



Protection
and sensing

zillion

We offer switching, protection, and sensing solutions designed to integrate into any low-voltage panel configuration, providing the most suitable option for each use case.

Our systems allow for the measurement of essential electrical parameters directly at the protection point, which simplifies the panel layout and enhances network visibility from the source. Sensors can be installed both at the top and bottom of fuse switches, and we offer products compatible with panels protected either by fuse switches or by automatic circuit breakers.

Additionally, some solutions do not require electrical shutdowns, making field installation easier without service interruptions.

The range includes both compact and modular versions, designed for easy integration into third-party equipment, offering maximum flexibility without compromising advanced technical performance.

01. Protection and sensing

01.1 SFS Smart Fuse Switch - Lower position solution

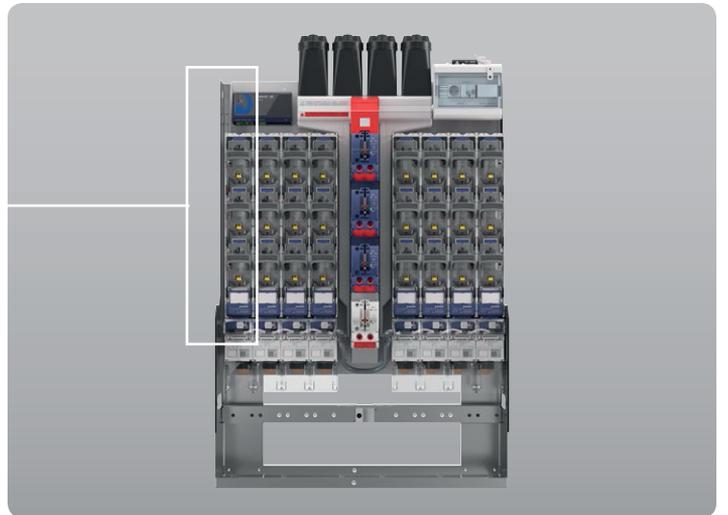
The SFS is an intelligent fuse switch that integrates current transformers and an electronic card to digitise the network's electrical parameters. This solution incorporates both the current transformers and a feeder meter in the lower part of the switch. Its compact design and minimal wiring simplify installation and operation, while ensuring reliable protection through NH fuses. The system allows the replacement of feeder meters under voltage (without requiring power shutdown) and can be retrofitted into existing panels.

FUNCTIONALITIES AND CHARACTERISTICS

- NH fuse switch disconnection and protection.
- Electrical signal acquisition directly at the protection point.
- Analogue signal digitisation for real-time monitoring.
- Compact architecture with reduced cabling for easier installation.
- Compatible with existing installations (retrofit-ready).
- Safe replacement of feeder meters under voltage, without power interruption.
- Three-phase supervisor per outgoing.
- Built-in current transformers and voltage taps.

KEY USE CASE

- Ideal for low-voltage distribution panels requiring compact protection and monitoring, with simplified wiring and enhanced operational continuity.
- Equipped as standard with SAL (Advanced Line Supervisor) and with TSA (Advanced Supervision Card).



01. Protection and sensing

01.2 SFS Smart Fuse Switch - Upper position solution

The SFS is an intelligent fuse switch that integrates current transformers, voltage connections, and a feeder meter within an upper position configuration. This compact and space-saving design makes it ideal for distribution panels where installation space is limited, offering seamless integration without compromising safety or functionality.

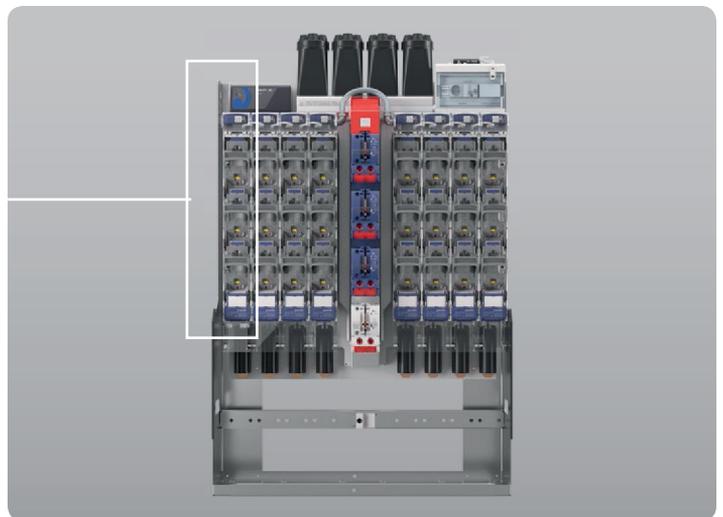
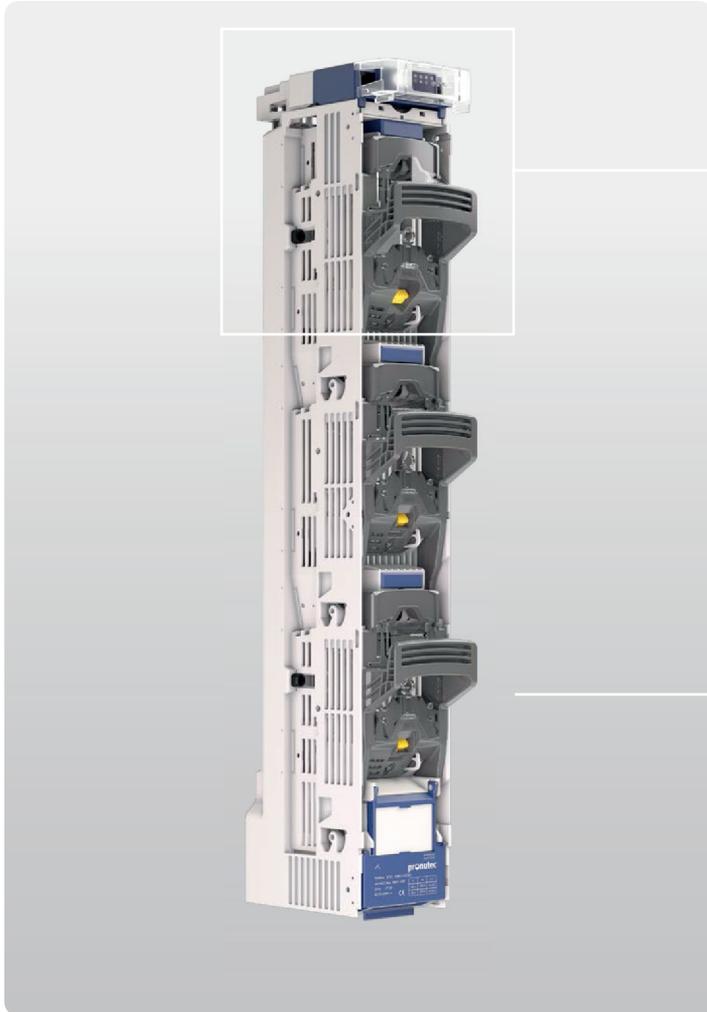
It ensures reliable protection through NH fuses and enables the replacement of feeder meters under voltage (without the need for power shutdown). The unit combines protection, measurement, and monitoring in a single, easily installable solution that can also be retrofitted into existing low-voltage panels.

FUNCTIONALITIES AND CHARACTERISTICS

- NH fuse switch disconnection and protection.
- Electrical signal acquisition directly at the protection point.
- Analogue signal digitisation for real-time monitoring.
- Compact architecture with reduced cabling for easier installation.
- Compatible with existing installations (retrofit-ready).
- Safe replacement of feeder meters under voltage, without power interruption.
- Three-phase supervisor per outgoing.
- Built-in current transformers and voltage taps.

KEY USE CASE

- Ideal for low-voltage distribution panels where installation space is limited, requiring compact protection and monitoring with simplified wiring and enhanced operational continuity.
- Equipped as standard with SAL (Advanced Line Supervisor) and with TSA (Advanced Supervision Card).



01. Protection and sensing

01.3 SAL – Advanced Line Supervisor

The SAL (Advanced Line Supervisor) is a compact measurement device designed to capture electrical signals through integrated current transformers and voltage connections for each phase. It provides accurate electrical data directly from the fuse switch, enabling precise monitoring and diagnostics across the low-voltage network.

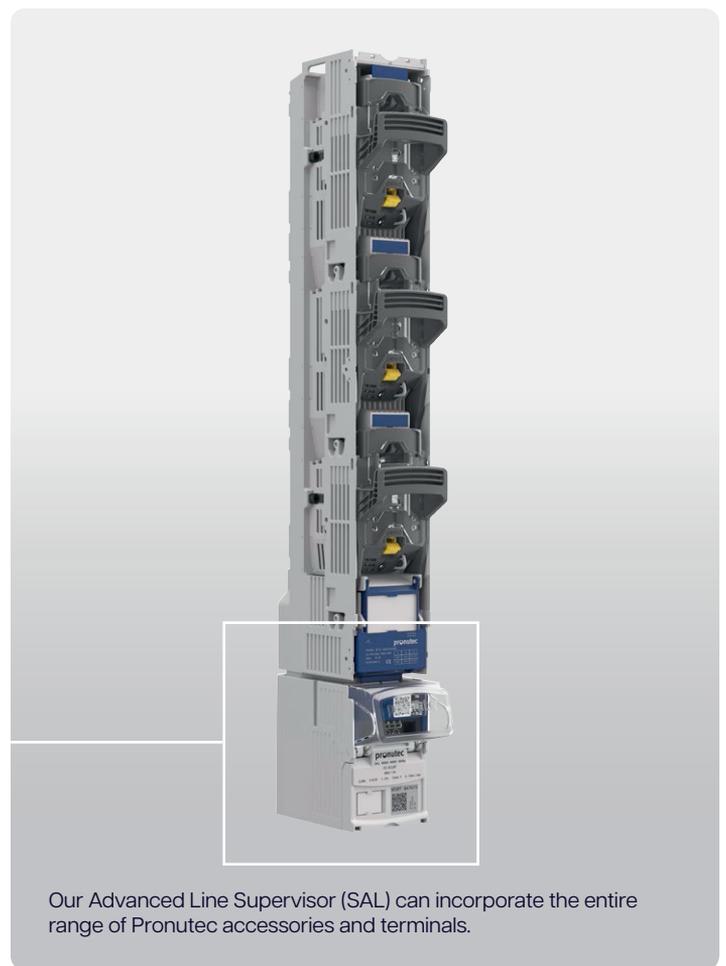
Available in multiple current transformer ratios depending on the amperage of the fuse switch. It offers flexible adaptation to different configurations.

FUNCTIONALITIES AND CHARACTERISTICS

- Integrated current transformers and voltage connections per phase.
- Multiple current ratios available (250 A / 400 A / 600 A).
- Accurate signal acquisition for protection and monitoring.
- Designed for use with fuse switches in low-voltage panels.
- Compatible with existing installations (retrofit-ready).
- Requires power shutdown for installation.

KEY USE CASE

Ideal for retrofitting or replacing existing monitoring units in low-voltage panels equipped with fuse switches, providing precise electrical measurement where full smart functionality is not required.



Our Advanced Line Supervisor (SAL) can incorporate the entire range of Pronutec accessories and terminals.

CURRENT TRANSFORMER RATIOS

| I prim. | I sec. | VA | Pr. Cl. | FS | Gama |
|---------|--------|---------|---------|-----|-------|
| 250 A | 1 A | 2,5 VA | 0,5 | < 5 | 120 % |
| 400 A | 1 A | 2,5 VA | 0,5S | < 3 | 120 % |
| 600 A | 1 A | 2,5 VA. | 0,5 | < 5 | 120 % |

01. Protection and sensing

01.4 TSA – Advanced Supervision Card

The TSA (Advanced Supervision Card) is a three-phase feeder meter integrated inside the any Smart Advanced Line Supervisor such as our SAL (Advanced Line Supervisor).

It converts analogue signals into digital data, reading all key electrical parameters and transmitting them to the LV Edge Node through RS485 serial ports.

Compact and precise, the TSA enables real-time supervision of voltage, current, power, and energy across each phase, forming the digital core of Zillion’s monitoring architecture.

FUNCTIONALITIES AND CHARACTERISTICS

Calculates RMS values per second for:

- Voltage and current per phase (including neutral current).
- Active, reactive, and apparent power (per phase and total).
- Power factor, frequency, and phase presence.
- Imported/exported energy and reactive energy in all four quadrants.
- Internal temperature.
- Voltage and current oscillography in case of alarm.

Communicates via RS485 in daisy-chain configuration (up to 24 feeder meters per bus), ensuring reliable data transmission.

Alarm generation per phase: blown fuse, over/under voltage, current overload, short-circuit current.

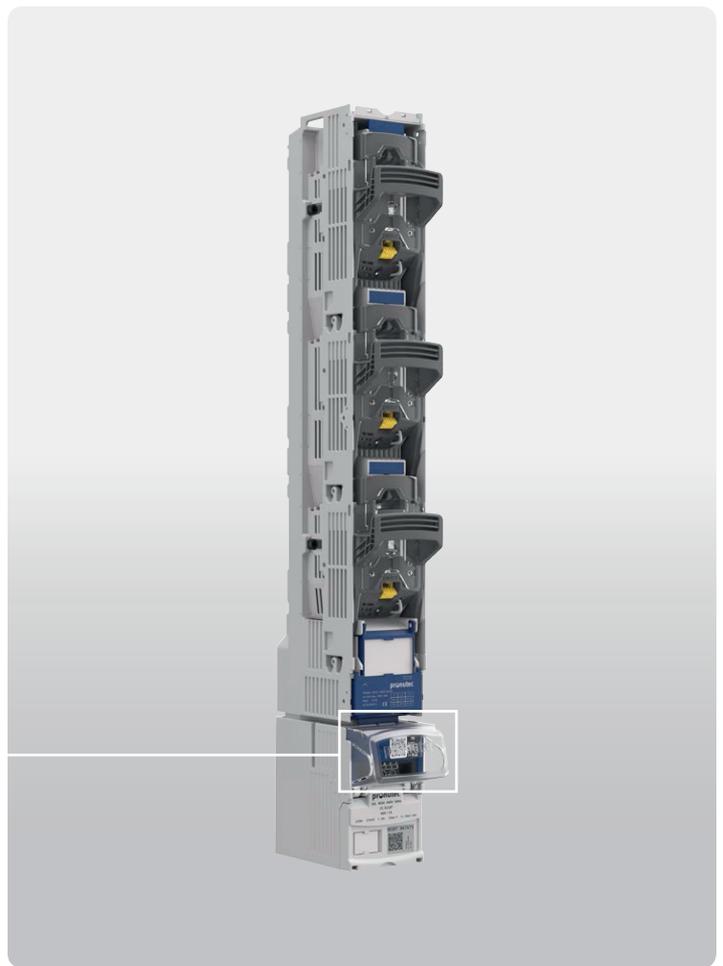
Communication via DLMS/COSEM (HDLC) or Modbus protocols.

Compatible with both upper- and lower-mounted LV monitoring solutions.

Available in two formats for different space and measurement requirements (amperes/millivolts).

KEY USE CASE

Ideal for real-time digital supervision in modular LV monitoring solutions, transforming analogue signals into actionable data for network diagnostics and control.



01. Protection and sensing

01.5 LRS – Life Retrofit Supervision

The LRS is a new low-voltage monitoring solution that enables live installation without power shutdown. Designed for retrofit applications, it allows advanced supervision on any type of three-pole fuse switch or circuit breaker, regardless of brand or panel configuration.

It uses the same electronic components and measurement performance as other Zillion supervisors, ensuring full compatibility and consistent accuracy across all systems.

FUNCTIONALITIES AND CHARACTERISTICS

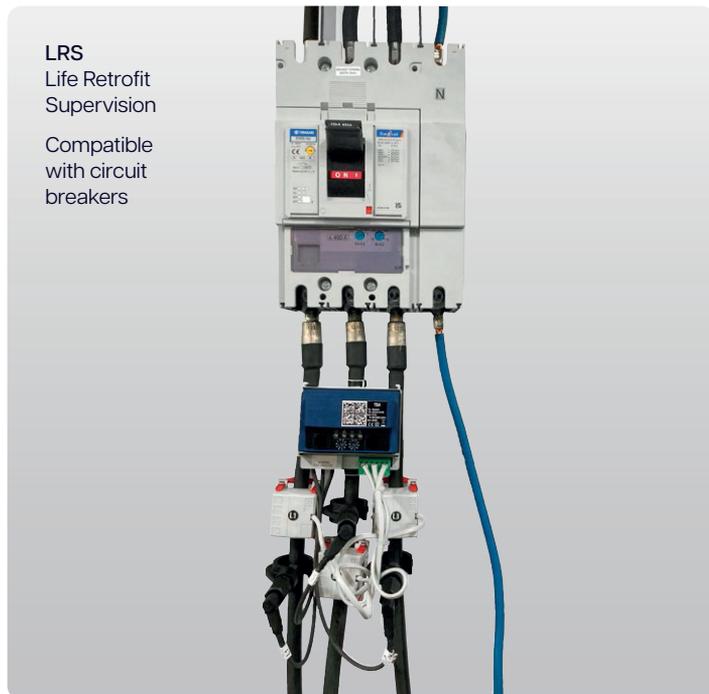
- Live installation without energy supply interruption.
- Open-core current transformers for quick and easy fitting.
- Insulation-piercing voltage taps for direct and safe connection.
- Equipped as standard with TSA (Advanced Supervision Card), delivering the same functionalities as other Zillion supervisors.
- Voltage and current measurement per line and phase for accurate real-time monitoring.
- Compact components and concentrated cabling per line, avoiding clutter on the substation floor.
- Flexible component positioning along distribution cables for optimal integration.
- Integrated card holder for direct sensor connection and signal interface.
- Protection fuses included for enhanced safety.
- Fully compatible with any LV infrastructure—any type, standard, or brand of fuse switch or circuit breaker. Suitable for both new and legacy panels, with no need for prior inspection before retrofit.
- Fast and simple deployment, ideal for field upgrades.

KEY USE CASE

Designed for utilities and operators modernising existing low-voltage networks, the LRS enables real-time monitoring and diagnostics without service interruption. Perfect for retrofit projects, asset digitalisation, and progressive network automation where installation time and continuity of supply are critical.

CONNECTION OPTIONS

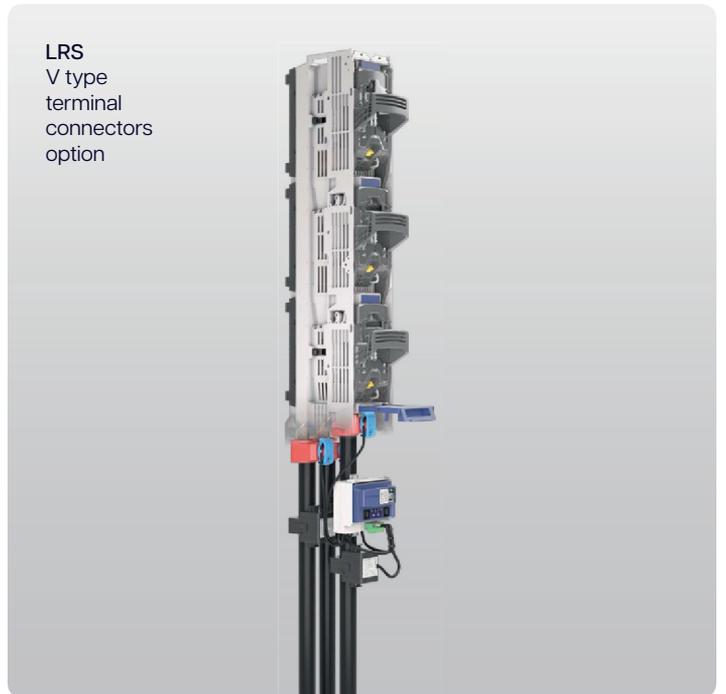
Voltage taps option (Vampire Clips): for direct connection to insulated cables. Ring terminal option: for secure and standardised connections to terminal blocks or busbars. V-Type terminal connector option: for flexible, quick-fit connection in space-constrained environments.



01. Protection and sensing

01.5 LRS – Life Retrofit Supervision

Zillion's LRS range offers different connection models to adapt to any installation requirement or cabling configuration. Each option ensures reliable voltage acquisition and easy integration into existing panels without cutting or stripping insulated cables.



01. Protection and sensing

01.6 LRG – Life Retrofit Rogowski

The LRG is a live-installation monitoring solution that enables advanced low-voltage supervision without interrupting the power supply. It uses Rogowski coils for current measurement—lightweight, flexible sensors that avoid saturation and do not require a ferromagnetic core.

Fully compatible with any low-voltage panel, fuse switch, or circuit breaker, the LRG ensures precise line and phase measurement even in compact or retrofit environments.

FUNCTIONALITIES AND CHARACTERISTICS

Installation without power interruption.

Current measurement using Rogowski coils (no saturation, lightweight, and flexible).

Compatible with any LV panel, brand, and type of three-pole fuse switch or circuit breaker.

Same performance as other Zillion monitoring solutions, including line and phase measurements.

Concentrated cabling on each line – no loose cables on the floor.

Flexible placement of components on power distribution cables.

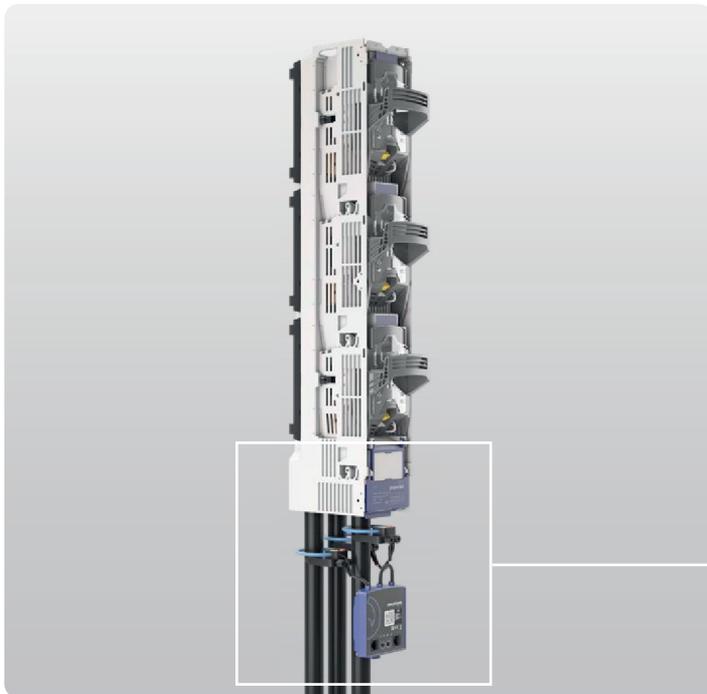
Voltage measurement using vampire clips, screw-nut, or other commercial accessories.

KEY USE CASE

Retrofit solution for low-voltage monitoring based on Rogowski coils.

Ideal for installations with limited space or where mechanical constraints prevent traditional transformers.

Compatible with existing infrastructures and suitable for fast, non-intrusive upgrades.





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zillion@gorlan.com