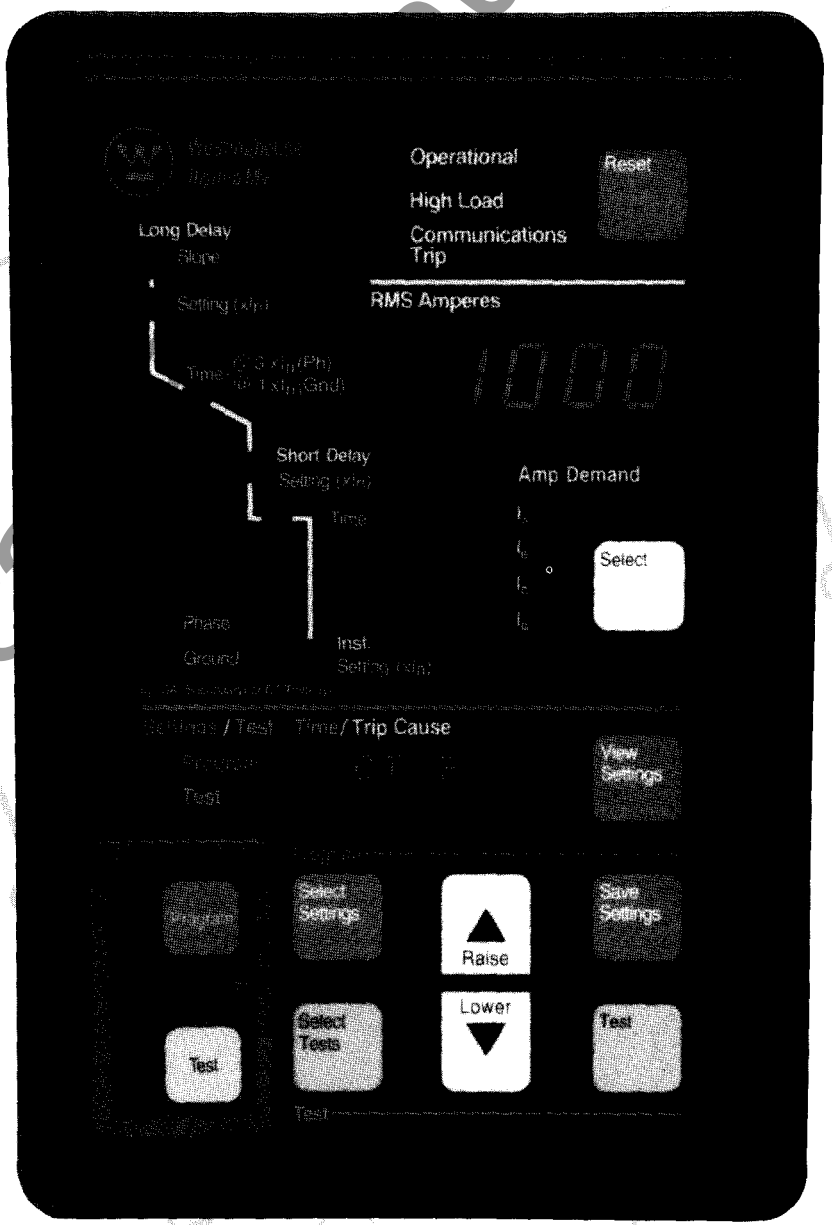
Digitrip MV Trip Unit



DIGITRIP MV TRIP UNIT

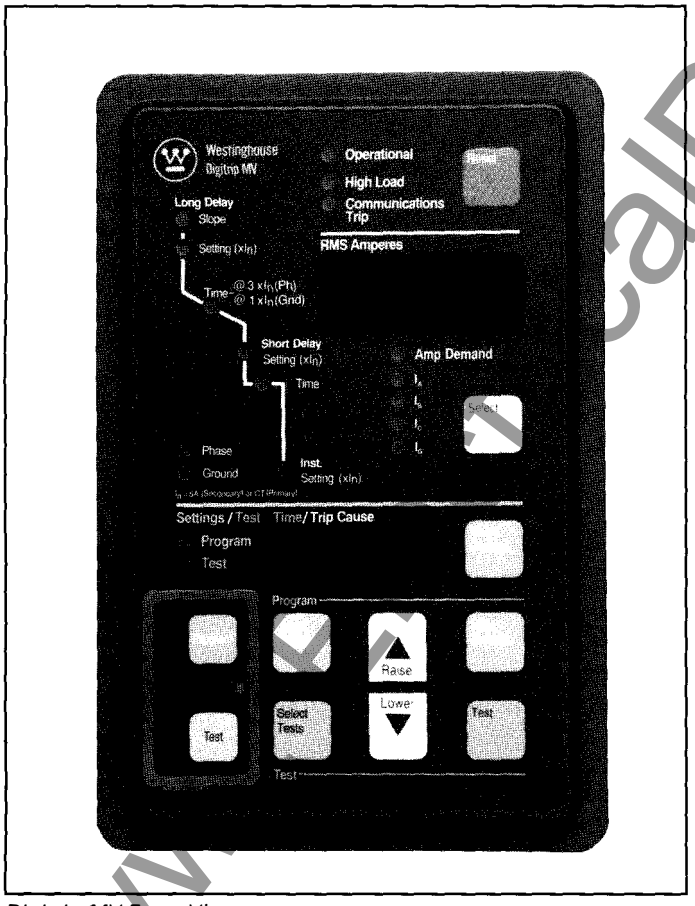
The Digitrip MV Trip Unit is a multi-function, micro-processor based overcurrent trip unit designed for both ANSI and IEC applications. It is a panel mounted, self contained trip unit which operates from either AC or DC control power. The Digitrip MV design provides true RMS sensing of each phase and ground current. Only one trip unit is required for each three-phase circuit. Current monitoring and operator selectable protective functions are integral to each trip unit.

The Digitrip MV Trip Unit operates from the 5 ampere secondary output of standard switchgear current transformers. Current transformer ratio information is quickly programmed into the trip unit via DIP switch settings located at the back of the unit. This enables the trip unit to display current in primary amperes.

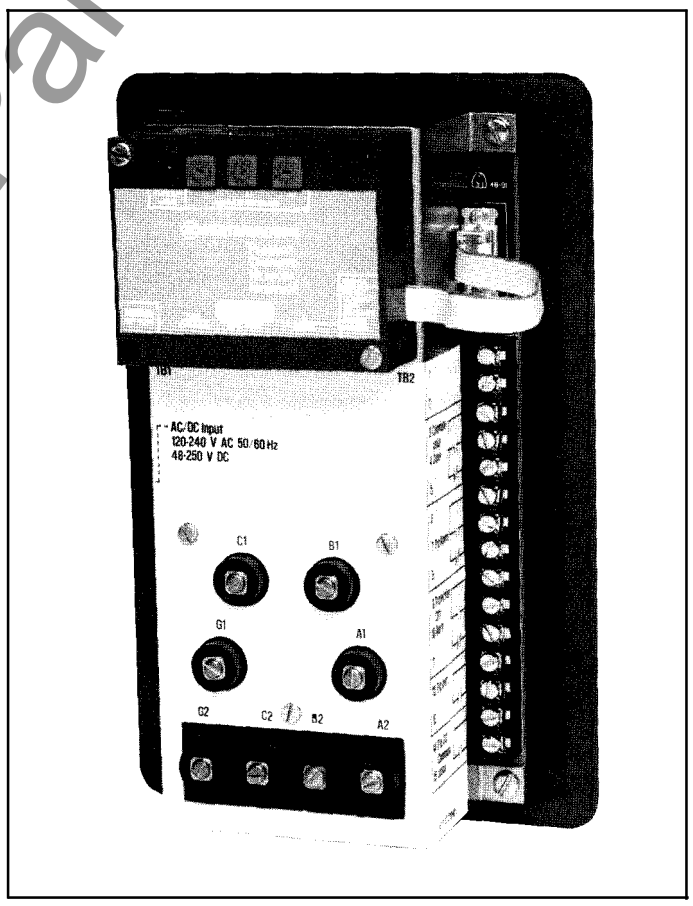
Digitrip MV features a user friendly operations panel to monitor, program, and test the trip unit. Operating parameters and troubleshooting information are displayed in the two highly visible display windows. In addition, all locally viewed trip unit data and information can be delivered to a host computer equipped with the appropriate software. A "Communication Trip" and "Communication Close" control command can also be initiated by a host computer, if desired.

Two styles are available with both offering the same features and functions except for the communication capability. One style includes a built-in INCOM communication capability compatible with the Westinghouse IMPACC system. The other style includes provisions for future communication by simply field installing a communications (PONI) module.

Current Transformer Ratio DIP Switches



Digitrip MV Front View



Digitrip MV Rear View with INCOM PONI Module Installed

DIGITRIP MV FEATURES

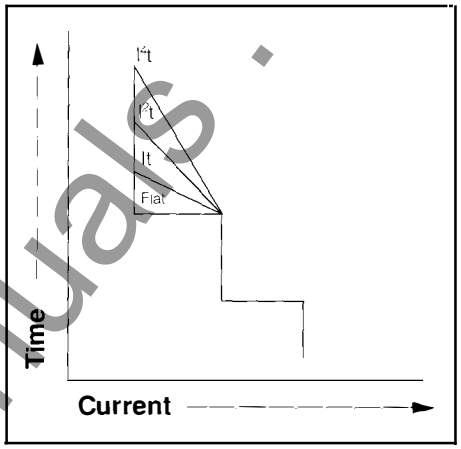
General
- ANSI or IEC applications
- User friendly front panel
- Non-volatile memory
- View settings any time
- DIP switch set CT ratios
- Direct reading (no multiplying factor)
- Individual phase targeting
- Integral test mode (phase and ground)
- Program and test mode security access cover
- Continuous internal circuitry self-testing
- Programmable lockout/self reset after trip
- Unit failure alarm contact
- Trip alarm contact

System Protection
- True RMS sensing of each phase and ground current
- Phase overcurrent protection per time-current curve
- Ground fault protection per time-current curve
- Ground element capable of residual, zero sequence or external source connections
- Selectable long time curve slope
- Selectable true making current release (discriminator)
- Instantaneous trip contact independent of time-overcurrent trip contact for flexibility
- Zone selective interlocking (phase and ground)

Information and Data Delivery
- Displays individual phase currents
- Displays ground current
- Displays magnitude and phase of current causing trip
- Displays peak current for each phase and ground since last reset
- Displays current transformer ratio
- Indicates cause of trip
- Capability to transmit all data/information to a remote location
- Capability to provide breaker "Open" or "Close" status to a remote location via IMPACC

Phase Overcurrent Pick Up Ranges	
• *Long Delay Setting:*	(0.2 to 2.2) x I_n
• *Short Delay Setting:*	(1 to 11) x I_n, None
• *Instantaneous Setting:*	(1 to 25) x I_n, None
Ground Overcurrent Pick Up Ranges	
• *Long Delay Setting:*	(0.1 to 2.0) x I_n, None
• *Short Delay Setting:*	(0.1 to 11) x I_n, None
• *Instantaneous Setting:*	(0.5 to 11) x I_n, None
Time Delay Settings	
• *Long Delay Time:* [@3 x I_n (Ph)] [@1 x I_n (Gnd)]	Flat Slope: 0.2 to 2 sec. It, I^2t, I^4t Slope: 0.2 to 40 sec.
• *Short Delay Time:*	0.05 to 1.5 sec.

Protective Function Settings (I_n is current transformer rating)



Representative Curve Showing Four Selectable Slopes

ELECTRICAL POWER SYSTEM PROTECTION

Digitrip MV Trip Units provide phase and ground protection for most types of medium voltage electrical power distribution systems. Protection curves are similar to those on low voltage power circuit breaker trip units, and provide close coordination with downstream devices, as well as upstream fuse and/or electromagnetic relays. Just one Digitrip MV Trip Unit replaces the normal complement of three or four conventional electromagnetic overcurrent relays, an ammeter, a demand ammeter, an ammeter switch and, in some situations, a lockout relay switch (device 86).

Five protective functions are provided by Digitrip MV for both phase and ground protection. The ground element is capable of a residual, an external source ground or a zero sequence connection. Each protective function is independently programmed to fit specific system requirements, or simply lock out the protective function not required. The five protective functions are:
- Long Delay Setting
- Long Delay Time
- Short Delay Setting
- Short Delay Time
- Instantaneous Setting

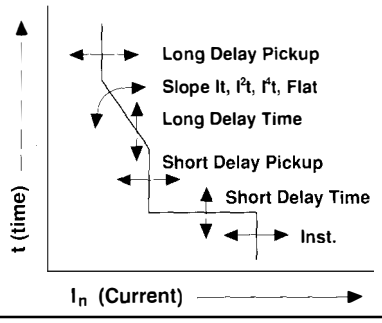
The Digitrip MV Trip Unit delivers greater selective coordination potential by permitting curve shaping possibilities not previously available in medium voltage applications. The slope of the long time protection curve, for example, is selectable to coordinate with existing electromagnetic overcurrent relays and power fuses. Four selectable slopes are available:
- It (Moderately Inverse)
- I^2t (Very Inverse)
- I^4t (Extremely Inverse)
- Flat (Definite Time)

All Digitrip MV Trip Units have zone selective interlocking capabilities for phase and ground fault protection. This feature permits two or more coordinated trip devices to communicate and alter their preset tripping modes. The result is a faster response for certain upstream fault conditions.

SμRE-FLEX COORDINATION

SμRE-FLEX COORDINATION is the very flexible coordination capabilities package featured in the Digitrip MV Trip Unit. Digitrip MV Trip Units provide circuit breakers with an extensive degree of selective coordination potential and permit curve shaping over a wide range. Each setting is programmed independently permitting each specific portion of the time-current curve to be moved independently as shown below. An extensive array of pick-up settings, time delay settings, and long delay (phase and ground) slope selections also contributes significantly to the flexibility and effectiveness of Digitrip MV.

SμRE-FLEX COORDINATION



Phase Long Time Protection
Long time (overload and fault) protection consists of a long delay current setting, a long delay time setting and a choice of four different slope selections for the time line.

Phase Short Time Protection
Short time (fault) protection responds to short circuit conditions. It is similar to the Phase Long Time Protection in that current and time settings are offered. It differs, however, in two ways: (1) "NONE" is a Short Delay Pickup setting which, if selected, will disable the Phase Short Time Protection, and (2) a slope selection is not available for the time line.

Instantaneous Protection
Instantaneous (short circuit) protection reacts to high level fault currents. If "NONE" is selected for the instantaneous setting, the instantaneous trip function is disabled and a true making current release (discriminator) option is offered. If selected, the discriminator is functional for 10 cycles and will trip the breaker instantaneously, if the fault current is above 11 times (I_n).

Ground Fault Protection
The ground fault protection function is a composite of the Ground:
- Long Delay Current and Time Settings
- Short Delay Current and Time Settings
- Instantaneous Setting

The curve automatically assumes the same slope as the phase slope. A "NONE" setting selection disables that characteristic of the ground fault protection.

Zone Selective Interlocking (Phase and Ground)
Zone Selective interlocking is a protection function pioneered by Westinghouse. It functions to minimize equipment damage resulting from a short circuit fault or a ground fault in an area where long time and/or short time delay is in use.

When the zone interlocking feature of Digitrip MV is utilized, an immediate trip is initiated when the fault is in the breaker's zone of protection, regardless of its preset time delay. Upstream Digitrip MV protected breakers are restrained from tripping immediately by an interlocking signal from the downstream Digitrip MV Trip Unit. This interlocking signal requires only a pair of wires from the downstream breaker to the upstream breaker. It provides standard coordinated tripping when the fault is located outside the zone of protection.

In the sample zone interlocking system shown below, circuit breakers A, B and C are equipped with Digitrip MV Trip Units.

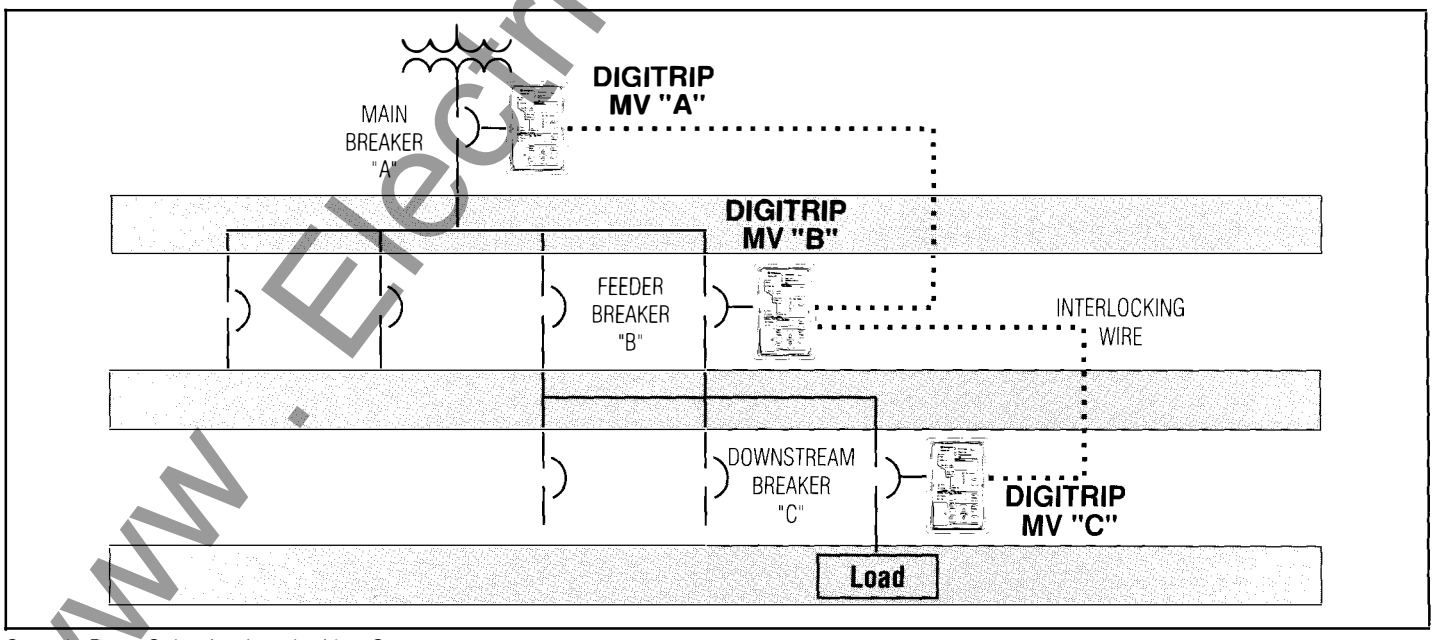
Fault Location Zone 3
If a fault occurs at a point in Zone 3, Digitrip MV of Downstream Breaker C senses the fault and sends a restraining signal to the upstream Digitrip MV of Feeder Breaker B. Having received this signal, Digitrip MV of Feeder Breaker B withholds its trip command. As a result, only Downstream Breaker C is tripped.

Fault Location Zone 2
If a fault occurs at a point in Zone 2, Digitrip MV of Feeder Breaker B senses the fault and sends a restraining signal to the upstream Digitrip MV of Main Breaker A.

Digitrip MV of the Downstream Breaker C does not see this fault since it is situated on the downstream side of the fault. As a result, Digitrip MV of Downstream Breaker C does not send a restraining signal to Digitrip MV of Feeder Breaker B.

Since it did not receive a restraining signal from Digitrip MV of Downstream Breaker C, Digitrip MV of Feeder Breaker B identifies that the fault is in Zone 2 and immediately trips Feeder Breaker B, regardless of its time setting.

Fault Location Zone 1
If a fault occurs in Zone 1, no restraining signals are received by Digitrip MV of Main Breaker A. As a result Main Breaker A is immediately tripped by its Digitrip MV Trip Unit regardless of its time setting.



Sample Zone Selective Interlocking System

PROGRAMMING SIMPLICITY

The Digitrip MV Trip Unit was designed with programming simplicity in mind. Protection functions are quickly programmed by an operator using pushbuttons on the faceplate of the trip unit. For security, the "Program Mode" pushbutton is located behind a sealable door. Programming can only take place when the circuit breaker is open. Direct reading displays indicate the present setting while LEDs indicate the specific functions being programmed.

Once the circuit breaker and the security door on the front of the trip unit are open, programming for the Digitrip MV Trip Unit can begin. Programming (establishing the desired settings) is initiated by the "Program Mode" pushbutton and enables existing settings to be altered. The **Programming Sequence Preview** flowchart shows the general programming steps Digitrip MV follows, always beginning with the "Slope" selection and ending with the "Frequency" selection. Each time the "Select Settings" pushbutton is pressed and released, the trip unit advances to the next sequential step.

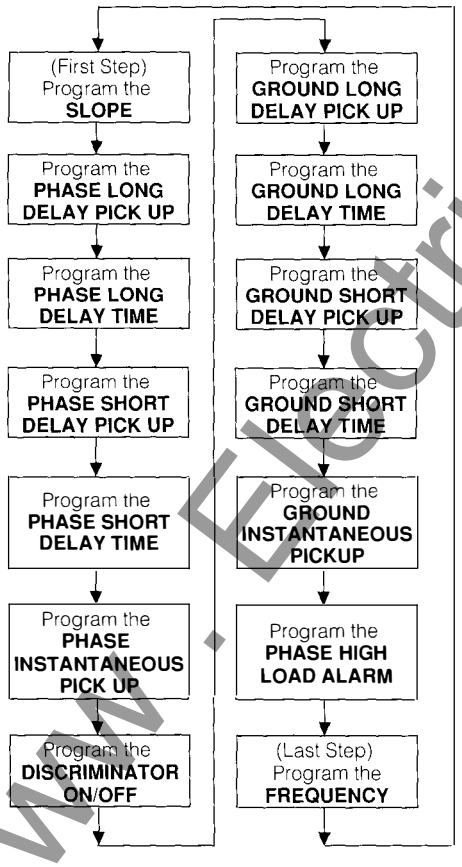
For example, when the step for programming the "Phase Long Delay Pick Up" has been reached in the programming sequence, the Long Delay Setting LED begins blinking green on the trip unit's time-current curve display. At the same time, the Phase LED also begins blinking green. The "Raise" and "Lower" pushbuttons are then used to adjust the setting viewed in the display window.

Once the operator is satisfied with the displayed Phase Long Delay Pickup setting, the "Select Settings" pushbutton is pressed and released to move to the next step. Each protection function is simply set in a similar manner.

New settings must be saved before exiting the "Program Mode." The "Save Settings" pushbutton can be used to save settings during the programming process or at the end after all the settings are selected.

It is as simple to exit the "Program Mode" as it was to enter. This is accomplished by pressing and releasing the "Program Mode" pushbutton or "Reset" pushbutton. The "Program Mode" is also exited automatically if no programming activity takes place for approximately 2 1/2 minutes.

Programming Sequence Preview



Digitrip MV Trip Unit with Security Door Open

GENERAL SPECIFICATIONS

Models

Catalog Number
DTMV01: Built in INCOM communication
or
Style Number
3D86762G01

Catalog Number
DTMV02: Provision for future field installed communication module (i.e. INCOM PONI, RS232 PONI, Modem PONI)
or
Style Number
3D86762G02

Current Inputs

CT's: 5 Amp Secondary

CT Burden: <0.004 ohm
<0.1VA@ Rated Current (5A)

CT (Primary) Settings Available

Phase: 50/75/100/150/200/250/300/400/500/600/630/800/1000/1200/1250/1500/2000/2400/2500/3000/3200/4000

Ground: 50/100/400
or same as Phase CT Setting

Control Power

Input Voltage: Nominal:
48 to 250VDC
120 to 240VAC 50/60Hz
Operating Range:
28 to 280VDC
90 to 254VAC 50/60Hz

Power Consumption: 25VA

Environment

Operating Temp.:-30 to +55 Degrees C

Operating Humidity: 0 to 95% Relative Humidity (Non-condensing)

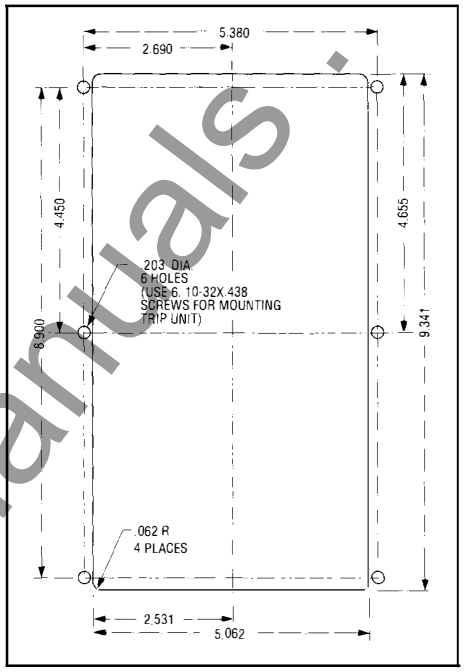
Storage Temp.: -40 to +70 Degrees C

Current Monitoring Accuracy:

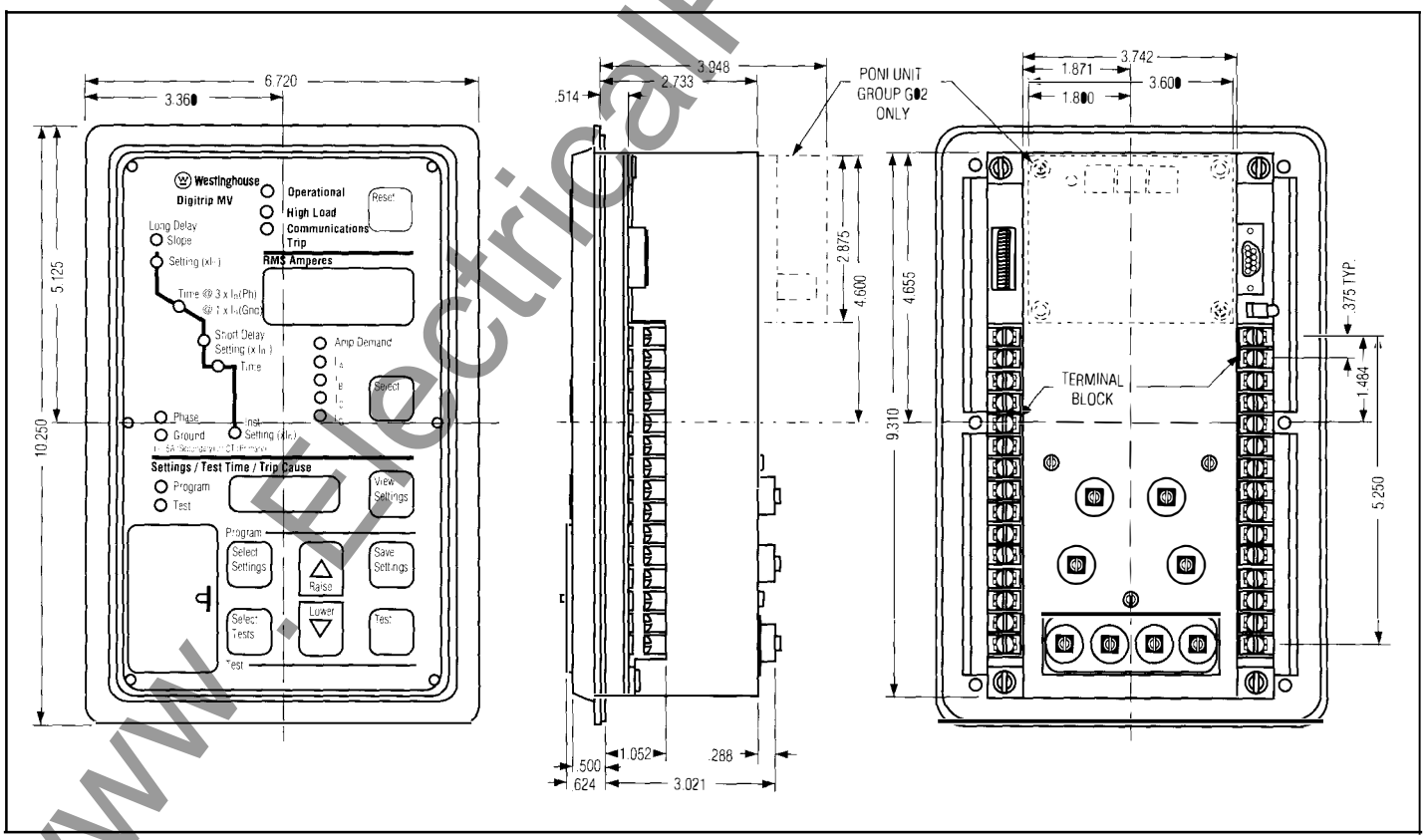
±1% of Full Scale (I_n)

Communications

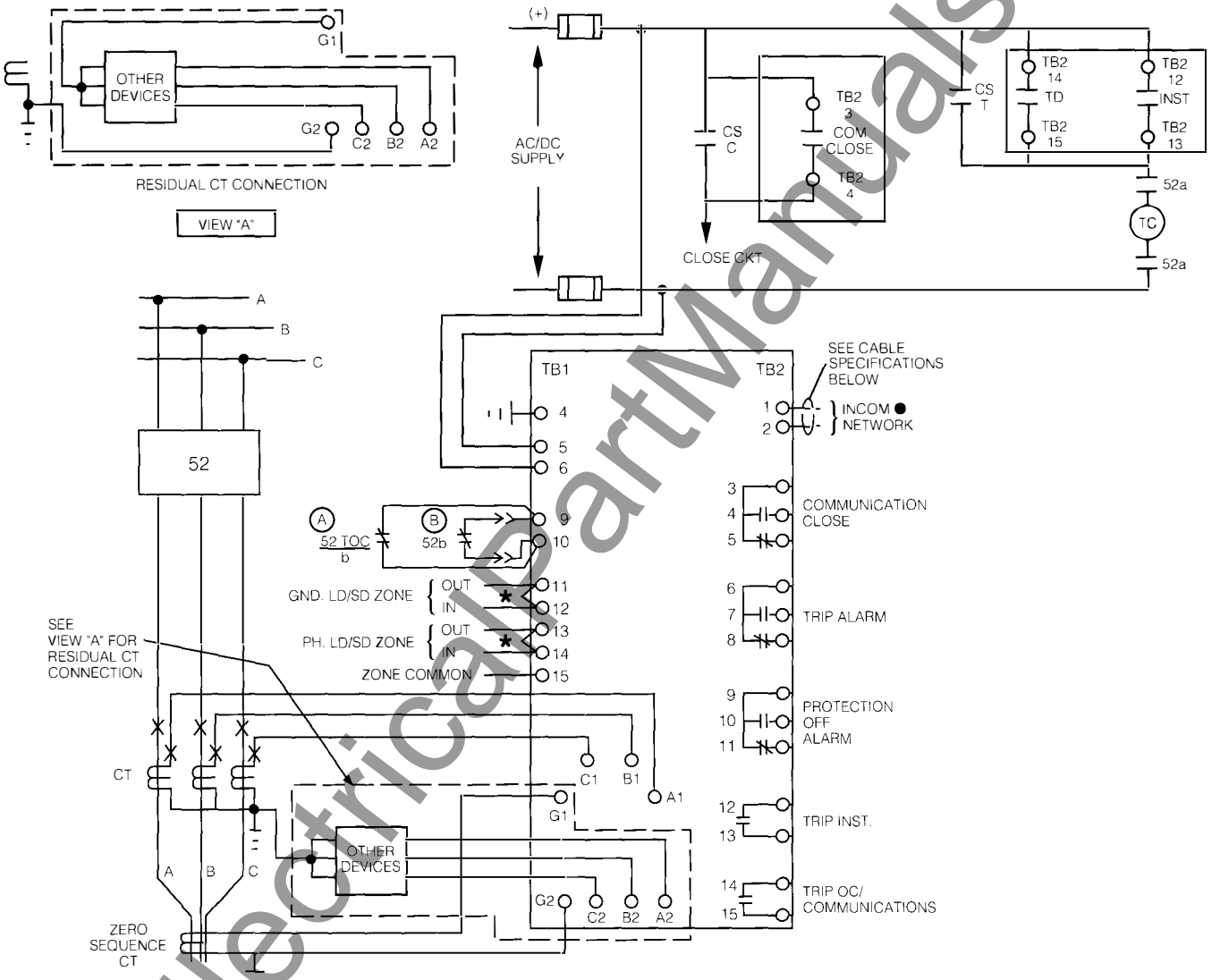
Baud Rate: 1200 or 9600



Cutout Dimensions (Inches)



Trip Unit Dimensions (Inches)



NOTES: (A) CIRCUIT BREAKER TRUCK OPERATED CELL SWITCH (SHOWN WITH CIRCUT BREAKER IN DISCONNECTED POSITION) IS RECOMMENDED SO THAT THE TRIP UNIT CAN BE PROGRAMMED WHEN CIRCUIT BREAKER IS NOT IN CONNECTED POSITION

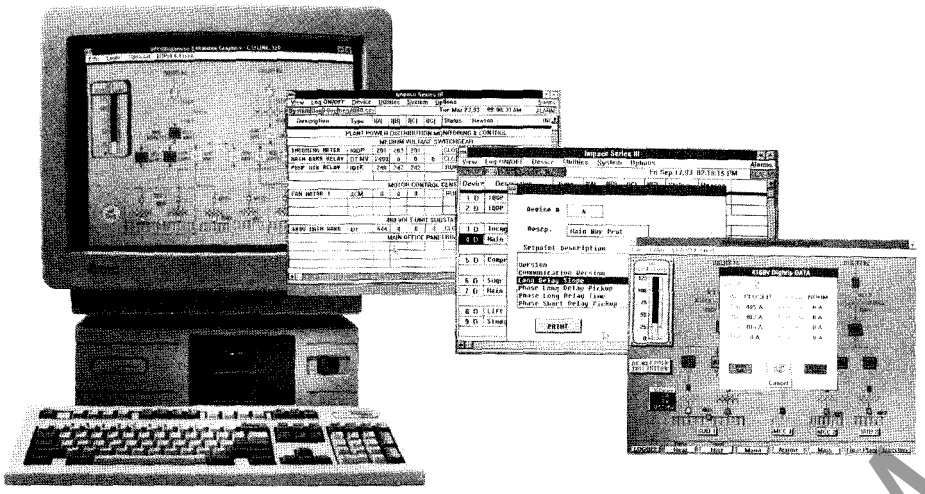
(B) THE 52b CONTACT IS REQUIRED FOR PROPER OPERATION OF THE DIGITRIP MV TRIP UNIT

* - REMOVE JUMPERS IF ZONE INTERLOCKING IS REQUIRED

● - FOR CATALOG NO. DTMV01 WITH BUILT IN COMMUNICATIONS CAPABILITY ONLY

CABLE SPECIFICATIONS: USE WESTINGHOUSE CABLE CAT # IMPCABLE, STYLE # 2A95705G01
OR BELDEN 9463 CABLE FAMILY
OR IDENTICAL EQUIVALENT COMMSCOPE OR QUABBIN CABLES

Digitrip MV Typical Wiring Diagram



IMPACC

All Digitrip MV trip unit parameters can be transmitted to a system master (e.g. personal computer or programmable controller), and also can be controlled by this system master over IMPACC, Westinghouse's local area network.

IMPACC - Integrated Monitoring, Protection and Control Communications - centralizes information from electrical distribution equipment such as switchgear, motor control centers, and medium voltage starters via IMPACC compatible devices to enhance the performance of a facility's electrical distribution. For more information on IMPACC see SA-11998.

Due to the centralization of data, an IMPACC system eliminates the need to individually read, record, and compile data from electrical distribution assemblies and equipment.

The Digitrip MV protection and monitoring information available over IMPACC includes:
- breaker status (open/closed/tripped)
- individual phase and ground currents
- peak demand currents for phase and ground
- protection settings
- high load alarm
- impending trip and trip alarms
- cause and magnitude of trip (time/date stamped)

The Digitrip MV control functions available via IMPACC include:
- the ability to open/close the breaker
- the ability to reset trips
- the ability to change the trip settings

IMPACC utilizes electrical monitoring, metering, and protection devices as data gathering tools, adds digital communications capabilities, and links all devices to a central personal computer or a programmable logic controller which acts as the IMPACC system master control or monitoring unit.

The result is a communications system which accumulates and processes data from as many as 1,000 different compatible devices - data which can be used to monitor, protect, and control manufacturing or building management systems more productively.

Compatible devices can be located as far from the controlling computer as 7500 feet using twisted pair wire without repeaters. If the data is transmitted over telephone circuits, there is no distance limitation.

Its flexibility means that IMPACC communications can be added at a later date in virtually any electrical distribution system that uses IMPACC compatible devices.

Communications in Digitrip MV is achieved in one of two ways. One trip unit model offers a built-in communication capability provided by the Westinghouse developed INCOM communications chip. A second trip unit model provides for the future addition of a communication capability through the field installation of an addressable communications (PONI) module.

Series III

Series III is a software program with user friendly, menu-driven screens that permit easy set-up and operation. An IBM (or approved compatible) personal computer acts as the system's master control unit.

Series III can also provide monitoring and recording of vital system data as it is occurring. This data can be collected and displayed at the IMPACC master control unit or it can be stored in data base format for custom report generation. Series III software has the capability to coordinate information from up to 200 IMPACC compatible devices. A smaller version of Series III, Series III Lite has the capability to handle up to 20 devices.

Features include:
- System/device alarm logging and reporting
- Time/event data logging and trend recording
- Information storage and retrieval by device event
- Hardware diagnostics
- Dedicated computer not required
- Security code protection
- Gateway Interface

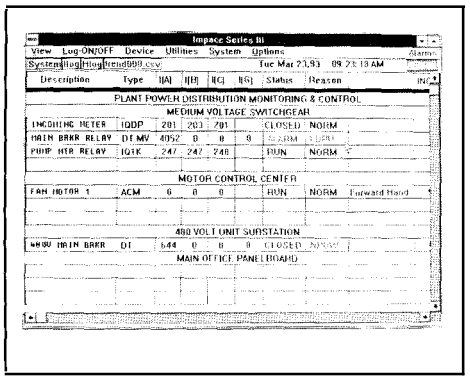
Enhanced Graphics

The Enhanced Graphics software program adds the capabilities of generating custom animated color graphics and networking multiple computers to the Series III software. With Enhanced Graphics, Series III users can create customized one-line drawings of their electrical power distribution systems, and view those drawings on a remote computer or on the same computer running Series III. Real-time information can be displayed from the devices on the IMPACC network.

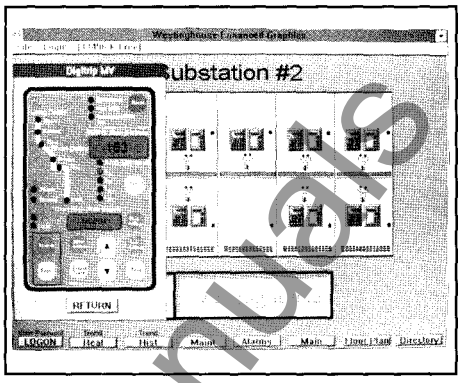
Other third party software packages that interface with Series III include Iconic's GENESIS, Intellution's FIX DMACS, and Expert Edge's ROCKY.

IMPACC Connectivity

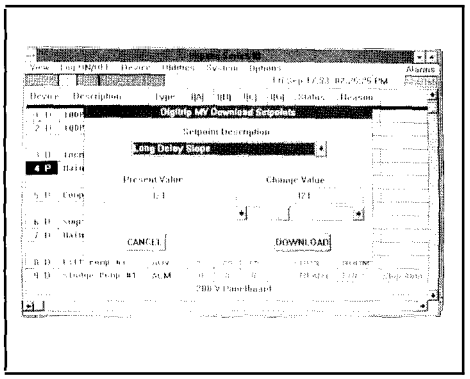
The IMPACC network can interface with other PLCs and DCS networks using a Master INCOM Network Translator (MINT II). The MINT II translates IMPACC communications to and from RS232, enabling a device with an RS232 port to function as the IMPACC master control unit.



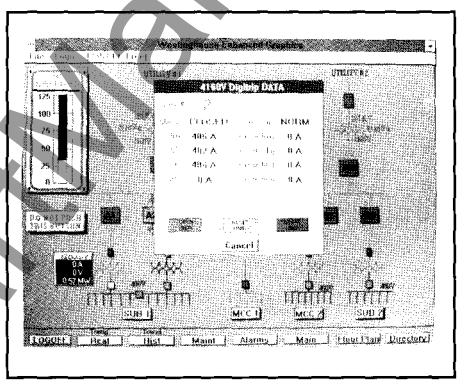
Real Time Monitoring and Alarming: IMPACC Series III Software eliminates the time-consuming task of gathering individual device information.



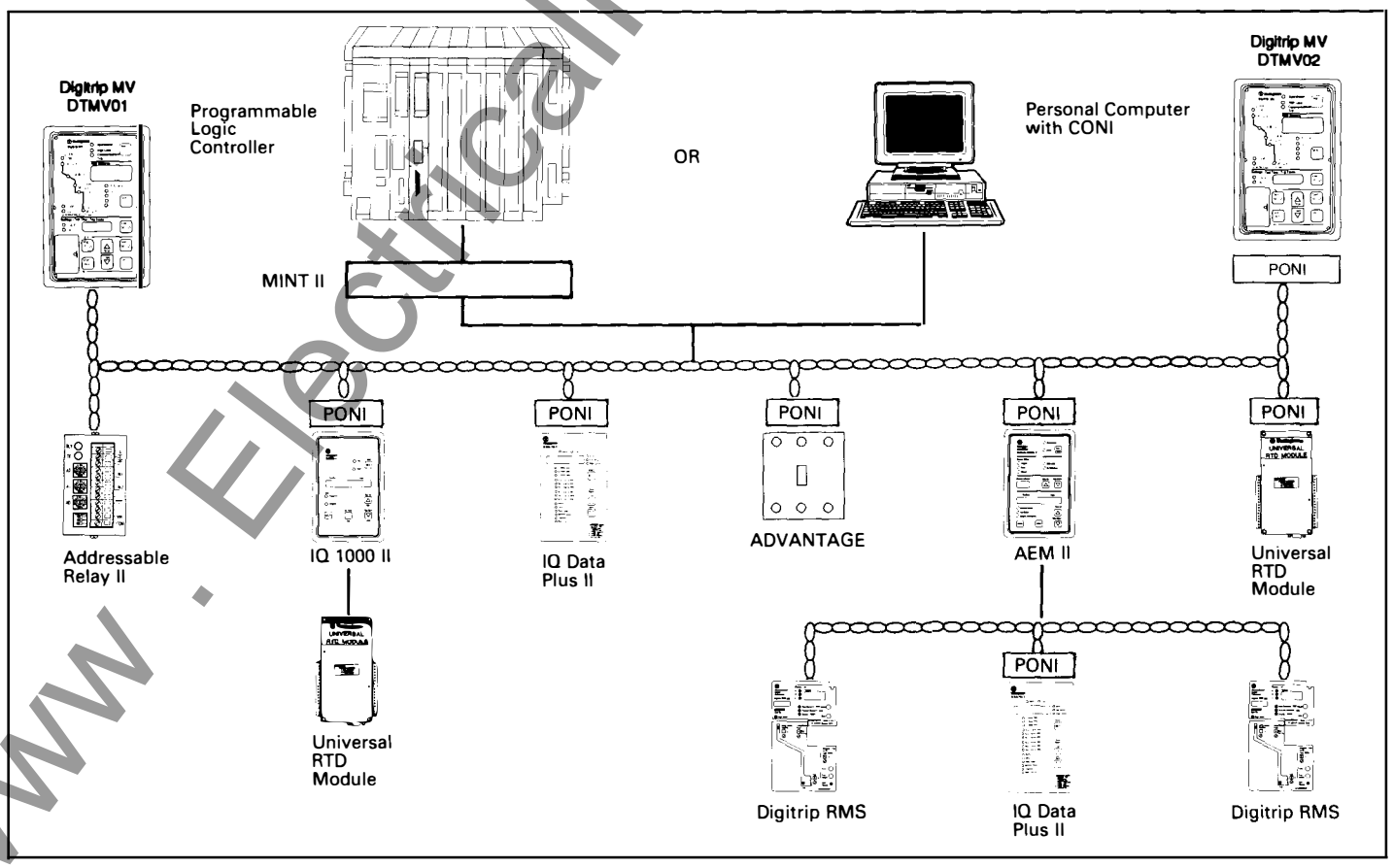
Remote Device Monitoring: Westinghouse Enhanced Graphics allows the user to call up an elevation graphic of the gear and view the face-plate of the Digitrip MV. Trip unit push-buttons can be controlled by the host computer.



Downloading and Viewing Setpoint Data: IMPACC Series III Software reduces programming time by allowing remote downloading and viewing of Digitrip MV setpoint data.



Remote Control of Devices: Westinghouse Enhanced Graphics allows control of the trip unit from a remote location.

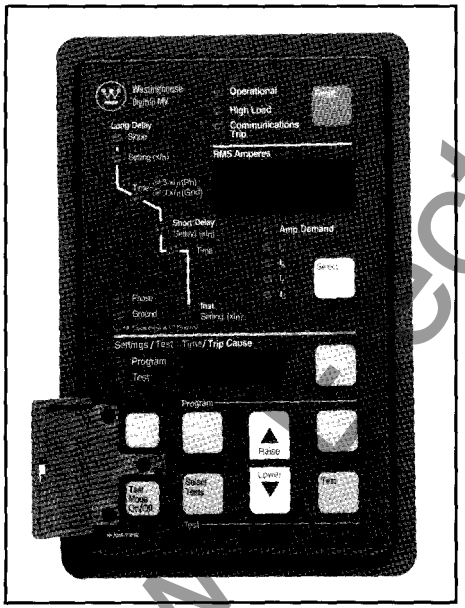


INTEGRAL FIELD TESTING

Digitrip MV Trip Units have a front accessible, integral field testing capability. This feature introduces a selected level of internal test current to simulate an overload or short circuit. It checks proper functioning of the trip unit and verifies that curve settings have been set-up correctly. The integral test function provides selectable "Trip" and "No Trip" test settings for both phase and ground.

The "Test Mode" is not intended for live primary current interruption. The intent is to permit the periodic performance of simple tests that verify the functional performance of the trip unit.

Like the "Program Mode" pushbutton, the sealable security door must be opened to access the "Test Mode" pushbutton. Once the "Test Mode" pushbutton has been pressed and released, Digitrip MV is in the "Test Mode." To exit the "Test Mode", simply press and release the "Test Mode" pushbutton or "Reset" pushbutton. If no testing activity takes place for approximately 2 1/2 minutes, the "Test Mode" is automatically exited.



Digitrip MV Trip Unit with Test Mode Accessed

DIGITRIP MV OVERVIEW

To date, characteristics of relays used with medium voltage circuit breakers have been electromagnetic induction disk relay characteristics or electronically duplicated characteristics. The most likely reason for this was the belief that this characteristic provided better coordination. It was believed that the additional effort required to make electronic trip unit characteristics of that form was justified by the performance potential. Medium voltage overcurrent protection generally implies the use of devices producing induction disk relay type characteristics.

When electronic circuit capability was first introduced in low voltage circuit breaker trip units, designs to achieve responses that imitated thermal bimetal trip units were not sought after. Such responses would have been quite difficult to achieve or make economically feasible. If smooth curve characteristics would have been absolutely required, the development of economical electronic trip units would have been set back. This set back would have lasted until smaller electronic components, today's digital electronic circuit chips and related manufacturing technologies became available. Instead, the natural tendency, at the time, was to utilize the capabilities of electronic circuits to form mathematically simpler trip unit characteristics made up of, as much as possible, connected straight line segments, and to provide all of the requisite functions for protection. Mathematical integration of sensed signal current magnitudes over time could be accomplished readily in these electronic circuits, and straight line alternatives to the smooth curve bimetal trip unit heater characteristics became acceptable and commonplace in low voltage breaker trip units. Through continued development over a period of time, electronic trip unit circuit designers were able to add features like short-time delay and zone interlocking to produce even more effective protective devices.

In taking a new look at the distribution system from this new and more balanced perspective, it was possible to see the potential benefit of a medium voltage trip unit design incorporating all of the advantages of the proven low voltage devices with an upstream interface that could more readily be adapted to familiar medium voltage practices. By utilizing the straight line segment approach to building time-current characteristics, more of the digital logic capability of the trip unit could be used for functional utility, and less of it for shaping response characteristics. The new functions of It and I^4t are introduced in the Digitrip MV Trip Unit. The user can now choose definite time, It, I^2t or I^4t functions or slopes for the straight line characteristics, suggestive of the terminology of inverse, moderately inverse, and extremely inverse when referring to traditional induction disk relay applications.

Relative to the characteristic time-current curves, it was decided to follow the existing medium voltage practice of using a single line characteristic to describe a trip unit response rather than the two line band characteristic used for low voltage applications. This distinguishes medium voltage characteristics from low voltage characteristics when referring to coordination curves. It also implies that time difference for coordination of medium voltage trip unit characteristics with other overcurrent device characteristics should be handled in the same manner as other medium voltage trip devices, such as induction disk relays. For this reason, separation required between characteristics can be smaller. A 0.3 second separation would be more appropriate than the 0.4 second interval used for induction disk relays.

In addition to the flexibility of new slope options in the characteristics and the inherently available IEEE function logic the output contacts incorporate (i.e. functions 50, 51, 86 and 87 devices), the straight line segment characteristic curves of the Digitrip MV Trip Unit can facilitate the design of very effective and flexible selectively coordinated systems.

SPECIFICATION GUIDE

Devices for phase time overcurrent, instantaneous overcurrent and ground fault protection (ANSI 50/51, 50/51G, 50/51N) shall be incorporated into a single device. This device shall be Westinghouse Digitrip MV or an engineer approved equal having all the features and functions herein specified.

The device shall be a solid state, microprocessor based multi-function type that operates from the 5 ampere secondary output of current transformers. It shall provide protective ANSI 50/51 functions for each of the three phases, and ANSI 50/51N or 50/51G ground fault protection functions as shown on the plans or as determined by the coordination study. The device shall be true RMS sensing of each phase and ground. The ground element shall be capable of being deactivated or being utilized in residual, zero sequence, or ground source connection schemes.

The primary current transformer rating being used for phase and ground protection feeding the device shall be programmable by means of DIP switch settings for current transformers with primary current ratings from 50 through 4000 amperes.

Protective curves shall be field programmable and similar to those on low voltage breaker trip units for close coordination with downstream and upstream devices. The time overcurrent protection curves for phase and ground shall have field selectable FLAT, It, I^2t and I^4t long delay slopes, as well as selectable long and short delay pickup and time settings to coordinate with existing overcurrent relays and power fuses. The phase instantaneous overcurrent trip shall have field programmable pickup points from 1.0 to 25 times the current transformer primary rating or "NONE". In addition, a selectable "ON" or "OFF" discriminator circuit shall be integral to the trip unit. It shall function such that when phase instantaneous overcurrent has been programmed to "NONE", the discriminator circuit can be selected to protect against currents exceeding 11 times the current transformer primary rating for the first ten cycles after the breaker is closed. The device shall also have independent time-overcurrent contacts. The device shall have an integral alpha-numeric display capable of displaying the following information with metering accuracy of one (1) percent of the primary current transformer rating or full scale:

1) Individual Phase Currents
2) Ground Current
3) Cause of Trip
4) Magnitude and Phase of Current Causing Trip
5) Peak Current Demand for Each Phase and Ground Since Last Reset
6) Current Transformer Primary Rating
7) Programmed Phase and Ground Setpoints
8) Frequency

The device shall have the following features:

1) Integral Manual Testing Capability (Phase and Ground)
2) Zone Selective Interlocking Capability for Phase and Ground Elements (Both Long and Short Time Functions)

   This function shall be provided and factory wired. FOR ANY REQUESTED SUBSTITUTE RELAY NOT HAVING THIS FEATURE, A FULL BUS DIFFERENTIAL SCHEME SHALL BE REQUIRED FOR BOTH PHASE AND GROUND IN ADDITION TO SPECIFIED TIME OVERCURRENT AND INSTANTANEOUS OVERCURRENT PHASE AND GROUND FAULT PROTECTION. THE BUS DIFFERENTIAL SCHEME SHALL BE PROVIDED WITH SEPARATE DIFFERENTIAL CURRENT TRANSFORMERS FOR ALL INCOMING AND OUTGOING LOADS, AS WELL AS APPROPRIATE DIFFERENTIAL RELAYS (ANSI 87 AND 87G) APPROVED BY THE ENGINEER.

3) High Load Alarm Indication (85% of Long Delay Setting with Adjustable Time Delay of 0-5 minutes)
4) Continuous Self-Testing of Internal Circuitry
5) Unit Failure Alarm Contact (Customer Use)
6) Programmable Lockout/Self Reset After Trip Function
7) Programmable Setpoints for Device Curve Selection
8) Programmable Inputs (Such As Current Transformer Ratios)
9) Program and Test Mode Sealable Hinged Security Cover To Limit access

The device shall be suitable for operating in temperatures from -30 to +55 degrees C. It shall also be suitable for operating in 0 to 95% relative humidity (non-condensing).

The device shall have either an integral communication capability or be designed to accept a field installed communication module accessible from the rear. Communication shall be via a local area network equivalent to Westinghouse IMPACC. In addition, the device shall be capable of the following over the communication network:

1) Transmit All Device Information (Such As Currents, Setpoints, Trip Cause, Trip Current Magnitude, Time/Date Stamping of Trip, Alarm, and Open-Close Trip Status)
2) Close and Open Associated Breaker From Remote Location Over Communication Net work

Trip alarm and/or trip contacts shall not change state if control power is lost or an undervoltage occurs. These contacts shall only cause a trip or alarm upon detection of an overcurrent or fault condition based on programmed settings.

The device shall be suitable for operating on control power with a nominal input voltage of 48 to 250 volts DC or 120 to 240 volts AC (50 or 60 hertz). When AC control power schemes are shown on the drawings, a single phase uninterruptable power supply shall be included along with any specified control power transformer or remote control power source for the purpose of supplying protective device control power.

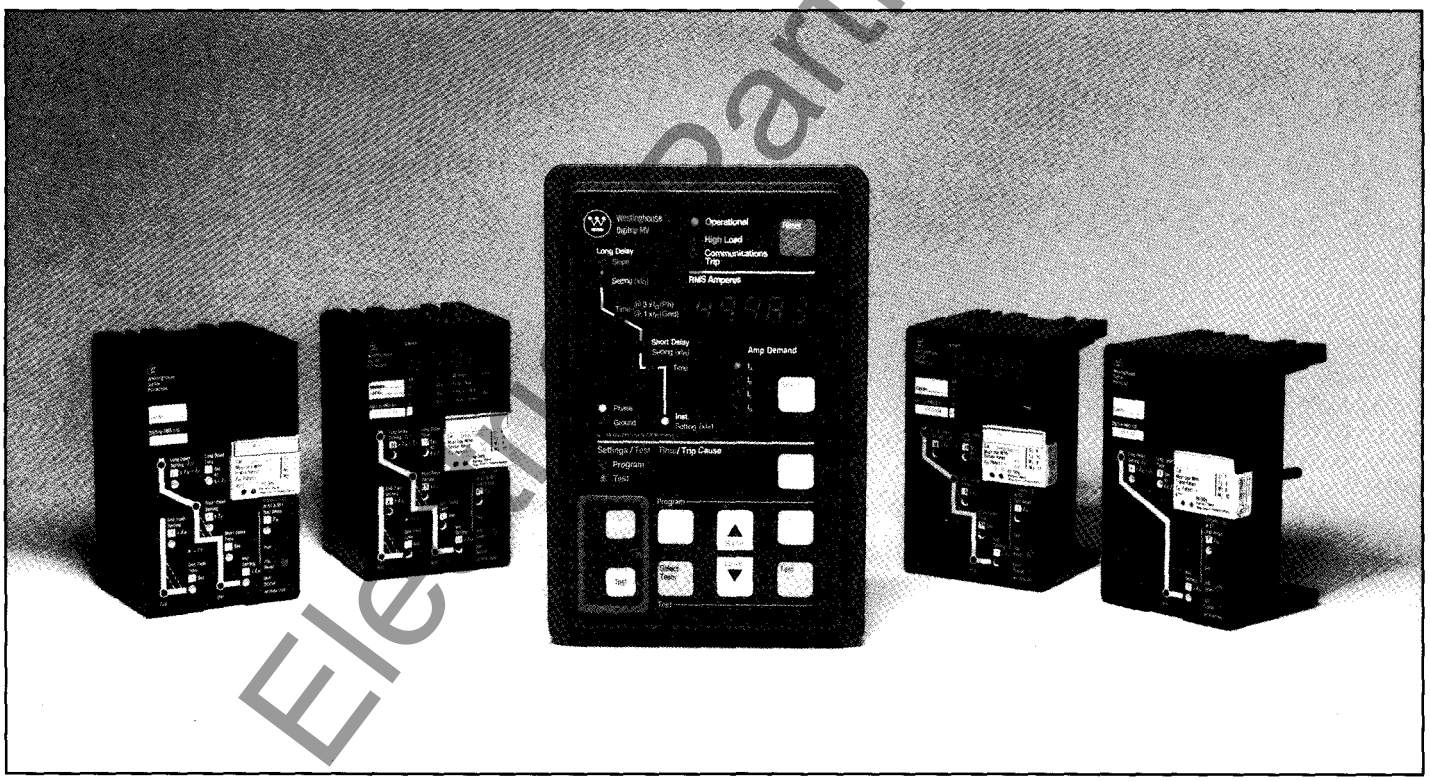
PRODUCT SUPPORT

Application Support
Westinghouse sales offices worldwide provide technical assistance in the specification and use of Westinghouse Digitrip Products.

Factory Assistance
Westinghouse provides factory application and technical assistance to its customers. Available by telephone, Westinghouse personnel quickly respond to customer needs - troubleshooting, system operation analysis, and cordination of component repair/replacement. Factory assistance is obtained by calling the Advanced Product Support Center at (800)542-7883 or (412)937-6790.

Training
Westinghouse also provides comprehensive training on IMPACC and IMPACC compatible devices at its Pittsburgh Training Center. For more information on training, please call (412)937-6270.

Further Information
Price List — PL 33-725
Sales Aid — SA-12020
Application Data — AD 32-266
Instruction Book — I.B. 33-740
IMPACC — SA-11998



Digitrip Family of Products

Westinghouse Electric Corporation
Distribution and Control Business Unit
Electrical Components Division
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