

*Operating Instruction*

**Testbox T2**  
*for addressable sensors*



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## Technical Data

Measuring ranges:	
Frequency	500 .. 2500 Hz
Tolerance	±1 Hz, ±1 Digit
Current	0 .. 25 mA
Tolerance	5 %
Voltage	1 .. 100 V DC
Tolerance	5 %
Resistance	0 .. 200 MΩ
Tolerance 0,1 .. 200 MΩ	±10 % typ.
Tolerance 1,0 .. 100 kΩ	±5 % typ.
Sensor test voltage	40 .. 90 V DC
Test voltage for resistance meas.	90 V DC
Power supply	Li-Ion battery, 7.4 V, 1900 mAh
Charging voltage	12 V DC
Charging current max.	0.5 A
Life with Li-Ion battery	10 h typ.
Charging time of Li-Ion battery	8 h typ.
Memory card	SD, max. 2 GB, FAT 16
Earphone impedance	32 Ω
Operating temperature	0 .. 50 °C
Storage temperature	-20 .. 70 °C
Admissible humidity	0 .. 95 % rel. humidity, non-condensing
Dimensions (L / W / H)	approx. 221 / 106 / 35 mm
Weight	approx. 0.62 kg

## Ordering Data

**Testbox T2** for addressable sensors, incl. earphone, measurement cables with banana jacks and spring-loaded clamps, charger with mains plug, rechargeable Li-Ion battery and carrying bag **Order-no. 050833.100**

### Spare parts

<b>Earphones</b> impedance 32 Ω	<b>Order-no. 073883.000</b>
<b>Measurement cable</b> 2 m with spring-loaded clamps	<b>Order-no. 073783.000</b>
<b>Carrying bag</b> for Testbox T2	<b>Order-no. 073847.000</b>
<b>Charger AC/DC</b> 100 .. 240 V AC / 12 V DC	<b>Order-no. 073845.000</b>
<b>USB cable</b> Testbox T2/PC	<b>Order-no. 073957.000</b>



### Important!

**It is imperative to read and observe all safety instructions prior to initial operation!**

## General Information

These operating instructions should make it easier for you to become acquainted with the product. They contain important information to ensure safe, appropriate and cost-effective use of the equipment.

The operating instructions endorse the directives of national regulations for the prevention of accidents and the protection of the environment.



**These operating instructions shall be read and adopted by anyone assigned to work with/on the equipment, e. g. during operation to include setting up, maintenance and trouble-shooting.**

In addition to the operating instructions and the mandatory regulations for the prevention of accidents, applicable in the operator's country and at the place of use, the recognised technical regulations for safe and professional operation shall also be observed.

## Designated Use

The Testbox is designed to check all kinds of addressable sensors and to measure insulation and loop resistance. This may happen individually before installation as well as in service via the Tx-Bus pair in the LANCIER Monitoring System.

The Testbox T2 is destined for the use in residential and small business areas. Any non-compliant use excludes the manufacturer from liability for any damages. The operator carries the risk!

## Safety Instructions

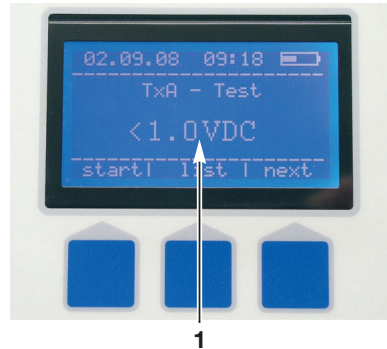


**Important!**  
**Read and observe safety instructions prior to initial operation!**

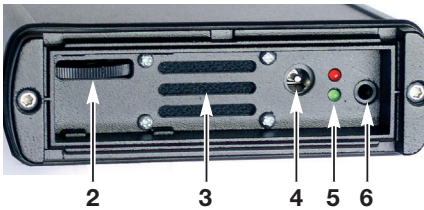
- Keep the operating instructions ready to hand!
  - The unit should only be operated in technically sound condition, for its designated use, with safety and risk awareness in mind, taking into account the operating instructions. In particular, operational faults, which can compromise safety, should be rectified immediately!
  - Protect instrument from moisture - danger of short circuit!
  - Do not make any modifications to the equipment!
  - Mounting, maintenance and repair work should only be performed by trained personnel!
  - Only use original LANCIER replacement parts!
-

## Product description

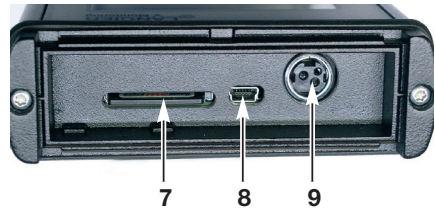
- 1 Display with three control keys (soft keys)
- 2 Operating wheel/volume control
- 3 Speaker
- 4 Charger socket 12V DC
- 5 Charging status display
- 6 Earphone socket
- 7 SD memory card compartment
- 8 USB interface
- 9 Measurement cable connecting socket



Device base



Device top



## Scope of supply



- 10 Measurement cables with banana jacks and spring-loaded clamps
- 11 Earphones
- 12 USB cable

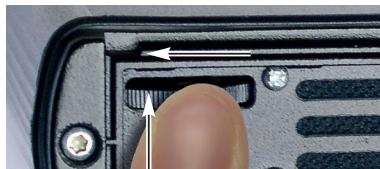
- 13 Charger with mains plug
- 14 Carrying bag with accessories compartment  
Operating instruction (without illustration)

## Operation

### Switching on the Testbox T2

The Testbox T2 is supplied in a protective carrying bag. It can stay in its bag cover whilst in use.

- Open the bag and secure the flap on the back with the Velcro fastener.
- Turn the operating wheel (2) on the device base to the left, overcoming the resistance. The Testbox T2 is now turned on. Use the operating wheel (2) to adjust volume as well.
- The display (1) shows the LANCIER Monitoring logo and the software version with issue date.
- The SD memory card is then initialised.



2



- The Testbox T2 is now ready for use. The display (1) shows
  - a Date and time
  - b Battery condition
  - c Measurement mode
  - d Measurement cable voltage  
Measurement range: 1 .. 100 V DC  
(if no measurement cable is connected or the value is below 1 V DC "<1.0 V DC" will be shown.)
  - e Soft key menu



### Error messages

When initialising the SD memory card (7) the following error messages may be shown:

- „No SD-Card inserted“  
No SD memory card is in the slot (7) or the card was inserted wrongly.

#### Remedy:

- Switch the Testbox T2 off by turning the operating wheel (2) to the right.
- Take the card (7) out, turn it and reinsert it over the spring resistance until it clicks in place.
- Insert a new card in the same way.
- Turn the Testbox T2 on again.

- **„Initialisation fault“**

The SD memory card (7) is damaged or not formatted.

**Remedy:**

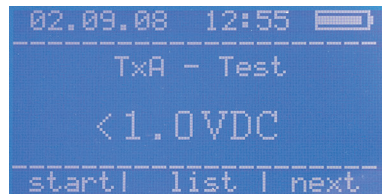
- Switch the Testbox T2 off by turning the operating wheel (2) to the right.
- Remove the card (7) and insert a new one over the spring resistance until it clicks in place.
- Reformat the card (7) on your PC (FAT 16) and then reinsert it as above.
- Turn the Testbox T2 on again.

## Main menu options

Measurement modes and service menu are differentiated between in the main menu. Select your option using the „next” soft key.

### 1. TxA-Test

- Standard mode is automatically chosen on switching on.
- The device is used for checking correct addressing of individual sensors before Tx-bus assembly and
- checking addressable sensors already on a measurement pair for function and address.



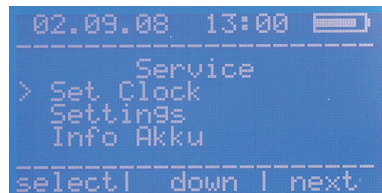
### 2. MegOhmMeter

- For measuring loop and insulation resistance in cables.



### 3. Service

- For adjusting device parameters and detailed display of the battery condition.



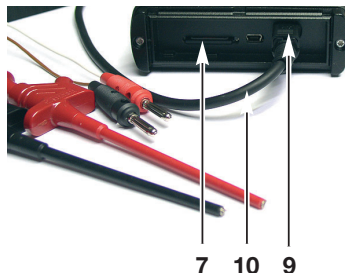
## Connecting the measurement cable

- Insert the measurement cable (10) supplied in the polarised socket (9) on the device top (flattened plug side upwards) and click in place.

The measurement cable is thus automatically secured against unintentional loosening.

**Always use the plug to disconnect!**

- Check that the SD memory card (7) has been inserted.



## Measuring

### TxA-Test - Single sensor

Addressable sensors should be checked before installation with the Testbox T2 for function and correct addressing.

The Testbox T2 automatically switches to the correct measurement mode when turned on. Press the "next" soft key in the menu (e) until "TxA-Test" is displayed (1) at position (a) (see page 6) if you wish to change this setting.



- **Connecting sensors**

Secure a sensor pair to the red and black spring-loaded clamps respectively on the measurement cable.

- Polarity is of no import here.

- **Connect earphones (optional)**

In noisy environments use the earphones to hear the device's acoustic signals.

- Insert the earphone plug (11) in the earphone socket (6) as far as it will go.

*The acoustic signals are now only audible through the earphones. The speaker is off.*





- **Start the scanning cycle**
  - Press the "**start**" soft key in menu (e).  
*The sensor addresses 1 to 127 are then scanned in sequence at 2-second intervals.*
  - The display (1) shows
    - Measurement voltage in V DC,
    - Current consumption DC in mA and
    - Sensor address with measurement value in Hz.
  - If an occupied address is scanned the sensor frequency makes a noise.



- **End scanning cycle**
  - Press the "**stop**" soft key in menu (e), e.g. if the sensor with the highest available address has been scanned.
  - The Testbox T2 stores the data of the entire measurement cycle automatically on the SD memory card.



If the "stop" soft key isn't pressed the entire measurement cycle will be run through up to the highest possible sensor address, 127, and the Testbox then automatically saves the measurement values.

**If the memory card isn't inserted or incorrectly inserted then the Testbox cannot save the measurement data. "Save Data ...." will not then show on the display.**



The scanning cycle can be started and interrupted as often as you like. It begins again at address 1 after each interruption.

Before restarting the scanning cycle there must be a pause of 2 seconds to allow the measurement voltage in the cable/s scanned to run down. The "**start**" soft key in menu (e) blinks and is deactivated for this time.

### **TxA-Test - several sensors on one measurement pair**

The Testbox T2 can check function and correct addressing of addressable sensors already connected to a measurement pair.



#### **Important note!**

**The signal line must be open at the other end!  
No monitoring station may be connected! For listening in when a monitoring station is connected - see page 11.**

The measurement direction of any monitoring system connected up is to be preferred. However, it can be changed in exceptional cases.



### Important note!

The signal line must be potential-free!

There must be no low ohm voltage source between the wires of the pair or between measurement pair and earth.

- **Connect measurement pairs**

Connect one of the pairs respectively to the red and the black clamps on the measurement cable (10).

- Polarity is unimportant here.

- **Connect earphones (optional)**

In noisy environments use the earphones to hear the device's acoustic signals.

- Insert the earphone plug (11) in the earphone socket (6) as far as it will go.

*The acoustic signals are now only audible through the earphones. The speaker is off.*



- **Start the scanning cycle**

- Press the "start" soft key in menu (e).  
*The sensor addresses 1 to 127 are then scanned in sequence at 2-second intervals.*

- The display (1) shows

- Measurement voltage in V DC,
- Current consumption DC in mA and
- Sensor address with measurement value in Hz.

- If an occupied address is scanned the sensor frequency sounds.



- **End scanning cycle**

- Press the "stop" soft key in menu (e), e.g. if the sensor with the highest available address has been scanned.

- The Testbox T2 stores the data of the entire measurement cycle automatically on the SD memory card.

If the "stop" soft key isn't pressed the entire measurement cycle will be run through up to the highest possible sensor address, 127, and the Testbox then automatically saves the measurement values.



**If the memory card isn't inserted or incorrectly inserted then the Testbox cannot save the measurement data. "Save Data ...." will not then show on the display.**

The scanning cycle can be started and interrupted as often as you like. It begins again at address 1 after each interruption.

Before restarting the scanning cycle there must be a pause of 2 seconds to allow the measurement voltage in the cable/s scanned to run down. The "**start**" soft key in menu (e) blinks and is deactivated for this time.

### TxA-Test - listen to measurement pair with active monitoring system

The Testbox T2 can be used to check the function and correct addressing of addressable sensors in an active monitoring system.

The measurement pairs can be wired at any point as above.

- **Start listening**

The scanning cycle starts automatically when the linked monitoring system starts its own cycle or beforehand. The sensor addresses 1 to 127 are queried in sequence using the timing set and each shown on the display (5).



- **Check sensors**

The following data for each sensor is shown when queried:

- Sensor address
- Measurement value in Hz
- Measurement voltage in V DC
- Current consumption cannot be measured in listening mode

- **End listening**

The listening mode can be ended by pressing the "**stop**" soft key in menu (e). Listening can only be resumed when the external voltage has fallen below 20 V (e.g. restart scanning via the monitoring system or brief disconnection of the Testbox T2 from the measurement pairs).

### Troubleshooting

- **Multiple assignment of sensor address**

If no clear signal can be heard at any sensor address but rather a vibrating overlaid tone then that address is multiply assigned.

A measurement value that differs greatly will probably be shown. In the measurement value list the value quality (last column) for that address will be in the 0 - 10 % range.

**Ascertain which sensor/s is/are involved and encode unique address/es.**

- **External voltage**

If the measurement pair carries an external voltage of over 20 V DC e.g. due to measurement by any monitoring system wired in, then the Testbox T2 will automatically start in listening mode.

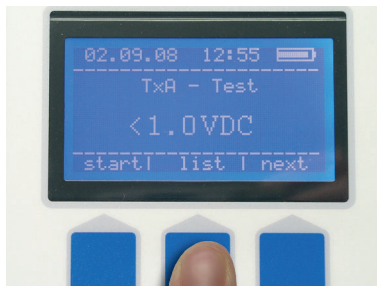
The listening mode can be ended by pressing the "**stop**" soft key in menu (e). Listening can only be resumed when the external voltage has fallen below 20 V (e.g. restart scanning via the monitoring system or brief disconnection of the Testbox T2 from the measurement pairs).

## Show stored measurement values (TxA-Test only)

- **Show measurement value list**

- Press the **"list"** soft key in menu (e).

Address, frequency, DC and signal quality in percent will be shown. Ten frequency blocks are measured per time window. The signal quality value (frequency stability) shows how many frequency blocks are within  $\pm 3$  Hz of the frequency also shown. 100% means all the frequency blocks measured have the frequency value shown.



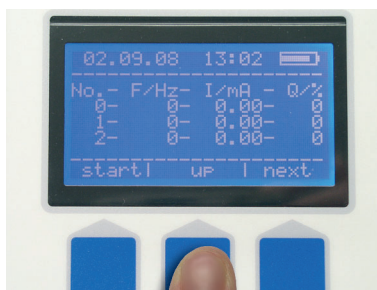
The measurement values of the first three sensors are shown in tabular form.

- **Scroll table:**

- Press the **"up"** soft key in menu (e).

This moves the table up one line.

This action can be continued as far as the last line. Thereafter the display reverts to "TxA Test".



- **Close measurement list**

- Press the **"start"** soft key in menu (e).

The list closes and a new measurement cycle begins.

- Press the **"next"** soft key in menu (e).

The display will change to the "MegOhmMeter" measurement mode.

## MegOhmMeter - Insulation and loop resistance measurement

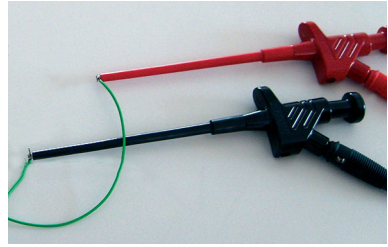
The "OhmMeter" Testbox T2 function is used to measure insulation and loop resistance.

It can also be used to measure any other resistance up to 200 M $\Omega$ .

Press the "next" soft key in the menu (e) until "MegOhmMeter" is displayed (1) at position (a) (see page 6).



- **Connect measurement pairs**  
Connect one measurement lead respectively to the red and the black clamps on the measurement cable (10).  
- Polarity is unimportant here.



- **Carry out zero calibration**  
This is only done when measuring low-ohm resistance (e.g. loop resistance).  
- Short circuit the measurement cable.  
- Press the **"start"** soft key in menu (e).  
*The resistance offset will be shown.*  
- Press the **"zero"** soft key in menu (e).  
*The resistance value will drop to "0".*



- **Start the measurement**  
- Press the **"start"** soft key in menu (e).  
*The measurement value is shown.*  
- Press the **"stop"** soft key in menu (e).  
*The measurement pair voltage will be displayed.*

**Resistance measurement values are NOT saved!**



## Service menu

This menu is used to change device settings and/or read them out.

Press the **"next"** soft key in the menu (e) until **"Service"** is displayed (1) at position (a) (see page 6).



- **Choose menu option**

- Press the "**down**" soft key in menu (e) repeatedly until the desired option is marked with ">".
- Press the "**select**" soft key in menu (e).  
*This starts the menu option chosen.*



## Setting date and time

- **Select the "Set Clock" menu option**

- Press the "**set**" soft key in menu (e) repeatedly until the value to be changed is marked.
- Press the "**up**" soft key in menu (e) repeatedly until the desired value is set.
- Press the "**set**" soft key in menu (e) to save.  
*The next adjustable value is marked.*
- Repeat the procedure for each value to be changed.



- To end or interrupt the procedure press the "**back**" soft key in menu (e).  
*The display then reverts to showing the service menu.*

## Device settings

- **Choose the "Settings" menu option**

Only measurement voltage can currently be adjusted.

- Press the "**up**" soft key in menu (e) repeatedly until the desired measurement voltage is set (40 - 90 V).

*Once the maximum value has been reached the display will revert to the lowest value.*

- To save press the "**set**" soft key in menu (e)

*The display then reverts to showing the service menu.*



### **Important note!**

**Measurement value reverts to the default value of 60 V DC when the Testbox T2 is switched off.**

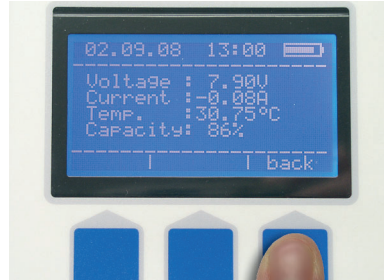
## Checking battery condition

- Choose the "Info Akku" menu option

The following battery values are shown:

- Battery voltage (Voltage)
- Charge/discharge current (Current)
- Device interior temperature (Temp.)
- Battery capacity (Capacity)

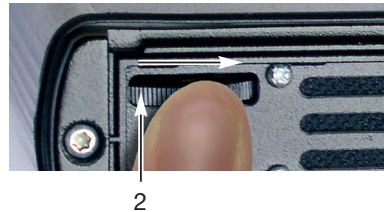
Press the "back" soft key in menu (e) to revert to the service menu.



- Switching off the Testbox T2

Turn the operating wheel (2) on the device base to the right against resistance.

The display will turn off.

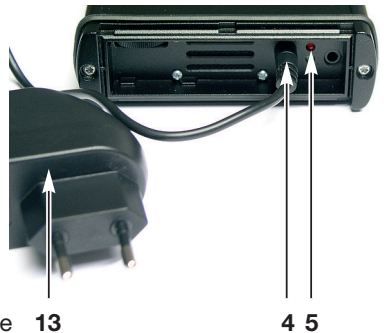


## Charging the battery

The Testbox T2 has an integrated rechargeable battery. The battery condition is shown in the display (2) top right.

To charge the battery insert the mains plug charger (13) in the charger socket (4) on the device and the other end in a mains socket.

Charging progress is shown by the red and green diodes on the charging status display (5) next to the charger socket (4). If the device is on during charging the battery condition bar will run from empty to full in the display (1).



Once charging is complete

- **the green diode illuminates** in the charging status display (5) showing that charge voltage is available,
- **the red diode goes out** in the charging status display (5) (when the device is turned off),
- **the battery condition display stands still (c)** in the display (1) (with the device on).

Disconnect the charger mains plug (13) and store it in the accessories compartment.

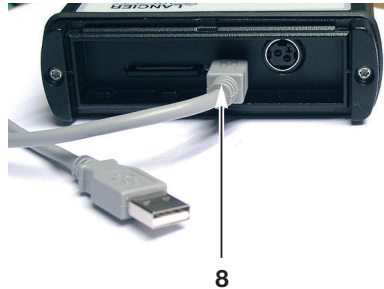
## Copying measurement data to a PC

All TxA-Test measurement values in the Testbox T2 are saved on a PC-compatible SD memory card. This is in CSV (comma separated values) format, which can e.g. be used by spreadsheet software.

### Data transmission by USB cable

- **Connecting the USB cable (12)**

Disconnect measurement cable and charger from Testbox T2 if extant. Insert the USB mini plug into the USB interface port (8) on the front of the Testbox T2. Connect the other end to a USB port at your PC.



#### Important note!

Do not apply measurement cable, charger and USB cable at the same time. Disconnect measurement cable and charger from Testbox during data transmission by USB cable.

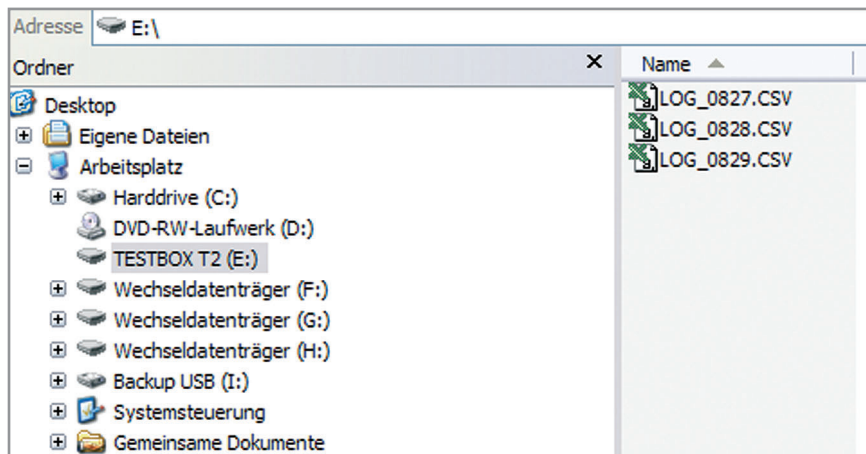
### Data transmission by card reader

- Remove the SD memory card (7) from its slot on the front.
- Insert it in the appropriate card reader slot.





After initialisation a new portable data carrier will be shown on your PC, namely "Testbox T2 (E):".



Open the drive to show the files.

Name ▲	Größe	Geändert am
LOG_0827.CSV	1 KB	27.08.2008 14:50
LOG_0828.CSV	1 KB	28.08.2008 09:23
LOG_0829.CSV	1 KB	29.08.2008 08:11

The file names reflect the storage date of the measurements:

LOG\_MMDD.CSV (MM = month, DD = day)

LOG\_0827 = log file 27 August with all measurements on that date.

Such files can be copied to a hard disc directory for storage or opened for evaluation.

## Evaluating/editing measurement data

The CSV files can e.g. be opened in a spreadsheet software. Settings must be such that a semicolon is accepted as data separator.

EuroValue		Date: 06.05.08 Time: 15:08						
Aus		A	B	C	D	E	F	G
13	0	1300	3,08	100				
14	1	1300	3,27	100				
15	2	1300	3,4	100				
16	3	1299	3,24	100				
17	4	1299	3,38	100				
18	5	1299	3,49	100				
19	6	1300	3,26	100				
20	7	1300	3,13	100				
21	8	1300	3,43	100				
22	9	1300	3,16	100				
23	10	1300	3,44	100				
24	Date: 06.05.08 Time: 15:12							
25								
26	Date: 06.05.08 Time: 15:32							
27	Address	Frquency [Hz	Current [mA]	Quality [%]				
28	0	0	0,03	0				
29	1	0	0,03	0				

If several measurements were carried out on the same date then the data will be appended to the data already stored for that date.

Storage data and time are shown before each measurement cycle so that the measurement location can be identified using the measurement time.

## Deleting measurement data

Some or all measurement files can be deleted from the SD memory card (6) whilst same is connected to your PC. This should only be done if the data is already stored on the hard disc of your PC or no longer needed.



### Important note!

Deletion is irreversible.

SD memory cards have no backup function!

The contents of your SD memory card can be completely deleted or the card formatted.

# EC Declaration of Conformity Power Pack



**COMPUTER TECHNOLOGY EUROPE, s.r.o.**

## EU Declaration of Conformity

Model name: **SYS1308N-xyxy series**  
 (Note: 'x' is 2 digit number which represents the output power, 'y' is 2 digit number which represents the output voltage)

Name and address of the importer: **SUNNY Computer Technology Europe, s.r.o.**  
 Trnkova 156, Brno, 628 00, Czech Republic  
 VAT: CZ26920026, tel.: +420-544500327, fax.: +420-544500328

This declaration is issued under the sole responsibility of SUNNY Computer Technology Europe, s.r.o.

**The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:**

Directive 2014/35/EU relating low voltage (LVD)  
 Directive 2014/30/EU relating to electromagnetic compatibility (EMC)  
 Directive (EU) 2015/863 provides an amendment to Annex II of RoHS (2011/65/EU) on the restriction of the use of certain hazardous substances in electrical and electronic equipment  
 Directive (EU) 2019/1782 on eco design requirements for energy-related products.

**References to the relevant harmonised standards used:**

EN 62368-1:2014+A11:2017  
 EN 55032:2015 Class B  
 EN 61000-3-2:2014  
 EN 61000-3-3:2013  
 EN 55035:2017  
 EN IEC 63000:2018  
 EN 50563:2011+A1:2013

Signed for and on behalf of: **SUNNY Computer Technology Europe, s.r.o.**

Place and date of issue: **Brno, Czech Republic, 2020-07-22**

Name, Function, Signature: **Bc. Petr Nešpor, Director of European operations**



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## EC Declaration of Conformity

We declare under our sole responsibility, that the product

**Make:** LANCIER Monitoring  
**Type:** Testbox T2

to which this declaration refers, meets the relevant health and safety requirements of the following EC directives:

**2014/30/EU** Electromagnetic compatibility  
**2011/65/EU** RoHS-II

For proper implementation of the health and safety requirements named in the EC directives the following standard(s) and/or technical specification(s) have been consulted:

**EN 61326-1** Electrical equipment for measurement, control and laboratory use - EMC requirements (class B)

Münster, 20.01.2021



Managing Director