ENA Tecnología

CRYSSMA

Centralization of Recorders and Supervision of Safety and Maintenance

General Functionality

CRYSSMA, the *System of Centralization of Recorders and Supervision of Safety and Maintenance*, is an advanced solution designed to optimize the safety and efficiency of critical facilities, especially at Level Crossings.

It captures and stores essential operational data, providing a unified platform for information analysis and management.

Thanks to its advanced expert system, **CRYSSMA** analyzes this data in real time, allowing for quick identification and resolution of incidents, thus ensuring maximum safety and operational performance.

RECORD

Record and **store** any change of state in the vital elements supervised in a Level Crossing protection installation.

DETECT

Detect possible **failures** or **incidents** that occur in the supervised installations.


INFORM

Immediately inform about such incidents. **Facilitate** the consultation of stored information for analysis.

ARCHITECTURE

The architecture of the **CRYSSMA** system is designed to ensure comprehensive supervision and management of Level Crossing protection facilities. This structure is organized in several key levels, each performing specific functions within the **CRYSSMA** ecosystem, thereby ensuring smooth and safe operation.

- **Track level:** This level houses the Level Crossings, equipped with RDX5020 devices and ISPs that collect critical data in real time. The communication of these devices with the core of the system is secured through a variety of connections, including GPRS and Ethernet, among other advanced options. This diversity in communication modalities ensures reliable and versatile connectivity, adapting to different environments and operational requirements, and strengthening the resilience of the **CRYSSMA** system.

- **Centralization level:** At this crucial level, the server acts as the core of the system, aggregating and synthesizing information from multiple Level Crossings. This centralization allows the server to offer a global and detailed view of operations, facilitating effective management and supervision of all facilities. The server's ability to process and analyze data in real time is fundamental for the optimal performance and safety of the **CRYSSMA** system.

- **Operation level:** This level serves as the user interface, providing an accessible and friendly platform for direct interaction with the system, facilitating the monitoring and management of operations in an intuitive and efficient manner.

- **Alert level:** This level offers real-time alerts and crucial information. Users receive immediate notifications about conditions and critical events, allowing for a quick and effective response. This level ensures that users are always informed and prepared to act, thus reinforcing the safety and operational effectiveness of the **CRYSSMA** system.

The interconnection between these levels is facilitated through a TCP/IP network, ensuring the reliability and efficiency of communications. This layered approach not only enhances the system's responsiveness to incidents but also optimizes the management of facilities, ensuring safe and efficient operation.
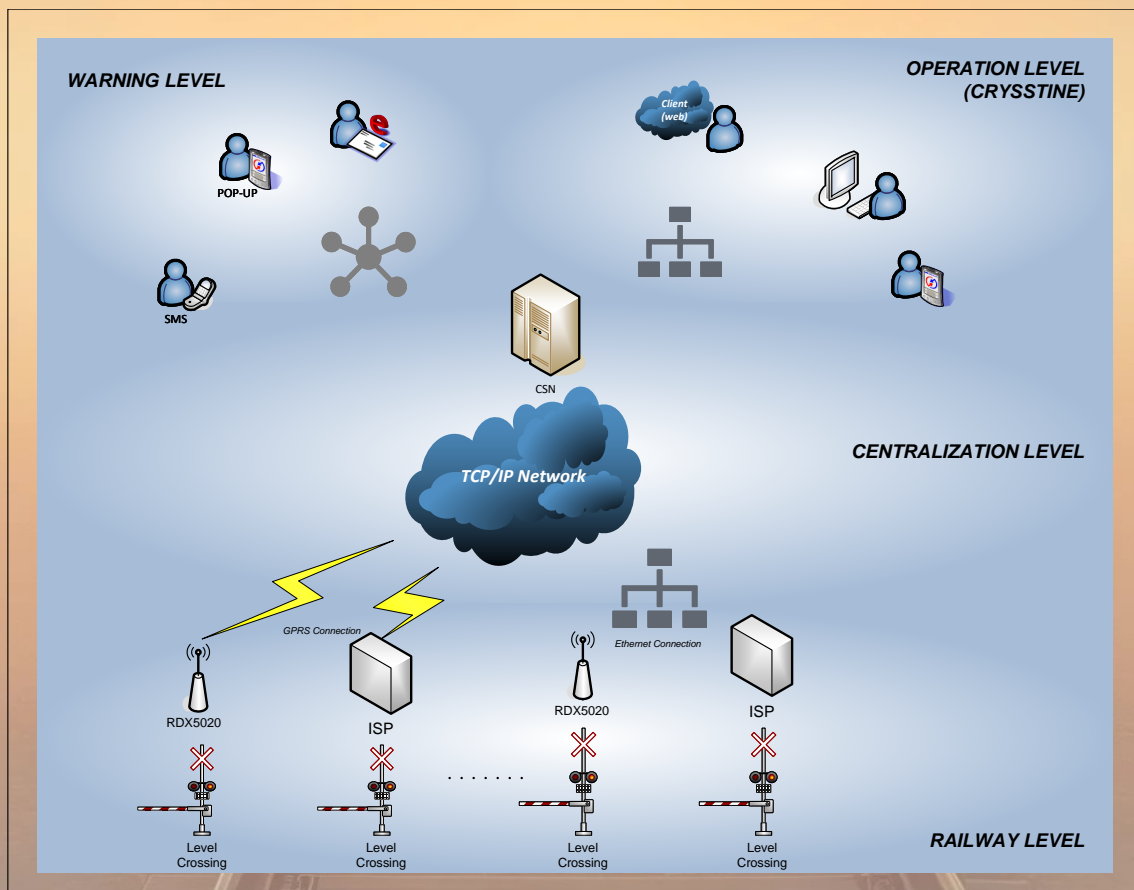
ISP 4008

The **ISP 4008** is an essential component in the supervision and control of critical systems, designed for efficient integration in security infrastructures. With its capability to handle multiple digital inputs, this device adapts to a wide range of applications, ensuring accurate and real-time data collection. Its robustness and reliability make it an ideal choice for demanding environments, where precision and stability are crucial.

This device stands out for its flexibility in terms of connectivity, offering various options such as Ethernet, GPRS, and 4G, facilitating its deployment in different network configurations and ensuring continuous communication with central systems. The ISP 4008 is compatible with existing security installations, allowing seamless integration without the need for costly modifications.

Validated by ADIF and certified in compliance with the Technical Specification *"Event Recorders for Level Crossings, ET 03.365.551.5 ed1 January 2020"*, the **ISP 4008** sets a new standard in railway protection and security.

Inputs

The **ISP 4008**, equipped with 24VDC digital inputs and an impedance $\geq 2200\Omega$, is designed to ensure safe and reliable integration in critical security systems. With the option to choose between 34 and 64 inputs, it offers exceptional adaptability to the specific needs of each installation. This device stands out for its capability to ensure operation without interfering with or compromising the integrity of existing security systems, making it an optimal solution for supervision and control in demanding environments.

Communications

The **ISP 4008** offers multiple communication options, including USB, GPRS, 4G, Ethernet, and RS-232, ensuring flexible and efficient connectivity for a wide range of applications.

Installation

The **ISP 4008** is easily installed in systems with relays or electronic modules, ensuring compatibility and efficiency in various infrastructures.

Format

Available in ADIF standardized R1 box

Various

The **ISP 4008** is distinguished by its complementary features designed to maximize efficiency and usability. It includes a backup μSD memory to ensure data preservation, an internal clock that can synchronize with NTP servers, and a front display for an intuitive user interface. Additionally, the configuration backpack facilitates quick and easy setup, adapting the device to the specific needs of each installation.

RDX 5020

The **RDX 5020**, a low-power device, is ideal for use in installations powered by photovoltaic energy.

Equipped with a wide range of communication options, including USB, GPRS, 4G, and Ethernet, this device stands out for its flexibility.

Additionally, it has a backup µSD memory for secure data storage. It includes a temperature-compensated local clock to maintain time accuracy and comes equipped with a configuration backpack to facilitate its installation and initial adjustments.

Designed to fit into 19-inch racks, the RDX 5020 integrates seamlessly into ADIF-type Electrans installations, offering a versatile and efficient solution.

Low Consumption

Ultra Low Consumption: $\leq$ 30mW
Suitable for photovoltaic installations.

Communications

Integrated communication ports:
USB
GPRS
4G
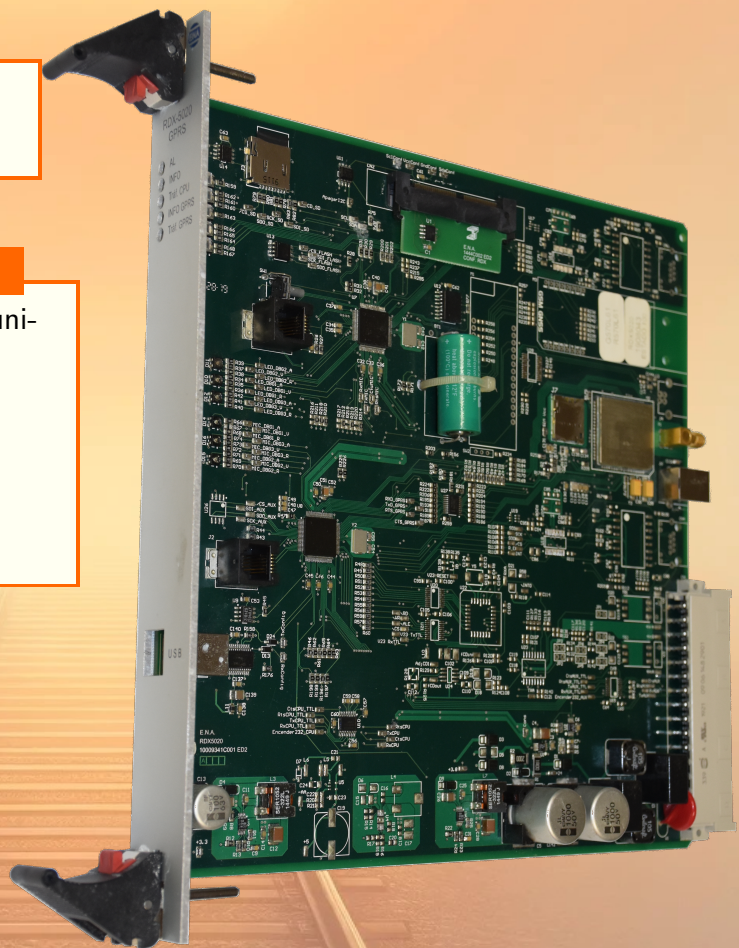Ethernet
RS-232

Installation

ADIF Type Electrans PaN

Format

Dual Europe 6U 19" card

Various

Backup µSD memory.
Temperature-compensated local clock
Configuration backpack

LEGAL REGISTRATION

CRYSSMA ensures secure and reliable data management, meeting the most stringent standards, including the GDPR, for the protection of personal information. Its advanced storage system records events, guaranteeing the integrity and legality of information through encryption and digital signature. This not only certifies the truthfulness and confidentiality of the data but also establishes a verifiable issuer, ensuring that each piece of information is unalterable and protected against unauthorized access.

GDPR
GDPR Compliance

STORAGE
Event logging

ENCRYPTION
DIGITAL SIGNATURE

LEGITIMACY
Verifiable issuer

VERACITY
Unmodifiable data

CONFIDENTIALITY
Secure data

INFRASTRUCTURE

The robustness and efficiency of **CRYSSMA** not only lie in its advanced software and processing capabilities but also in its solid infrastructure and the versatile communication options that back it up. This section breaks down the key components of the **CRYSSMA** infrastructure and the communication technologies that ensure reliable and secure data transmission, fundamental for uninterrupted operation and high availability of the system. From cluster servers to adaptability in communications, each element has been designed to meet the rigorous demands of critical environments.

High Availability
Servers configured in a cluster to ensure maximum availability and performance.
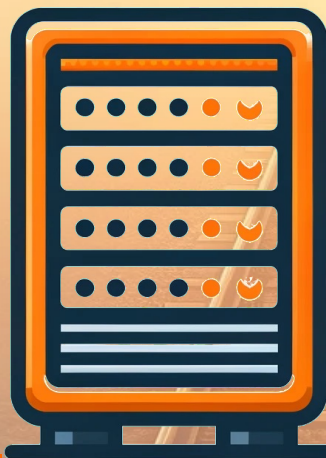
TCP/IP
Robust transport-level communications using the TCP/IP protocol, ensuring reliable connectivity.

Adaptation
Various communication options to adapt to any operational need, including GPRS, 4G, Optical Fiber (FO), and more.

Virtualization
Capability to operate both on physical and virtual machines, adapting to different technological environments.

Configuration and User Experience

Flexibility and efficiency define the essence of the **CRYSSMA** configuration, ensuring that each system component, from alarms to communications, is perfectly tailored to operational needs. User experience is paramount, offering intuitive and accessible interfaces that enable effective system management and monitoring in real time. This section delves into the advanced system configuration and how users interact with **CRYSSMA** to ensure maximum effectiveness in the supervision and management of Level Crossings.

System

CRYSSMA allows advanced system customization, enabling the specific configuration of hierarchies, alarms, incidents, and warnings to adapt to the operational and safety needs of each installation.

Equipment

In terms of equipment configuration, **CRYSSMA** stands out for its flexibility in configuration, allowing precise adjustments in channels, communications, and specific features to align with the requirements and existing infrastructure, thus ensuring optimal integration and functioning.

Icono	Nivel	Descripción
❌	1	Necesidad de actuación correctiva inmediata por fallo identificado.
❗	2	Necesidad de actuación preventiva por fallo identificado.
⚠️	3	Posible necesidad de actuación correctiva o preventiva por fallo no identificado.
ℹ️	4	Información de actuación y control de acceso a la instalación del paso a nivel en campo.

User Experience

For user applications, **CRYSSMA** offers an intuitive and configurable platform including a PC application, direct connection without the need for additional applications, and full capabilities for remote data configuration and management, thus adapting to different workflows and user preferences.

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