OPEN & SAFETY LOOPS

FOR GC 840 & GC 841 LOOPS
&
FOR GC 810, GC 827 AND GC 827-12 LOOP DETECTORS

PRESENCE

RELAY 2

H
M SENS
L

625X

H
M FREQ
L

RESET
(HOLD FOR 3 SECONDS)

AGS™

Manufacturing Excellence in Gate Automation

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Contents

TECH TIP !
Making Your Own Loops
Loop wires may be twisted with any standard hand drill.

LOOP MUST BE ONE
CONTINUOUS WIRE

TWIST WIRE FROM
CORNER WHERE WIRE
ENTERS AND LEAVES THE LOOP
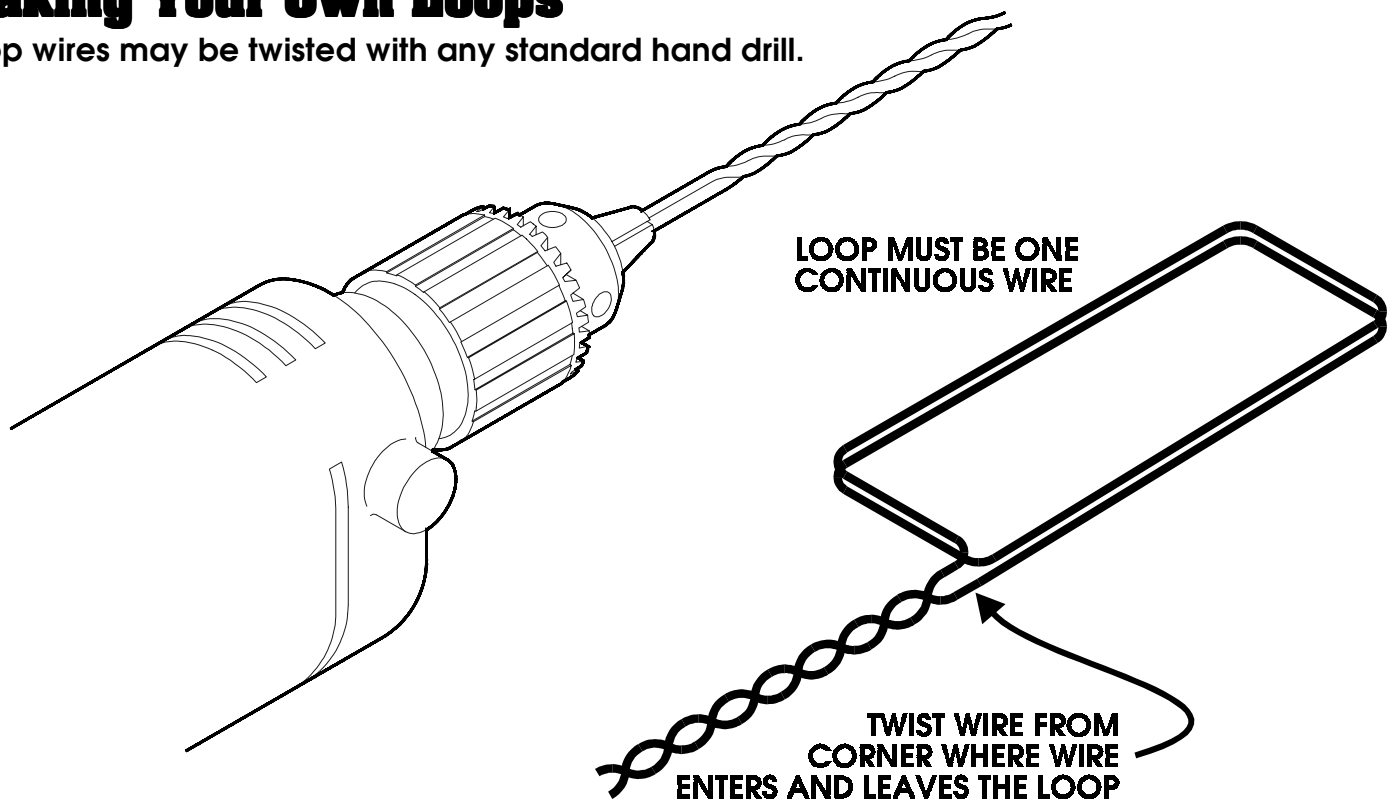
● **OPEN AND SAFETY FUNCTIONS**

For automatic gates, the terms open and safety have specific meaning when referring to the function of a gate operator. The difference between these functions is determined by the gate operator and not by the loop detectors. What is meant by an opening function is a function which will open and/or hold open an automatic gate. An opening function will open an automatic gate in any position of the gate including the closed position, during the closing travel, or while the gate is stopped in mid travel. What is meant by a safety function is a function which will open and/or hold open an automatic gate while it is open or closing. A safety function will open an automatic gate in any position of the gate **except** the closed position. This function is useful for gate operators that distinguish between the opening and closing directions of travel such as operators with auto close timers which will automatically close the gate after a number of seconds. A safety function is important for peripherals such as safety loops which must be placed near the gate to hold it open if necessary but cannot be used for unauthorized access through a closed entrance.

● **EXIT AND SAFETY LOOPS**

Exit and safety loops are equipment that connect to an automatic gate operator, commanding the operator to perform either the open or the safety function. Open and safety loops normally consist of loops (coils of wire) which are placed below the surface of the driveway and are connected to a loop detector which is placed close to or inside of the gate operator.

● **SHADOW LOOPS**

Shadow loops add additional protection to swinging gates and can be used in addition to standard safety loops. Loops are typically placed near but not in the path of the gate so that the metal gate will not effect the gates operation. For swinging gates that are very long, the distance between safety loops may be too great to provide adequate protection to vehicles passing through. A shadow loop can be placed directly in the path of the gate and not effect operation.

● **HOW DO LOOPS WORK?**

When a large metal object such as a car passes over the loops in the driveway, the loop detector which is connected to the loops in the driveway senses the object and then gives a command to the gate operator. The operator will respond to this command according to the function that the loop detector is connected to. Because the loop detector will sense only metal objects, a pedestrian will not be detected.

● **WHAT ARE THE ADVANTAGES OF USING LOOPS?**

One of the greatest advantages to using loops is that they work with little or no effort. There is no need to get out of a vehicle or even open a window. All that is required is simply driving across the loop. Another advantage of using loops is that they must be triggered by a large metal object such as a vehicle which makes it difficult for anyone to use the loops for unauthorized access.

● **WHAT ARE THE DISADVANTAGES OF USING LOOPS?**

One of the disadvantages of using loops in the case of safety loops is that they can detect only large metal objects and thus do not detect a pedestrian. For automatic gate operators which have little or no internal safety features, it is recommended that something in addition to safety loops be installed to protect pedestrians from possible injury.

● **WHAT IS NEEDED TO INSTALL LOOPS?**

If an exit loop will be installed this requires a loop detector and an exit loop. The exit loop can be either a pre-fabricated loop which can be installed before the driveway is paved or the loop can be cut and laid into an existing concrete or asphalt driveway. The exit loop can also be wired with two loops if needed (see wiring diagram page 7 for double loop open input). If safety loops will be installed this requires a loop detector and a pair of safety loops that are installed on both the inside and the outside of the gate. Safety loops can also be installed using only one loop on one side of the gate (see wiring diagram page 6 for single loop safety input). Because exit and safety loops perform two different functions, they each require their own loops and loop detectors. One loop detector cannot be used for both open and safety loops. If exit or safety loops will be cut into an existing concrete or asphalt driveway, a concrete cutting saw will be needed. These can be rented at various equipment rental facilities. The blade on the saw must be 1/4 inch in width and capable of cutting at least 2 inches in depth. The use of a shadow loop will also make an additional loop detector necessary.

Using GC 840 and GC 841 Pre-Made Loops

❶ This page of instructions is for installing GC 840 and GC 841 prefabricated open and safety loops for a sliding gate before the cement or asphalt driveway has been installed. If loops are being cut into an existing driveway for a sliding gate, refer to page 3. If loops are being installed on a swinging gate, refer to pages 4 and 5.

❷ Measure and mark where the loops will be placed. All loops should be placed so that they are approximately two feet wide by eight feet long. Loops other than 8 feet in length can be special ordered from the factory that are between 4 and 20 feet in length. Safety loops should be no closer than 4 feet away from a sliding gate. The GC 841 exit loop is designed to be placed 15 to 20 feet away from the gate. If the exit loop needs to be placed farther away from the gate, it can be special ordered from the factory to be placed as far away as 100 feet. Decide where the loop detectors will be located. The loop detectors will need to be placed in a weather proof box such as an electrical junction box or in many cases can be placed inside of the operator itself.

❸ Once the locations of all loops are determined, lay the loops flat on the ground in their permanent locations with the "leaders" (twisted part of the loop) directed toward the location of the loop detectors. The exit loop is identified by its blue wire and the safety loops are identified by their red wires. If the driveway will be paved with cement, the loops and loop leaders may be pinned to the ground or tied directly onto the wire mesh. If the driveway will be paved with asphalt, the loops and loop leaders should be placed 1 to 2 inches below the surface of the ground to prevent heat damage. Run the loop leaders to the location of the loop detectors and put them through conduit in places where there is no cement protecting them.

SLIDING GATE INSIDE LOOKING OUT
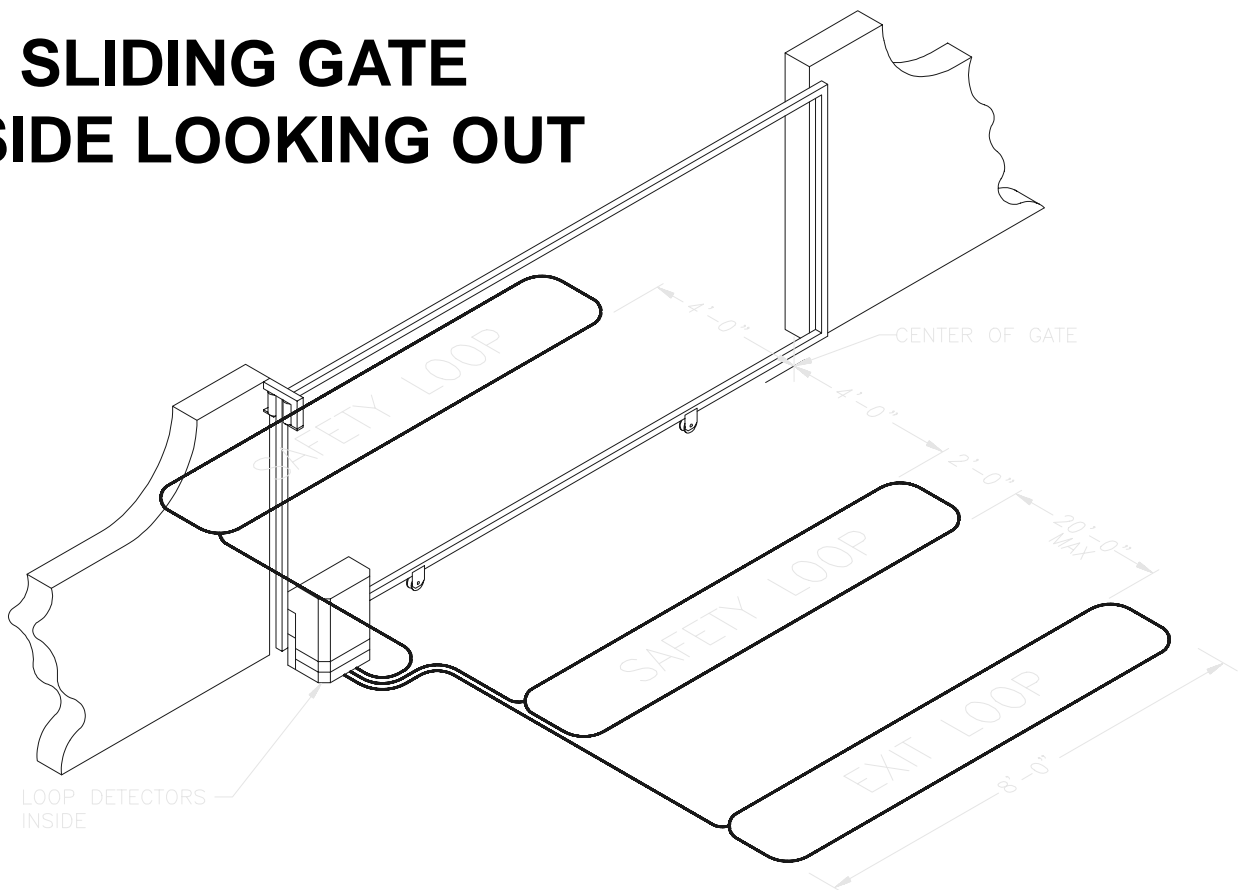
Making Loops in an existing driveway

❶ This page of instructions is for cutting and laying loops in an existing concrete or asphalt driveway on a sliding gate. If GC 840 or GC 841 pre-fabricated loops are being installed on a sliding gate, refer to page two. If loops are being installed on a swinging gate operator, refer to pages 4 and 5.
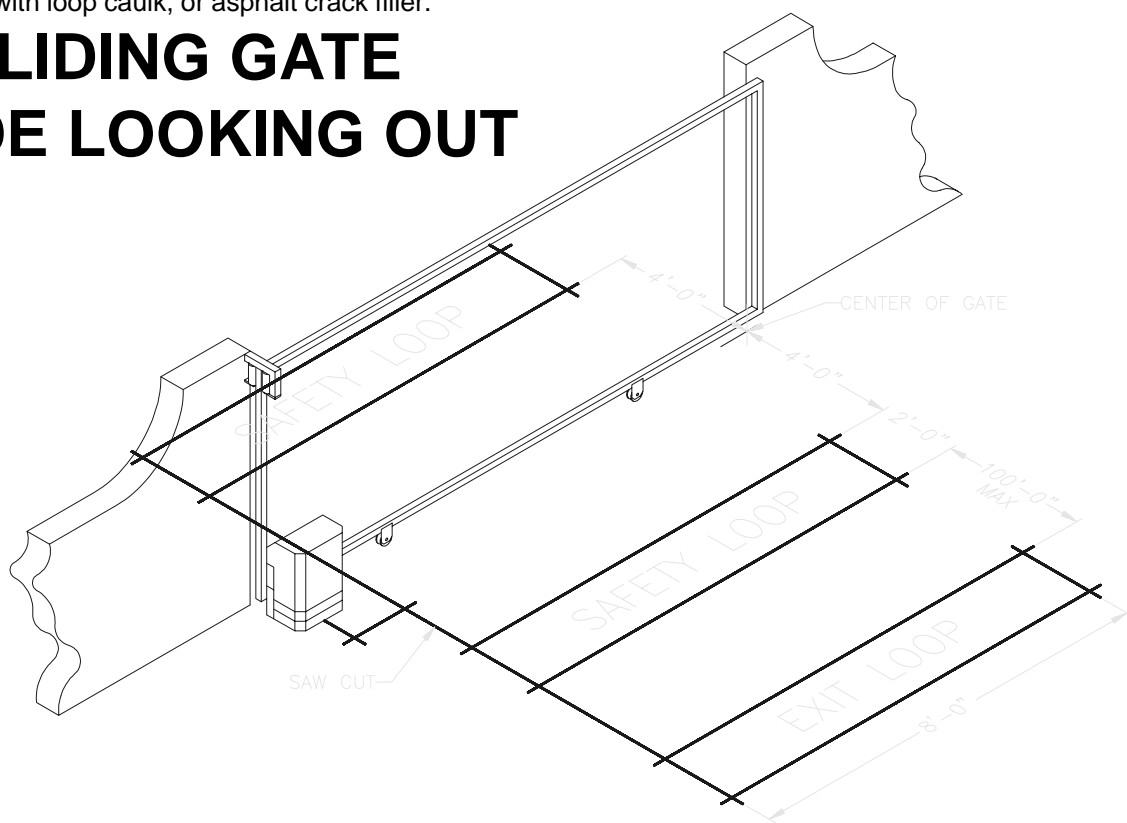
❷ Measure and mark where the loops will be cut. All loops should be approximately two feet wide by eight feet long but can be varied from 4 to 20 feet in length to accommodate different driveways. Safety loops should be no closer than four feet away from a sliding gate. The exit loop is usually placed 15 to 20 feet away from the gate but can be placed as far away as 100 feet. When marking where the loops are to be cut, use a marker that will not wash away such as a lumber crayon. Be sure to mark for cutting a line so that all loop "leaders" (twisted part of the loop) can be run to the location of the loop detectors. The loop detectors will need to be placed in a weather proof box such as a junction box or in many cases can be placed inside of the operator itself.

❸ The loops will need to be cut with a concrete cutting saw. If there is no concrete cutting saw available, it is possible to rent them from various equipment rental companies. All cuts will need to be 1/4 inch wide and 2 inches deep. Make sure that the saw has a 1/4 inch wide blade. The corners of the loops will need to cross over in order maintain a consistent depth of 2 inches. Once the loops are cut, be sure to wash the cuts out completely and wash all slurry off of the driveway. This should be done while the slurry is still wet, otherwise it will become more difficult as the slurry dries.

❹ Begin laying wire into the saw cuts. The preferred wire to use is 14 gauge solid insulated wire. Start laying wire into the saw cuts beginning at the location of the loop detectors and be careful not to scar the insulation on the wire. Be sure to leave at least 3 feet of extra wire at the starting point because this wire will become shorter when it is twisted. Run the wire around one of the rectangular safety loop cuts two turns and back to the origin of the wire. **Each loop must be one continuous wire and contain no splices.** Cut both ends of the wire the same length and twist them together all the way to the corner of the loop using a drill. Repeat this operation to install the other safety loop. The exit loop is installed in the same way that the safety loops were done except that the wire will go around the rectangular exit loop cut three turns instead of two.

❺ Once all loop wires are laid down in the saw cuts, the cuts need to be sealed over. If this is a new experience it may be preferred to wire in the loop detector and test the loops before sealing (refer to wiring diagrams). If the cuts were made in cement, the cuts can be filled with loop caulk, mortar, grout, or pour stone. If the cuts were made in asphalt, they can be filled with loop caulk, or asphalt crack filler.

SLIDING GATE
INSIDE LOOKING OUT

Using GC 840 and GC 841 Pre-Made Loops

❶ This page of instructions is for installing GC 840 and GC 841 prefabricated open and safety loops for a swinging gate before the cement or asphalt driveway has been installed. If loops are being cut into an existing driveway for a swinging gate, refer to page 5. If loops are being installed on a sliding gate, refer to pages 2 and 3.

❷ Measure and mark where the loops will be placed. All loops should be placed so that they are approximately two feet wide by eight feet long. Loops other than 8 feet in length can be special ordered from the factory that are between 4 and 20 feet in length. The outside safety loop should be no closer than 2 feet away from a swinging gate in the closed position. The inside safety loop should be no closer than 1 foot away from the end of the gate in the open position. The GC 841 exit loop is designed to be placed 15 to 20 feet away from the gate. If the exit loop needs to be placed farther away from the gate, it can be special ordered from the factory to be placed as far away as 100 feet. Decide where the loop detectors will be located. The loop detectors will need to be placed in a weather proof box such as an electrical junction box or in many cases can be placed inside of the operator itself.

❸ Once the locations of all loops are determined, lay the loops flat on the ground in their permanent locations with the "leaders" (twisted part of the loop) directed toward the location of the loop detectors. The exit loop is identified by its blue wire and the safety loops are identified by their red wires. If the driveway will be paved with cement, the loops and loop leaders may be pinned to the ground or tied directly onto the wire mesh. If the driveway will be paved with asphalt, the loops and loop leaders should be placed 1 to 2 inches below the surface of the ground to prevent heat damage. Run the loop leaders to the location of the loop detectors and put them through conduit in places where there is no cement protecting them.
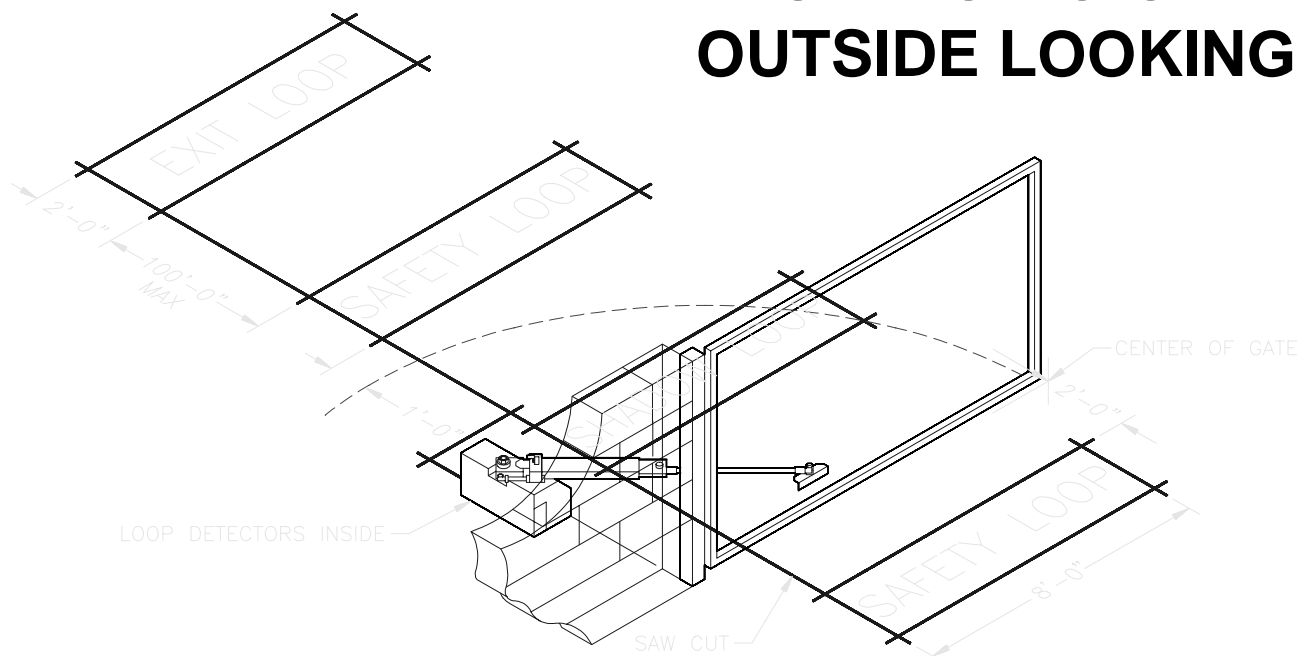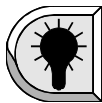
SWINGING GATE
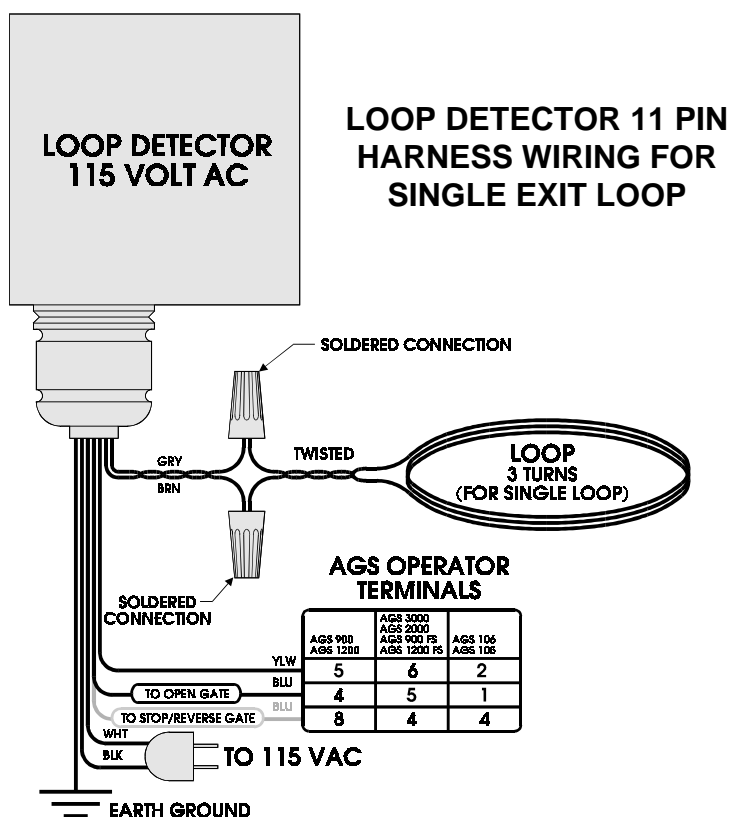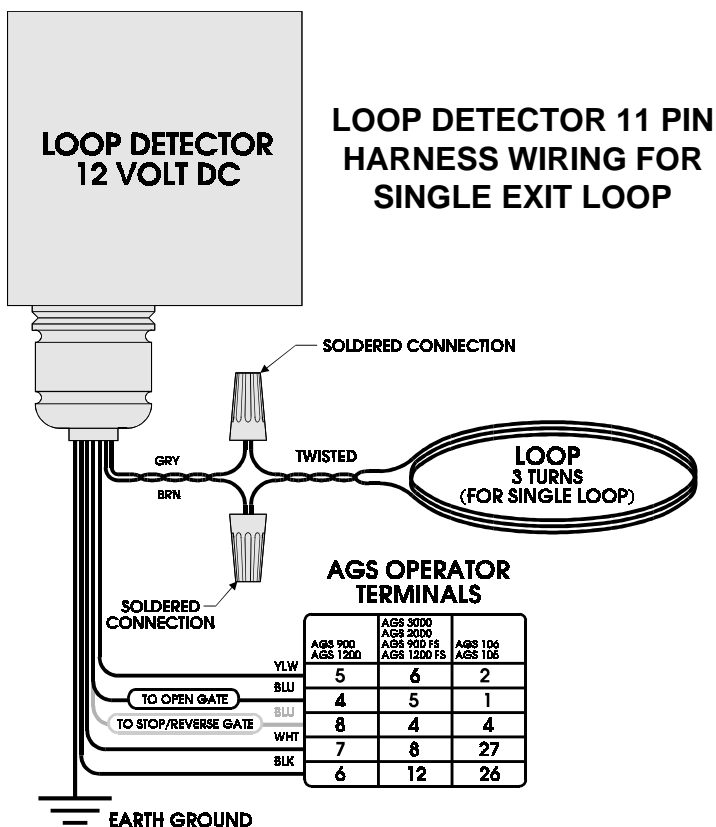## OUTSIDE LOOKING IN
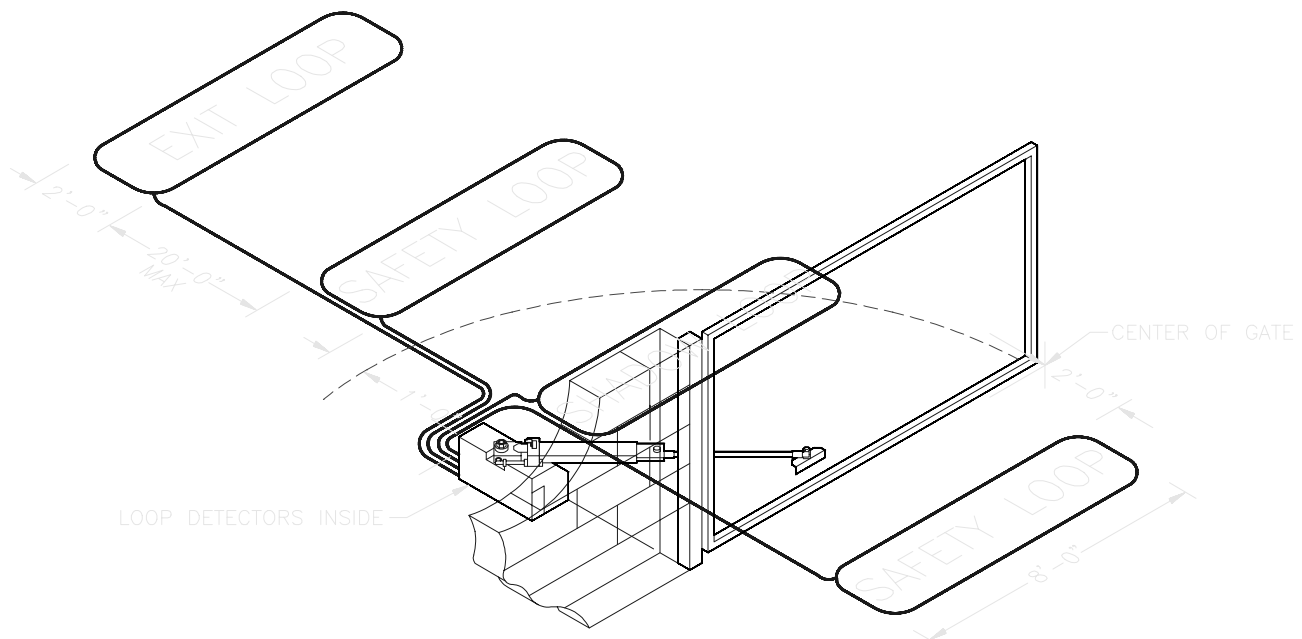
Making Loops in an existing driveway

❶ This page of instructions is for cutting and laying loops in an existing concrete or asphalt driveway for a swinging gate. If GC 840 or GC 841 pre-fabricated loops are being installed on a swinging gate, refer to page 4. If loops are being installed on a sliding gate operator, refer to pages 2 and 3.

❷ Measure and mark where the loops will be cut. All loops should be approximately two feet wide by eight feet long but can be varied between 4 and 20 feet in length to accommodate different driveways. The outside safety loop should be 2 feet away from the gate in the closed position. The inside safety loop should be about 1 foot away from the end of the gate in the open position. The exit loop is normally placed 15 to 20 feet away from the gate but can be placed as far away as 100 feet. When marking where the loops are to be cut, use a marker that will not wash away such as a lumber crayon. Be sure to mark for cutting a line so that all loop "leaders" (twisted part of the loop) can be run to the location of the loop detectors. The loop detectors will need to be placed in a weather proof box such as an electrical junction box or in many cases it can be placed inside of the operator itself.

❸ The loops will need to be cut with a concrete cutting saw. If there is no concrete cutting saw available, it is possible to rent them from various equipment rental companies. All cuts will need to be 1/4 inch wide and 2 inches deep. Make sure that the saw has a 1/4 inch blade. The corners of the loops will need to cross over in order maintain a consistent depth of 2 inches. Once the loops are cut, be sure to wash the cuts out completely and wash all slurry off of the driveway. This should be done while the slurry is still wet, otherwise it will become more difficult as the slurry dries.

❹ Begin laying wire into the saw cuts. The preferred wire to use is 14 gauge solid insulated wire. Start laying wire into the saw cuts beginning at the location of the loop detectors and be careful not to scar the insulation on the wire. Be sure to leave at least 3 feet of extra wire at the starting point because this wire will become shorter when it is twisted. Run the wire around one of the rectangular safety loop cuts two turns and back to the origin of the wire. **Each loop must be one continuous wire and contain no splices.** Cut both ends of the wire the same length and twist them together all the way to the corner of the loop using a drill. Repeat this operation to install the other safety loop. The exit loop is installed in the same way that the safety loops were done except that the wire will go around the rectangular exit loop cut three turns instead of two.

❺ Once all loop wires are laid down in the saw cuts, the cuts need to be sealed over. If this is a new experience it may be preferred to wire in the loop detector and test the loops before sealing (refer to wiring diagrams). If the cuts were made in cement, the cuts can be filled with loop caulk, mortar, grout, or pour stone. If the cuts were made in asphalt, they can be filled with loop caulk, or asphalt crack filler.

SWINGING GATE
OUTSIDE LOOKING IN

LOOP DETECTOR 12 VOLT DC

LOOP DETECTOR 11 PIN HARNESS WIRING FOR SINGLE EXIT LOOP

SOLDERED CONNECTION

GRY
BRN
TWISTED

LOOP
3 TURNS
(FOR SINGLE LOOP)

SOLDERED CONNECTION

AGS OPERATOR TERMINALS

	AGS 900 AGS 1200	AGS 3000 AGS 2000 AGS 900 FS AGS 1200 FS	AGS 106 AGS 105
YLW	5	6	2
BLU	4	5	1
BLU	8	4	4
WHT	7	8	27
BLK	6	12	26

TO OPEN GATE
TO STOP/REVERSE GATE

EARTH GROUND

LOOP DETECTOR 115 VOLT AC

LOOP DETECTOR 11 PIN HARNESS WIRING FOR SINGLE EXIT LOOP

SOLDERED CONNECTION

GRY
BRN
TWISTED

LOOP
3 TURNS
(FOR SINGLE LOOP)

SOLDERED CONNECTION

AGS OPERATOR TERMINALS

	AGS 900 AGS 1200	AGS 3000 AGS 2000 AGS 900 FS AGS 1200 FS	AGS 106 AGS 105
YLW	5	6	2
BLU	4	5	1
BLU	8	4	4

TO OPEN GATE
TO STOP/REVERSE GATE

WHT
BLK
TO 115 VAC

EARTH GROUND

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❶ Make sure that all power is OFF before doing any electrical connections. If this loop detector is being used as an open input device or "Exit Loop" connect the loop harness yellow and blue wires to the open input terminals of the gate operator. If this loop detector is being connected as a single loop safety device or "Safety Loop", connect the yellow and blue wires to the safety input terminals of the operator.
NOTE: The blue wire is a normally open contact. If an operator has input terminals that require a normally closed contacts, use the red loop harness wire in place of the blue.

❷ Connect the two wires from the single loop to the grey and brown wires of the loop harness as shown in the illustration at left. Solder both connections and cap them with wire nuts. Make sure that the brown and grey wires are twisted and that the wires from the loop are twisted. Failure to follow these guidelines may result in system malfunction.

❸ Before connecting the black and white wires of the loop detector harness to power, make sure that the main circuit breaker is OFF.
For 12 Volt DC detectors...
Connect the loop harness to 12 VDC as shown in the illustration at top left.
❍ Black to (+) postive
❍ White to (-) negative
❍ Green to Ground
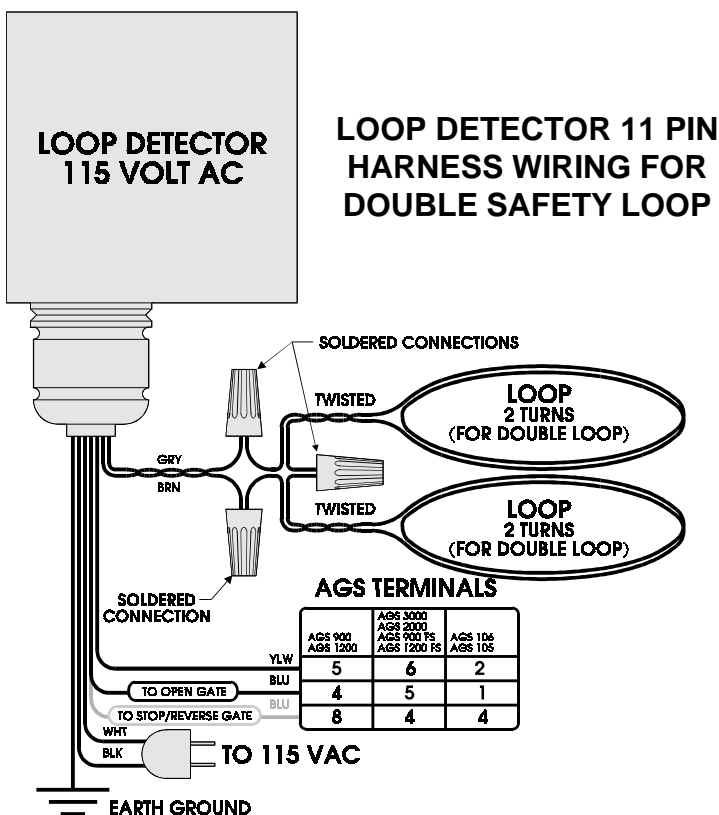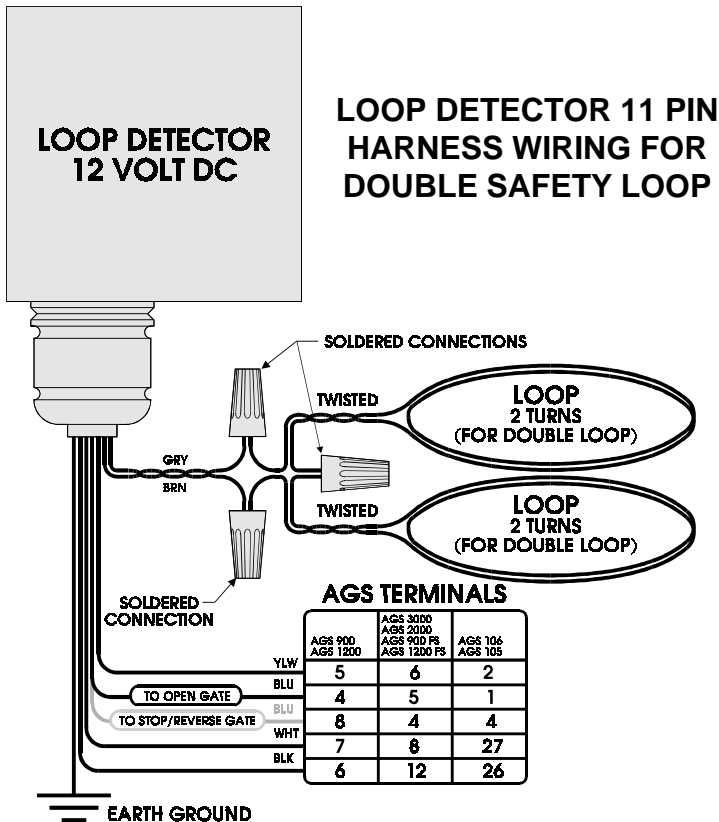**For 115 Volt AC detectors...**
Connect the loop harness to 120 VAC as shown in the illustration at bottom left.
❍ Black to Line
❍ White to Neutral
❍ Green to Ground

❹ To tune the loop detector refer to the instructions on the loop detector or to TUNING on page 8 of these instructions. See also the label on the detector for tuning and other relay contacts.

LOOP DETECTOR 12 VOLT DC

LOOP DETECTOR 11 PIN HARNESS WIRING FOR DOUBLE SAFETY LOOP

SOLDERED CONNECTIONS

TWISTED

LOOP
2 TURNS
(FOR DOUBLE LOOP)

GRY
BRN

TWISTED

LOOP
2 TURNS
(FOR DOUBLE LOOP)

SOLDERED
CONNECTION

AGS TERMINALS

	AGS 900 AGS 1200	AGS 3000 AGS 2000 AGS 900 FS AGS 1200 FS	AGS 106 AGS 105
YLW	5	6	2
BLU			
TO OPEN GATE — BLU	4	5	1
TO STOP/REVERSE GATE	8	4	4
WHT	7	8	27
BLK	6	12	26

EARTH GROUND

LOOP DETECTOR 115 VOLT AC

LOOP DETECTOR 11 PIN HARNESS WIRING FOR DOUBLE SAFETY LOOP

SOLDERED CONNECTIONS

TWISTED

LOOP
2 TURNS
(FOR DOUBLE LOOP)

GRY
BRN

TWISTED

LOOP
2 TURNS
(FOR DOUBLE LOOP)

SOLDERED
CONNECTION

AGS TERMINALS

	AGS 900 AGS 1200	AGS 3000 AGS 2000 AGS 900 FS AGS 1200 FS	AGS 106 AGS 105
YLW	5	6	2
BLU			
TO OPEN GATE — BLU	4	5	1
TO STOP/REVERSE GATE	8	4	4
WHT			
BLK			

TO 115 VAC

EARTH GROUND

❶ Make sure that all power is OFF before doing any electrical connections. If this loop detector is being connected as a double loop safety device or "Safety Loop", connect the yellow and blue wires to the safety input terminals of the operator. If this loop detector is being used as a double loop open input device or "Exit Loop" connect the loop harness yellow and blue wires to the open input terminals of the gate operator. NOTE: The blue wire is a normally open contact. If an operator has input terminals that require a normally closed contacts, use the red loop harness wire in place of the blue.

❷ Connect the 4 wires of the two loops to the grey and brown wires of the loop harness as shown in the illustration at left. Do this by connecting one wire from each loop together and then connecting the remaining two loop wires to the brown and grey loop harness wires. Solder all three connections and cap them with wire nuts. Make sure that the brown and grey wires are twisted and that the wires from the loop are also twisted. Failure to follow these guidelines may result in system malfunction.

❸ Before connecting the black and white wires of the loop detector harness to power, make sure that the main circuit breaker is OFF.
For 12 Volt DC detectors...
Connect the loop harness to 12 VDC as shown in the illustration at top left.
❍ Black to (+) postive
❍ White to (-) negative
❍ Green to Ground
For 115 Volt AC detectors...
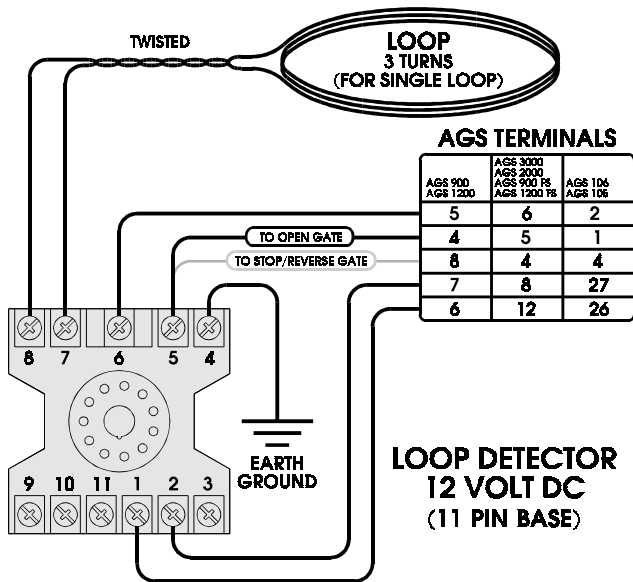Connect the loop harness to 120 VAC as shown in the illustration at bottom left.
❍ Black to Line
❍ White to Neutral
❍ Green to Ground

❹ To tune the loop detector, refer to the instructions on the loop detector or to TUNING on page 8 of these instructions. See also the label on the detector for tuning and other relay contacts.

Using Optional 11 Pin Detector Base

TWISTED

LOOP
3 TURNS
(FOR SINGLE LOOP)

AGS TERMINALS

AGS 900 AGS 1200	AGS 3000 AGS 2000 AGS 900 FS AGS 1200 FS	AGS 106 AGS 105
5	6	2
4	5	1
8	4	4
7	8	27
6	12	26

TO OPEN GATE

TO STOP/REVERSE GATE

8 7 6 5 4

9 10 11 1 2 3

EARTH GROUND

LOOP DETECTOR 12 VOLT DC
(11 PIN BASE)

625X

1) Set the frequency (FREQ). If there is only one detector being used, the frequency can be set to any one of the three settings "H" high, "M" medium or "L" low. If more than one detector is being used, set each detector different from the next. Examples:
a) single detector: Set frequency switch to "H"
b) two detectors: Set the switch on one detector to "H" and the other to "L"
c) three detectors: Set one detector freq to "H", another to "M" and the last one to "L"
2) Set the Sensitivity: This determines how large or how small the metal object must be in order for the detector to sense it. The possible settings are "H" high, "M" medium, "L" low. The "H" setting will typically detect smaller objects and higher vehicles. The "L" setting typically requires larger and closer objects. Set this switch so that the detector will detect a vehicle of representative size and height and so that the metal gate will not effect the detector. If more sensitivity is required, set switch one on the back of the detector to ON. This will double the sensitivity.
3) Set the Logic: This will determine what the detector does when it is activated by a car.
a) Pulse on entry: (Switch 3 OFF and Switch 2 OFF) This setting will make the detector activate for one second as soon as the vehicle approaches the loop.
b) Pulse on exit: (Switch 3 ON and Switch 2 OFF) This setting will make the loop detector activate for one second as soon as the vehicle has passed beyond the loop.
c) Presence: (Switch 3 OFF and Switch 2 ON) This setting will make the loop detector activate continuously as long as the vehicle remains on the loop. (This is the most common setting)
4) Initiate the Detector: After all the switches have been set, initialize the detector by pressing and holding the reset button for more that 3 seconds.

525AX

1) Set the frequency. If there is only one detector being used, the frequency can be set to any one of the four settings high, medium-high, medium-low, or low. If more than one detector is being used, set each detector different from the next. Examples:
a) single detector: Set frequency switches to F0 and F0
b) two detectors: Set the switches on one detector to F0 and F0, set the other detector to F1 and F0
c) three detectors: Set one detector freq to F0 and F0, another to F1 and F0, and the last one to F0 and F2
2) Set the Sensitivity: This determines how large or how small the metal object must be in order for the detector to sense it. The possible settings range from high to low to off and are controlled by switches 1, 2 and 3. The normal settings are switch 1 to 0, switch 2 to 2, and switch 3 to 4. For other settings, see the description label located on the loop detector.
3) Set the Logic: This will determine what the detector does when it is activated by a car.
a) Pulse on entry: (Set pulse switch to EN) This setting will make the detector activate for one second as soon as the vehicle approaches the loop.
b) Pulse on exit: (Set pulse switch to LV) This setting will make the loop detector activate for one second as soon as the vehicle has passed beyond the loop.
c) Presence: (Set PRES switch to HI) This setting will make the loop detector activate continuously as long as the vehicle remains on the loop. (This is the most common setting)
4) Initiate the Detector: After all the switches have been set, initialize the detector by pressing and holding the reset button for more that 3 seconds.

LD2000

1) Set the frequency (FREQ). If there is only one detector being used, the frequency can be set to any one of the three settings "H" high, "M" medium or "L" low. If more than one detector is being used, set each detector different from the next. Examples:
a) single detector: Set frequency switch to "H"
b) two detectors: Set the switch on one detector to "H" and the other to "L"
c) three detectors: Set one detector freq to "H", another to "M" and the last one to "L"
2) Initiate the Detector: After all the switches have been set, initialize the detector by pressing and holding the reset button for more that 3 seconds.
3) If sensitivity needs to be changed, there are switches located inside the detector for sensitivity and Fail Safe/Secure modes of operation. See instructions provided with the detector.