This document is intended as a reference guide for installing and using a BENDER RCMA420 ground fault monitor. This document includes installation, setup, and usage instructions. For complete details, including installation, setup, settings, and troubleshooting, refer to the RCMA420 user manual, document number TGH1411en. This document is intended as a supplement and not a replacement to the complete user manual.

Only qualified maintenance personnel shall operate or service this equipment. These instructions should not be viewed as sufficient for those who are not otherwise qualified to operate or service this equipment. This document is intended to provide accurate information only. No responsibility is assumed by BENDER for any consequences arising from use of this document.

## Installation

### Mounting
RCMA420 series devices may be DIN rail mounted, or screw mounted using the black clips located on the top and bottom of the device. Screw mounting requires an extra black clip (article number B98060008, sold separately).

### Wiring - General
Refer to figure 1 for wiring the RCMA420. Refer to section "Wiring - Current Transformers" for detailed information regarding connecting current transformers.
When routing the circuit through the current transformer, whether it is single-phase, three-phase, or DC, ensure all conductors are routed through, including the neutral if it is being used. Do not place the ground conductor through the CT.

⚠ **DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Disconnect all power before servicing.
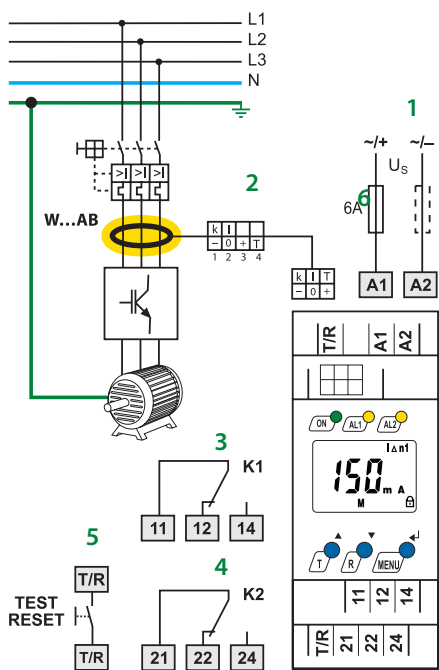- Observe all local, state, and national codes, standards, and regulations.



*Figure 1 - RCMA420 wiring diagram*

1. External supply voltage; 6A fuse recommended for internal device protection
2. Connection to current transformer. All conductors, including the neutral if it is being used, must be routed through the CT. Do not route the ground conductor through the CT.
3. Alarm relay K1: SPDT contact
4. Alarm relay K2: SPDT contact
5. External test / reset terminal (N/O contact; momuntary closure for reset, closure for > 1.5 s for test)

### Wiring - Contacts
Using a normally closed or normally open contact utilizes two factors: wiring out of the proper terminal, and setting the respective contact to normally energized or deenergized operation. Refer to the chart below for relay conditions. For changing the energized state of the contact, refer to "Figure 8 - Contact operation" on the reverse side of this document.

The factory default for the RCMA420 is normally energized operation for relays K1 and K2.

### Device Relay Conditions

| Relay Operation Setting | Device Alarm State | K1 STATE | K2 STATE |
|---|---|---|---|
| Normally deenergized mode (N/D) Non-failsafe mode "N/O" in device settings menu | Power ON, normal state (no alarms) | 11-12 CLOSED 11-14 OPEN | 21-22 CLOSED 21-24 OPEN |
| Energized in the alarm state | Power OFF | 11-12 CLOSED 11-14 OPEN | 21-22 CLOSED 21-24 OPEN |
| Relay will switch when the alarm is activated. | Power ON, alarm state | 11-12 OPEN 11-14 CLOSED | 21-22 OPEN 21-24 CLOSED |
| Normally energized mode (N/E) Failsafe mode "N/C" in device settings menu | Power ON, normal state (no alarms) | 11-12 OPEN 11-14 CLOSED | 21-22 OPEN 21-24 CLOSED |
| Energized in the normal state | Power OFF | 11-12 CLOSED 11-14 OPEN | 21-22 CLOSED 21-24 OPEN |
| Relay will switch when the alarm is activated, or when supply voltage to the device is lost. | Power ON, alarm state | 11-12 CLOSED 11-14 OPEN | 21-22 CLOSED 21-24 OPEN |

## Wiring - Current Transformers
Only the following BENDER current transformers may be used with the RCMA420: W20AB, W35AB, W60AB. Use WX series connecting cables (sold separately) to connect the CT to the RCMA420. Ensure that the arrow on the current transformer is pointing in the correct direction for the desired trip level. Current transformers may be screw mounted with the included mounting feet. Refer to RCMA420 series user manual for complete technical details.
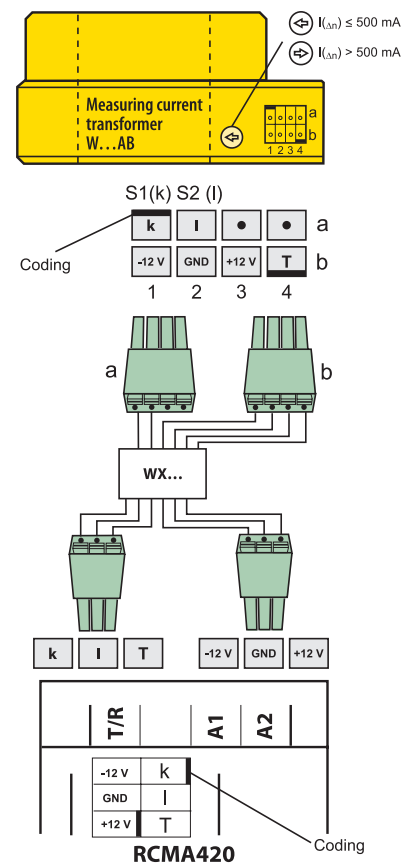


*Figure 2 - Current transformer wiring*
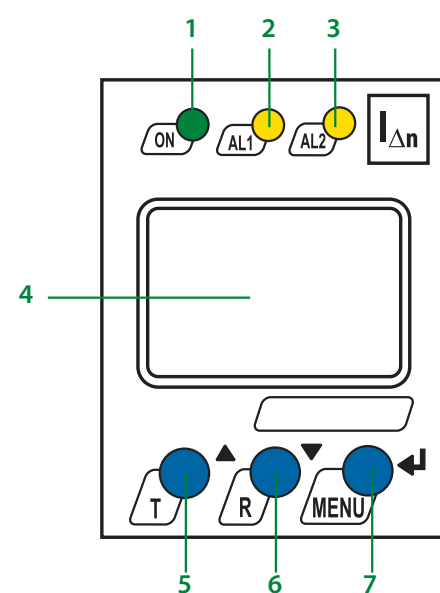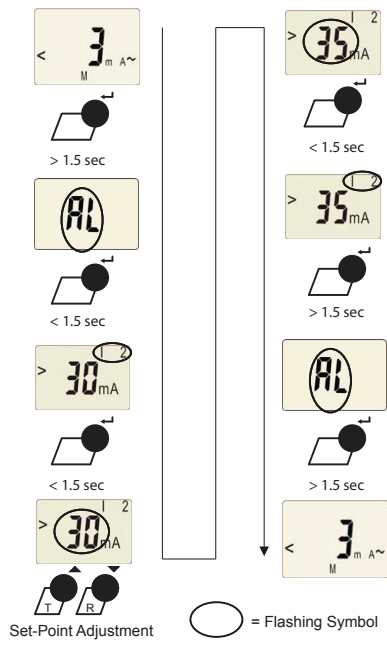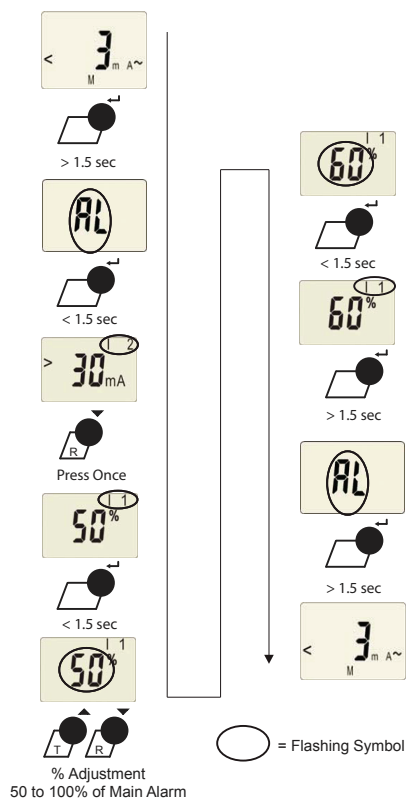
## Front Panel Display



*Figure 3 - RCMA420 front display*

1. LED "ON" (green): Illuminates when power is applied to the device. Flashes when the CT connection alarm is active.
2. LED "AL1" (yellow): Illuminates when the prealarm is activated. Flashes when the CT connection alarm is active.
3. LED "AL2" (yellow): Illuminates when the main alarm is activated. Flashes when the CT connection alarm is active.
4. Backlit LCD display
5. TEST / UP button: Activates self-test / scrolls up inside main menu.
6. RESET / DOWN button: Resets device / scrolls down inside main menu.
7. MENU / ENTER button: Activates main menu / Confirms (momuntary push) or goes back a step (held > 1.5 s) inside main menu.
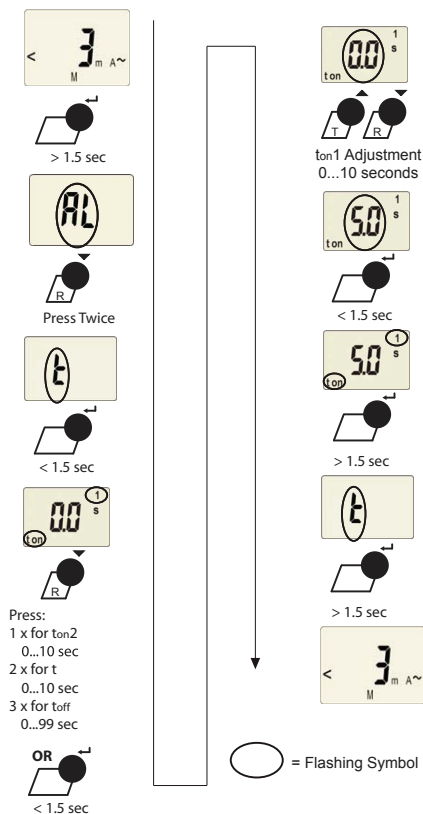
## Figure 4 - Setting main alarm trip value



Set-Point Adjustment

⬭ = Flashing Symbol

## Figure 5 - Setting prealarm trip value



% Adjustment
50 to 100% of Main Alarm
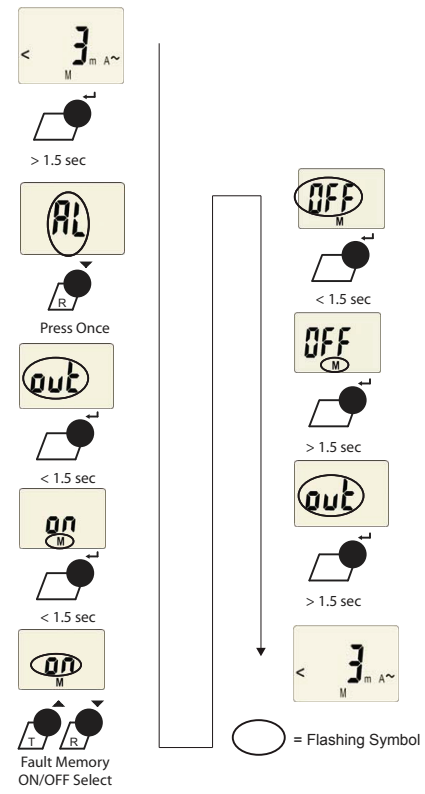
⬭ = Flashing Symbol

## Figure 6 - Changing Time Delays

Four separate time delays are available:

- $t_{on1}$ - Response delay, prewarning
- $t_{on2}$ - Response delay, main alarm
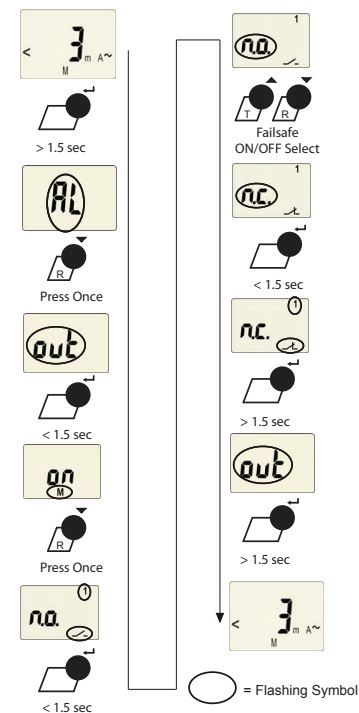- t - Startup delay
- $t_{off}$ - Delay on release



Press:
1 x for $t_{on2}$
0...10 sec
2 x for t
0...10 sec
3 x for $t_{off}$
0...99 sec

$t_{on1}$ Adjustment
0...10 seconds

⬭ = Flashing Symbol

## Figure 7 - Latching behavior (fault memory)

Changing this setting to "ON" will cause the RCMA420 to latch in the event of an alarm, and require a manual reset if the alarm clears. Changing this setting to "OFF" will cause the RCMA420 to automatically reset if the alarm clears.



Fault Memory
ON/OFF Select

⬭ = Flashing Symbol

## Figure 8 - Contact operation

Use this option to change the behavior of the contacts between normally deenergized (non-failsafe) mode and normally energized (failsafe) mode. The two SPDT contacts may be changed individually. Note that the RCMA420 labels normally deenergized operation as "N/O" and normally energized operation as "N/C"; utilzing a normally open or normally closed contact only depends on which contact output is wired.



Failsafe
ON/OFF Select

⬭ = Flashing Symbol

## Menu Flow Chart for Common Settings

Figures 4 through 8 contain flow charts for modifying commonly used features and settings in the RCMA420's main menu. Not all available features are listed in this document. For more information, consult the RCMA420 user manual.

## Menu Legend

 DOWN ARROW button

$< 1.5$ s    Momuntary button push

 UP ARROW button

$> 1.5$ s    Hold button for at least 1.5 s, then release

 MENU / ENTER button