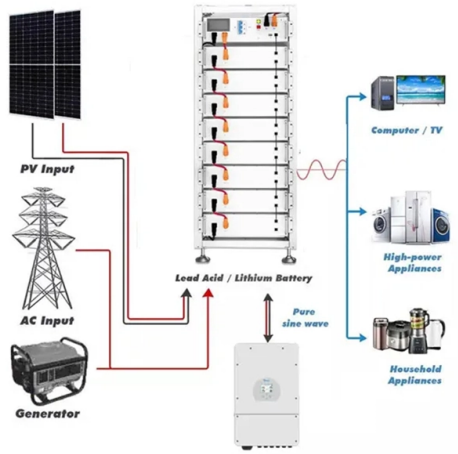
Relay Protection MMS Network



Overview

The relay detects a protection trip or alarm → The relay immediately sends an MMS report to SCADA with the event, timestamp, and quality information.

Key Takeaways

MMS (Manufacturing Message Specification) in IEC 61850 networks enables protection relays to communicate with SCADA and other IEDs for monitoring, control, and reporting over Ethernet.

Overview of MM

S in Relay ProtectionMMS is a communication protocol used in IEC 61850 networks to transport structured data between intelligent electronic devices (IEDs) and SCADA systems. It allows relays, bay controllers, and other substation devices to exchange real-time measurements, status updates, alarms, and control commands over TCP/IP networks without relying on vendor-specific protocols.

MM

S operates on a client–server model, where the relay acts as the server and SCADA or engineering tools act as clients, initiating requests or subscribing to reports.

Key Functions in Relay Protection



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Monitoring and Reporting: Relays automatically send MMS reports containing current, voltage, breaker status, and alarms when data changes or at periodic intervals. This ensures SCADA systems have up-to-date information for operational decisions. Remote Control: Commands such as breaker operations are sent from SCADA to the relay using MMS services like Select-Before-Operate or Operate, ensuring secure and verified execution.

Configuration and File Exchange: MMS supports reading/writing relay settings, transferring configuration files, and updating firmware, enabling centralized engineering and maintenance.

Network Setup Considerations

Ethernet Connectivity: Relays connect to substation switches using CAT-6 cables, ensuring high-speed, reliable communication.

I

P Configuration: Each IED must have a unique IP address, and SCADA systems should be on the same subnet for seamless communication.

SC

L Files: Substation Configuration Language (SCL) files, such as ICD or CID, define the communication structure, datasets, and report control blocks for MMS messaging. Redundancy and Timing: For critical protection applications, redundant networks and precise timing (IEEE 1588 PTP) are used to ensure deterministic and fault-tolerant operation. Integration with Other IEC 61850 ServicesWhile MMS handles non-time-critical functions like reporting and control, GOOSE messages are used for fast, event-driven protection signals such as trips and interlocks.

Together, MMS and GOOSE provide a complete digital protection and automation solution, replacing traditional hardwired connections.

Advanced Applications

Virtual Protection Relays (VPRs): Software-based relays use MMS and GOOSE over Ethernet to implement protection logic on servers, offering scalability, high availability, and simplified maintenance. Interoperability: MMS ensures that relays from different manufacturers can communicate seamlessly with SCADA and other IEDs, supporting multi-vendor substation automation. In summary, MMS in relay protection networks provides a standardized, flexible, and reliable method for monitoring, control, and configuration of protection relays, forming the backbone of modern IEC 61850-based digital substations.

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Article Content

IEC 61850 MMS Explained: Full Guide to Reporting, Control, and ...

The relay detects a protection trip or alarm → The relay immediately sends an MMS report to SCADA with the event, timestamp, and quality information. This makes IEC 61850 MMS

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This guide explains IEC 61850 communication between MiCOM relay and SCADA, covering network setup, IP configuration, SCL files (ICD/CID), and

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GOOSE delivers protection trips, interlocks and status updates in milliseconds over Ethernet. Learn how GoCB, stNum, sqNum, retransmission

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IEC61850 Under The Hood for SCADA and Relay Engineers John

As the use of IEC61850 by utilities to set up protection and control schemes in substations increases, it is critical that Relay and SCADA engineers develop an understanding of IEC61850, have an

IEC 61850 configuration instructions Easergy P3 Application Book

GOOSE data is multi-casted to the Ethernet network. The multicast MAC Address, Application ID and Configuration Revision are the main parameters when routing the information from one device to the

IEC 61850 MMS SCADA Network Optimization for IEDs

Optimization of report messages (produced by IEDs using IEC 61850 MMS methods for use on the network) involves configuring dead bands for analog quantities, selecting appropriate trigger options,

SIPROTEC Protection Relays | Siemens

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IEC61850 and Ethernet Redundancy

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Utilities & industries have been striving to have reliable communications between substation assets like protection relays & substation automation systems (SAS) that can monitor, record & clear system

IEC 61850 Substation Automation System (SAS) with MMS

Different scenarios for protection and communication are designed between IEDs by using the HYPERSIM library parts. Target I/O interface block is used to link HYPERSIM components''

IEC 61850 – What It Can and Cannot Offer to Traditional Protection

Then they can accurately specify the substation local-area networks (LANs) or intersubstation wide-area networks (WANs) to guarantee the reliable operation of their protection

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Protection Relay Testing

Reliably working protection relays are key in modern energy systems. Read on to learn about best practices, challenges, and trends in protection testing.

IEC 61850 MMS SCADA Network Optimization for IEDs

This paper discusses a field-proven methodology to optimize the behavior of MMS messages within a SCADA network that contains IEC 61850-compliant devices. Using actual system commissioning

IEC 61850 Communication Between MiCOM Relay and SCADA

Modern digital substations rely on fast, standardized communication between protection relays and supervisory systems. This guide explains IEC 61850 communication between MiCOM

Appendix B: MMS Network Planning

238 MMS NETWORK PLANNING Figure B.I SMS versus MMS The basic difference with respect to the well-known SMS is that the message can be a combination of text, pictures and voice, in a roughly

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Abstract Microprocessor-based protection relays that provide reliable and fast responses to abnormal conditions are of paramount importance to electrical grids. Modern numerical relays

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