



FORTEZA<sup>®</sup>

TRIBOELECTRIC FENCE  
PROTECTION SYSTEM FORTEZA  
TRIBO-S

OPERATION AND INSTALLATION  
MANUAL

## 1. GENERAL INFORMATION

This operation and installation manual contains information on the design and technical data of the triboelectric fence protection system TRIBO-S (hereinafter referred to as the protection system) and information on its installation and operation.

**The system is designed to detect an intruder:**

- climbing over the fence
- destroying the fence

The system is used in objects characterized by an irregular shape of the perimeter or an increased requirement for the placement of a hidden protected zone.

The system can have up to four protection zones. The processor registers electric discharges generated by the sensitive element that detects an attempt to break into the territory. The processor activates an alarm if the number of received electric discharges exceeds the norm.

The protection system ensures monitoring of

the integrity of the sensitive and connecting (non-sensitive) element. During operation the sensitive element is completely passive.

### 1.1 Operating conditions:

The protection system is intended for continuous twenty-four-hour operation. The security system does not generate false alarms under the exposure to outdoor environment (EOE) listed in Table 1.

Table 1.

EOE	DESCRIPTION	VALUE
Acoustic noise	Not regulated	
Elevated ambient temperature	Elevated operation temperature	+ 50°C
Low ambient temperature	Low operation temperature	- 40°C
Increased humidity	Up to 98% at + 35 °C temperature	
Low humidity	Not regulated	
Rain	Not regulated	
Frost and ground frost	Not regulated	

Roots of trees	Not closer than 50 cm from a sensitive element	
Snow cover	Not regulated	
Fog	Of any intensity	
Saline (sea) fog	Of any intensity	
Dust (sand)	Not regulated	
	Not regulated	
Ultraviolet solar radiation	Not regulated	
Wind	Not regulated	
Hail and sand storms	Of any intensity	
Laying depth of sensitive element	Min.	2 cm
	Max	15 cm
Grass	Not regulated	
Movement of one person, few persons (3 - 5 persons) and big animals	Distance to the protected zone	0.5 m
Freight and passenger trains	Distance to the protected zone	from 10 m to 20 m
Electric lines (up to 500 kV)	Distance to the protected zone	10 m

Exposure to the radar electromagnetic field	Not regulated (when processor is installed in the metal box)	
Exposure to the ultra-short pulses of the electromagnetic field	Not regulated (when processor is installed in the metal box)	
Exposure to the momentum neutron field	Not regulated	
Influence of birds and animals	Weight	Up to 20 kg

## 2. SYSTEM COMPONENTS


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- Processor;
- User manual;
- Set of fastening materials;
- Set of tools and installation parts;

**Optional:** end sleeve, connection sleeve, RS-BL (light) converter, RS 485-USB converter, sensitive element, non-sensitive element. At user's request all of this can be included in the delivery kit. Their quantities are specified at the time of ordering.

### 3. TECHNICAL CHARACTERISTICS

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- Length of the sensitive element (SE-86) in a single zone up to 300 m;
- Length of the non-sensitive element (NON-SE) in a single zone up to 300 m;
- Inputs – 2 or 4 independent zones;
- Relay outputs – 2 or 4 independent outputs;
- Relay output – integrity control of sensitive and non-sensitive element;
- Relay output – unauthorized opening of the processor case.
- All relay outputs – dry contact of outbound relay;
- Power supply 10-30 V (DC); 
- When voltage drops below 9.5 V, the protection system goes into the Alarm mode;
- Current consumption < 25 mA;
- Operating temperature from -40°C to +50°C;
- The duration of alarm signal is at least 1 s;

- Fixed resistance value, control of integrity of sensitive and non-sensitive elements;

**INSTALLATION ON THE FENCE** – The sensitive cable SE-86 is mounted on the fence using plastic ties or other appropriate fastening methods, depending on the fence type. Ensure that the horizontal cable is securely fixed and does not move or sag after installation.

#### **System setting methods:**

- Using RS-485/USB converter, wired connection (Windows software);
- Using built in Bluetooth converter, wireless connection (IOS/Android device);

## 4. PRINCIPLE OF OPERATION

The basis for the protection system operation is generation of electrical signals in the sensitive element and at its stress centres (points of the sensitive element rigid fastening to the fence) under mechanical action on the fence components and their subsequent detection by the signal-processing

### 4.1 SENSITIVE ELEMENT (SE-86)

A sensitive element mounted on the fence is meant for electrical signal generation under unauthorized mechanical actions on the fence. The sensitive element protection length depends on the guarded zone length, the fence height, number of supports, and the selected way of the sensitive element mounting on the fence.

### 4.2 NON-SENSITIVE ELEMENT (NON-SE)

The non-sensitive element is a part of the TRIBO-S protection system. It is insensitive to deformation and vibration. The non-sensitive element is used for transferring signals between the TRIBO-S processor and the sensitive element (SE-86) or for connection of two sensitive elements (SE-86 and SE-86) using connection sleeves (e.g. bypassing gates, asphalted passages etc.). We recommend using a non-sensitive cable in a plastic or metal pipe to connect the processor to the sensitive element.

### 4.3 PROCESSOR TRIBO-S

Processor Forteza TRIBO-S is used for detection, processing and alarm generation of the sensitive element signals.

### 4.4 CONNECTION SLEEVE (CS)

Designed to connect the sensitive element to the non-sensitive element or to restore the

system after cable damage and for shielding and sealing the connection point. Installation of sleeve in the ground is allowed with additional sealing means, except the places where the ground may be flooded for a long time. It is recommended to use as small number of connection sleeves as possible.

#### 4.5 END SLEEVE (ES)

End sleeve provides a continuous integrity of input lines. It is also designed for shielding and sealing the sensitive element's end point (1 MΩ RESISTANCE). Installation of sleeve in the ground is allowed with additional sealing means, except the places where the ground may be flooded for a long time.

#### 4.6 RS-485/USB CONVERTER

Used to connect TRIBO-S processor with Windows device to set up and control system parameters.

## 5. APPLICATION

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The system provides high stability of protection (detection of unauthorized actions), strong noise immunity (virtually no false alarms), and specified resistance to sabotage.

### THE FOLLOWING SHOULD BE PROVIDED:

- proper fence mounting (flexible fences should be stretched uniformly with specified tension force);
  - combination of different-type fences with respective schemes of sensitive element laying and fastening;
  - fence uniformity, i.e. the fence should be made of the same material because different-material sections generate signals of different strength when subjected to an unauthorized action;
  - sensitive element proper installation and tightness;
- SPU detection zones optimal sensitivity setting;

### FENCE INSTALLATION OPTIONS

Installation of sensitive element of Tribo-S triboelectric perimeter fence protection system:

- 1) Max. length SE-86 „Forteza“ per one input of signal processing unit (SPU) security detector Tribo-S – up to 300 m;
- 2) Sensitive element SE-86 „Forteza“ is to be laid in accordance with the draft layout;
- 3) Sensitive element SE-86 „Forteza“ is fixed to the fence by plastic ties 140\*3,5 mm – every 30-40 cm. To make “fixing point“ at the points of SE-86 binding to the fence, binding should be performed in such a way to obtain visible cable sheath deformation not leading to cable damage;
- 4) When laying SE-86 over the supports, SE-86 contact with the support should be avoided;

- 5) Connection and end sleeves should be mounted on a fence horizontally and higher than SE-86 cable line;

### **5.1 SENSITIVE ELEMENT LAYOUT ON LIGHT WELDED MESH FENCE**

Flexible fence is actually a fence made of metal element netting according, barbed element, element of rust-resistant steel, bimetallic element, reinforced barbed tape, etc.



*Pic.1 LIGHT WELDED MESH FENCE*

The sensitive element is mounted directly on the fence's flexible elements. The supports enabling an intruder to get over the fence without touching its flexible elements being

available, the sensitive element is mounted on the supports as well. "Alarm" signal is generated on the flexible fence under local deformation of the fence and the sensitive element fastened to it in the case of an unauthorized penetration by climbing over the fence, without any facility, and as a result – deformation of the fence and the sensitive element over its fasteners.

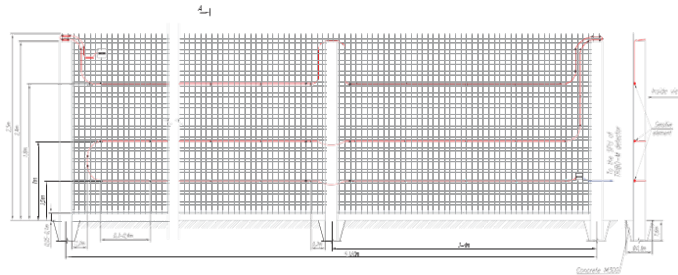
To obtain the required noise immunity, be sure to limit the flexible fence mobility under wind as much as possible.

#### **NOTE:**

- Fence supports should be buried to the appropriate depth as conditioned by the ground type and climatic conditions, but not less than 1.5m of a 3-4m pitch;
- The welded mesh must be evenly tensed between the supports with the min. force of 100 kg;

- Recommended welded mesh parameters:  
mesh cell size: 250/50 mm; min. wire diameter 2.8 mm;

- Recommended welded mesh parameters:  
mesh cell size: 250/50 mm; min. wire diameter 2.8 mm;



Pic.2 SENSITIVE ELEMENT LAYOUT ON LIGHT WELDED MESH FENCE

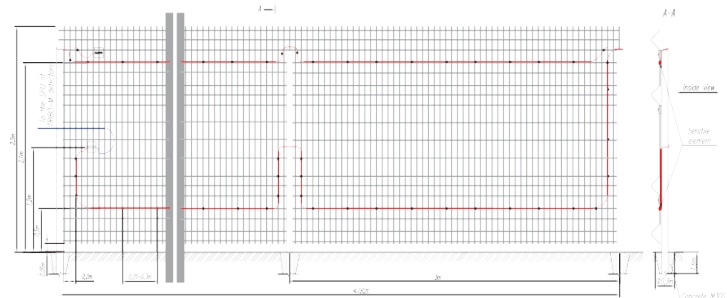
## 5.2 SENSITIVE ELEMENT LAYOUT ON NYLOFOR MESH FENCE

### NOTE:

- Fence supports should be buried to the appropriate depth as conditioned by the ground type and climatic conditions, but not less than 1.5m of a 3-4m pitch;
- The welded mesh must be evenly tensed between the supports with the min. force of 100 kg;



Pic.3 NYLOFOR MESH FENCE



Pic.4 SENSITIVE ELEMENT LAYOUT ON NYLOFOR MESH FENCE



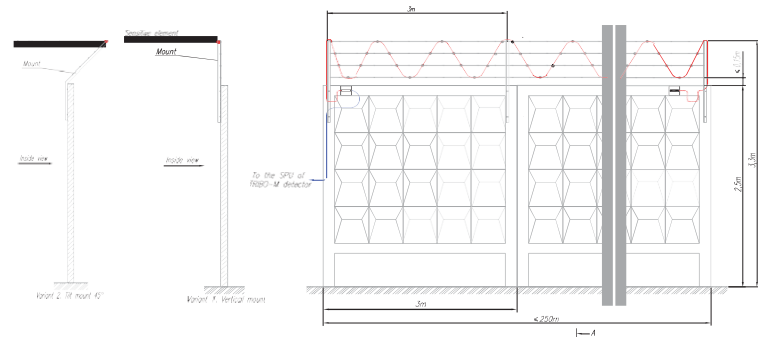
## 5.4 SENSITIVE ELEMENT LAYOUT ON BARBED WIRE FENCE EXTENSIONS

### NOTE:

- The extension mounts should be installed on a fence with the max. step of 3 m;
- The barbed wire must be evenly tensed between fence extension mounts with the force of 70 kg or more;
- Max. distance between barbed wire fixing points is 0.15 m;



Pic.7 BARBED WIRE FENCE EXTENSIONS



Pic.8 SENSITIVE ELEMENT LAYOUT ON BARBED WIRE FENCE EXTENSIONS

## 5.5 SENSITIVE ELEMENT LAYOUT ON LIGHT WELDED MESH FENCE EXTENSIONS

### NOTE:

- 3 m distance between fence extension mounts is recommended;
- The mesh must be evenly tensed between fence extension mounts with the force of 70 kg or more;

## 5.6 SENSITIVE ELEMENT LAYOUT ON RAZOR WIRE FLAT SPIRAL FENCE EXTENSION

### NOTE:

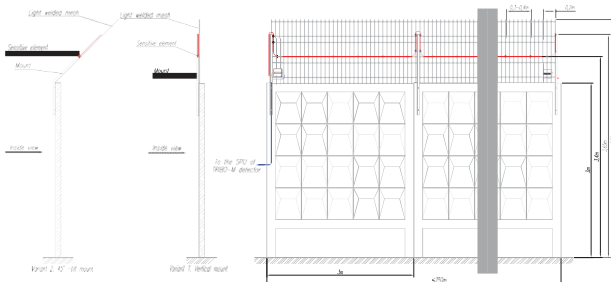
- 3-4m distance between fence extension mounts is recommended;
- Steel ropes with min. diameter of 3mm or razor wire should be used as the tension ropes;
- The tension ropes should be stretched using turnbuckles and a winch with the force of 70 kg or more;
- Each flat spiral turn must be fixed to the tension ropes with 1.6 mm galvanized binding wire;



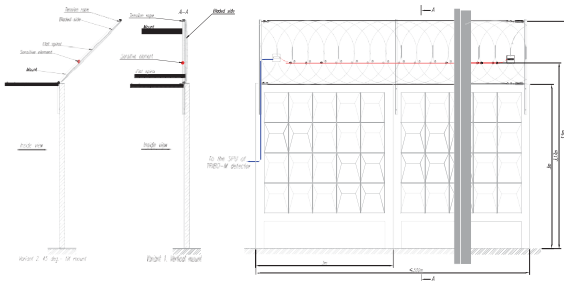
Pic.10 RAZOR WIRE FLAT SPIRAL FENCE EXTENSION



Pic.9 LIGHT WELDED MESH FENCE EXTENSIONS



Pic.7 SENSITIVE ELEMENT LAYOUT ON LIGHT WELDED MESH FENCE EXTENSIONS



*Pic.11 SENSITIVE ELEMENT LAYOUT ON RAZOR WIRE FLAT SPIRAL FENCE EXTENSIONS*

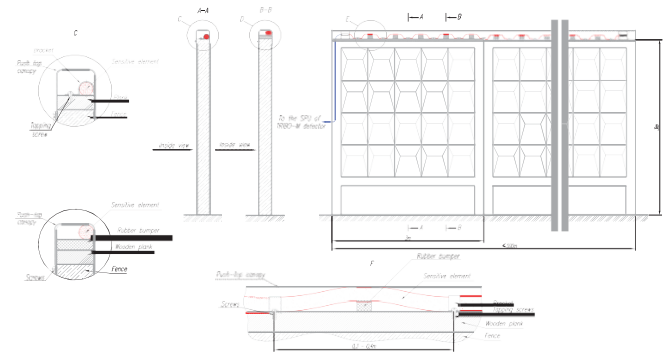


*Pic.12 PUSH-TOP CANOPY OVER SOLID FENCE*

## 5.7 SENSITIVE ELEMENT LAYOUT ON PUSH-TOP CANOPY OVER SOLID FENCE

### **NOTE:**

- To protect concrete fence from climb over be sure to lay the sensitive element SE-86 "FORTEZA" along the fence upper crown under the visor made of deformable material, for example, metal or wooden plate;
- In the middle of the strength points made to the fence, additional rubber bumper must be used as strength points;
- Preliminary sensor pressure force 5 kg;



*Pic.13 ELEMENT LAYOUT UNDER PUSH-TOP CANOPY OVER SOLID (CONCRETE) FENCE*





## 5.11 SENSITIVE ELEMENT LAYOUT WITH EXCLUSION OF GATES FROM THE DETECTION ZONE

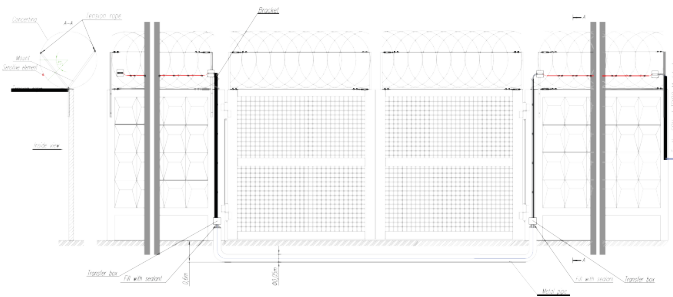
### NOTE:

- The gates are passed by with NON-SE connection cable;
- NON-SE cable under the gates is to be laid in a metal pipe  $\geq 50$  mm;
- Installation of transfer boxes or cabinets is recommended;
- NON-SE cable lengths from adapter joint to transfer box are to be laid in a pipe diameter 8 mm;

## 5.12 SENSITIVE ELEMENT LAYOUT WITH INCLUSION OF GATES IN THE DETECTION ZONE

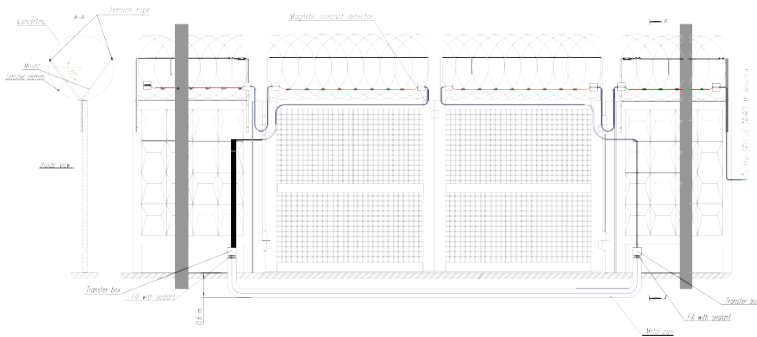
### NOTE:

- The gates are passed by with NON-SE "FORTEZA" connection cable;
- NON-SE "FORTEZA" cable under the gates is to be laid in a pipe diameter  $\geq 50$  mm;
- Installation of transfer boxes or cabinets is recommended;
- NON-SE "FORTEZA" cable lengths from adapter joint to transfer box are to be laid in a pipe diameter 8 mm;
- The fence and the gate being of the same material, just one sensitive element can be used;



Pic.20 SENSITIVE ELEMENT LAYOUT WITH EXCLUSION OF GATES FROM THE DETECTION ZONE

In this setup, the sensitive element is run on supports between the fence and the gate. This installation requires stretch-out boxes, connection sleeves, and a spiral wrap hose. Note that the element must pass under the gate leaves via a metal bypass pipe buried at least 0.3 m deep.

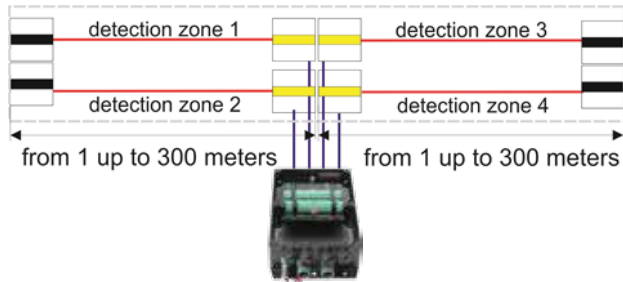


*Pic.21 SENSITIVE ELEMENT LAYOUT WITH INCLUSION OF GATES IN THE DETECTION ZONE*

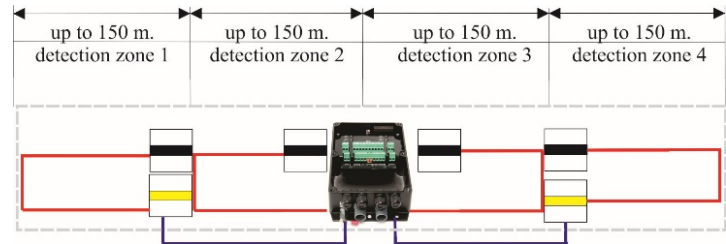
## 6. SENSITIVE ELEMENT INSTALLATION METHODS FOR DETECTION ZONES

### Sensitive element installation methods for detection zones:

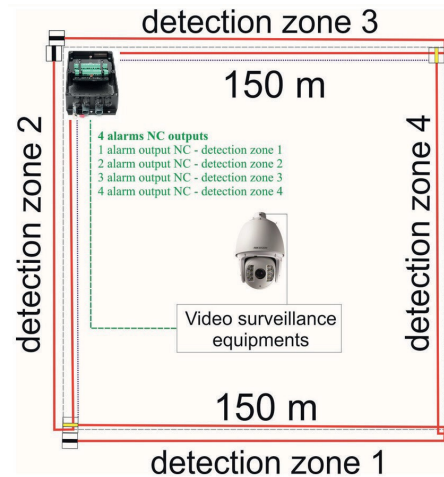
TRIBO-S system is very flexible and can be integrated with different security and automatization systems. Depending from client/object requirements we can offer different detection zones lengths, installation variants.



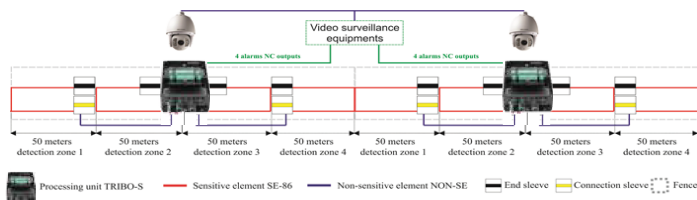
Pic.22 TRIBO-S UNIT INSTALLED NEAR THE FENCE. FENCE HEIGHT 2 METERS, NEEDED DETECTION ZONE LENGTH 600 METERS



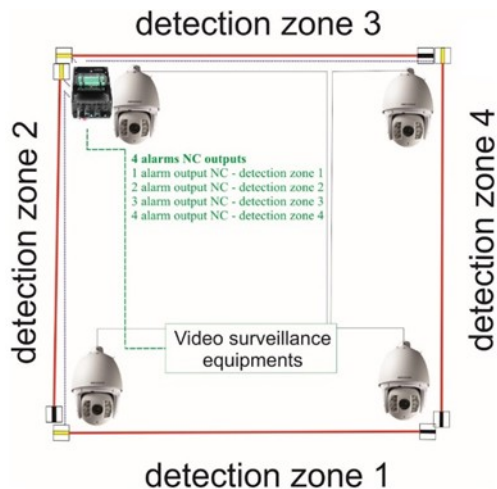
**EXAMPLE:**



Pic.23 TRIBO-S UNIT IS INSTALLED ON THE FENCE. FENCE HEIGHT 2 METERS, EACH DETECTION ZONE IS 150 METERS



**EXAMPLE:**

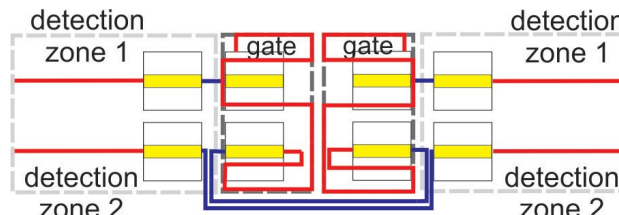


*Pic.24 TRIBO-S UNIT IS INSTALLED NEAR THE FENCE OR IN THE BUILDING; FENCE HEIGHT IS 1.5 METERS; EACH DETECTION ZONE IS 50 METERS*

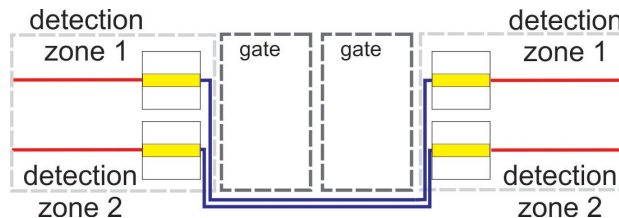
If TRIBO-S system is connected with CCTV system there is an option to install detection zone up to 50 m.

This case is most successful used for perimeter protection, where TRIBO-S connected with CCTV system were after alarm camera made the photo and send it to security post.

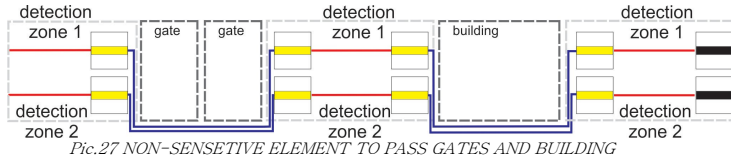
**NON sensitive element installation methods for detection zones:**



*Pic.25 GATE PROTECTION NON-SENSITIVE ELEMENT TO PASS FROM FENCE TO GATES*



*Pic.26 PASS GATES. NON-SENSITIVE ELEMENT TO PASS GATES*



## 7. SERVICEABILITY CHECK

### Precautions

Only a skilled electrician, familiar with this manual is entitled to perform the protection system installation, operation and maintenance.

### Serviceability check

The security alarm must be checked for defects on its receipt from the manufacturer. Check the serviceability of the protection system according to Table 1.

**Table 1**

Checking action	Technical requirement
Check of complete set	Conformity to the assembly list
Visual inspection	Absence of mechanical damage and corrosion. If the manufacturer's control sticker on the processor housing cover is intact.

## 8. INSTALLATION AND PREPARATION FOR USE

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### GENERAL INFORMATION (Tips)

All assembly and wiring norms and regulations shall be complied for the installation of the security system.

Tribo-S protection system is powered from the remote power source, select the type of element and the conductor cross-section that the voltage across the processor terminals is from 10 to 30 V when the output power supply voltage changing within permissible limits.

**IMPORTANT!** In order to ensure the protection system trouble-free operation, care should be taken of the standby power supply.



### 8.1 PROCESSOR TRIBO-S INSTALLATION

Arrange the processor in such a way that connectors, signalling components, RS-485 components and power cables are conveniently connected and that the processor settings can be checked and adjusted periodically.

The following equipment must be connected to the processor:

- ground connection (uninsulated copper element of cross-section at least 1.0 mm<sup>2</sup>) (not indicated);
- sensitive element (can be connected directly or using a non-sensitive element) (input 1, input 2, input 3, input 4);
- alarm outputs (output 1, output 2, output 3, output 4);
- power supply line (DC);
- RS 485 interface for connecting several processors (Network);
- SE and NON-SE sabotage alarm output (TamperE);

- alarm output of processor sabotage (lid opening) (TamperC);

## 8.2 LAYOUT OF SENSITIVE ELEMENT

### *FORTEZA RECOMMENDATIONS*

1. Before starting the installation, it is necessary to mark the area where the sensitive cable will be laid. Please note that one line of sensitive cable protects from 20 cm to 30 cm of the ground's surface along the entire length of the line, so the number of lines must correspond to the task;
2. If the ground is soft (humus, sand, etc.), it is necessary to "remove" the ground with a shovel and gradually lay the cable at a depth of 2-15 cm. After laying, the cable must be tamped down into the ground;
3. If the ground is gravelly, in order to lay the cable, it is necessary to dig a trench with a depth of 2-15 cm and a minimum width. After laying, fill it with already excavated soil and tamp down;



Fig.1 SENSITIVE ELEMENT CONNECTION TO INPUT

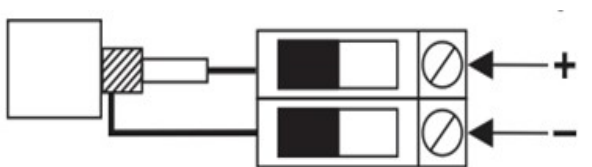


Fig.2 NON-SENSITIVE ELEMENT CONNECTION TO INPUT

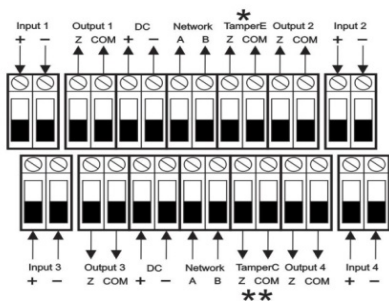


Fig.3 TRIBO-S PROCESSOR WIRING DIAGRAM

Before mount the sensitive element, the following steps shall be done:



- proceed according to the project documents;
- make sure that the ambient temperature is not less than minus 10°C;
- make sure that its turning radius is not less than 120 mm;
- the parts of the sensitive element must be connected using a connection sleeve only.
- for more convenient installation of the sensitive cable, in some places (for example, in turns) the sensitive cable can be fixed to the ground (with a weight or a clip).

### 8.3 CONNECTION OF SENSITIVE AND NON-SENSITIVE ELEMENTS

Prepare the wire ends of the sensitive and non-sensitive elements.

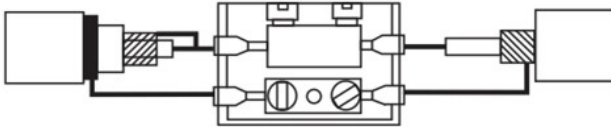


Fig.4 CONNECTING THE SENSITIVE ELEMENT (SE-86) WITH THE NON-SENSITIVE CABLE (NON SE)

- 1) Connect sensitive and non-sensitive elements;



- 2) Isolate the contact;



- 3) Use the foil to shield the connection;



- 4) Collect the connection sleeve;

## 8.4 END SLEEVE CONNECTION

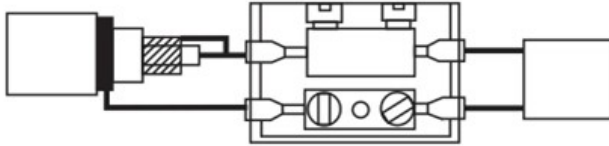
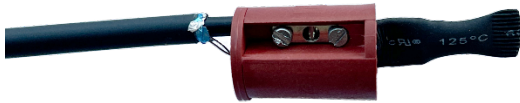


Fig.5 END SLEEVE CONNECTION

- 1) Connect the sensitive element with the end resistance;



- 2) Seal the contact and the end resistance with seal tape;



- 3) Use the foil to shield the end sleeve;



- 4) Collect the connection sleeve;

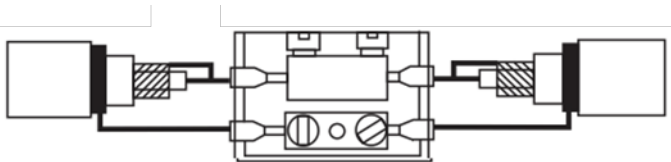


Fig.6 SENSITIVE ELEMENT (SE-86) CONNECTED TO SENSITIVE ELEMENT (SE-86)

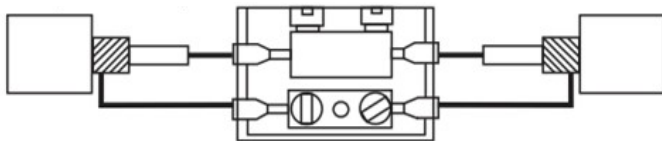
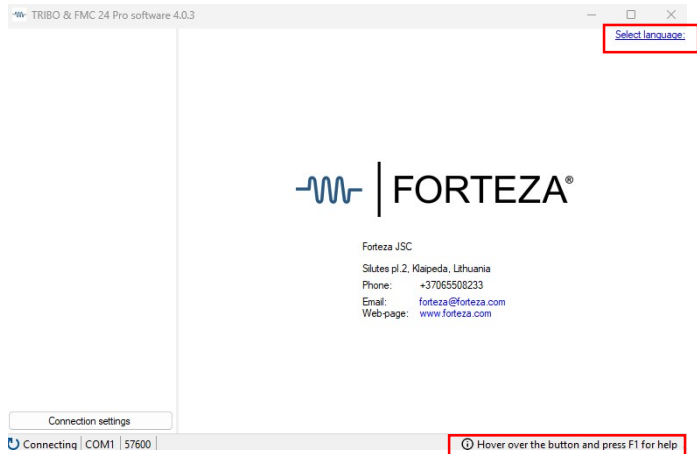


Fig.7 NON-SENSITIVE CABLE (NON-SE) CONNECTED TO NON-SENSITIVE CABLE (NON-SE)

## 9. SYSTEM SETTINGS

Before the work with the TRIBO-S system it is necessary to download and install the FMC 24 Pro & TRIBO system software 4.0.0. When starting the program, the login configuration window opens.

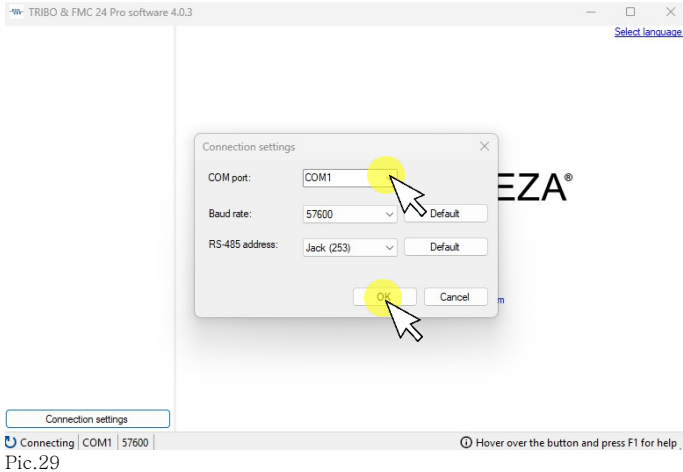
**i** You can change the language and use the helpers in the software by pressing F1.



Pic.28

In this window in order to select the corresponding COM-Port connection and Network Address you need to select Connection Settings.

Each TRIBO-S processor has internal (Network) address. The factory settings are as follows – when connected through a special socket in the TRIBO-S housing, the internal address is 253 (cannot be changed), when connected through the inputs A B internal address is 1 (after program start-up, if necessary, can be changed from 1 to 250).



ensure that later the information is correctly displayed in the LOGS log.

Tab header background colour at the screen top shows the input status:

- Normal — green;
- Alarm — red;
- Failure (breakage, sensitive cable not connected, noise) — yellow;

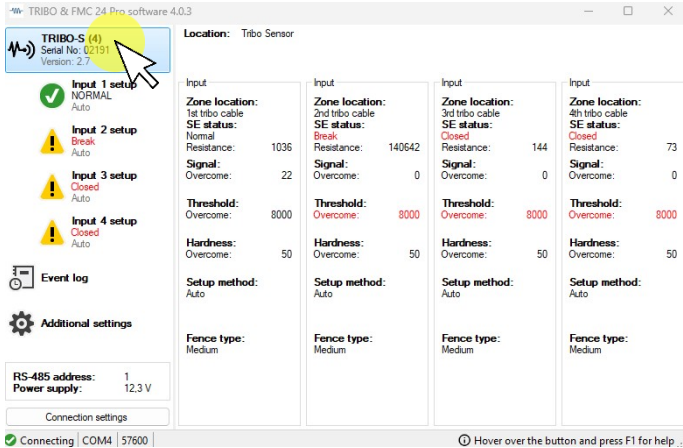
If the sensitive element is faulty, the corresponding SE STATUS line will be highlighted in red, indicating the fault reason (open circuit (Break), short circuit (Close), increased noise level (Noise)).

UNUSED PROCESSOR INPUTS SHOULD BE SUPRESSED WITH 1 MΩ RESISTANCE (each set includes 1 pcs).

If the supply voltage is insufficient, the entry POWER will be marked in the left column in the same way.

## 9.1 PROGRAM START-UP, TAB "GENERAL"

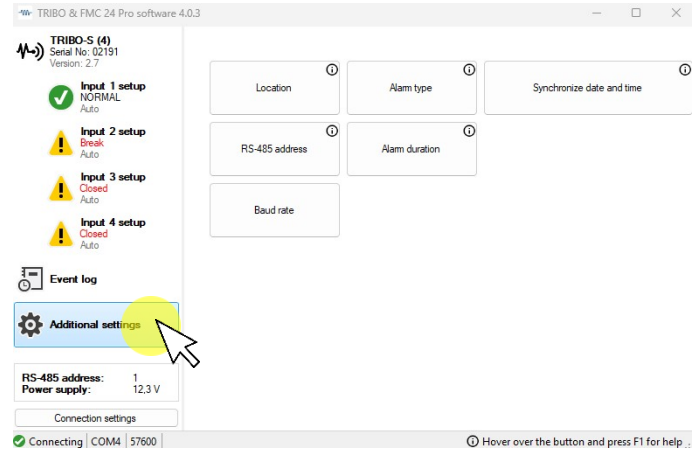
After connecting to the TRIBO-S processor, the main window with active GENERAL tab (Pic.30), which displays the processor parameters and the status of each all its inputs (protection zone), appears. Before finishing the settings, it is recommended to open the ADDITIONAL SETTINGS tab and synchronize the date and time. This action is necessary to



Pic.30

After pressing **ADDITIONAL SETTINGS** button (Pic.31) you can change information about the location of the processor (**LOCATION**), change its internal network address (**RS-485 ADDRESS**), change the type of output relay contacts (**ALARM TYPE**) and alarm duration (**ALARM DURATION**). Acceptable number of functions and limits of numbers are displayed

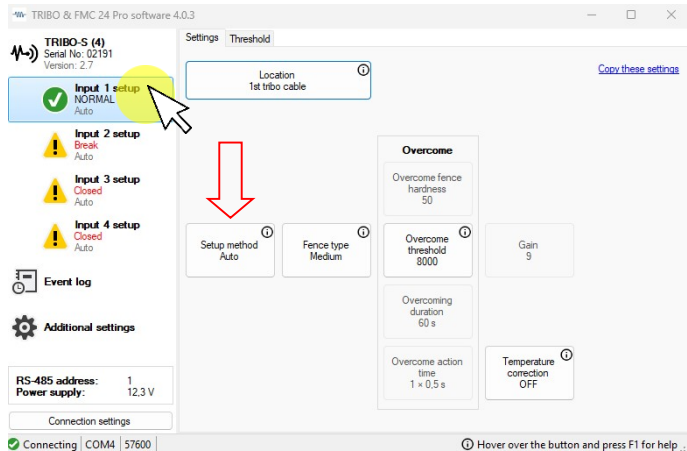
in the pop-up window tips.



Pic.31

## 9.2 INPUT TAB AND ASSIGNING ITS INDIVIDUAL FIELDS AND TABS

In order to obtain detailed information on any input (zone) status, it is necessary to click the appropriate **INPUT** button (Pic.32). After that, the selected tab will become active and the selected modes and selected zone detection parameters will be displayed on the screen.



Pic.32

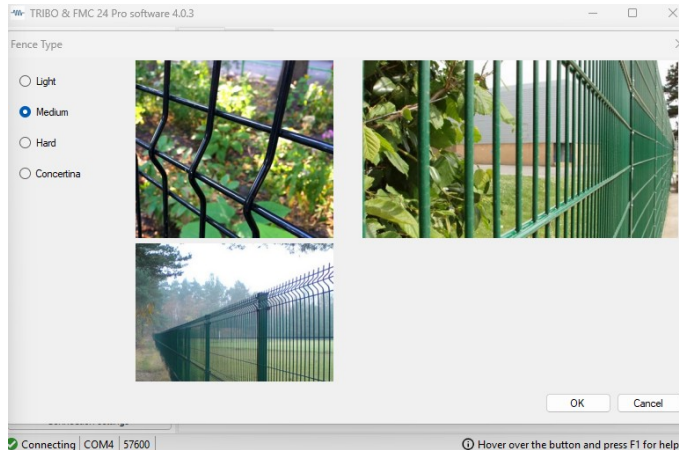
It is possible to enter information on the features of sensitive element location (**ZONE LOCATION**), fence hardness (**FENCE TYPE**), number and duration of actions (**Quantity of impacts and their duration**), strengthening (**GAIN**), way of configuration (**SETUP METHOD**) and working threshold (**OVERCOME THRESHOLD**). Activating the temperature correction (**TEMPERATURE CORRECTION**) button allows you to compensate the changes in the characteristics of the sensitive cable when the ambient temperature drops.

## 9.3 DESCRIPTION OF AUTO METHOD

In delivery state the detector has an automatic setting method (**AUTO**) and averaged detection parameters typical for medium-hardness fences (**MEDIUM**) for welded 3D panels.

In most cases, it is sufficient to monitor alarm signals generation, when simulating the boundary overcome for such fences.

In case of using other fence types the closest fence type should be selected in the **FENCE TYPE** tab (Pic.33), after which the detection parameters that are most suitable for the selected fence type will be automatically set.

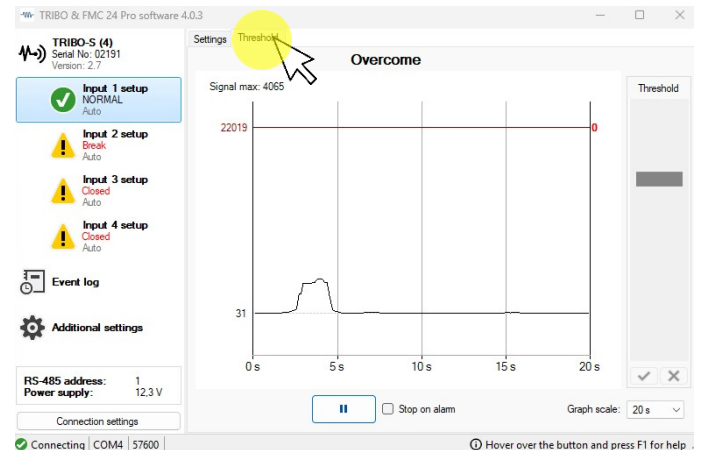


Pic.33

After that, it is necessary to monitor the formation of alarms when performing control overcomes and their absence under the influence of outside interference factors.

It may be necessary to adjust the operating threshold if there are no alarms (when simulating the boundary overcome) or false alarms (on outside interference factors) generated, only.

To do it, select **THRESHOLD** tab (Pic.34).

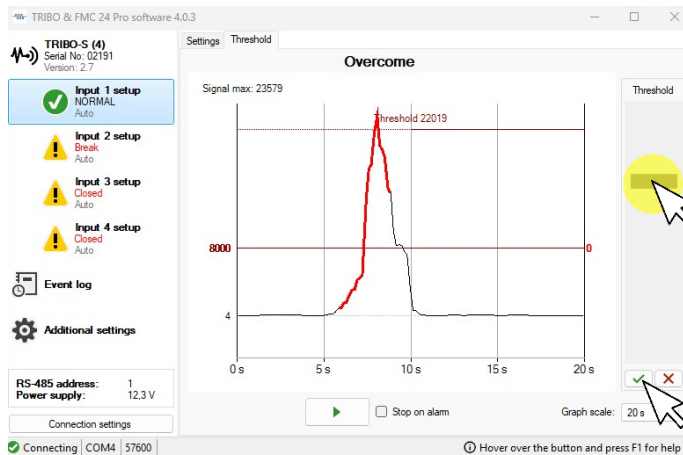


Pic.34

Selected tab will become active and the current signal waveform will be displayed on the

screen, that allows to estimate the noise and signal level from the intruder, when crossing the boundary in real time (Pic.34).

Observing the signal behaviour during overcome simulation, it is necessary to select and set the operating threshold that is most appropriate to these conditions (sensing element cable type, fence type, attachment method and etc.).




Pic.36

It is recommended to set operating threshold at 90% level from the maximum signal value. The threshold is set by moving the threshold line with button pressed.

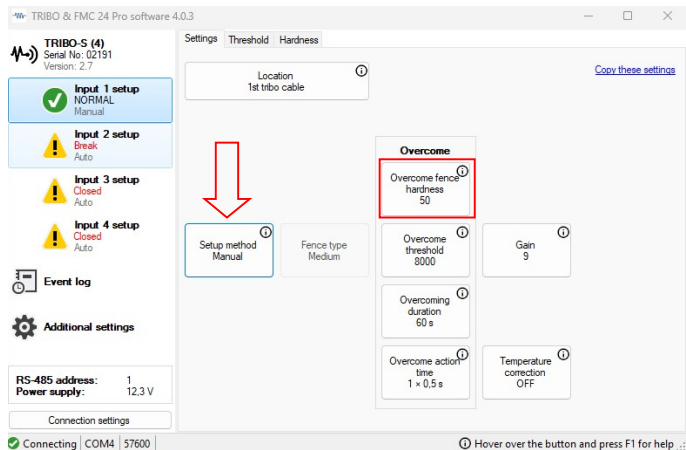
Calculate threshold value as follows:  
minimal recorded peak – 10 percent (in this case 11296 – 10% = 10166)

At the screen top there are buttons of stop, fixation upon and diagram expansion. There is the possibility of alarms counting (ALARM COUNTER button) and screenshots of the screen during alarms (EVENTS RECORDER).

After confirmation, press the green check mark .

## 9.4 DESCRIPTION OF MANUAL METHOD

For more precise detector adjustment, when fence characteristics deviate from the standard ones, if the signal from the intruder is insufficient or too large, in the presence of interference, and etc. it is necessary to open **SETTINGS** tab and select **MANUAL** configuration method (Pic.37).

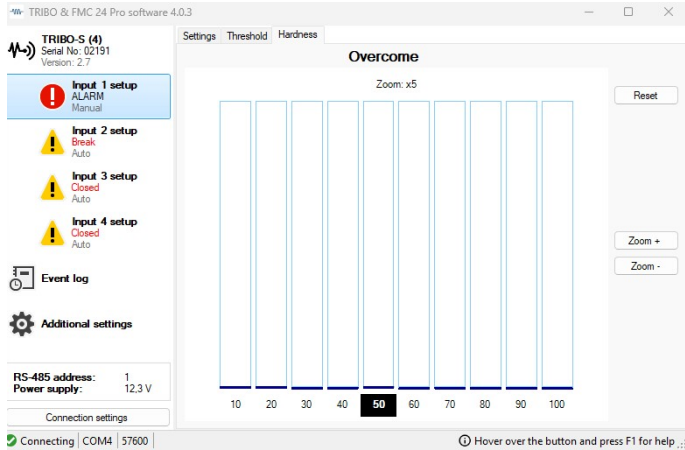


Pic.37

Wherein the possibility for more precise adjustment of operating parameters depending on the fence hardness (**FENCE HARDNESS**), the possibility to set the total time to overcome the boundary (**OVERCOME TIME**), time of single action and number of actions, when overcoming (**ACTION TIME**), appear.

To configure the listed parameters, select **FENCE HARDNESS** tab in the left column.

After that, the selected tab will become active, and fence hardness histogram will be displayed on the screen. It helps to estimate the noises during fence oscillating (Pic.38).



Pic.38

To select the hardness, simulate wind effects on the fence and select the column with the largest interference amplitude pressing the corresponding numeric key at the bottom of the screen.

In this case, interference from fence parasitic oscillations will not be considered, when generating alarms.

When necessary, it is possible to use zoom histogram function (**ZOOM+ /-**).

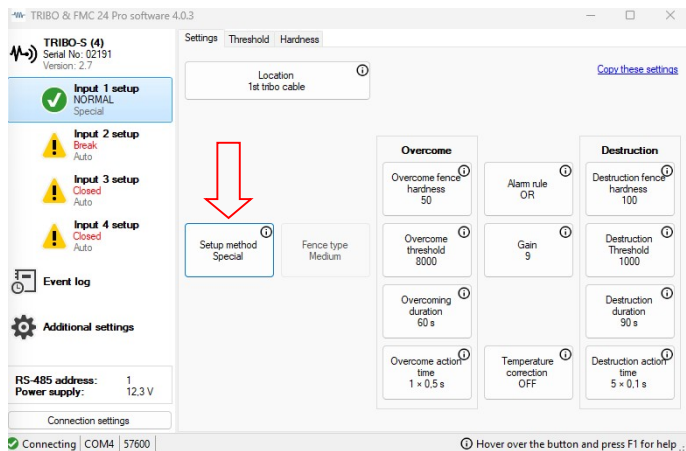
After configuring the fence hardness select **THRESHOLD** tab, simulate overcoming the boundary and estimate the typical time for overcoming, duration, amplitude and number of recorded impacts.

Having set the appropriate parameters in **SETTING** tab, it is necessary to check alarms generation, when performing control boundary overcoming.

## 9.5 DESCRIPTION OF SPECIAL METHOD

When there is the threat of penetration by destroying the fence portion or transferring the sensor cable, it is possible to connect the additional processing algorithm that provides alarm generation under the specified impacts.

To connect this function, open SETTINGS tab and select SPECIAL configuration method (Pic.39).



Pic.39

In this case, the additional DESTRUCTION column appears on the right side of the screen with detection parameters. When determining the rigidity of the fence, perform an imitation of penetration by cutting the fastening elements of

the sensitive cable, BUT not by imitation of outside interference factors.

## 9.6 DANGER SIGNAL GENERATION LOGIC

**SELECT LOGIC OF ALARM GENERATION WHEN DEFINED THRESHOLDS ARE EXCEEDED:**

**AND:**

Alarm is generated only if the signal exceeds the set threshold in both Overcome and Destruction modes

**OR:**

Alarm is generated when the signal exceeds the set threshold in at least one of the modes: Overcome or Destruction

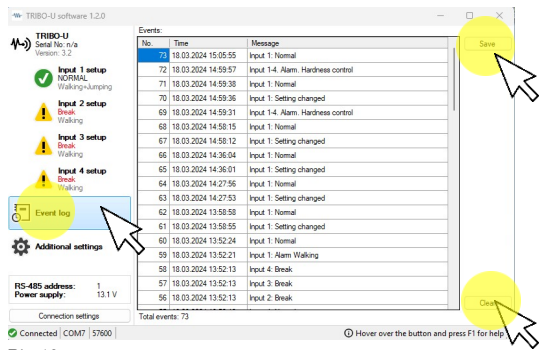
## 9.7 SETTING "GAIN"

In both Overcome and Destruction modes the criterion for setting the threshold is the selection of the highest digital value of the

proposed gain (1-3-9-27), but when an offender is moving in the zone, the signal range must be minimum 1,000 and maximum 30,000.

## 9.8 WORK WITH LOGBOOK (LOGS)

During operation the processor records all occurring events and writes them to read-only memory. In order to view the events history, it is necessary to open EVENT LOG tab (Pic.40), press SAVE button, after that the information from the processor's memory will be transferred to the Windows device. The log is cleared by pressing the CLEAR button.



Pic.40

LOGS contain the history of statuses of each processor input (normal, alarm, break, close) and duty personnel actions history (changing the processors settings).

Log can be used for the detailed analysis of the events that occurred during operation.

After finishing settings, it is recommended to set the date and time. For that it is necessary to press TIME AND DATE SYNCRONIZATION button in ADDITIONAL SETTINGS sections. Time and date are used to generate entries in the event log.



Pic.41

If the processor power fails, time and date are not saved. Therefore, after each power failure time and date should be set again.

Maximum 1000 records may be stored in the processor's memory. When the 1001st event occurs, the oldest record is deleted.

## CONTACTS

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