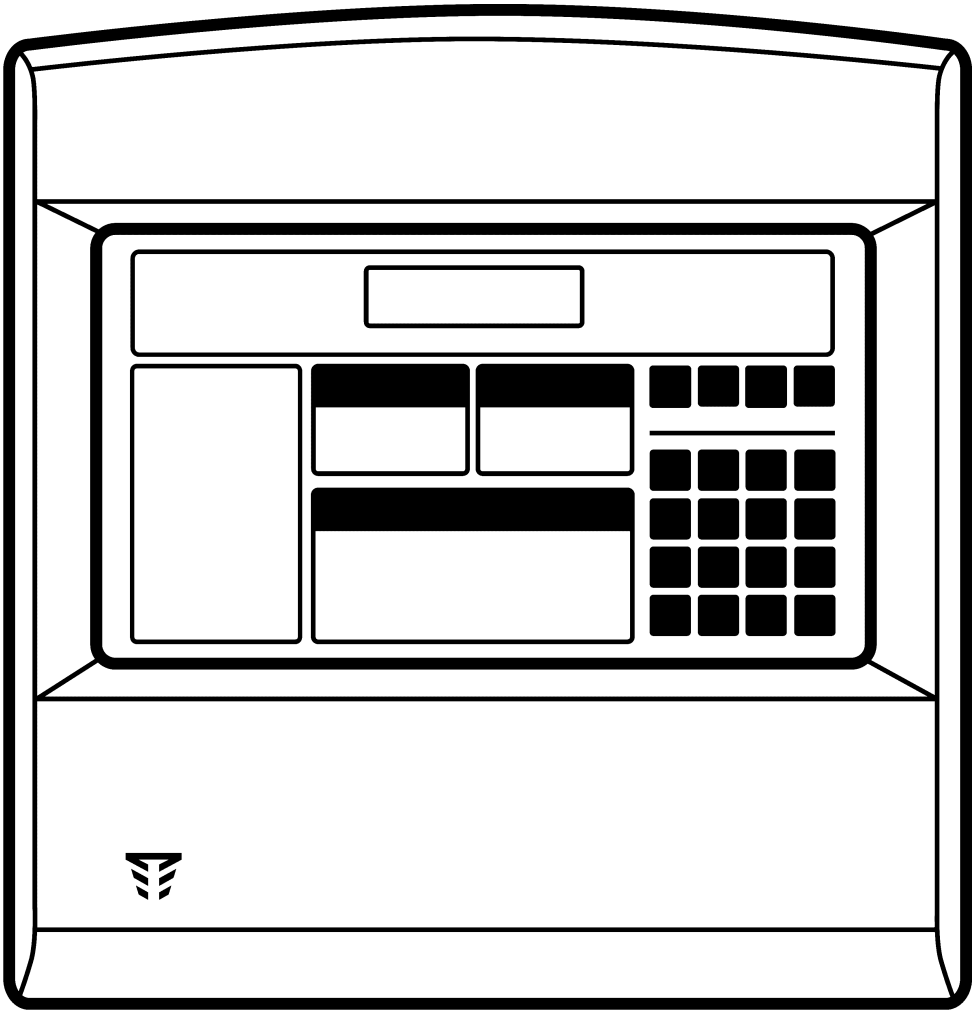
FIRE ALARM SYSTEMS

TIRAS



# FACP «TIRAS PRIME 8L»

**Installation Manual** AAZCh.425521.014-02 IM

CE EN 54

ISO 9001:2015

Thank you for choosing
equipment produced by Tiras-12 Ltd.

Before using the product,
please refer to this document *
and save it to receive
the necessary information in the future.

For more information
and loading the documentation
use the following links:

**www.tiras.ua**

DOCUMENTS:

User manual

Installation manual

APPLICATIONS:

tLoader (Windows)

tLoader (Android)

* - this manual is intended for built-in firmware PRIME8L_1

Fire Alarm Control Panel «Tiras PRIME 8L» complies with essential requirements of the following European Union Regulations and Directives:

- Construction Products Regulation (EU) No 305/2011;
- Low Voltage Directive 2014/35/EU;
- EMC Directive 2014/30/EU;
- Directive 2011/65/EU (RoHS).

Fire Alarm Control Panel «Tiras PRIME 8L» complies with requirements of the following European Union standards:

- EN 54-2:1997+AC:1999+A1:2006;
- EN 54-4:1997+AC:1999+ A1:2002+A2:2006

The EC Certificate of Constancy of Performance No 1438-CPR-0647 was issued by the CNBOP-PIB Notified Body

CE

**19**

**«Tiras-12» LTD**
2nd Lane Khmelnytske Shosse, 8, Vinnytsia, Ukraine, 21021
**1438**
**1438-CPR-0647**

**Fire Alarm Control Panel «Tiras PRIME 8L»**

EN 54-2:1997+AC:1999+A1:2006;
EN 54-4:1997+AC:1999+ A1:2002+A2:2006

Main provided functions:

- Output to fire alarm devices
- Alarm transmission routing equipment
- Fault warning routing equipment
- Total loss of the power supply
- Dependencies on more than one alarm signal
- Delay to outputs

Information about additional functions, inputs and outputs specified in this manual.

The full text of the declarations of conformity to technical regulations and certificates is available on the website at the following address: www.tiras.ua.

**Contents**


**1 Purpose** ..... 5
**2 General information** ..... 5
**3 Structure** ..... 6
**3.1 Connection terminals** ..... 8
**3.2 Control and indication panel** ..... 9
**3.2.1 Indication** ..... 9
**3.2.2 Control buttons** ..... 10
**3.3 Operation modes (conditions)** ..... 11
**4. Installation and preparing to work** ..... 11
**4.1 Safety requirements** ..... 11
**4.2 Installation of FACP** ..... 12
**4.3 Connection** ..... 14
**4.3.1 Connecting of zones (Zx)** ..... 14
**4.3.2 Connecting sounders (Sx, USx)** ..... 16
**4.3.3 Relay outputs (REL1, REL2, C1-C4)** ..... 16
**4.3.4 Fire Alarm and Fault outputs (AL and FT)** ..... 16
**4.3.5 Connecting power outputs +24V** ..... 17
**4.3.6 Connecting primary power source (230V)** ..... 17
**4.3.7 Connecting alternative power supply (Batteries)** ..... 18
**4.3.9 Installation of M-OUT4R module** ..... 19
**4.3.10 Installation of M-Z(f) module** ..... 20
**5 Access levels** ..... 21
**5.1 Level 1 (View)** ..... 21
**5.2 Level 2 (Control)** ..... 22
**5.2.1 Operation on 2nd access level** ..... 22
**5.3 Level 3 (FACP configuration)** ..... 27
**5.3.1 Zone settings** ..... 29
**5.3.2 Configuration of outputs** ..... 32
**5.3.3 Configuration of users** ..... 33
**5.3.4 General settings and delays** ..... 33
**5.3.5 Event log and language** ..... 33
**5.3.6 Additional functions** ..... 34
**5.3.7 Scripts** ..... 34
**5.3.8 Loading factory settings and access codes** ..... 35
**5.3.9 Update of firmware** ..... 36
**5.4 Level 4 (Service)** ..... 36
**6 Complex testing after installation** ..... 36
**7 Technical features of FACP** ..... 37
Appendix A ..... 39
Appendix B ..... 40
Appendix C ..... 41
Appendix D ..... 42
Appendix E ..... 43
Appendix F ..... 44

This guidance includes the description, operation principle, instructions on installation, configuration and operation of fire alarm control panel (further – FACP) Tiras PRIME 8L.

In order to avoid possible errors during operation and possible damage to the equipment, before the installation, configuration and operation of FACP, please read this document and also the user manual, which are provided with the control panel.

This document does not specify the installation rules for fire alarm systems.

The following abbreviations are used in this document:

| | |
|---|---|
| FACP | – fire alarm control panel; |
| FARS | – fire alarm receiving station; |
| PC | – personal computer; |
| ATS | – alarm transmission system; |
| SC | – short circuit; |
| PS | – power supply; |

## 1 Purpose

FACP is designed to:

- Control the state of fire alarm detectors;
- Control the sounders;
- Control the external devices;
- Control the state of external devices;

FACP is the basis of fire alarm system, which can be added to:

- Expansion module, for increasing the number of zones – M-Z (f). *Installed on the FACP board;*
- **Relay module** for 4 relays **M-OUT4R**. *Installed on the FACP board;*

The example of connection of modules to FACP is provided in **appendix A**.

## 2 General information

- **8 zones** (can be expanded to 20 zones, using M-Z(f) module);
- Up to **32 detectors** in each zone;
- **Dependence** in zones **(Verification);**
- **2** controlled **outputs for sounders**;
- Outputs to **fire alarm** and **fault warning** routing equipment;
- **2 programmable relay outputs**;
- Controllable **power outputs - 24V**;
- **LCD display** wit highlight;
- **Day-Night** mode to control the activation of outputs;
- Programming of **scripts** for outputs and inputs operation;
- **Configuration with** PC and Android-device (via USB);
- **Intelligent** charging device with battery capacity control;
- **Non-volatile clock** and event log – up to 1000 events;
- Alternative power supply – 2 batteries with a capacity of 7 Ah;
- **Intelligent** charging device with battery capacity control;
- Powerful switching PS – 24V/2A;

## 3 Structure

The appearance of FACP Tiras PRIME 8L is shown in Fig. 1. The appearance with the front cover removed is shown in Fig. 2. The appearance of the housing without the main module is shown in Fig. 3. The view of the main module is shown in Fig. 4 and Fig. 5. Control and indication panel is shown in Fig.4




Figure 1 – Appearance of FACP

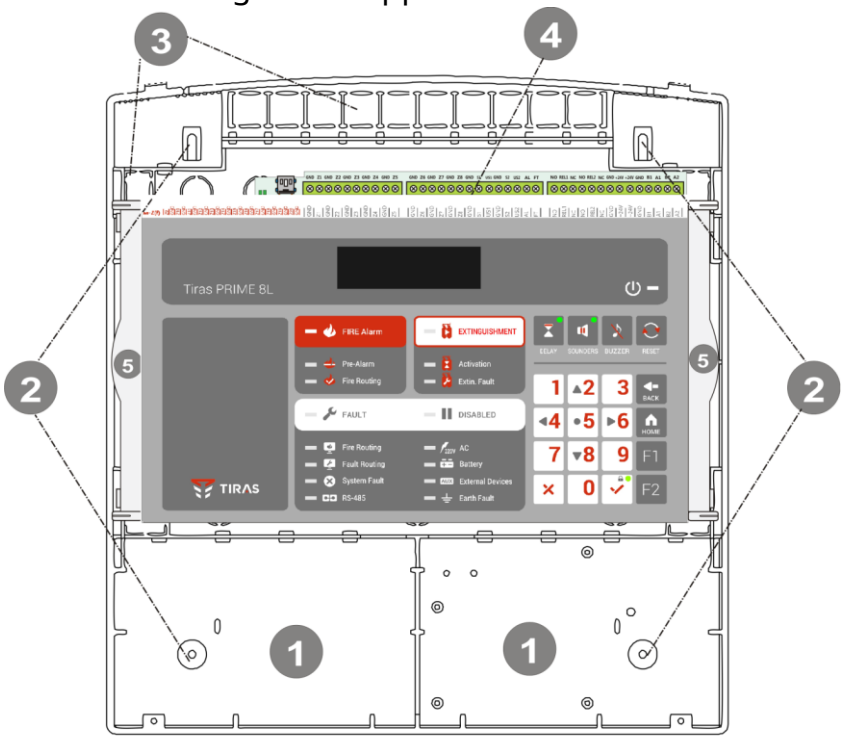



Figure 2 – Appearance of FACP with front cover removed:
1. Slot for battery; 2. Holes for mounting and fixing on the wall (see. sec. 4.2);
3. Holes for wiring; 4. Main module (control and indication panel with connection terminals); 5. Holes for fixing main module with self-tapping screw (after installation is complete).

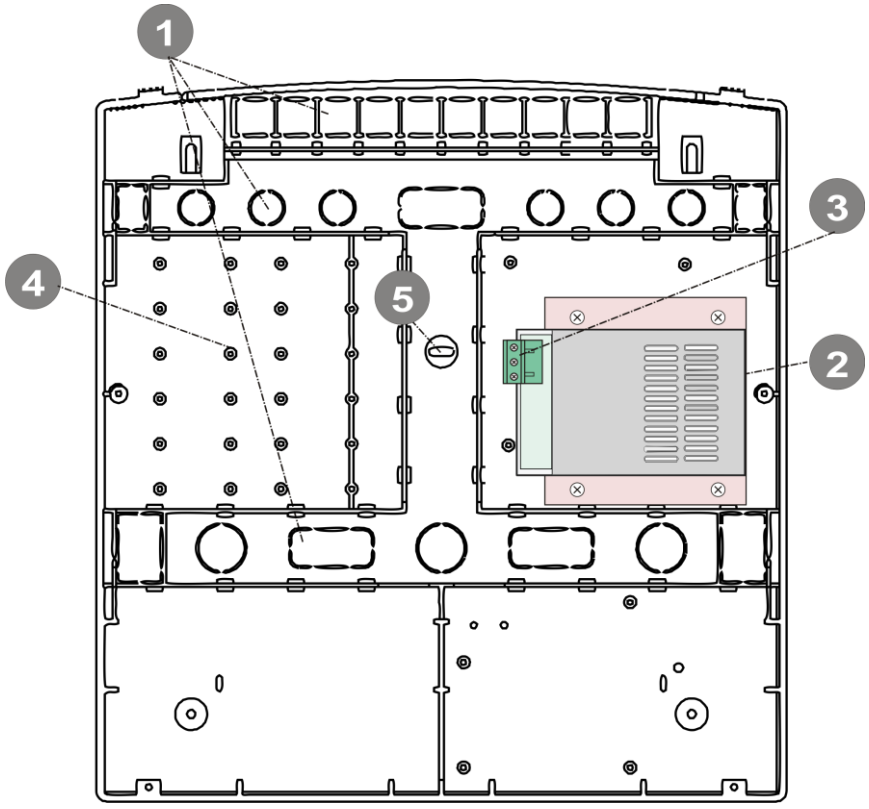



Figure 3 – Appearance of the housing without main module of FACP:
1. Holes for wiring; 2. Main supply unit; 3. Terminals for connection to power supply network 230V; 4. Slot for installation of additional modules; 5. Additional hole for fixing on the wall.

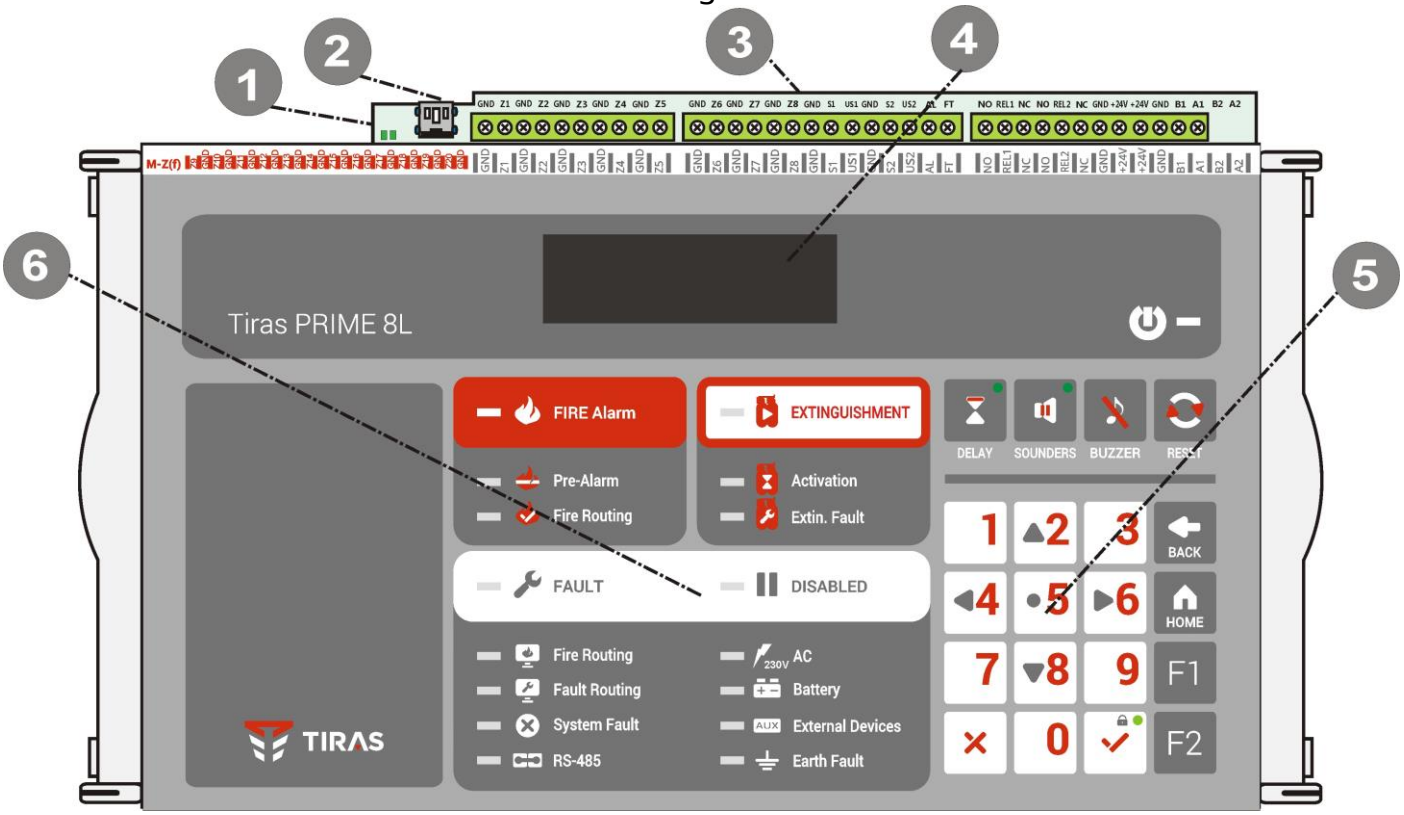



Figure 4 – Main module with control and indication panel:
1. Indicators LED1 and LED2 (see details in Sec. 5.3.7); 2. MiniUSB socket; 3. Terminals for connection (description is given in table 7.1); 4. Display; 5. Keypad; 6. LED indicators.

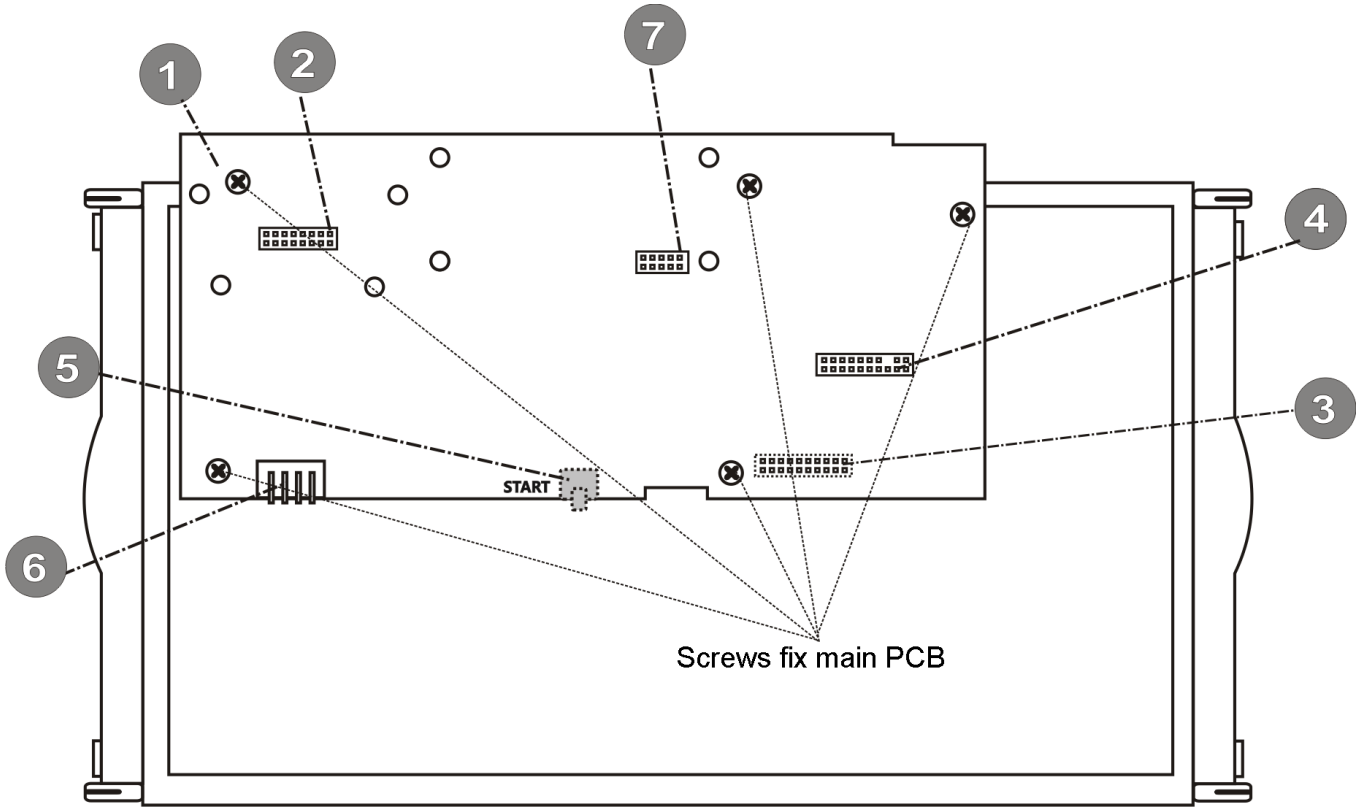



Figure 5 – Rear side of the main module:
1. Main PCB; 2. Connector for M-OUT4R; 3. Indication board connector;
4. Communicator connector; 5. START button; 6. PS connector;
7. M-Z(f) connector.

### 3.1 Connection terminals

Table 3.1 - Description of terminals for connection (fig.4 pos.3)

| Terminal | Designation |
|---|---|
| **GND** | Logic ground |
| **Z1-Z8** | Connection of zones (inputs) |
| **S1, S2** | Sounders control outputs |
| **US1, US2** | Sounders power supply inputs |
| **FT** | Output to fault warning routing equipment |
| **AL** | Output to fire alarm routing equipment |
| **REL1, REL2** | Programmable relay outputs |
| **NC** | Normally closed relay contact |
| **NO** | Normally open relay contact |
| **+24V** | Power outputs 24V |
| **A1, B1** | Terminals for connection of system bus (RS-485) |

Wiring scheme is given in detail in **Appendix B**

### 3.2 Control and indication panel

#### 3.2.1 Indication

| Indicator | Colour | Name | Indication |
|---|---|---|---|
| | Green | Power supply | Lighting –FACP is powered on |
| FIRE Alarm | Red | General fire | Blinking – fire alarm in one or several zones |
| Pre-Alarm | Red | Verification in zone (zones) | Blinking – verification in one or several zones |
| Fire Routing | Red | Transmission of fire alarm signal/ Checking of transmission | Blinking – fire alarm signal is transmitted to FARS<br>Lighting – received confirmation on transmission of fire signal to FARS |
| FAULT | Yellow | General fault indicator | Blinking – fault in at least one of the controlled circuits or functions |
| Fire Routing | Yellow | Central monitoring station «Fire» output | Blinking – fault of AL output (Fire) connection circuit[1]<br>Lighting – AL output and transmission of fire alarm to FARS is disabled |
| Fault Routing | Yellow | Central monitoring station «Fault» output | Blinking – fault of FT output (fault) connection circuit[1]<br>Lighting – FT output and transmission of fire alarm to FARS is disabled |
| System Fault | Yellow | System error | Blinking – system (program) error of FACP |
| RS-485 | Yellow | System bus | Blinking – fault of system bus |
| EXTINGUISHMENT | Red | Activation of fire extinguishment[2] | Lighting – fire extinguishment device is in “Extinguishing” mode |
| Activation | Red | Activation of fire extinguishment delay[2] | Blinking – fire extinguishment device is in “Activation” mode |
| Extin.Fault | Yellow | Fault of fire extinguishment[2] | Blinking – detected fault in fire extinguishment device |
| DISABLED | Yellow | General disablement | Lighting – at least one disabling is detected in the system |
| 230V AC | Yellow | Main power supply | Blinking – fault of main power supply – 230V |
| Battery | Yellow | Backup power supply | Blinking – fault of backup power supply |
| AUX External Devices | Yellow | Outputs +24V/ External devices | Blinking – fault of one of outputs +24V / fault of connection line to zones-inputs |
| Earth Fault | Yellow | Grounding control | Blinking – fault (missing) protective grounding |
| | Yellow | Delay | Lighting – delay function is off (or NIGHT mode is activated)<br>Blinking – delay activation |

| Indicator | Colour | Name | Indication |
|---|---|---|---|
|  | Yellow | Sounders | Lighting – sonder outputs are off<br>Blinking – fault of at least one of the sounder outputs |
|  | Green | Access | Lighting – access to 2nd level is completed |
| [1] – blinking of both indicators "FARS fire" and "FARS fault" indicates a fault of the communicator.<br>[2] – active with a fire extinguishing device connected. | | | |

### 3.2.2 Control buttons

| Button | Function | Required access level (see 7.2.4) |
|---|---|---|
|  | Disable current delay | 1 |
| | Enable / disable delay function | 2a |
|  | Enable / disable sounder outputs | 2a/2b |
|  | Disable internal buzzer (Silencing) | 1 |
|  | Reset FACP | 2b |
|  | Back (to menu) | 1 |
| | Select active field on display:<br>(fire  - fault  - disable  ) | |
|  | Main (Go to main menu) | 2a/2b |
|  | Function 1 (menu of the 3rd access level) | 3 |
|  | Function 2 (menu of the 2nd access level) | 2a/2b |
|  | Keypad | 1 |
|  | Deleting | 2a/2b/3 |
|  | Access | 2a/2b/3 |

### 3.3 Operation modes (conditions)

FACP can be in one of the following operating modes:

- **Quiescent** – no other operating modes, only green indicator lights, display shows the information on device name and current time
- **Fire** – indicator blinks, zones with fire are showed on display, buzzer is activated;
- **Verification** – indicator blinks, zones with verification are showed on display in **Fire** field. Activation of buzzer. This condition may change to **Fire** only upon confirmation of fire according to special algorithm, which is assigned during programming from the 3rd access level. If during the programmed time fire is not confirmed, **Verification** condition of FACP is changed to **Quiescent** condition.
- **Fault** – indicator and indicator of fault zone or circuit blinks, fault function is showed on display, buzzer is activated;
- **Disabled** – indicator lights, showing disabled circuit. Displays the disabled circuit or zone on display;
- **2nd access level** – indicator on the button lights. Shows the 2nd access level menu on the display.
- **3rd access level** – no indication, no information on display, used for FACP programming. See the details in the guidance on installation.

FACP can be in Fire, Verification, Fault and Disabled conditions at the same time. Conditions under which FACP switches to particular modes are shown in **Appendix C.**

## 4. Installation and preparing to work

### 4.1 Safety requirements

| | |
|---|---|
|  | **All connections must be carried out with disconnected all power supplies of FACP: main (230 V AC) and alternative (batteries)** |
|  | **Caution! Caution!** Printed circuit boards of FACP and modules contains static-sensitive components. To avoid damage to sensitive components before handling any boards you should discharge static electricity in your body by touching ground |
|  | **Caution!** Installing and removing modules should be carried out with disconnected power sources (AC and DC) to avoid damaging of main board and modules. |

4.1.1 Installation, uninstallation, operation and maintenance of FACP shall be carried out by qualified in accordance with the electrotechnical regulations and fire safety regulations.

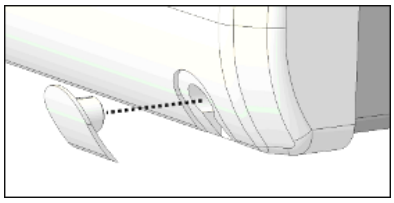
4.1.2 Installation, uninstallation and maintenance of FACP must be carried out with the power supply disconnected.

### 4.2 Installation of FACP

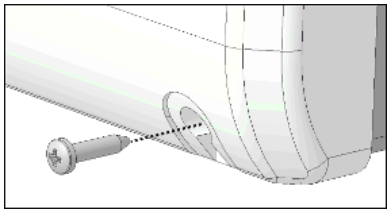
FACP should be installed in premises with controlled climatic conditions and temperature range of -5°C … +40°C, the relative humidity must be not more than 93%. The housing is intended for vertical installation on the wall or other flat surface.

FACP should be installed as far away as possible from sources of electromagnetic interference (for example, electrical equipment, heating devices, air conditioners, radio transmitters, etc.)

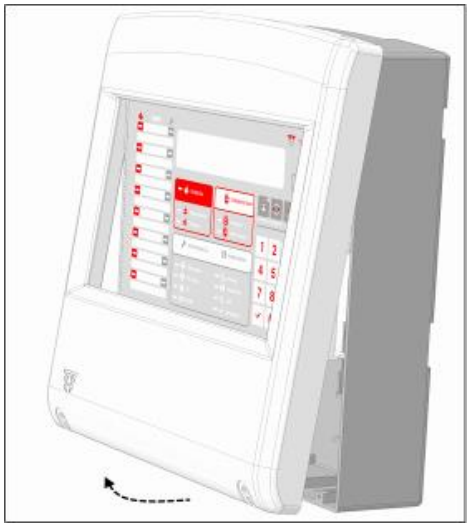
**Installation:**



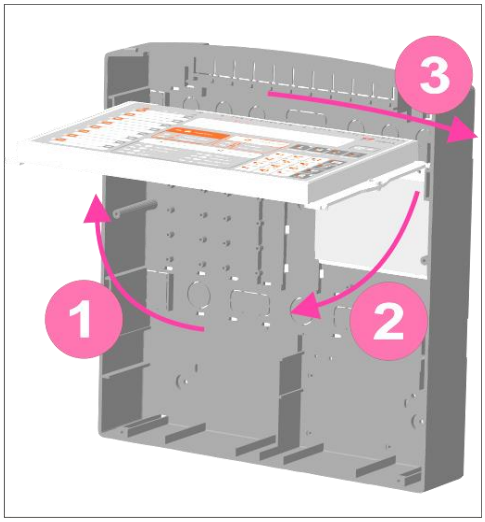
1. Remove 2 plugs on the bottom of housing.



2. Unscrew 2 screws, which fix the cover.



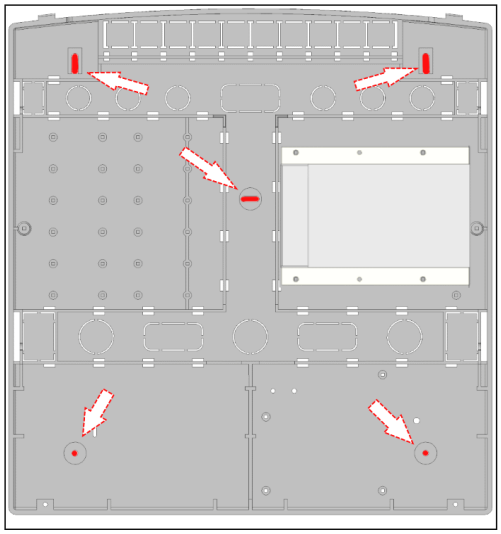
3. Remove the cover.




4. Disconnect the power connector from the primary PCB, remove primary module:

1 - Lift the primary module, 2 - Remove the lock on the right side 3 - pull the main module from the left lock, by moving it to the right.

(When opening, module is automatically fixed in perpendicular to the body position. To return to operational state move the module as it is shown in fig.3).



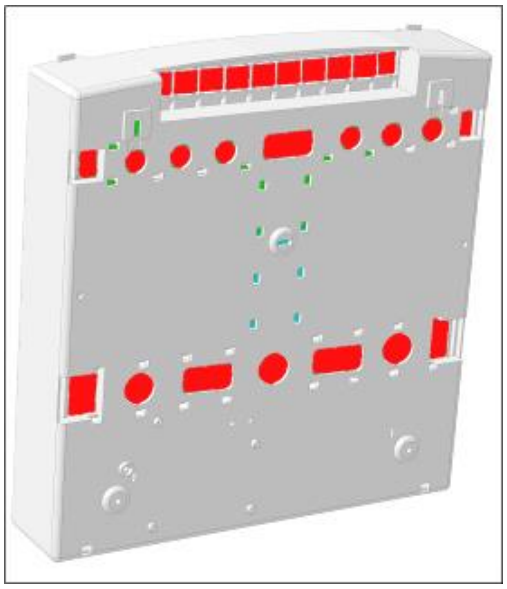
*The FACP is designed for wall mounting. The mounting surface shall flat and non-metal. The two keyholes on the top (Ø5mm) are used for hanging. Other three holes (Ø4.2mm) are for fixing. The housing mounting drawings is shown in appendix F. Check the wall to decide a suitable screw fixing and dowels. It's recommended to use minimum a 6x35 mm dowels and screws with a semicircular head with 3.5-4,0 mm diameter and 35 mm length. The FACP should be installed at the level of the user's eyes, not higher than 2 meters.*

5. Attach the housing of FACP to the wall, align its position with level meter and mark two upper holes. Drill in the holes in marked areas for dowels. Insert dowels and screws and put the housing on them.

6. Check the position of housing using level meter. Mark 3 fixing holes, remove the case.

7. Drill in the holes for dowels in marked areas. Insert dowels.

8. Break down the necessary holes to feed wires.



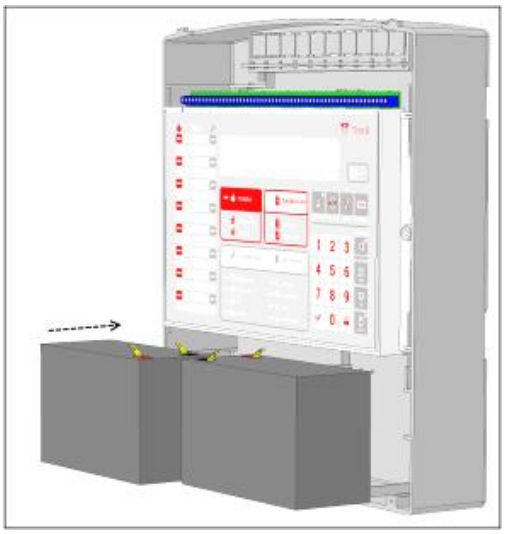
9. Feed the wires.

<u>To ensure IP30 class, always use a special cable seal of appropriate size (depending on the type of cable).</u>

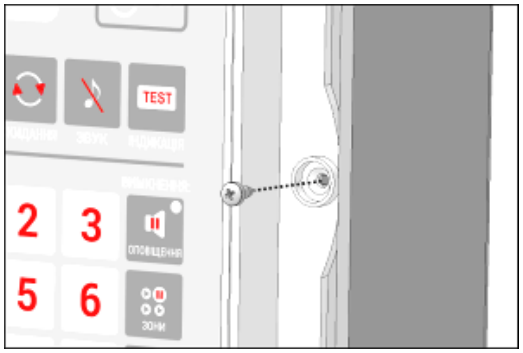
10. Screw in the housing to the wall with screws.

11. Install the primary module.

12. Perform the necessary connections (see. 4.2). Install necessary modules (4.2.9).



13. Put in and connect 2 batteries (see section 4.2.8).




14. Fix the panel with 2 screws.

15. Perform steps 1-3 in reversed order.

### 4.3 Connection

#### 4.3.1 Connecting of zones (Zx)

FACP Tiras PRIME 8L has 8 onboard zones to connect detectors, and enables to connect M-Z(f) module to extend zone number by 20. Any of the zones, depending on the configuration, in addition to the functions of the fire zone can serve as a universal input.

**Connecting automatic fire detectors**

The maximum number of automatic fire detectors in one zone is no more than 32. Connection of detectors is shown in Fig. 7. At line end (the last detector) terminal resistor $R_t$ - 6.8 kOhms, 0.5 Watt must be installed. A limiting resistor $R_{add}$ (0.5 W) must be connected to each detector, the resistance of which depends on the type of detector. $R_{add}$ resistance is calculated using the formula:

$$\mathbf{R_{add} = 2\ kOhms - R_d}$$

where $R_d$ is an internal resistance of detector after the responce (560 Ohms in case of detectors by Tiras-12 ltd). Additional resistor of 1.5 kOhms.

$R_{add}$ is a resistor selected from a number of standard values, such as E12 (k): 0.56, 0.68, 0.82, 1.0, 1.2, 1.5, 1.8.

Maximum current consumption and the maximum number of detectors in zone is determined by the resistance of the connecting wires and calculated with the help of table 4.1:

Table 4.1 – Current consumption in zones

| Detector power supply | Loading current, mA | | |
|---|---|---|---|
| | $R_{zw}$ = 0 Ohms | $R_{zw}$ ≤50 Ohms | $R_{zw}$= 50-100 Ohms |
| ≥18V | 3 | 2,2 | 3,5 |
| ≥10V | 4,5 | 3,7 | 5,5 |
| $R_{zw}$ – resistance of zone wires | | | |

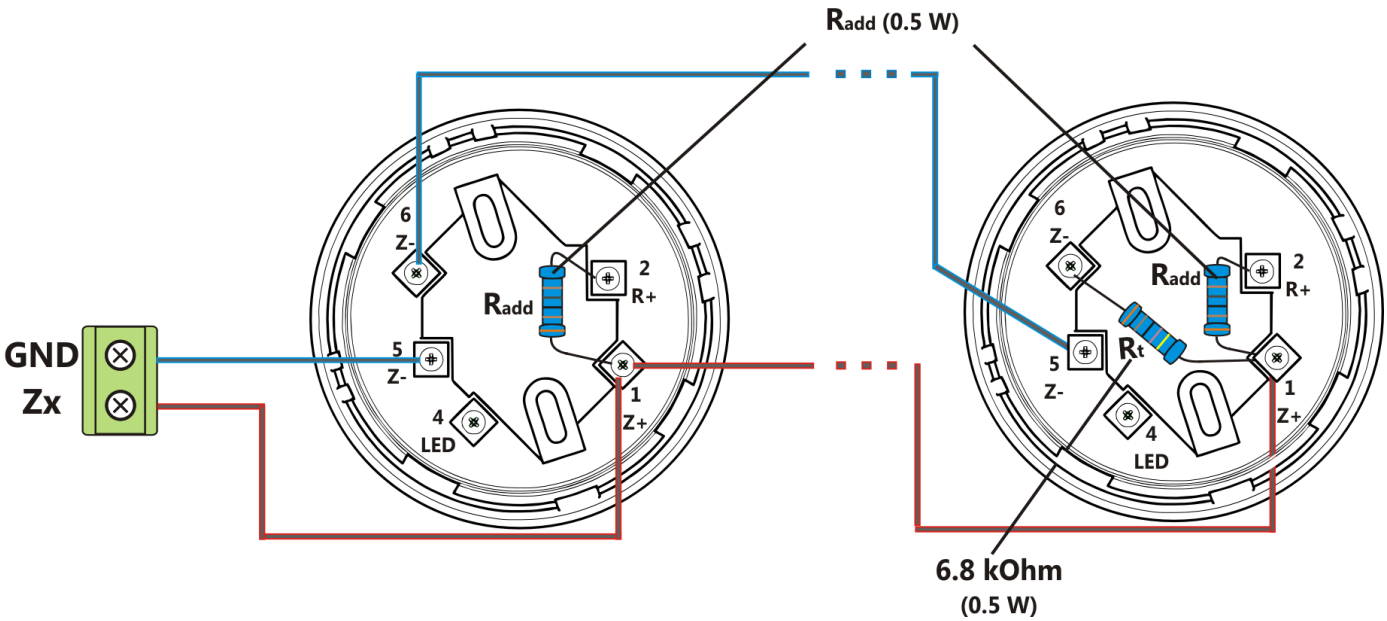



Figure 6 – Connecting of automatic detectors *
(«X» means the number of zone)

* - numbers of contacts of detectors are indicated for those produced by Tiras-12 ltd (SPD2). Wiring diagrams (and contact numbers of detector bases) of other manufacturers should be given in the technical documentation to them.

**Connection of manual call points**

Connection of manual call points is the same as that of automatic fire detectors (fig. 6).

| | |
|---|---|
| | **If zone is not used, it can be disabled at configuration.** |

| | |
|---|---|
| | **According to EN54-13, it is not allowed to connect manual call points and automatic smoke detectors in one zone at the same time.** |

**Connecting «Universal input» zone**

When using zones as universal inputs, 7 options of operations are possible, see details in zone settings - Section 6.2. Connection is carried out according to Fig. 7.

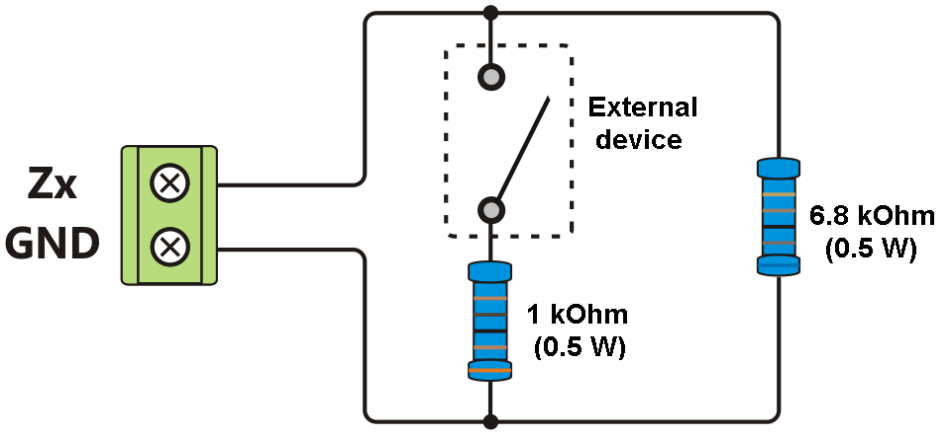



Figure 7 – Connecting universal input
(«X» means number of zone)

### 4.3.2 Connecting sounders (Sx, USx)

FACP contains 2 outputs for connection of sounders. Connection of sounders is shown in Fig. 8. In case sounders are powered from FACP, put jumper between the USx input and +24V output. In case the sounders current consumption exceeds the load capacity of +24V output, FACP must use a separate power source. Terminal resistor is installed at the end of the line – 6.8 kOhm, 0.5 Watt. «x» in the name of output means its number on the PCB.

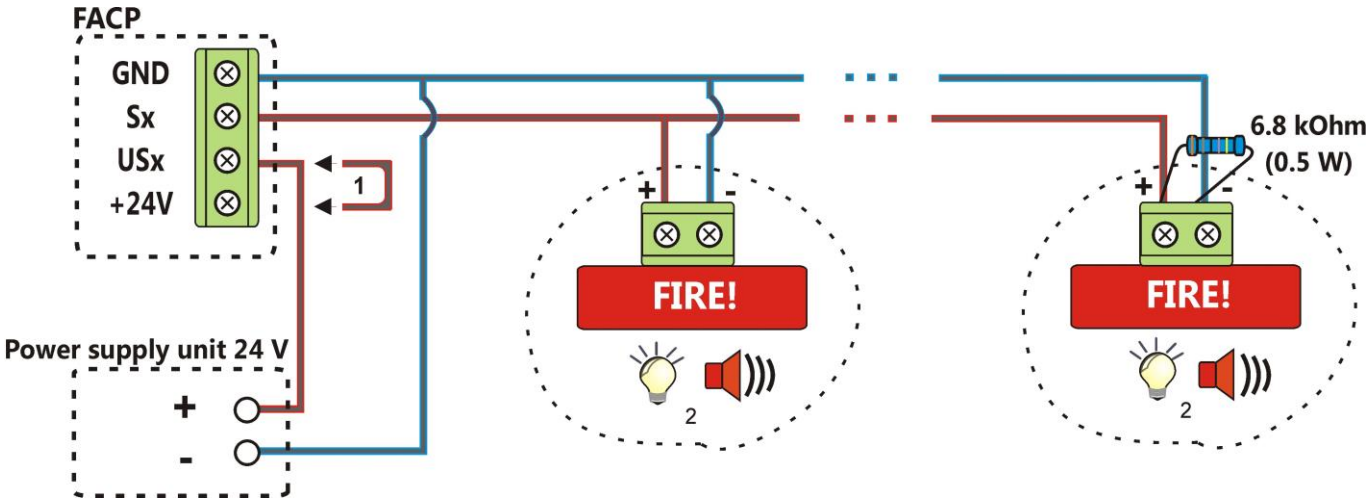



Figure 8 – Connection of sounders
1 – Jumper used, when sounders are powered from FACP;
2 – You can connect both sounders and emergency lighting.

### 4.3.3 Relay outputs (REL1, REL2, C1-C4)

FACP contains two programmable relay two-way contacts (NC - normally closed, NO - normally open) with respect to the central one (REL1 and REL2). Events or zones to activate the relay are assigned in 3rd access level (see. Section 5.3.2).

In order to increase the number of relay outputs you can use M-OUT4R module, which contains 4 relays with two-way contacts, similar to REL1 and REL2. Installation of module is shown in 4.2.9, its programming is given in Section 5.3.2.)

### 4.3.4 Fire Alarm and Fault outputs (AL and FT)

FACP contains Fire Alarm (AL) and Fault (FT) outputs for connection to external devices or routing equipment (communicator). The outputs are of transistor type with limited switching current (100mA) and control of the connection line. The resistor 6.8 Ohms, 0.5 Watts

must be installed at the end of the line. Connection must be carried out according to Fig. 10. If the output is not used, resistor is mounted directly on the output terminals (between + 24V and FT or AL)

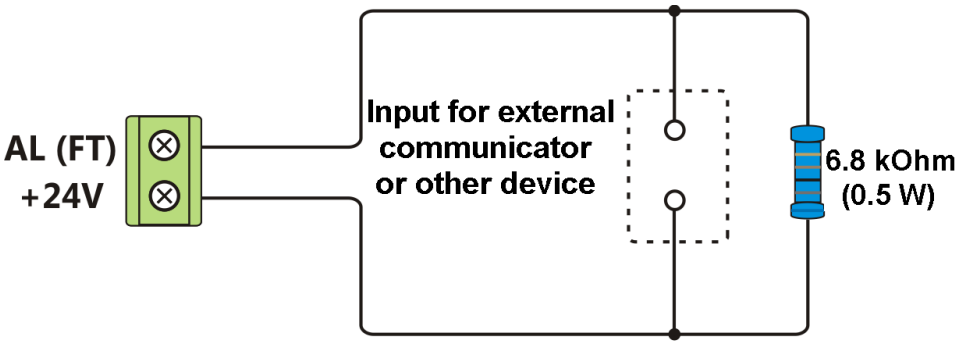



Figure 9 – Connecting outputs AL and FT

### 4.3.5 Connecting power outputs +24V

FACP contains 2 power outputs to power devices and external devices, the power voltage is 24V. Each output has a resettable fuse with the maximum current of 400 mA. Outputs on the main PCB are marked with "+24V".

| | |
|---|---|
|  | **To restore the normal state of fuse on the +24V output after its activation, remove the load from the output for several seconds** |

### 4.3.6 Connecting primary power source (230V)

| | |
|---|---|
|  | **Before connecting the main power supply of FACP ensure the voltage is not supplied** |
|  | **FACP should be provided with a protective grounding!** |

The AC connection must be made by a separate power line with protective grounding. The connection has to be made via a circuit breaker with a 16A maximum rated current.

The primary power supply source connects via the connector on the power supply unit (PSU) of FACP. One part of this connector is located on PSU, the other one is installed on the cable (see Fig. 10). After connecting the connector to 230V network, the wires must be anchored with a special tie, (see Fig. 11). To connect to 230V network, it is recommended to use cable with a cross section of wires at least 1.0 $mm^2$. Cross section of power wires must be selected taking into account the length of lines and use components powered by them. The recommended minimum wire cross section for the earth connection is more than1.0 $mm^2$.

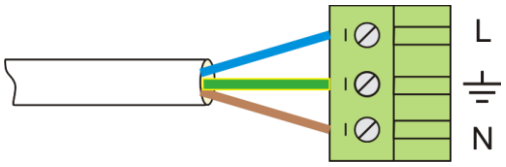



Figure 10 – Connection to 230V connector

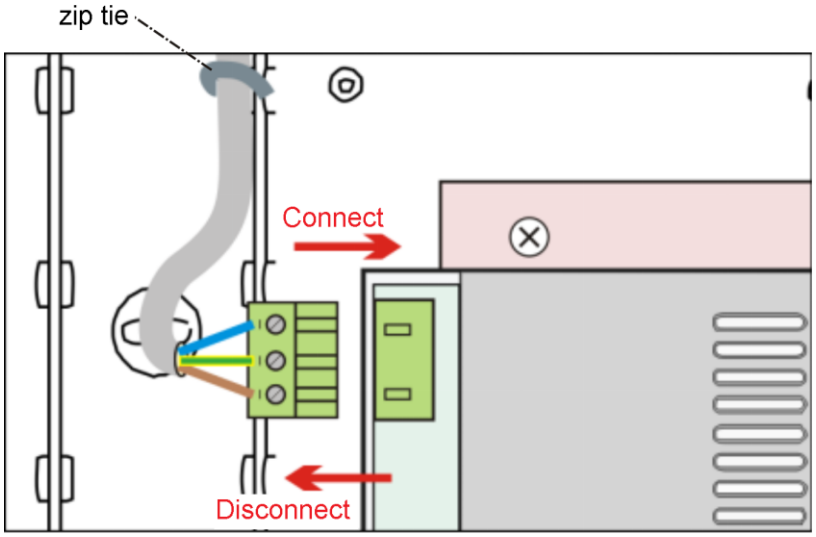



Figure 11 – Connection and fixation of power cable of 230V network

### 4.3.7 Connecting alternative power supply (Batteries)

| | |
|---|---|
| | **Caution!** Check polarity when connecting the batteries. |
| | **Caution!** Do not short terminals. It will cause damage or explosion of batteries. |
| | **Caution!** Some batteries contain sulfuric acid. In case of acid hit on the skin or eyes as a result of damage to the battery, immediately flush affected areas with water for 15 minutes and seek medical attention. |

Two sealed lead-acid batteries (12V, 7Ah) can be used as a backup power supply for FACP. Batteries are connected to terminals "+" (red) and "-" (black) and are connected by jumper (included), according to the color of the battery terminals, (see Fig. 12). The FACP controls the voltage and internal resistance of the battery – if it decreases below 23V (11.5V on each) FACP forms the message "Battery fault - low voltage" and disconnect the battery while reducing the total voltage below - 21V, to avoid possible damage. Current consumption of the battery after shutdown, is lower than 0,1 mA. The charger includes protection against incorrect connection of the battery as a fuse.

The charger performs 3 steps of battery charging (see Fig. 13):

- Current charging (no limitation of voltage, with respect to temperature) to achieve approximately 80% of capacity;
- Constant voltage charging (values are 2V less than the charging voltage at step 1 with respect to thermal compensation);
- Relaxation - disconnects the charger, the self-discharge process (storage) of battery. In this mode, the batteries are ready to provide backup power of FACP. In case of 230V fault, switching to battery is instant and automatic.

After reaching the threshold of self-discharge the charging cycle is repeated.
The range of the battery voltage thermal regulation is -5 to +50°C.

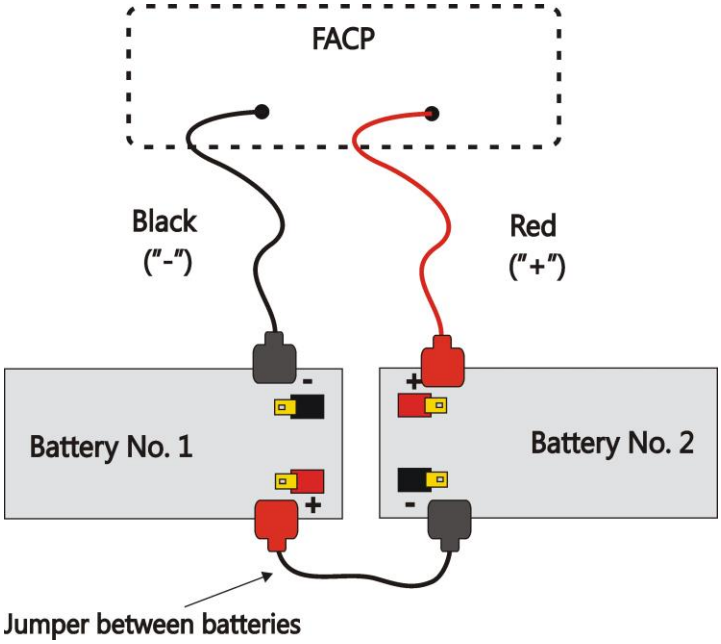



Figure 12 – Connecting the battery

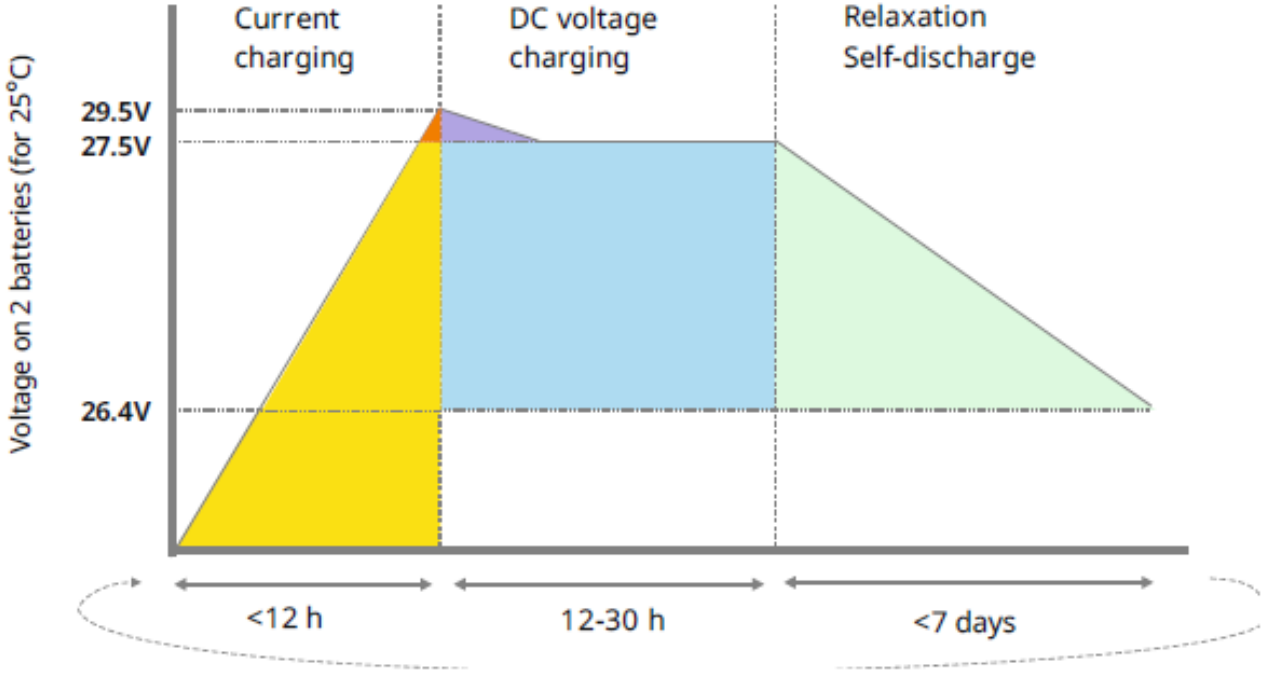



Figure 13 – Cycles of device charging

To start the FACP from the battery (without 230V) connect the battery and press **START** button (Fig. 5), hold it till you hear three beeps. An example of calculation of backup power capacity is given in **Appendix D.**

### 4.3.9 Installation of M-OUT4R module

The M-OUT4R is installed on the bottom on the mainboard and is connected to the appropriate connector (Figure 5).

To connect the module, first install plastic holders on the mainboard (the holders are supplied with M-OUT4R - 4 pcs.), then insert the module on the mainboard connector (Fig.5, pos.2).

**Check the shifts of module connectors.**

The installed module and its terminals are shown on fig. 14.

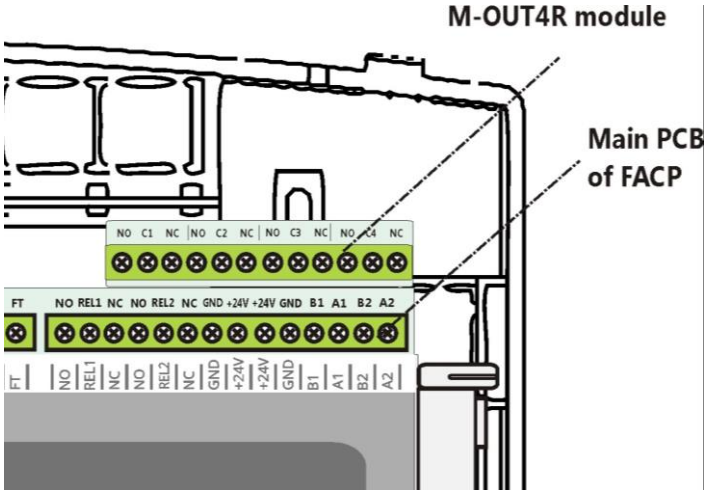



Figure 14 – FACP with M-OUT4R module installed

### 4.3.10 Installation of M-Z(f) module

MZ (f) module is intended to increase the number of FACP zones up to 20. To install M-Z(f), first install the plastic holder on the main board of FACP (holders are included with M-Z(f) - 4 pcs.) and install M-Z(f) on main PCB of FACP, by connecting the terminal of communicator to FACP connector (Fig. 5).

Installation of M-Z(f) is shown in Fig. 15. The module is installed in the bottom of the main PCB (Fig. 16).

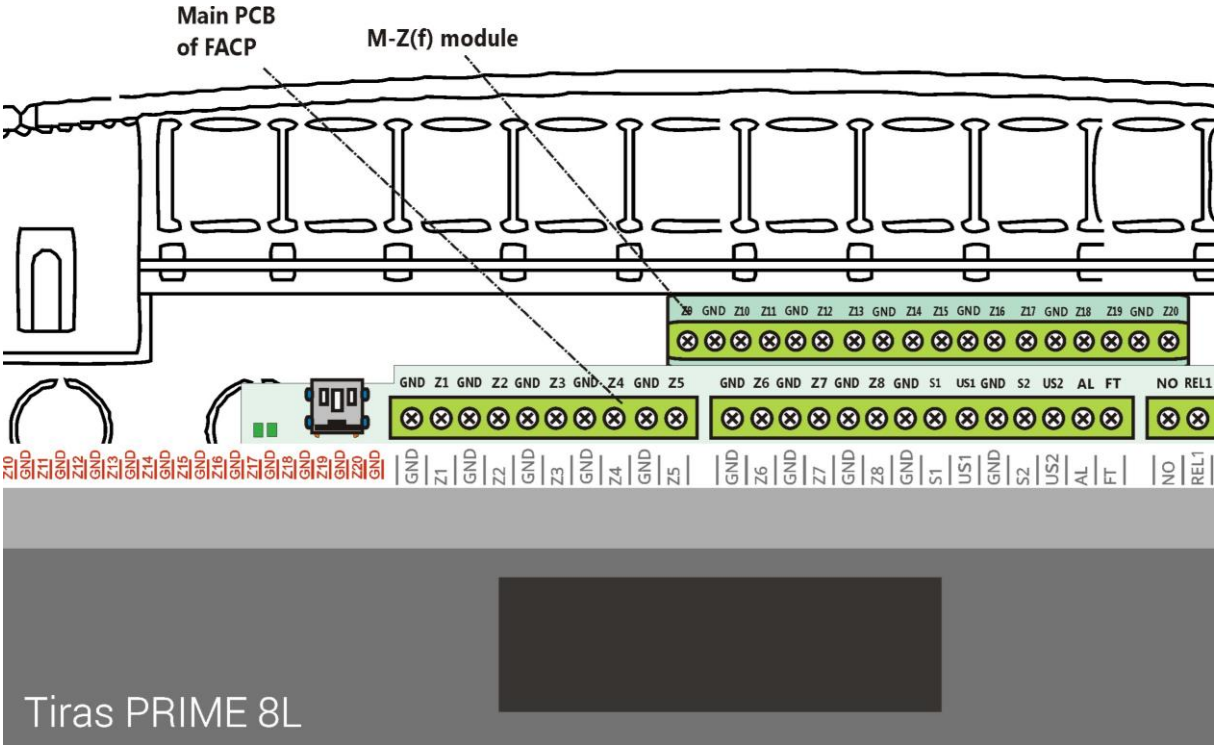



Figure 15 – FACP with M-Z(f) module installed

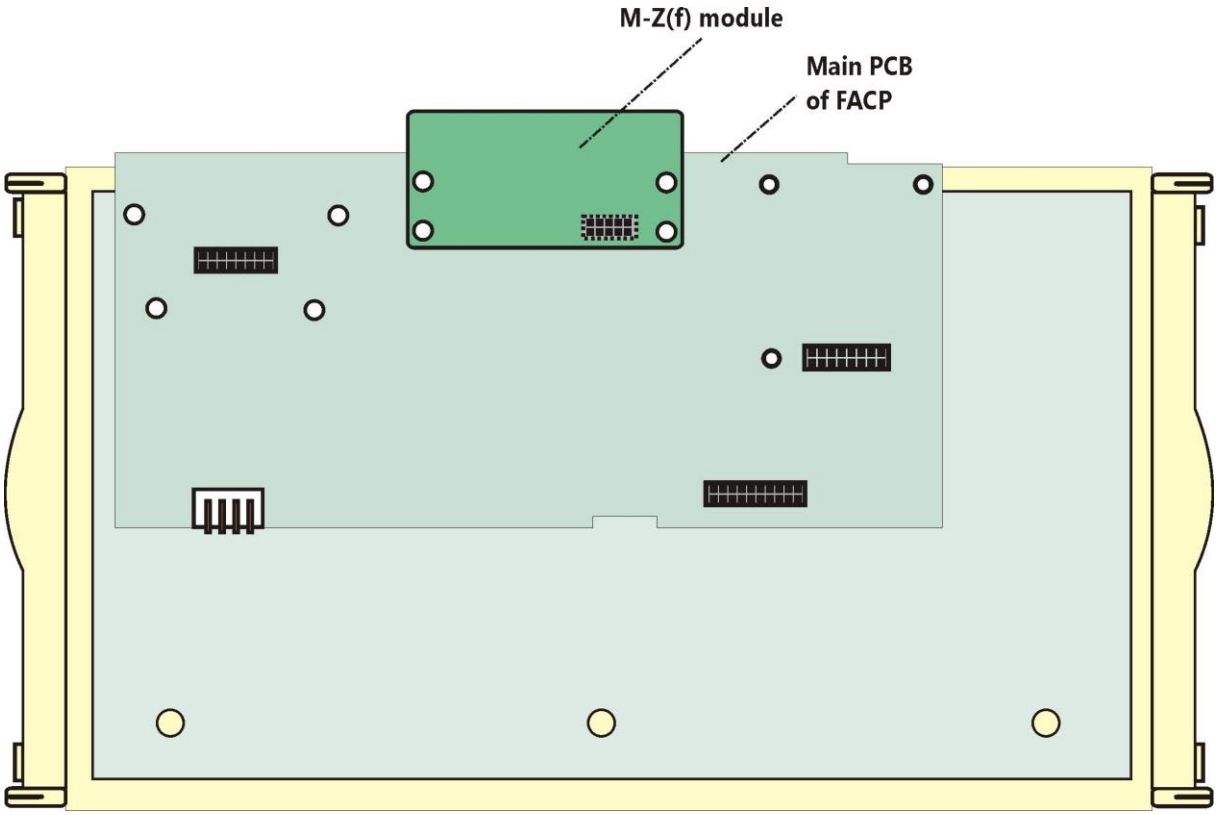



Figure 16 – FACP with M-Z(f) module installed (rear view of the primary module)

## 5 Access levels

FACP has four access levels: View (1st level), Control (2nd level), Configuration (3rd level), Service (4th level).

The following audible indication is possible when working wtih keypad:

- 1 short beep - character input / button pressing;
- 2 short beeps - confirmation of section input / function selection;
- 3 short beeps - Enter/Exit from the 2nd access level, FACP start;
- 1 long signal - wrong code or symbol entered / performed reset to factory defaults;

### 5.1 Level 1 (View)

Allows getting the information without any operations and perform the following functions:

- Turn off sounder (if active) – button .
- Deactivate delay - button (if Verification condition is active for zone of C-type);
- Switch active display fields (Fig. 17) – button BACK;
- View main menu (information on FACP) – button HOME




Figure 17 – Example of active display fields (Fire, Fault, Disable)

### 5.2 Level 2 (Control)

Level 2 (**Control**) has 2 sublevels:

- Level 2a (**User**)
- Level 2b (**Administrator**)

Access to level 2a and 2b is protected with password.

**Factory passwords:**

- Level 2a – **[1];**
- Level 2b – **[1111].**

On **level 2a (User)** one may do the following:

- Enable/disable delay;
- Reset **Fire** condition;
- Turn on/off the alert.

On **level 2b (Administrator)** one may do the following:

- Enable/disable delay;
- Reset Fire condition;
- Enable/Disable alert outputs.
- View event log;
- Enable/Disable Fire and Fault outputs and communicator (if both outputs are disabled);
- Enable/disable signaling system for fire extinguishment system (if configured);
- Enable/Disable zones of FACP and M-Z(f) (if installed);
- Change the names of zones;
- View information about FACP (version and revision of software, serial number)
- Select interface language;
- Test indication on FACP;
- Change access codes of level 2 (for existing users)
- Set time and date;
- Export event log to disk of FACP;
- Fast restart of FACP (to go to the access level 3), see detailed information in sec. 5.3.

#### 5.2.1 Operation on 2nd access level

Access codes and some settings are entered from the keypad of FACP.

To enter the menu of the access level 2b, press the button 

, enter the access code requested and confirm it, by pressing the button  - LED on the button  lights up.

Functions of buttons in different submenus of access level 2b may vary, in such case the current mode of buttons is indicated at the bottom of the display string.

User automatically exits access level in 20 seconds after last pressing of any button.

**Reset Fire or Verification condition:**

- Press the button , to mute buzzer (if necessary)
- Press the button ;
- Enter access code of the 2nd access level;

FACP switches to **Quiescent** condition in 10 seconds.

| | |
|---|---|
|  | **You can reset Fire condition only when Fire field is active on display, see 5.1.** |
|  | **You can reset Fault condition the same way as Fire mode. In case of the loss of the main power supply, 230V, fault indication turns off automatically after power is restored.**<br>**If Fire or Fault conditions appear again after reset, please contact your service company (installed your system).** |

Table 5.1 –menu structure of access level 2b.

| |
|---|
| 1: Event log<br>• **Time***: Event*<br>• … |
| 2: Disable outputs<br>• *Output name* **(state)**<br>• … |
| 3: Disable zone<br>• *Zone No.1* **(state)**<br>• … |
| 4: Zone names<br>• **Z1***: Name*<br>• … |
| 5: Day/Night |
| 6: Info on FACP |
| 7: Menu language<br>• **Українська**<br>• **Русский**<br>• **English** |
| 8: Indication test |
| 9: Change password<br>• **No.1 Name**<br>• … |
| 10: Time and date |
| 11: Export event log |
| 12: Restart |

***1:Event log (fig.18):***

- Enter menu of access level 2b;
- Select menu «1:Event log» and press [•5];
- Use keypad arrows [▼8] and [▲2] to select the message needed, for details, press [•5].

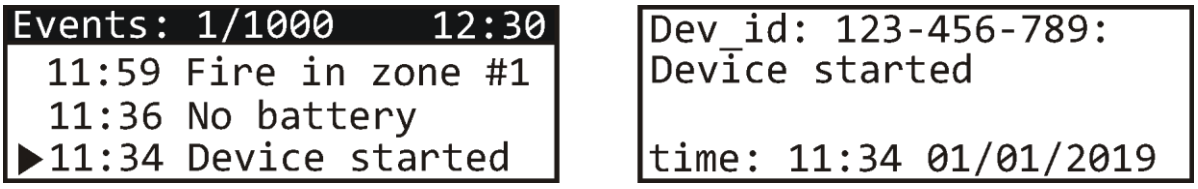



Figure 18 – Indication of display in event view log and event details

***2:Disable outputs:***

**<u>Disable/enable alert (sounders):</u>**

- Enter menu of access level 2b;
- Select menu «2:Disable outputs »;
- Using arrows [▼8] and [▲2] on keypad and go to «Sounder1» and/or «Sounder2» and press to select the state – Dis./En.

When disabled - LED indicators ▮▮ lights as well as that on the button , display shows Disable sounders in the **Disable** field.

You can also turn off alerts without entering the menu of access level 2b – by pressing button and entering access code level 2. This disables both "Sounder" outputs of FACP simultaneously.

**<u>Enable/disable Delay function:</u>**

- Enter menu of access level 2b;
- Select menu «2:Disable outputs »;
- Using arrows [▼8] and [▲2] on keypad and go to **Delay** and press [•5] to select the state – Dis./En.

When the power is switched off, the indicator ▮▮ lights, and the display shows a message on delay shutting down the in the Disable field.

When this function is disabled all configured delays for a zone with verification of type C will be canceled (see section 5.3.1).

The delay can also be deactivated without entering the menu by pressing the button and entering an access code (level 2a or 2b).

**<u>Disable/Enable Fire and Fault outputs or communicator (function of messages sending to monitoring station):</u>**

- Enter the menu of access level 2b;
- Select menu «2: Disable outputs»;

- Using arrows on keypad 8 and 2 go to Output AL and Output FT, then press 5 and select state - Dis./En.
- When both outputs are disabled – function of messages sending to monitoring station (device) is off.

When disabled and indicators and/or light, the display shows the appropriate disabling in **"Disable"** field.

**<u>Disable/Enable signal passing to fire extinguishment devices:</u>**

- Enter menu in access level 2b;
- Select menu «2:Disable outputs»;
- Using arrows 8 and 2 on keypad go to «Ext.REL (x)» (where "x" is an output of FACP, set to the fire extinguishment mode. In other modes it is not used) and press 5 to select the state – Dis./En.

When disabled – indicator lights, the display shows the message in the Disabling field.

***3:*** **Disable/enable zones:**

- Enter menu of access level 2b;
- Select menu «3:Disable zones »;
- Using arrows on keypad 8 and 2 go to zone(s) needed, then press 5 and select the state of zone – Dis./En.

When zone is disabled – indicator lights, the display shows the current amount of zones and their numbers.

***4:Zone names:***

- Enter menu of access level 2b;
- Select menu «4: Zone name »;
- Using arrows 8 and 2 on keypad and go to the zone needed and press button 5;
- Using instructions on the display, enter zone name with the help of buttons-arrows on the keypad 8, 2, 4 and 5.

***5: Day/Night:***

- Enter the access level menu 2b;
- Select menu "5: Day/Night";
- Using FACP keypad, select the state – Off/On. Enter the start time - Day and the start time - Night in the format of HH:MM, (where HH are hours, and MM are minutes);
- Press the buttons and BACK.

***6: Info (fig.19):***

- Enter the access level menu 2b;
- Select menu «5: Information» using button •5.

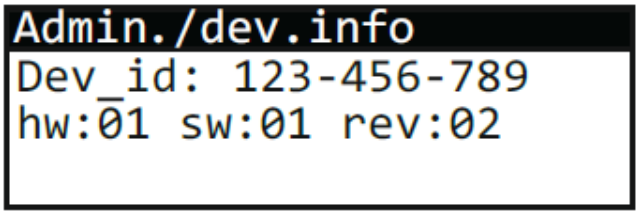



Figure 19 –Example of Indication on display in FACP info viewing condition

***7: Menu language***

- Enter menu of access level 2b;
- Select menu «7:Menu language »;
- Select the language you want using buttons ▼8 and ▲2 on the keypad and press •5, the available languages are Ukrainian, Russian and English;
- Confirm, by pressing button •5

***8:Indication test:***

- Enter menu of the access level 2;
- Select menu «8: Indication test»;

All the indicators of FACP and all the fields must light up for up to 3 seconds and all the display fields are filled with black;

***9: Change password:***

- Enter menu of access level 2b;
- Select menu «9: Change password»;
- Using buttons-arrows on the keypad ▼8 and ▲2, select the user, then press button •5;
- Enter new password and press buttons ✓ and BACK.

The maximum length of code is 10 symbols.

***10: Time and date:***

- Enter menu of access level 2b;
- Select menu «10: Time and date»;
- Enter date and time in the following format "*HH:MM DD/MM/YY*", (where *HH* are hours, *MM* are minutes, *DD* are days, *MM* are months, *YY* are years);
- Press buttons ✓ and BACK.

***11:Export event log:***

- Enter menu of access level 2b;

- Select menu «11: Export event log»;
- Confirm export – press button .

After this operation, EXP_LOG.TXT is created on the disk of FACP, it contains the information similar to that available in "1: Event Log" menu. Access to file is provided at the 3rd access level

***12:Restart:***

- Enter menu of access level 2b;
- Select menu «12: Restart»;
- Confirm restart – press the button .

This function is used for quick restart of FACP and/or switching to access level 3 (for details - see. 5.3).

| | |
|---|---|
| | **If FACP is powered from 230V network, display is highlighted constantly and when it is powered form the battery, the highlighting turns off automatically after the last pressing on any button with the delay of:**<br>– **5 seconds in 1st access level;**<br>– **180 seconds in 2nd access level.** |

### 5.3 Level 3 (FACP configuration)

There are two possible ways to configure FACP:

- Configure using tLoader application.
- Configure using keypad and display of FACP;

Configuration with the use of tLoader app is carried out on PC under Windows OS or mobile device under Android OS (ver. 4 or higher), which can be downloaded from tiras.ua and from Google Play.

FACP is connected to PC with the help of USB-miniUSB cable, and connected to mobile device via an optional OTG cable. The location of the connector is shown in Fig. 4

When connecting the FACP, one must switch to the configuration mode (restart) from the access level 2b (see section 5.2.1, item 11).

It is also possible to configure the switched off FACP, in this case, the device is powered via USB port.

After connecting FACP in My Computer folder on a PC or Android device, depending on the connection, a new disk appears – Tiras PRIME 8L (the capacity of 2 MB), see Fig. 20

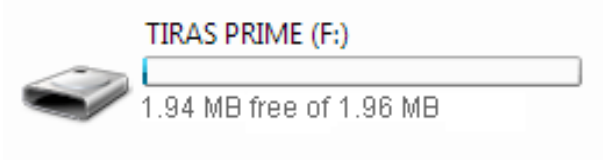



Figure 20 – USB drive of FACP

This removable disk contains the configuration file of FACP and the event log file (if export is made, see section 5.2.10). The description of work with the event log is given in section 5.3.5.

Access to programming with tLoader app is limited by the use of a tool – a screwdriver. Access to programming using the keypad is limited by the password of 3rd access level.

*Factory password of the 3rd access level is* **[1234]**

To access the menu of the 3rd access level from the keypad, one needs to press the button F1, enter the requested password on the display and confirm the input by a button  - the indicator on the button  lights up.

In various menu items of Level 3 (Table 5.2), the keypad functions differ, the current mode is indicated on the bottom row of the display.

User automatically exits 3rd access level after 180 seconds from the last click of any button, or by pressing 

button.

Table 5.2 – Structure of menu of the 3rd access level on the display of FACP.

| |
|---|
| **1: Zones**<br>• **Zx***:*<br>• *Status (En/Dis)*<br>  • *Zone type*<br>  • *Verification*<br>  • *Adjacent zone*<br>  • *Verification time*<br>  • *Calibration* |
| **2: Outputs**<br>• *Sounder 1*<br>• *Sounder 2*<br>• *Output REL1*<br>• *Output REL2*<br>• *Output C1*<br>• *Output C2*<br>• *Output C3*<br>• *Output C4* |
| **3: Delays**<br>• Delays (Dis./En.)<br>• Output AL (min)<br>• Output FT (sec)<br>• Alarm transmission to FARS (min)<br>• Fault 230V (min) |
| **4: System**<br>• Grounding control (Dis./En.)<br>• Always siren (Dis./En.)<br>• Use M-Z(f) (Dis./En.)<br>• Reset (sec) |
| **5: Change password** |
| **6: Factory settings** |
| *Note:*<br>*"X" means zone number* |

### 5.3.1 Zone settings

When programming each zone can be assigned a unique name.

Zones can work with fire detectors (automatic and manual), or a universal input, which responds to resistance changes in zone. Types of zones displayed during programming on the display are listed in parentheses.

**<u>Zones with fire detectors (common):</u>**

**1) Without verification** - automatic mode in which the actvation of a detector in zone immediately turns the FACP to Fire mode (By default – all zones);

**2) Verification of A type** (reactivation with automatic reset) - after the activation, an automatic detector is automatically resetting without displaying Fire or Pre-Alarm condition.

Switching to Fire condition is only in case if, within the programmed time, the second detector responses in the same zone;

**3) Verification of B type** (reactivation with Pre-Alarm indication) - after the activation of the automatic detector, FACP – in Pre-Alarm condition, with appropriate audible and visual indication. FACP switches over to Fire condition only in case if, within the programmed verification time, the second automatic detector in the same zone or in the adjacent zone, or manual call point is activated. If within the programmed time there is no second activation, Pre-Alarm condition is automatically canceled, manual cancelling by executing Reset operation is also possible;

**4) Verification of C type** (fire alarm delay) - after the activation of the automatic detector, there is a delay of sounders activation, Alarm output (AL), relay outputs and transmission of messages to FARS for the programmed time or until the confirmation of a fire in any other zone or manually – by pressing Delay button;

**5) Manual** – a type of zones with manual call points, the activation in zone immediately turns FACP to Fire condition. If there are zones with verifications of Type C - this zone performs the delay canceling.

**Verification time** - programmable time (only for verifications of A and B types) within which the confirmation of verification is expected. When this time is over, FACP automatically resets Verification condition. Values range 5..30 min. By default, the parameter value is 10 minutes.

**Adjacent zone** – zone, which is used to confirm the verification in zone with the verification of any type.

All types of verification are listed in table 6.1:

Table 6.1 – Verification types in zones

| Type of zone | Verification | Fire | Adjacent zones | Delay |
|---|---|---|---|---|
| No verification | – | + | – | – |
| Type A | – | Confirmation in the same zone | – | – |
| Type B | + | Confirmation in the same or adjacent zone | Any, including the same zone | – |
| Type C | – | Confirmation with any zone or manual call point | – | + |
| Manual | – | + | – | – |

Algorithm of “verification” condition is presented in fig. 21.

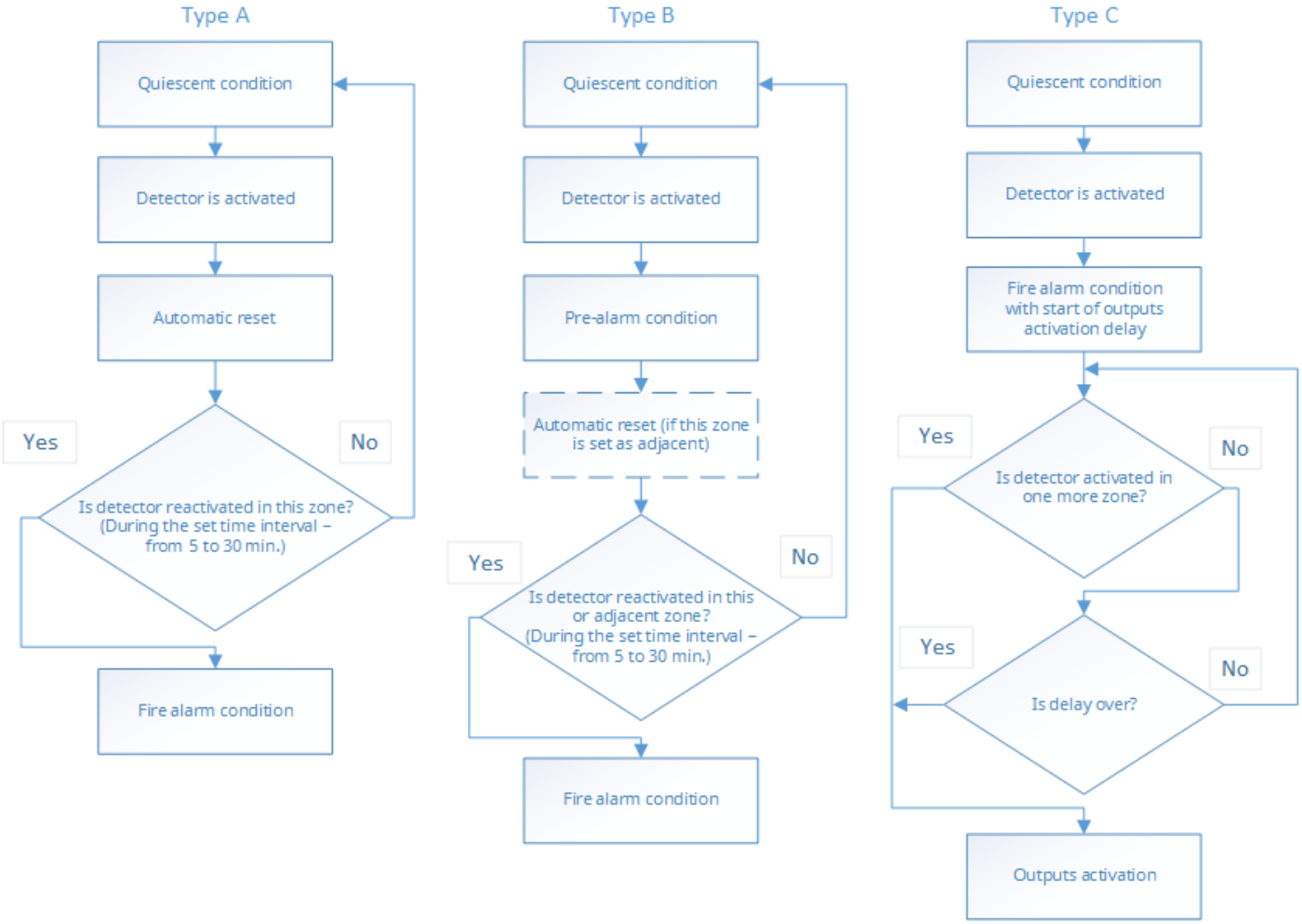



Figure 21 – Algorithms of Verification condition

| | |
|---|---|
| | **Zones, configured to work with manual call points immediately turn these zones and zones with active verification condition to Fire condition.** |

**Zones – universal inputs**

When zone works as universal input, there are 7 possible options. Each of them has various indication of active status. The faults of the connection line are showed on the display. List of "Universal Input" mode options and their indication are provided:

- **Confirmation of fire (FARS)** - in case of Fire condition – Fire routing indicator lights;
- **Control of external device (POWCON)** - Fault and External Devices indicators flash in case of activation);
- **Control of fire extinguishing activation (ACTCON)** - Activation indicator flashes, in case of activation;
- **Control the activation of extinguishment (EXFT)** – Extin. Fault indicator flashes, in case of activation;
- **Control of fire extinguishment completion (EXDONE)** - Extinguishment indicator flashes in case of activation;

- **Fire dumper (VALVE)** - in this mode, in case of a Fire condition in any zone, FACP waits for 1 minute to activate the input, in case of no activation – displays fault of zone (yellow zone indicator flashes);
- **Operation scenario (SCEN).** – when the zone is activated, the prescribed scenario is executed (see 5.3.9).

| | |
|---|---|
|  | **When configuring from FACP keypad, a calibration function is available in the setup menu for each zone, which allows to adjust the Quiescent resistance range (see Appendix B) to more accurately detect fire and fault in the zone.** |

### 5.3.2 Configuration of outputs

FACP contains the following outputs:

- Relay (REL1, REL2);
- Fire alarm output (AL);
- Fault output (FT);
- Relay outputs C1-C4 (if M-OUT4R module is installed)

| | |
|---|---|
|  | **FT output does not respond if 230V network is disconnected.** |

During the configuration process, the outputs are named, their operation mode and delay are defined, zones are assigned as well. One can also disable the output, which is not used, except for Fire Alarm and Fault outputs, for which only delay time can be configured.

S1 and S2 outputs perform only the function of output for connection of sounders and emergency lighting. By default, the S1 output is assigned to the first half of zones, and the rest of zones – to the S2 output.

Outputs REL1, REL2 and outputs C1-C4 (M-OUT4R module) can have only one of the 3 operation modes (the names of the operating modes displayed in the 3rd access level are indicated in brackets):

- **Fire extinguishment (EXTING)** - activation output for fire extinguishers.
- **General (SIMPLE)** - activation of the output in case of activation of assigned zones.
- **Scenario (SCEN)** – output operation in programmed scenario.

By default, the REL1 output is assigned to the first half of fire alarm zones, and REL2 output is assigned to the rest of them.

The activation delay parameter for each output (except for Fault output) and Delay on sending messages to the monitoring station by communicator (if installed) is activated only if the programmed zones have the verification of C type, and is set in a range of 0..10 min. The delay for Fire output is set in the range of 0..100 sec.

There is also the possibility of setting time delays for Fault output (range 0..100 sec), the delay in detection of fault in 230V power supply (the range is 0-10 minutes).

**By default,** the delay time for outputs S1 and S2 is 1 minute. Delay time for outputs REL1 and REL2 is “0”. The operation with M-OUT4R is disabled. Delay time of Fire and Fault outputs is disabled, data transmission by communicator is disabled. The delay of 230V fault detection is equal to 5 minutes.

### 5.3.3 Configuration of users

It is possible to set up to 8 users in FACP, regardless of levels (levels 2a and 2b in total). There are following fields for each code:

**Use** – enable or disable this code;

**Name** - the name of a particular user, up to 25 characters;

**Privileges** - user or administrator (level 2a or 2b, respectively, see. 5);

**Password** - a combination of 1 to 10 characters;

**Phone number** - mobile phone for notification, 3-21 characters.

### 5.3.4 General settings and delays

#### 5.3.4.1 Setting delay on outputs f FACPs

One can set the delay of output activation and indication of some features:

**Using delays** - enable or disable the delay of AL output activation and transmitting messages to the monitoring station when operating with zones of C type.

**Delay of verification of AL output activation** - delay time of Fire output activation for zones of C type (0-10 min);

**Delay of transmission to the monitoring station** – delay time on transmission of fire alarm messages to central monitoring station for zones of C type (0-10 min);

**Delay activation of FT output** - a delay time of fault detection and FT output activation (except faults other than 230V), (0-100s);

**Delay of fault detection in 230V network** - delay time of 230V network failure detection (0-10 min).

#### 5.3.4.2 Configuration of Day-Night mode (delay and notification)

**Day-Night** mode is designed to automatically turn off output delays (and transmission to the monitoring station), and alert at defined times, for example at night. To set the mode, enter two times options: Start of Day mode and start of Night mode in HHMM format, **HH** - hours, **MM** - minutes.

By default, this mode is disabled.

| | |
|---|---|
|  | **When Day-Night mode is activated, zone with verification mode of C type is turned to Fire condition without any delay.** |

### 5.3.5 Event log and language

Event log is stored in non-volatile memory of FACP. To view the event log, one must perform its export to FACP disc from the 2nd access level for further viewing with the help of tLoader or any text editor. (See sec. 5.2.1). The format of event log file is a text document (TXT) and contains up to 1000 records. When the event log is full, new events replace the irrelevant old events. The structure of one event in the log file is shown below.

| | |
|---|---|
|  | **Events of the same type (such as the same fault in one zone) are limited 10 events per hour. The counter is refreshed with Reset operation** |

| Time | Date | FACP event | FACP type | FACP serial number | Source of message |
|---|---|---|---|---|---|
| HH-MM-SS | DD/MM/YYYY | «Fire» | Tiras PRIME 8L | xxx-xxx-xxx | Zone, output, or user, who caused the event |

The language of exported event log is the same as that set on FACP during configuration. One of 3 languages is available – Ukrainian, Russian, English. The language of the FACP is also used when sending SMS messages (if specified for a specific user/administrator, see 5.3.3).

The default setting is Ukrainian.

### 5.3.6 Additional functions

One can set the alert disabling condition in FACP - **Repeat alert in case of a new fire.** This hand-off notification is automatically activated when a new fire in any zone.

By default: enabled

**Protective grounding connection control** function. The power supply unit controls the range of protective grounding connection, its status is displayed on the corresponding indicator (see sec. 3.2.1)

By default: disabled

**M-Z (f) usage** function. When one activates this function in zone setting section (see. Sec. 6.2), in addition to the basic 8 zones of FACP, additional 12 zones of the M-Z(f) module are available. Setting and connection (4.3.1) is the same as in basic zones.

By default: disabled

**Reset time** function. Sets the duration of the FACP reset operation (in case of a fire or fault). Is set in the range 2...30 sec.

By default: 10 s.

### 5.3.7 Scripts

FACP enables a user to set scripts – the sequences of automatic actions, which are executed depending on operating modes, the status of FACP inputs, etc.).

Each script includes:

- Script name;
- Script actions;
- Method (or several) to start the script.

The action can be as follows:

- Activation of the output;
- Deactivation of the output;
- Repeating (cyclic execution of the script actions);
- Delay between actions (in seconds);
- Pause (script stopping point), performance of actions recorded after a pause takes place only after the event that triggered the script is eliminated).

If after the elimination of event that triggered the script, you need to return the outputs to normal state, then this action (or actions) must be added after the repeat command (for cyclic scenarios) or after the pause command (for simple scripts).

The following events can be used to start the script:

- Fire in zone;
- Verification in zone (pre-fire);
- Activation of AL output (any general fire);
- FACP start;
- 230V fault;
- 230V recovery;
- FARS fault (communicator);
- FACP fault (any fault except for faults of battery and 230V network);
- Battery fault;
- Activation of zone, which is configured as “Universal input”.
- Reset of FACP*

* - reset operation is active only for 5 seconds, therefore, all the scripts, connected to it are active during this time.

The maximum number of scripts is 32. The maximum number of actions in a script is 32. Each script can have one or several ways of running.

By default, there are no scripts in FACP. In tLoader app, the configuration of script has a tabular appearance, in one table you select how to run, in the other one – you specify the sequence of actions of the script.

Example of a script:

| Run method | Actions |
|---|---|
| Fire in zone 1 | 1. Activation of REL1 |
| | 2. Delay of 60 seconds |
| | 3. Activation of REL2 |
| | 4. Pause |
| | 5. Deactivation of REL1 |
| | 6. Deactivation of REL2 |

This script, in case of fire in zone No. 1, performs the activation of the REL1 output of FACP, after 60 seconds, performs the activation of REL2 and in this mode waits (pause) until the event that caused the script disappears. After zone No.1 change its condition (performed from the FACP keypad with the "Reset" operation), the outputs REL1 and REL2 are disabled. Other examples of scripts are given in **Appendix E.**

### 5.3.8 Loading factory settings and access codes



***Factory settings can be downloaded using one of the following methods:***
***1) Using the Reset button.***
**When FACP is turned off, press and hold the Reset button;**
**Supply the power to FACP, wait until the Power indicator turns on, release the button;**

| | |
|---|---|
| | **After 3 beeps, the factory settings are set.**<br>***2) From the 3rd access level.***<br>**Enter the 3rd access level;**<br>**Select the Factory setting menu item and follow the tips on the display.**<br>***3) Using tLoader app.***<br>**Record the factory settings in FACP using tLoader app (see details in the description of tLoader)** |
|  | ***To load the factory access codes:***<br>**When FACP is turned off, press and hold Access button;**<br>**Supply the power to the FACP, wait until the Power indicator lights up, release the button;**<br>**After a long beep - the factory default codes are set**<br>**(1 - user, 1111 - administrator, 1234 - installer).** |

### 5.3.9 Update of firmware

Firmware update can be done manually using the firmware file. Firmware files are available for download on www.tiras.ua and have the format:

**B9B_PP_RR.HEX** - where **B9** is the code of **FACP** Tiras PRIME 8L, **B** - hardware version of FACP, **PP** - version of the software, **RR** - revision of the app.

To update the firmware, you have to copy the firmware file to FACP disk using the PC or Android device (see section 4.4), disconnect the miniUSB cable, and switch on FACP (if disabled). The upgrade process takes up to 2 minutes and is displayed by the flashing indicators LED1 and LED2 (fig. 4), after the update completes – FACP enters the "Quiescent" condition. After the update, the firmware file is automatically removed from the FACP drive. If the firmware file is corrupted or incorrect, the update does not take place, and the file is also be automatically deleted.

### 5.4 Level 4 (Service)

Access to level 4 is limited by a special tool and is carried out by the manufacturer.

## 6 Complex testing after installation

After connecting and configuring FACP at the facility and after each subsequent change of settings, it is necessary to make a check in order to exclude the possibility of improper connection and adjustment of FACP.

The following sequence of FACP verification is proposed:

1) Eliminate existing faults and shutdowns ("Quiescent" condition);
2) Check the work of all programmed access codes;
3) Perform testing of the indicators (see section 5.2.1, paragraph 8);
4) Check for at least 1 detector in each zone;
5) Check the triggers of all alarm outputs;
6) Check the fault indication – simulate a fault in at least one zone, check the correctness of the light and audible indication;
7) Check the start of all automatic devices, controlling (guiding) FACP;

## 7 Technical features of FACP

Table 7.1 – Technical features of FACP

| Parameter name | Value |
|---|---|
| *Main power supply:* AC power voltage, V | 230, +10%, -15% |
| *Main power supply:* AC power frequency, Hz | 50±1 |
| Maximum consumption current from main power supply, A | 0.27 |
| Maximum power consumption from main power supply, VA | 60 |
| *Alternative power supply:* two sealed lead-acid batteries with the voltage of, V (each) | 12 |
| *Alternative power supply*: two sealed lead-acid batteries with the capacity of, Ah (each) | 7 |
| Maximum charging current of battery, mA | 500 |
| Maximum permissible internal resistance of battery cells and their connection circuits, $R_{imax}$[1], Ohms | 1,0 |
| Output voltage $U_{PS}$, V | 19 - 29 |
| Ripple of the output voltage $U_{PS}$, mV, max. | 400 |
| Minimum current consumption from the $U_{PS}$ in Quiescent condition, Imin [1], A | 0,08 |
| Minimum current consumption from $U_{PS}$ in Fire condition, A | 0,11 |
| Maximum long-term current consumption from $U_{PS}$ with maximum loads, Imax_a [1], A | 0,91 |
| Minimum current consumption from battery in Quiescent condition (without display backlighting, for calculation of backup power supply), A | 0,075 |
| Maximum load current of +24V outputs (each), mA | 400 |
| Dimensions (W x H x D), mm | 350 x 370 x 96 |
| Net weight (without battery), kg, max. | 2.5 |
| Average time to failure, hours, min. | 40000 |
| Average lifetime, min. | 10 |
| Enclosure protection degree (IEC 60529) | IP30 |
| **Inputs and outputs** | |
| Number of zones (base/extension), pcs | 8/20 |
| Number of detectors in zone, pcs, max. | 32 |
| Voltage in zone in Quiescent condition, V | 18 - 21 |
| Current in zone in Quiescent condition, mA | 3,0 – 5,5 |
| Maximum current in zone (SC), mA | 43 ± 3 |
| Resistance of leakage in zone (between each wire and ground), kOhms, not less than | 50 |
| Resistance of detection circuits (zones), Ohms, max. | 250 |
| Resistance of the terminal resistor, kOhms | 6,8 ± 1% (3,9 ± 1%)[2] |

| | |
|---|---|
| Resistance of the terminal resistor of the system bus, Ohms | 120 |
| Switching current of S1+ and S2+ outputs, A, max. | 3 |
| Switching voltage of S1+ and S2+ outputs, V, max. | 24 |
| Switching current of relays REL1 and REL2, A, max. | 3 |
| Switching voltage of relay contacts REL1 and REL2, V, max.<br>- direct current<br>- alternate current | <br>24<br>120 |
| Switching current of outputs FT and AL, mA, no more than | 100 |
| **Fuses** | |
| AC [3], A | 3.15, fusible |
| Battery[3], A | 1.85, resettable |
| Additional loads, outputs +24V, A | 2 x 0.5, resettable |
| Fire and Fault outputs, A | 0.5, resettable |
| **Time characteristics** | |
| Zone reaction time to alarm (fault), sec, max. | 10 |
| Time to defect faults (except zones), sec, max. | 100 |
| Time to detect the capacity of battery (low capacity), min, max. | 15 |
| Time to detect the absence of battery, min, max. | 2 |
| Cross-section of wires[4] allowed for clamping in terminals, $mm^2$ | 0,22 - 1,5 |

[1]-according to EN54-4

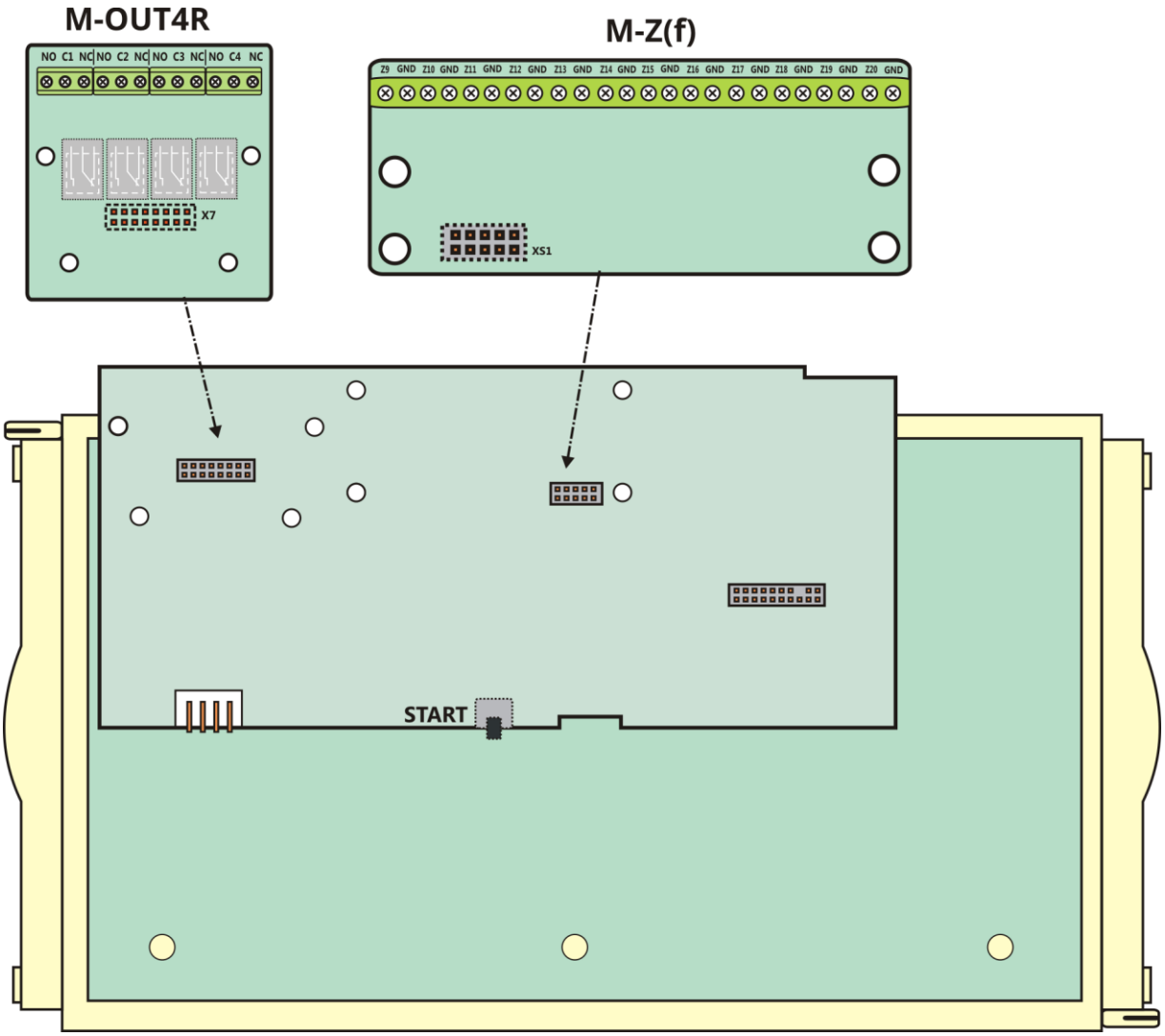
[2]-using terminating resistors 3.9 kOhms, the consumption of FACP in all conditions of operation increase by 25 mA.

[3]- accessible only from 3rd access level.

[4]- cross-section of wires is indicated for copper multi-conductor wires.

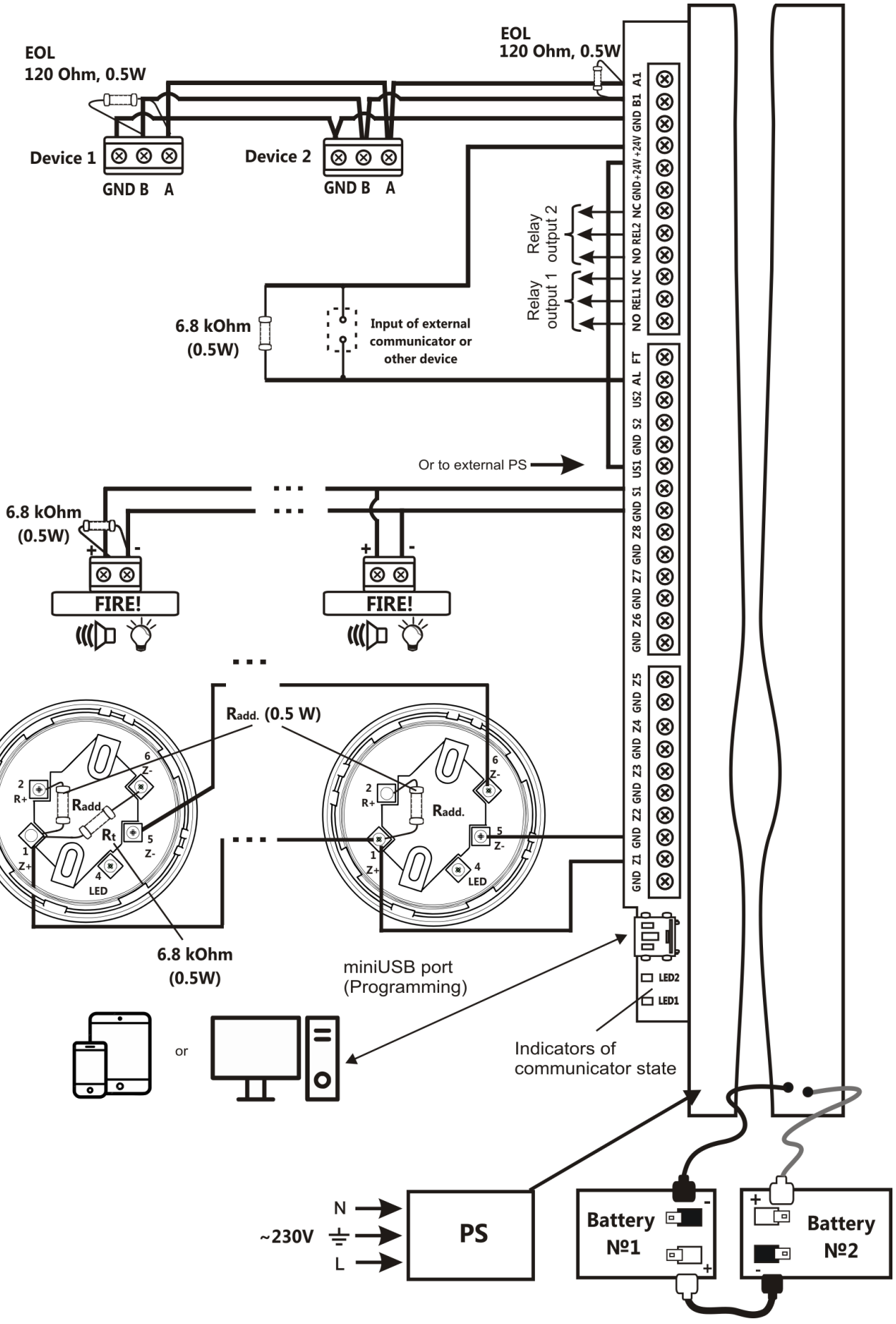
## *Appendix A*

Example of modules connection to FACP



## *Appendix B*

Wiring diagram



## *Appendix C*

Parameters of FACP conditions forming

Table B.1 – Parameters of operating conditions forming

| **FACP conditions** | **Parameters of forming** | | |
|---|---|---|---|
| Quiescent | Equivalent resistance of zone is in the range 2,1..8,4 kOhms | | |
| Fire | Fire/ Verification | Resistance of the zone with closing contacts (N.O. contact) in the range of 0.3..2.0 kOhms | |
| | Fire extin-guishment | Fire extinguishment activated | |
| | Activation | Fire extinguishment delay | |
| Fault | Zones | Open circuit | Resistance of zone is equal or higher than 8,5 kOhms |
| | | Short circuit | Resistance of zone is lower than 0.3 kOhms |
| | Network | No voltage in 230V network | |
| | Battery | Missing/defective battery | |
| | | Voltage on battery is lower than 23V | |
| | | Battery capacity is lower than 25% | |
| | AUX | Loading current of output(s) +24V are exceeded | |
| | CP | Fault of FACP firmware | |
| | FARS fire<br>FARS fault | No connection with monitoring station, messages are not received on FARS | |
| | Sounders | Short circuit/open for sounders | |
| | RS-485 | No connection with FACPs/fault of devices on system bus | |
| | Grounding | Fault of circuit protection grounding | |
| Disabling | Disabling of any function or circuit | | |

## *Appendix D*

Calculation of backup power source

Calculation is given for normal operating conditions of FACP for a minimal system based on FACP Tiras PRIME 8L. Data for calculations is given in the table D.1

Table D.1 – Input data for calculations

| Component of FAS | $I_s$[1], A | $I_f$[2], A | Number of components |
|---|---|---|---|
| FACP Tiras PRIME 8L | 0,075 | 0,11 | 1 |
| Manual call point SPR | - | Iz | 4 |
| Smoke detector SPD2 | 0,0001 | Iz | 50 |
| Sounders | - | 0,1 | 1 |

[1] $I_s$ is a current consumption of FACP/device in Quiescent condition;

[2] $I_f$ is a current consumption of the FACP/device in Fire condition;

[3] $I_z$ – in order to calculate the consumption of detectors in the fire condition one must take the value of $\mathbf{I_z = 15\ mA}$ for each zone (less than the short-circuit current in zone, due to the minimum operating voltage of the detectors).

Consumption current in Quiescent condition:
$\mathbf{I_s = I_{sp}(FACP)\cdot 1 + I_s(SPD2)\cdot 50}$

Current in Fire condition:
$\mathbf{I_f = I_f(FACP)\cdot 1 + I_z\cdot 4 + I_f(Sounder)}$

According to the requirements of Technical Specification CEN/TS 54-14, the FACP must operate from the standby power source in Quiescent condition for at least 30 hours (in case of connection to FARS) and at least for 30 minutes in Fire condition. The capacity of the battery ($\mathbf{C_{BAT}}$), needed to ensure the operation of FAS for the above conditions:

$\mathbf{C_{BAT} = I_s\cdot 30 + I_f\cdot 0{,}5\ (Ah)}$
$\mathbf{I_s = (0{,}07 + 0{,}0001\cdot 50) = 0{,}1\ (A)}$
$\mathbf{I_f = (0{,}1 + 4\cdot 0{,}02 + 0{,}1) = 0{,}3\ (A)}$
$\mathbf{C_{BAT} + 25\% = 0{,}1\cdot 30 + 0{,}3\cdot 0{,}5 = (3+0{,}15) * 1{,}25 = 3{,}94\ (Ah)}$

In case of standalone operation of 72 h in Quiescent condition and for 30 min. in Fire condition:
$\mathbf{C_{BAT} = I_s\cdot 72 + I_f\cdot 0{,}5\ (Ah)}$
$\mathbf{I_s = (0{,}07 + 0{,}0001\cdot 50) = 0{,}075\ (A)}$
$\mathbf{I_f = (0{,}1 + 4\cdot 0{,}02 + 0{,}1) = 0{,}28\ (A)}$
$\mathbf{C_{BAT} + 25\% = 0{,}075\cdot 72 + 0{,}28\cdot 0{,}5 = (5{,}4+0{,}14) * 1{,}25 = 6{,}93\ (Ah)}$

## *Appendix E*

Examples of scripts

**1) Resetting the power of the detectors (requiring additional power supply).**

Description:

Additional power detectors are connected through relay contacts REL1 (NC, REL1) to the +24V output of FACP. REL1 output is set to Script mode (see 5.3.1).

The script temporarily deactivates the power supply of detectors for 5 seconds - NC, REL1 contacts are unlocked. Resetting the power supply of detectors is performed when performing the "Reset" operation from the access level 2b.

Script actions:

Action 1: Activate the output. Exit that is activated: REL1.

Action 2: Delay. Delay time: 5 seconds.

Action 3: Deactivate the output. Output that is deactivated: REL1.

Starting method: “Reset”.

**2) Reset (restart) the external communicator.**

Description:

The external communicator is connected to the Fire and Fault outputs on the FACP. The power supply of communicator comes from FACP (output + 24V) and connected via REL1 and NC contacts. In quiescent condition, the communicator receives power supply, and in case of a failure of the messages transmission to the FARS, activates REL1 relay for 3 seconds, which results in power reset of the communicator. Exit REL1 is set to Script mode (see 5.3.1).

Script actions:

Action 1: Activation of output. Activated output: REL1.

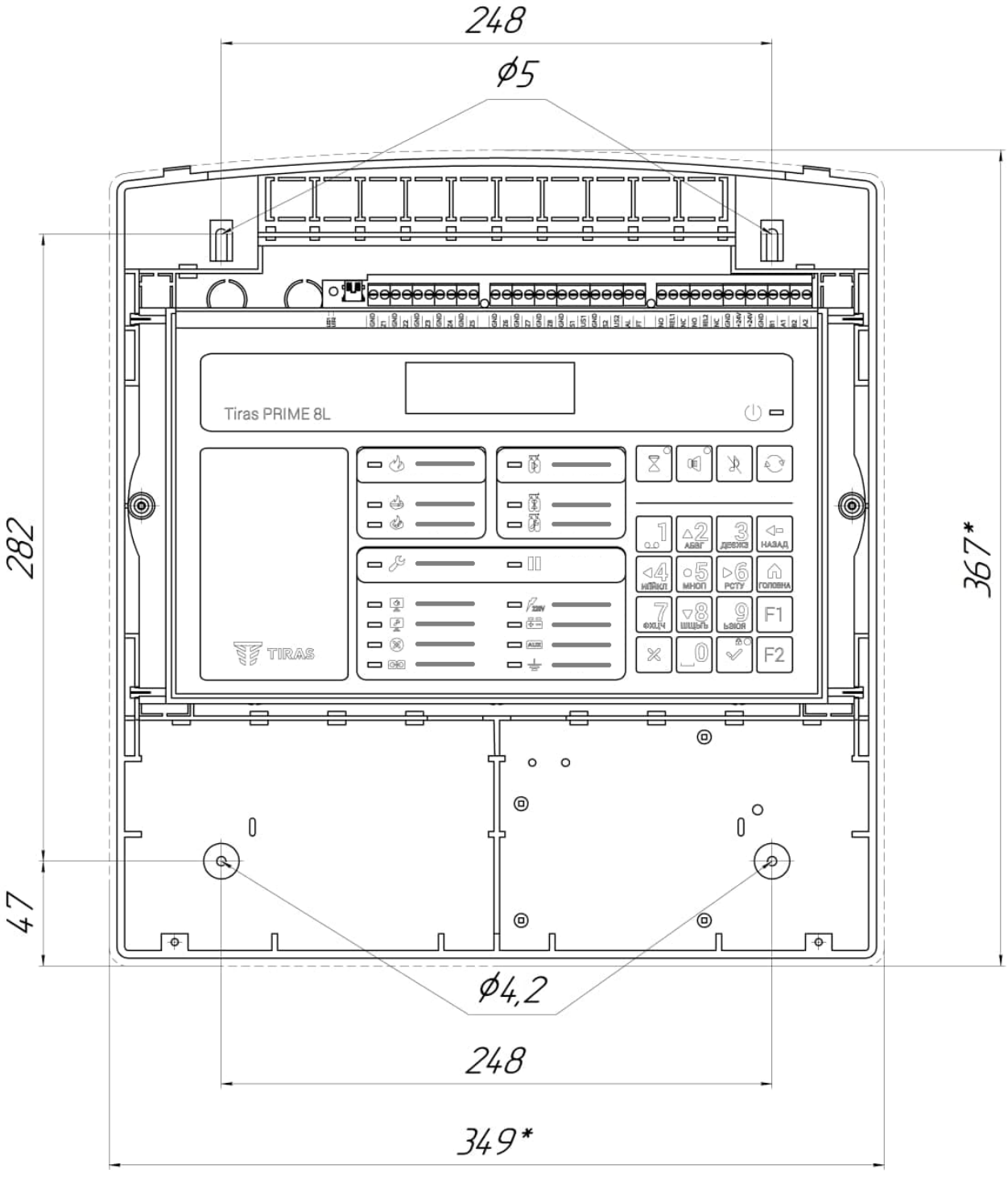
Action 2: Delay. Delay time: 3 seconds.

Action 3: Deactivate the output. Output that is deactivated: REL1.

Starting method: "FARS fault".

## *Appendix F*

housing mounting drawings



Issue 14.06.2021

TIRAS

**tiras.ua**

Manufacturer:
**«Tiras-12» LTD**
21021 Ukraine, Vinnytsia, 2nd lane Khmelnytske shosse, 8

In any questions please contact:

**Sales department:** market@tiras.ua

**Technical department:** support@tiras.ua

**Warranty and post-warranty service:** otk@tiras.ua

**Telephones (multichannel):**

+38 (067) 564-73-75

+38 (095) 282-76-90