Proven Overcurrent Protection
with
Power Management Communication

The MDP Overcurrent Relay

The Advantages of
Microprocessor Distribution Protection

The MDP provides . . .

- Space Savings
- Coordination Flexibility
- Communication Options
- Increased Uptime
- Proven Reliability
- Value for your Investment



The MDP features . . .

- Digital, Microprocessor-Based, Overcurrent Relay Platform
- Protection for phase-to-phase and phase-to-ground faults
- User Selection of Eight TOC characteristics for phase and ground protection
- Instantaneous overcurrent protection



The MDP contains . . .

Display for Relay Status
Trip Information
Current Data

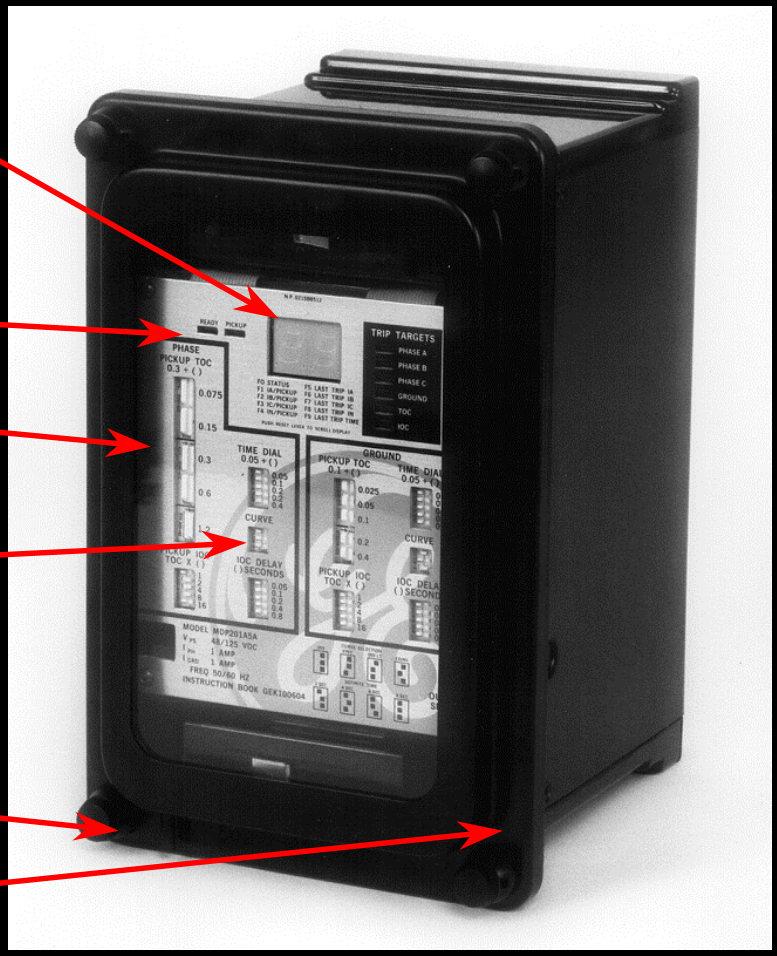
Pickup Status LEDs

Adjustable Phase Settings

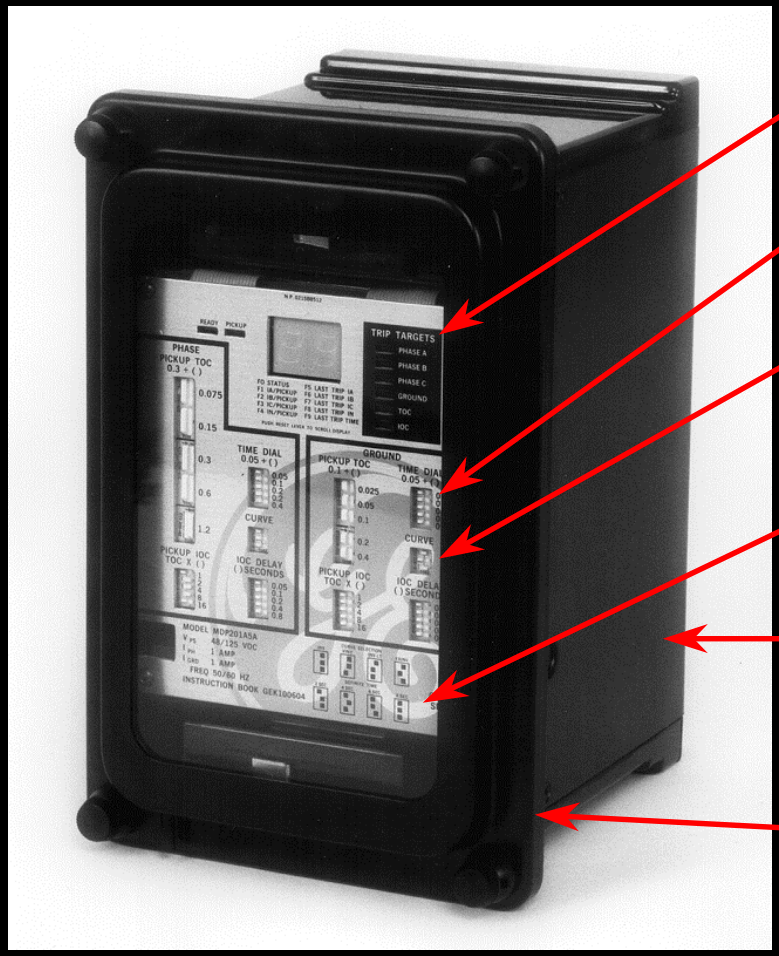
Phase Time-Current
Curve Selection

Target Reset & Display Scroll
Through the Cover

Wire Sealing Provisions



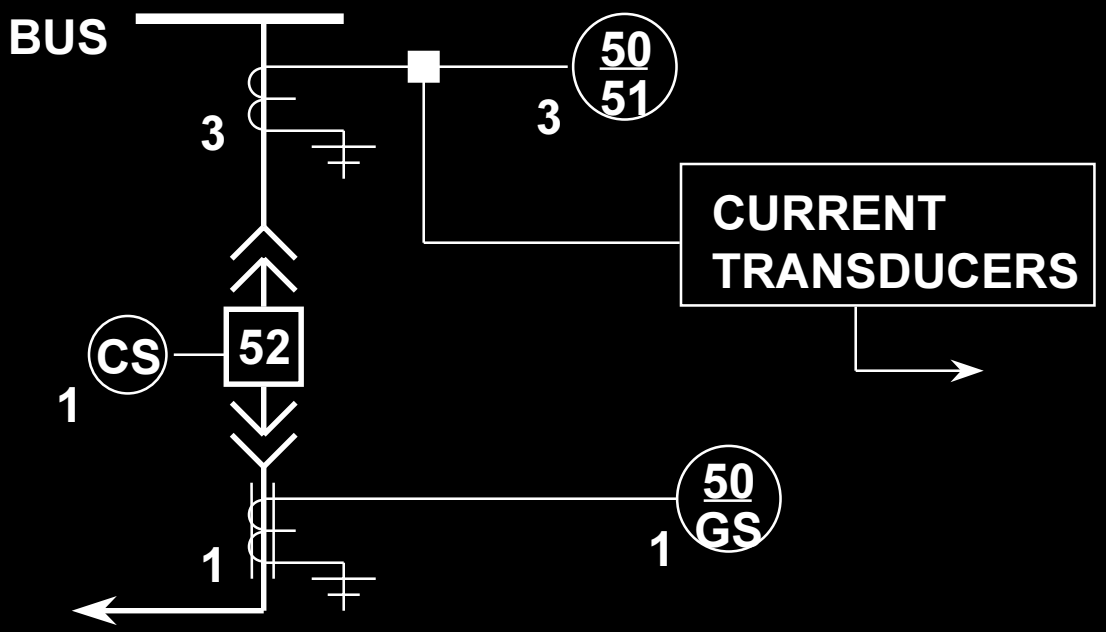
The MDP contains . . .

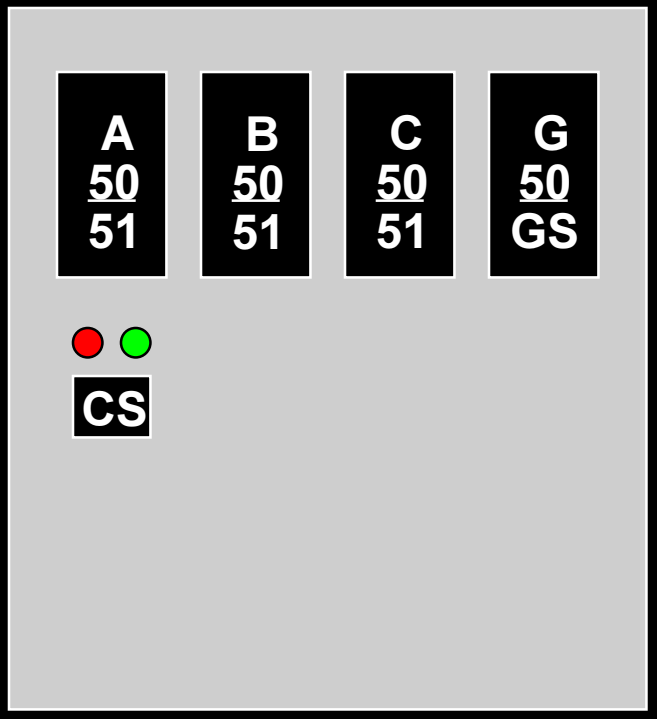


- Trip Target LEDs
- Adjustable Ground Settings
- Ground Time-Current Curve Selection
- Curve Selection Guide
- Communications Connection (optional field-installable)
- Draw-out Case with In-case Test Feature

Space Savings

Space Savings





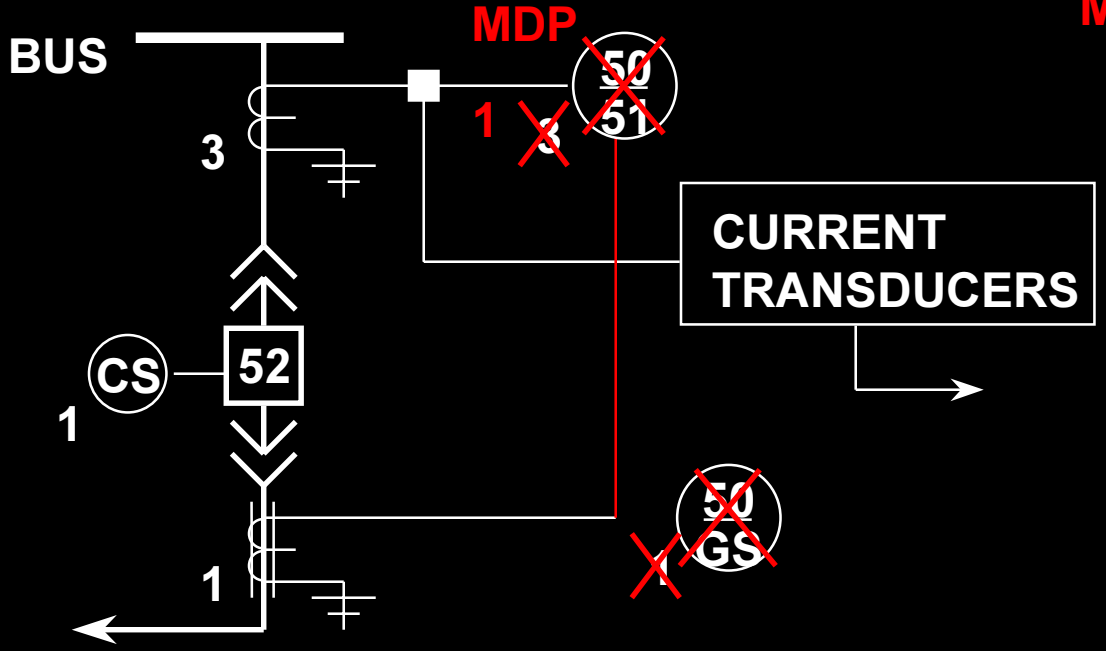
Typical Medium Voltage General Purpose Feeder

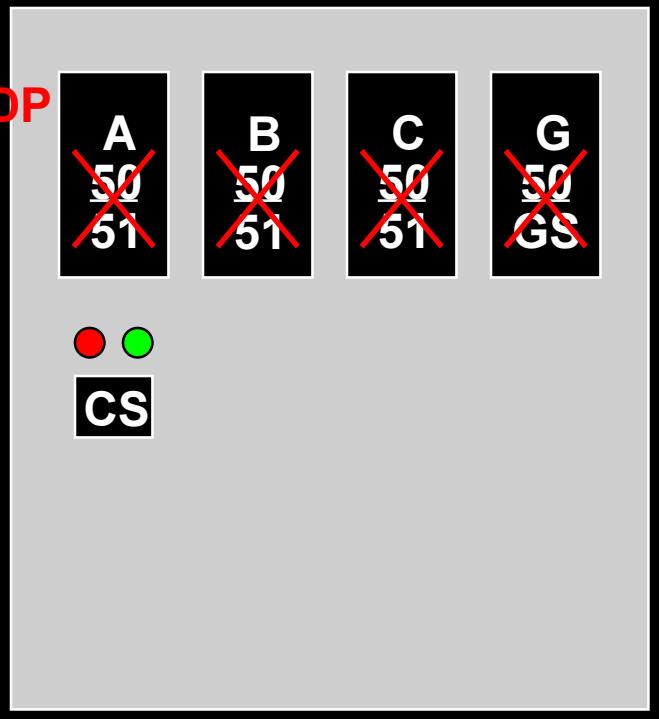
3 - Phase Overcurrent Relays (50/51)

1 - Ground Sensor Relay (50/GS)

1 - Set of Current Transducers

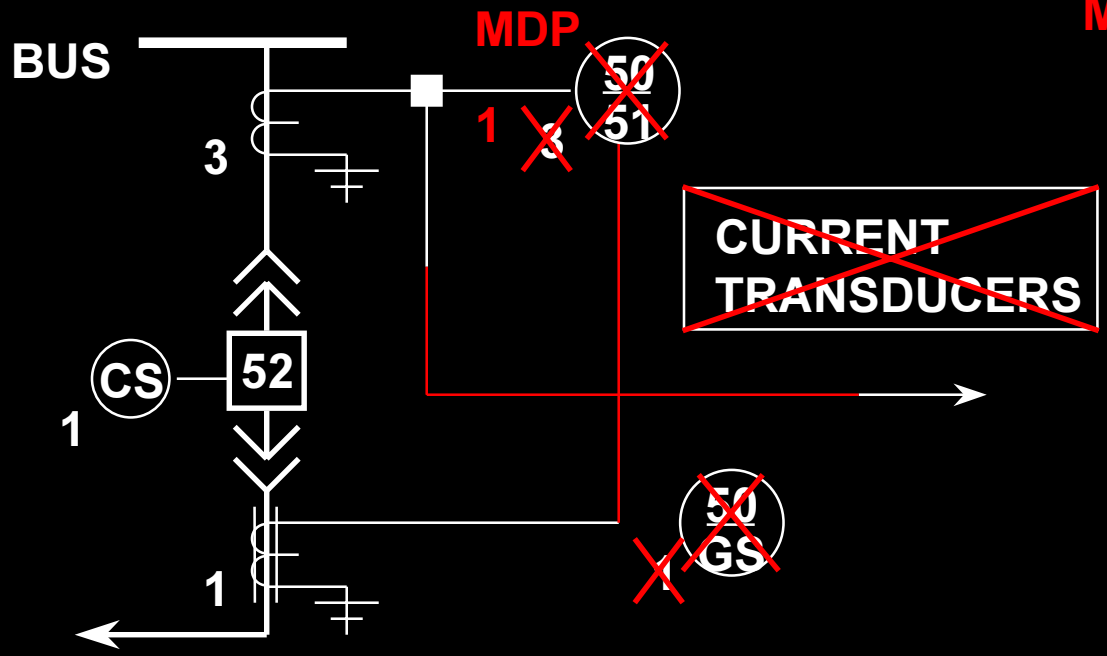
Space Savings

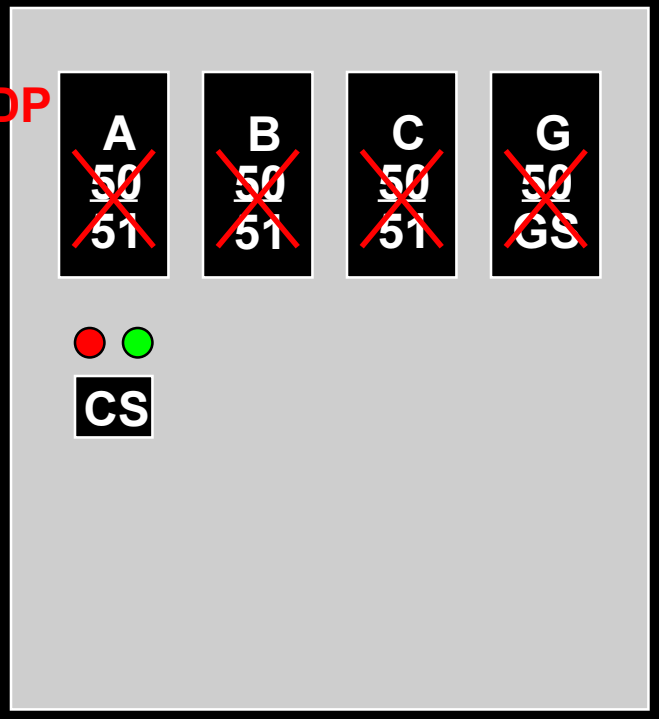




Replaces 3 Phase Time Overcurrent and Instantaneous Protective Devices and 1 Ground Fault Overcurrent (Residual or Zero Sequence) Protective Device

Space Savings

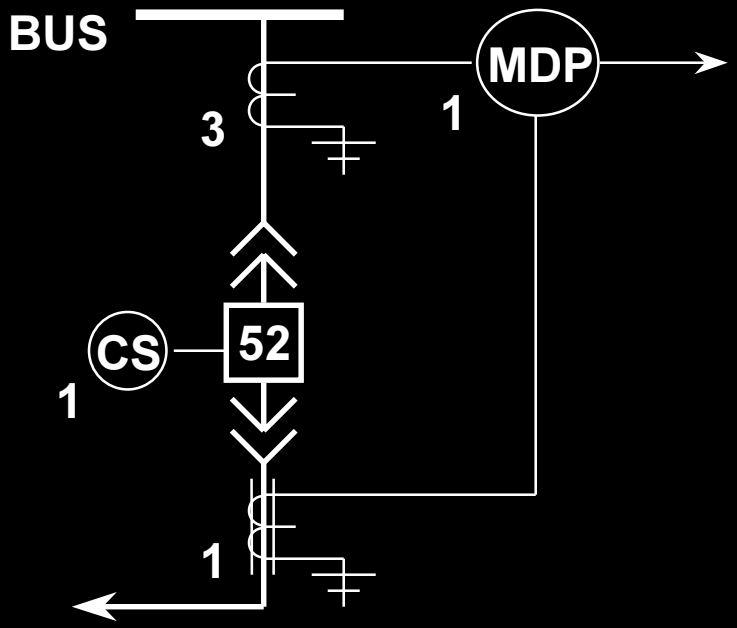


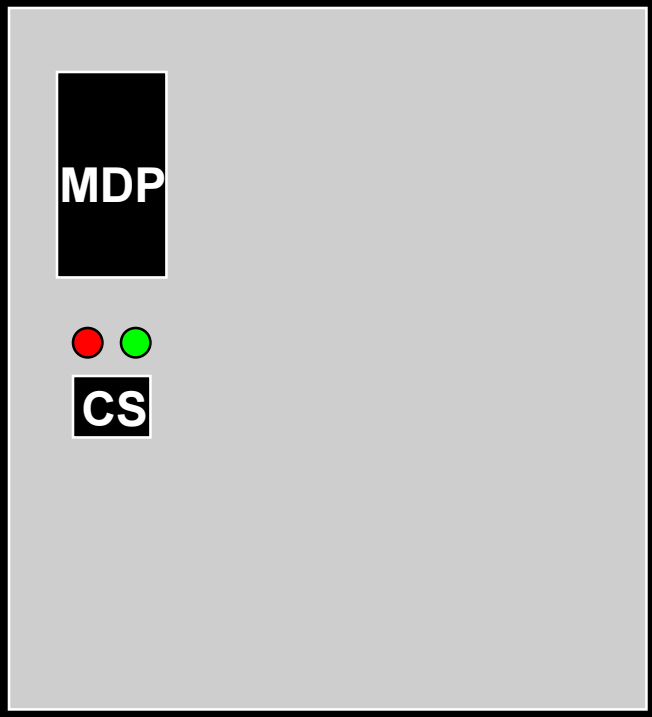


Replaces 3 Phase Time Overcurrent and Instantaneous Protective Devices and 1 Ground Fault Overcurrent (Residual or Zero Sequence) Protective Device

Integral Communication Connection

Space Savings



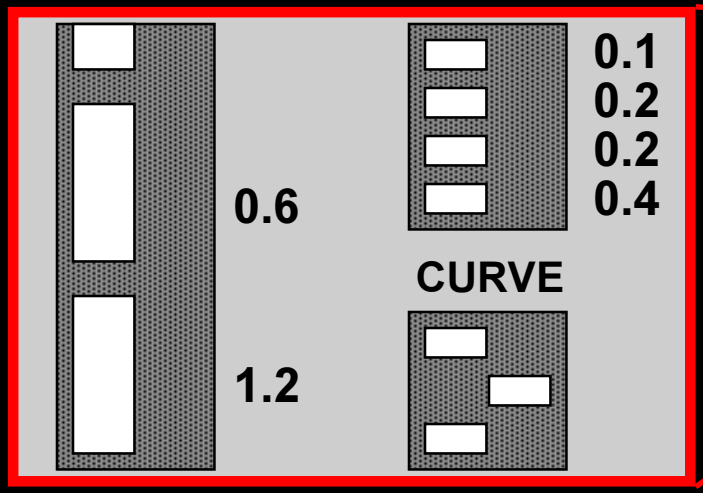


Added Functionality with less “Real Estate”
and you get more

Coordination Flexibility

Coordination Flexibility

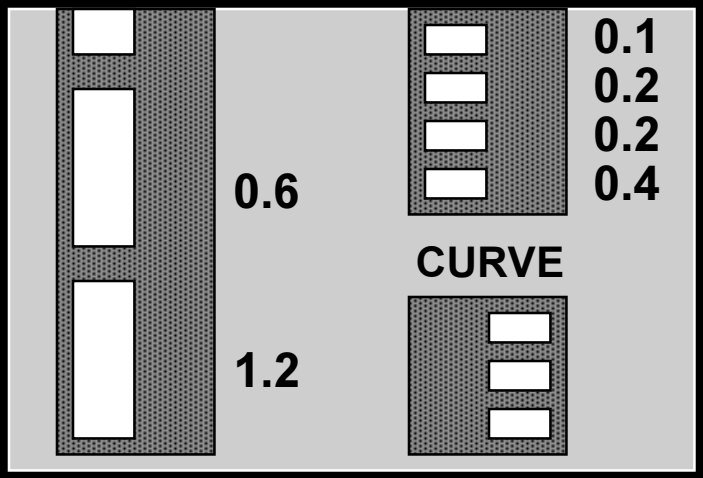
User Selection of ONE Time Current Curve from EIGHT Possible Choices

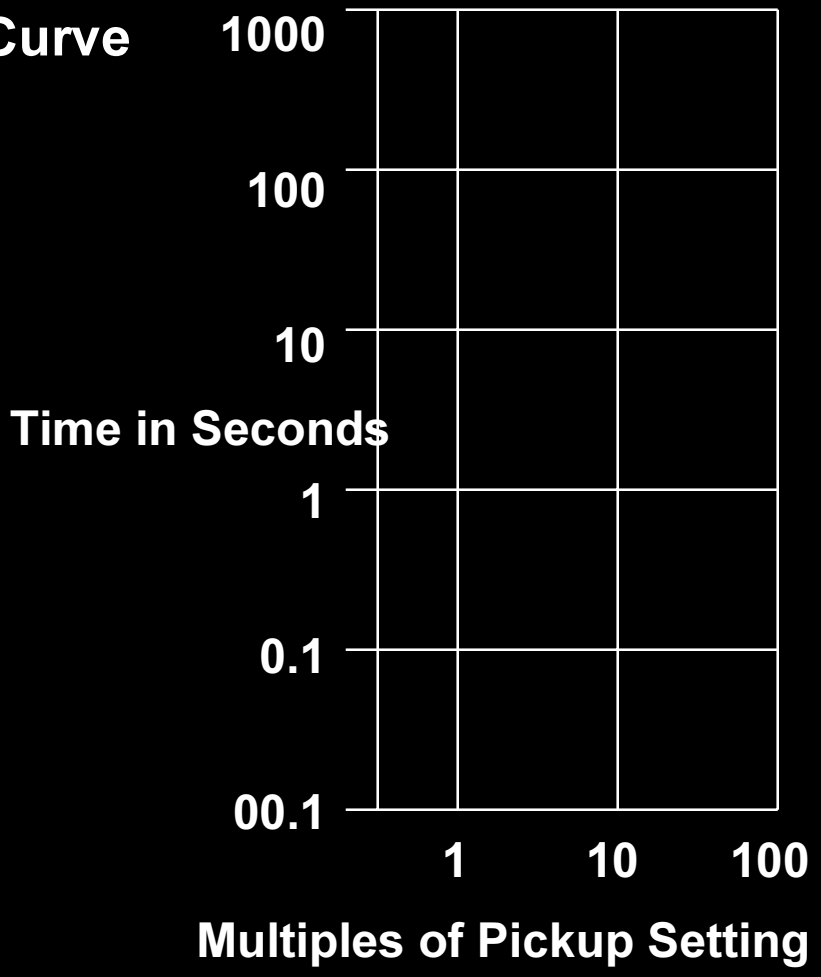




Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

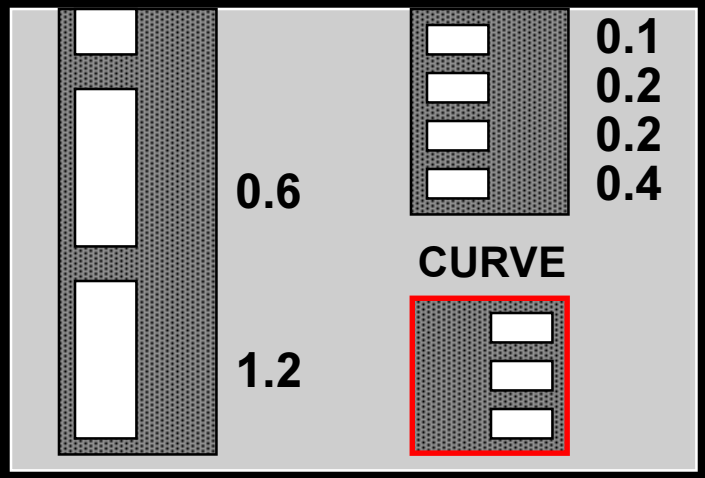




Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

Inverse (GE 51)





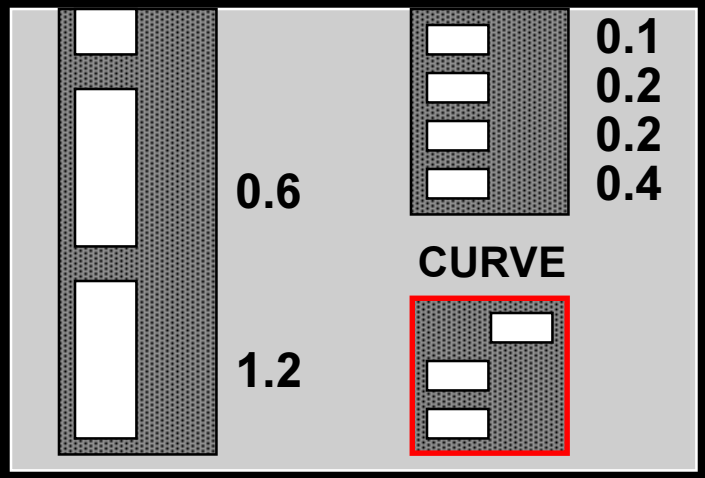
(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

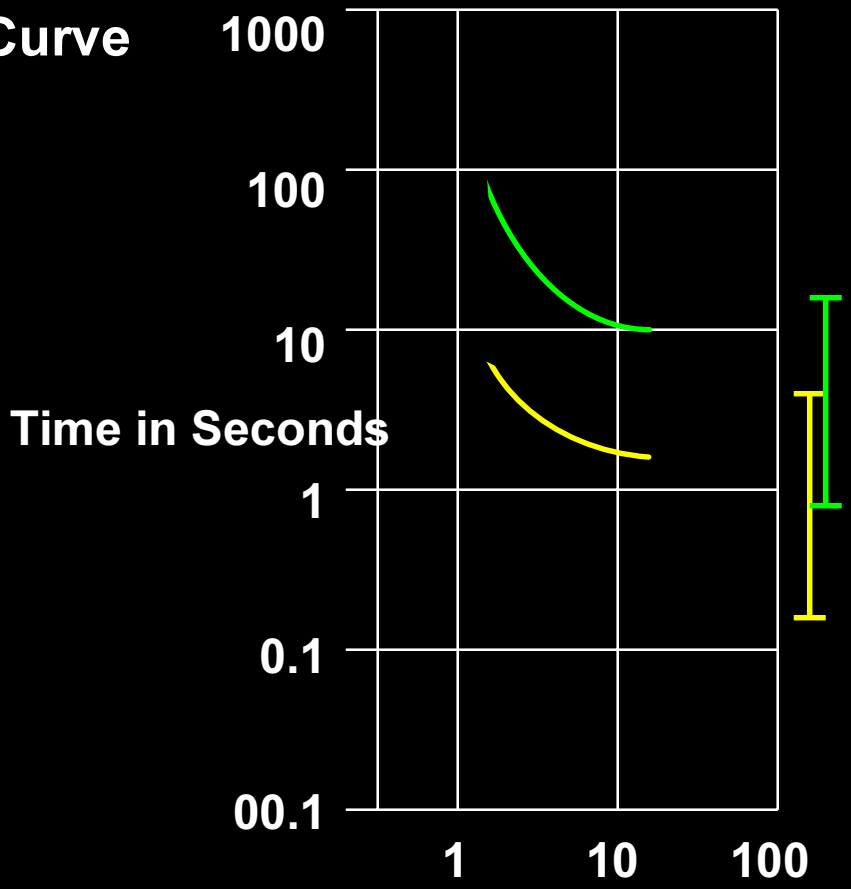
Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

Inverse (GE 51) OR

Inverse Long Time (GE 66)



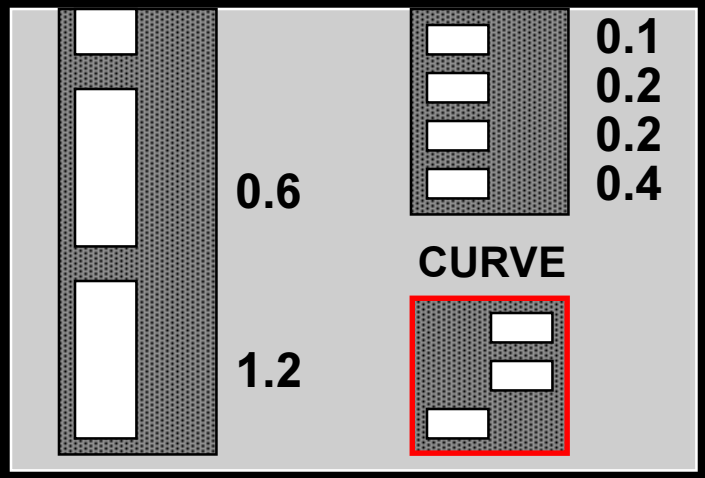


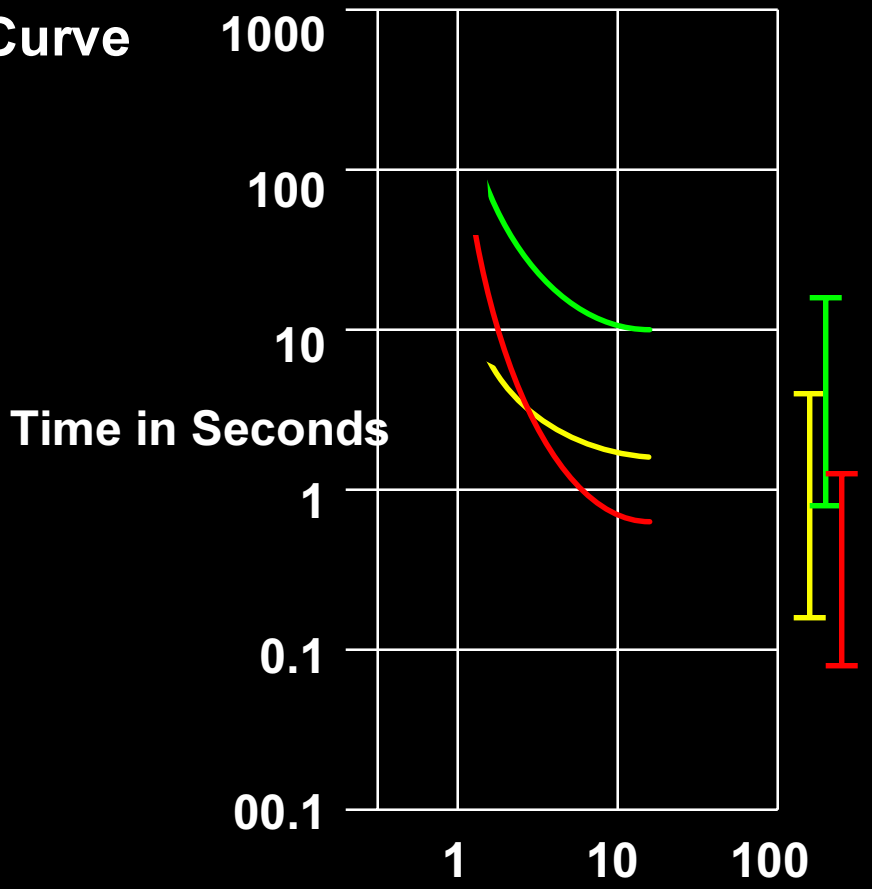
(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

- Inverse (GE 51) OR
- Inverse Long Time (GE 66) OR
- Very Inverse (GE 53)



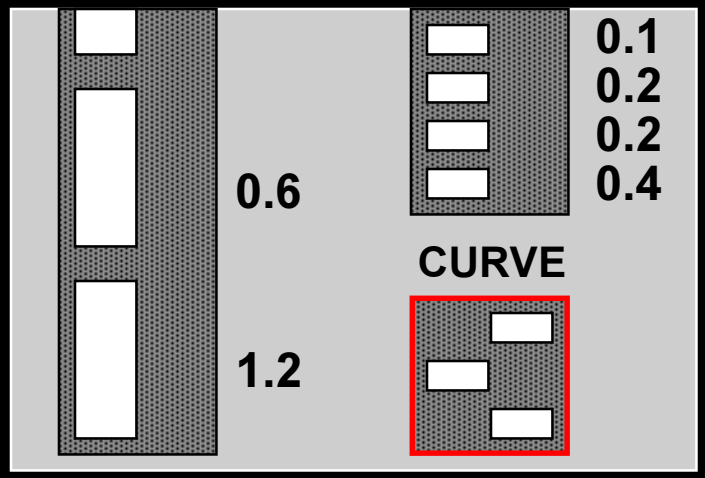


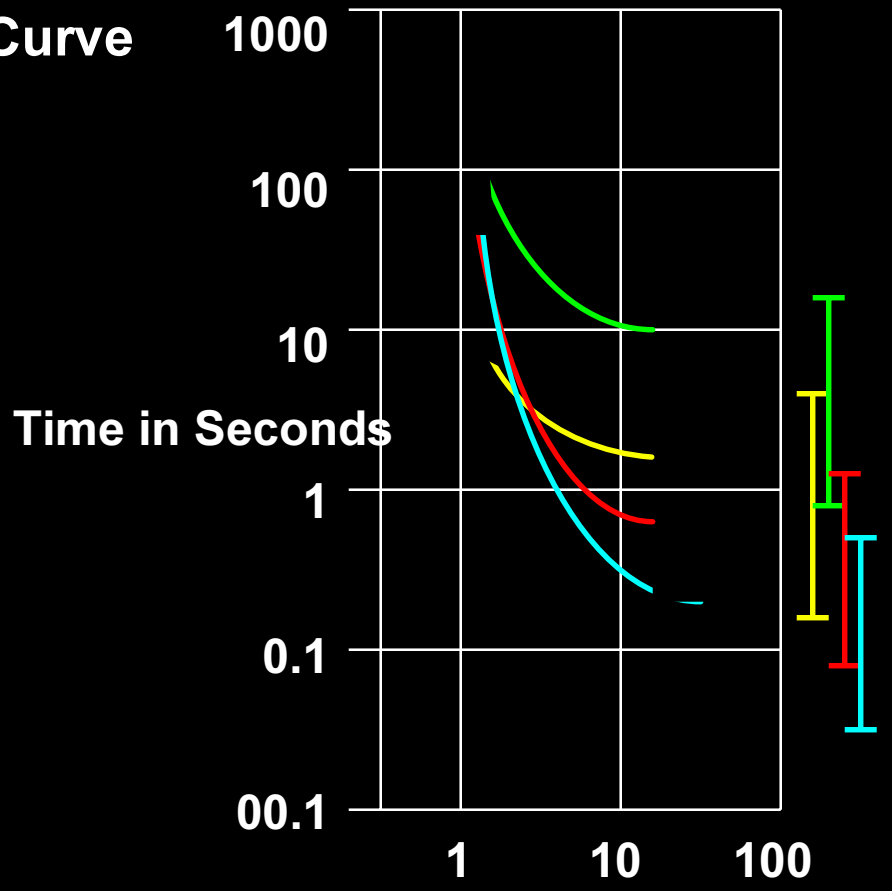
(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

- Inverse (GE 51) OR
- Inverse Long Time (GE 66) OR
- Very Inverse (GE 53) OR
- Extremely Inverse (GE 77)



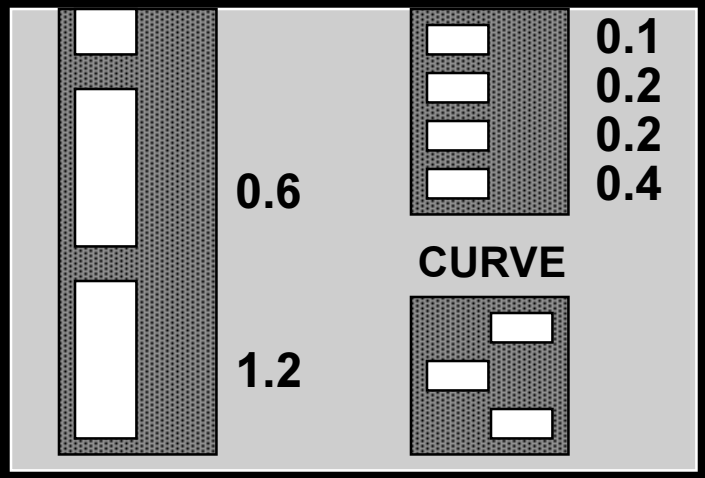


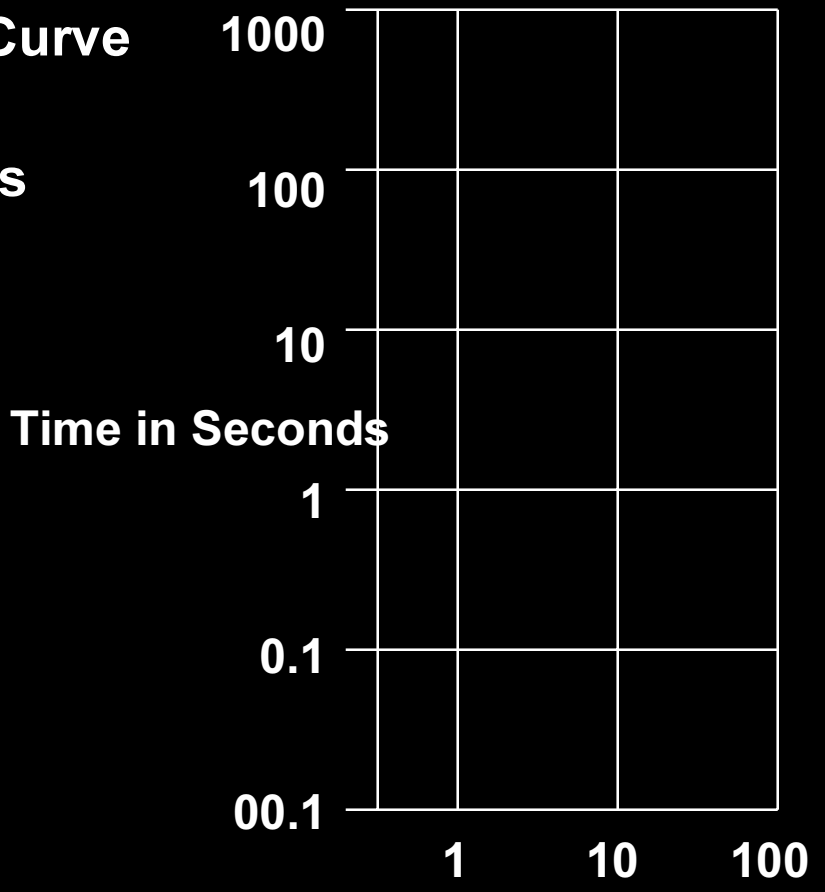
(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

Definite Time - Four time settings





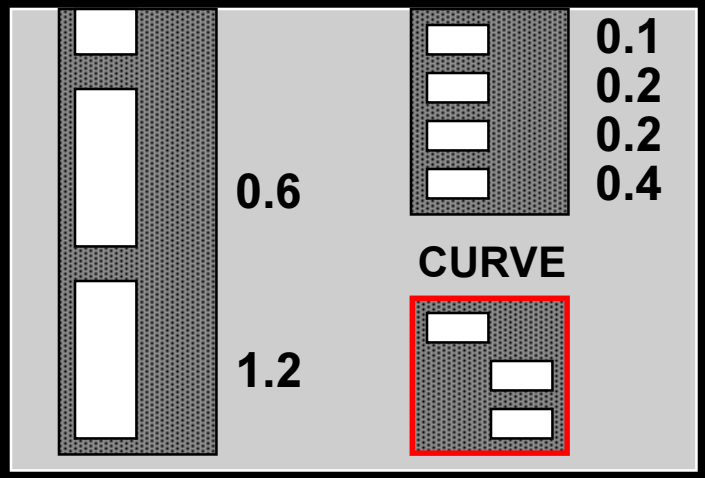
(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

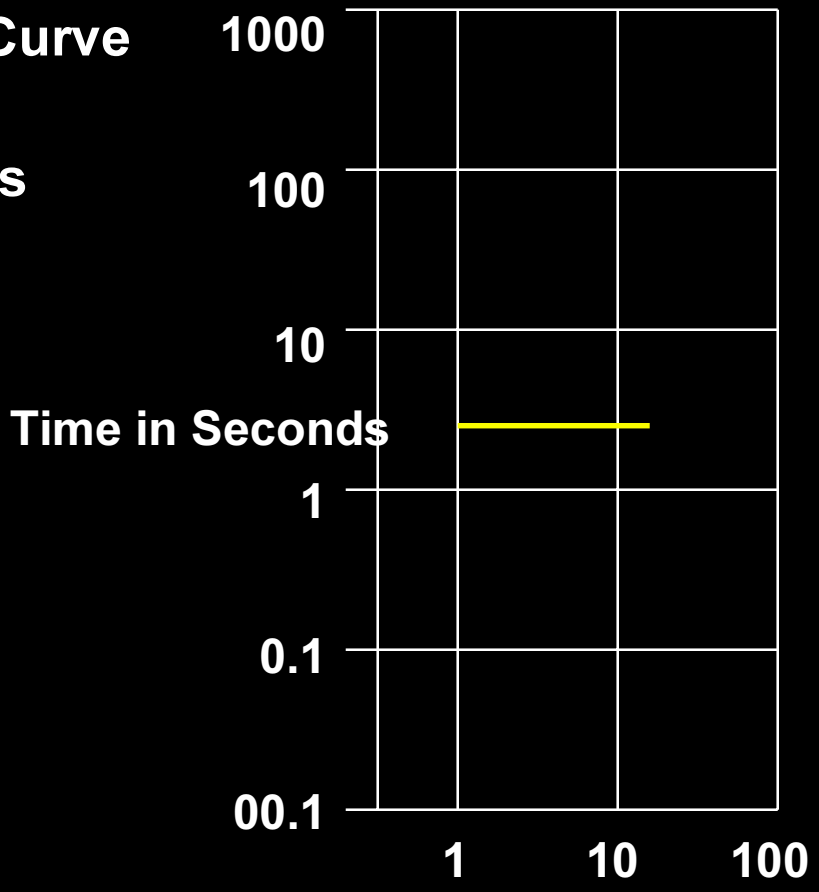
Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

Definite Time - Four time settings

2 Seconds





(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

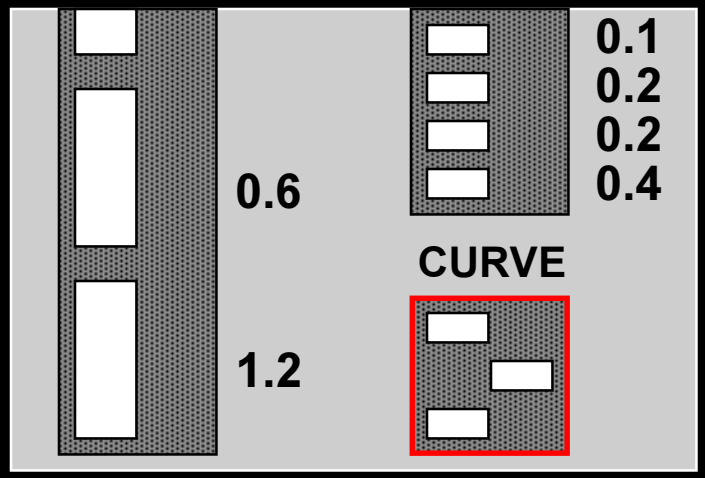
Coordination Flexibility

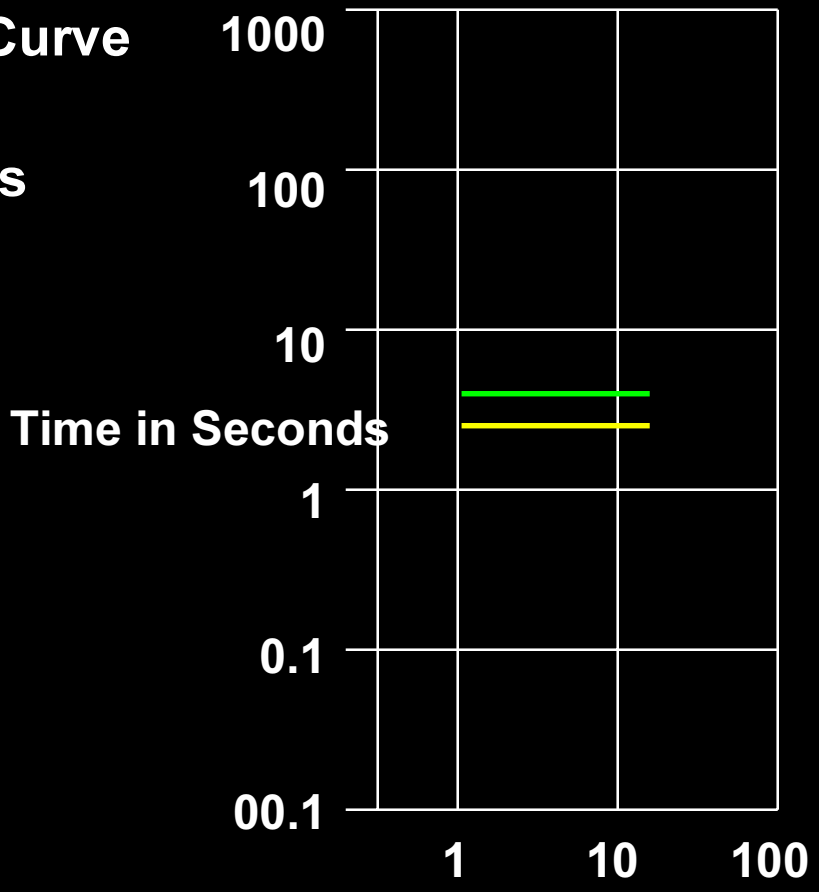
User Selection of ONE Time Current Curve from EIGHT Possible Choices

Definite Time - Four time settings

2 Seconds OR

4 Seconds





(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

Coordination Flexibility

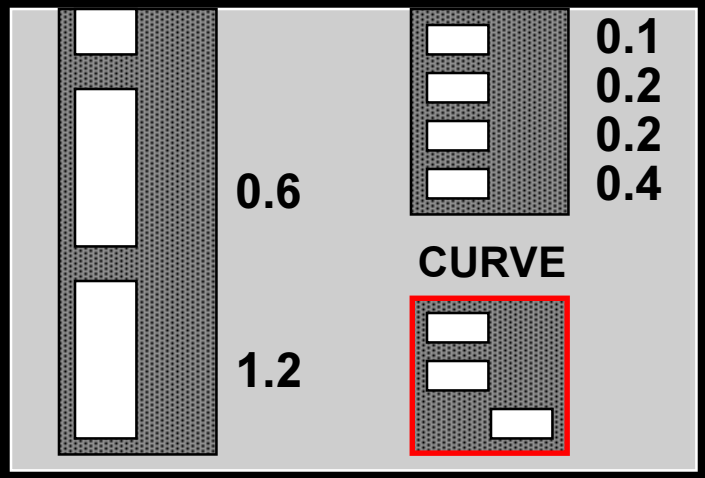
User Selection of ONE Time Current Curve from EIGHT Possible Choices

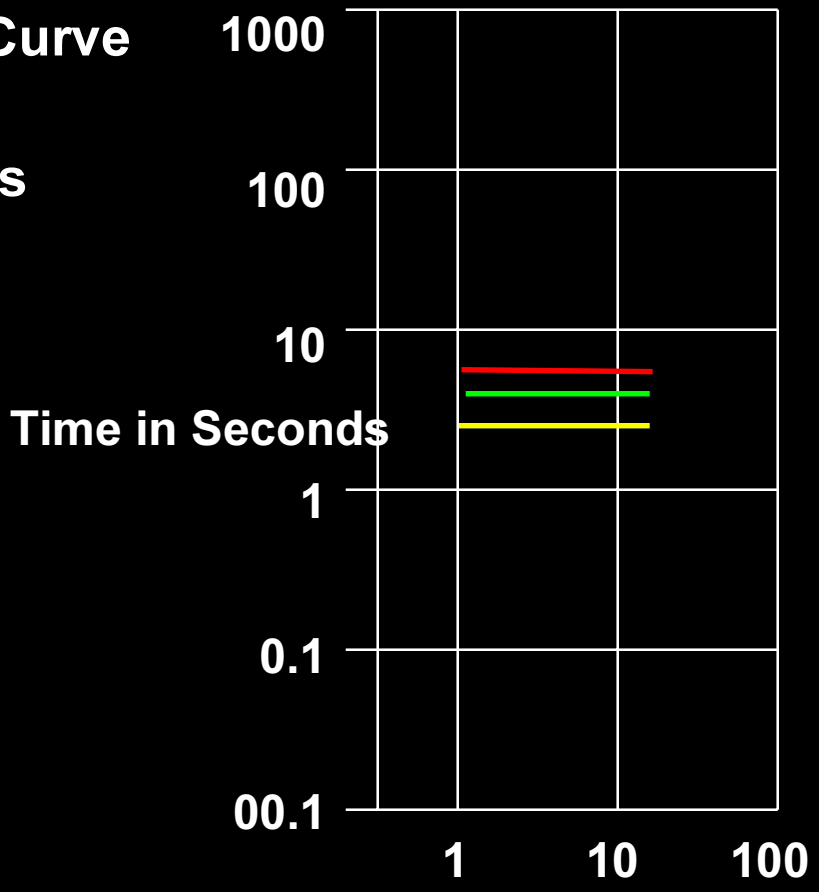
Definite Time - Four time settings

2 Seconds OR

4 Seconds OR

6 Seconds





(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

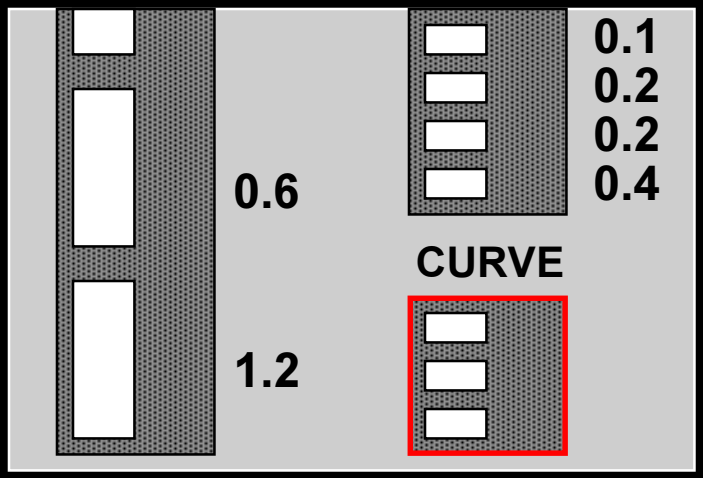
Definite Time - Four time settings

2 Seconds OR

4 Seconds OR

6 Seconds OR

8 Seconds





(No. 5 time-dial setting is shown for each curve, range of setting is 0.5 to 10)

Coordination Flexibility

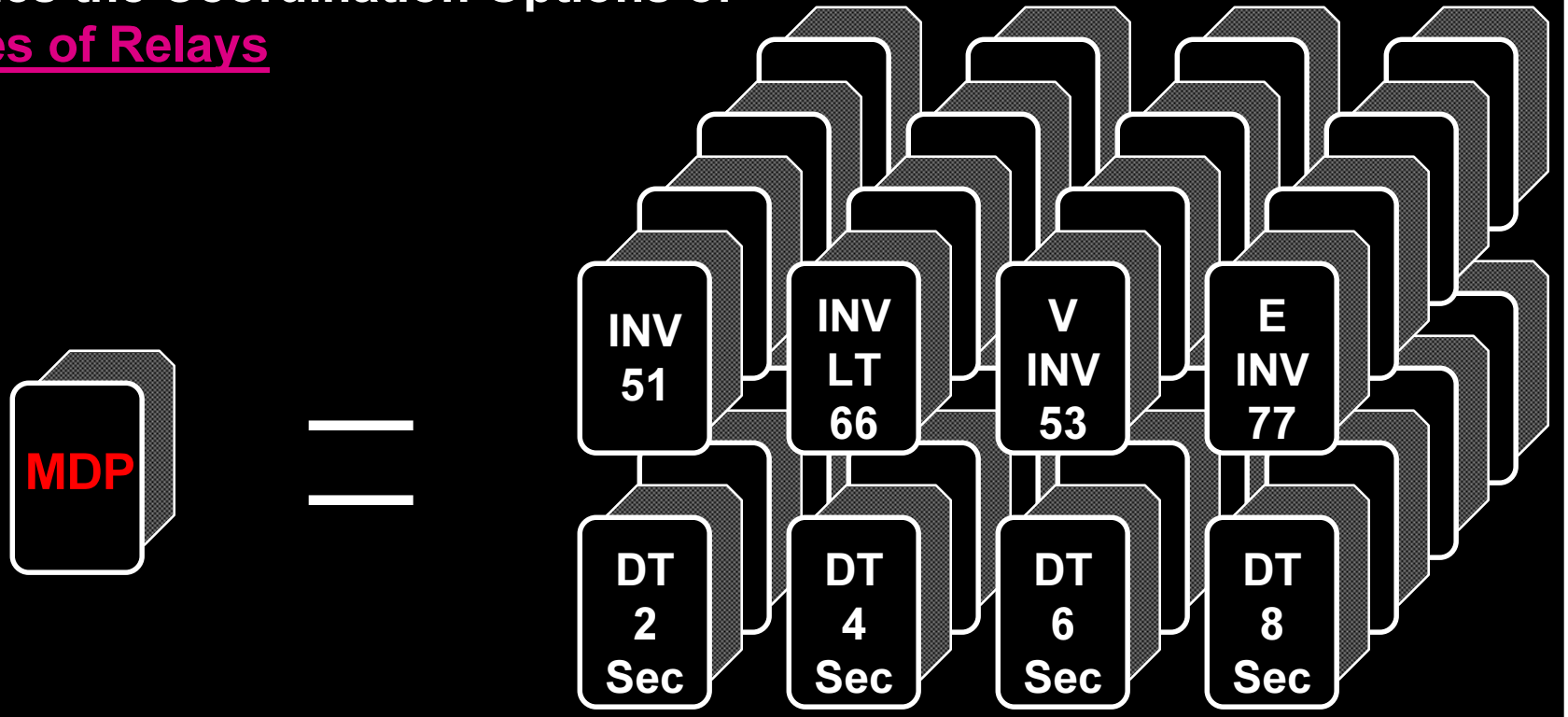
User Selection of ONE Time Current Curve from EIGHT Possible Choices

Provides the Coordination Options of 8 Types of Relays

Coordination Flexibility

User Selection of ONE Time Current Curve from EIGHT Possible Choices

Provides the Coordination Options of 8 Types of Relays



Coordination Flexibility

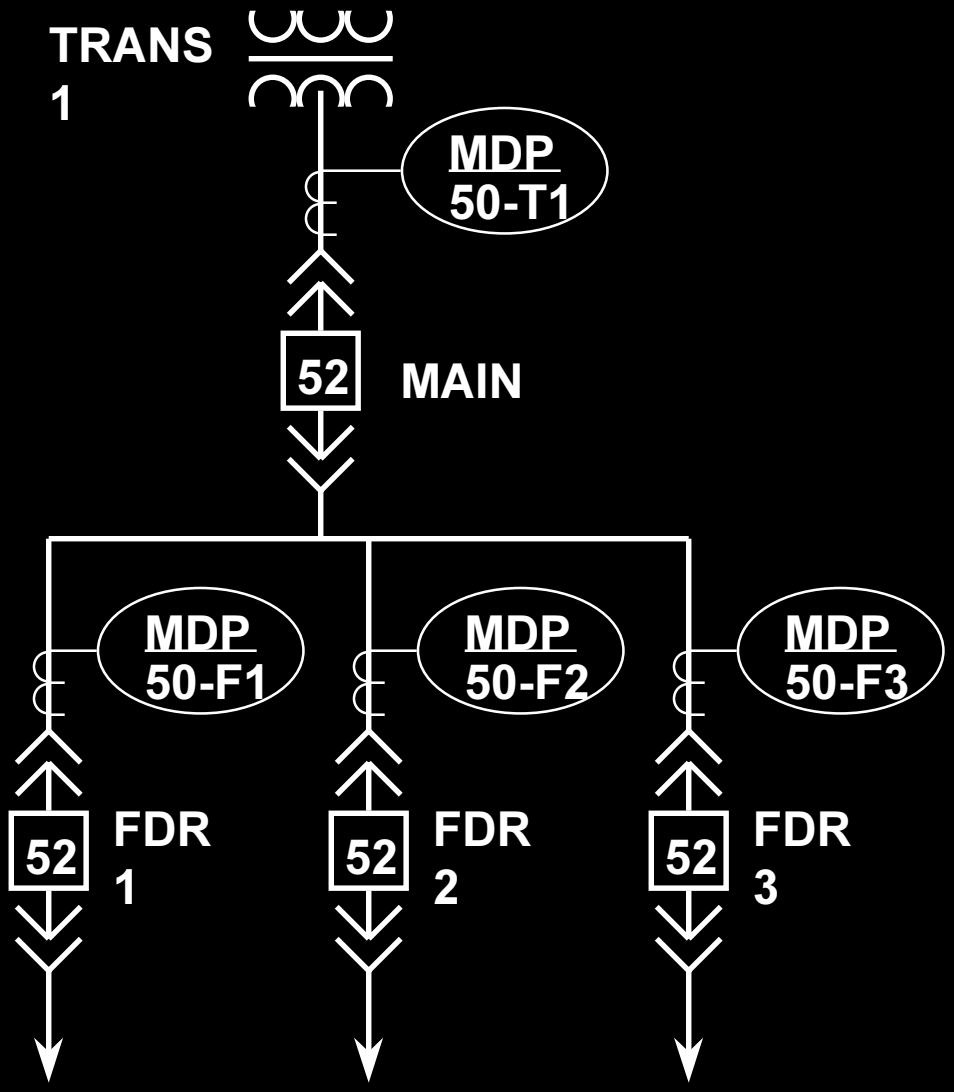
Independent Curve Selection for Phase and Ground

Instantaneous Delay Setting

Close coordination with reclosers
- Negligible Over travel and
- High Dropout to pickup ratio

Block Instantaneous and Block Ground
(Zone Selective Interlock)
- Aides in isolating fault

Coordination Flexibility

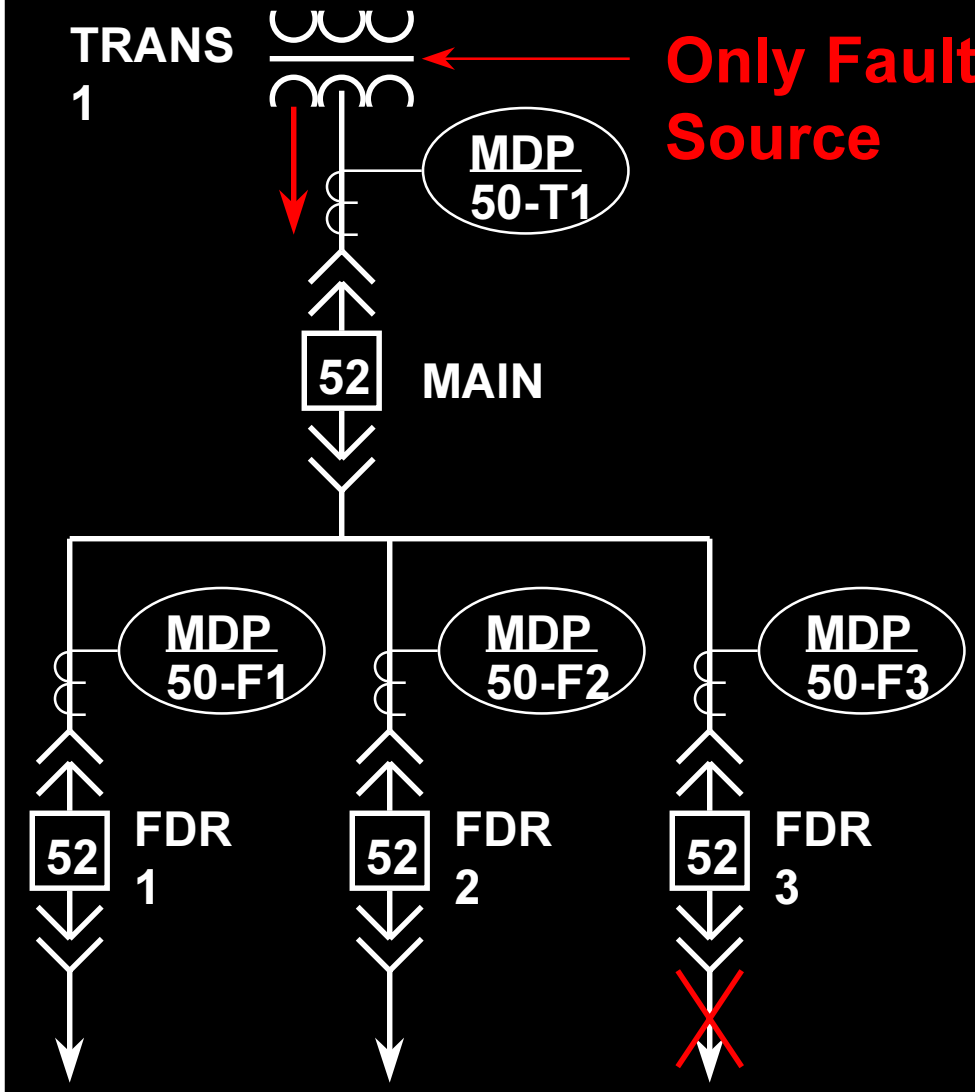


For Zone Selective Interlock

Set 50-T1 IOC Delay to 0.05 Sec.

Set 50-F1, 50-F2 and 50-F3
IOC Delay to 0 Sec.
and Output Select to Position “A”

Coordination Flexibility



For Zone Selective Interlock

Set 50-T1 IOC Delay to 0.05 Sec.

Set 50-F1, 50-F2 and 50-F3
IOC Delay to 0 Sec.
and Output Select to Position "A"

Provides Zone of Protection (main / feeder)

Communication Options

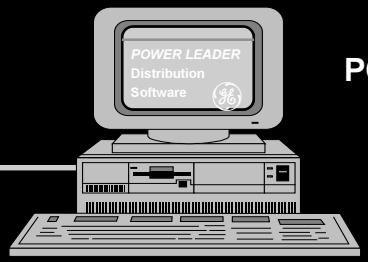
RS-232 Option*

- Use MDP link on your PC or write your own interface software
- *Must be installed at factory

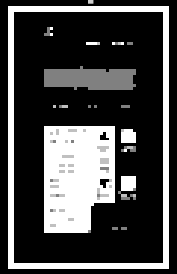
Field Upgradeable, Modular Card

- Connects MDP with POWER LEADER™ Distribution Software
- Allows you to upgrade anytime

MDP Overcurrent Relay



POWER LEADER Distribution Software



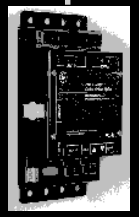
POWER LEADER Meter

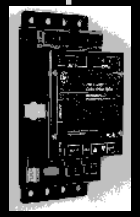


MicroVersaTrip PM Trip Unit for AKR ACB and, Power Break ICCB



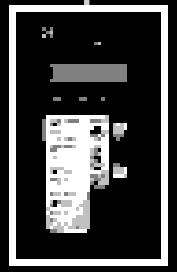
EPIC MicroVersaTrip Trip Unit for EPIC ACB



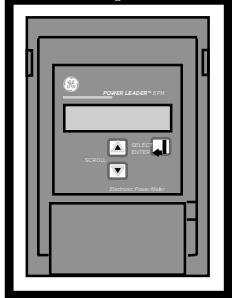


Product Interface Module for Multilin 269+ Motor Relay

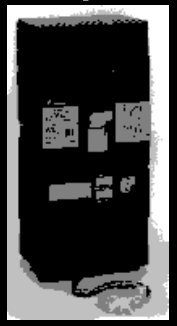
for Multilin 565 Feeder Relay



POWER LEADER Monitor



POWER LEADER EPM Meter



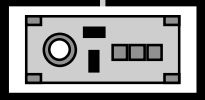
Spectra RMS SG/SK MCCB with MicroVersaTrip PM Trip Unit





MicroVersaTrip PM Trip Unit for GE and NON-GE ACB Upgrades

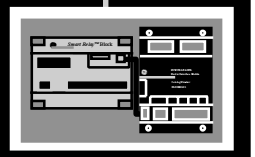
for PowerBreak II ICCB



Spectra RMS Extended Function Module



MDP Medium Voltage Feeder Relay



POWER LEADER I/O Module

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Increased Uptime

Fast Diagnosis of Trips

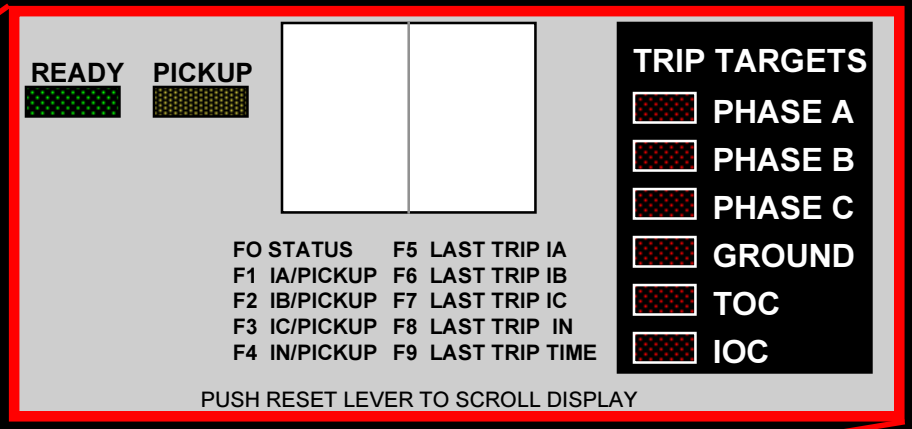
Information at Relay

Increased Uptime

Fast Diagnosis of Trips

Information at Relay



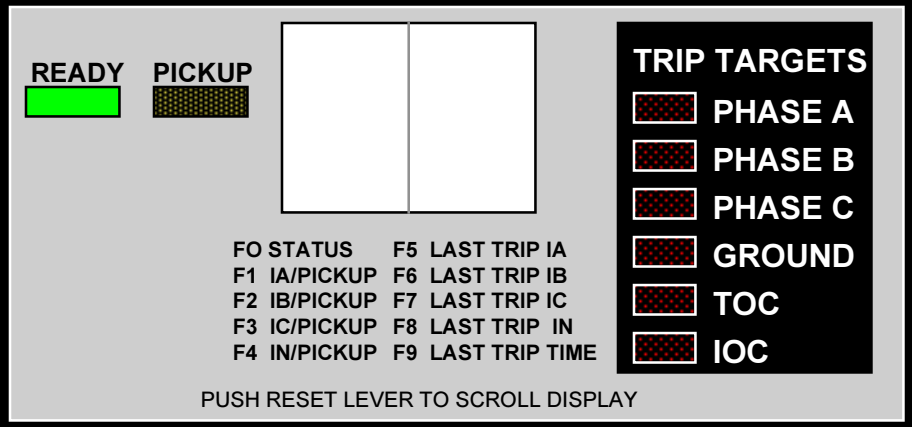


Increased Uptime

Fast Diagnosis of Trips

Information at Relay

- Type of Trip
  - TOC or IOC
  - Phase or Ground

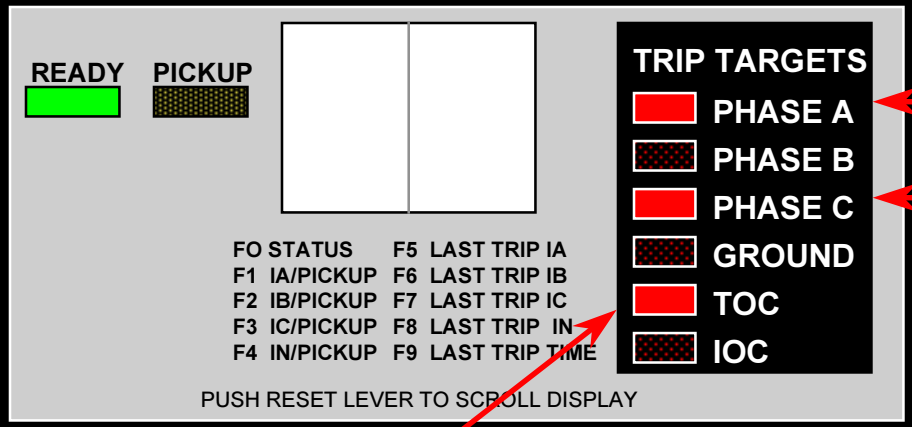


Increased Uptime

Fast Diagnosis of Trips

Information at Relay

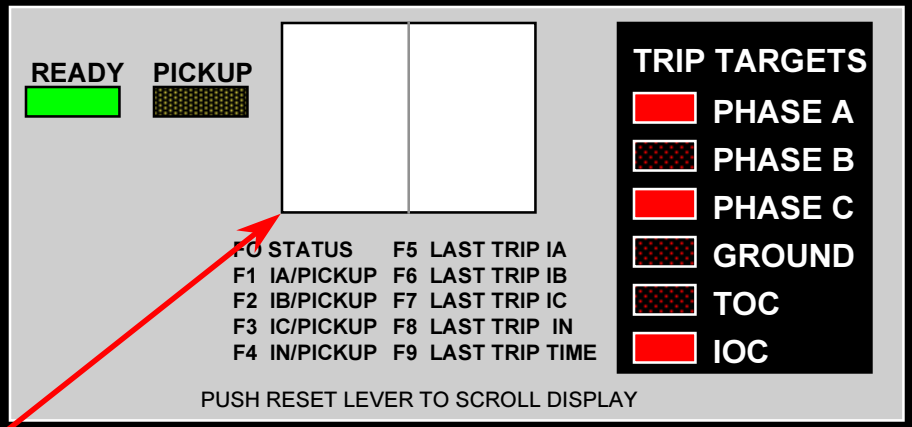
- Type of Trip
  - TOC or IOC
  - Phase or Ground



Trip Targets Indicate a
Time Overcurrent Trip
Involving Phase A and Phase C

Increased Uptime

- Fast Diagnosis of Trips
- Information at Relay
  - Type of Trip
    - TOC or IOC
    - Phase or Ground
  - Amps at Time of Trip



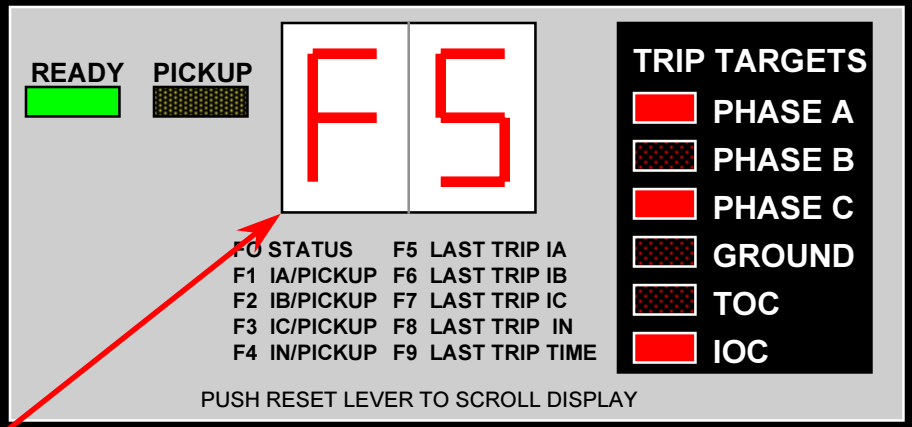
Pressing the RESET LEVER will allow scrolling through the Functions

Increased Uptime

Fast Diagnosis of Trips

Information at Relay

- Type of Trip
  - TOC or IOC
  - Phase or Ground
- **Amps at Time of Trip**



Pressing the RESET LEVER will allow scrolling through the Functions

Function “F5” provides Phase A current multiple for the last trip

Increased Uptime

Fast Diagnosis of Trips

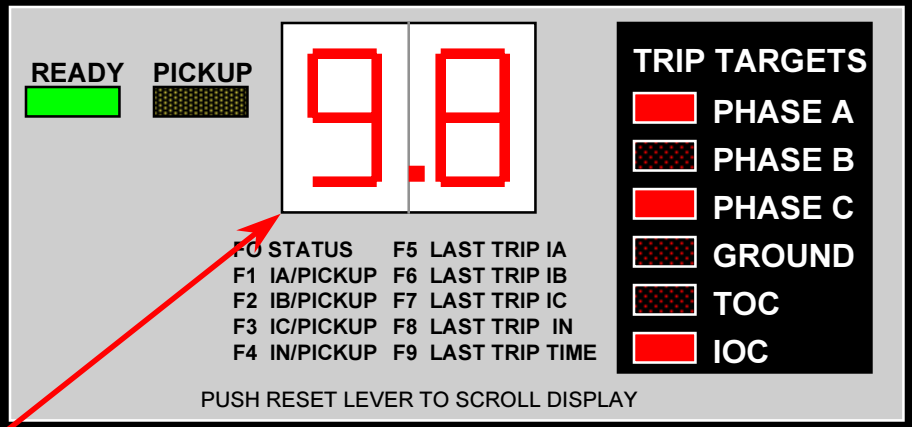
Information at Relay

Type of Trip

TOC or IOC

Phase or Ground

Amps at Time of Trip



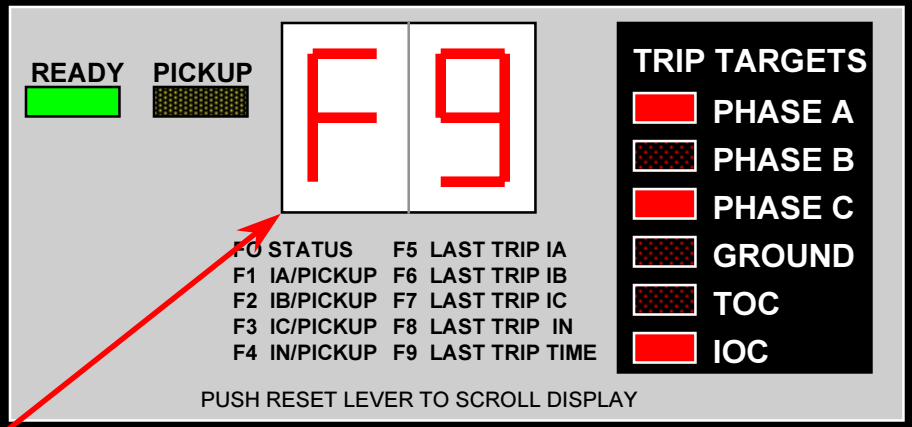
Pressing the RESET LEVER will allow scrolling through the Functions

Function “F5” provides Phase A current multiple for the last trip

A display value of “9.8” would represent 9.8 times the Pickup Setting times the CT Ratio

Increased Uptime

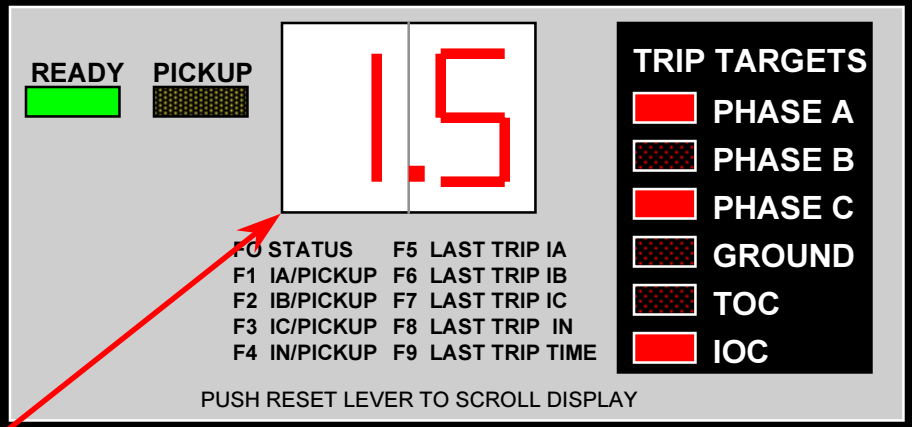
- Fast Diagnosis of Trips
- Information at Relay
  - Type of Trip
    - TOC or IOC
    - Phase or Ground
  - Amps at Time of Trip
  - **Time to Trip**



Scrolling to Function “F9” provides Operating Time for the last trip

Increased Uptime

- Fast Diagnosis of Trips
- Information at Relay
  - Type of Trip
    - TOC or IOC
    - Phase or Ground
  - Amps at Time of Trip
  - **Time to Trip**



Scrolling to Function “F9” provides Operating Time for the last trip

A display value of “1.5” would represent 1.5 second Operating Time Value of the trip

Increased Uptime

Fast Diagnosis of Trips

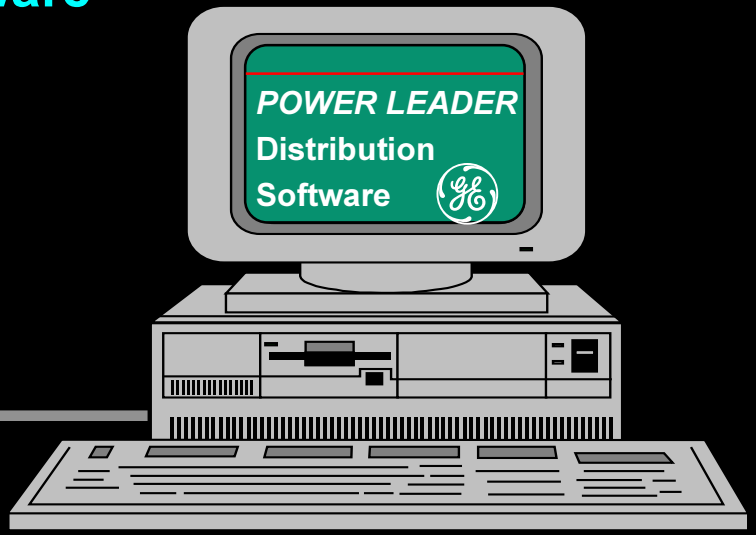
Information at Host Personal Computer with POWER LEADER™ Distribution Software

Increased Uptime

Fast Diagnosis of Trips

Information at Host Personal Computer with POWER LEADER™ Distribution Software





Commnet Bus (Communication Network)
Shielded Twisted Pair

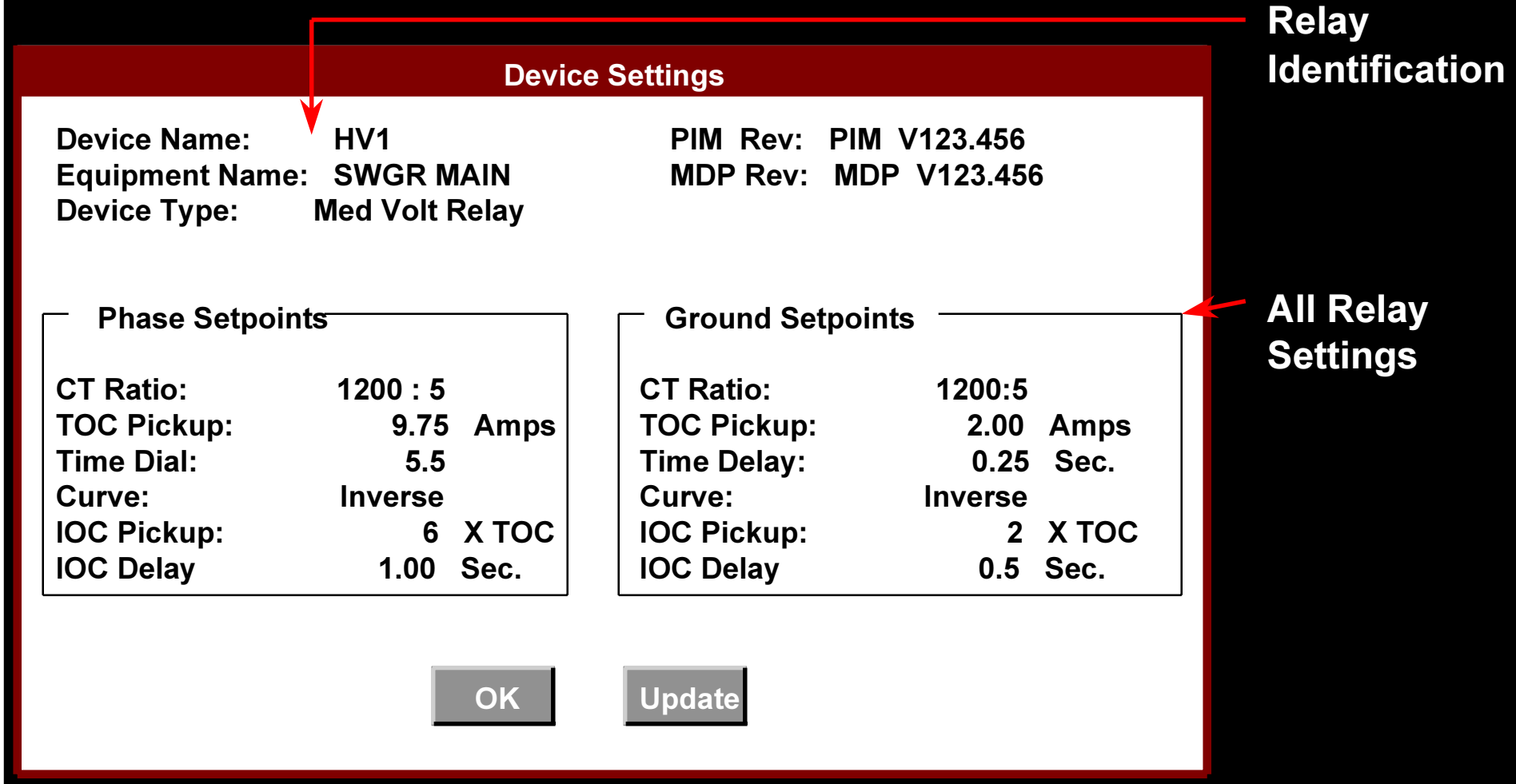
Increased Uptime

Fast Diagnosis of Trips

Information at Host Personal Computer with POWER LEADER™ Distribution Software

- Set Point Review and Exception Reporting
- Metering of Current
- Trip Notification
  - Type of Trip (TOC or IOC, and Phase or Ground)
- Trip Details
  - Amps at time of trip
  - Timetag of Trip to 0.01 sec.
  - Trip time of relay
- Independent Alarm Setup and Notification
- Trending Information

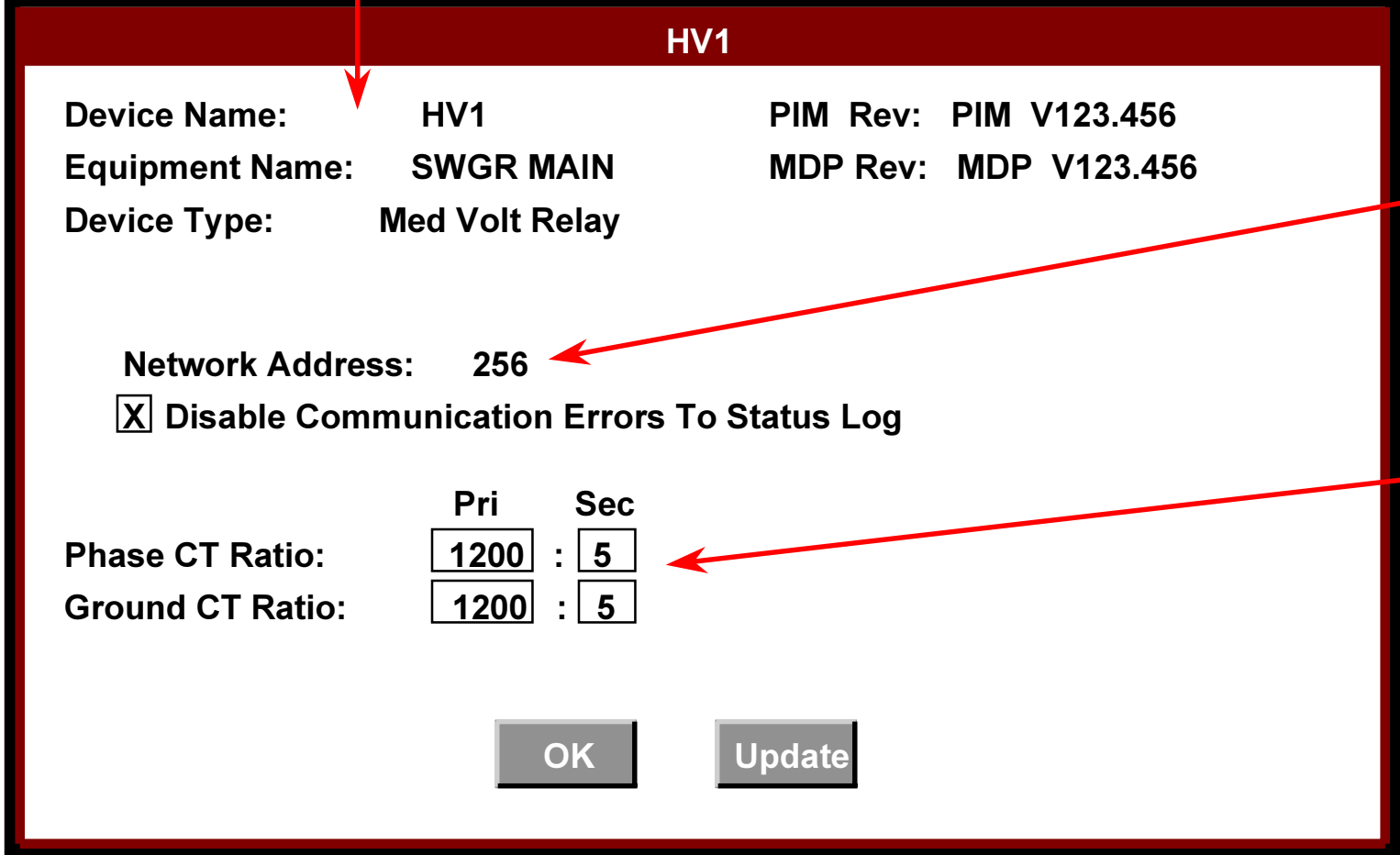
Host PC Device Settings Screen



Relay Identification

All Relay Settings

Host PC Device Settings Screen

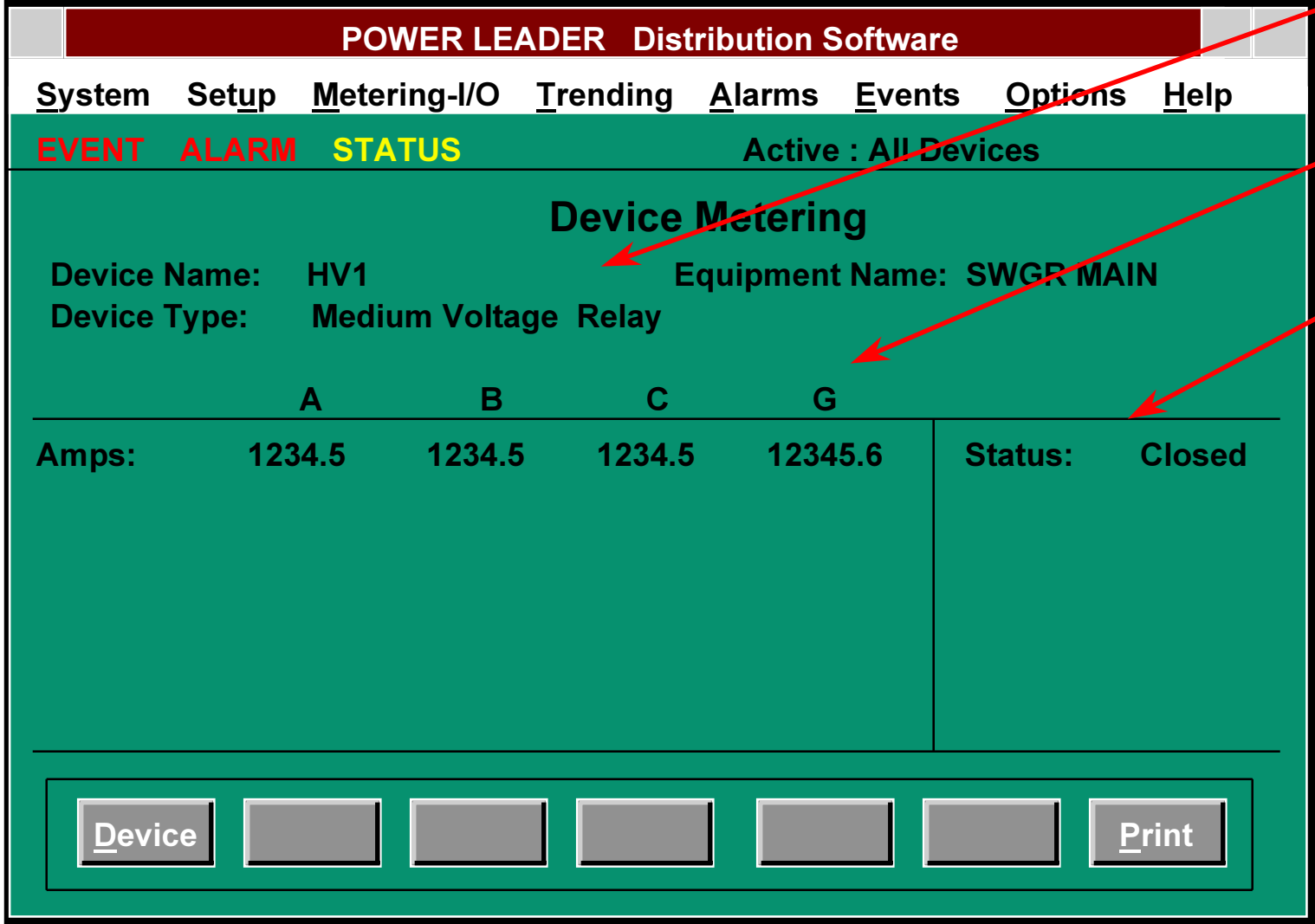


Relay Identification

Relay Network Address

Relay CT Settings

Host PC Device Metering Screen

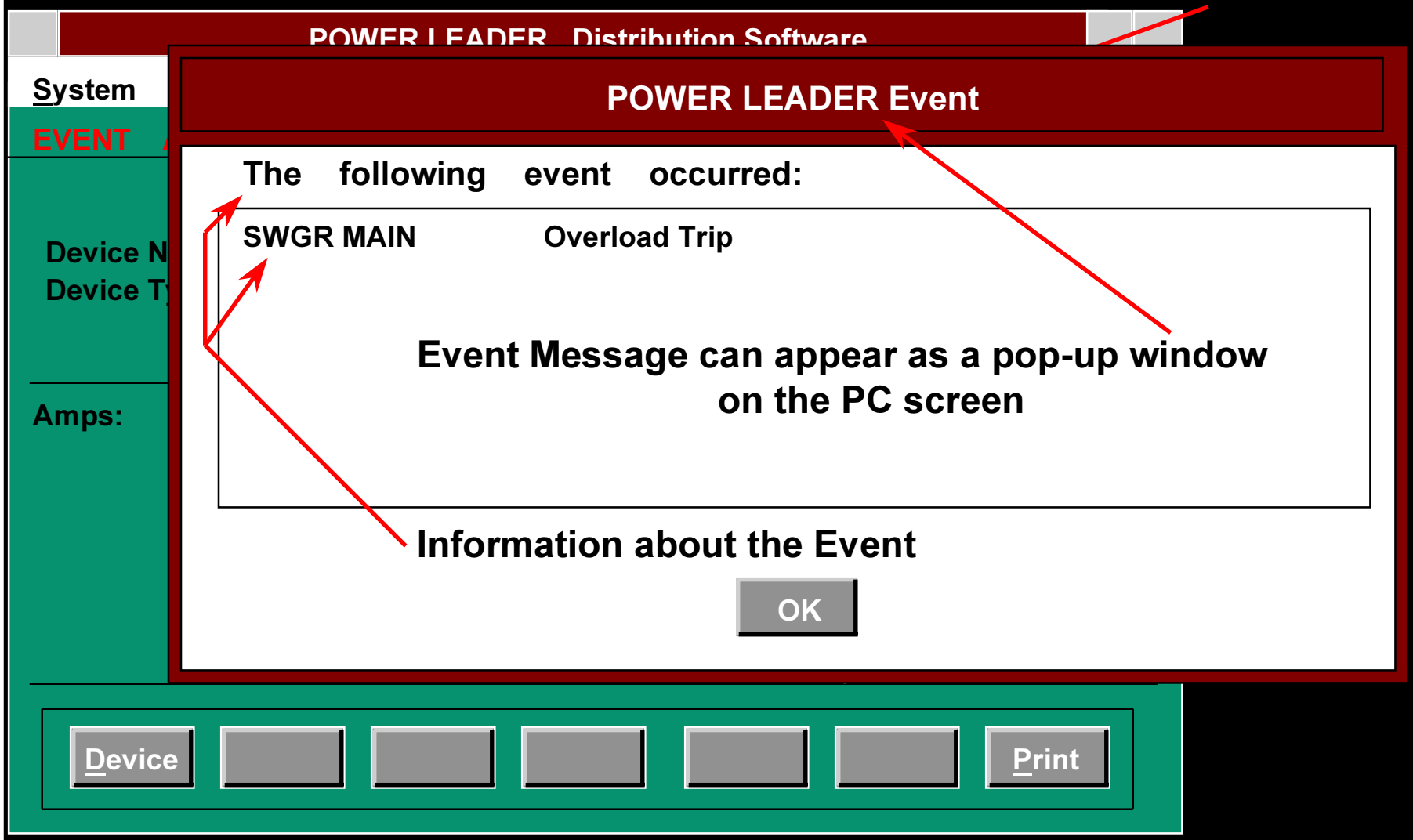


Relay Identification

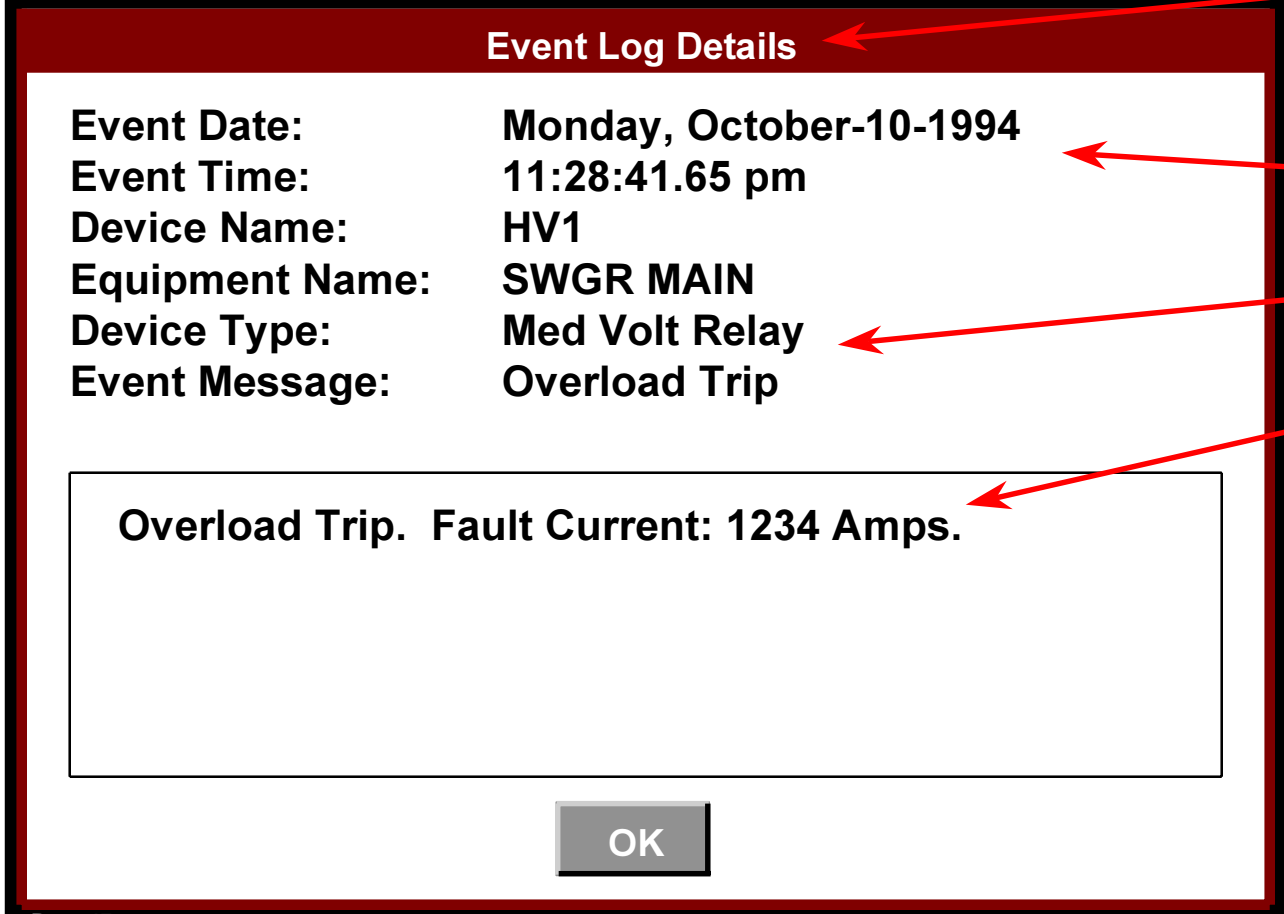
Relay Metering

Relay/Device Status

Host PC Device Metering Screen



Host PC Event Log Details Screen



Enter the Distribution Software Program

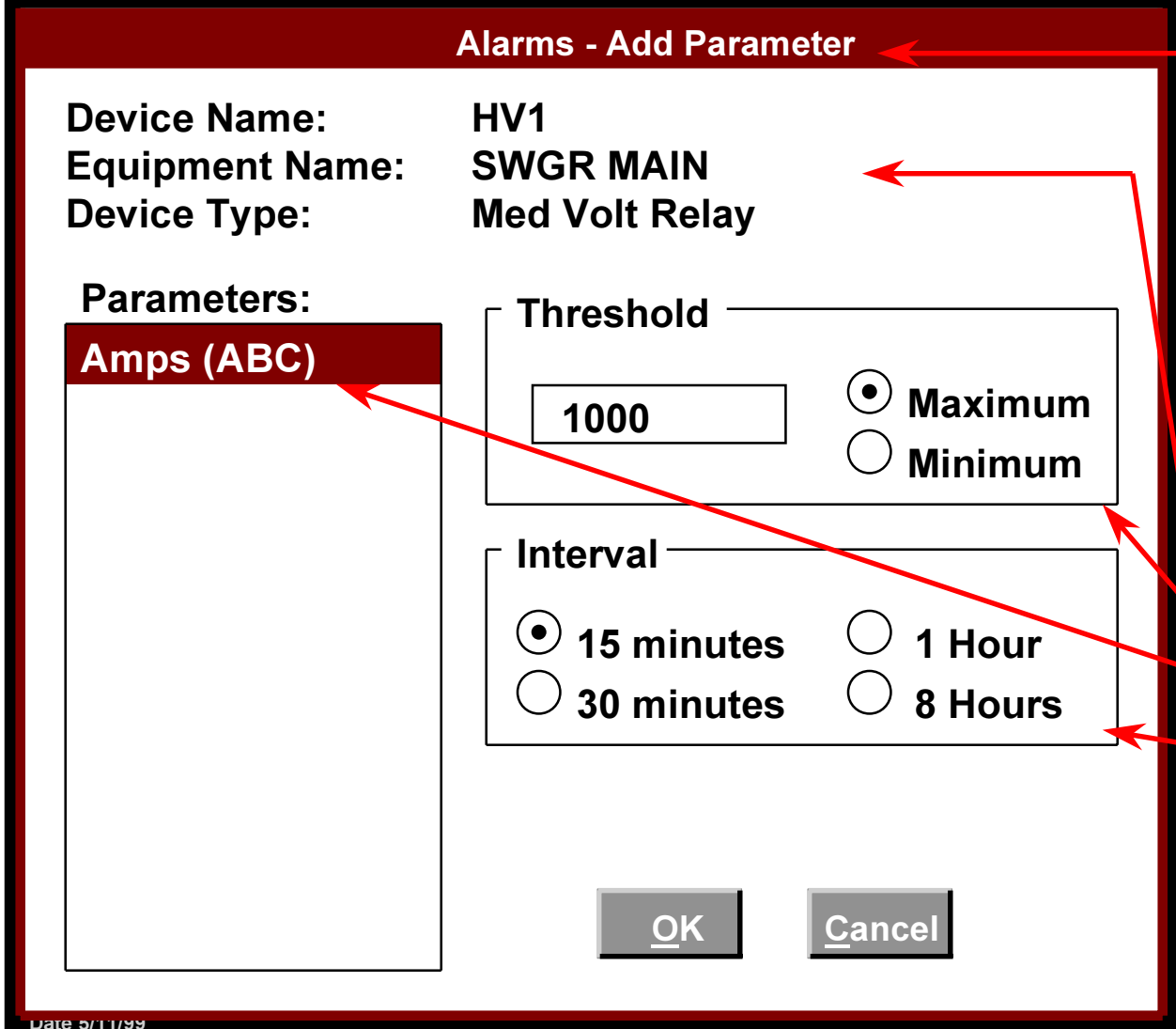
Bring up the Event Log and request Details

Date / Time Information

Relay Identification

Specifics about the Event

Host PC Alarms Screen



Enter the Distribution Software Program

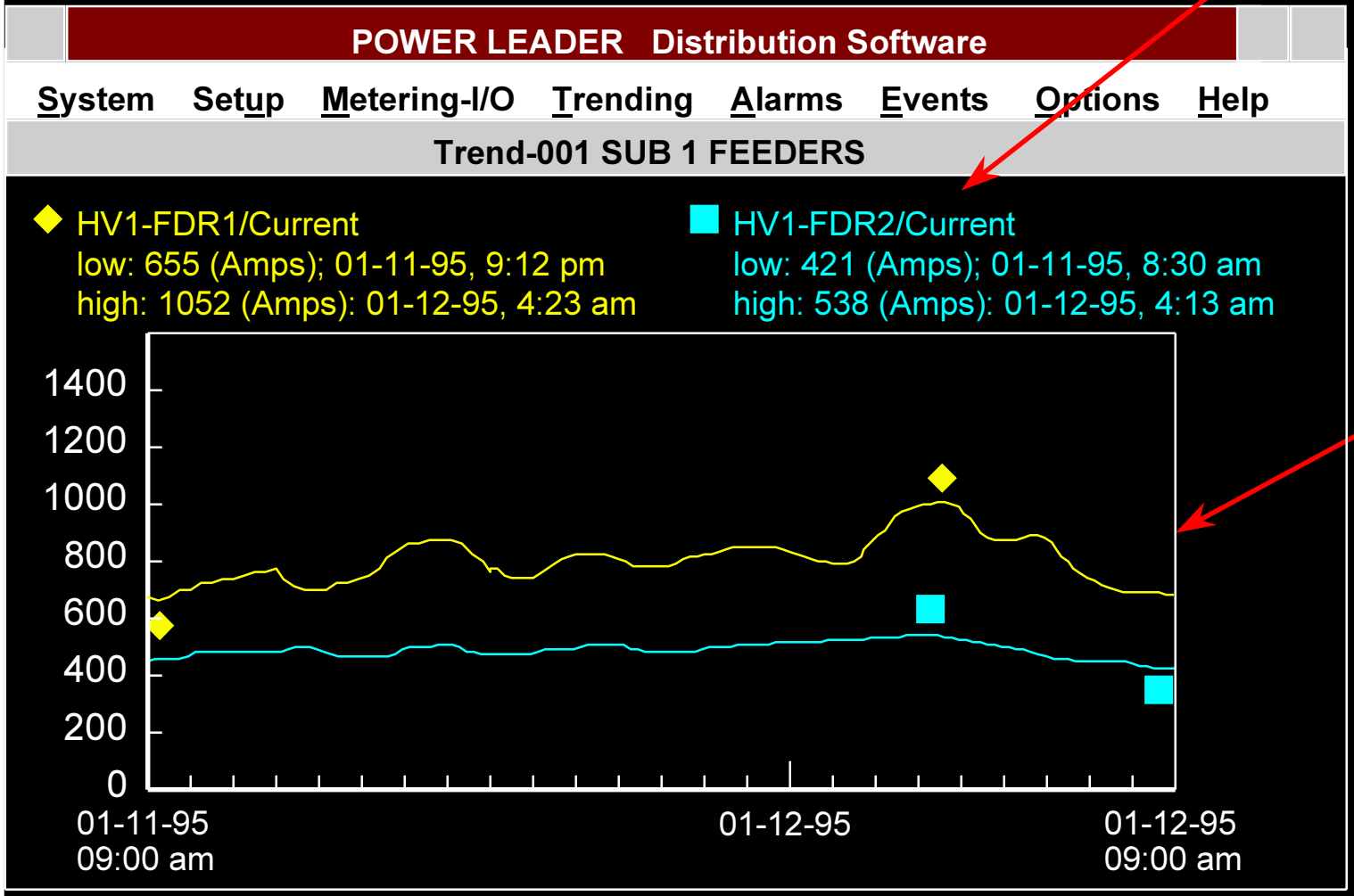
Bring up the Alarms Screen and request ADD

This allows proactive evaluation of a relay's performance by obtaining an advanced warning ALARM (NO TRIP)

User Defined:
Device
Threshold
Parameter

Interval

Host PC Trending Screen



Once TRENDS are defined (which device, parameter and duration) the data is automatically collected by the Software Program.

The data can then be reported or displayed as a graph

Proven Reliability

Over a Thousand Relay Years of Service

Meets Global Standards

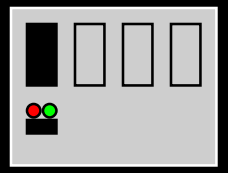
- ANSI C37.90
- IEC 255
- UL Listed

Drawout Construction with built-in Test Facilities

Continuous Self-Test with Notification contact

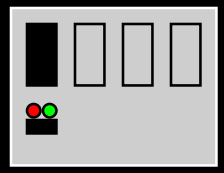
Value for your Investment

Value for your Investment

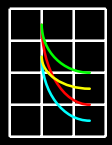


Four Relays in One Integrated Package

Value for your Investment

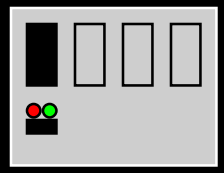


Four Relays in One Integrated Package

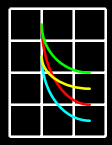


User Selectable Time Overcurrent Curves

Value for your Investment



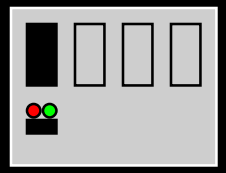
Four Relays in One Integrated Package



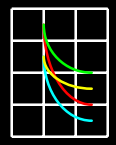
User Selectable Time Overcurrent Curves

Commnet Card for Field Upgrade Communications

Value for your Investment

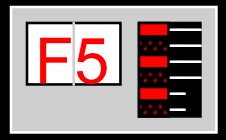


Four Relays in One Integrated Package



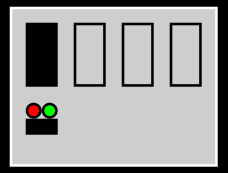
User Selectable Time Overcurrent Curves

Commnet Card for Field Upgrade Communications

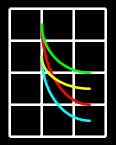


Event Data helps you get back on-line fast

Value for your Investment

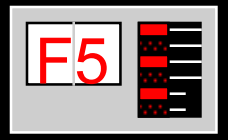


Four Relays in One Integrated Package

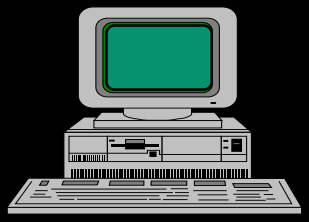


User Selectable Time Overcurrent Curves

Commnet Card for Field Upgrade Communications

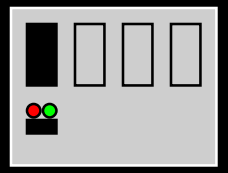


Event Data helps you get back on-line fast

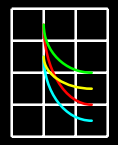


Communicates with POWER LEADER™ Distribution Software

Value for your Investment

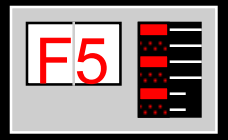


Four Relays in One Integrated Package

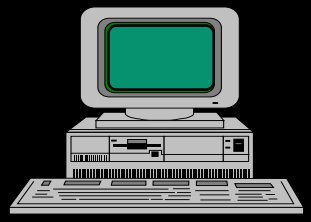


User Selectable Time Overcurrent Curves

Commnet Card for Field Upgrade Communications



Event Data helps you get back on-line fast



Communicates with POWER LEADER™ Distribution Software

Proven In-Service Reliability

Cat. No. Prefix	Version / Description
MDP0	No communication or digital inputs*
MDP1	Digital inputs* & modular communication upgrade socket
MDP2	Digital inputs* & modular commnet communications module installed
MDPA	Digital inputs & RS232 communication inputs**
MDPCMN	Commnet communication card only (for field upgrade of MDP1 units)

* Digital Inputs include block ground, block instantaneous and breaker status (open/closed)

** RS232 communications is not field upgradeable. Breaker status is not available

The MDP provides . . .

Space Savings

Four Relays in One Integrated Package

Coordination Flexibility

User Selectable Time Overcurrent Curves

Communication Options

Commnet Card - Factory / Field Upgrade or RS232 - Factory

Increased Uptime

Event

Data (Local & Remote) helps you get back on-line fast

Proven Reliability

Over 1000 Relay Years of Service, Meets Global Standards

Value for your Investment

The MDP Overcurrent Relay

Thank you for your time



MDP Relay Definition of Terms and Application

MDP — A General Electric digital, microprocessor-based relay that provides non-directional phase overcurrent and ground overcurrent protection. The relay's time overcurrent (TOC) function can be inverse time (where four families of curves are provided) or definite time (where four ranges of delay are provided). The instantaneous overcurrent (IOC) function includes an adjustable time delay. All of these features are offered in a single relay for three-phase and ground protection. The MDP relay is applied on alternating current circuits (feeders, motors, transformers, etc.) and provides effective protection against overloads and rapid detection of short circuits.

50/51 — Designation from the USA Industry Standard ANSI C37.2 commonly used in protective relaying. The "50" device number refers to an Instantaneous Overcurrent Function. The "51" device number refers to an AC Time Overcurrent Function. Other suffix descriptions often used include "N" for Neutral or "G" for ground.

52 — Designation from the USA Industry Standard ANSI C37.2 commonly used in protective relaying. The "52" device number refers to an AC Circuit Breaker.

POWER LEADER Distribution Software — A General Electric user-friendly software package that runs under Microsoft Windows 3.1 and runs on an IBM -compatible 386 or 486 personal computer. The software links the computer with devices via a 2-wire shielded twisted pair. A Communication Network Interface (CNI) card is required in the PC to interface with commnet (the GE communication network protocol).

MDP Relay Definition of Terms and Application

INVERSE TIME	A time/current operating characteristic generally applied where the short-circuit current magnitude is dependent largely upon the system generating capacity at the time of the fault. The GE designation is "51" for this operating characteristic.
VERY INVERSE	A time/current operating characteristic generally applied where the short-circuit current magnitude is dependent largely upon the relative position of the fault with TIME respect to the relay and only slightly or not at all upon the system generating capacity. The GE designation is "53" for this operating characteristic.
EXTREMELY INVERSE TIME	A time/current operating characteristic generally applied where sufficient time delay must be provided to allow a re-energized circuit to pick up without unnecessary tripping during the inrush period and at the same time coordinate properly with power fuses and fuse cutouts. The GE designation is "77" for this operating characteristic.
INVERSE LONG TIME	A time/current operating characteristic generally applied where a long time delay must be provided to allow protection of motors against overloads under conditions where the customary thermal devices are not applicable. The GE designation is "66" for this operating characteristic.
DEFINITE TIME	A time only operating characteristic generally applied where timing functions are required and the current characteristic is generally of little consequence.