Intelligent Distribution Box Control Module

Overview

Low Voltage Power & Data Distribution | LEONI GroupOur intelligent and mechanical boxes in the area of power and data distribution offer modular solutions.

Key Takeaways

An Intelligent Control Module enables remote monitoring, automated control, and energy management for modern distribution boxes, enhancing safety, efficiency, and integration with IoT systems.

Overview

An Intelligent Control Module (ICM) is a central component in smart distribution boxes that manages power distribution, monitors energy usage, and allows automated or remote control of electrical circuits. It integrates with traditional components like air switches, AC contactors, and leakage protectors, while adding digital intelligence for real-time monitoring and control.

Key Features

Remote Control and Automation: Users can turn circuits on/off via mobile apps or PC applications, schedule operations, and automate responses to sensor triggers such as smoke, motion, or power loss. Energy Monitoring: Modules often include energy meters to track consumption per channel, enabling efficient energy management and cost savings. Safety Enhancements: Intelligent modules can cut off power remotely, respond to emergency triggers, and maintain critical functions during faults or accidents, such as in automotive applications.

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Io

T Integration: Many modules support Wi-Fi, 4G, or 5G connectivity, allowing integration with smart home platforms (e.g., Tuya) or industrial IoT systems for predictive maintenance and real-time alerts. Sensor Connectivity: Inputs from environmental or security sensors allow the system to automatically respond to conditions like fire, intrusion, or water leakage.

Applications

Smart Homes and Buildings: Control lighting, HVAC, and appliances remotely, with energy monitoring and automated safety features. Industrial and Factory Floors: Manage high-demand circuits, monitor equipment status, and perform predictive maintenance using edge computing and AI algorithms. Automotive and Transportation: Intelligent power distribution modules (iPDS/iPDM) manage vehicle electrical systems, ensuring safety-critical functions remain operational while non-essential loads can be switched off during emergencies.

Utility and Grid Management: Enterprise solutions like Huawei's IDS provide digital monitoring of transformer districts, enabling greener, safer, and more stable power distribution.

Technical Considerations

Controller Types: Modules may use microcontrollers (e.g., ESP32) or embedded Linux systems (e.g., Raspberry Pi CM4) to handle multiple relay channels and digital inputs. Load Capacity: Depending on the design, modules can control from a few channels to 32 or more, with configurable AC or DC outputs. Integration with Existing Infrastructure: Intelligent modules can be retrofitted into traditional distribution boxes or designed as part of a new smart panel, supporting both local and cloud-based control.

Benefits

Enhanced safety through automated cut-offs and sensor-triggered responses. Improved energy efficiency via monitoring and scheduling. Greater convenience with remote access and automation.

Scalability for residential, industrial, and automotive applications. Data-driven insights for predictive maintenance and operational optimization. Intelligent Control Modules transform conventional distribution boxes into smart, connected, and safer energy hubs, suitable for modern homes, industrial facilities, and vehicles, while enabling integration with IoT and AI-driven management systems.

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Article Content

Low Voltage Power & Data Distribution | LEONI Group

Our intelligent and mechanical boxes in the area of power and data distribution offer modular solutions for all voltage levels and at the same time optimize

Intelligent Distribution Solution | Huawei Enterprise

Huawei Intelligent Distribution Solution enables the rapid deployment of low-voltage distribution services on the cloud, intelligent end-to-side and O&M.

IX3212 Intelligent Xpansion™ Power Distribution Module

The IX3212 Intelligent Xpansion™ power distribution module (PDM) expands CAN bus control networks by replacing existing relay and fuse boxes with more reliable solid-state switches

POWER DISTRIBUTION BOX – Smart Home

Smart Distribution Box Solution Powered by KinCony B32M + B16M Controllers The KinCony Smart Distribution Box is a professional intelligent electrical control

2025-09-16 FORVIA HELLA successfully launches its

As the first product of its kind, the iPDM ensures a reliable, fail-operational power supply in the vehicle and is thus a key component for highly

Intelligent distribution box-Product Center-Hangyue Intelligent

Combined with the Hangyue intelligent operation and maintenance system, it achieves permission management for opening (closing) doors and connecting (disconnecting) wires of the distribution box

Intelligent Power Distribution Box Solution

Compared with the traditional power distribution box, it is safer to cut off the strong power supply remotely, and it can save energy through the timing mode while

Intelligent Distribution | Solutions | ABB

Solutions for smart low voltage electrical distribution Digital technologies such as Cloud Computing, Big Data, Internet of Things (IoT), Artificial Intelligence (AI)

Low Voltage Power & Data Distribution | LEONI Group

Low Voltage Power & Data Distribution Safety and efficiency: key aspects of power distribution Our intelligent and mechanical boxes in the area of power and data

Dahua Technology

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Dahua Technology is a world-leading video-centric AIoT solution and service provider. With its ''Dahua Think#'' corporate strategy, Dahua Technology focuses on two core businesses: City and Enterprise.

pvsolarstore

pvsolarstore offers a wide range of high-quality solar products and solutions, including PV modules, energy storage systems, microinverters, and accessories for sustainable energy needs.

POWER DISTRIBUTION BOX – Smart Home Automation | KinCony

Smart Distribution Box Solution Powered by KinCony B32M + B16M Controllers The KinCony Smart Distribution Box is a professional intelligent electrical control solution designed for smart homes,

Intelligent Power Distribution Modules (IPDMs)

An Intelligent Power Distribution Module (IPDM) is an advanced vehicle component that manages the distribution and control of electrical power

Solid State Automotive Power Distribution Module with eFuse

Renesas provides an efficient power distribution network system built on intelligent power device (IPD) technologies. The advanced protection and diagnostic functions of IPDs enhance safety compared to

IoT-Based Low-Voltage Power Distribution System Management

The intelligent distribution station area is based on the intelligent perception device as the core, supporting intelligent low-voltage equipment in order to support the new energy cooperative

Intelligent Remote Distribution Box Monitoring Solution

Remote distribution box monitoring By leveraging the intelligent remote monitoring function, you can collect the electric meter readings and implement networked transmission and control the safety energy.

Murphy by Enovation Intelligent Xpansion Power Distribution Module

The Murphy Intelligent Xpansion™ Power Distribution Module (PDM) expands CAN bus control networks by replacing existing relay and fuse boxes with more reliable solid-state switches that can

Smart power distribution for future vehicle electrical systems

This is where the intelligent power distributors from Leoni come into play. The iPDS (intelligent Power Distribution Switch) and the iPDM (intelligent Power Distribution Module) prevent a

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