terneo

Technical data sheet, installation and operation manual

# PRO DRY CONTACT

**smart heating control**

**The terneo PRO weekly programmer with a dry contact** is designed for efficient operation of:

- an automatic gas or electric boiler,
- a water underfloor heating system with 24 V thermoelectric heads.

The water underfloor heating system can have either a normally closed or normally open electric thermoelectric actuator.

If desired, you can use a temperature controller with a dry contact to manage both electric and water underfloor heating systems with 230 V thermoelectric heads. However, note that we also offer a similar model without a dry contact, the terneo PRO, which is more convenient for connections.

The "dry contact" is convenient for wiring when you need to switch currents other than 230 V. Additionally, the dry contact prevents the power voltage from the terminals 5 and 6 of the temperature controller from reaching the control terminals of the boiler.

By choosing a thermostat with a weekly schedule function, you get:

- up to 50% energy savings. For example, on weekdays during the day when no one is at home, an energy-saving temperature will be maintained.
- extended boiler lifespan by reducing the frequency of its on/off cycles.

Temperature control is managed based on readings from two temperature sensors: the built-in sensor in the unit and the external one. If you plan to place the thermostat in the boiler room but want the boiler to maintain the temperature, for instance, in the living room, place the external sensor in the living room and select the “Floor-based” temperature mode in the settings. The sensor can be placed wherever is convenient, not necessarily under the floor.

The energy-independent memory stores all settings and the heating schedule in the event of a power outage.

## IN THE BOX

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



## TECHNICAL DATA

| | |
|---|---|
| Adjustment range | air 5...35 °C<br>floor 5...60 °C |
| Maximum load current (for AC-1 category) | 16 A |
| Maximum load power (for AC-1 category) | 3 000 VA |
| Input voltage | 230 V ±10 % |
| The number of switches under the load, at least | 50 000 cycles |
| The number of switches without the load, no less than | 20 000 000 cycles |
| Temperature hysteresis | air 0,5 °C<br>floor 0,1...10 °C |
| Cross section of connection wires | not more than 2,5 mm² |
| Temperature sensor in box | NTC thermo-resistor 10 kOhm at 25 ° C (R10) |
| Supported sensors types analog | NTC 4.7, 6.8, 10, 12, 15, 33, 47 kOhm at 25 °C |
| digital | d18 |
| Length of the sensor connected cable | 3 m |
| Maximum extension length of the temperature sensor | 20 m |
| Overall dimensions (w x h x d) | 85 x 80 x 38 mm |
| Inner overall dimensions of decorative frame: | 45 x 45 mm |
| Weight in the complete set | 0,18 kg ±10 % |
| Compatibility with frames from other manufacturers | Schneider Electric Unica and Unica New |
| Available interface languages | ua, cs, en, ru, de |

Please read this document thoroughly before installing and using the thermostat.
This will help you avoid potential hazards, mistakes, and misunderstandings.

The long-lasting operation of the power relay and the reliability of its contacts are ensured by:

- Protection against frequent relay switching in the thermostat;
- Activating the load as close as possible to the zero-crossing point of the voltage sine wave.

Minor deviations from the zero-crossing point may occur due to varying disconnection times of different power relay models.



## INSTALLATION

The thermostat is designed for indoor installation at a height ranging from 1,4–1,6 meters from the floor level. The ambient temperature during installation should be within –5...+45 °C. When installing in a bathroom, toilet, kitchen, or pool, place the thermostat in a location not exposed to accidental splashes. Minimize the risk of moisture and liquids entering the installation area.

### Recommendations for connecting loads more then 10 A

The terneo thermostat may not handle a current of 16 A and could overheat in the presence of unfavorable factors such as poor heat dissipation from the socket, high ambient temperature, or poor installation quality. We guarantee stable operation of the thermostat with a current up to 10 A. If the current exceeds 10 A, we recommend connecting the heating cable through a contactor (magnetic starter) rated for the required current. See diagram 2.

To protect against short circuits, install an automatic circuit breaker (CB) with a rating of up to 16 A in the phase wire break before the thermostat.

To protect against electric shock, install an SSD (safety shutdown device). See diagram 1.

For installation you need:

- make a hole in the wall with a diameter of 60 mm for the mounting box and channels for power supply and sensor wires;
- bring the heating system power and sensor wires to the mounting box;
- make connections according to this manual;
- secure the thermostat in the mounting box.

The terminals of the thermostat are designed for wires with a cross-section of no more than 2.5 mm². It is recommended to use soft copper wire, which can be tightened in the terminals using a screw-driver with a blade width not exceeding 3 mm and a torque of 0.5 N·m. The use of aluminum is not desirable.

A screwdriver with a blade width greater than 3 mm may cause mechanical damage to the terminals, which can result in the loss of warranty service rights.

Place the sensor in the floor screed using a mounting tube, such as a 16 mm diameter metal-plastic tube, which bends once with a radius of at least 5 cm and is inserted into the heating zone for 50 cm. To ensure the sensor can be replaced in the future, seal the end of the tube with a copper plug or insulation tape. Sealing with a copper plug will provide more accurate floor temperature measurements. Insert the sensor into the tube after the screed has hardened. Strip and crimp the ends of its wire with insulated terminals.

If necessary, reduction and increasing (up to 20 m) of sensor connecting wires is acceptable. For extending, use a separate cable with a cross-section



of 0,5... 0,75 mm². Near the sensor connecting wires should not be the power cables, they may be interfere.

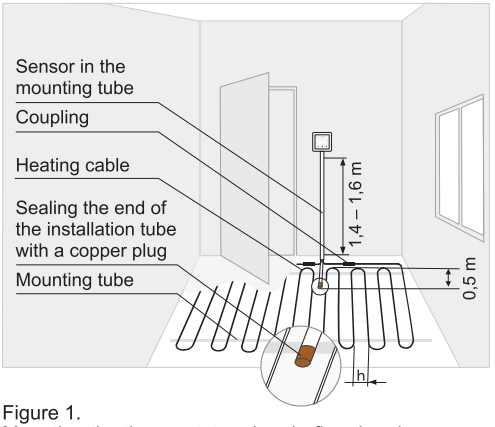



Figure 1.
Mounting the thermostat and underfloor heating

## WARRANTY TERMS

The warranty for 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, contact the General distributor in your area or 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 check the full text of the warranty and the data you need to send to your Service Center on the website https://www.ds-electronics.company

terneo

**SERVICE CENTER CONTACT**
+38 (091) 481-91-81
Viber Whats App Telegram
support@dse.com.ua

## WARRANTY CARD

serial №:

date of sale:

a seller,
a seal:

place of a seal

an owner contact
for a service center:

## ELECTRICAL CONNECTION DIAGRAM

The thermostat comes with an external analog temperature sensor. Connect the sensor to terminals 1 and 2.

The power supply (230V ±10%, 50 Hz) should be connected to terminals 3 (neutral, N) and 4 (phase, L).

Terminals 5 and 6 (dry contact) are used to control the boiler. Below are wiring diagrams for connecting to a gas boiler and an electric boiler controlled by the terneo BeeRT thermostat.

If you need to connect a digital sensor, connect the white wire to terminal 1 and the blue wire to terminal 2. In the thermostat menu, change the sensor type to d18 (see page 11, "Sensor Type" menu option).

Important!

The thermostat may fail if phase voltage is applied to terminals 1 or 2. Be careful when connecting the temperature sensor and power supply.

Before connecting to the boiler, ensure that there is no voltage on terminals 5 and 6.

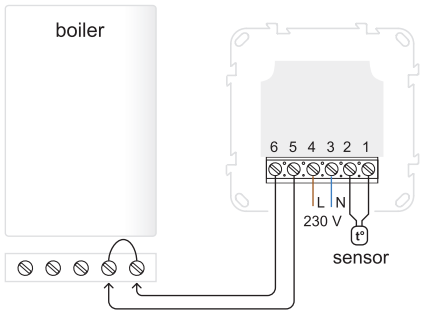



*Diagram 1. The connection to the gas boiler is made using a separate terminal block on the control board or an external terminal strip instead of a jumper.*

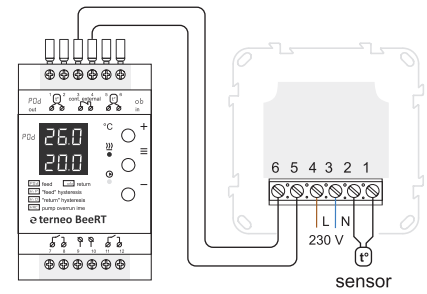



*Diagram 2. Connection diagram for terneo BeeRT*



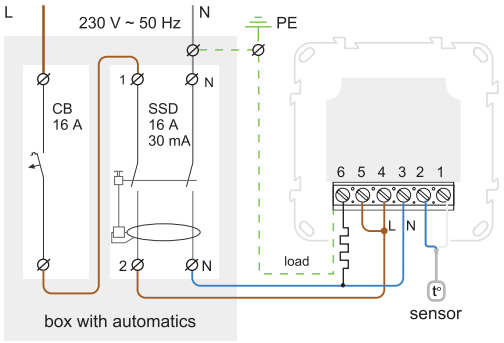



*Diagram 3. Connection diagram for the thermostat, to underfloor heating powered by 230 V.*

## MAIN SETTINGS

Initial Setup Recommendation

We recommend performing the first setup of the thermostat using the Setup Wizard, which configures the device's main operating parameters. It starts automatically upon first power-up or after resetting the device to factory settings.

**To access the Setup Wizard:**
**Menu → Settings → Setup Wizard**

Save settings and proceed to the next menu option by pressing the "OK" button.

**1. Choose language** (factory setting — Ukrainian)



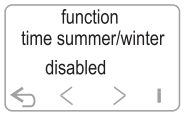

Available for selection:
- Ukrainian
- Czech
- English
- Russian
- German

**2. Set date / time**




**3. Daylight saving time / winter time function**
(factory setting — disabled)

If this function is enabled, the time will automatically move forward by one hour at 3:00 AM on the last Sunday of March and back by one hour at 4:00.





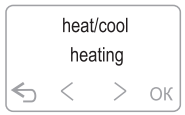

**4. Temperature maintenance mode**

- 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:




**5. Heating and Cooling Mode**



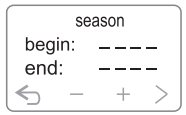

(factory setting — Heating)

If you use the terneo pro to control cooling equipment, switch the mode to Cooling. The Cooling mode is available when maintaining the temperature by floor or air sensor (see section 4).

**6. Battery Saving function**

(factory setting — disabled)

The function allows you to extend the service life of the thermostat by saving the internal battery. To activate, enter the start and end date of the heating season, and on the last day of the season the device will automatically disconnect the battery and turn off itself.



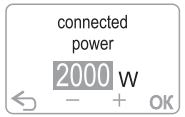




**7. Set the power of the connected load**

BE SURE TO SET THE POWER

(factory setting: 2000 W, range: 100–3000 W)

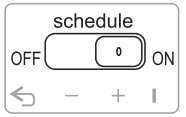



To calculate statistics, set the power of the connected load in the settings.

If the load is switched by a contactor, enable the Contactor function in the General settings and enter the power that will pass through the contactor (see page 12).



**8. Enable / disable the Schedule mode**

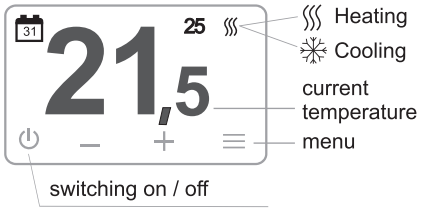



(factory setting — disabled)

If you want to maintain a single set temperature, disable the Schedule mode.

## EXPLOITATION

**Main screen:**




Schedule mode is enabled

Temporary mode is automatically activated when the current temperature changes in Schedule mode

Manual mode is automatically activated when Schedule mode is turned off. In Manual mode, the thermostat maintains a single set temperature

### Locking the buttons

To lock/unlock, hold the far-left and far-right buttons for 5 seconds. We recommend using this feature in public places and as child protection.




### Turning On and Off

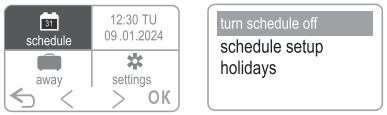
To turn off the thermostat for a short period, hold the "⏻" button for 5 seconds.

In case of a long break in the device's operation, such as at the end of the heating season, we recommend stopping the clock and turning off the automatic switch-off function.

## Schedule

(factory setting — enabled)

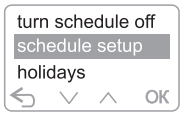
If you turned off the Schedule during the initial setup through the "Setup Wizard," you can turn it on by pressing "Enable Schedule." Then, proceed to the Schedule Settings.

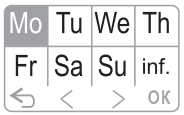


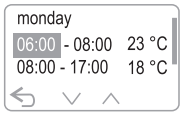


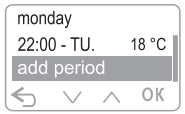


First, set up the schedule, for example, for Monday. Select the temperature that the thermostat should maintain in the morning, afternoon, evening, and night. The number of temperature periods can be increased to 16 periods.

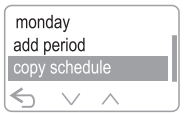


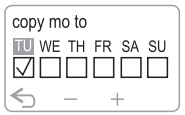




For other weekdays, create an individual schedule, or if there is a single schedule for all weekdays, click "Copy schedule".

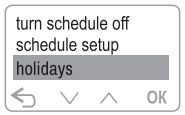



**Separate schedule for public holidays**

(factory setting — enabled / Ukraine)

Use this function if you spend holidays at home. We added this feature because holidays often fall on weekdays, but require maintaining a comfortable temperature during the day, as everyone is at home instead of at work.
For convenience, we have prepared templates for public holidays in Ukraine, Moldova, Romania, Poland, Germany, and the Czech Republic. You can create your own template: select the country, and then make adjustments. Up to 16 holidays can be added.

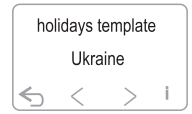








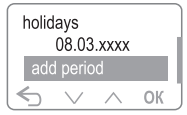


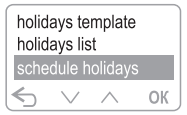



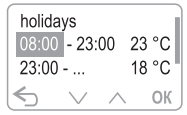

Holidays are set in a format:

| | |
|---|---|
| dd.mm.xxxx | a date that is repeated annually |
| dd.xx.yyyy | date repeated every month of certain year. For example, 01.xx.2024 — every first day of 2024 |
| 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 |
| | whole year |



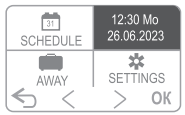



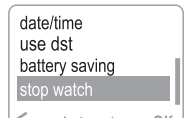




## Date and time

These settings are described in detail in "Main settings" on page. 6, points 2, 3, 6.

**The Stop Clock function** allows you to force the battery to turn off, for example, at the end of the heating season. This will turn off the thermostat completely and save battery power.

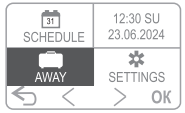


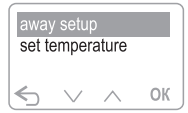



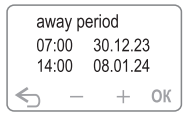

## Away

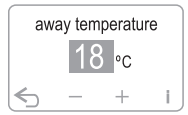
Adjust the temperature and the Away period so that comfort is restored by the time you return.

To deactivate the mode, select "Away reset".



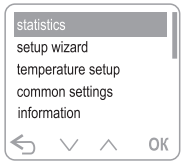






## Settings




### 1. 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.

### 2. 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.

### 3. Temperature setup



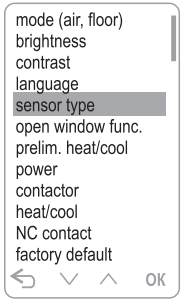

**3.1** Here, you can change the minimum/maximum floor temperature (for the "Air with floor limitation" temperature control mode) entered in the "Setup wizard".

**3.2 Frost-free function** (factory setting — on) The heating will turn on automatically if the room temperature drops below 5 °C.

**3.3 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 and your reference device are not the same.

**3.4 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.

### 4. Common settings




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



**4.1 Open Window function**
(factory settings — disabled)

When turned on, it will provide additional energy savings by turning off the load for 30 minutes in the event of a sharp drop in room temperature.




The window icon means that the Open Window function has been activated

**4.2 Preliminary heating / cooling**
(factory settings — disabled)

Use it to ensure that the desired temperature is already reached at the beginning of each period. After enabling the function, the thermostat will go through a self-learning process and calculate the time for which the heating should be turned on in advance.




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

**4.3 Function Contactor**
(factory setting — disabled)

Activate it if you use it during connection. If you are using a contactor, be sure to go to the Load Power menu and enter the power that will be passed through the contactor. The power can be set up to 500 kW.

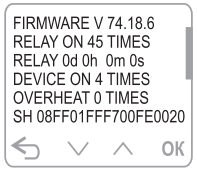
**4.4 Function "nc" contact**
(factory setting — disabled)

Activate it, for example, when connecting a normally open servo drive.

**4.5 Reset to factory settings.**
After resetting the Main Settings, go through the "Setup Wizard" from the beginning.

### 5. Information

Displays the thermostat malfunctions, if any, and also displays the firmware version, the total number of relay activations, the total relay operating time, and the number of thermostat activations.



## POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

The thermostat has a self-diagnostic system and displays the detected errors when the power is turned on and displays them in the "Information" menu section.

**Load is off, screen is off**

*Possible cause:* no power supply.

*It is necessary to:* make sure that the voltage supply is available. If power supply is available, contact the Service Center.

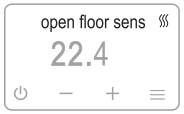
**The main menu displays an exclamation mark on the clock icon "!"**

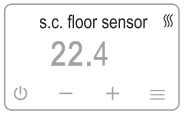
*Possible cause:* failure of internal battery or clock.

*It is necessary to:* 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**



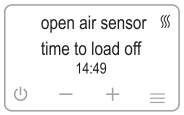



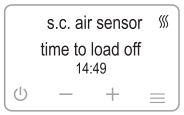

*Possible cause:* incorrect connection, damage of the sensor and its circuit, incorrectly selected sensor type in the thermostat settings, the temperature measured by the analogue sensor exceeds range of –30...75 °C.

*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**

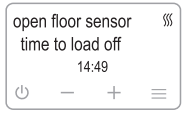
*It is necessary to:* you should contact the Service Center.

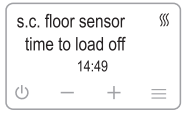





**Load does not operate according to the settings, the sign "open floor sensor" or "s.c. floor sensor" is displayed**



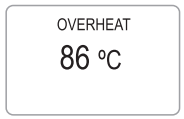

*Possible causes:* incorrect connection, damage of the detector circuit, or temperature outside the measured range (−30...75 °C).

*It is necessary to:* check the external sensor circuit, the absence of mechanical damage along the entire length of the connecting wire, and the absence of power wires passing close by.

*The thermostat has switched to the Timer Emergency Mode:* this mode will ensure the operation of the underfloor heating in case of sensor damage: in a 30-minute cycle interval, the thermostat turns on the load for the time you set, and the load will be turned off the rest of the time. You can set the load operation time in the range of 1...29 minutes. If you want the load to run continuously, set time longer than 29 minutes, and time of less than 1 minute to be switched off.

In this case, the temperature is not monitored by the respective sensor.

**Load doesn't operate, the temperature readings flash on the screen and "overheat" is displayed**




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

*Possible cause:* inner overheating of the device which can be caused by: 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 the 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**




*Possible cause:* 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 load is not operating according to the settings, and the screen displays the load's on/off times**

*Possible cause:* malfunction of the internal overheat sensor when the thermostat operates with an air sensor or air with floor temperature limitation.
*It is necessary to:* contact the Service Center.

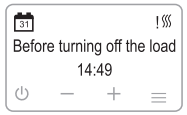



Table 1. Resistance of external temperature sensor at different ambient temperatures

| | | | | | |
|---|---|---|---|---|---|
| 5 °C | 25339 Ω | 10 °C | 19872 Ω | 20 °C | 12488 Ω |
| 30 °C | 8059 Ω | 40 °C | 5330 Ω | | |

## ADDITIONAL INFORMATION

Please do not burn or dispose of the thermostat with household waste.

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

The product is transported in packaging that ensures its preservation.

The thermostat can be transported by any kind of transportation (such as by car, plane, train or ship).

The manufacturing date is indicated on the back of the device, and there is no expiration date.

If you have any questions regarding this device, please contact the Service Center at the phone number provided in the Warranty Terms section.

The manufacturer reserves the right to make changes to the firmware, server interface, mobile applications, and desktop application my.terneo.ua to improve the energy efficiency of the thermostat and optimize its operation.



**Technical Support Chat**

If you haven't found the answer, please contact our technical support engineer

**dselectronics_bot**
**terneo_official**

## SAFETY INSTRUCTIONS

To avoid injury and damage to the thermostat, carefully read and understand these instructions for yourself.

The installation of the thermostat should be carried out by a qualified electrician.

Do not connect 230 V mains voltage instead of the sensor (this will damage the thermostat).

Before starting the installation (disassembly) and connection (disconnection) of the thermostat, disconnect the power supply and follow the "Rules of an arrangement of Electric Installations".

Do not immerse the sensor with its connecting wire in liquid environment.

Do not connect the thermostat to the power supply in a disassembled state.

Prevent liquid or moisture from coming into contact with the thermostat.

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

Do not clean the thermostat using chemicals such as benzene and solvents.

Do not store or use the thermostat in dusty environments.

Do not attempt to disassemble or repair the thermostat yourself.

Do not exceed the maximum current and power limits.

Use surge protectors to protect against overvoltage caused by lightning discharges.

Keep children away from playing with a functioning device as it is dangerous.

*versions: 74.18.6*

EMC Directive 2014/30/EU
Low Voltage Directive 2014/35/EU

04136, Ukraine, Kyiv region, Kyiv, 1–3 Pivnichno-Syretska str.
Sales Department: +38 (091) 481-91-81, support@dse.com.ua
www.ds-electronics.company