



Digital Loop Detector



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GTO/PRO Loop Detector Settings and Layout

1) DIP SWITCH SETTING:

a) DIP 1: PRESENSE TIMER

OFF (Factory default): The loop will automatically re-tune if an object is present for more than 1 hour.

ON: Automatic retune as described above is disabled.

b) DIP 2: SAFE/SECURE

OFF: Fail-safe mode. When the controller detects a fault (shorted or open loop) the output relay is activated. Typically, the normally open output relay is connected to the 'FREE EXIT' input on the gate's controller that would hold the gate open.

ON: Fail-secure mode. When the controller detects a fault (shorted or open loop) the output relay is NOT activated.

c) DIP 3: ENTER/LEAVE

OFF: The output relay is activated when a vehicle enters the loop.

ON: The output relay is activated when a vehicle is leaves the loop.

d) DIP 4: CONTINUOUS/PULSE

OFF: Continuously activates the output relay when a vehicle is detected.

ON: Momentarily activate the output relay when a vehicle is detected.

e) DIP 5: INSTANT/DELAY

OFF: Instantly activate the output relay when a vehicle is detected.

ON: Delay for 2 seconds before activating the output relay when a vehicle is detected. If the vehicle is moved in less than 2 seconds relay will not be activated.

f) DIP 6,7,8: SENSITIVITY

DIP 6	DIP 7	DIP 8	Inductance change	Vehicle size
OFF	OFF	OFF	2%	Larger
OFF	OFF	ON	1%	
OFF	ON	OFF	.5%	
OFF	ON	ON	.25%	
ON	OFF	OFF	.125%	
ON	OFF	ON	.06%	
ON	ON	OFF	.04%	
ON	ON	ON	.02%	Smaller

g) DIP 9,10: FREQUENCY SELECT

These two switches provide four selectable loop frequencies. This allows multiple loops of the same design to co-exist in close proximity without interference with each other. The actual frequency is dependent on the loop inductance.

2) LED INDICATORS:

- a) RED LED: The red LED blinks when power is present.
- b) GREEN LED: The green LED blinks when detection occurs.

NOTE: Both LEDs blink when fault is detected at the loop.

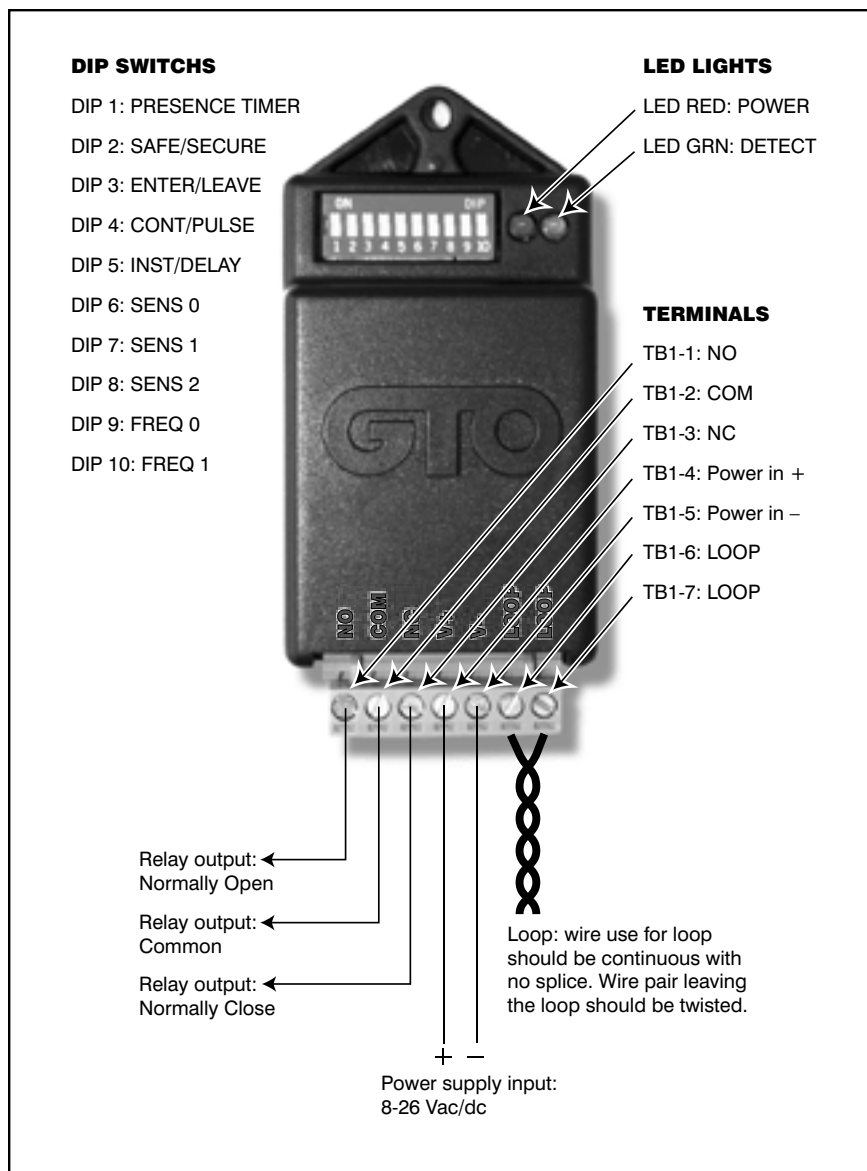
3) TERMINAL BLOCK (PLUGGABLE):

- a) OUTPUT RELAY: Relay is 'dry-contact' output.

- i) TB1-1: Normally open side of output relay.
- ii) TB1-2: Common side of output relay.
- iii) TB1-3: Normally closed side of output relay.

- b) POWER SUPPLY INPUT:

- i) TB1-4: 8-26 Vac/Vdc positive input.
- ii) TB1-5: 8-26 Vac/Vdc negative input.



Loop Installation Guidelines

The typical sensing height is 2/3 of the shortest leg of a loop (in feet). Therefore a 4' x 8' loop typically has a detection range of 2.6'.

The inductance of a conventional four-sided loop can be estimated using the formula:

$$L = P \times (T^2 + T) / 4$$

Where L = Loop Inductance in microHenries
P = Loop Perimeter in feet
T = Number of turns of wire in saw slot

Therefore a 4' x 8' loop with 3 turns would be:

$$L + (4 + 8 + 4 + 8) \times (3^2 + 3) / 4$$

$$L = 24 \times (9 + 3) / 4$$

$$L = (24 \times 12) / 4$$

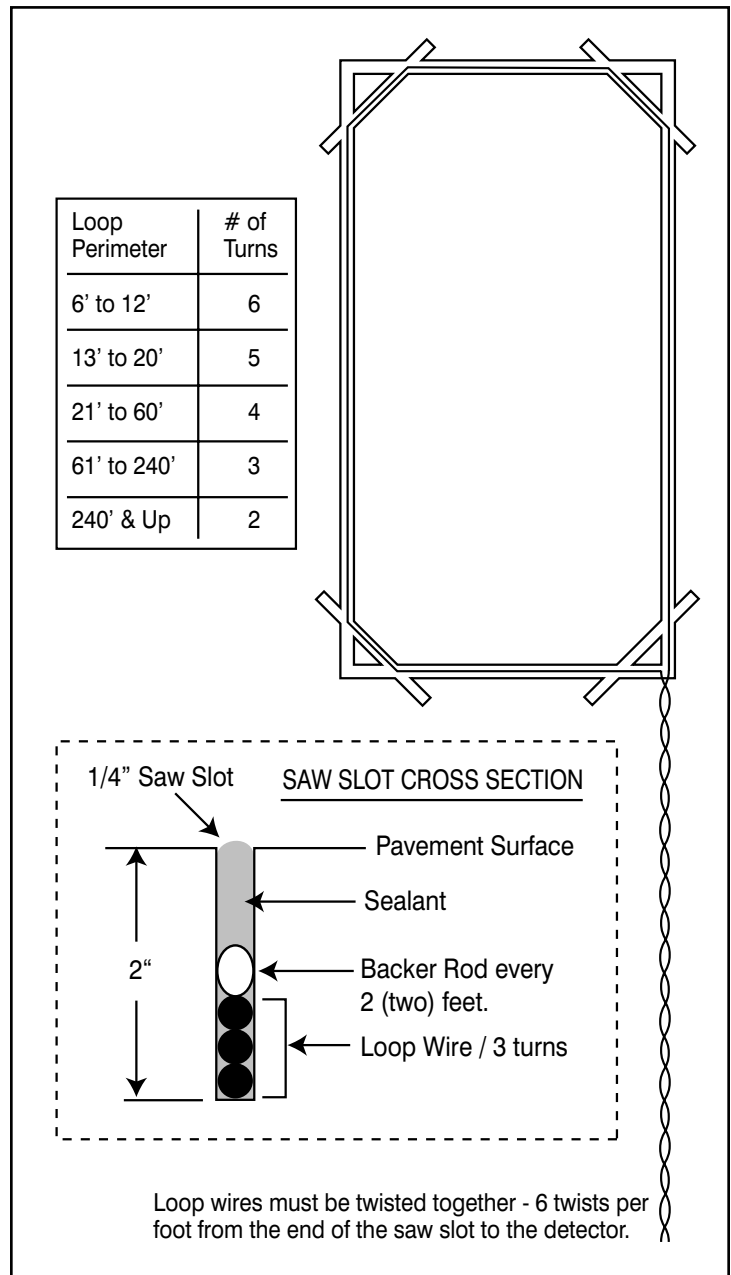
$$L = 24 \times 3$$

$$L = 72 \text{ microHenries}$$

NOTE: Loop feeder cable typically adds 0.22 microHenries of inductance per foot of cable.

The following are suggested guidelines for loop installation:

1. Make sure the pavement surface in the area that the loops are to be installed is dry and free of debris.
2. Design the loop geometry considering the area of detection, the type of vehicles to be detected and the distance between the loop and the loop detector.
3. The outline of the loop(s) should be marked on the pavement in such a way that the lines can be followed easily by the saw operator and not be erased by the water feed from the saw.

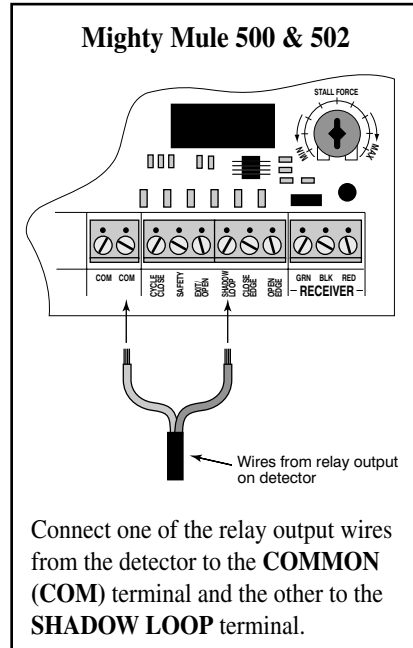
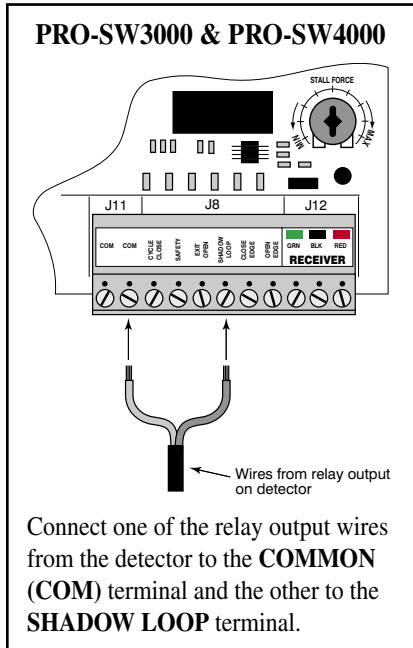


4. When the outline of the loop and the lead-in has been marked the pavement can be cut. The saw cut should be approximately 2.0 inches deep and 0.25 inches wide. All 90 degree corners should be chamfered so that the course of the loop wire does not change direction sharply but rather at shallow angles of 45 degrees or less. The saw slot should be cleaned out and allowed to dry.
5. Loop wire is typically 14, 16, 18, or 20 AWG with cross-linked polyethylene insulation, rated for direct burial. Since moisture can cause significant changes in the dielectric constant of the insulation, which results in excessive loop (frequency) drift, choose an insulation which is most impervious to moisture. PVC, TFFN, THHN and THHN-THWN should be avoided since they tend to absorb moisture and crack easily. XLPE (cross-linked polyethylene) is very resistant to moisture absorption and provides good abrasion resistance.
6. If long lead-ins are required, it is suggested that the loop cable be spliced onto shielded, pre-twisted, lead-in wire (IMSA specification 50-2 is recommended) at a convenient pull box location close to the loop. The shield may be connected to earth ground at the cabinet end but should then be insulated and isolated from earth ground at the loop end.
7. Start laying the loop wire from the termination of the lead-in out towards the loop, continue around the loop for the number of turns required and finally return to the lead-in termination. Leave the lead-in wire out of the slot so that it may be twisted together before being laid in the slot. Lead-ins should be twisted with a minimum of 4 to 6 twist per foot to prevent any separation of the lead-in wires.
8. Make sure that the loop wire is pushed fully to the bottom of the saw slot. The wire must be held firmly in the bottom of the slot using a plastic foam material called "backer rod", before applying loop sealant.
9. Many different types of loop sealant are now available. Single part types are the easiest to apply since no mixing is required, but they also tend to be more expensive in terms of linear feet of saw slot filled. When applying the sealant, make sure that it is able to sink to the bottom of the slot and completely encase the loop wire. The wire should not be able to move when the sealant is set. Ensure that there is enough sealant to completely fill the slot; if possible the sealant should protrude slightly above the surface of the pavement so that small rocks or other debris cannot collect in the slot. The sealant manufacturer's instructions concerning cure time should be noted - especially when determining the length of time to wait before allowing vehicles to cross the loop area.
10. It is very important that any splices be soldered and each splice point be protected with a moisture proof seal. Failure to do so will result in system problems, if not immediately then sometime in the near future.

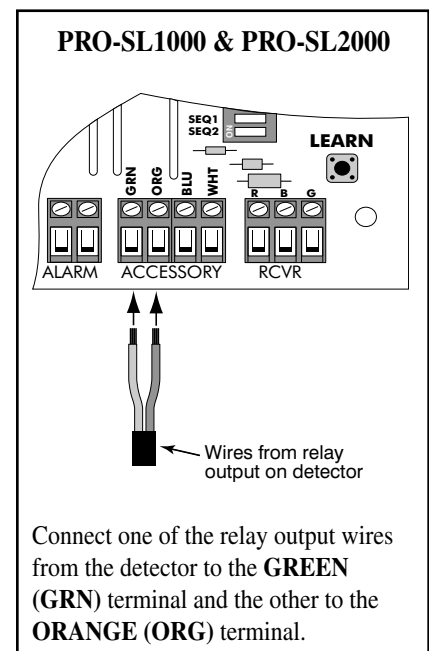
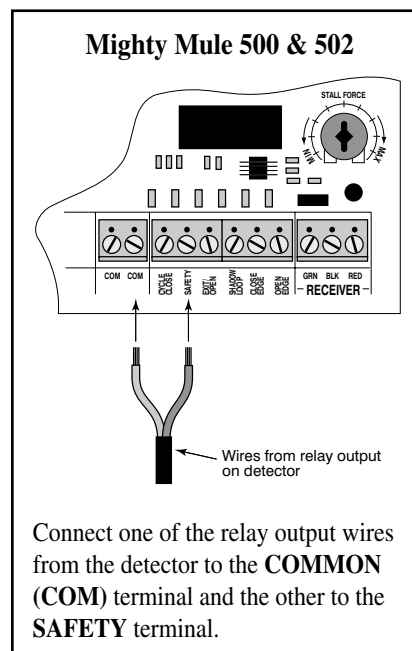
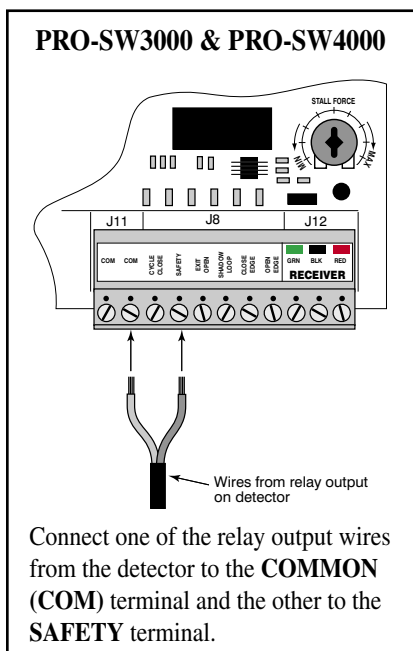
Wiring the Loop Detector to GTO Systems

Always make sure the power switch to the operator is turned off before connecting accessory device wiring to the terminal blocks. Unplugging the transformer does not turn power to the operator OFF.

Wiring the detector as a Shadow Loop

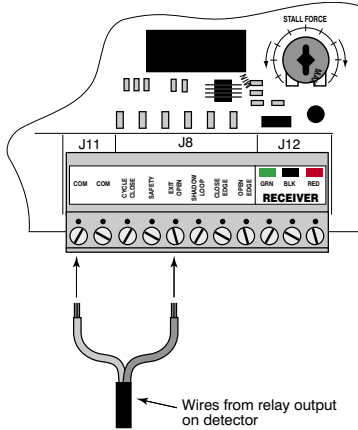


Wiring the detector as a Safety Loop



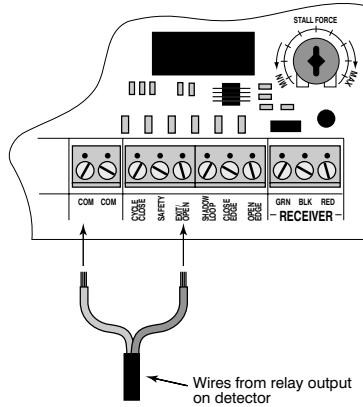
Wiring the detector as a Free Exit Loop

PRO-SW3000 & PRO-SW4000



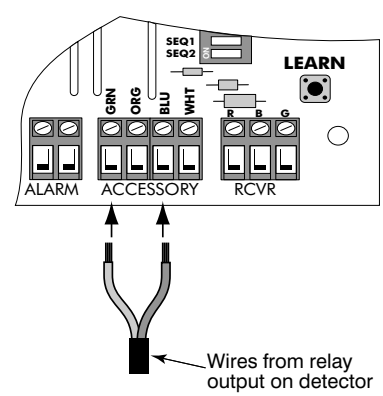
Connect one of the relay output wires from the detector to the **COMMON (COM)** terminal and the other to the **EXIT OPEN** terminal.

Mighty Mule 500 & 502



Connect one of the relay output wires from the detector to the **COMMON (COM)** terminal and the other to the **EXIT OPEN** terminal.

PRO-SL1000 & PRO-SL2000



Connect one of the relay output wires from the detector to the **GREEN (GRN)** terminal and the other to the **BLUE (BLU)** terminal.

Conversion Chart

Converting Metric Units to English Equivalents

When You Know	Multiply By	To Find	Symbol
centimeters	0.3937	inches	in. (or “)
meters	3.2808	feet	ft. (or ‘)
kilograms	2.2046	pounds	lb. (or #)

Converting English Units to Metric Equivalents

When You Know	Multiply By	To Find	Symbol
inches	2.5400	centimeters	cm
feet	0.3048	meters	m
pounds	0.4535	kilograms	kg

Converting Temperature

deg. Celsius	$(^{\circ}\text{C} \times 1.8) + 32$	deg. Fahrenheit	$^{\circ}\text{F}$
deg. Fahrenheit	$(^{\circ}\text{F} - 32) \div 1.8$	deg. Celsius	$^{\circ}\text{C}$



This product and any accessory you purchase should only be installed on a gate operator that meets the current safety standard, UL325, latest edition. If you have a gate operator that is not listed with the current standard please contact the GTO sales department for consultation on a gate operator that can meet your specific needs.

GTO Limited One Year Warranty:

GTO, Inc., gate operators and accessories are warranted by the manufacturer against defects in materials and manufacturer workmanship for a period of one (1) year from date of purchase, *provided the recommended installation procedures have been followed.*

In the case of product failure due to defective material or manufacturer workmanship within the one (1) year warranty period, the product will be repaired or replaced (at the manufacturer's option) at no charge to the customer, if returned freight prepaid to GTO, Inc., 3121 Hartsfield Road, Tallahassee, Florida, USA 32303. **IMPORTANT: Call (850) 575-4144 or Fax (850) 575-8950 for a Return Goods Authorization (RGA) number before returning accessory to factory.** Products received at the factory without an RGA number will not be accepted. Replacement or repaired parts are covered by this warranty for the *remainder* of the one (1) year warranty period or six (6) months, whichever is greater. GTO, Inc. will pay the shipping charges (equal to United Parcel Service GROUND rate) for return to the owner of items repaired under warranty.

The manufacturer will not be responsible for any charges or damages incurred in the removal of the defective parts for repair, or for the reinstallation of those parts after repair. This warranty shall be considered void if damage to the product(s) was due to improper installation or use, connection to an improper power source, or if damage was caused by lightning, wind, fire, flood, insects or other natural agent.

After the one (1) year warranty period, GTO, Inc. will make any necessary repairs for a nominal fee. Call GTO at (800) 543-1236 for more information. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. This warranty is in lieu of all other warranties, expressed or implied. **NOTE: Verification of the warranty period requires copies of receipts or other proof of purchase. Please retain these records.**

If you have any questions call Technical Support at... **(800) 543-1236**
or GTO/PRO Sales at... **(800) 543-4283**