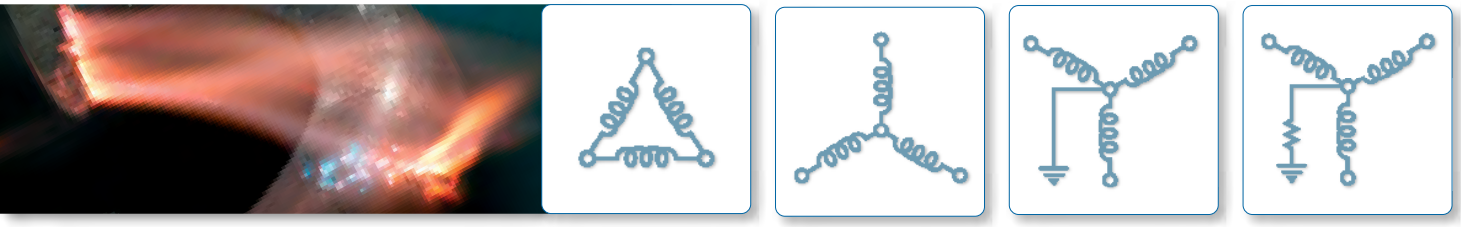
GARD

Unparalleled Protection

mGARD-10

GROUND FAULT RELAY

mGARD-10-C
mGARD-10-C1
mGARD-10-C2



C-EG20EM mGard-10-C Instruction Manual, Dec 2025
(Previously C-417EM)

ABOUT I-GARD

I-Gard's commitment to electrical safety provides both industrial and commercial customers with the products needed to protect their electrical equipment and the people that operate them.

As the only electrical-safety focused company whose product portfolio includes neutral grounding resistors, high-resistance grounding systems and optical arc mitigation, we take pride in our technologies that reduce the frequency and impact of electrical hazards, such as arc flash and ground faults.

For those customers who have purchased from us over the last 30 years, you know us for the quality and robustness of our products, our focus on customer service and technical leadership. We build on this foundation by investing in developing new products in electrical safety education by actively participating in the IEEE community programs on technical and electrical safety standard, and working with local universities at discovering new technologies. We remain unrelenting in our goal of improving electrical safety in the workplace.

Our commitment to excellence is validated by long-standing relationships with industry leaders in fields as diverse as petroleum and gas, hospitals, automotive, data centers, food processing, aerospace, water and waste water plants, and telecommunications. We provide our customers with the product and application support required to ensure that their electrical distribution system is safe and reliable.

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Note: mGard-10C series is functionaly identical to mGard-10A series. The 'C' enclosure is larger and three terminals have been added to accomodate future feature enchancement.

2. INTRODUCTION

The mGARD-10-C is a microprocessor-based ground fault relay designed and built to be used on solidly grounded or resistance grounded systems. This innovative digital electronic relay measures ground fault current using a built-in 1.125 '' zero sequence current sensor (ZSCS).

The mGARD-10-C reacts to alternating current only and will reject direct current signals. Harmonic filtering can be enabled using a DIP switch. With the harmonic filtering feature enabled, the mGARD-10-C rejects all frequencies except the fundamental. This can be used to eliminate false tripping when using the relay on systems with variable frequency drives. With the harmonic filter disabled, the relay will accurately respond to AC currents between 25 and 400Hz.

System voltage should not exceed 600V when passing the system power conductors through the built-in ZSCS. However, by using an I-Gard current sensor, connecting the secondary to terminals 10 and 11, and passing the system insulated power conductors through the window, the mGARD-10-C can be applied on any system voltage.

As shown in Table 1.0, three versions of the mGARD-10-C relay are available, providing a wide range of trip levels and delays. The ground fault current trip level, delay and operating mode is set on a front-accessible DIP switch. The trip level can be set just above the charging current. Any deterioration in the circuit will trip the relay.

Table 1.0 mGARD-10 Relay Versions

CATALOGUE NUMBER	LEVEL	DELAY	NOTES
mGARD-10-C	500mA - 10A	0.5s to 10s	TxA I-Gard type silicon steel zscs
mGARD-10-C1	10mA - 6A	20ms to 5s	TxB I-Gard type nickel alloy zscs
mGARD-10-C2	500mA - 10A	0.5s to 10s	TxA I-Gard type silicon steel zscs comes with horizontal DIN rail adapter

All mGARD-10 relays are available with low voltage DC power supplies including 12V and 24V. Other specific ratings are available upon request, please consult I-Gard if other ratings are required.

The output relay has Form "Z" (4 terminal) N.O. (normally open) and N.C. (normally closed) contacts which may be used to operate the upstream protective device and to indicate a failure of the system. The relay can be set to operate in any one of the following modes: failsafe, non-failsafe, or auto reset by means of front-accessible DIP switches.

By double clicking the remote test/reset button connected to terminals 8 and 10, a functional test of the mGARD-10-C is invoked. A single press of the remote test/reset button resets the relay after a trip. (It is not necessary to press the remote test/reset button to invoke auto reset.)

The green LED indicates two functions: When slow flashing it means control power is applied to terminals N- and L+; when fast blinking it denotes the relay has sensed a ground fault current higher than the trip level for a period longer than the trip time and that the output contacts have operated.

The mGARD-10-C operates on any control voltage from 40 to 240V AC or DC, and contains an isolated power supply. The eleven position terminal block is pull-apart, simplifying connection of field wiring.

A three position, pull-apart terminal connects the mGARD relay to the mGARD-SYM remote indicator (with modbus connectivity) for remote test/reset and monitoring. An analog meter (0-1mA) can also be connected to terminals 11 and 9 for remote indication.

Special consideration must be taken in the selection of the neutral grounding resistor in a high resistance grounded system as the capacitance-to-ground charging current on a system will vary depending on: the overall length of the cables; the types of loads; the quality of insulation on the phase conductors; the surrounding equipment grounding, cable trays, junction boxes, the type of transformer, etc. A "Rule-of-Thumb" for systems 600V and lower: The charging current is 0.5 Amps per 1000 kVA of transformer capacity. In electrical systems of 600V and below it is common to use a 5 Amp continuous rating for the neutral grounding resistor and setting the pickup current at 20% of that value (1 Amp) for all relays and coordinating between upstream and downstream relays by selecting different time delays.

3. OPERATION

3.1 OPERATION AND GLOSSARY OF TERMS

Auto Reset:

After a trip, the relay will automatically reset itself three seconds after the ground fault current drops below the trip current set point. The auto reset feature can be used in both failsafe and non-failsafe modes.

Chassis Ground:

Chassis ground is the ground to which all of the non-current carrying metal equipment is connected/bonded. Typically, equipment grounding is provided by means of a ground bus. A solid connection is to be made from terminal 7 of the mGARD-10-C to the nearest chassis ground to ensure the relay complies with the specified Electromagnetic compatibility (EMC) standards. If using an external zero sequence current sensor, do not ground the zscs secondary wires.

External Zero Sequence Current Sensor:

External zero sequence current sensors (CT's) are required for any of the following applications:

- The size of the power conductors on which the mGARD-10-C is being applied is too large for the 1.125" built-in CT.
- The system voltage on which the mGARD-10-C is being applied is higher than 660V.
- The system primary phase current on which the mGARD-10-C is being applied exceeds 125 Amps RMS continuous.
- The mGARD-10-C and mGARD-10-C2 relays can be used with any I-Gard T x A Type external zero sequence current sensor (terminals 10 and 11).
- The ground fault trip current settings do not change when using an external T x A sensor. The maximum continuous primary phase current is to be 1000 Amps.
- Optionally, the mGARD-10-C, mGARD-10-C2 relays can be used with a 5 Amp (terminals 15 and 16) and 1 Amp (terminals 16-17) metering CT.
- Similarly the mGARD-10-C1 can be used with any I-Gard T x B-type zero sequence current sensor, with a nickel alloy core.

Failsafe:

The output relay changes state when control power is applied to terminals N- & L+. The N.O. contact closes and the N.C. contact opens. When a trip occurs or control voltage is removed, the N.O. contact is opened and the N.C. contact is closed.

Ground (Earth):

The conductive mass of the earth, at which point all the exposed conductive parts of the system should be bonded at a conventional voltage value of zero.

Ground Fault:

A ground fault is understood to be an accidental contact between a live conductor at phase potential and ground.

Manual Reset:

A N.O. contact remote RESET pushbutton connected to terminals 8 and 11 of the mGARD-10-C must be pressed once to reset the output relay after a trip, providing the ground fault has been cleared.

Non-Failsafe:

The output relay does not change state when control power is applied to terminals N- & L+. When a trip occurs the N.O. contact is closed and the N.C. contact is opened. The non-failsafe mode can be used when the output relay is operating under-voltage devices. This includes: contactor coils, starter coils, and circuit breakers equipped with UV trip coils.

Pickup Current / Trip Levels:

The value of the zero sequence current at which the relay trips (operates), which is when the relay contacts change their status.

Time Delay:

Intentional period of time programmed to elapse before the tripping (operation) of the relay. It should not be confused with the breaking time of the protection device.

Zero Sequence Current:

A vectorial summation of all electrical currents in an electrical line. Theoretically in any electrical system the summation of all the electrical currents is zero. When the resulting summation value is other than zero, it is an indication of a current leakage to ground.

3.2 DIPSWITCH SETTINGS

The DIP switches are mounted inside of the relay and are accessible through the front cover. It is recommended that all of the DIP switches be set at one time and before energizing the relay.

The changes to the DIP switch settings when the mGARD-10-C relay is energized, may be performed without having any adverse effect on the relay.

Please refer to Table 3.0, and 3.2 for DIP switch settings for the mGARD-10-C, mGARD-10-C1 and mGARD-10-C2 respectively.

Trip levels can be scaled down by adding turns through the current transformer. Tables 3.1, 3.3, display the trip levels with multiple turns through the ZSCS for the mGARD-10-C, mGARD-10-C1 and mGARD-10-C2 respectively. Please note that the values are shown considering 10 Amperes as 100%.

Table 3.0 mGARD-10-C/C2 DIP Switch Settings

SWITCH	FUNCTION	SET TO	MEANING
1	Harmonic Filter	L ◄ R	Disabled Enabled
2	Trip Contacts	L ◄ R	Non-Failsafe Failsafe
3	Auto Reset	L ◄ R	Disabled Enabled
4, 5, 6	Ground Fault Trip Current Limit	L L L ◄ L L R L R L L R R R L L R L R R R L R R R	5 Percent 10 Percent 15 Percent 20 Percent 25 Percent 50 Percent 75 Percent 100 Percent
7, 8, 9	Trip Time Delay	L L L ◄ L L R L R L L R R R L L R L R R R L R R R	0.5 seconds 1.0 seconds 1.5 seconds 2.0 seconds 2.5 seconds 5.0 seconds 7.5 seconds 10.0 seconds

-(In the table below 'R' denotes right and 'L' denotes left) 10 Amperes -100%

-Factory Setting ◄

Table 3.1 mGARD-10-C/C2 Trip Levels vs. Turns through CT

DIP SETTING	1 TURN	2 TURNS	3 TURNS	4 TURNS	5 TURNS	10 TURNS
5% (L, L, L)	500mA	250mA	167mA	125mA	100mA	50mA
10% (L, L, R)	1A	500mA	333mA	250mA	200mA	100mA
15% (L, R, L)	1.5A	750mA	500mA	375mA	300mA	150mA
20% (L, R, R)	2A	1A	667mA	500mA	400mA	200mA
25% (R, L, L)	2.5A	1.25A	833mA	625mA	500mA	250mA
50% (R, L, R)	5A	2.5A	1.67mA	1.25A	1A	500mA
75% (R, R, L)	7.5A	3.75A	2.5A	1.875A	1.5A	750mA
100% (R, R, R)	10A	5A	3.33A	2.5A	2A	1A

-Applies to both internal and external CT

Table 3.2 mGARD-10-C1 DIP switch settings

SWITCH	FUNCTION	SET TO	MEANING
1	Harmonic Filter	L ◄ R	Disabled Enabled
2	Trip Contacts	L ◄ R	Non-Failsafe Failsafe
3	Auto Reset	L ◄ R	Disabled Enabled
4, 5, 6, 7	Ground Fault Trip Current Limit	L L L L ◄ L L L R L L R L L L R R L R L L L R L R L R R L L R R R R L L L R L L R R L R L R L R R R R L L R R L R R R R L R R R R	10 milliamps 20 milliamps 30 milliamps 50 milliamps 100 milliamps 120 milliamps 150 milliamps 210 milliamps 300 milliamps 500 milliamps 600 milliamps 1 amp 2.4 amps 3 amps 4.2 amps 6 amps
8, 9	Trip Time Delay	L L ◄ L R R L R R	20 milliseconds 500 milliseconds 2.0 seconds 5.0 seconds

-(In the table below 'R' denotes right and 'L' denotes left) 10 Amperes -100%

-Factory Setting ◄

Table 3.3 mGARD-10-C1 Trip Levels vs. Turns through CT

10mA (L, L, L, L)	10mA	5mA	3.3mA	2.5mA	2mA
20mA (L, L, L, R)	20mA	10mA	6.7mA	5mA	4mA
30mA (L, L, R, L)	30mA	15mA	10mA	7.5mA	6mA
50mA (L, L, R, R)	50mA	25mA	16.7mA	12.5mA	10mA
100mA (L, R, L, L)	100mA	50mA	33mA	25mA	20mA
120mA (L, R, L, R)	120mA	60mA	40mA	30mA	24mA
150mA (L, R, R, L)	150mA	75mA	50mA	37.5mA	30mA
210mA (L, R, R, R)	210mA	105mA	70mA	52.5mA	42mA
300mA (R, L, L, L)	300mA	150mA	100mA	75mA	60mA
500mA (R, L, L, R)	500mA	250mA	166.7mA	125mA	100mA
600mA (R, L, R, L)	600mA	300mA	200mA	150mA	120mA
1A (R, L, R, R)	1A	500mA	333mA	250mA	200mA
2.4A (R, R, L, L)	2.4A	1.2A	800mA	600mA	480mA
3A (R, R, L, R)	3A	1.5A	1A	750mA	600mA
4.2A (R, R, R, L)	4.2A	2.1A	1.4A	1.05A	840mA
6A (R, R, R, R)	6A	3A	2A	1.5A	1.2A

-Applies to both internal and external CT

3.3 INDICATION

There is one green LED on the front of the mGARD-10-C:
• LED Off: No control voltage or mGARD-10-C defective
• LED Slow Flashing: Normal, control voltage on
• LED Fast Blinking: Ground Fault Trip
• LED Steady On: Control voltage too low or mGARD-10-C defective

3.3.1 Analog Meter

Terminals 9 and 11 are used to connect a (0-1ma) I-Gard GM-AM1 analog meter. The current output is proportional to the fault current as a percentage of the trip level. If the relay is set to 1 Amp, the analog meter will output 500uA if there is a 500mA fault (50%). Notice that the positive terminal of the meter is connected to the common (11) on the relay and the negative is connected to terminal 9.

Special labeling for the meter background in amperes or colored sections is available from I-Gard upon request.

3.3.2 mGARD-SYM Remote Indicator

The mGARD-SYM is a remote display indicator that is used in conjunction with I-Gard Corporation relays. The indicator has the capability to interconnect with up to 50 relays including the mGARD-10 relays in a bus network topology and provides detailed device status information.

As shown in Figure 3.0, the display has a 4-line screen that shows a list of connected devices. A device can be selected and viewed in detail. The relay mode, delay and trip level settings can be viewed (but not altered). The reset and test functions can also be performed directly from the display.

Fault levels are displayed as a percentage of the selected pickup (trip) current level. If the trip level is 1 Amp and there is a 500 mA fault current, the reading on the display will appear as 50%. Screen navigation is done using a 4-button interface. The menus are displayed on the right side of the LCD; the left side is reserved for viewing relay information.

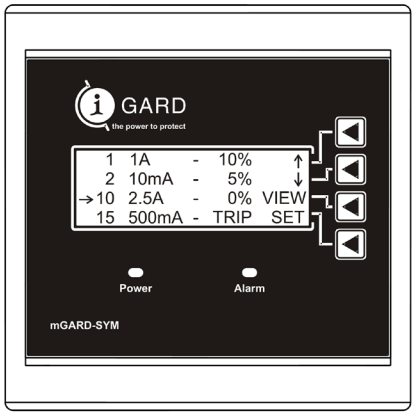

Figure 3.0 mGARD-SYM Remote Indicator

3.4 RESET

The mGARD-10-C has two terminals 8 and 11 for a remote N.O. test/reset non latching button. After a trip, the relays remain in the tripped state until the ground fault has been cleared and the reset button has been pressed, or the control voltage is removed from terminals L- & N+.

It is NOT necessary to press the remote test/reset button after the ground fault has been cleared when the mGARD-10-A is set in the pulsed trip auto reset mode. In this mode the relay will reset automatically in 3 seconds.

3.5 GROUND FAULT TEST

Double clicking the external button connected to terminals 8 and 11 invokes a relay test. A simulated current which exceeds the trip current set on the trip level DIP switches replaces the measured current. Once the trip delay time set on the trip delay DIP switch has elapsed, the relay should trip and the green LED will blink at a fast rate. This procedure tests the functionality of the unit.

After the trip, if the relay operating mode is manual reset, the output relay will remain tripped and the green LED will blink fast until the reset button is pressed. If the relay operating mode is pulsed trip auto reset, the output relay will reset and the green LED will revert to a slow flash 3 seconds after the test button was pushed or the test was remotely invoked.

3.6 FUTURE FEATURES

Terminals S1, S2 and S3 are for use with future feature enchancements.

4. INSTALLATION INSTRUCTIONS

DANGER
Hazard of Electrical Shock, Burn or Explosion
All installation, servicing and testing referred to in this manual must be performed by qualified personnel. All power should be disconnected prior to removing covers or enclosures and where live conductors may otherwise be exposed.
Failure to observe these precautions may result in death or severe personal injury and damage to equipment. Before placing an intentional ground fault on the power system, check that a fault does not already exist. Any test ground fault equipment must be rated for full system voltage and be fused for protection.

The internal electronics have been encapsulated in epoxy to improve the performance in high vibration environments. Try to keep the exposure to mechanical shock and vibration to a minimum and place the mGARD-10-C in a clean dry enclosure. Locate the relay close to the isolating device (circuit breaker or contactor) that is protecting the circuit being monitored.

When using an external zscs keep the distance between the relay and the ZSCS as short as possible. If that is not possible use twisted cable and increase the gauge of the conductor as per the table below:

Table 4.0 CT secondary wire size

MAXIMUN CABLE RUN IN FEET/METERS	MINIMUN WIRE GAUGE
Up to 300 Ft. / 91m.	16
301ft / 92m to 450ft / 137m	14

Provide maximum clearance between the mGARD-10-C (and the external ZSCS if required) and any strong magnetic flux- producing devices such as power transformers, autotransformers, control transformers, reactors, and high power conductors and bus work.

CAUTION: To obtain a reliable ground fault detection by the mGARD-10-C use one configuration only: either the built-in CT; or the external ZSCS (i.e. do not pass power conductors through the built-in CT when using an external sensor.)

4.1 MOUNTING

Refer to Figure 8.0, 8.1 and 8.2 for mounting dimensions of the mGARD-10-A relay. The mGARD-10-C is designed to be mounted with either mounting screws or on a 35 mm DIN rail. Refer to figure 8.3, 8.4 and 8.5 for mounting dimensions of the mGARD-10-C relay.

Two #8-32 x 3/4" (M4 x 20) mounting screws are required for screw mounting.

For DIN rail mounting the rail should be bolted to a flat surface. Install the DIN rail horizontally. Allow at least ¾" (20 mm) of rail to extend beyond each end of the relay. Secure the relay to the DIN rail ensuring the release latch at the bottom of the relay engages the rail. If the relay is to be mounted in any other position take appropriate steps to prevent the relay from disengaging from the DIN rail.

4.2 BUILT-IN CURRENT TRANSFORMER

The mGARD-10-C has a built-in current transformer (CT) with 1.125" (28.5 mm) opening. The maximum continuous primary phase current is 100 Amps.

Figure 4.0 illustrates a wiring arrangement for detecting ground faults on a solidly grounded system. Pass the neutral and phase conductors through the CT window. Note that the relay is located downstream of the neutral ground point.

This wiring arrangement permits the relay to lose power once the breaker trips. This is acceptable when the relay is operating in non-failsafe mode.

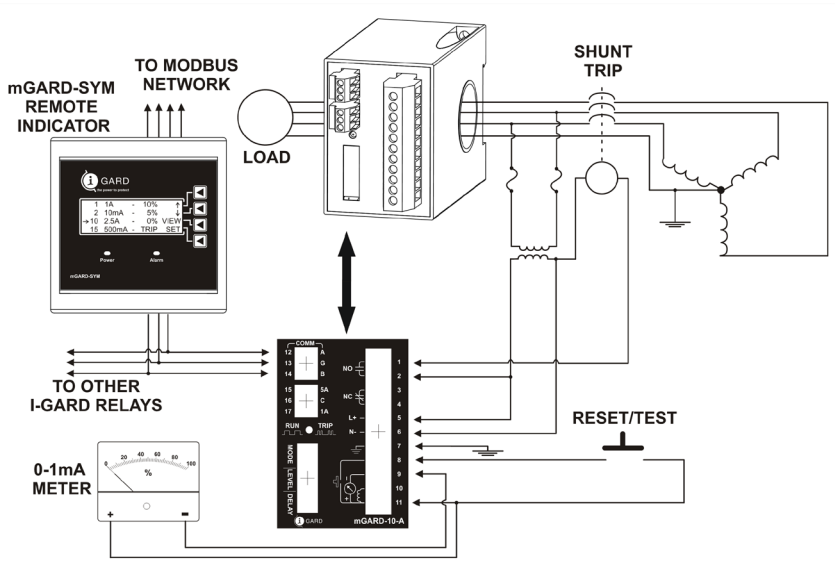

Figure 4.0: mGARD-10-C wired for internal current transformer, non-failsafe operating mode.

4.3 EXTERNAL CURRENT SENSORS

Refer to the glossary of terms to determine if an external current transformer is required for the application.

The mGARD-10-C will work with I-Gard Corporation Type TxA zero sequence current sensors (TxB type zero sequence current sensors for mGARD-10-C1). Contact I-Gard Corporation for the catalogue number of the zero sequence current sensor with the correct opening diameter required for the application in case it is not shown on the table below.

WIRE SIZE	14	12	10	8	6	4	2
Diameter (inches)	0.126	0.142	0.179	0.241	0.31	0.358	0.418
of Cable (mm)	3.2	3.6	4.6	6.1	7.9	9.1	10.6

Table 4.1 Primary wire size vs. CT window size

NO. OF CABLES IN FEEDER							
3 Cables in. (form factor 2.16) mm	0.27	0.3	0.39	0.52	0.67	0.77	0.95
	6.9	7.8	10	13	17	20	23
4 Cables in. (form factor 2.42) mm	0.3	0.34	0.43	0.59	0.75	0.87	1.02
	7.74	8.7	11	15	19	22	26
6/7 Cables in. (form factor 3.0) mm	0.37	0.43	0.54	0.73	0.93	1.07	1.26
	9.6	10.8	14	18	24	27	32
9/10 Cablse in. (form factor 3.85) mm	0.49	0.55	0.69	0.93	1.19	1.38	1.62
	12.3	13.9	18	24	30	35	41
12 Cables in. (form factor 4.15) mm	0.52	0.59	0.75	1	1.29	1.47	1.74
	13.3	14.9	19	25	33	38	44
Sensor Type Inside Diameter in mm	mGARD-10	T2A		T3A		T6A	
	1.125	1.875		2.75		5.75	
	28.6	48		70		146	

Phase conductors must be insulated for the system voltage whenever the system voltage is higher than 660V.

Refer to Figure 4.1, pass the phase and neutral conductors through the window of the external zero sequence current sensor. Note that the relay is located downstream from the neutral ground point.

Position the cable in the centre of the zero sequence current sensor window opening. Keep cables and bus-work clear of the split on split core zero sequence current sensors (T3A-S and T6A-S).

The two secondary terminals of the external zscs are to be connected to terminals 10 and 11 of the mGARD-10-C. The maximum continuous primary phase current when using an external zscs is 1,000 Amps.

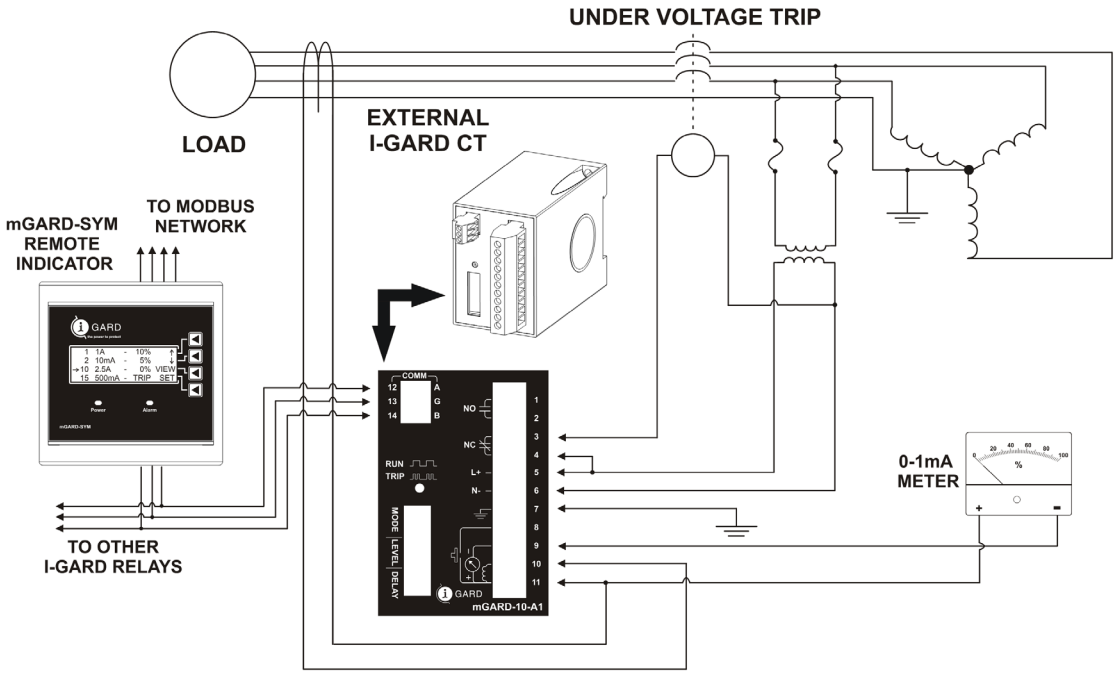

Figure 4.1: mGARD-10-C1 wired for external current transformer, non-failsafe operating mode, auto-reset with mGARD-SYM remote indicator and analog meter

Figure 4.2 shows a mGARD-10-C2 relay operating in non-failsafe mode. The relay is monitoring the neutral conductor in a resistance grounded system.

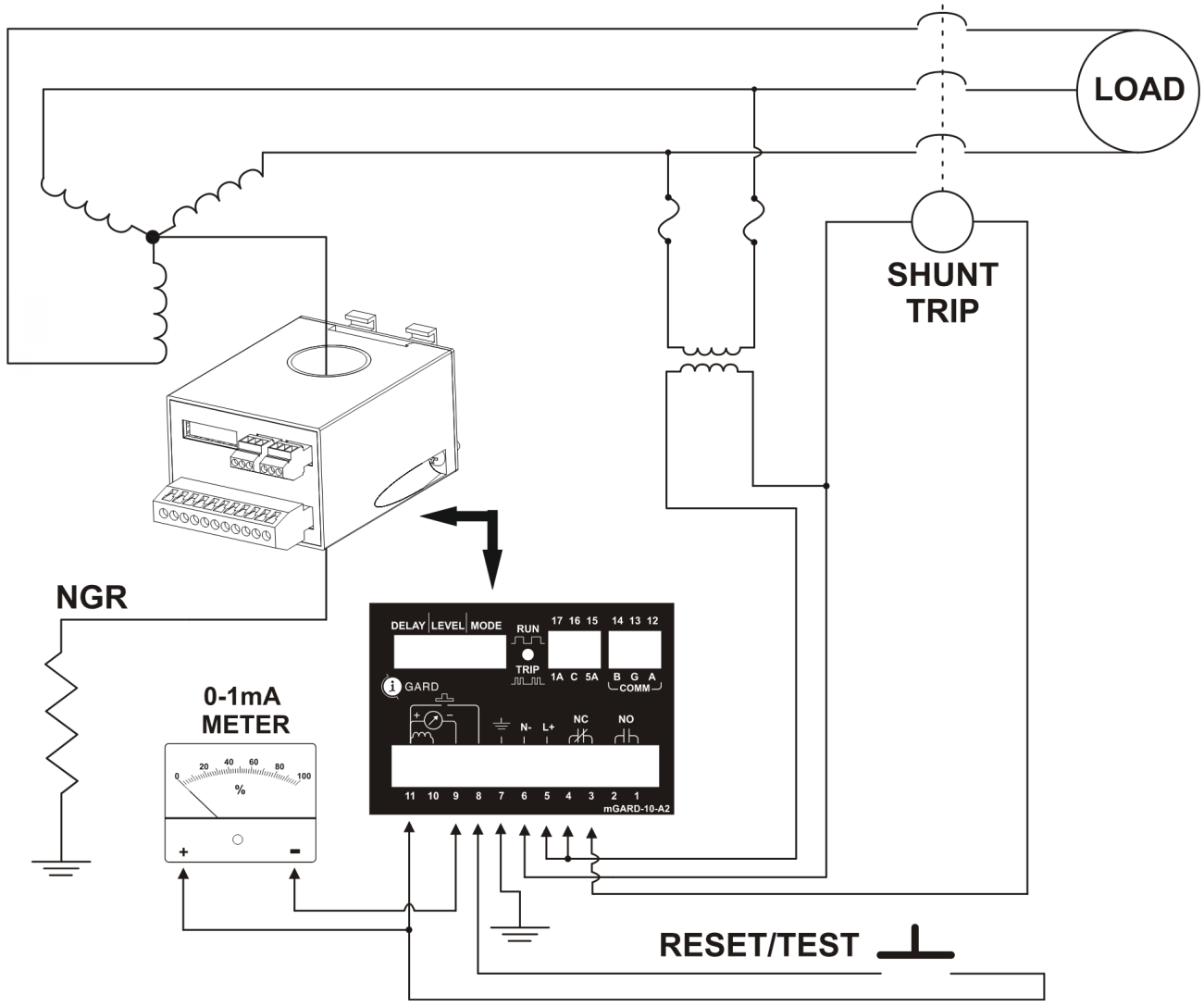

Figure 4.2 mGARD-10-C2 relay monitoring a resistance grounded system.
Operating in Failsafe mode, manual reset.

Figure 4.3 shows a system with several mGARD-10 relays monitoring branch circuits.

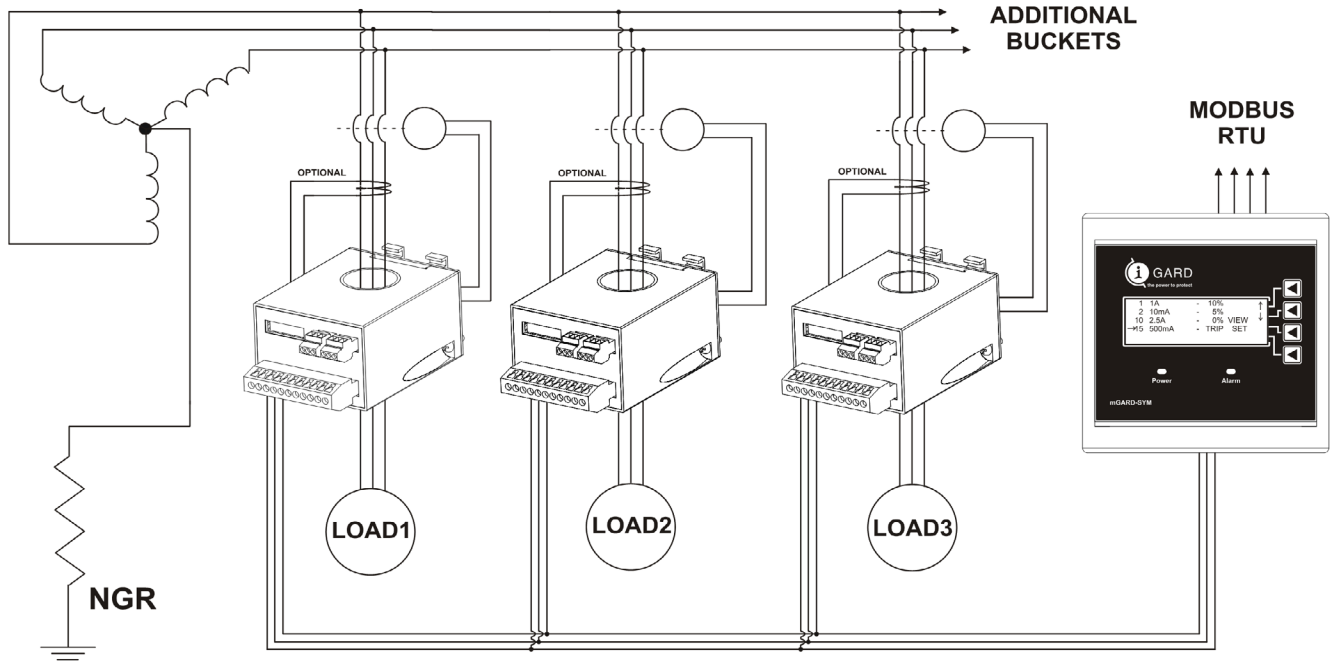

Figure 4.3 mGARD-10-C2 relay monitoring a resistance grounded system.
Operating in Failsafe mode, manual reset

4.4 CONNECTIONS

All connections to the mGARD-10-C are by means of screw clamp terminals rated 10 Amps, 300V. Terminals will accept any wire gauges from #26 to #12 AWG solid or stranded conductors. The terminals are pull-apart style to simplify wiring.

If an external current sensor is being used, connect the two secondary terminals of the current sensor to terminals 10 and 11 of the relay using 14 AWG (minimum). Twist the leads to optimize electromagnetic immunity.

For remote test and reset connect a N.O. momentary contact (non-latching) TEST/RESET button to terminals 8 and 11.

Connect AC or DC control power to terminals N- and L+.

In order to meet the electromagnetic compatibility (EMC) requirements a chassis bond is required between terminal 7 and the nearest ground point. This distance should be kept to a minimum. If the mGARD-10-C is mounted on 35 mm DIN rail, a DIN rail mounted ground terminal block can be installed beside the relay to act as the chassis ground point.

4.5 CONNECTING MORE THAN ONE MGARD-10-C TO REMOTE TEST/RESET

Up to 5 mGARD-10-C relays in the same enclosure may share a common remote test/reset button. Connect one button to all the relays in parallel.

5. CATALOGUE NUMBERS

mGARD-10-C ground fault relay with built-in 1.125" (28.5mm) CT, 40 – 240V AC or DC

Table 5.0 mGARD relay catalogue numbers
control voltage, for use on 660 Volts maximum, 50/60 Hz power system.

CATALOGUE NUMBER	LEVEL	DELAY	NOTES
mGARD-10-C	500mA-10A	0.5s to 10s	TxA type silicon steel ZSCS
mGARD-10-C1	10mA-6A	20ms to 5s	TxB nickel alloy ZSCS
mGARD-10-C2	500mA-10A	0.5s to 10s	TxA type silicon steel ZSCS comes with horizontal DIN rail adapter

All mGARD-10 relays can be ordered with several low voltage DC power supplies as listed below in Table 5.1.
control voltage, for use on 660V maximum, 50/60Hz power system.

Table 5.1 mGARD DC control voltage options

DC VOLTAGE RANGE	CATALOGUE NUMBER SUFFIX	EXAMPLE
12V (9-18 VDC)	/12DCV	mGARD-10-C1 /12DCV
24V (18-36 VDC)	/24DCV	mGARD-10-C2 /24DCV

Zero Sequence Current Sensors: For mounting dimensions and catalogue information on I-Gard Corporation zero sequence current sensors please refer to the current I-Gard Corporation Catalogue (C-700 Current Sensors).

Table 5.2 I-Gard Current sensors

DC VOLTAGE RANGE	CATALOGUE NUMBER SUFFIX	EXAMPLE
T2A	2 Inch diameter, Silicon steel	mGARD-10-C, mGARD-10-C2
T3A	3 Inch diameter, Silicon steel	mGARD-10-C, mGARD-10-C2
T6A	6 Inch diameter, Silicon steel	mGARD-10-C, mGARD-10-C2
T9A	9 Inch diameter, Silicon steel	mGARD-10-C, mGARD-10-C2
T2B	2 Inch diameter, Nickel Alloy	mGARD-10-C1
T3B	3 Inch diameter, Nickel Alloy	mGARD-10-C1

6. SERVICE

For assistance in installation, set-up or testing please call I-Gard toll free at the following number:
1-888-737-4787 (1-888-RESISTR) or email us at support@i-gard.com

There are no recommended, user-serviceable parts in the mGARD-10-C. All other services should be referred to qualified factory representatives, other than direct replacement of entire modules to I-Gard. Please visit the I-Gard website for information regarding field service representatives in your area.

Note: Please ensure that proper authorisation is obtained from I-Gard before returning any material.

7. TECHNICAL SPECIFICATIONS

Control Power:
3VA AC or 3W DC
40-240V AC/DC ±10% (36-264V AC/DC)

DC Control Power:
5V DC: 4.5-9 V DC, 1.5W
12V DC: 9-18 V DC, 1.5W
24V DC: 18-36 V DC, 1.5W

Temperature Range (Celsius):
Operating Temperature: -40°C to + 65°C
Storage Temperature: -40°C to + 85°C

Dielectric:
Relay contacts to chassis:
1480V rms. for 1 minute
Control terminals to chassi:
1480V rms. for 1 minute

Ground Fault:
Pickup Settings:
mGARD-10-C: 5%, 10%, 15%, 20%, 25%, 50%, 75%, 100%
mGARD-10-C1: 10mA, 20mA, 30mA, 50mA, 100mA, 120mA, 150mA, 210mA, 300mA, 500mA, 600mA, 1A, 2.4A, 3A, 4.2A, 6A
mGARD-10-C2: 1, 2, 2 ½, 4, 6, 8, 10

Pickup Tolerance: –15%, +0%

Terminal Contact Material:
Clamping screw: nickel-plated brass
Plug contacts: tin-plated bronze

Physical:
Weight: 0.40 kg (0.88 lbs)
Dimension: See Figs. 8.0 to 8.5

Mounting:
Din Rail: 35mm
Two Screw: #8 x 3/4" (M4 x 20 mm)

Standards: CSA

Notes:
The mGARD-10-C contains:
• An isolated power supply.
• A single Dual Pole Dual Throw (DPDT, 2 Form C) relay for true failsafe operation.

Delay Settings (Sec.):
mGARD-10-C, mGARD-10-C2:
½, 1, 1 ½, 2, 2 ½, 5, 7 ½, 10
mGARD-10-C1:
20 ms, ½ s, 2 s, 5 s

Delay Tolerance: ±2.5%

Thermal Withstand:
Internal CT:
10000 Amps for 1 seconds
External CT:
20000 Amps for 1 seconds

Zero Sequence Sensors:
Toroidal, with window diameter up to 225mm.
(Input impedance C, C2 10 ohm, C1 200 ohm)

Output Contacts:
Main Trip Relay:
Type: Form Z (NO and NC pair)
Rating: 10A @ 250V AC,
10A @ 30V DC,
1/2HP @ 240V AC

Future Feature Contacts:
S1, S2, S3

Table 7.0 mGARD-10-C1 Timing tolerance

SETTING	DELAY (MS) WHEN CURRENT EXCEED TRIP LEVEL BY FACTOR 2
10mA	50-70ms
20mA	50-70ms
30mA	25-35ms
50mA	25-35ms
100mA	25-35ms
120mA	25-35ms
150mA	25-35ms
210mA	25-35ms
300mA	25-35ms
500mA	25-35ms
600mA	25-35ms
1A	25-35ms
2.4A	25-35ms
3A	25-35ms
4.2A	25-35ms
6A	25-35ms

NOTE: I-GARD RESERVES THE RIGHT TO CHANGE SPECIFICATIONS OF ITS PRODUCTS WITHOUT NOTICE.

8. DIMENSIONAL DRAWINGS

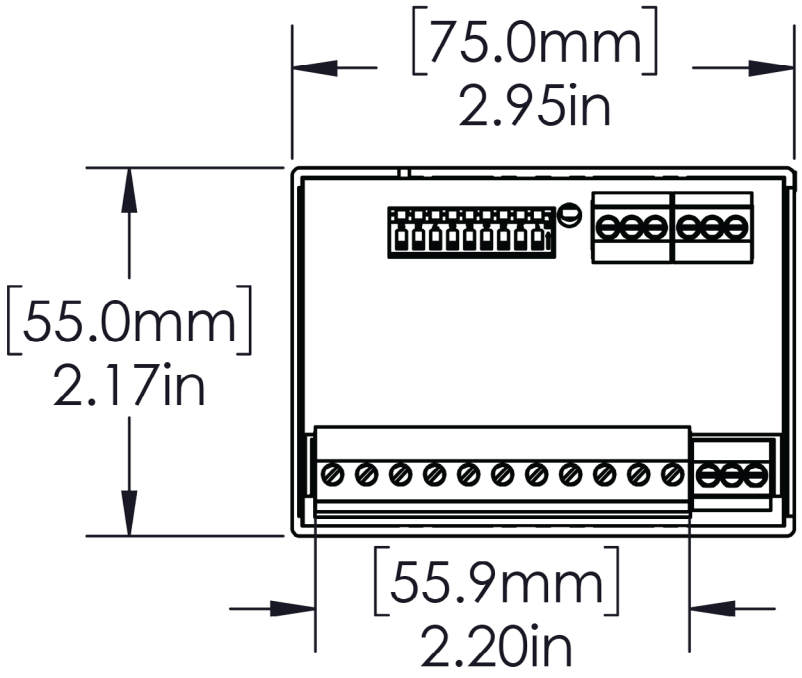

Figure 8.0: mGARD-10 Front Dimensions (in an mm)

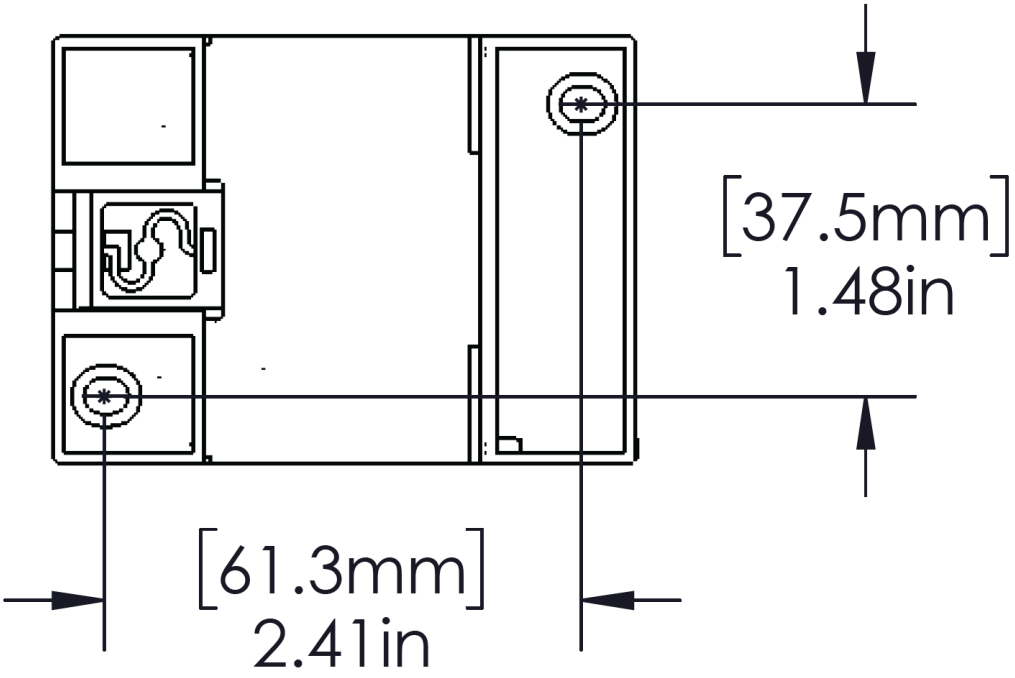

Figure 8.1: mGARD-10 Bottom Dimensions (in and mm)

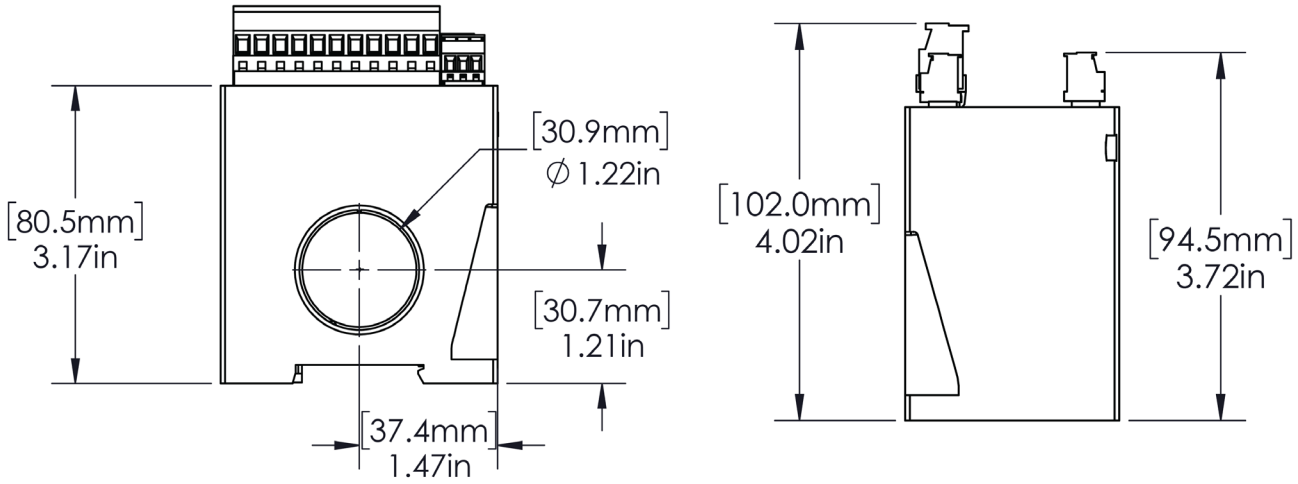

Figure 8.2: mGARD-10 Side Dimensions and Side Bottom Dimensions (in and mm)

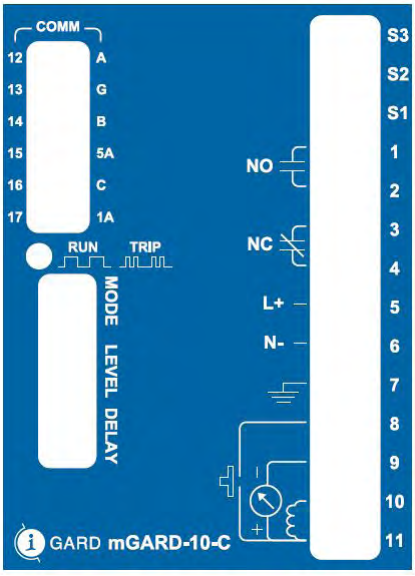

Figure 8.3: mGARD-10 Faceplate

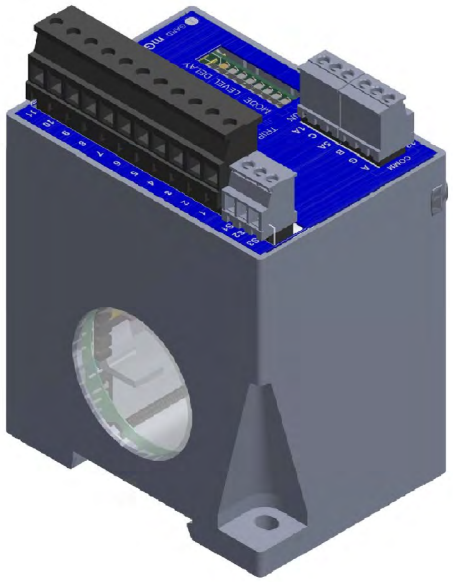

Figure 8.4: mGARD-10 3D Draw for reference

GARD

Unparalleled Protection

Designed & Manufactured in Canada

C-EG20EM mGard-10-C
MANUAL

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