



# Configuring the MIF Relay to be used as a One Shot Recloser

**GE Multilin Publication No.: GET-8463**

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## Operation

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### DESCRIPTION

This Application Note describes how the MIF (Option 2) relay can be configured to include a one shot recloser. To facilitate this process, a pre-configured special model MIF-05 relay can be ordered.

This recloser can be configured to work in one of the following two modes:

- Once in Lockout, wait for an operator to reset the Logic by pushing the button on the front of the MIF relay.
- Automatically reset when the operator closes the breaker.

In the default MIF-05 logic, the selected option is automatic reset. This is accomplished by configuring Input #1 as Breaker Status (52b) and resetting the latched outputs; in this case, the Lockout output (while active, this output blocks the operation of the logic).

## Input/Output Configuration

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### OUTPUTS

The MIF relay provides two (2) non-configurable outputs: (A5-A6) as Trip and (B5-B6) as Relay Alarm. It also provides four (4) configurable (Option 2) outputs: (B7-A7), (B8-A7), (B9-A7), and (B10-A7).

The MIF-05 output configuration is as follows:

- **Output #1 (B7-A7): Close.**  
This signal comes from Logic #2.

- **Output #2 (B8-A7): Lockout.**

This signal comes from Logic #4. The relay can be configured in two different ways:

1. The operator must manually close the breaker and reset the recloser by pressing the faceplate pushbutton to return the recloser to operation.
2. The relay automatically leaves the Lockout status as soon as the operator manually closes the breaker, without having to press any button on the relay.

- **Output #3 (B9-A7).**

This signal comes from the Ground trip.

- **Output #4 (B10-A7).**

This signal comes from the 50 Trip.

## INPUTS

The MIF relay (Option 2) provides two (2) configurable inputs: (A8-A10) and (A9-A10). The MIF-05 inputs are configured as follows:

- **Input #1 (A8-A10).**

Receives the **52b** signal from the breaker. To set the recloser to automatically reset from the Lockout status when the operator closes the breaker, configure this input as **52b plus Reset** (inverted) of latched outputs. The relay must reset latched outputs when the breaker is closed; i.e. when voltage is removed from the **52b** input (this is why Reset appears as inverted).

- **Input #2 (A9-A10).**

Receives the **Reclose Block** signal, plus the Lockout (Output B8-A7), connected in parallel. When this input is active, as a result of the operator activating the input (e.g. using any key to block reclosing) or 79 going lockout after reclosing and tripping again (only one shot is allowed), the recloser logic is blocked.

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## Logic Configuration

### DESCRIPTION

MIF Option 2 models provide four (4) configurable logic circuits (AND, OR and Timers), which can be used to design logic to close outputs or illuminate LEDs. These logic circuits can be configured to operate as a one shot recloser.

### LOGIC #1

- When the breaker is open, the logic will not function, as it requires the 52b signal to be off (circuit breaker closed) to start (first AND in Logic #1).
- When the breaker is closed, if there is a fault and the relay trips, and if Input #2 is off (indicating there is no external block and that 79 is not in lockout), then the Logic is started.
- Logic #1 converts the Trip signal into a pulse wide enough to act as an input to the timer which counts the reclosing time (dead time) in Logic #2. This conversion is done by the Timer in Logic #1, using a drop-out time of 22 seconds.  
This signal is called the Reclose Initiation.

**LOGIC #2**

- The Reclose Initiation signal (from Logic #1) goes into an AND gate in Logic #2. If the signal is active, the breaker is open (after the trip, that is, INP #1 is active), there is no Trip condition, and there is no block or lockout (INP #2 is not active), then the AND gate is operated and the reclosing time set to 21 seconds. As there are only three inputs to the AND gate, two of the four conditions (breaker open and no block/lock-out) are grouped in an OR gate, using the Morgan rules to convert the AND gate into an OR gate as follows:

$$\text{Inp \#1} \times \overline{\text{Inp \#2}} = \overline{\overline{\text{Inp \#1}} + \text{Inp \#2}} \quad (\text{EQ 1})$$

- The Timer outputs the Close signal, which is configured to Output B7-A7.

**LOGIC #3**

- After reclosing the breaker, the logic must count the Reset time to determine if the fault still exists. If the fault exists, the relay will trip again and the recloser will go into Lockout, as only one shot is required.
- The Logic #3 Timer counts the reset time, set to 60 seconds.

**LOGIC #4**

- If the relay trips while the output from Logic #3 is active (this is, while the reset time is being counted down after having reclosed the breaker) then the 79 is sent to Lockout and Output B8-A7 is closed and latched.
- The B8-A7 output also activates Input A9 to avoid new reclosing attempts.

## LED Configuration

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**DESCRIPTION**

MIF relays provide six (6) LEDs, two (2) of them are non-configurable and are assigned to Ready and Trip conditions. The other 4 are configurable.

**MIF-05 CONFIGURATION**

- LED#1: Ready
- LED#2: Trip
- LED#3: Ground
- LED#4: 79 in progress (from Logic #1)
- LED#5: 79 lockout (from Logic #4)
- LED#6: Pickup

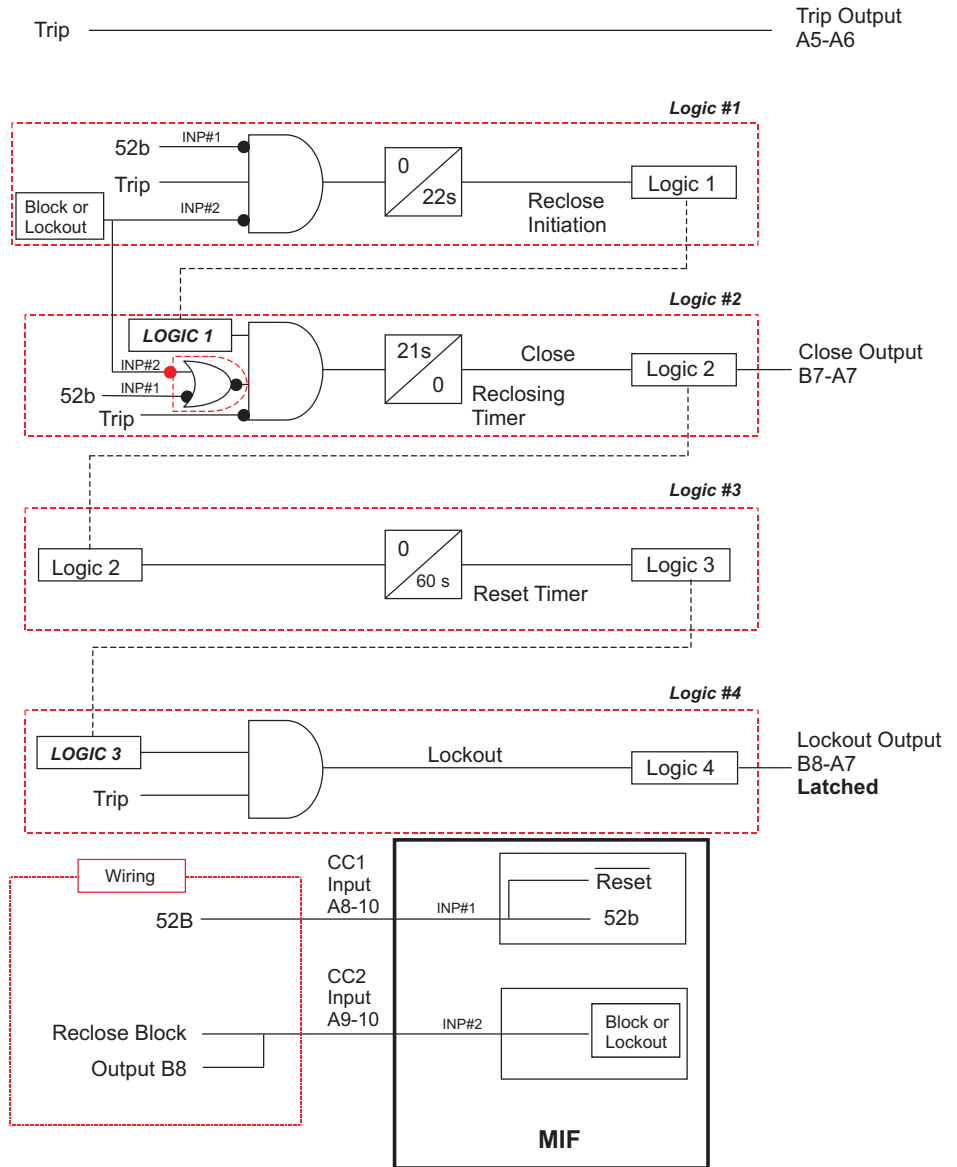
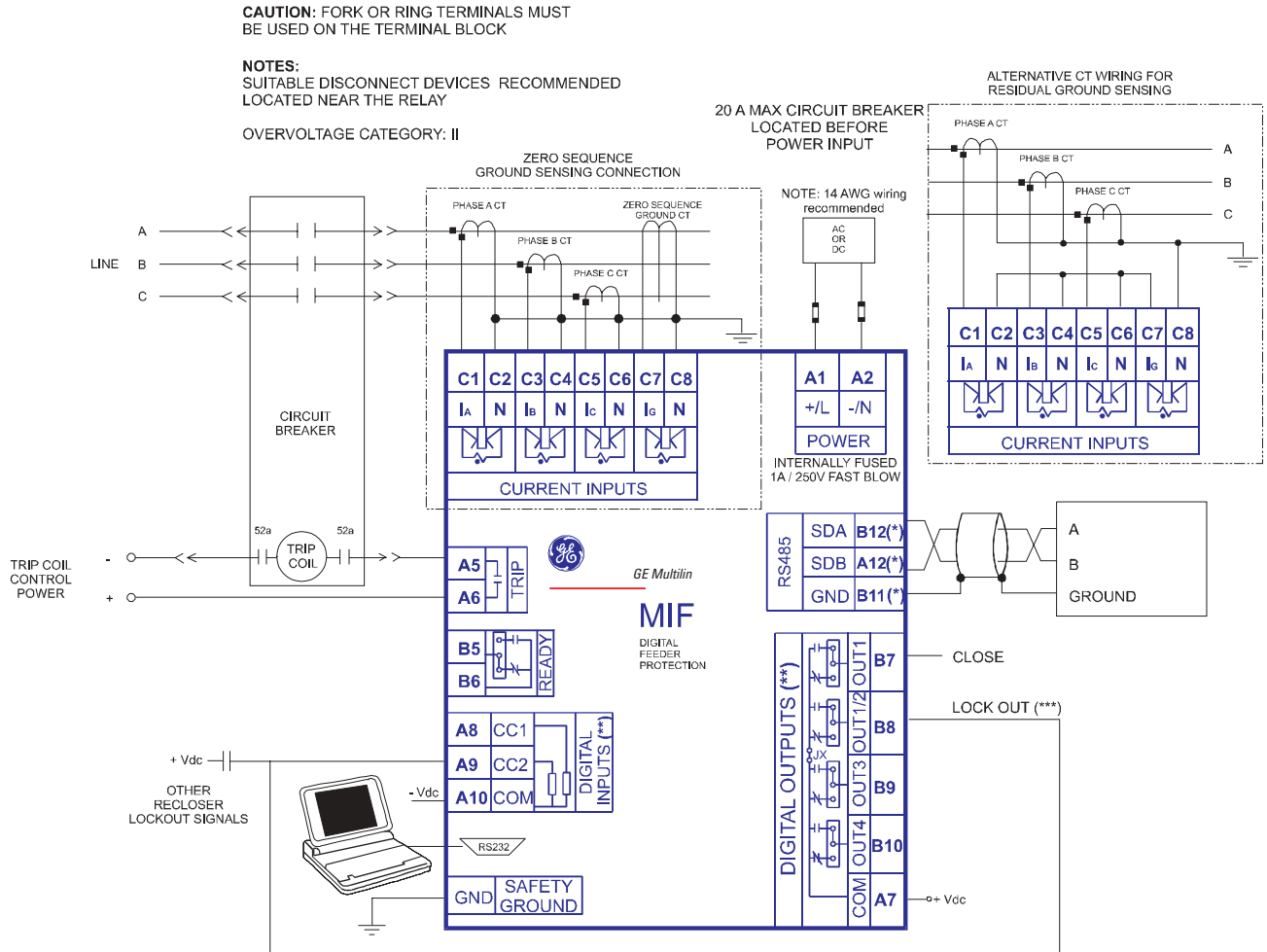


FIGURE 1. MIF-05 Logic

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(\*) Terminals B12, A12 and B11 must be connected to SELV (safety extra-low voltage) parts (on the PLC). They are not to be tested for hipot test under any circumstance

(\*\*) Inputs and outputs are configured as follows:

**INPUTS**  
 CC1: 52b  
 CC2: BLOCK RECLOSER

**OUTPUTS**  
 OUT1: CLOSE  
 OUT2: LOCK OUT  
 OUT3: GROUND TRIP  
 OUT4: 50 TRIP

(\*\*\*) Recloser resets from Lockout when circuit breaker closes

FIGURE 2. MIF-05 Wiring Diagram