terneo

pro
smart thermostat

Technical data sheet, installation and operation manual

The terneo pro thermostat with two air and floor temperature sensors is designed to maintain a comfortable temperature in the room according to the weekly schedule. Savings of up to 50% are ensured due to the fact that underfloor is heated only when it is needed.

The thermostat provides 3 modes of maintaining a comfortable temperature: air with floor restriction, floor and air.

Electric and water heated floors are controlled using data from temperature sensors. The basis of the electric floor heating can be a heating cable or film. Water heated floor should be controlled by a normally closed or normally open electrothermal actuator with an operating voltage of 230 V.

Control of electric convectors, infrared panels, other electric heaters or coolers is carried out using the built-in air sensor.

In case of no voltage, wall thermostat and heating schedule settings are kept in the non-volatile thermostat storage.

For durable operation of the power relay and the reliability of its contacts, the following is provided:
— protection against frequent switching of the thermostat relay;
— switching on the load as close as possible to the moment when the voltage sinusoid passes through zero. Small deviations from the zero crossing are possible due to different trip times for different types of power relay.

IN THE BOX

Thermostat, frame	1 piece
Temperature sensor with connected wire	1 piece
Technical data sheet, installation and operation manual and warranty card	1 piece
The packing box	1 piece

IMPORTANT. Before the installation and operation of the device, please read by the end of this document.This will help to avoid possible danger, mistakes and misunderstandings.

TECHNICAL DATA

Adjustment range	air 5...35 °C floor 5...60 °C
Maximum load current (for category AC-1)	16 A
Rated load capacity (for category AC-1)	3 000 VA
Input voltage	230 V ±10 %
Weight in the complete set	0,18 kg ±10 %
Temperature sensor (in set)	NTC thermo-resistor 10K OM at 25 °C (R10)
The length of the sensor connected cable	3 m
Types of the supported sensors:	NTC 4.7, 6.8, 10, 12, 15, 33, 47K OM at 25 °C d18
Number combinations under heat, at least	50 000 cycles
Number of combinations without heating, no less than	20 000 000 cycles
Temperature hysteresis	air 0,5 °C floor 1...10 °C
Overall dimensions (w x h x d)	75 x 75 x 38 mm
Inner overall dimensions of decorative frame:	45 x 45 mm
Cross section of connection wires	not more than 2,5 mm^2
Maximum extension length of the temperature sensor	20 m
Compatibility with frames from other manufacturers	Schneider Electric Unica и Unica New
Available interface languages	ua, cs, en, ru, de

WIRING

Thermostat supports two types of sensors: analog sensor (thermal resistor) or digital sensor (DS18B20).

Analog sensor (R10) is connected to terminals 1 and 2.

Digital sensor (D18) is connected to terminal 1 using white wire and to terminal 2 using blue wire.Be sure to select the type of sensor in the functional menu of the thermostat when using a digital sensor: d18 (see page 10 menu item «Type of sensor»).

Power voltage (230 V ± 10 %, 50 Hz) is supplied to terminals 4 and 5, at that phase (L) is determined by indicator and is connected to terminal 5, and neutral (N) — to terminal 4.

Load (connecting wires from heating element) is connected to terminals 3 and 6.

THE THERMOSTAT IS MOUNTED AND CONNECTED after the installation and load testing.

IN THE CASE OF INCORRECT WIRING, is possible failure of the thermostat. Make sure that external sensor and mains voltage are connected correctly.
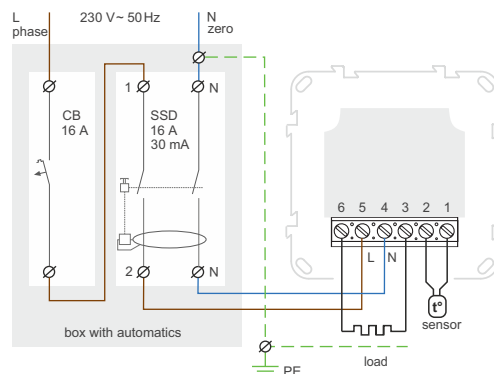
Wiring 1. Connection of the circuit breaker and SSD

INSTALLATION

The thermostat is designed for indoor installation. The ingress risk of moisture or liquid into the place of installation must be minimized. When installed in a bathroom, toilet, kitchen, swimming pool the thermostat should be installed at the place out of reach of casual spraying. The ambient temperature during installation must be between –5...+ 45 °C. The installation height of the thermostat should be in the range 0,4...1,7 m above the floor level.

To protect against short-circuit in the load circuit the circuit breaker (CB) has to be installed before installing the thermostat. It should be designed for not more than 16 A. To protect a people against electric shock leakage is installed the SSD (safety shutdown device). This event is obligatory when installing floor heating in wet areas (Wiring 1).

The thermostat is mounted in the standard mounting box 60 mm in diameter, with mounting screws. For installation you must:
— make a hole in the wall for box mounting and wall chase for power wires and the sensor;
— take the power wires of the heating system and the sensor to the mounting box;
— perform the compounds according to the passport data;
— fix the thermostat in the mounting box.

The thermostat terminals are designed for a wire with section not more than 2,5 mm^2. To reduce the mechanical loads on the terminals it is desirable to use a soft wire. The wires are tightened in the terminals using a screwdriver with a blade width no more than 3 mm with torque 0,5 N·m. The use of aluminum is not desirable. The screwdriver with a blade width more than 3 mm can

cause mechanical damage to the terminals. This may result in the loss of right for warranty.

From the mounting box with thermostat the mounting tube (metal tube Ø 16 mm) is put into a zone heated by about 0,5 m. The curves and the length of the tube should ensure smooth movement of the sensor. The end of the pipe introduced into the zone, which is heated, must be carefully sealed to avoid ingress of the solution, for example, with a tape. The sensor is introduced into the pipe after solidifying of screed.

If necessary is acceptable reduction and increasing of sensor connecting wires. Near the sensor connecting wires should not be the power cables, they may be interfere.

It is important to remember that it is desirable to place the on the inner wall of the room. It is recommended to store out the thermostat of direct sunlight and drafts (Fig. 1).

It is necessary for the thermostat to switch the current to no more than 2/3 of the maximum current specified in the specification. If the current exceeds this value, the load must be connected through a contactor (magnetic actuator, power relay), which is optimized for this current (Wiring 2).

WARRANTY TERMS

The warranty for terneo devices is valid for 36 months from the date of sale, provided that the instructions are followed. The warranty period for products without a warranty certificate is counted from the date of production.

If your device is not working properly, we recommend that you first read the section «Possible problems». If you cannot find an answer, contact Service Center. In most cases, these actions resolve all issues.

If you continue to have issues with the device, please send it to a Service Center or to the store where you purchased the device. If your device is defective due to our fault, we will repair or replace it under warranty within 14 business days.
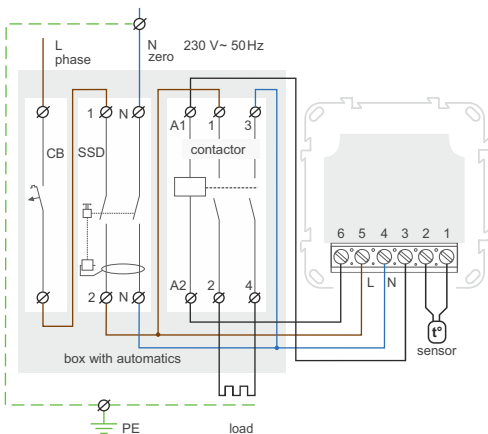
Please see the full text of the warranty and the data you need to send to your Service Center on the website https://www.ds-electronics.com.ua/en/. If you have a warranty case, please, contact the General distributor in your area.

WARRANTY CARD

serial №:	date of sale:
a seller, a seal:	place of a seal
an owner contact for a service center:	

Wiring 2. Wiring and simplified internal circuit

When connecting via contactor, turn on the Contactor function in the menu «Settings → Common settings».
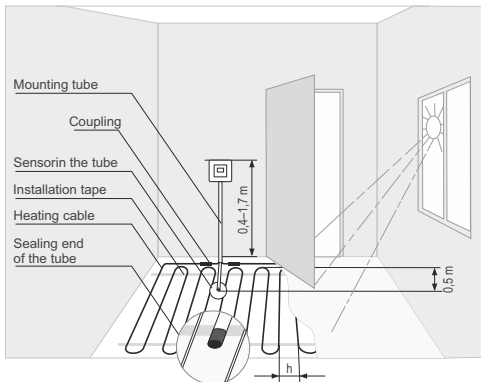

Figure 1.
Mounting the thermostat and «warm floor» system
MOUNTING OF THE SENSOR MUST BE PERFORMED SO THAT IT WAS POSSIBLE TO EASILY REPLACE IT.

MAIN SETTINGS

We recommend that you do the first setting of the thermostat through the «Setup Wizard», which sets the basic parameters of the device. It starts automatically when you turn it on for the first time or after resetting the device to factory settings. You can enter the «Setup Wizard» in the following way:
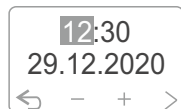
Menu → Settings → Setup Wizard

Save the settings and go to the next item with the «OK» button.

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1. Choose language (factory setting — Ukrainian)
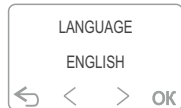
Available for selection: Ukrainian, Czech, English, Russian, German.

2. Set date / time

3. Function use DST (factory setting — disabled)

If enabled, the time will automatically move forward one hour at 3:00 am on the last Sunday in March and 1 hour back at 4:00 am on the last Sunday in October.

4. Select work control:

• By floor
• By air
• By air with floor restriction. The thermostat will maintain the temperature of the air, while not allowing the floor to overheat or cool down excessively. For this mode, enter the minimum and maximum floor temperatures.

The main screen in Air with floor restriction mode will display the FLOOR icon and the floor temperature when floor restriction is triggered:


set air temperature
current air temperature

5. Select heating or cooling mode of thermostat , depending on the load it controls: heater or cooler (factory setting — heating)
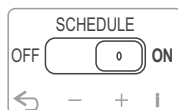

6. The Battery Saving function (factory setting — disabled) automatically turns off the thermostat at the end of the season. To do this, enter the date of the beginning and end of the season (by default — April 15 in heating mode, October 15 in cooling mode). When thermostat reaches 00 hours 01 minutes at this date, it will automatically turn off the battery and shutdown. This will prolong the life of the internal battery, which keeps the clock running when the power is not supplied.

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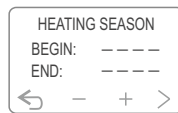
7. Be sure to set the power of the connected load for the correct statistics and air temperature measurement (factory setting 2000 W, range 100–3000 W)
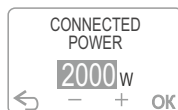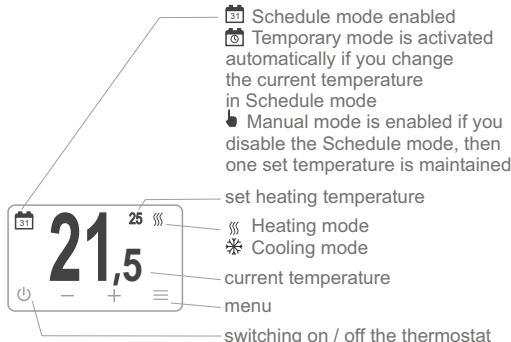

8. If you want to maintain one set temperature, then disable the Schedule (factory setting — enabled)


EXPLOITATION

Main screen:

📅 Schedule mode enabled
📷 Temporary mode is activated automatically if you change the current temperature in Schedule mode
🔥 Manual mode is enabled if you disable the Schedule mode, then one set temperature is maintained

set heating temperature
〴 Heating mode
❄ Cooling mode
current temperature
menu
switching on / off the thermostat

Schedule

If you disabled the schedule in the «Setup Wizard», then you need to enable it.

Schedule setup

Set up a weekly schedule for the selected day according to your rhythm of life. By default, 4 periods are available

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during the day, it is possible to add up to 16. The schedule can be entered manually, or you can use the «Copy schedule» function.
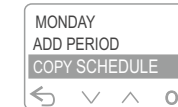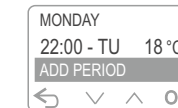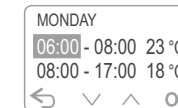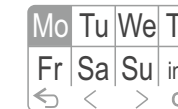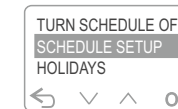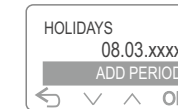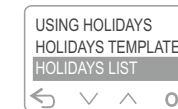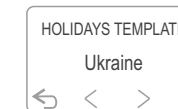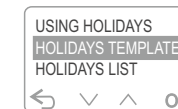

Holidays

If you spend the holidays at home, set up a separate holiday schedule (factory setting — disabled).

To ensure convenient of setting holidays, we have developed template of public holidays for the following countries: Ukraine, Moldova, Romania, Poland, Germany, Czech Republic (factory setting — Ukraine). Select your country and then edit the holiday template we have prepared if you wish. It is possible to set up to 16 holidays.

It is also possible to set holidays in the following format:

dd.mm.xxxx	a date that is repeated annually
dd.xx.yyyy	date repeated every month of certain year. For example, 01.xx.2022 — every first day of 2022
dd.xx.xxxx	each specified number. For example, 01.xx.xxxx — every first number
xx.mm.yyyy	the whole month of the specified year,
xx.mm.xxxx	the whole month of each year,
xx.xx.yyyy	whole year

HOLIDAYS TEMPLATE
HOLIDAYS LIST
SCHEDULE HOLIDAYS
↰ ∨ ∧ OK

HOLIDAYS
08:00 - 23:00 23 °C
23:00 - ...   18 °C
↰ ∨ ∧ OK

Date / time

📅31	12:30 Mo
SCHEDULE	09.01.2021
🧳	⚙
AWAY	SETTINGS
↰ < > OK

DATE/TIME
USE DST
BATTERY SAVING
STOP WATCH
↰ ∨ ∧ OK
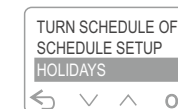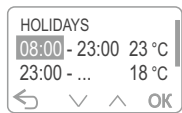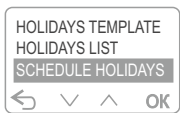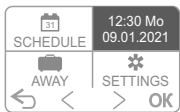
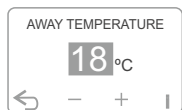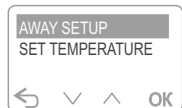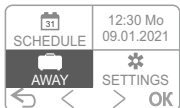These settings are described in detail in «Main settings» on page 6, clauses 2,3,6.

Stop watch function provides for disconnecting the battery, for example, at the end of the heating season. This will turn off the thermostat completely and save battery.
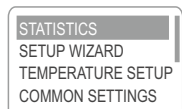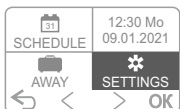
Away

Adjust the temperature and the Away period so that comfort is restored by the time you return.

To deactivate the mode, select «away reset».

📅31	12:30 Mo
SCHEDULE	09.01.2021
🧳	⚙
AWAY	SETTINGS
↰ < > OK

AWAY SETUP
SET TEMPERATURE
↰ ∨ ∧ OK

AWAY PERIOD
07:00   30.12.21
14:00   08.01.22
↰ − + OK

AWAY TEMPERATURE
18 °C
↰ − + I

Settings

📅31	12:30 Mo
SCHEDULE	09.01.2021
🧳	⚙
AWAY	SETTINGS
↰ < > OK

STATISTICS
SETUP WIZARD
TEMPERATURE SETUP
COMMON SETTINGS
INFORMATION
↰ ∨ ∧ OK

Statistics
Reset the statistics before the start of the heating season to find out the estimated load energy consumption in kW*h for the selected period. For statistics, you need to set the load power.

Setup Wizard
Use it when turning on the device again or if you are not sure that you have set all the basic parameters for the operation of the thermostat.

Temperature setup

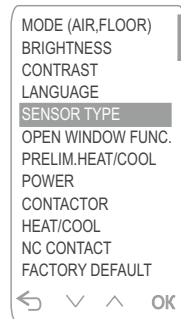| MIN.FLOOR TEMP. |
|---|
| MAX.FLOOR TEMP. |
| ANTI FROST |
| FLOOR TEMP.CORR. |
| AIR TEMP.CORR. |
| FLOOR HYSTERESIS |
| ↰ ∨ ∧ OK |

Here you can change the minimum/maximum floor temperature (for the «Air with floor limit» mode) entered through the «Setting Wizard».

Activate the **anti-frost function** (factory setting — disabled) so that the heating will turn on automatically if the room temperature drops below 5 °C.

Floor temperature correction / air temperature correction (factory setting 0 °C, range –10...+10 °C). You can use the correction if the temperature readings on the screen mismatch with temperature of your reference device.

Floor hysteresis (factory setting 1 °C, range 0,1–10 °C, step 0,1 °C). A smaller hysteresis value allows more accurate maintenance of temperature, a larger one saves on energy consumption and increases the life of the relay by reducing the number of loads switching.

Common settings

MODE (AIR,FLOOR)
BRIGHTNESS
CONTRAST
LANGUAGE
SENSOR TYPE
OPEN WINDOW FUNC.
PRELIM.HEAT/COOL
POWER
CONTACTOR
HEAT/COOL
NC CONTACT
FACTORY DEFAULT
↰ ∨ ∧ OK

Sensor type (factory setting — 10K OM). The thermostat is compatible with floor sensors from most manufacturers, which allows you to replace another thermostat with terneo pro.

Open Window function (factory setting — disabled) provides additional energy savings by shutting down the load for 30 minutes when the room temperature drops sharply.

21,5 25 🪟
⏻ ∨ ∧ ≡

The opened window icon indicates the activation of the corresponding function.

Preliminary heat / cool (factory settings — disabled) use it so that the desired temperature has already been reached by the beginning of each period. According to the factory settings, the thermostat will undergo self-learning and will independently calculate the time for which you need to turn on the heating. If you prefer economy, disable this function.

21,5 25 🕐
⏻ ∨ ∧ ≡

The on-screen clock icon indicates the pre-heating / pre-cooling function

Activate the **Contactor** function (factory setting — disabled) if you use it when connecting. If a contactor is activated, enter Power Setting menu and set up power that will flow through the contactor. Power can be set up to 500 kW.

Activate the **«nc» contact** function (factory setting — disabled), for example, when connecting a normally open servo drive.

Reduce to factory reset. After the reset, reconfigure the thermostat using the «Setup Wizard».

Information

Display the device faults if any and also to display the firmware version, the total number of the relay switchings, the total working time of the relay and the number of the thermostat starts.

FIRMWARE V 1.17.11
RELAY ON 9 TIMES
RELAY 0d 0h 0m 0s
DEVICE ON 4 TIMES
OVERHEAT 0 TIMES
SH 08FF01FFF700FE0020
↰ ∨ ∧

Enabling / disabling

To turn off the thermostat for a short period of time, hold down the «⏻» button for 5 seconds.

In case of a long break in the operation of the device, for example, at the end of the heating season, we recommend that you stop the clock and turn off the circuit breaker.

Button blocking

It is used if the thermostat is available to children or it is installed in a public place. You need to press the leftmost and the rightmost buttons simultaneously and hold them for 5 seconds to enable / disable the lock function.

| 21,5 25 ≋ |
|---|
| 🔒   🔒 |

Lock icon means that Key Lock is on

The thermostat has a self-diagnosis system. Detected errors are displayed by the temperature controller when the power is turned on and displayed in the «Information» menu section.

Load is off, screen is off
Possible cause: no power supply.
It is necessary: make sure that the supply voltage is available. If power supply is available, contact the Service Center.

The main menu displays an exclamation mark on the clock icon

📅31	12:30! Mo
SCHEDULE	09.01.2021
🧳	⚙
AWAY	SETTINGS
↰ < > OK
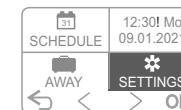
Possible cause: failure of internal battery or clock.

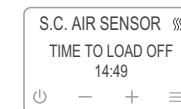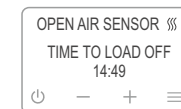*It is necessary:* contact the Service Center since clock may not work correctly.

The load operates according to air sensor, the floor control is not carried out. The sign «OPEN FLOOR SENSOR» or «S.C. FLOOR SENSOR» is displayed

OPEN FLOOR SENS. ≋
22.4 °C
⏻ − + ≡

S.C. FLOOR SENSOR ≋
22.4 °C
⏻ − + ≡
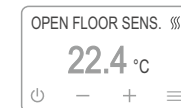
Possible cause: incorrect connection, damage to the sensor and its circuit, incorrectly selected sensor type in the thermostat settings, the temperature measured by the analogue sensor exceeds range of –30...75 °C.

It is necessary: to check the place of connection of the temperature sensor to thermostat and its circuit, the absence of mechanical damage along the entire length of the connecting wire, as well as the absence of power wires that are laid close.

Load does not operate according to the settings, the sign «OPEN AIR SENSOR» or «S.C. AIR SENSOR» is displayed

OPEN AIR SENSOR ≋
TIME TO LOAD OFF
14:49
⏻ − + ≡

S.C. AIR SENSOR ≋
TIME TO LOAD OFF
14:49
⏻ − + ≡

It is necessary: you should contact the Service Center.

Load does not operate according to the settings, the sign «OPEN FLOOR SENSOR» or «S.C. FLOOR SENSOR» is displayed

```
OPEN FLOOR SENS. ))) 
   TIME TO LOAD OFF
        14:49
 ⏻    −    +    ≡
```

```
S.C. FLOOR SENSOR )))
   TIME TO LOAD OFF
        14:49
 ⏻    −    +    ≡
```

Possible cause: Failed connection, damage to the sensor circuit, or temperature out of range (–30 ...75 °C).

It is necessary: to check the integrity of the sensor and the absence of mechanical damage to its circuit, the absence of power wires that are laid close.

Timer-based emergency operation mode. This mode ensures the operation of the thermostat in case of damage to the sensor: in a 30-minute cyclic interval it turns on the load for the set time, the rest of the time the load is turned off. The load operating time is adjustable from 1 to 29 minutes. To ensure continuous operation of the load, select «on» and to turn the load completely off, select «oFF».
Heating temperature control is not available.

Load doesn't operate, the temperature readings flash on the screen and «OVERHEAT» is displayed

```
    OVERHEAT
    86 °C
```

The temperature inside the housing exceeded 85 °C and triggered protection against internal overheating.

Possible cause: inner overheating of the device to which can lead: bad contact in the terminals of the device, high ambient temperature, overwhelming power output or incorrectly selected cross-section of wires for connecting.

It is necessary to: check tension of power wires in the device terminals, make sure that the switching load does not exceed the permissible and that the cross section of the wires is selected correctly.

Features of the protection against internal overheating: when the temperature inside the housing drops below 75 °C, the thermostat will resume operation. When the protection is triggered more than 5 times in a row, the thermostat will be blocked until the temperature inside the housing drops below 80 °C and the «OK» button is pressed.

Load operates, «!» symbol is displayed on the screen

```
           25 !)))
    21,5
 ⏻   ∨   ∧   ≡
```

Possible cause: is a break or short circuit of the internal overheating sensor. Internal overheating is not monitored.

It is necessary: to send the thermostat to the service center. Otherwise, overheating control will not be carried out.

THE RESISTANCE OF THE SENSOR at different temperatures	
5 °C	25339 Ω
10 °C	19872 Ω
20 °C	12488 Ω
30 °C	8059 Ω
40 °C	5330 Ω

ADDITIONAL INFORMATION

Do not fire and do not throw away the device with the household waste.

After the end of its service life, the product must be disposed of in accordance with applicable law.

Transportation of goods carried in the package, ensuring the safety of the product.

The device is transported by any kind of transport (rail, sea, motor, air transportation).

Date of manufacture is on the back side of device. Application time is unlimited.

The device does not contain harmful substances.

If you have any questions or you something will not clear, call the Service centre the telephone number listed below.

SAFETY INSTRUCTIONS

Carefully read and become aware of yourself these instructions.

Connection of the device must be done by a qualified electrician.

Do not connect 230 V mains voltage instead of the sensor (it leads to failure of the thermostat).

Before the installation (dismantling) and connection (disconnection) of the device, turn off voltage supply and also act according to the «Rules of an arrangement of electric installations».

Do not immerse the sensor with a connecting wire in the liquid medium.

Do not switch the non assembled device to the network.

Turning on and off or and configure the device should be with dry hands.

Do not connect the device to the network disassembled.

Avoid hitting of water or moisture to the device.

Do not expose the device to extreme temperatures (higher than 40 °C or below -5 °C) and high humidity.

Never clean the device with the use of chemicals such as benzene, solvents.

Do not store the device and do not use it in areas with the dust.

Do not attempt to disassemble and repair the device.

Do not exceed the landmarks value adaptor and power.

To protect against overvoltage caused by lightning discharges, use a lightning protector.

Protect the children from games with the working device, it is dangerous.