

2.27 RAM-1 - Daljinski nadzor elektroenergetskega omrežja

2.27 RAM-1 - Remote power grid monitoring

Namen

Prvi v svetu smo izdelali in s patentom zaščitili pametno napravo RAM-1, ki omogoča daljinski nadzor elektroenergetskega omrežja.

Usage

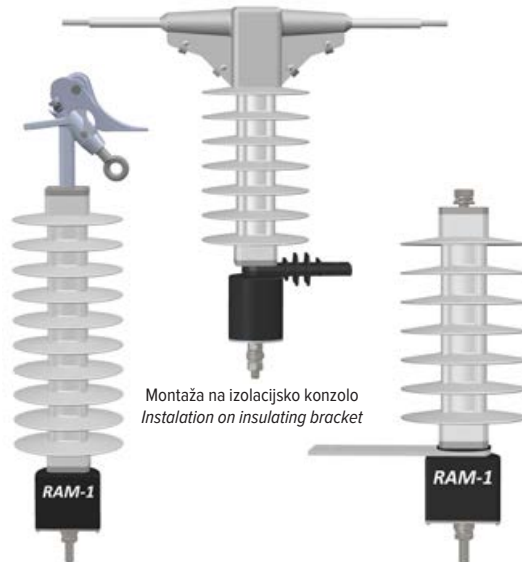
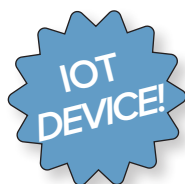
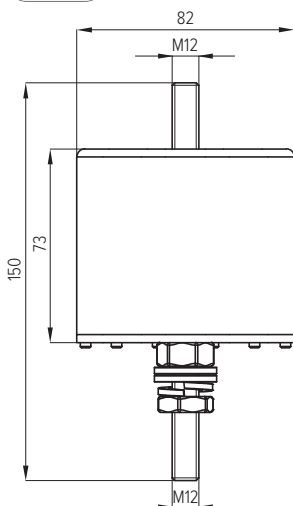
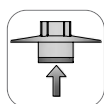
We are the first on the world to design and patent a smart device RAM-1 which is intended for remote monitoring of power grids.

Tehnični podatki

| | |
|------------------------|---|
| Uporaba | daljinski nadzor vgrajenih odvodnikov prenapetosti nad 1 kV |
| Osnovna meritve | ohmska komponenta uhajavega toka od 0 ... 3 mA ($\pm 10\%$) |
| Ostale meritve | okvara, števec strel, temperatura, nagib, lokacija |
| Standard | IEC 60099-5 |
| Temperaturno območje | - 20 °C (- 40 °C) ... + 85 °C |
| Stopnja zaščite ohišja | IP 67 |
| Frekvenca | 48 Hz ... 62 Hz |
| Uporabniški vmesnik | web, app, email |
| Merilni cikel | 1 ura |
| Komunikacijski cikel | okvara - takoj, normalno delovanje - 60 dni (nastavljivo) |
| Komunikacija | Bluetooth, 4G, 5G ali LoRaWAN |
| Avtonomija | do 20 let brez vzdrževanja |
| Material ohišja | termoplast V-0 (UL 94), nerjavno jeklo A2 ali A4 |
| Priključek / material | M12 / nerjavno jeklo A2 ali A4 |
| Montaža | na ozemljitveni strani odvodnika |
| Masa | 0,580 kg |

Technical data

| | |
|-----------------------------|---|
| Application | remote monitoring of installed surge arresters above 1 kV |
| Main measurement | resistive component of leakage current from 0 ... 3 mA ($\pm 10\%$) |
| Other measurements | instant fault, surge counter, temperature, position, location |
| Standard | IEC 60099-5 |
| Temperature range | - 20 °C (- 40 °C) ... + 85 °C |
| Housing IP protection level | IP 67 |
| Frequency | 48 Hz ... 62 Hz |
| User interface | web, app, email |
| Measuring cycle | 1 hour |
| Communication cycle | instant fault - instantly, normal conditions - 60 days (customizable) |
| Communication | Bluetooth, 4G, 5G or LoRaWAN |
| Autonomy | up to 20 years with out maintenance |
| Housing material | termoplast V-0 (UL 94), stainless steel A2 ali A4 |
| Connector / material | M12 / stainless steel A2 ali A4 |
| Installation | on the earthing side of the arrester |
| Mass | 0,580 kg |



Prostozačna montaža
Installation on overhead power line

Montaža na izolacijsko konzolo
Installation on insulating bracket

Montaža na kovinsko konzolo
Installation on steel bracket

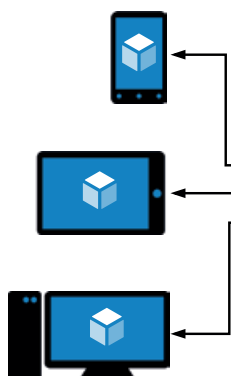
Prednosti

- Trenutno javljanje okvare, avtonomno delovanje, prikaz mesta vgradnje
- Enostavna vgradnja, ugodna cena, do 20 let brez vzdrževanja, brez stroškov povezave
- Dograditev na vse tipe vgrajenih ali na nove odvodnike prenapetosti od 1 kV dalje
- Pripravljeno za strojno učenje

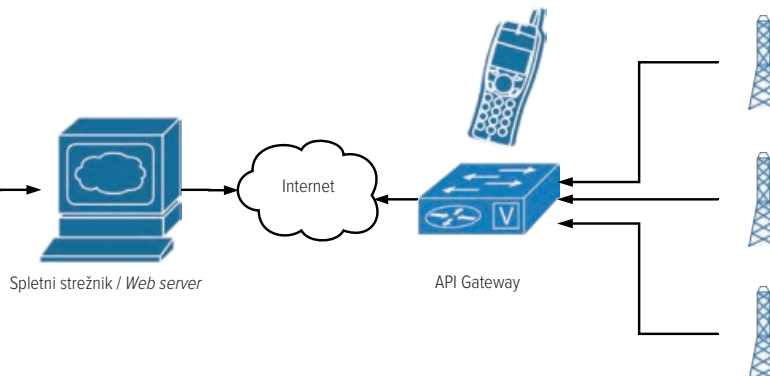
Advantages

- Alarm in case of instant fault, autonomous working, showing the installation location
- Simple installation, low price, up to 20 years with out maintenance, no connection fees
- Installation possible on all already installed or new surge arresters above 1 kV
- Machine learning ready device

Shema delovanja (RAM-1)



Operation scheme (RAM-1)



Paketi / Package

| | 1 | 2 | 3 | 4 |
|---|-------------------------------|------------------|-----------------------|---------------------|
| | Nelicenčni Without licence | Osnovni Basic | Razširjen Extended | Upravljanje Full |
| Meritve / Measurements | | | | |
| Ohmska komponenta uhajavega toka IEC 60099:5 Resistive component of leakage current IEC 60099:5 | ✓ | ✓ | ✓ | ✓ |
| Okvara / Instant fault | ✓ | ✓ | ✓ | ✓ |
| Lokacija / Location | | ✓ | ✓ | ✓ |
| Števec strel / Surge counter | | | ✓ | ✓ |
| Temperatura / Temperature | | | ✓ | ✓ |
| Nagib / Position | | | ✓ | ✓ |
| Izračun izgub (v pripravi) / Calculation of power loss (in preparation) | | | ✓ | ✓ |
| Povezljivost / Connectivity | | | | |
| 4G / 4G | ✓ | ✓ | ✓ | ✓ |
| 5G / 5G | | | ✓ | ✓ |
| Bluetooth / Bluetooth | ✓ | ✓ | ✓ | ✓ |
| LoRaWan / LoRaWan | | | ✓ | ✓ |
| Obveščanje / Messaging | | | | |
| Prikaz sporočila na 2 meseca (email) / Status report every 2 months (email) | ✓ | ✓ | ✓ | ✓ |
| Prikaz zadnjih 5 meritev (web, app) / Display of last 5 status reports (web, app) | | ✓ | ✓ | ✓ |
| Prikaz celotne zgodovine meritev, grafični prikaz (web, app) Display of entire history of status reports (web, app) | | | ✓ | ✓ |
| Avtomatsko obveščanje ob prekoračitvi dovoljene vrednosti (email) Automatic status report when set values are exceeded (email) | ✓ | ✓ | ✓ | ✓ |
| Avtomatsko obveščanje ob prekoračitvi dovoljene vrednosti (web, app, email) Automatic status report when set values are exceeded (web, app, email) | | ✓ | ✓ | ✓ |
| Nastavljiv interval poročanja / Adjustable status report interval | | | ✓ | ✓ |
| GPS lokacija (koordinate) / GPS location (coordinates) | | ✓ | ✓ | ✓ |
| GPS lokacija (koordinate, zemljevid, vodenje do naprave) GPS location (coordinates, map, guidance to surge arrester) | | | ✓ | ✓ |
| Alarm za okvaro (email) / Alarm in case of instant fault (email) | ✓ | ✓ | ✓ | ✓ |
| Alarm za okvaro (web, app, email) Alarm in case of instant fault (web, app, email) | | ✓ | ✓ | ✓ |
| Opcije / Additional options | | | | |
| Odčitavanje meritev iz naprave RAM-1 na terenu (Bluetooth) Status report from RAM-1 in the field (Bluetooth) | | ✓ | ✓ | ✓ |
| Jezik uporabniškega vmesnika - angleški / User Interface - English language | ✓ | ✓ | ✓ | ✓ |
| Jezik uporabniškega vmesnika - na željo kupca / User Interface - language by request | | | ✓ | ✓ |
| Beleženje aktivnosti naprave (pregledi, popravki, morebitne poškodbe, ...) Activity log (inspections, repairs, maintenance, ...) | | | ✓ | ✓ |
| Upravljanje z uporabniki (omejeno) / User management (limited) | | ✓ | | |
| Upravljanje z uporabniki (neomejeno) / User management (unlimited) | | | ✓ | ✓ |
| Upravljanje s sistemom RAM-1 v domeni podjetja Izoelektro Outsourcing services - management of RAM-1 system by Izoelektro | | | | ✓ |
| Možnost integracije v obstoječ nadzorni sistem (SCADA) Possibility of integration into the existing control system (SCADA) | | ✓ | ✓ | |
| Pripravljeno za strojno učenje / Machine learning ready device | ✓ | ✓ | ✓ | ✓ |