

Using PLC relay protection



AI Overview

A PLC interfaces with a protective relay by using its low-voltage outputs to monitor, control, or trip the relay, often through an intermediate relay for isolation and signal amplification.

PLC and Relay Basics A PLC operates using low-voltage DC signals (typically 5–24 V) to process logic and control industrial devices. Its outputs are not designed to handle high currents directly, so a PLC relay or interposing relay is often used to amplify the signal and provide electrical isolation between the PLC and high-power devices like motors or protective relays. The relay ensures that voltage spikes or faults in the field do not damage the PLC's internal circuitry. A protective relay monitors electrical quantities such as current, voltage, frequency, or impedance. When it detects a fault or abnormal condition, it sends a trip signal to a circuit breaker or other interrupting device to isolate the faulted equipment. Protective relays do not interrupt current directly; they act as decision-making devices that command breakers or contactors.

Integration of PLC and Protective Relay

Signal Monitoring: The PLC can receive status signals from the protective relay, such as trip indications, alarm conditions, or breaker positions. These inputs are typically low-voltage signals derived from the relay's auxiliary contacts.

Control and Trip Commands: The PLC can send a command to the protective relay or directly to the breaker via an interposing relay. The PLC output energizes the relay coil, which closes contacts to complete a higher-current circuit that actuates the breaker or relay trip mechanism.

Electrical Isolation and Amplification: Using a relay between the PLC and the protective relay ensures that the PLC is electrically isolated from high-voltage circuits. The relay also amplifies the PLC's low-current output to drive the protective relay or breaker coil safely.

Logic Implementation: PLCs can implement complex logic, such as sequencing, interlocks, or time delays, to coordinate multiple protective relays and breakers. This is similar to traditional relay logic but programmable and...

Article Content

ASED ADAPTIVE RELAY PROTECTION SYSTEM

Taking into account the peculiarities of modern microprocessor-based relay protection devices, we propose a structural diagram shown in Fig. 2 to implement PLC based adaptive protection system.

Simplifying EFT, Surge and Power-Fail Protection Circuits in PLC ...

ABSTRACT The Programmable Logic Controller (PLC) system is usually connected to an external DC power supply to provide power to the controller unit, backplane and I/O modules. The input

Use of standard outputs in safety loops of PLC-based control systems

To achieve the required PL (PLr) of your safety function, you have options by using different categories (B, 1 to 4) as well as MTTFD, DC and other values. These categories have requirements like zero- or

Three-Phase Motor Phase Loss — Detection, Protection, and Recovery

Motor phase loss protection — single phasing causes, current imbalance effects, NEMA MG-1 derating, phase-loss relay selection, and VFD phase monitoring.

Protection Relays in PLC & Automation Control Panel

When correctly integrated, protection relays improve uptime, simplify troubleshooting, and provide a more resilient PLC & Automation Control Panel architecture for manufacturing lines, water treatment

Why Relay Is Used In PLC?

Learn why relay is used in PLC for signal interfacing, electrical isolation, load switching, enhanced safety features, and control flexibility.

Why Relays Are Used in PLCs? | Benefits & Types

Why relay is used in PLC? Learn how relays enhance PLC functionality, types of relays used, their characteristics, and selection tips.

PLC Relay with Circuit Breaker

The combination of a PLC relay with a circuit breaker is foundational in modern industrial control systems. It offers a balance between automation and protection, enabling industries to scale

IED (Intelligent Electronic Device) advanced functions

2. IED advanced functions 2.1 Protection function including phasor estimation The protection function is the primary function of a relay IED, as IEDs

Protection Relays in PLC & Automation Control Panel

Improve PLC panel reliability with coordinated protection relay integration. Contact our engineering team for IEC-compliant designs.

What Is a PLC Relay and How Does It Work?

Discover how PLC relays amplify low-voltage signals to control industrial automation, protecting sensitive electronics from high voltage.

Interposing Relay (IPR)

Complete guide to Interposing Relay in PLC systems covering wiring, panel layout, selection, applications, and FAQs.

Protection Relays in PLC & Automation Control Panel

Protection relays in PLC and automation control panels are used to safeguard feeders, process drives, auxiliary systems, and critical plant equipment while maintaining high availability of the control system.

Protection relays — ABB Group

ABB's smart protection technology ensures smooth and safe everyday life without blackouts. ABB released its first programmable relays based on the use of microprocessors in 1985. ABB's Relion®

Guide to Safety Relays and Safety Circuits

Safety relays are an easy and practical way of providing your machine with a safety circuit. Learn how to build a safety circuit with a safety relay.

Simplifying EFT, Surge and Power-Fail Protection Circuits in PLC ...

Industry's first high-voltage eFuse, the TPS266x devices, integrate all of the necessary functions required to simplify the complete protection needs. This application report describes how the

Relay Logic Explained 2026 | How It Works + Diagrams

To understand where this evolution leads, read what is PLC programming and explore practical PLC ladder logic examples that translate relay circuits directly into PLC rungs.

PLC-Based Adaptive Relay Protection System

PLC based settings adaptation system and relay protection test set RETOM-61 The graphical operator panel shown on Fig. 7. The panel displays: •

Protection relays

Protection relays Numerical relays are based on the use of microprocessors. The first numerical relays were released in 1985. A big difference between

Why Add Relays to the Output of a PLC?

By using a relay, the PLC only needs to provide a small amount of current to energize the relay coil. Once activated, the relay's contacts handle the higher

Power System Protective Relays: Principles & Practices

Abstract: Protective relays and devices have been developed over 100 years ago to provide “last line” of defense for the electrical systems. They are intended to quickly identify a fault and isolate it so the

Microprocessor-Based Protective Relay Configurations: Effective ...

The protective relays used in modern industrial installations are complex microprocessor-based devices. Some of them deserve to be called protection programmable logic controllers (PLCs)

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Protective relay

Electromechanical protective relays at a hydroelectric generating plant. The relays are in round glass cases. The rectangular devices are test connection blocks,

AN-79A-00.PDF

Line Sectionalizing Using A, PLC And ABB Protective Relays ABSTRACT: With the advent of utility deregulation, uptime and minimal line restoration times are demanded. With the economics of off-the

Integrated PLC/HMIs have two processors to boost performance

A relay version provides 8 relay outputs, while transistor versions provide 6 points sinking or 6 points sourcing (4 configurable as pulse outputs) and two 0-10V DC or 4-20mA analogue

A Reliable Power-Line Carrier-based Relay System

While new technologies introduce new pilot channel options, the simple PLC channel is still an economically viable channel for one or several protective relay functions.

Hi student here. is it a good practice to use relays as a ...

If you're worried about protection use surge suppressors between the sensors and the plc inputs. You would only need to use relays as interposing relays if voltages are different (as already mentioned

Evolving from Safety Relays to Safety PLCs

This would be based on the risk assessment for the machine or application. The relays are typically connected to a standard PLC to control the safety application. It's worth noting that the need for a

Protection Relays for PLC Control Panels | LV Panel | LV Panel

Protection relays in a PLC & Automation Control Panel are selected not only for protection accuracy, but also for their compatibility with dense control architecture, communication networks, and enclosure

Contact Us

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