



# Cutler-Hammer

## Digitrip 1150V with Maintenance Mode

Effective December 2006  
I.S. 70C1499  
Supplement to I.L. 66A7535



FIGURE 1. Digitrip with ARMs in Medium Voltage Circuit Breaker (VCP-T)

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## WARNING

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**ONLY CERTIFIED AND COMPETENT PERSONNEL SHOULD ATTEMPT TO INSTALL OR MAINTAIN POTENTIALLY HAZARDOUS EQUIPMENT.**

**DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH OR SEVERE PERSONAL INJURY CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING. ALWAYS FOLLOW SAFETY PROCEDURES.**

**EATON IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.**

### 1.0 General

Per the above WARNING, it is highly recommended that maintenance be conducted on electrical equipment including circuit breakers with the system de-energized.

For situations that arise where this is not possible, the Maintenance Mode function of the Digitrip 1150ARMV family (*Cat. # 11ARMVLSIG*) can reduce Arc Flash incident energy that is generated on a fault condition. This is accomplished by an analog trip circuit which, when armed, provides a fast acting response to the fault. The reduced arc condition will occur only in devices downstream of the trip unit in Maintenance Mode. This is separate from the normal system protection setting of Instantaneous. The Maintenance Mode is located in the "SYSTEM" submenu of the programmable settings menu (PGM SET). (*See Appendix for screen details.*)



## CAUTION

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**OBSERVE ALL RECOMMENDATIONS, NOTES, CAUTIONS, AND WARNINGS RELATING TO THE SAFETY OF PERSONNEL AND EQUIPMENT. OBSERVE AND COMPLY WITH ALL GENERAL AND LOCAL HEALTH AND SAFETY LAWS, CODES, AND PROCEDURES.**

**A FLASH HAZARD ANALYSIS SHOULD BE DONE TO DETERMINE PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS.**

### 2.0 Maintenance Mode Settings

The Maintenance Mode Settings provide the Arc Flash Reduction setting. 2.5 x Rating Plug Value is the Maximum reduction setting which correlates to the lowest pickup value.

Available Trip current of Maintenance Mode Settings:

2.5 x Rating Plug Amperes

4.0 x Rating Plug Amperes

6.0 x Rating Plug Amperes

8.0 x Rating Plug Amperes

10.0 x Rating Plug Amperes

### 3.0 Arming Maintenance Mode

There are three ways to arm the Maintenance Mode Arc Flash Reduction setting. One method is via the local keypad located on the trip unit. The setting is located in the "SYSTEM" submenu of programmable settings (PGM SET). When the Maintenance Mode Arc Flash reduction setting is enabled, the message "Maintenance Mode Enabled" is displayed to confirm that the function is on. If any key is pressed, the Maintenance Mode message is removed and replaced by normal display messages. If no keys are pressed, the Maintenance Mode message will reappear after 10 seconds.

For the second method, a remote switch wired through the breaker secondary contacts can remotely arm the Maintenance Mode setting. A high quality, gold plated or palladium contact is required in this application. The Maintenance Mode Enabled message will verify that the function is armed. (*See wiring diagram on adjacent page.*)

A third method to arm the maintenance setting is via a communication device. A Palm Pilot along with an IR Mint device can be employed to arm the setting. By initiating the ENABLE setting, the Maintenance Mode selection in the control screen of the Palm, Maintenance Mode is set. There is a confirmation screen that verifies the arming. A BIM (Breaker Interface Module) is another communication method to arm the setting. When Maintenance Setting is enabled via device communications, this setting must be disabled by device communications.



**FIGURE 2. Digitrip 1150V with ARMs**

#### 4.0 Remote Indicator

Circuit breakers built after December 2007 will be wired with secondary contacts A12 which is reassigned to Maintenance Mode Enable. (MM\_E) - (See label on secondary contacts) A normally open contact (A10, A11) is available for customer use via programming of RelayA. This contact can be used to indicate remotely that the Maintenance setting is armed. Refer to diagram on page three for a wiring of this remote (blue light) indicator.

In general, the selection of one of the Reduction Settings should be determined and selected by a person who is experienced in power system analysis.

This setting choice normally does not change unless there are future system modifications that could increase or decrease fault levels at the circuit breaker location.

For time/current curve information, refer to drawing # 70C1498.

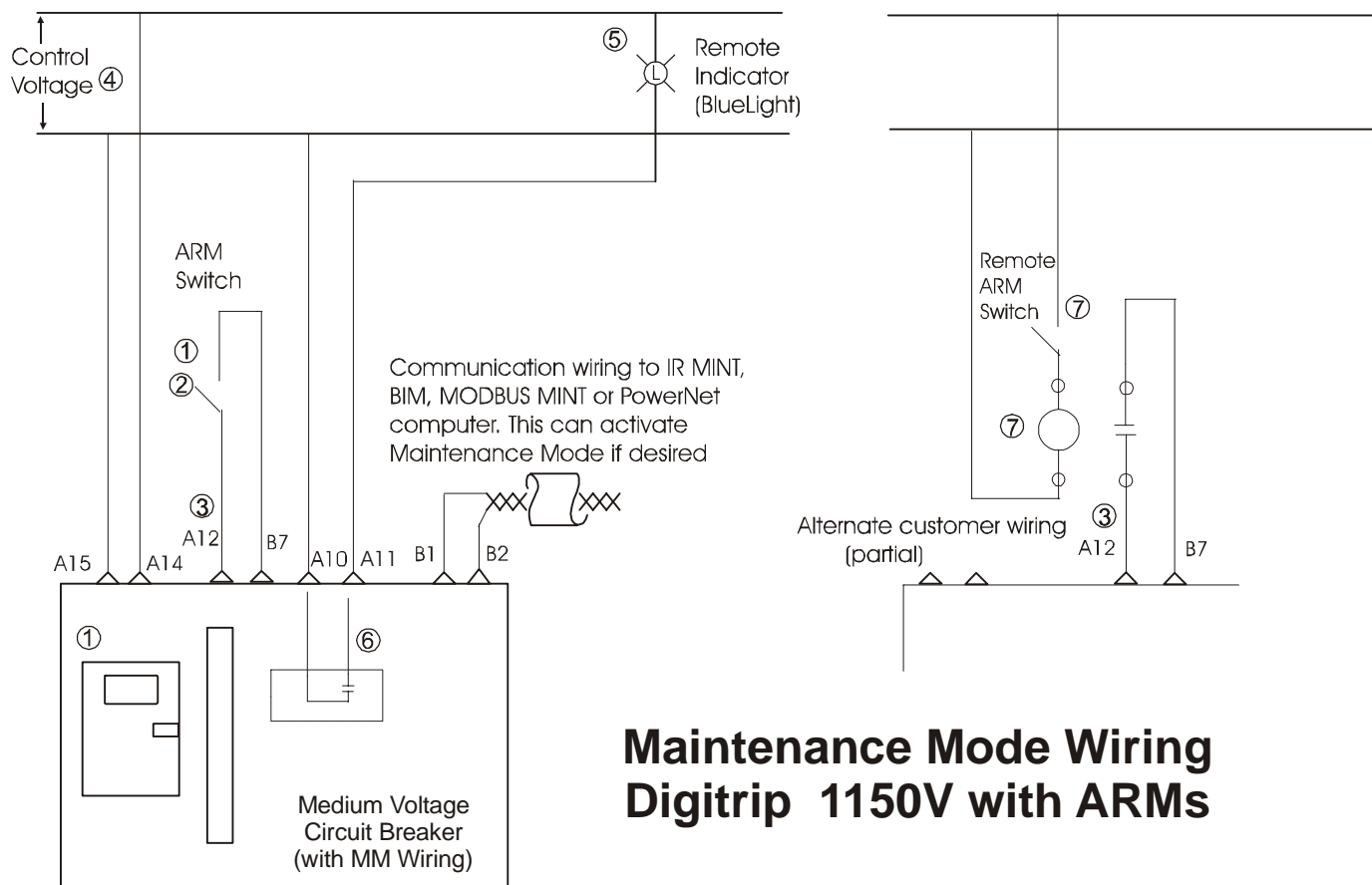
#### 5.0 Choosing the Reduction Setting

The Arc Flash Maintenance Switch has five unique settings. From the factory, the circuit breaker is shipped with the Digitrip unit set to the 2.5x setting and with its Maintenance Mode disabled. The "Maintenance Mode Enabled" message provides an indication that the Maintenance Mode setting is armed per one of the three methods described in section 3.0.

#### 6.0 Tripping and Testing

The Maintenance Mode function will provide fast tripping even when the regular Instantaneous is set to OFF. The Instantaneous LED position is also used to indicate a trip initiated by the Maintenance Mode setting. The message "Maintenance Mode Trip" will be displayed after a trip.

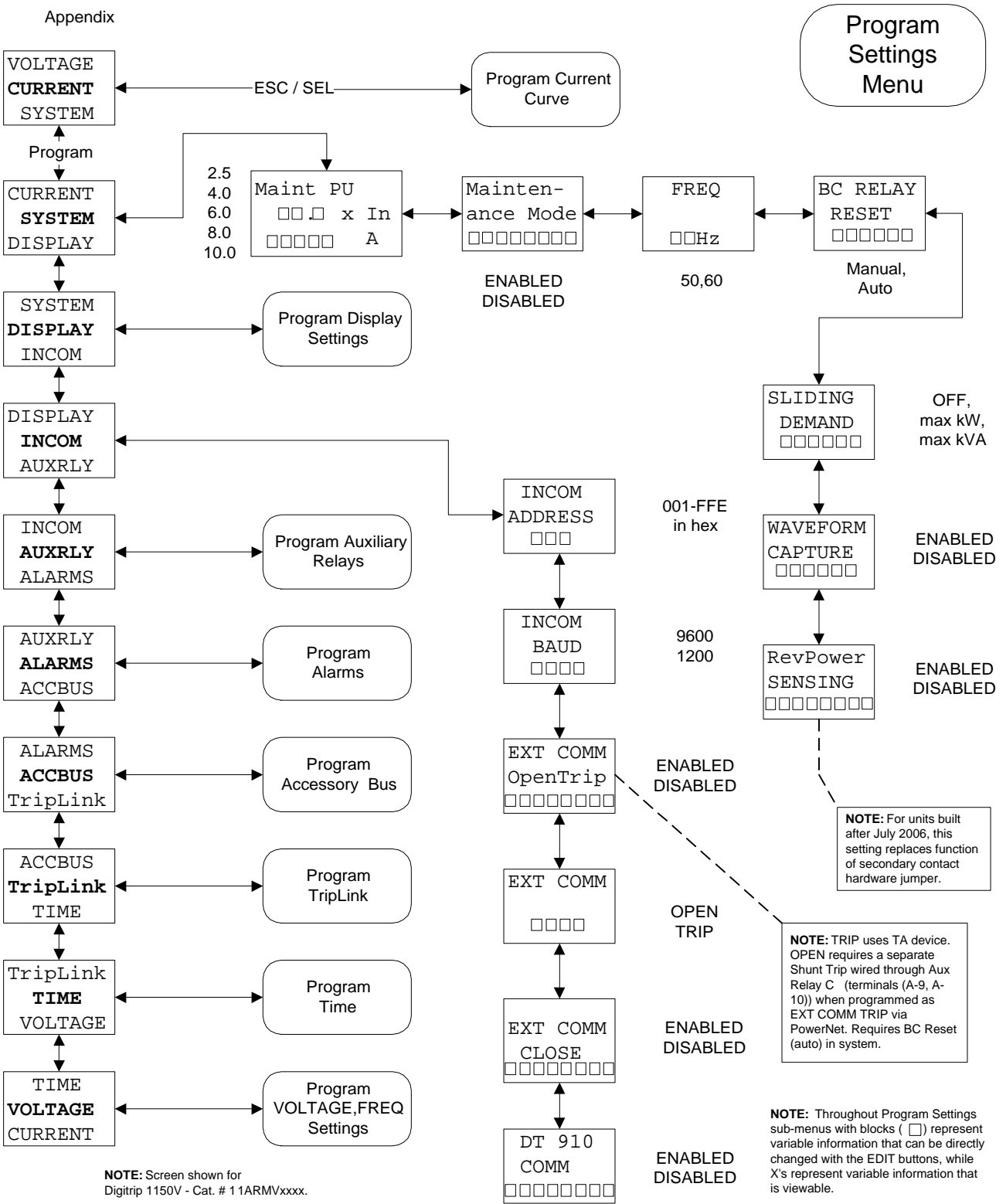
The Maintenance setting, external wiring (if any) and tripping functionality should all be periodically verified by primary or secondary injection current testing.



### NOTES:

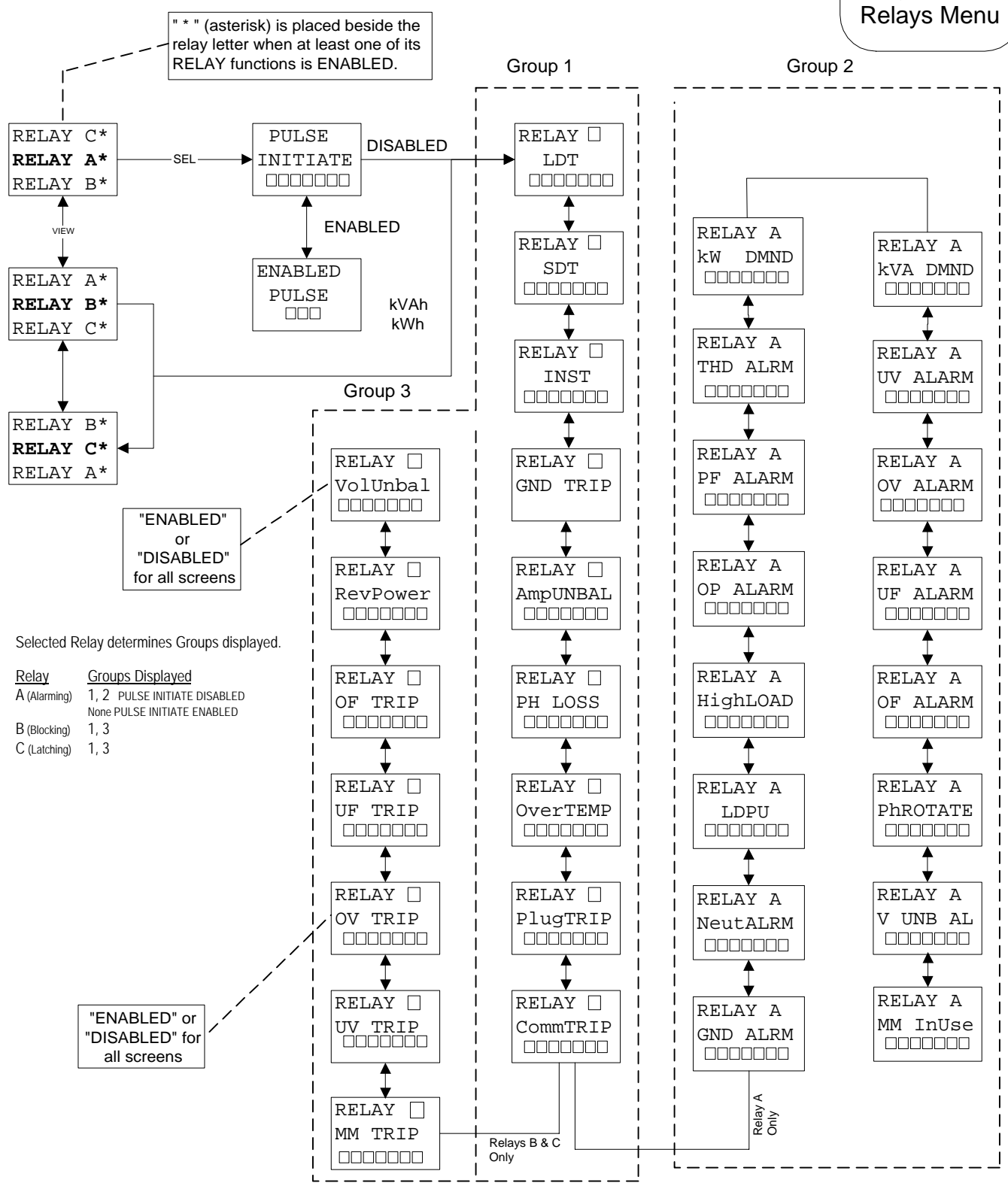
- ① The Digitrip 1150V (Cat #11ARMVxxx) can locally be placed in Maintenance Mode via front panel programming of the Trip Unit. The function can also be armed via a remote switch as shown. In addition, the function can be activated via communications. The display will indicate "Maintenance Mode In Use" when in this special mode.
- ② The recommended selector switch for this low voltage application is Cutler Hammer part number # 10250T1333-2E which includes a contact block rated for Logic Level and Corrosive Use.
- ③ The maximum length of this wiring to the remote ARM switch (or alternate relay contact) is three meters (9.78 feet). Use #20 AWG wire or larger.
- ④ Control voltage is 120 VAC or 230 VAC or 24-48 VDC or 125 VDC as ordered. Check circuit breaker front cover for Trip Unit Power requirements.
- ⑤ A remote Stack Light, Annunciator Panel or other remote indication device can be connected to remotely verify that the Digitrip is in Maintenance Mode.
- ⑥ RelayA contact changes state when Digitrip is in Maintenance Mode. This action requires pre-assigning RelayA to Maintenance Mode function. RelayC contacts (A9, A10) are also available to be programmed to provide an indication of a trip in Maintenance Mode. Contact is rated 1A @ 120 VAC or 0.5A @ 230 VAC or 1A @ 24-48 VDC or 0.35A @ 125 VDC.
- ⑦ The Digitrip 1150V can also be placed remotely in its Maintenance Mode via a General Purpose Relay (ice cube type with Logic Level contacts) activated by a remote control switch. A recommended type is IDEC Relay Ry22. Choose voltage as desired.

Appendix



NOTE: Screen shown for Digitrip 1150V - Cat. # 11ARMVxxxx.

# Program Aux Relays Menu

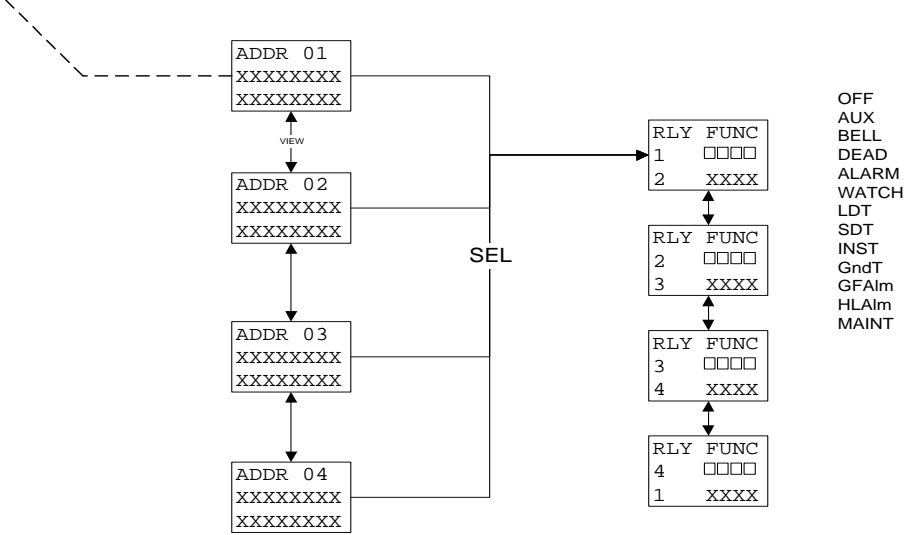


Program  
Accessory Bus

"XXXXXXXX NO SETTINGS If no relay functions are enabled  
XXXXXXXX" DIGITAL OUTPUT If any relay functions are enabled

Save

Each of the 4 addresses is a separate Save group



NOTE: The "MAINT" Relay Function will act as an indicator that the "Maintenance Mode" is enabled and in use.

Possible Events  
TRIP

Data and Time Stamp  
logged for each event.

LONG  
DELAY  
TRIP

1st & 2nd  
Meter screens  
Note 1

PlugTRIP

No data  
displayed

RevPower  
TRIP

Power kW screen  
displayed  
See Note 5

SHORT  
DELAY  
TRIP

1st & 2nd  
Meter screens

MAKING  
CURRENT  
TRIP

No data  
displayed

VOLT UN-  
BALANCE  
TRIP

L-L Voltage and  
FREQ screens  
displayed.  
See Note 5

INST  
TRIP

1st & 2nd  
Meter screens  
Note 2

PHASE  
LOSS  
TRIP

3rd Meter  
screen

Additional TRIP for Digitrips  
Cat # 11ARMxxx only

NEUTRAL  
TRIP

1st & 2nd  
Meter  
screens  
Note 3

HIGH  
INST  
TRIP

No data  
displayed

Mainten-  
ance Mode  
TRIP

No data  
displayed

GROUND  
FAULT  
TRIP

1st & 2nd  
Meter screens  
Note 4

Additional TRIPs for Digitrips  
Cat # 11Pxxx and  
11ARMxxx only

OPEN BY  
COMM

No data  
displayed

UndrVOLT  
TRIP

L-L Voltage and  
FREQ screens  
displayed.  
See Note 5

ACC BUS  
TRIP

No data  
displayed

OverVOLT  
TRIP

L-L Voltage and  
FREQ screens  
displayed.  
See Note 5

AMPERES  
OUT OF  
BALANCE

1st Meter  
screens

UndrFREQ  
TRIP

L-L Voltage and  
FREQ screens  
displayed.  
See Note 5

OVER  
TEMP  
TRIP

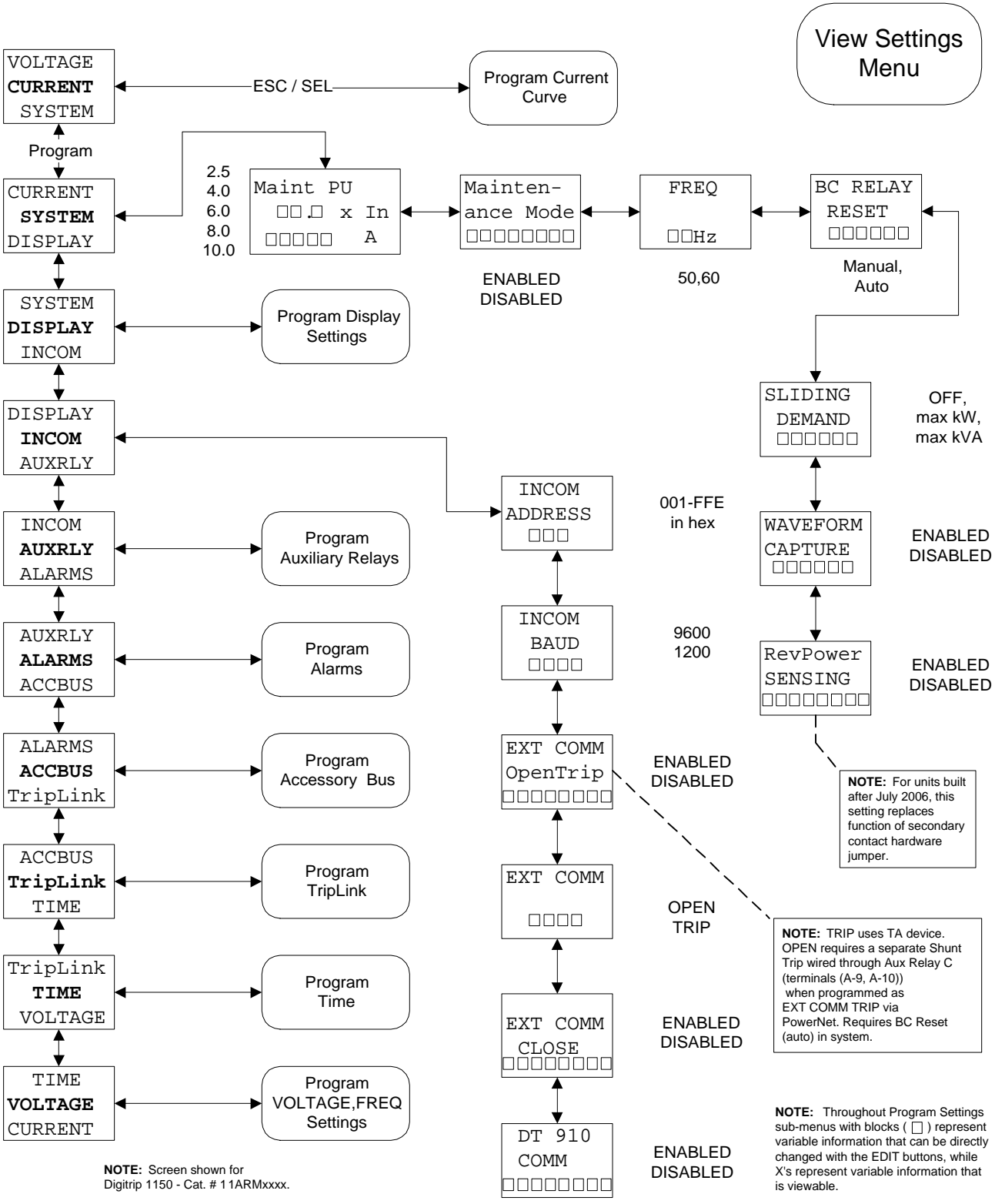
No data  
displayed

OverFREQ  
TRIP

L-L Voltage and  
FREQ screens  
displayed.  
See Note 5

1. LONG DELAY TRIP term is used by LSI, IEEE and IEC curve type indicating an overload trip.
2. INST TRIP values displayed could be less than actual fault levels due to fast response of this element.
3. NEUTRAL TRIP is a Long Delay Trip on Neutral or 4th pole
4. If IEC -EF style, "EARTH" will replace "GROUND"
5. Real Time data is shown for Voltage and Frequency. View EventLog screen for actual TRIP data.





NOTE: Screen shown for Digitrip 1150 - Cat. # 11ARMxxxx.

NOTE: Throughout Program Settings sub-menus with blocks ( ) represent variable information that can be directly changed with the EDIT buttons, while X's represent variable information that is viewable.

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