



# **MLRK 1012**

v.1.2

# **MLRK13,8V/1A**

**Buffer power supply module, linear  
with technical output FAC.**

EN\*

Edition: 8 from 01.03.2018

Supersedes the edition: 7 from 11.05.2015

## Features:

- uninterrupted supply of 13,8VDC/1A
- supply voltage: external transformer required 16-17VAC (e.g. AWT150)
- linear voltage regulator
- battery charging and maintenance control
- deep discharge battery protection (UVP)
- battery output protection against a short circuit and reverse polarity connection
- battery charging current 0,1A
- START facility for manual battery connection
- LED indication
- FAC technical output indicating AC power collapse
- adjustable times indicating AC power failure
- protections:
  - SCP short-circuit protection
  - OLP overload protection
  - OHP overheat protection
  - surge protection
- warranty – 5 year from the production date

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## 1. Technical description

### 1.1 General description

A buffer PSU module is intended for an uninterrupted supply to alarm systems devices requiring stabilised voltage of **12V DC (+/-15%)**. A linear stabilizing system, which has been used in the unit, provides voltage with a lower level of noise and a quicker response to interference when compared to a switched-mode regulator. The PSU module provides voltage of **13,8V DC** with current capacity:



- 1. Output current 1A (without a battery)
- 2. Output current 0,9A + 0,1A battery charge

**Total current of the receivers + battery: 1A max.**

In case of power failure, a battery back-up is activated immediately.



**CAUTION!** Using the module for supplying CCTV, KD, SSWiN devices (or others of similar purpose), requires implementing of the MZN 1 protection module in the DC power output's circuit.

## 1.2. Block diagram. (Fig.1)

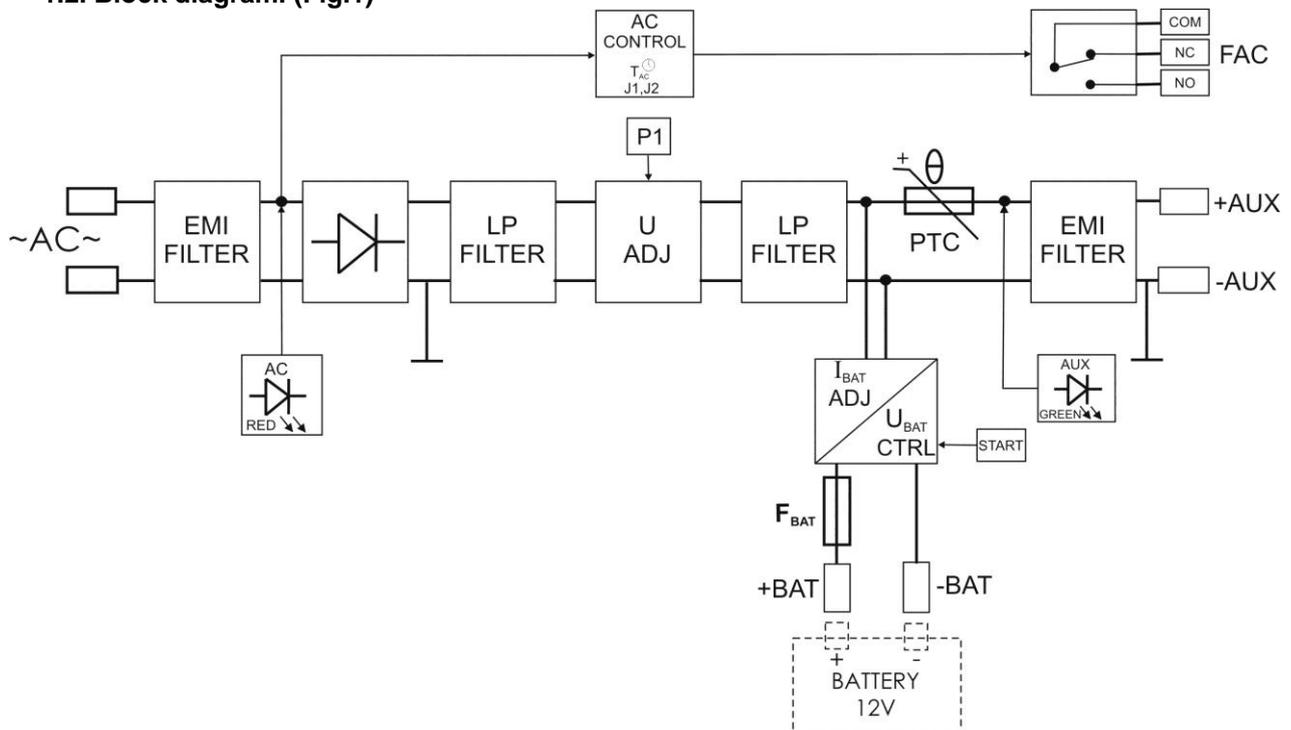


Fig.1. Block diagram of the PSU module.

## 1.3. Description of components and connectors

Table 1. Elements of the PSU pcb (see fig. 2).

Element no.	Description
[1]	P1 potentiometer, DC voltage adjustment
[2]	<b>LED indication:</b> AC – LED indicating presence of AC power AUX – LED indicating presence of DC output voltage
[3]	<b>Connectors:</b> ~AC~ - AC power input (see: transformer match) +AUX- DC power output (+AUX= Vcc, -AUX=GND)
[4]	FAC - AC absence technical output – relay type <b>Caution!</b> In Fig.1. the set of contacts indicates potential-free relay's status which corresponds to AC power outage (AC power failure).
[5]	T <sub>AC</sub> ; pins A, B, C, D - configuration of time lag for AC failure indication <ul style="list-style-type: none"> <li>• A= , B= , C= , D= : time lag T= 3 s</li> <li>• A= , B= , C= , D= : time lag T= 70 s</li> <li>• A= , B= , C= , D= : time lag T= 9 min</li> <li>• A= , B= , C= , D= : time lag T= 72 min</li> </ul> Caption:  jumper on,  jumper off
[6]	Battery output of DC supply (+BAT= red, -BAT = black)
[7]	F <sub>BAT</sub> fuse in the battery circuit
[8]	START button (activating the module with a battery)

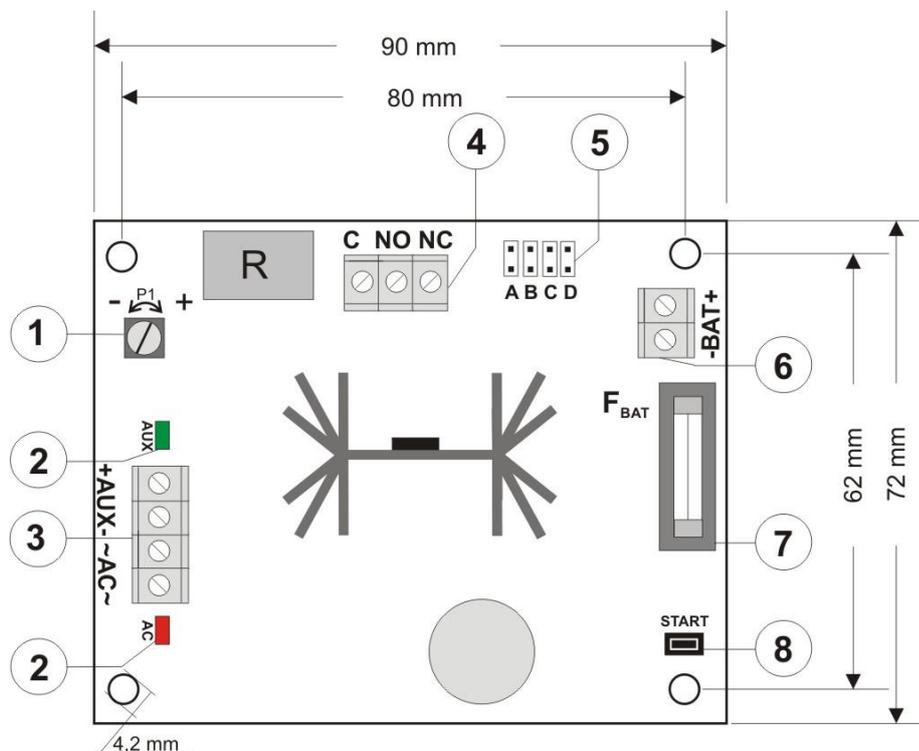


Fig. 2. The view of the PSU pcb.

#### 1.4. Specifications:

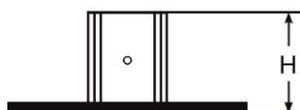
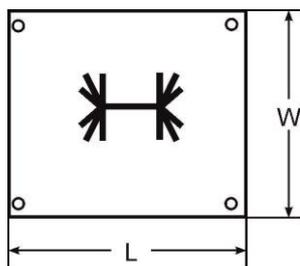
- electrical specifications (tab.2)
- mechanical specifications (tab.3)
- operating specifications (tab.4)

#### Electrical specifications (tab. 2).

Module's supply voltage	16V $\div$ 17V/AC
Current drawn from the transformer	1,9A max. (transformer's power 30VA min. e.g. AWT150)
Power frequency	50Hz
Module's power	14 W
Output voltage	12,8V $\div$ 13,8V DC – buffer operation
Output current	<b>1A (without a battery)</b> <b>0,9A + 0,1A battery charge</b>
Output voltage escalation, decrease, and keeping time	70ms/70ms/16ms
Output voltage adjustment range	12V $\div$ 14,5V
Ripple voltage	5 mV p-p max.
Current drawn by the PSU module systems	10 mA – battery-assisted operation
Battery charging current	0,3A (max.) 0,1A /24h (I <sub>sr</sub> /24h) @ 7Ah/12V
Short-circuit protection SCP	200% $\div$ 250% of PSU module power - current limiting and/or fuse damage in the battery circuit (fuse-element replacement required)
Overload protection OLP	110% $\div$ 150% (@65 °C $\div$ 25°C) of PSU module power - current limiting with the PTC resettable fuse, manual restart (failure requires disconnection of the DC output circuit)
Battery circuit SCP and reverse polarity protections	2A- current limiting, F <sub>BAT</sub> fuse (failure requires fuse-element replacement)
Deep discharge battery protection UVP	U<10V ( $\pm$ 5%) – disconnection (-BAT) of the battery
Technical output: - FAC; output indicating failure of AC power supply	- R type – relay, 1A @ 30VDC/50VAC max. approx. time lag: 3s/70s/9m/72m (+/-5%)
F <sub>BAT</sub> fuse	F2A / 250V

**Mechanical specifications (tab. 3).**

Dimensions	L=90, W=72, H=55 [mm] (+/- 2)
Fixing	Dowel pins x 4 (PCB fi=4,2 mm)
Net/gross weight	0,14kg/0,17kg
Connectors	Outputs: $\Phi 0,41 \div 1,63$ (AWG 26-14) BAT battery outputs: 6,3F-2,5, 30mm

**Operating specifications (tab.4).**

Operating temperature	-10°C...+40°C
Storage temperature	-20°C...+60°C
Relative humidity	20%...90%, without condensation
Vibrations during operation	unacceptable
Impulse waves during operation	unacceptable
Direct insolation	unacceptable
Vibrations and impulse waves during transport	PN-83/T-42106

**2. Installation.****2.1 Requirements**

The buffer PSU module is to be mounted by a qualified installer, holding relevant permits and licenses (applicable and required for a given country) for 230V/AC interference and low-voltage installations. The unit should be mounted in confined spaces, in accordance with the 2nd environmental class, with normal relative humidity (RH=90% maximum, without condensation) and temperature from -10°C to +40°C. The PSU shall work in a vertical position that guarantees sufficient convective air-flow through ventilating holes of the enclosure.



- 1. Output current 1A (without a battery)**
- 2. Output current 0,9A + 0,1A battery charge**

**Total current of the receivers + battery: 1A max.**

As the PSU module is designed for a continuous operation and is not equipped with a power-switch, therefore an appropriate overload protection shall be guaranteed in the power supply circuit. Moreover, the user shall be informed about the method of unplugging (most frequently through separating and assigning an appropriate fuse in the fuse-box). The electrical system shall follow valid standards and regulations.

The device should be installed in the metallic enclosure (cabinet). In order to meet the UE requirements, the rules concerning: supply, development and shielding ought to be followed- accordingly to the application power supply 16-17VAC with galvanic isolation (transformer insulation). The power of the transformer shall be matched in accordance with the following chart  $S=f(I)$  (chart1).

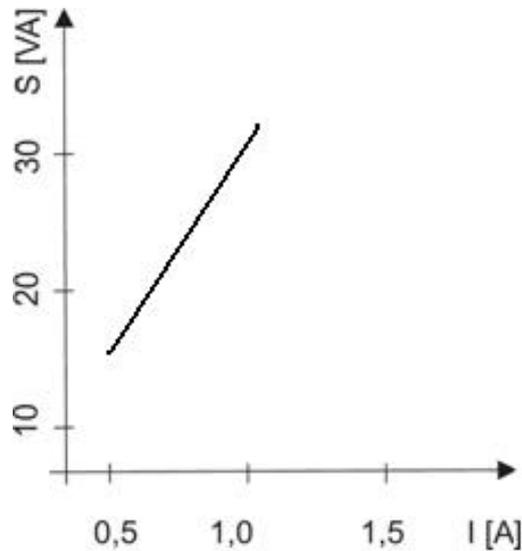


Chart.1. The dependence between the transformer's power -  $S$  and the output power of the PSU module -  $I_o$ .

## 2.2 Installation procedure



**Before installation, make sure that the voltage in the 230V power-supply circuit is cut off.**

1. Mount the enclosure (cabinet) and lay the cables.
2. Mount the module on dowel pins (the dowel pins shall be fixed prior to the installation of the enclosure/cabinet).
3. Deliver the output voltage from the AC transformer to the ~AC~ terminals.
4. Connect the receivers' cables to the +AUX, -AUX terminals of the terminal block on the PSU module's board.
5. If necessary, connect the device's wires to the COM-NC-NO technical output (alarm panel, controller, indicator, LED, etc.). With A, B, C, D jumpers set the time lag for failure indication.
6. Activate the ~230V/AC supply (the AC red diode and AUX green diode should be permanently illuminated).
7. Check the output voltage (the PSU module voltage without load should amount to 13,6V±13,9V, during battery charging 12V±13,8V). If the value of the voltage requires adjustment, it should be set by the P1 potentiometer, monitoring the voltage at the AUX output of the PSU module.
8. Connect the battery in accordance with the signs: +BAT red to 'plus', -BAT black to 'minus'.
9. Once the tests and operation control have been completed, the enclosure/cabinet can be locked.

## 3. Operating status indication.

### 3.1 LED indication

The PSU module is equipped with two diodes indicating operating status: AC, AUX

- **AC- red diode:** under normal status (AC supply) the diode is permanently illuminated. The absence of AC supply is indicated by the AC diode going out.
- **AUX- green diode:** indicates the DC supply status at the output of the PSU module. Under normal status, the diode is permanently illuminated. In case of a short circuit or overload the diode is off.

### 3.2 Technical output.

The PSU module is equipped with an indication output:

- **FAC - absence of AC supply output:** - relay output indicating the absence of AC supply. In case of power loss, the PSU module will switch the relay contacts after a time period defined by jumper configuration.



**CAUTION!** In Fig.1. the set of contacts indicates potential-free relay's status which corresponds to AC power outage (AC power failure).

## 4. Operation and use.

### 4.1 Overload or short circuit of the PSU module output

The AUX output of the PSU module is equipped with the PTC polyswitch-assisted protection. If the load of the PSU module exceeds 1,5A (load 110% ÷ 150% @25°C of the PSU module power), the output voltage is automatically cut off and indicated by the green diode going out. To restore the output power, cut off the output load for approximately 1 minute.

In case of a short-circuit in the AUX, BAT output or reverse battery connection, the F1 fuse in the battery circuit becomes permanently damaged and the restoration of the voltage at the BAT output requires the replacement of the fuse.

### 4.2 Battery-assisted operation.

In case of the main power outage, the device is immediately switched into a battery-assisted operation. In order to run the module from the battery only, connect the BAT connectors in accordance with the signs: + BAT red to 'plus' and, - BAT black to 'minus' then press the START button on the main board and hold it for 5 seconds.



**The PSU module is equipped with a discharged battery disconnection system (UVP).**

### 4.3. Maintenance.

Any and all maintenance operations may be performed following the disconnection of the PSU from the power supply network. The PSU module does not require performing any specific maintenance measures. However, in case of a thick dust layer, clean the PSU only with compressed air. In case of a fuse exchange, use the replacement of the same parameters.



**WEEE MARK**

**According to the EU WEE Directive – It is required not to dispose of electric or electronic waste as unsorted municipal waste and to collect such WEEE separately.**

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**CAUTION!** *The power supply unit is adapted for a sealed lead-acid battery (SLA). After the operation period it must not be disposed of but recycled according to the applicable law.*

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**Pulsar**

Siedlec 150, 32-744 Łapczyca, Poland  
Tel. (+48) 14-610-19-40, Fax. (+48) 14-610-19-50  
e-mail: [biuro@pulsar.pl](mailto:biuro@pulsar.pl), [sales@pulsar.pl](mailto:sales@pulsar.pl)  
http:// [www.pulsar.pl](http://www.pulsar.pl), [www.zasilacze.pl](http://www.zasilacze.pl)