

How to configure relay protection time



Article Overview

Relay protection time is set by calculating the Plug Setting Multiplier (PSM), determining the Time Setting Multiplier (TSM), and using the relay's time/PSM curve to achieve proper coordination.

Key Parameters

- **Plug Setting Multiplier (PSM):** This is the ratio of the fault current to the relay's pickup current. It determines how much the actual current exceeds the relay's pickup and directly affects the operating time on IDMT (Inverse Definite Minimum Time) curves. Higher PSM values result in faster relay operation .
- **Time Setting Multiplier (TSM):** TSM scales the base operating time obtained from the relay's characteristic curve. It allows coordination between upstream and downstream relays. A lower TSM results in faster tripping, while a higher TSM delays operation to ensure selective fault clearance .
- **Time/PSM Curve:** This graph shows the relationship between relay operating time and PSM. By plotting the curve, you can determine the base operating time for a given fault current and then adjust it using TSM to achieve the desired trip time .

Step-by-Step Procedure

- **Calculate Pickup Current:** Determine the relay's pickup current based on the system's current transformer (CT) ratio and the maximum load current. This ensures the relay does not trip under normal operating conditions .
- **Convert Fault Current to Relay Coil Current:** Divide the expected fault current by the CT ratio to find the current that flows through the relay coil .
- **Determine PSM:** Divide the relay coil current by the pickup current to obtain the Plug Setting Multiplier

Article Content

Oct 31, 2025

Protective Relay Testing and Maintenance Overview

1. Visual and Mechanical Inspection Testing and maintenance of protective relays always begin with a comprehensive

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Installing and Maintaining Protective Relay Systems

Introduction Relay systems protect high-voltage equipment and transmission lines to ensure safe, stable systems. Although failure of

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RELAY SETTING CALCULATION

Pick up current Chosen Required T803 MV Tripping Directional co-ordination O/C Relay with operating time at fault Maximum

May 31, 2026

Section2_EP3

The practical sessions covering the calculation of fault currents, selection of appropriate relays and relay coordination as well as

May 13, 2026

Power System Protection & Relay Coordination Studies

Power System Protection & Relay Coordination Studies Goal of the analysis: To ensure that protective relays, circuit breakers, and

Sep 08, 2025

Basics of Protective Relaying and Design Principles

Perform power system simulations of selected faults and observe how a given protection principle (overcurrent, impedance, and

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Protection Relay Setting Interactive Calculator | FIRGELLI

With this Protection Relay Setting Calculator, you'll be able to work out pickup current, time multiplier settings (TMS),

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Protective Relay Basics

There are many types of protective relay functions, but this presentation will focus on the most common type, basic overcurrent

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Over Current Relay Setting Calculator

Our Overcurrent Relay Setting Calculator will accurately calculate your overcurrent relay settings. Enter rated current,

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Protection Relay Setting Interactive Calculator | FIRGELLI

Interactive calculator for power system protection relay settings. Determine optimal pickup current, time multiplier

Dec 06, 2025

ETAP Relay Coordination Tutorial | Time-Current Curve Setup Guide ...

ETAP relay coordination tutorial covering time-current curve setup, protective device settings, and system modeling for

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Distribution Automation Handbook

Because the protection areas of the interlocking-based protection concept are not overlapping and because they do not reach into

May 10, 2026

Overcurrent Protection Relay Settings: Best Guide

Learn how to set overcurrent protection relay settings with a clear, step-by-step guide. Understand pickup settings,

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Time Delay Relay Protection Explained

A time delay relay plays a crucial role in modern electrical and automation systems, providing precise control over

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Time Overcurrent Relay Calculator

Calculate time overcurrent relay settings with IEEE & IEC standards. Learn IDMT relay formulas, TMS/TD settings

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Protection Relay Settings Calculations Made Easy

Power System Protection Setting Calculations The electrical grid is a vast and intricate system designed to ensure the

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Relay Setting in Real Power System

To configure protective devices such as making a relay setting, having all the consideration of the fault severity and

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Basic protection relay knowledge

Power system stability means also ability to maintain acceptable voltage. Stability may be lost due to too long clearing time of faults (

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Relay Time Calculation Formulas | True Geometry's Blog

Explanation Relay Operating Time Calculation: This calculator estimates the operating time of an overcurrent relay

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Practical handbook for relay protection engineers | EEP

Relay protection circuitry This handbook covers the code of practice in protection circuitry

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How to Determine Optimal Settings for Power System Protection Relays

Learn about the best methods and tools to choose the right settings for power system protection relays, and improve your network

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Pick Up Current | Current Setting | Plug Setting Multiplier and Time ...

Plug Setting Multiplier (PSM): The ratio of the fault current to the relay's pickup current, critical for relay operation.

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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

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Relay Protection Settings (PSM, TSM, EL, OL, MF)

Protection relays employ a wide range of configurable parameters to identify defects & trip the breaker in a controlled

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FEEDER PROTECTION CALCULATIONS & SETTINGS

In OC relays the coordination is based on the relay time-current characteristics of instantaneous and/or time delay units.

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Operation, maintenance, and field test procedures for protective relays

Plant protection system functional testing Protective circuit functional testing, including lockout relay testing, must take

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A Guide for Calculating Step Distance Relay Settings

Step Distance Relaying Step Distance Relaying is a setting philosophy that utilizes zones of protection and tripping time intervals to

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The fundamentals of protection relay co-ordination and time ...

In this method, an appropriate time setting is given to each of the relays controlling the circuit breakers in a power

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Setting the generator protective relay functions

Protective relay functions and data This technical article will cover the gathering of information needed to calculate

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Types of Electrical Protection Relays or Protective Relays

□□ Key learnings: Protective Relay Definition: A protective relay is an automatic device that senses abnormal conditions

Contact Us

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