	6	2025	3	21	23	17	
←	→	←	→	←	→	←	→
<b>ON</b>	<b>OFF</b>	<b>Save Time Setting</b>			<b>Control On</b> 		

# Setup Page

## State On

### Date and Time Settings

With the **red** and **green** arrows, you can reset the day, month, year, hour, minutes, and seconds. There's no need to press the red **OFF** button first like you do when setting new min/max temp or max humidity parameters.

All you need to do is click the corresponding buttons to reset the date and time, then click the [Save Time Setting](#)

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
Timer1 On		Timer2 On		Timer3 On		Timer4 On	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
8	0	11	0	14	0	20	0
←	→	←	→	←	→	←	→
Timer1 Off		Timer2 Off		Timer3 Off		Timer4 Off	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
10	45	13	45	19	45	1	0
←	→	←	→	←	→	←	→
<b>Save Timers Parameters</b>							
Temp Min	Temperature	Temp Max	T/H Timer		Humidity	Hum Max	
30.00	25.62	32.00	4		68.89	40.00	
←	→	←	→	←	→	←	→
<b>Saves temperature and humidity time slot settings</b>							
Day	Month	Year	WeekDay	Hours	Min	Second	
18	6	2025	3	21	23	17	
←	→	←	→	←	→	←	→
ON	OFF	<a href="#">Save Time Setting</a>		Control On			

# Setup Page: Status Active

The Default T&H and Default Timers buttons

By clicking the buttons **DefaultT&H** or **DefaultTimers** the default settings will be restored.  
Clicking on **HOME** will take you back to the Home Page.

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
<b>Timer1 On</b>		<b>Timer2 On</b>		<b>Timer3 On</b>		<b>Timer4 On</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
8	0	11	0	14	0	20	0
←	→	←	→	←	→	←	→
<b>Timer1 Off</b>		<b>Timer2 Off</b>		<b>Timer3 Off</b>		<b>Timer4 Off</b>	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
10	45	13	45	19	45	1	0
←	→	←	→	←	→	←	→
<b>Save Timers Parameters</b>							
Temp Min	Temperature	Temp Max	T/H Timer		Humidity	Hum Max	
30.00	25.62	32.00	4		68.89	40.00	
←	→	←	→	←	→	←	→
<b>Saves temperature and humidity time slot settings</b>							
Day	Month	Year	WeekDay	Hours	Min	Second	
18	6	2025	3	21	23	17	
←	→	←	→	←	→	←	→
ON	OFF	Save Time Setting		Control On		~	

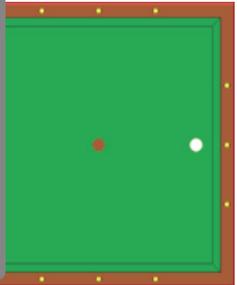
# Home Page Tooltip

19/06/2025 00:08:21 Control On T4 0 W  
Thursday Light On

INFORMATION  
Router running:  
Room0

Main voltage 230 V  
Days ON 3  
HoursWorkTime 5

A click on the time, restarts the LCD display  
The page updates automatically every 20 seconds  
for an immediate update click on the billiard table



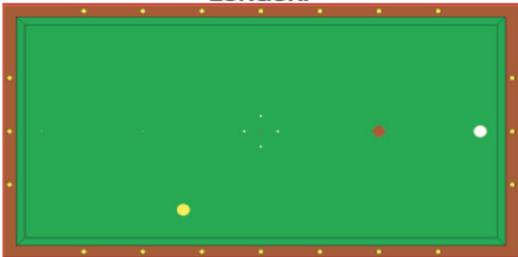
25.37 Ref 32.00 71.02 Ref 40.00 Kg 0

Save Energy&Work

Setup Billiard : 1 Energy used Wh: Work Minutes: 301

19/06/2025 00:09:51 Control On T4 0 W  
Thursday Light On

ThermoSmart by LONGONI



25.31 Ref 32.00 70.71 Ref 40.00

WattTimer1=  
WattTimer2=  
WattTimer3=  
WattTimer4=

19/06/2025 00:11:16 Control On T4 0 W  
Thursday Light On

ThermoSmart by LONGONI



25.44 Ref 32.00 70.36 Ref 40.00 Kg 0

WorkTimer1=  
WorkTimer2=  
WorkTimer3= 105  
WorkTimer4= 196

Setup Billiard : 1 Energy used Wh: Work Minutes: 301

# Setup Page Tooltip

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
Timer1 On		Timer3 On		Timer4 On			
Hours	Minutes	Hours	Minutes	Hours	Minutes		
8	0	14	0	20	0		
Timer1 Off		Timer3 Off		Timer4 Off			
Hours	Minutes	Hours	Minutes	Hours	Minutes		
10	45	13	45	1	0		
Save Timers Parameters							
Temp Min	Temperature	Temp Max	T/H Timer	Humidity	Hum Max		
30.00	25.56	32.00	4	69.95	40.00		
Saves temperature and humidity time slot settings							
Day	Month	Year	WeekDay	Hours	Min	Second	
19	6	2025	4	0	13	44	
ON	OFF	Save Time Setting		Control On		-w-	

**ATTENTION**  
For Temperature and Humidity the factory values will be restored

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
Timer1 On		Timer2 On		Timer4 On			
Hours	Minutes	Hours	Minutes	Hours	Minutes		
8	0	11	0	0	0		
Timer1 Off		Timer2 Off		Timer4 Off			
Hours	Minutes	Hours	Minutes	Hours	Minutes		
10	45	13	45	19	45	1	0
Save Timers Parameters							
Temp Min	Temperature	Temp Max	T/H Timer	Humidity	Hum Max		
30.00	25.56	32.00	4	69.95	40.00		
Saves temperature and humidity time slot settings							
Day	Month	Year	WeekDay	Hours	Min	Second	
19	6	2025	4	0	13	44	
ON	OFF	Save Time Setting		Control On		-w-	

**ATTENTION**  
For the timers times the factory values will be restored

Non sicuro 192.168.76.84/SetUpParam

ThermoSmart		DefaultT&H		DefaultTimers		HOME	
Timer1 On		Timer2 On		Timer3 On		Timer4 On	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
8	0	11	0	14	0	20	0
Timer1 Off		Timer2 Off		Timer3 Off		Timer4 Off	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
10	45	13	45	19	45	1	0
Save Timers Parameters							
Temp Min	Temperature	Temp Max	T/H Timer	Humidity	Hum Max		
30.00	25.56	32.00	4	69.95	40.00		
Saves temperature and humidity time slot settings							
Day	Month	Year	WeekDay	Hours	Min	Second	
19	6	2025	4	0	13	44	
ON	OFF	Save Time Setting		Control On		-w-	

**ATTENTION**  
To change T/H timer, turn OFF the control and then don't forget to turn it back ON again