POLON-ALFA

POLON 3000, POLON 4000 , POLON 6000
FIRE ALARM SYSTEMS

TLD-6000 DETECTION LINE TESTER

OPERATING INSTRUCTION

IK-E353-001

Edition 2

The manufacturer Polon-Alfa accepts no liability for any damage resulting from usage inconsistent with the manual.

A waste product, unsuitable for further use, shall be passed to a waste electric and electronic equipment collection point.	

Note - The manufacturer reserves the right to change specification of products at any time without a prior notice.

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1. Intended use

The TLD-6000 Detection Line Tester is intended for commissioning, checking the correct operation, diagnosing damages and measuring the characteristic parameters of the addressable detection lines (including installed line components) of the POLON 3000, POLON 4000 and POLON 6000 system, without connecting the control panel. An excellent tool for service technicians and installers, helps in solving problems related to eliminating faults.

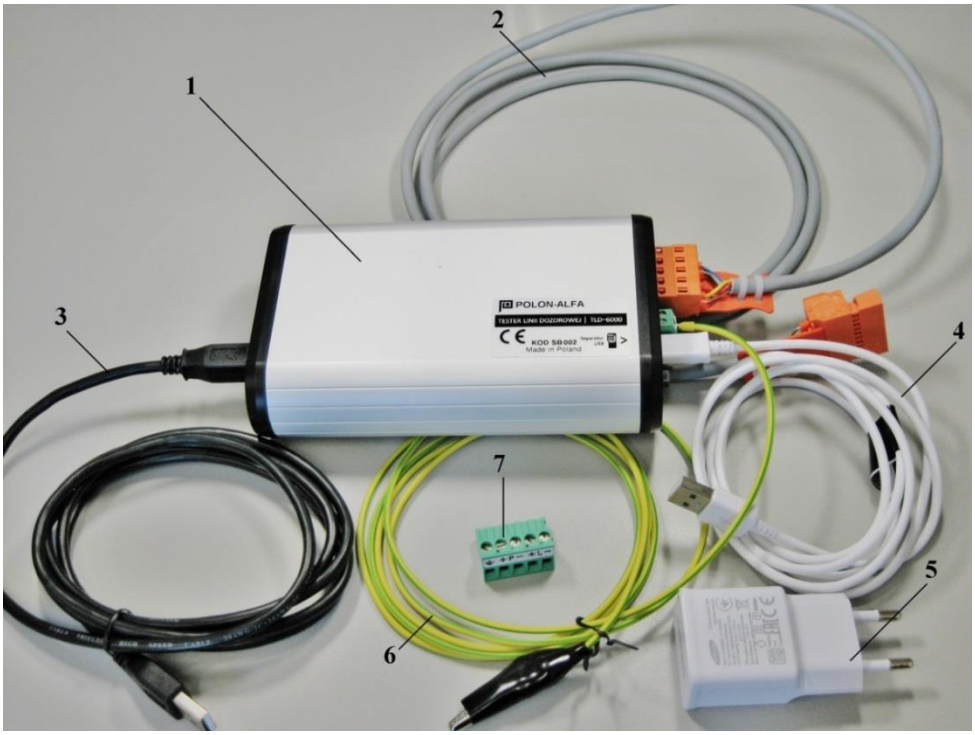
2. Warnings

Ensure safe working conditions for the device. Performing any repairs by the user may cause the device malfunction. Connecting the tester to devices other than dedicated ones may lead to its permanent damage. The tester is not a waterproof device. The tester is a portable device. Avoid heavy shocks and protect against falling.

3. Technical data

Supply voltage/current	5 V DC/min. 1 A
Operating temperature	-5 °C/+40 °C
Humidity	95 % RH
Housing	Aluminum
Rated detection loop current	20 mA/50 mA
Maximum resistance of the detection loop	2x100 ohms
Maximum loop capacity	300 nF
Dimensions	150 x 95 x 40 mm
Weight	280 g

4. Package contents

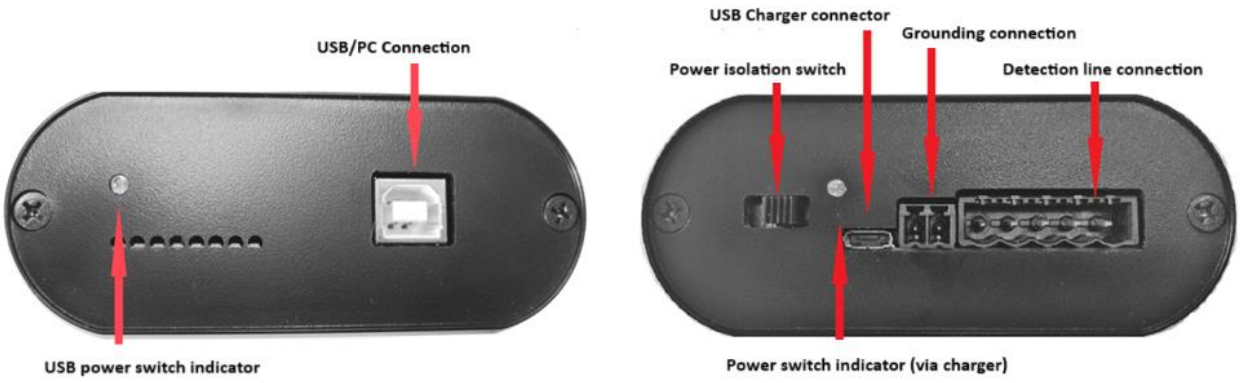


Pic. 4.1 Tester TLD-6000

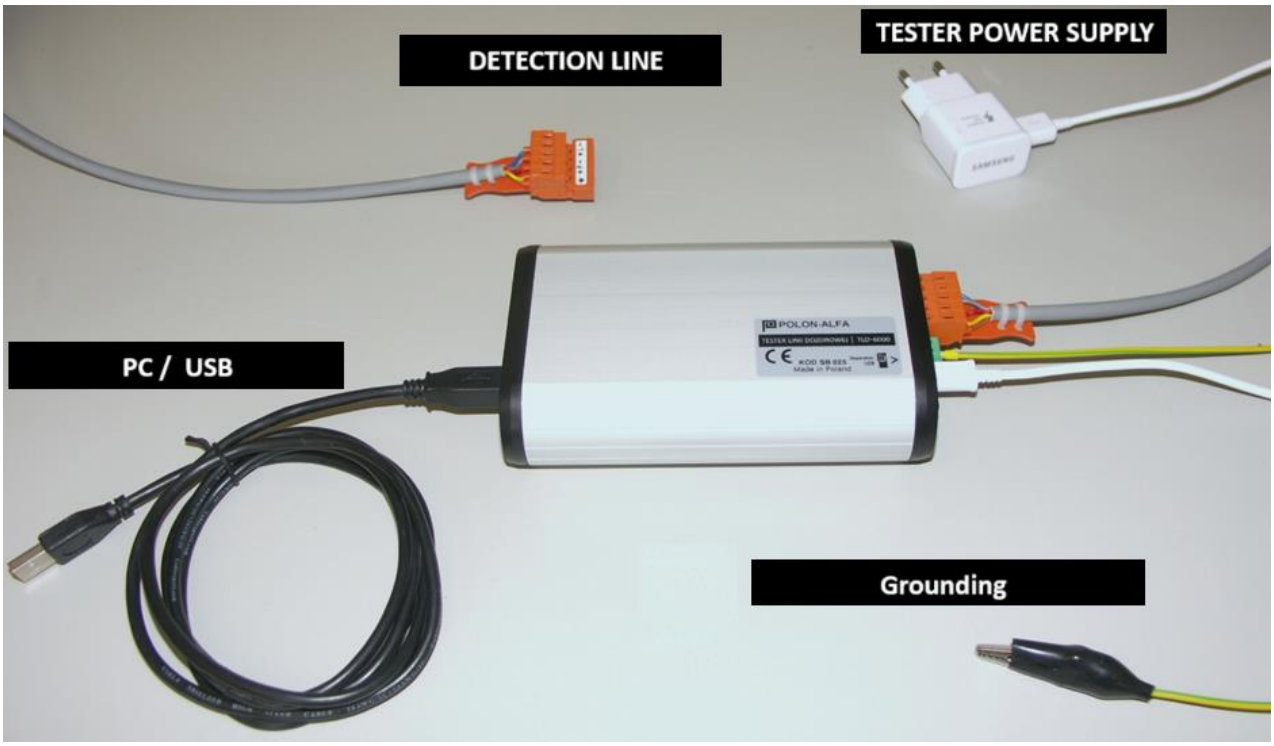
1 – TLD-6000 Tester
2 – Cable for the detection line connection (extension cable)
3 – USB cable for computer connection
4 – Micro USB cable for charger
5 – Tester power supply (5 V DC micro USB charger rated at min. 1 A)
6 – Grounding cable with crocodile clip
7 – Socket for connecting the detection line, compliant with the extension cable

5. Device description

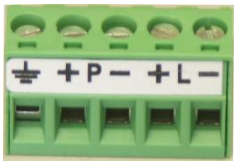
The device is equipped with a micro USB connector that allows it to be powered from the USB port of a computer, mobile phone charger or power bank battery.

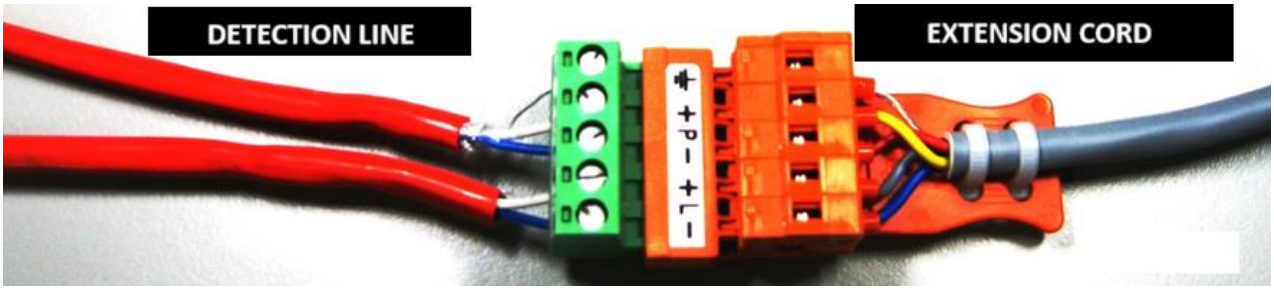


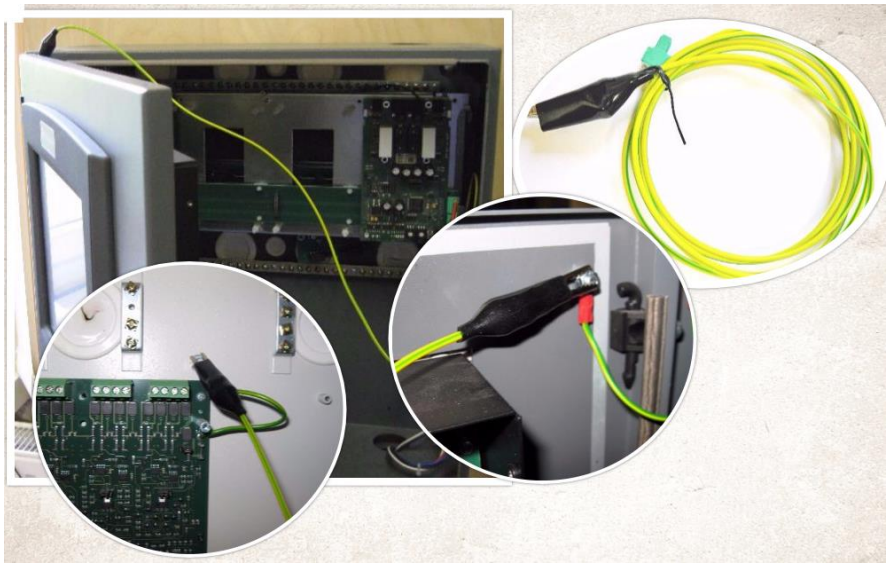
Using the intuitive interface of the **PolonTester** software, you can connect to any line component (detector, MCP, input/output device, etc.), configure it, check its status, read the characteristic parameters, etc. The application allows you to configure the line, save the profile configuration and import the configuration from the control panel software as well as it allows for test reports printing, system configuration and reading of the line topology.



Included socket is intended for connection to the POLON 4000 System line and is compatible with the extension cord.







The tester is equipped with a two-position slide switch. The switch position depends on the power source:

1. **USB** position when the Tester is powered from the computer
2. **Separator** position when power is supplied via a charger or other device approved by the manufacturer

Slide switch positions

6. Tester power supply

- It is recommended to supply the TLD-6000 Tester using the external USB power supply (so-called phone charger), which is by default included in the delivery, or using other power bank device. The two-position switch should be set to **Separator** position (**separation enabled**).

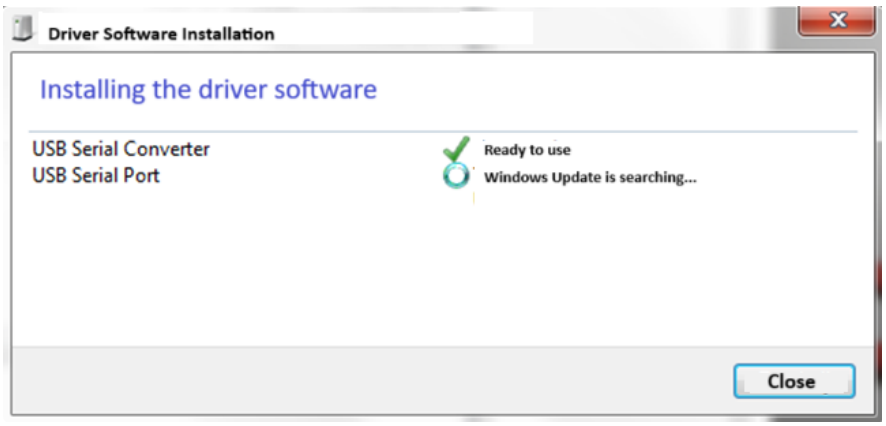
When choosing a power bank type battery, the recommended minimum capacity is 8000 mAh.

- When powered via the computer's USB port, it should be remembered that the Tester loaded with the detection line can temporarily consume up to approx. 1.5 A. The standard USB ports in the 2.0 specification are characterized by a maximum current capacity of 500 mA, and ports in the 3.0 specification provide 0.9 A. The two-position switch should be set to **USB** (**separation disabled**).

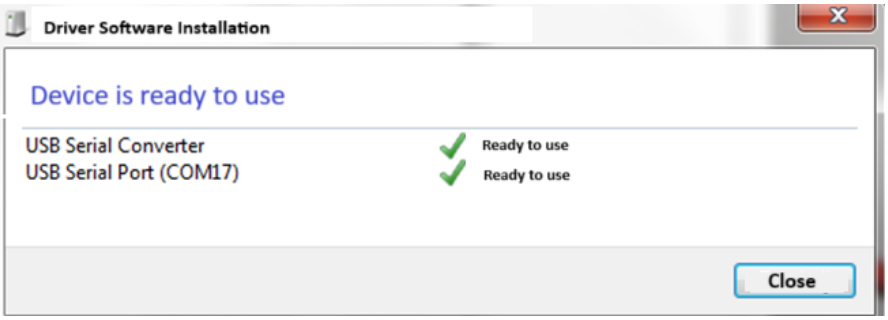
Note: In the case of an earth fault test, the switch must be switched to the **Separator** position (separation enabled) so that the tester does not provide incorrect results.

7. Launching the tester

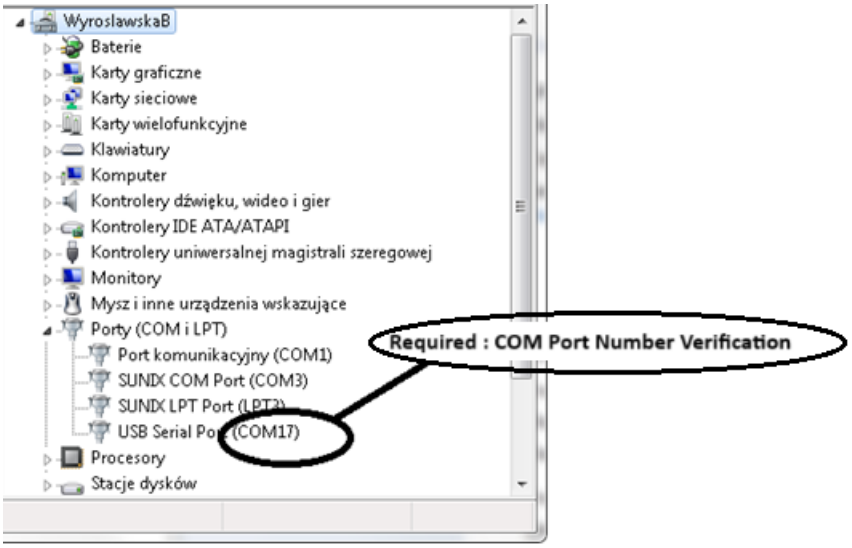
The first launch of the Tester involves the installation of **device driver software,** which may take a few seconds.



Installation of software driver in progress

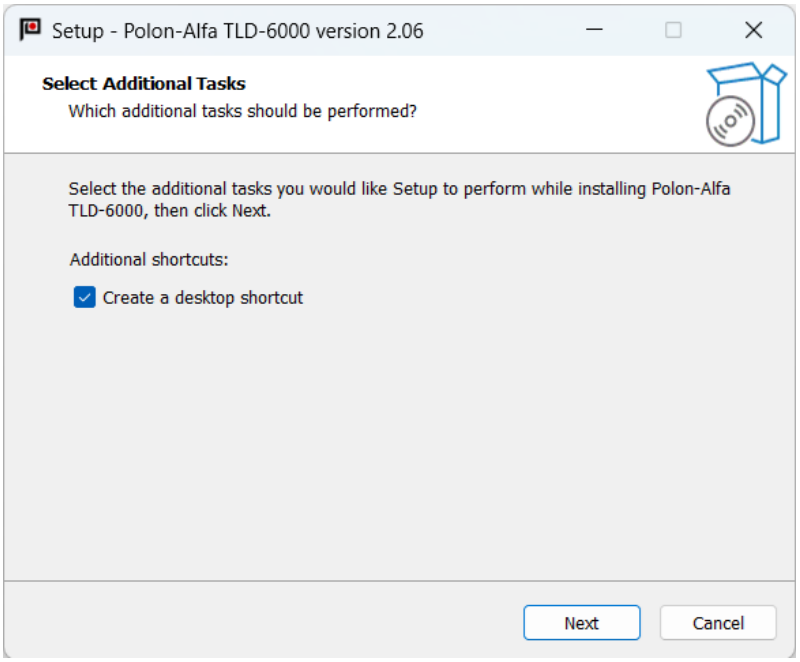


Software driver installation completed

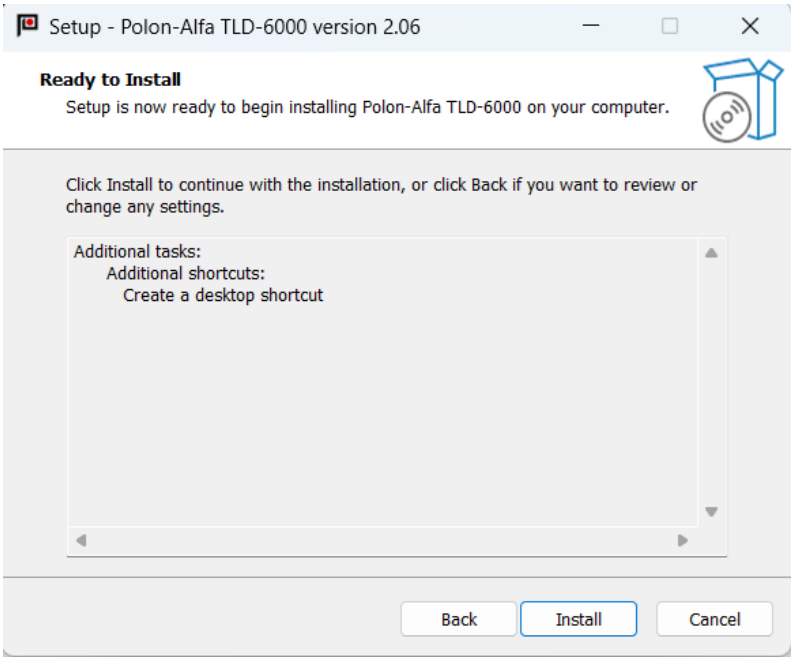


*It is required to verify the port COM number in the **Device Manager** (as shown above)

The **PolonTester-setup.exe** file is the installation application. The application is intuitive and its operation is simple. After starting the application, the installation window will appear:

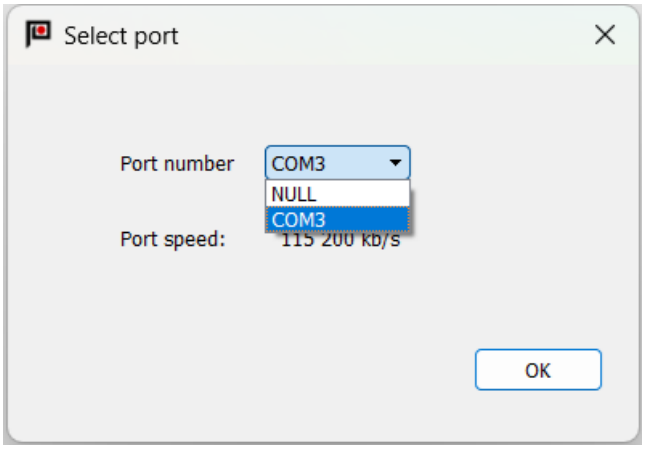


Follow the instructions on the screen



7.1. Port selection and opening

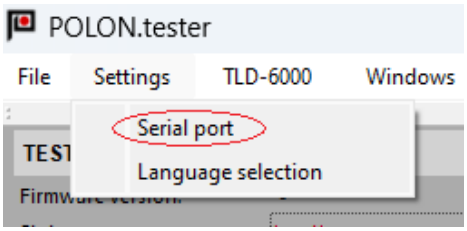
The application automatically searches for ports that are available on the computer



Note: Testing fails when the selected port is already used by another application. In such case, change the port.

The **Enter port** window displays all available ports.

Changing the port is done by selecting the **Settings - Serial port** from the top bar menu.



Correct connection of the tester and installation of the application allows to run the test program.

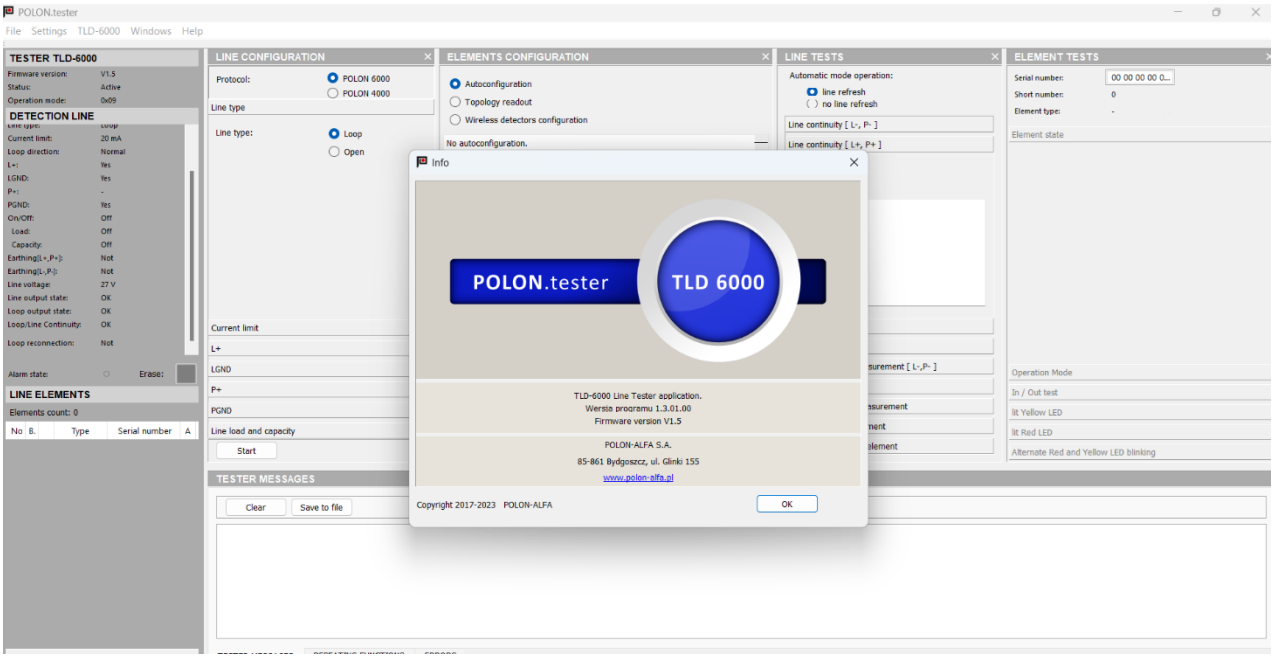
WARNING! In the absence of connected equipment or power supply to the tester, the test program will be inactive.

8. Navigation in the POLON Tester application

POLON-ALFA's TLD-6000 is a window-based application that thematically groups the functions of the tester. Navigate between windows using a *mouse*. Active windows can be stretched or narrowed and closed with .

The serial number of a line component can be dragged between windows to the appropriate fields.

After launching the application, a window with the name and version of the application appears on the screen. Polon.tester app requires the user to select the port number to which the device is attached.

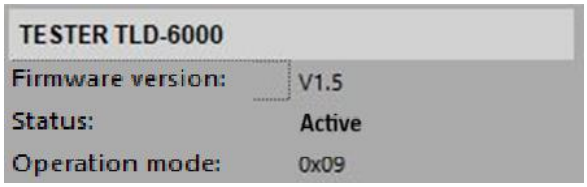


9. Device information window

The information window is divided into three parts:

- operation of the TLD 6000 Tester,
- properties of the detection line,
- line elements.

9.1. TLD-6000 Tester



Firmware version: Provides the firmware version

Status: - Active – Tester is active (tasks awaiting)
- busy – Tester is engaged (performs given task)
- Inactive - no communication with the device .

Operation mode: - Information related to the Tester's status and operating modes.

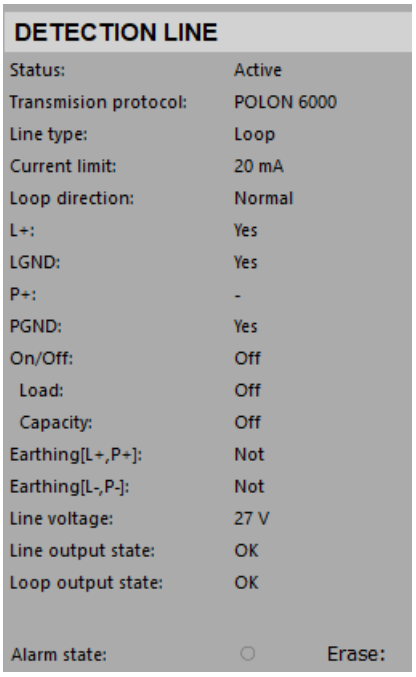
Operating modes of the TLD-6000 tester	FUNCTION CODE
Idle mode	0x00
External line preview mode	0x01
Test checking for continuity of LP- line	0x02
Test checking for continuity of the LP+ line	0x03
LP- earth fault test	0x04
LP+ earth fault test	0x05
Loop test	0x06
Loop voltages and currents test	0x07
Auto configuration test	0x08

Automatic operation mode	0x09
Manual operation mode	0x0A
Test locating the component breaking the line	0x0B
Test localizing the interfering component	0x0C
Reads the line topology	0x0D
Refreshes the status	0x0E
Line resistance test	0x10
Sets the line configuration	0x20
Sets line configuration parameters	0x21
Listens for signals from the line	0x22
Sets test modes	0x23
Tester response	0x24
Autoconfiguration order	0x25
Autoconfiguration result	0x26
Test of configured line components	0x27
Line component declaration	0x28
Command from the PC to the line component	0x40
Command from TLD-6000 to the line component	0x41
Line component response	0x42
Alarm reset	0x43
Disruption from line	0x50
Perform tester reset	0x90

9.2. DETECTION LINE

Detection line window shows the status and properties of the detection line. All line anomalies are marked in red. If more detailed information about the anomaly is needed, more thorough tests should be performed using the ***LINE TESTS*** window

Any changes to the detection line properties can be made using the **LINE CONFIGURATION** window.

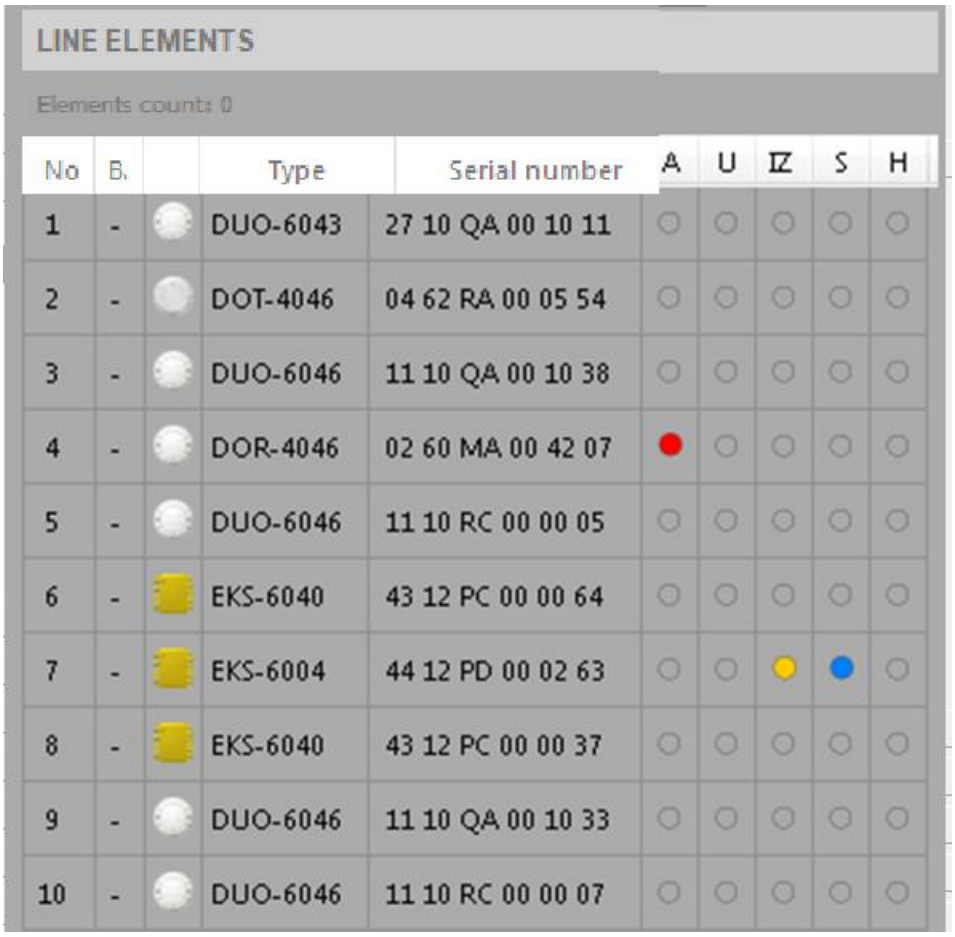


To reset the line ***alarm state*** use the ***ERASE*** button:

9.3. LINE ELEMENTS

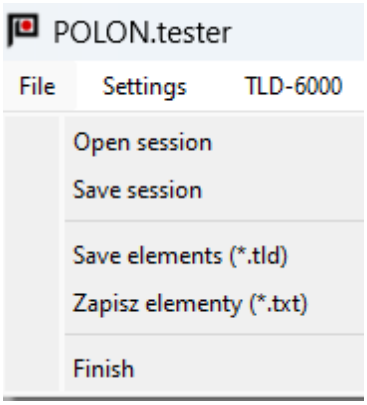
The third part of the information window displays the line components connected to the line along with their status after auto-configuration or following the topology readout. The meaning of the individual columns, respectively:

- Nr (No.) - Topological number
- O. - Branch number
- Loop device symbol
- Typ (Type) - device type
- Serial number
- A - Alarm state
- U – Fault state
- IZ - Line break state
- S - Service state
- H - for devices of the 6000 series equipped with Hall generator.



The device enables testing of each component separately. To do so display the ***ELEMENT TESTS***) window and drag the serial number of the tested component to the appropriate field in the ELEMENT TESTS window.

10.FILE



10.1. Open session

Opens the file with the program settings.

10.2. Save session

Saves the file with the program settings.

10.3. Save elements (*tld)

Saves information about the elements read by the tester in *.tld (format XML)

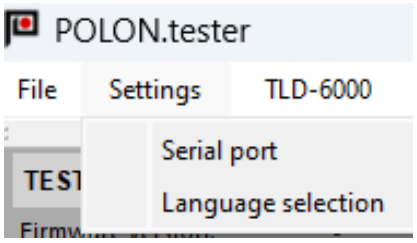
10.4. Save elements (*txt)

Saves information about the elements read by the tester in *.txt (text format)

10.5. Finish

Ends the program.

11.Settings



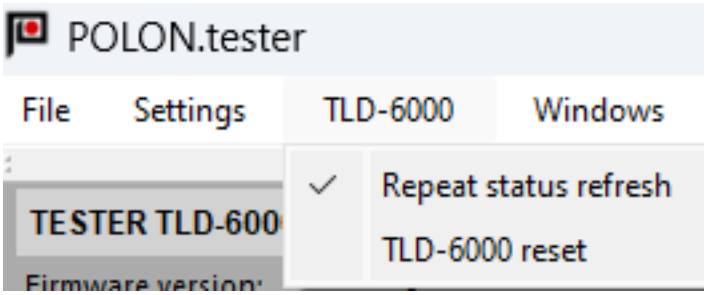
11.1. Serial port

Displays window port with the list of serial ports on the computer currently available.

11.2. Language selection

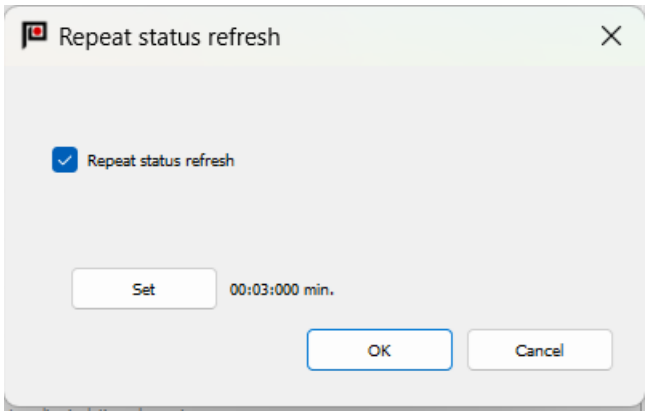
Displays available language selection window.

12.TLD-6000



12.1. Repeat status refresh

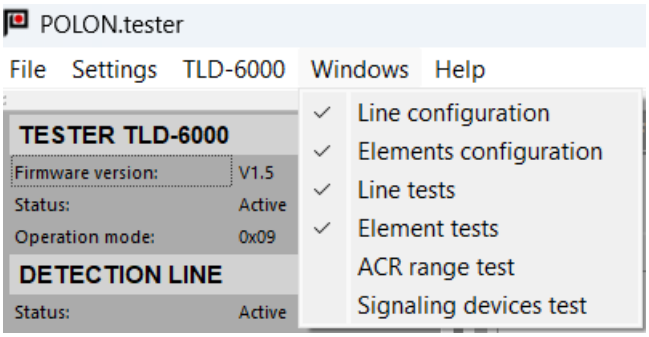
Selecting the ***Repeat status refresh*** option results in the application checking the line status every 3 seconds by default, regardless of the operating mode. This time may be changed after selecting the ***Set*** button.



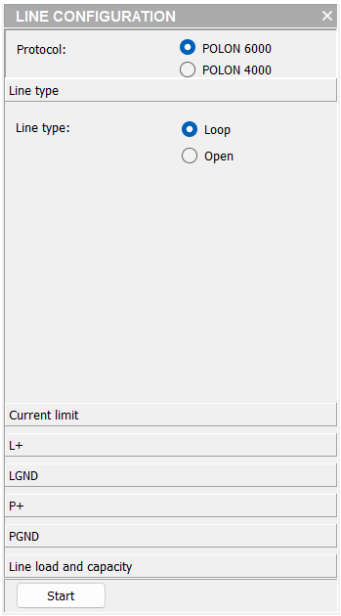
12.2. TLD-6000 reset

Clears the tester's registers and RAM and reinitializes the program.

13. Windows



13.1. Line Configuration



Line configuration enables setting the following line parameters:

- Protocol:

- POLON 6000
- POLON 4000

- Line type:

- Loop
- Open

- Current limit:

- 20 mA
- 50 mA

- L+ Power supply from the side line

- yes
- no

- LGND ground on the line side

- yes
- no

- P+ power supply from the loop

- yes
- no

- PGND ground on the loop side

- yes
- no

- Line load and capacity:

On / Off: - OFF

- from the Line Begin
- from the loop Return

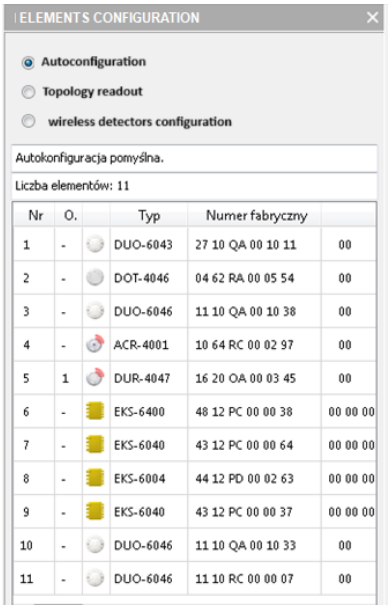
Load: - OFF

- 4 mA
- 8 mA
- 16 mA
- 24 mA
- 32 mA
- 40 mA
- 48 mA
- 60 mA

Capacity - OFF

- 200 uF

13.2. ELEMENTS CONFIGURATION



The configuration window has three options to choose from:

- ***Autoconfiguration*** - the tester reads the line configuration, saves it to memory and displays in the window the devices connected to the detection line together with their factory numbers and the operating mode,
- ***Topology readout*** - use this feature to read the saved configuration from memory and display it in the window,
- ***Wireless detectors configuration*** - use this feature to declare, read, clear detectors assigned to the selected wireless detector adapter.

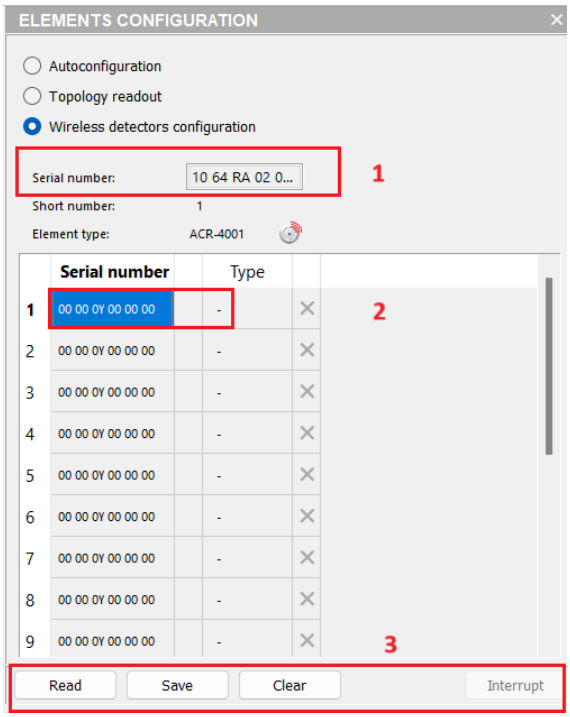
To ***configure wireless detectors*** enter the serial number of the appropriate ACR-4001 Adapter or drag the serial number to the chosen field using mouse (1).

After pressing the ***Read*** button, the app will read the serial numbers of the declared wireless components.

To assign a wireless call point to the ACR-4001 (up to 16 devices may be assigned) enter the serial number of the call point in the appropriate field according to the format

2 and the ***Run*** button confirms . 3

The ***Clear*** button removes all declared wireless components.

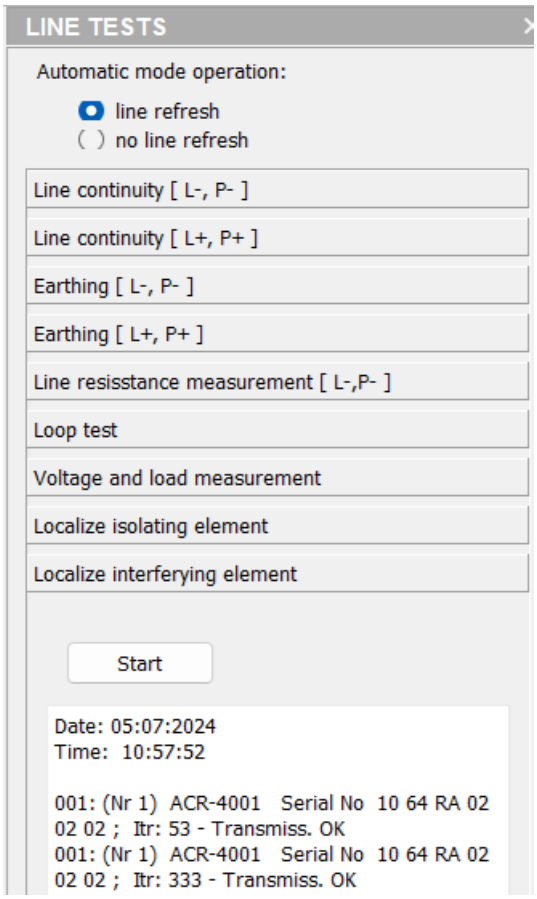


13.3. Line tests

The ***LINE TESTS*** window is used to discover damage of the detection line. The TLD-6000 tester can not only read and delete line errors but it can also measure important parameters.

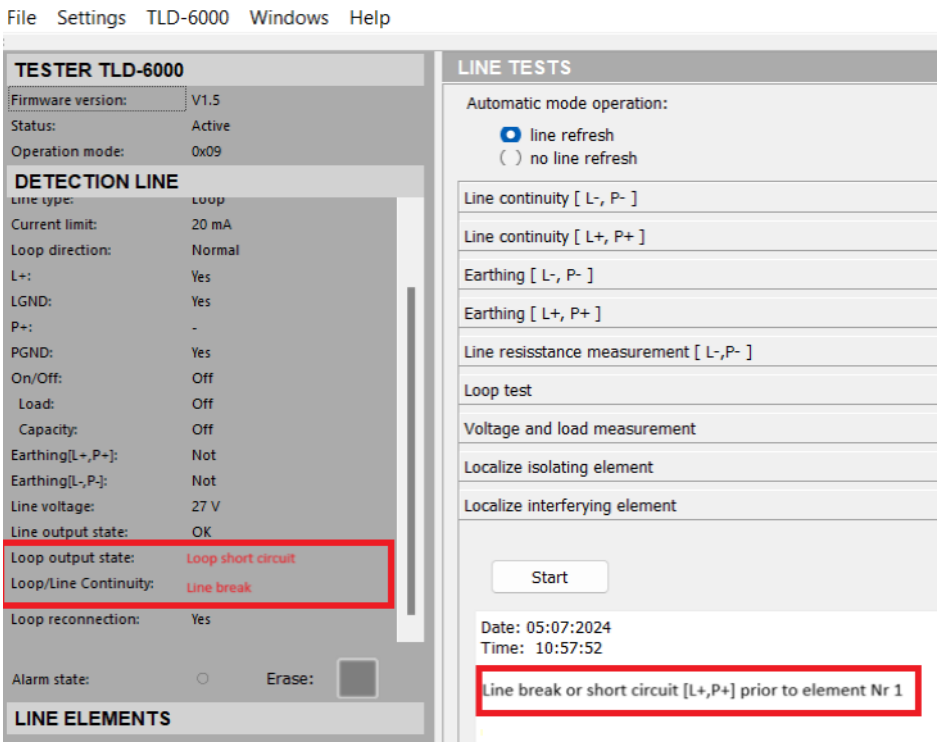
It has two modes of automatic operation:

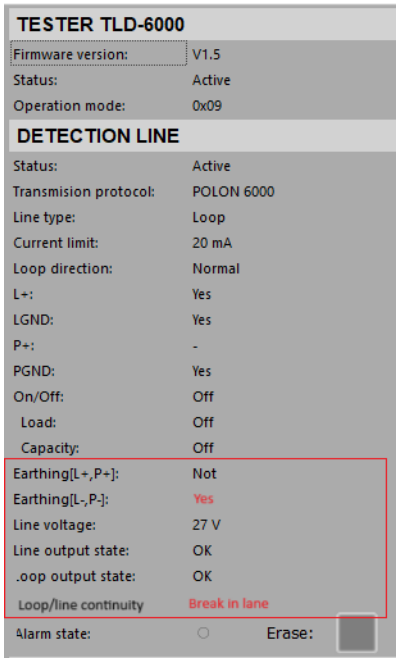
- ***line refresh*** this is a fully automatic mode (looped polling),
- ***no line refresh*** the tester is idle and is waiting for an order to be sent to the line.



The tester detects faults in the line and displays them in the information window in red. The information can be detailed by performing tests in the **LINE TESTS** window.

If a message appears informing about an open or short circuit and about loop being switched on, conduct line/loop continuity tests that will indicate the approximate location of the problem. The continuity tests are carried out separately for the loops on the - and + lines. Based on measurements of the line voltages ***U[L-, L+], U[P-, P+]*** and currents **I[L+], I[L-], I[P+], I[P-]**, the tester detects the fault location.

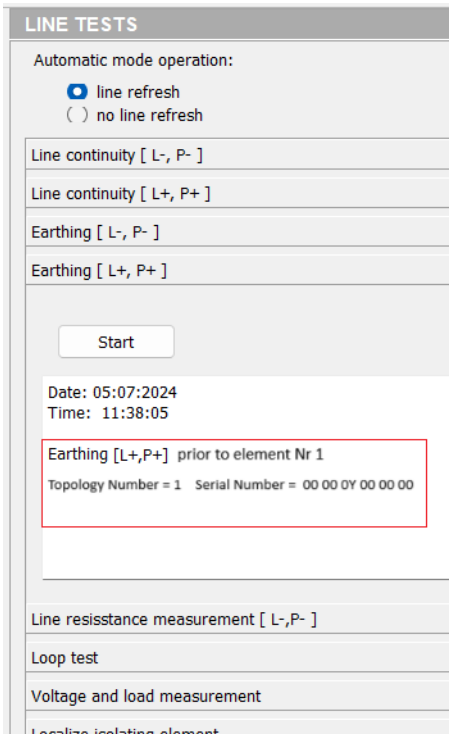




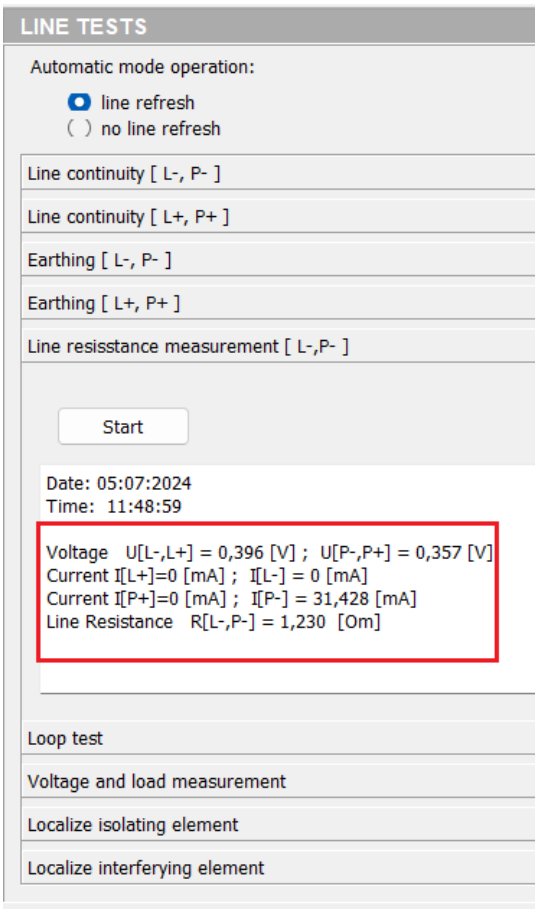
In the event of an earth fault, check whether the shielding is connected to the tester line. Then perform a detailed earth fault test. In the next step, disconnect the screen from the tester and connect the supplied grounding cable with the crocodile clip to the control panel housing and to the tester. Perform earth fault test again.

Note: The switch must be in the **Separator** (separation enabled) position so that the tester can properly carry out the earth fault test.

The negative result of **the earth fault test** is most often due to mechanical damage to the line (insulation worn-out and short circuited to the control panel housing, shorting of the detection line wire with the shielding, etc.) or due to independent/external events during operation that are not related to the installation, e.g. flooded detector.



Nonetheless, measurements of voltage, current and resistance of the line cables are important tests of the detection line depending on its configuration. The tester discovers excessive resistance, excessive voltage at the end of the detection line, as well as transmission errors due to excessive line capacity.

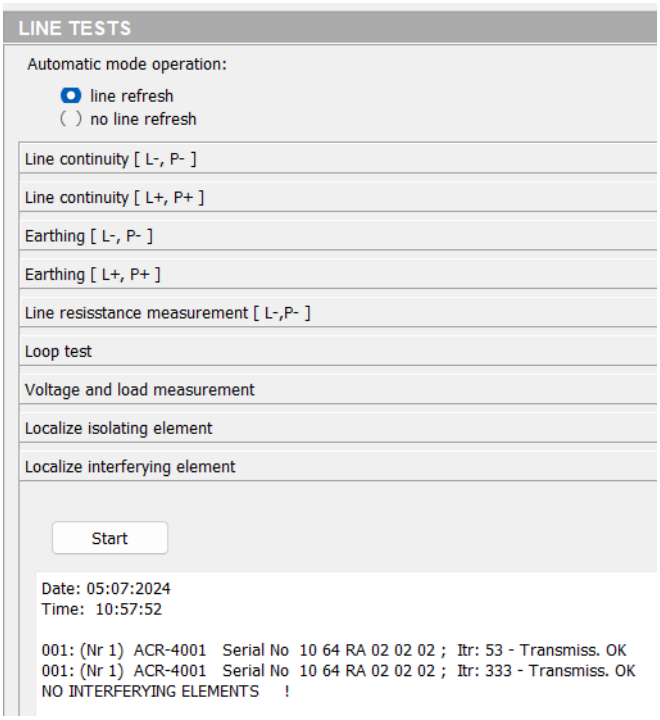


In open/radial detection lines, upon detection of a short circuit, the nearest isolator in front of short circuit is activated and the part of line behind this isolator becomes disconnected.

In the loop topology, as a result of a short circuit of the detection line wires, two insulators in the line device installed closest to the place of damage will activate, as a result of which only part of the detection loop between these elements will be disconnected.

The ***Locate isolating element*** test displays the type and number of the isolating component, if any.

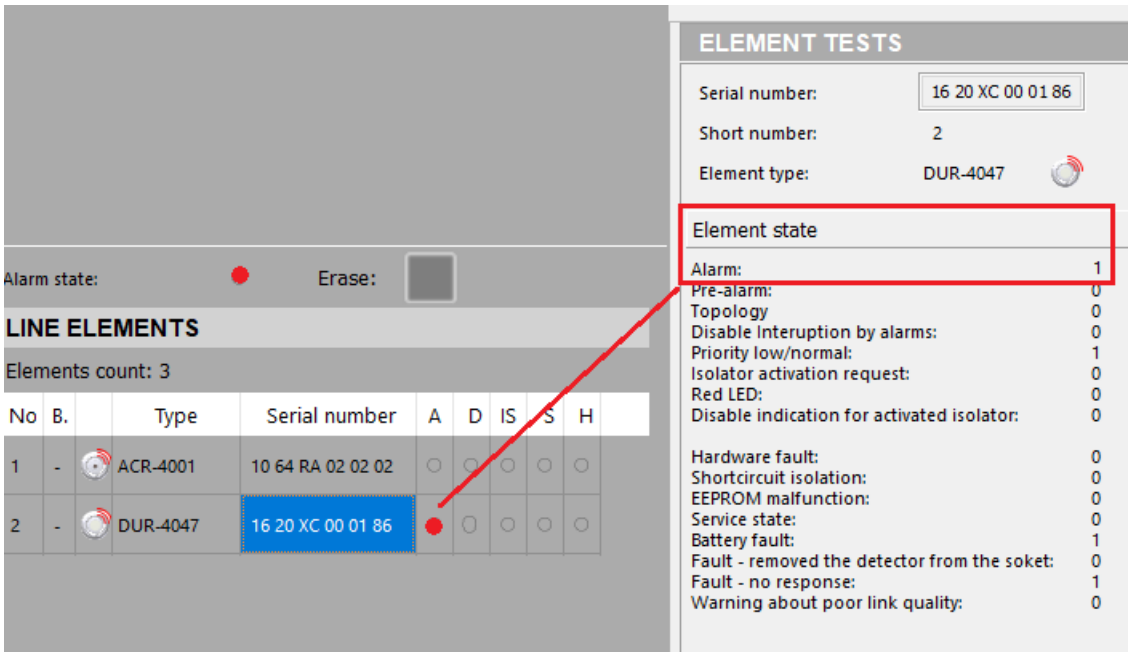
The ***Locate interfering element*** displays the type, topological and serial number of the interfering device.



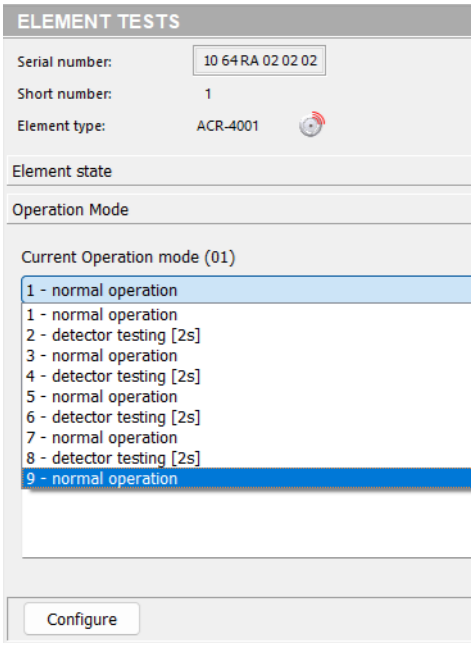
13.4. ELEMENT TESTS

The ***ELEMENT TESTS*** window displays messages related to the selected device. Type-in or drag the serial number to the appropriate field of the *ELEMENT TESTS* window using mouse. The status of the device and its operating parameters will be displayed, where 1 means the occurrence of the given parameter.

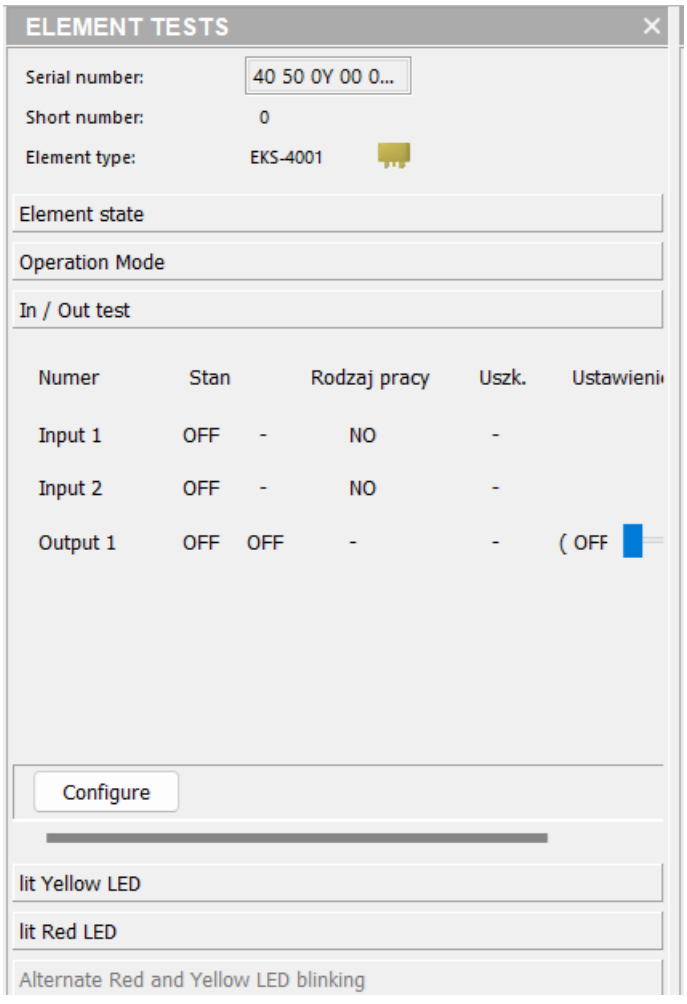
Element state - the state of the element and its operating parameters (where "1" means the occurrence of a given parameter).



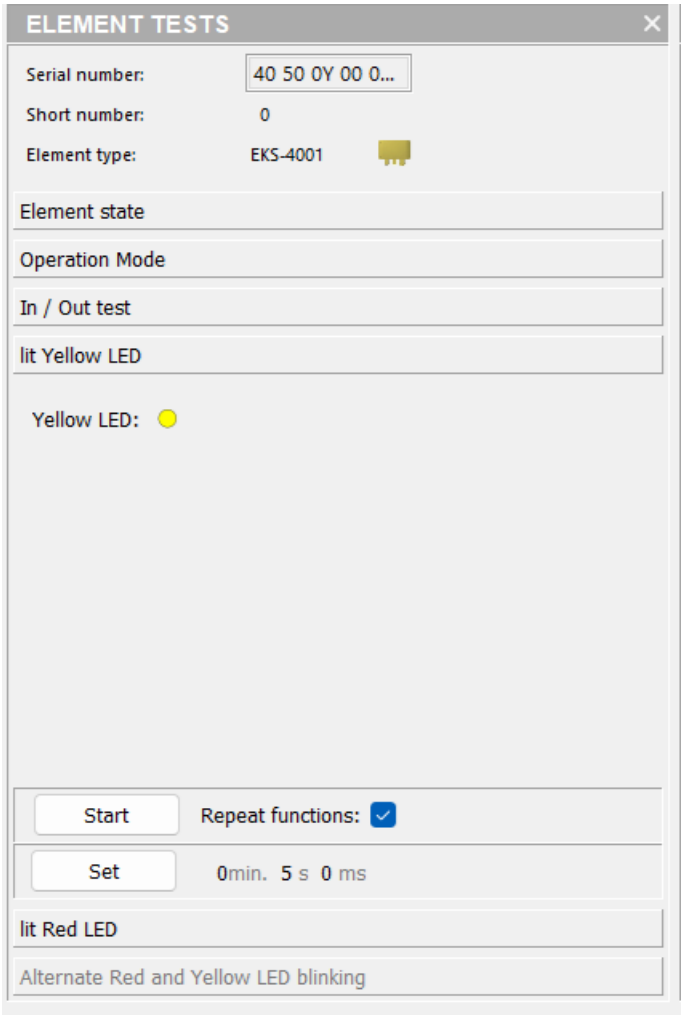
Operation mode – specifies the mode of operation of a given element and its modifications.



Input/output test – determines the state of inputs and outputs of a given element and allows their modification (applies to control and/or control elements).



Yellow LED on – forces the yellow LED of a given element to flash at a specified time.



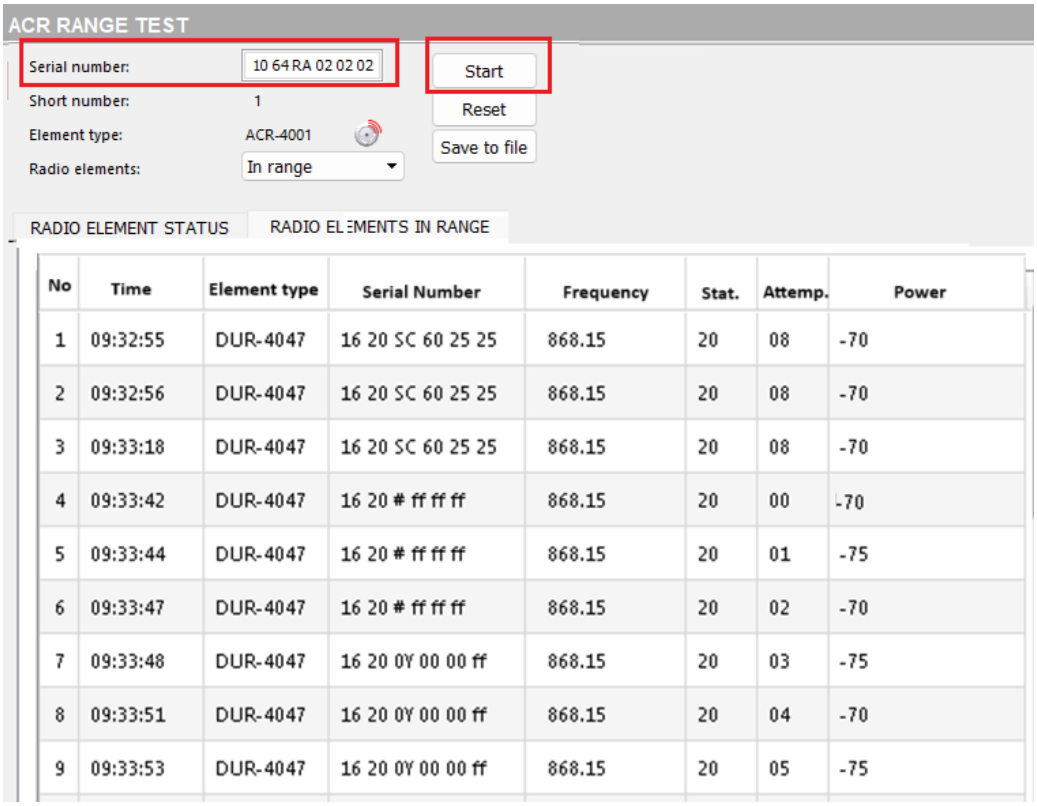
Red LED on – forces the red diode of a given element to flash every specified time.

Alternate flashing with red and yellow LEDs – forces the red and yellow LEDs of a given element to flash at a specified time (applies to ROP-4007M, DUR-4047 radio detectors).

13.5. ACR RANGE TESTS - Option (requires a special ACR module)

The optional window ***ACR Range Test*** is used to display wireless detection devices within the operating range of the ACR-4001 Wireless Detector Adapter. This window is only available for the special version of the ACR adapter.

To use the *ACR Range Test* enter the serial number of the appropriate ACR 4001 Adapter or drag the serial number with the mouse to the appropriate field, and then press the ***Start*** button.

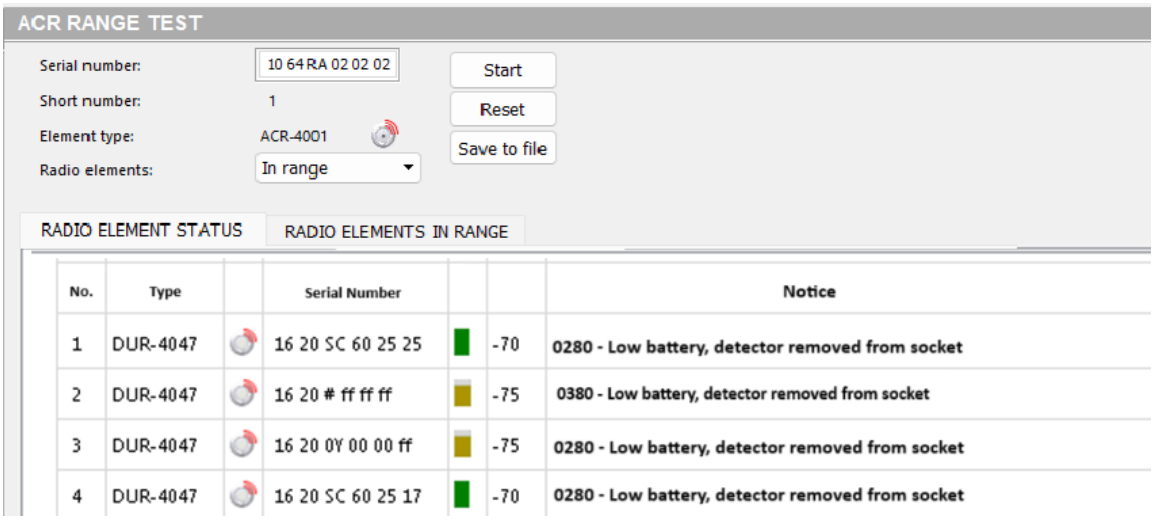


No	Time	Element type	Serial Number	Frequency	Stat.	Attemp.	Power
1	09:32:55	DUR-4047	16 20 SC 60 25 25	868.15	20	08	-70
2	09:32:56	DUR-4047	16 20 SC 60 25 25	868.15	20	08	-70
3	09:33:18	DUR-4047	16 20 SC 60 25 25	868.15	20	08	-70
4	09:33:42	DUR-4047	16 20 # ff ff ff	868.15	20	00	-70
5	09:33:44	DUR-4047	16 20 # ff ff ff	868.15	20	01	-75
6	09:33:47	DUR-4047	16 20 # ff ff ff	868.15	20	02	-70
7	09:33:48	DUR-4047	16 20 0Y 00 00 ff	868.15	20	03	-75
8	09:33:51	DUR-4047	16 20 0Y 00 00 ff	868.15	20	04	-70
9	09:33:53	DUR-4047	16 20 0Y 00 00 ff	868.15	20	05	-75

The ***Radio Elements in Range*** tab shows all radio devices, their communication frequencies, the number of attempts and signal strength. Devices may be detected multiple times by the adapter.

The ***Radio Element Status*** tab shows each component only once with additional warnings related to the quality of the battery.

The ***Stop*** button stops the ACR reading and the ***Reset*** button clears windows.



No.	Type		Serial Number			Notice
1	DUR-4047		16 20 SC 60 25 25		-70	0280 - Low battery, detector removed from socket
2	DUR-4047		16 20 # ff ff ff		-75	0380 - Low battery, detector removed from socket
3	DUR-4047		16 20 0Y 00 00 ff		-75	0280 - Low battery, detector removed from socket
4	DUR-4047		16 20 SC 60 25 17		-70	0280 - Low battery, detector removed from socket

To change the frequency at which ACR is works the operating mode in the *COMPONENT TESTS* window must be set:

- **Mode 1 and 2**: frequency pairs 868.15 and 869.850 (version 1.0)
  or 867.70 and 868.95 (for new detectors)
- **Modes 3 and 4**: frequency pairs 868.45 and 869.525
- **Modes 5 and 6**: frequency pairs 865.70 and 866.70
- **Modes 7 and 8:** frequency pairs 866.00 and 867.00
- **Modes 9 and 10**: frequency pairs 866.30 and 867.30

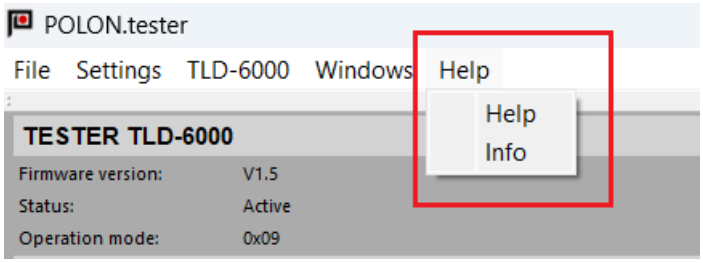
13.6. SIGNALLING DEVICES TEST

The **SIGNALLING DEVICES TEST** window displays a list of line elements. Pressing the Start button will turn on the signaling of the first item on the list that is in the signaling group: SAL-4001, SAW-xxxx, SAB-xxxx, DUO-xxxxAD, DUT-xxxxAD.
Using the **Previous** or **Next** buttons select the previous/next device. **Stop** button deactivates signaling.

SIGNALING DEVICES TEST

Nr	O.		Type	Serial Number
1	-		SAL-4001	50 68 TC 00 31 44
2	-		DUR-4046	06 69 5B 00 42 11
3	-		DOR-4046	02 68 MA 00 42 11
4	1		ROP-4001	30 68 UA 10 03 44
5	-		DOR-4046	02 68 MA 00 42 18
6	-		DUO-6043	27 10 QA 00 10 24
7	-		DUR-4046	06 64 3C 33 67 52
8	-		DOT-6046	0c 11 VA 01 05 60
9	-		-	00 00 0Y 00 00 00

14.HELP

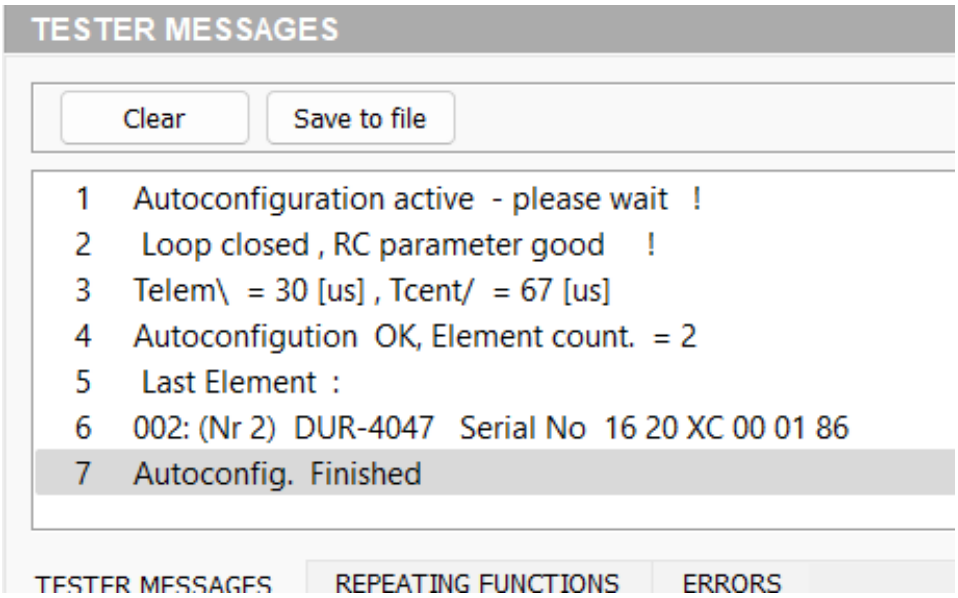


14.1. Help – Enables access to the POLON TESTER application user manual

14.2. Info – Software version

15.TESTER MESSAGES

The Tester Messages window displays summarized temporary and final results from other windows. This window works as an add-on only. The entire testing log can be saved to a file.



16.Storage and transportation

The TLD-6000 Tester should be stored in closed rooms with no corrosive vapors and gases in the atmosphere, within the temperature range from 0 °C to +40 °C, and with the relative humidity below 80 % at +35 °C.

During storage, the device should not be exposed to direct sunlight or heat from heating devices.