Fire Alarm
System 3000

ZARJA ELEKTRONIKA

SYSTEM 3000 IN NORMAL STATE

NJP-3007

NJP-3004

Dedal **Attestation & Certification**

ZARJA ELEKTRONIKA

Concept

System 3000 is a **network-based addressable and conventional state-of-the-art alarm system** primarily designed for **signalling fire alarms** but due to its flexibility, it can also be used to:

- signal technological alarms,
- signal increased gas concentration,
- signal SOS alarms,
- control active fire protection systems, technological devices and sending signals to building management systems (BMS) and alarm receiving centres (ARC).

System 3000 is **modular and fully scalable** in every aspect. A comprehensive range of control equipment, communication equipment and software capabilities for even the most demanding projects. The system gives installers and end-users a **simple user experience** through the modern graphical user interface.

System

System 3000 consists of **mandatory and functional modules built-in separate panels**. Each panel represents one of the maximum **128 network nodes** on a redundant, fail-safe and fault-tolerant ZarjaNet-3000 network. There are three different panels available:

- NJP-3007,
- NJP-3004,
- 0P-3000.

All three panels have some common characteristic features such as colour 10.1" touch screen, LED indicators for indication of the mandatory indications (power, fault, disabled, …), built-in speaker, network functionality and basic inputs/outputs, including two conventional lines.

Panels NJP-3007 and NJP-3004 have **built-in power supplies** with back up batteries. NJP-3007 has space for **7 functional modules**, while NJP-3004 has space for **4 functional modules**.

OP-3000 **does not have its source of power**; therefore, an external power supply is required. The panel is primary used as a **remote repeater**.

ZarjaNet-3000 Network

ZarjaNet-3000 is a **redundant network in a ring topology**. The network is based on an improved **RS-485 bus**, with an extended common-mode range (+/-25 V). The software protocol allows the so-called **fault-tolerant functioning**. That means that in case of interruption or short circuit on any part of the network, no panel will be lost. The network needs only an **unshielded twisted pair** for each connection between network nodes (panels).

The ZarjaNet-3000 network enables to connect of up to **128 network nodes**. The network's **bit rate 115.2 kbit/s** ensures reliable communication up to a distance of at least **1200 m** (between adjacent nodes) while on-the-fly data compression enables high speed transmission of large chunks of data.

In the network implementation **via optical fibres**, it is necessary to use **RS-485 to fibre optic converters**. The converters should be installed as close as possible to the panels (preferably: in the panel enclosure, where the power supply is available).
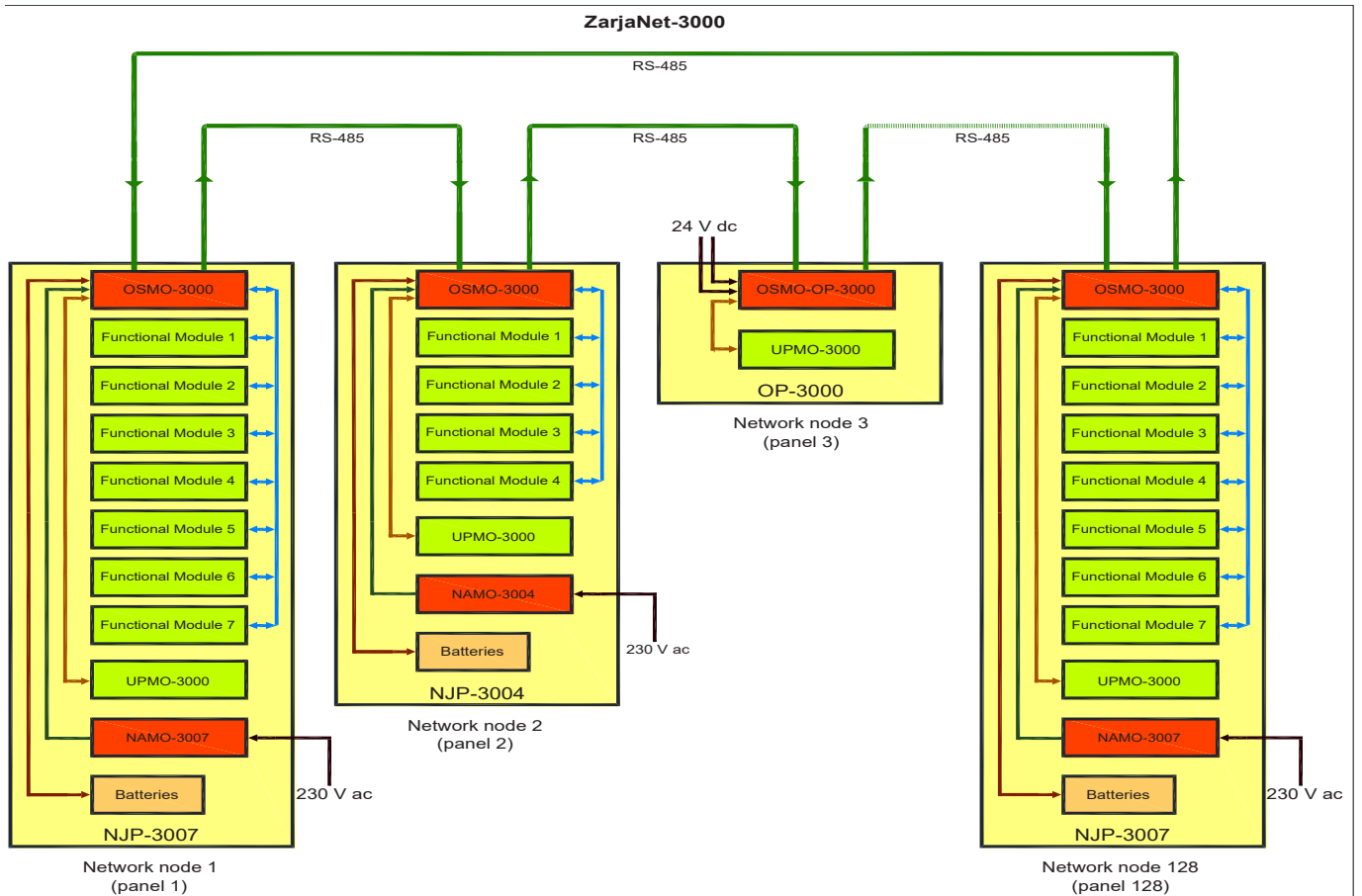
*ZarjaNet-3000 ports are present on every panel - **no additional hardware is needed.***

Panels **can be hierarchically organized** in up to three levels: main panel, panel and sub-panel. With the appropriate hierarchical organization the proper visibility of events and the proper rights to manage the system can be achieved.
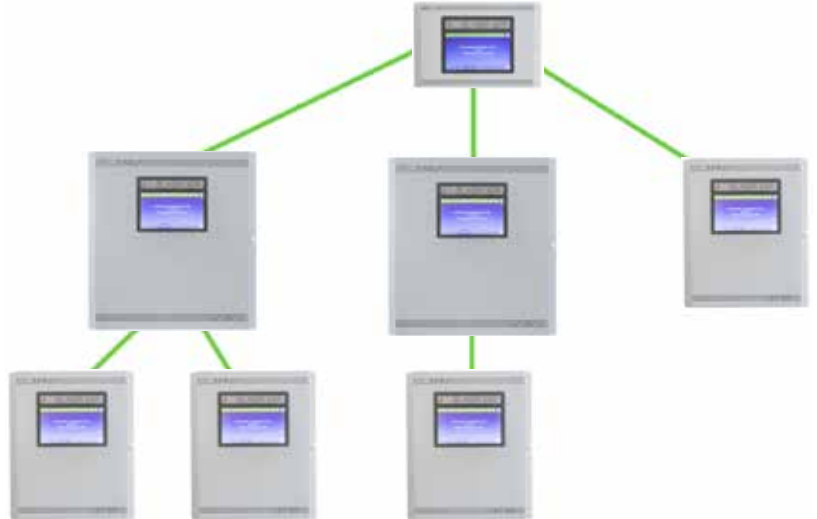
System Connectivity

The System 3000 allows connectivity with other systems such as:

- Alarm receiving centre (ARC),
- SCADA (Supervisory Control And Data Acquisition) and Building Management Systems,
- other systems (possibility of custom protocol).

Connectivity with other systems is based on **modern web-based protocols** via Ethernet port which is present on every panel - **no additional hardware is needed**.

System Programming

For entire system programming, the **Offline-3000** software package is available. The software enables user-friendly programming of all panels in the system:

- the number and type of panels,
- the hierarchy of these panels,
- the number and type of modules in each panel,
- connected device's properties,
- output's dependencies,
- delays< and much more.

Panels

Panel NJP-3007

The NJP-3007 panel can be fully expandable from **1 to 7 functional modules**.

The panel's **basic configuration** consists of:
*   metal housing OH-3007,
*   basic module OSMO-3000 (main and network processors, power management, networking and basic inputs/outputs, including two conventional lines),
*   power supply module NAMO-3007 (built-in power supply),
*   control and display module UPMO-3000 (conditionally mandatory),
*   batteries 2 x 12 V -maximum 85 Ah (battery compartment),
*   DIN rail for installation of additional devices.

The NJP-3007 panel is recommended when a **large number** of **(i) loops** (maximum 14) and/or **(ii) inputs and/or outputs** at one location are required. This panel is also recommended if the **power requirements** of connected elements is **high**, and a powerful power supply module is needed.

Panel NJP-3004

The NJP-3004 panel can be fully expandable from **1 to 4 functional modules**.

The panel's **basic configuration** consists of:
*   metal housing OH-3004,
*   basic module OSMO-3000 (main and network processors, power management, networking and basic inputs/outputs, including two conventional lines),
*   power supply module NAMO-3004 (built-in power supply),
*   control and display module UPMO-3000 (conditionally mandatory),
*   batteries 2 x 12 V -maximum 45 Ah (battery compartment),
*   DIN rail for installation of additional devices.

The NJP-3004 panel is recommended when a **medium number** of **(i) loops** (maximum 8) and/or **(ii) inputs and/or outputs** at one location are required.

Panel OP-3000

The panel OP-3000 is **not expandable**. It is primary used as a **remote repeater**.

The panel's **basic configuration** consists of:
*   metal housing OH-3000,
*   basic module OSMO-OP-3000 (main and network processors, power management, networking and basic inputs/outputs, including two conventional lines),
*   control and display module UPMO-3000 (conditionally mandatory).

The panel **does not have its source of power**; therefore, an external power supply is required. It has a doubled input for the external power supply (24 V dc).

The OP-3000 panel is recommended when a **shallow compact design is needed** (24-hour on-call service, entrance to the building, hallway, ...).

This panel is also recommended if the **inputs and outputs** available on the basic module OSMO-OP-3000 **are sufficient**. Two conventional lines allow the connection of up to 2 x 32 conventional detectors, covering the

Modules

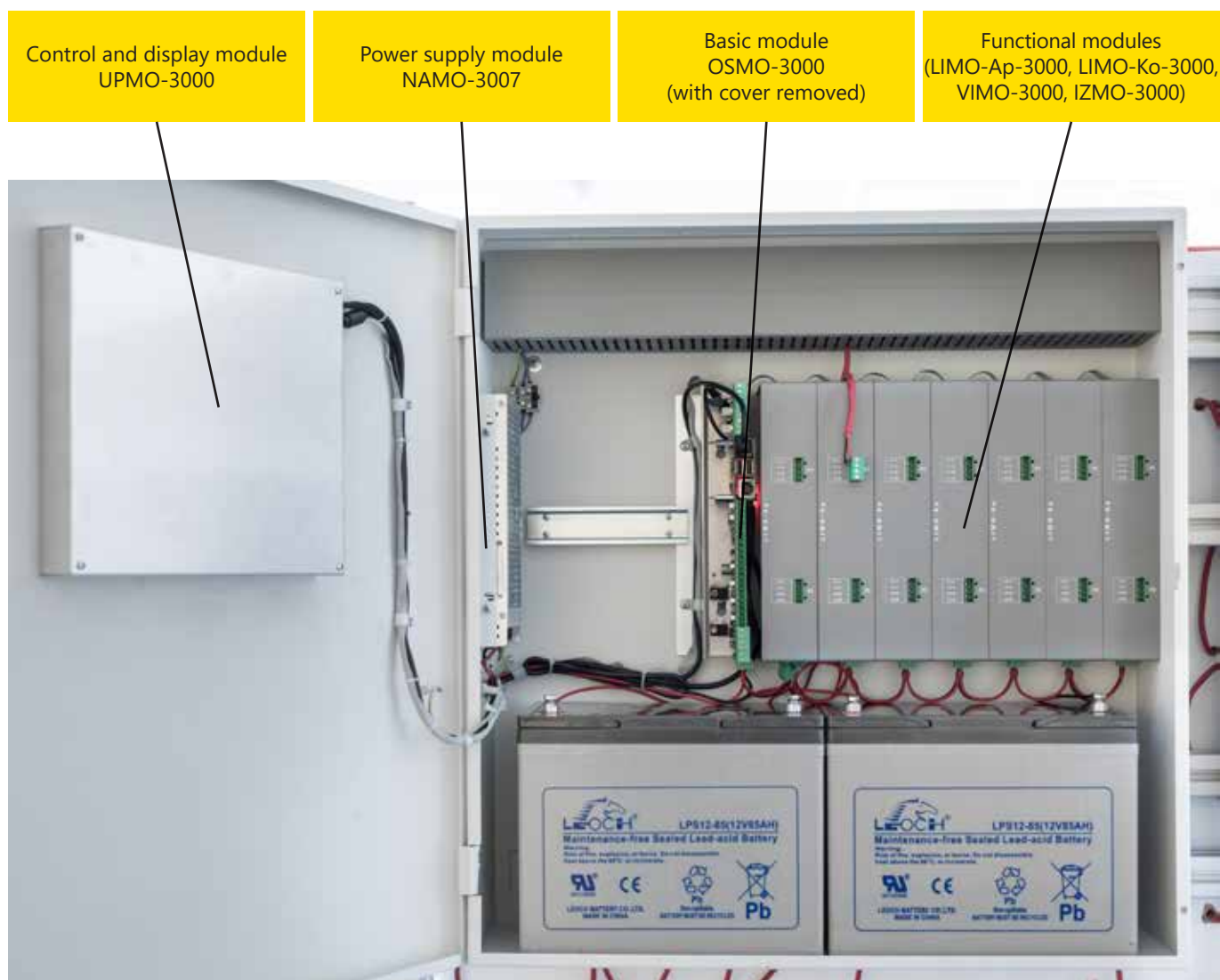The building blocks of the system are modules. We divided them into two groups:

MANDATORY MODULES (part of basic configuration)

- **OSMO-3000** (basic module) and **NAMO-3007** (power supply module) in panel NJP-3007,
- **OSMO-3000** (basic module) and **NAMO-3004** (power supply module) in panel NJP-3004,
- **OSMO-OP-3000** (basic module) in panel OP-3000,
- **UPMO-3000** (control and display module) in all three panels (***conditionally mandatory module** (at least one must be used per system)).

FUNCTIONAL MODULES (built-in panel NJP-3007 and NJP-3004 according to the requirements)

- **LIMO-Ap-3000** (addressable module),
- **LIMO-Ko-3000** (conventional module),
- **VIMO-3000** (input-output module),
- **IZMO-3000** (output module).

The picture below presents the layout of the modules in the panel NJP-3007.

| Control and display module UPMO-3000 | Power supply module NAMO-3007 | Basic module OSMO-3000 (with cover removed) | Functional modules (LIMO-Ap-3000, LIMO-Ko-3000, VIMO-3000, IZMO-3000) |

Mandatory Modules

NAMO-3007 and NAMO-3004 Power Supply Modules

NAMO-3007 and NAMO-3004 power supply modules provide power to panels NJP-3007 and NJP-3004. **The rated output power** of NAMO-3007 is **203 W**, while NAMO-3004 is **117 W**.

UPMO-3000 Control and Display Module (*conditionally mandatory)

UPMO-3000 module is mandatory when the system consists of only one panel. When more than one panel is used in the system, **at least one UPMO-3000** must be used in the main panel. Panels without UPMO-3000 are black-boxes for economical network solutions.

UPMO-3000 module has the following features:
- **10.1-inch colour resistive touchscreen** provides easy access to the panel's user menus and shows system status information,
- **16 LED indicators** for indication of the mandatory indications (power, fault, disabled, ...),
- **built-in speaker**,
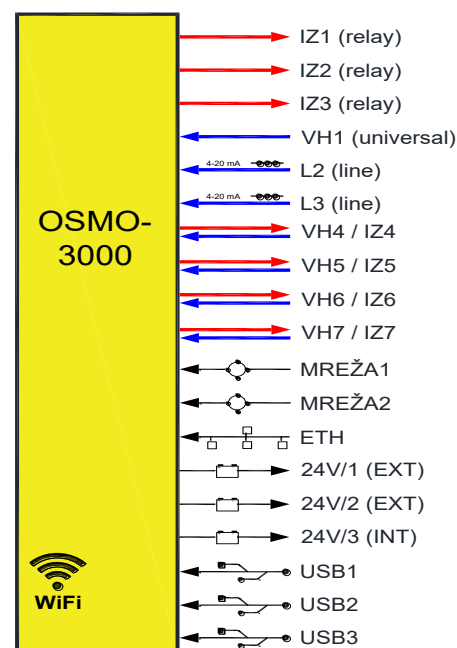- **on-screen site maps** for easy locating of zones in alarm.
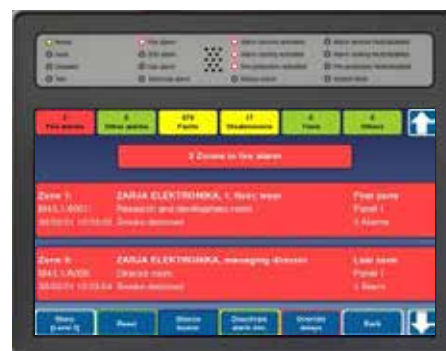
OSMO Basic Module

OSMO-3000 is a mandatory module used in panels NJP-3004 and NJP-3007, while the OSMO-OP-3000 module is mandatory in panel OP-3000.
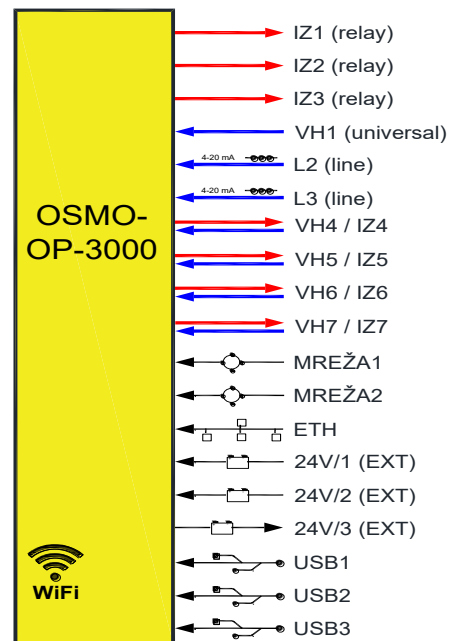
OSMO-3000 Basic Module

OSMO-3000 module has the following features:
- three relay (SPDT) outputs (**IZ1 - IZ3**; same as on IZMO-3000),
- one independent universal input (**VH1**; same as inputs on VIMO-3000),
- two conventional lines (**L2 - L3**; same as on LIMO-Ko-3000),
- four universal input/transistor output pairs (**VH4 - VH7, IZ4 - IZ7**; same as on VIMO-3000),
- two ZarjaNet-3000 ports (**MREŽA1 - MREŽA2**),
- one Ethernet port (**ETH**),
- two power supply outputs for external loads (**24V/1 – 24V/2**),
- one power supply output for internal loads (**24V/3**),
- three USB ports (**USB1 – USB3**),
- WiFi access point (**WiFi**; for transferring site specific data and diagnostic).

OSMO-3000

- IZ1 (relay)
- IZ2 (relay)
- IZ3 (relay)
- VH1 (universal)
- L2 (line) — 4-20 mA
- L3 (line) — 4-20 mA
- VH4 / IZ4
- VH5 / IZ5
- VH6 / IZ6
- VH7 / IZ7
- MREŽA1
- MREŽA2
- ETH
- 24V/1 (EXT)
- 24V/2 (EXT)
- 24V/3 (INT)
- USB1
- USB2
- USB3

WiFi

OSMO-OP-3000 Basic Module

The modules OSMO-3000 and OSMO-OP-3000 are almost identical, except that power supply ports on OSMO-OP-3000 are defined differently. **24V/1** and **24V/2** represent two power supply inputs while **24V/3** is power supply output for external loads.

OSMO-OP-3000

- IZ1 (relay)
- IZ2 (relay)
- IZ3 (relay)
- VH1 (universal)
- L2 (line) — 4-20 mA
- L3 (line) — 4-20 mA
- VH4 / IZ4
- VH5 / IZ5
- VH6 / IZ6
- VH7 / IZ7
- MREŽA1
- MREŽA2
- ETH
- 24V/1 (EXT)
- 24V/2 (EXT)
- 24V/3 (EXT)
- USB1
- USB2
- USB3

WiFi

Functional Modules

Functional modules are selected based on **(i)** the type of detectors and **(ii)** the type and number of devices controlled by the NJP-3004 and NJP-3007 panel.

LIMO-Ap-3000 Addressable Module

The module provides a connection of **two addressable loops (Z1 – Z2)** with up to **254 Apollo addressable devices** per loop (detectors or input/output devices). Apollo S90, XP95, Discovery and Core protocols are supported. Advanced algorithms and hardware implementation of the loop controller provide reliable communication over unshielded cables. Short circuit protection is provided at both ends of the loop. The high current loop capacity (**0.5 A**) allows a connection of various loop-powered addressable sounders and beacons. The loop voltage is stabilized at 28 V dc / 9 V pp or 35 V dc / 13 V pp (only Core protocol).

LIMO-Ap-3000

- + Z1/A
- - Z1/A   Addressable loop 1
- + Z1/B
- - Z1/B
- + Z2/A
- - Z2/A   Addressable loop 2
- + Z2/B
- - Z2/B
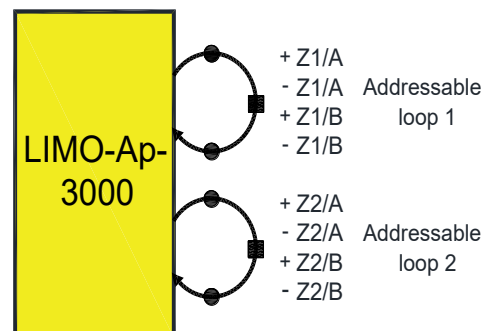
LIMO-Ko-3000 Conventional Module

The module has **16 conventional lines (L1 – L16)** with a maximum of **32 conventional detectors per line** (Apollo S-60/65, Orbis and other similar brands, also in intrinsically safe version). Line is monitored through the end of line resistor. Implementation of the module provides a direct connection of devices with a 4-20 mA output.

LIMO-Ko-3000

- L1 (line) — 4-20 mA
- L2 (line) — 4-20 mA
- L3 (line) — 4-20 mA
- .
- .
- .
- L16 (line) — 4-20 mA
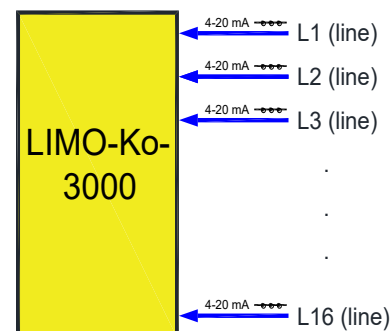
VIMO-3000 Input-Output Module

The module has **16 pairs of universal inputs (VH1 – VH16) and transistor outputs (IZ1 – IZ16)**. The outputs are short circuit protected. The capacity of each output is 1.3 A.

The inputs can be used to:
• supervise the output,
• supervise the devices with potential-free contact output,
• supervise the presence of voltage (fuse, switch state, ...).

VIMO-3000

- VH1 / IZ1
- VH2 / IZ2
- VH3 / IZ3
- .
- .
- .
- VH16 / IZ16
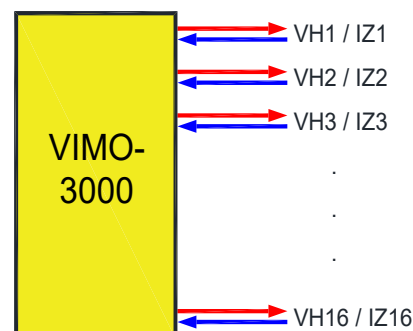
IZMO-3000 Relay Output Module

The module has **16 relay (SPDT) outputs (IZ1 – IZ16)**. The capacity of each output is 2 ! / 30 V dc (min: 10 mV dc, 10 µ!). Outputs are fundamentally intended to signal the status to the third-party devices.
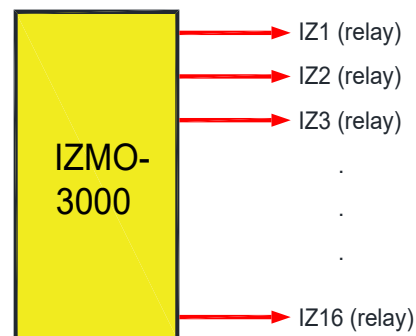
System Redundancy

System 3000 and each panel can supervise more than 512 detectors; therefore, redundancy is necessary. Each panel **has two main and two network processors**. Associated memories (**FLASH and RAM**) are also **doubled**. The panel automatically switches to a redundant processor if any of these processors or associated memory fails.
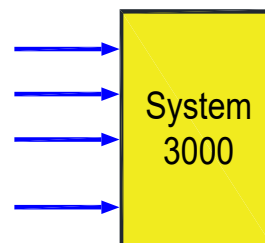
System Inputs

The System 3000 has the following **inputs**:
• input on the module (LIMO-Ko-3000, VIMO-3000, OSMO-3000, OSMO-OP-3000),
• address (on the address loop),
• address input (address loop interface).

Inputs on the System 3000 can **trigger the following events**:
• fire alarm,
• SOS alarm,
• gas warning and gas alarm,
• technical warning and technical alarm,
• fault,
• general event.

Certain inputs can trigger only certain events (e.g., address optical detector can trigger only fire alarm). Where appropriate, it is possible to **(i)** reverse the input state (normal, non-normal) and/or **(ii)** delay generation of the event.
When warnings, faults (except system fault) or general events occur, the system follows the input state. The inputs can be disabled or switched to test mode. An additional input option is to trigger system commands (reset, disable zone, ...).

System Outputs

The System 3000 has the following **outputs**:
• output on the module (IZMO-3000, VIMO-3000, OSMO-3000, OSMO-OP-3000),
• address output (address loop interface).

Outputs are classified by **purpose** to:
• alarm devices (sounders, audio/visual indicators, ...),
• fire protection (extinguishing systems, cooling systems, elevators, ...),
• alarm routing,
• fault routing,
• auxiliary (additional signalling).

Proper classification is essential for the correct functioning of the system.

The following sources can **trigger the outputs** on the System 3000:
• activation according to the site specific data (conditions fulfilled),
• manual activation (by user, from SCADA, ...).
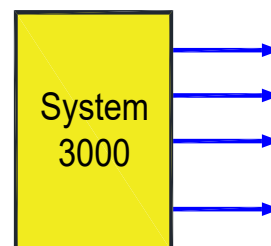
Outputs can be activated individually or by group addressing (on the address loop). Outputs can be delayed, and a delay in progress can be overriden. Outputs can also be disabled.

TECHNICAL SPECIFICATIONS

System 3000

Network topology:
- ring

Number of nodes (panels) in the system:
- max 128

Number of functional modules:
- 896 (128 panels x 7 funcional modules)

Number of fire alarm zones:
- 32767

Number of points (addresses, inputs, outputs):
- 512000

Distance between nodes (panels):
- up to 1200 m

Network speed:
- 115.2 kbit/s

Ethernet speed:
- 1000 Mbit/s

Standards:
- EN 54-2:1997/A1:2007,
- EN 54-4:1997/A2:2006,
- EN 54-13:2017+A1:2020.

Panel OP-3000

Power supply (2 x input for external power supply):
- 24 V dc (min: 20 V dc; max: 29 V dc)

3 x relay (SPDT) output:
- 2 A / 30 V dc (minimum: 10 mV dc, 10 µ!)

1 x independent universal input:
- maximum input voltage: 29 V dc

2 x conventional input:
- voltage of unloaded input: 19 V, current limitation: 25 mA +/-5 mA

4 x transistor output:
- 1.3 A, short circuit protected

4 x universal input:
- maximum input voltage: 29 V dc

2 x ZarjaNet-3000 port:
- RS-485 with extended common-mode range (+/-25 V)

1 x Ethernet port:
- 1000BASE-T

1 x output for external loads:
- voltage from external power supply – 1 V / 1.3 A, short circuit protected

3 x USB port:
- 1x USB 2.0, 2x USB 3.0

1 x WiFi access point:
- IEEE 802.11a/b/g/n

Housing dimensions (H x W x D mm):
- OH-3000: 450 x 295 x 80

Weight of basic structure:
- 4.3 kg

IP rating:
- IP-30

Panels NJP-3004 and NJP-3007

Power supply:
- 230 V ac +10 %, -15 %

Power supply – rated power
- NJP-3004: 117 W,
- NJP-3007: 203 W

Standby power supply (battery capacity):
- sealed lead-acid batteries,
- NJP-3004: 2 x 12 V, 45 Ah,
- NJP-3007: 2 x 12 V, 85 Ah

3 x relay (SPDT) output:
- 2 A / 30 V dc (minimum: 10 mV dc, 10 µA)

1 x independent universal input:
- maximum input voltage: 29 V dc

2 x conventional line:
- voltage of unloaded input: 19 V,
- current limitation: 25 mA +/-5 mA

4 x transistor output:
- 1.3 A, short circuit protected

4 x universal input:
- maximum input voltage: 29 V dc

2 x ZarjaNet-3000 port:
- RS-485 with extended common-mode range (+/-25 V)

1 x Ethernet port:
- 1000BASE-T

2 x output for external loads:
- 24 V dc (min: 21 V dc, max: 29 V dc) / 1.3 A, short circuit protected

1 x output for internal loads:
- 24 V dc (min: 21 V dc, max: 29 V dc) / 1.3 A, short circuit protected

3 x USB port:
- 1x USB 2.0, 2x USB 3.0

1 x WiFi access point:
- IEEE 802.11a/b/g/n

Housing dimensions (H x W x D mm):
- OH-3004: 597 x 450 x 180,
- OH-3007: 635 x 600 x 180

Weight of basic structure (without batteries):
- NJP-3004: 15 kg,
- NJP-3007: 20 kg

Weight of basic structure (with batteries):
- NJP-3004: 45 kg (max),
- NJP-3007: 70 kg (max)

IP rating:
- IP-30

TECHNICAL SPECIFICATIONS
Functional modules

LIMO-Ap-3000

- 2 loops with up to 254 addressable devices per loop
- **protocol:** Apollo S90, XP95, Discovery and Core
- **maximum current on each loop:** 0.5 A, short circuit protected
- **protocol voltage (stabilized):** 28 V dc / 9 V pp or 35 V dc / 13 V pp (only Core protocol)
- **maximum loop length:** 3000 m

LIMO-Ko-3000

- 16 conventional lines, compatible with devices with a 4-20 mA output
- **voltage of unloaded line:** 19 V, current limitation: 25 mA +/-5 mA
- maximum 32 detectors per line

VIMO-3000

- 16 pairs of universal inputs and transistor outputs
- **output capacity:** 1.3 A, short circuit protected
- **maximum input voltage:** 29 V dc

IZMO-3000

- 16 relay (SPDT) outputs
- **output capacity:** 2 A / 30 V dc (minimum: 10 mV dc, 10 µA)

TECHNICAL SPECIFICATIONS
Mandatory modules

UPMO-3000 (conditionally mandatory)

- 10.1-inch resistive touchscreen
- **touchscreen resolution:** 1024 x 600 pixels
- 16 LED indicators
- built-in speaker

NAMO-3004

- single output switching power supply
- **rated output power:** 117 W

NAMO-3007

- single output switching power supply
- **rated output power:** 203 W

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