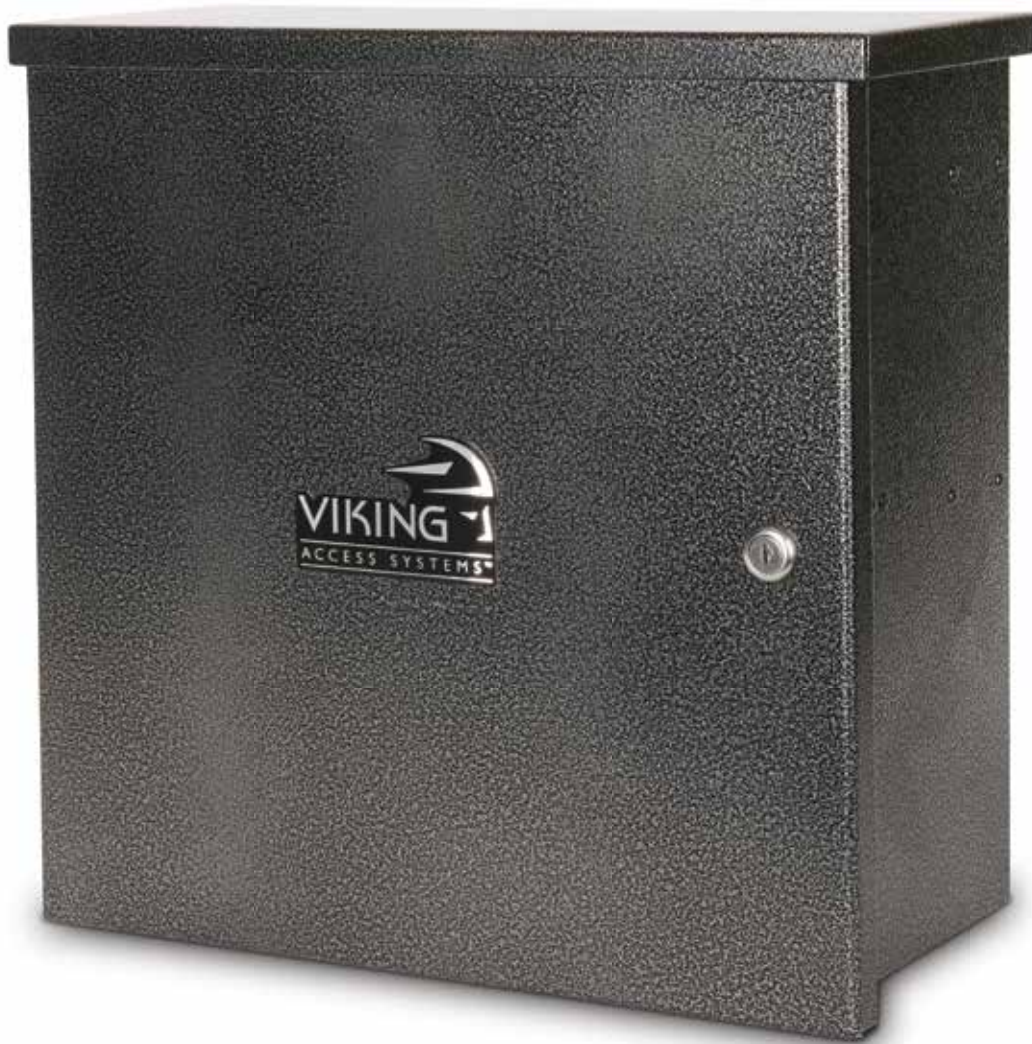




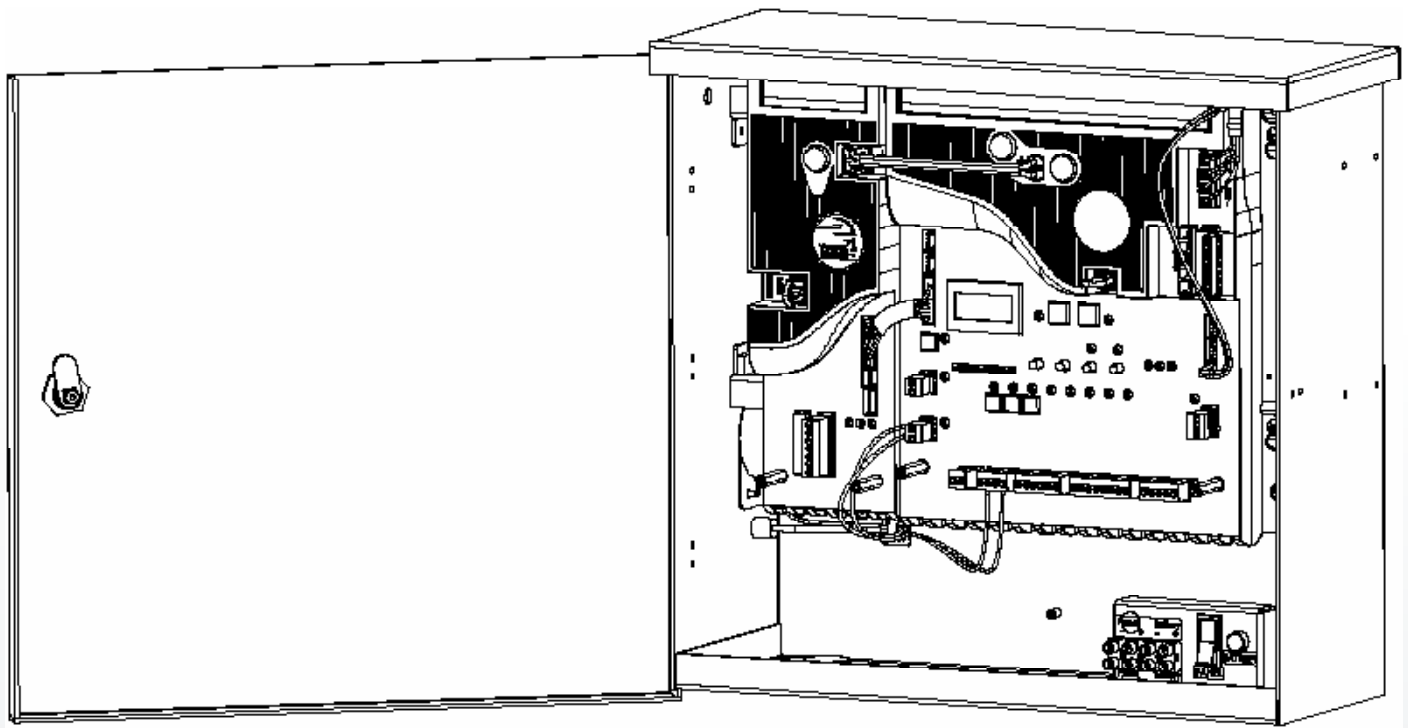
# INSTALLATION INSTRUCTIONS AND SAFETY INFORMATION

VIKING SOLAR SINGLE & MASTER/SLAVE ECU



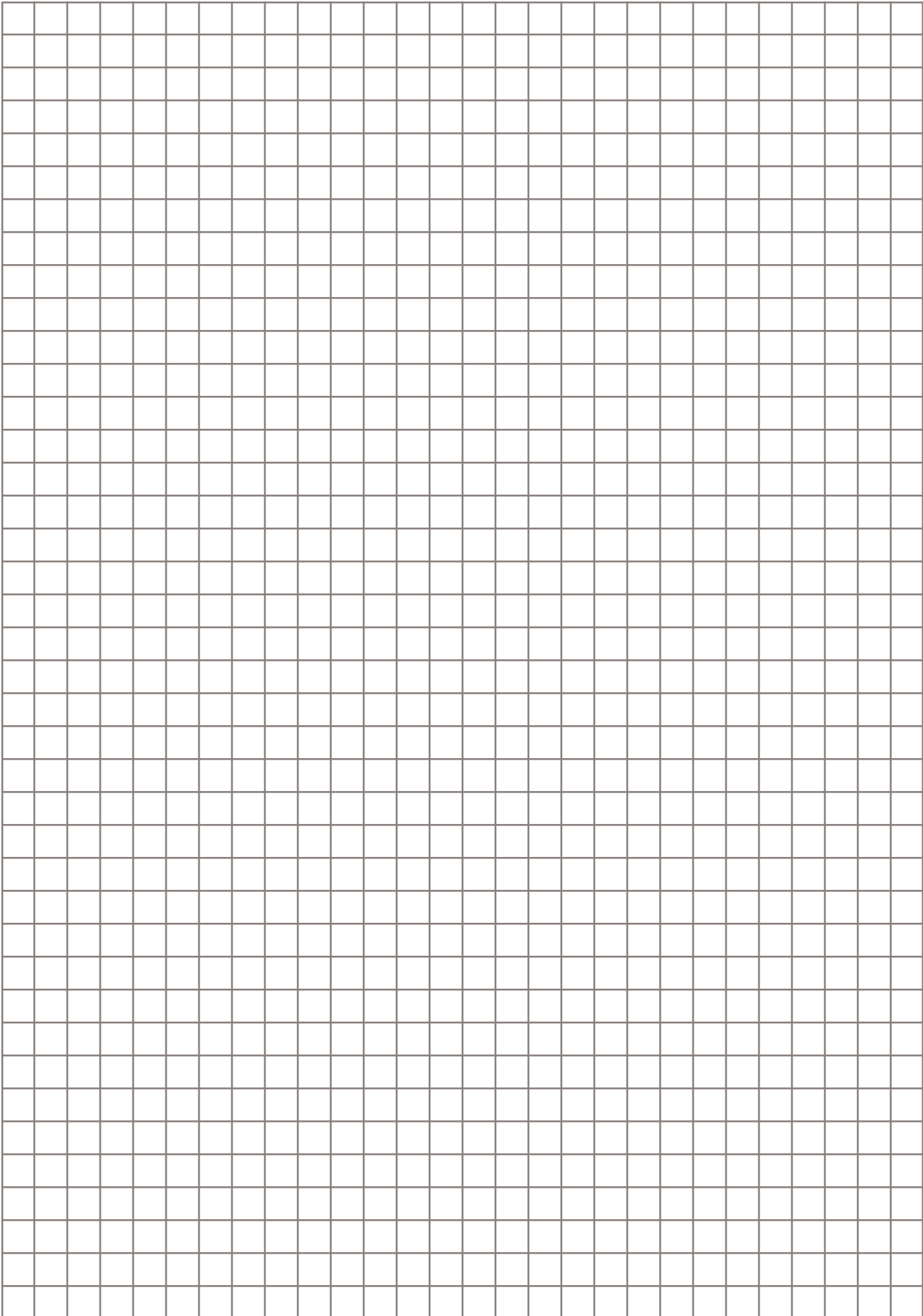
CLASS I  
**Residential Vehicular  
Swing Gate Control Unit**



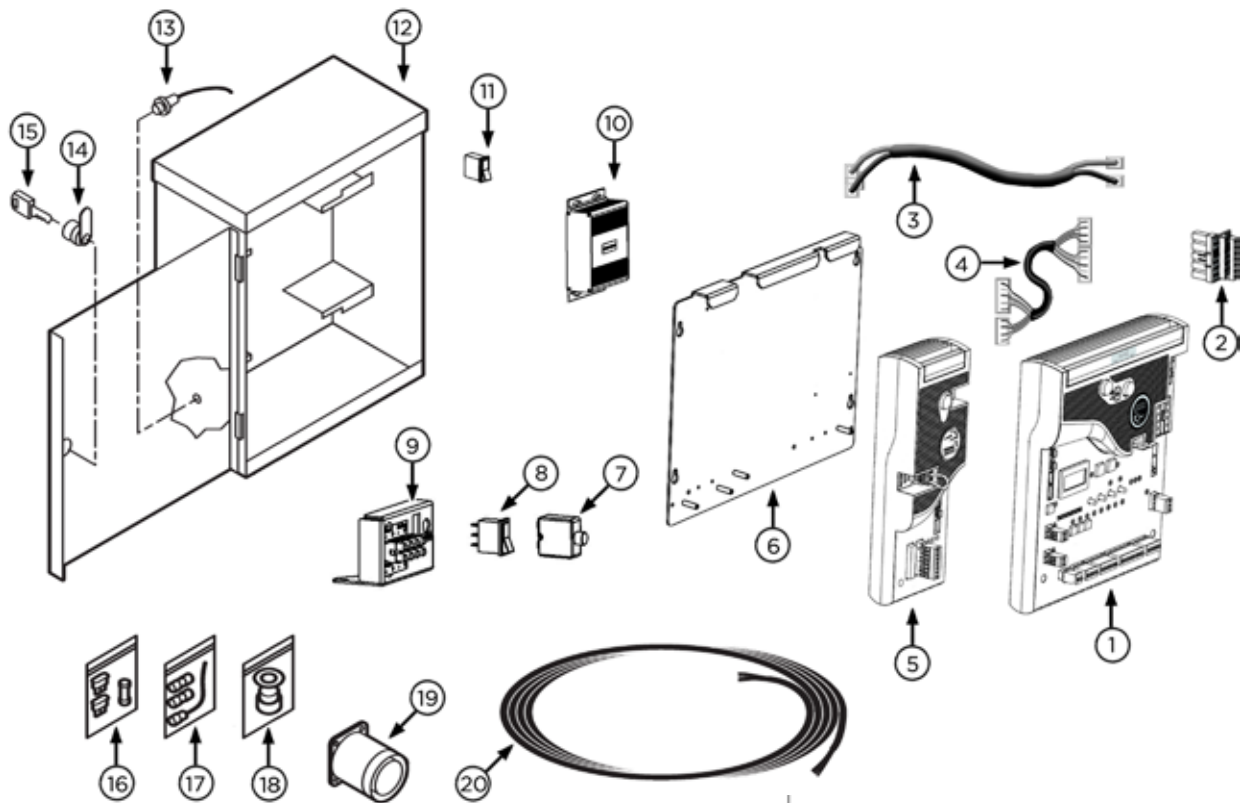


The Solar Electronic Control Unit “ECUS” is equipped with the most advance Solar VFlex controller and the intelligent Viking Solar Power Management Systems. The combination of the two, produces a very efficient gate operator capable to offer over 200 Cycles per day of operation with a 10W solar panel.

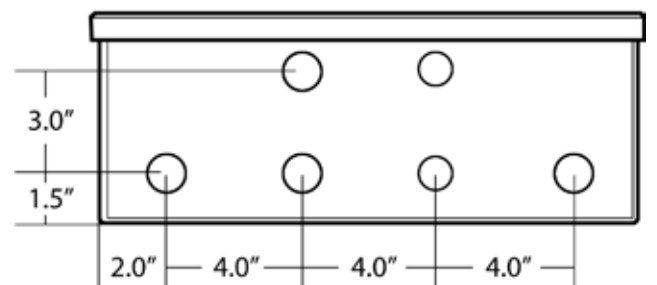
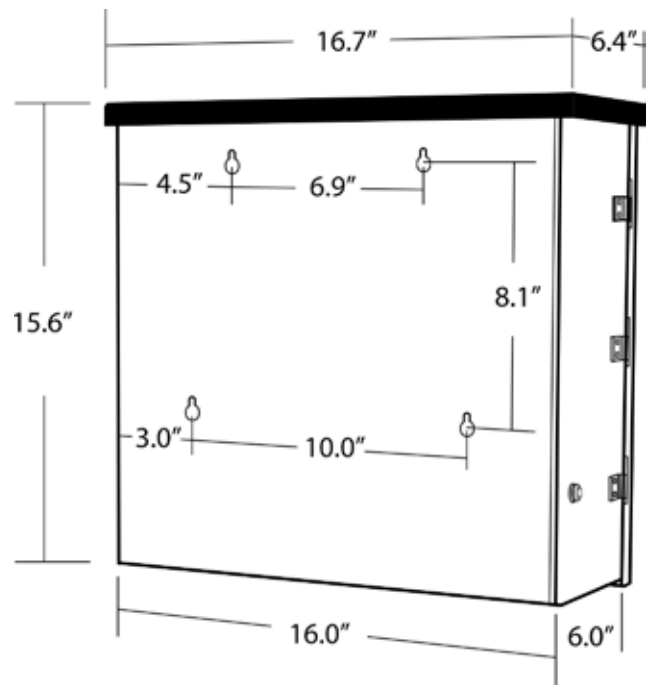
## THE VIKING ELECTRONIC CONTROL UNIT



# PARTS DIAGRAM:

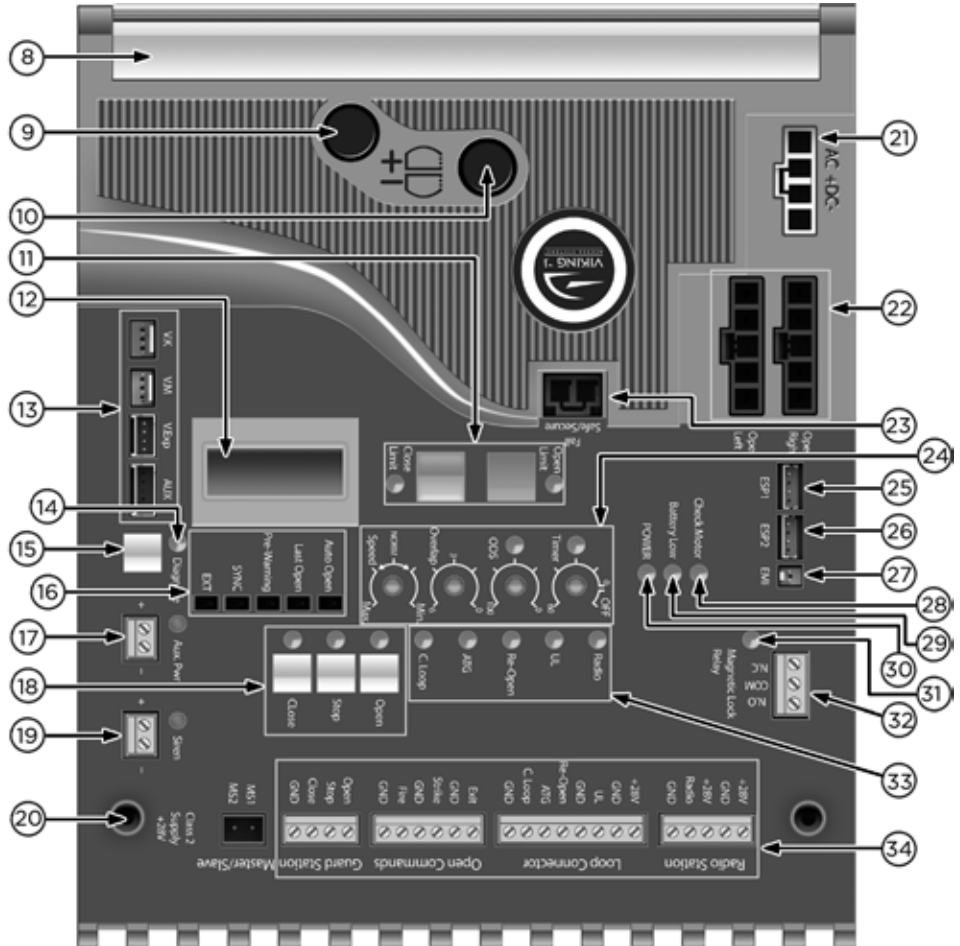
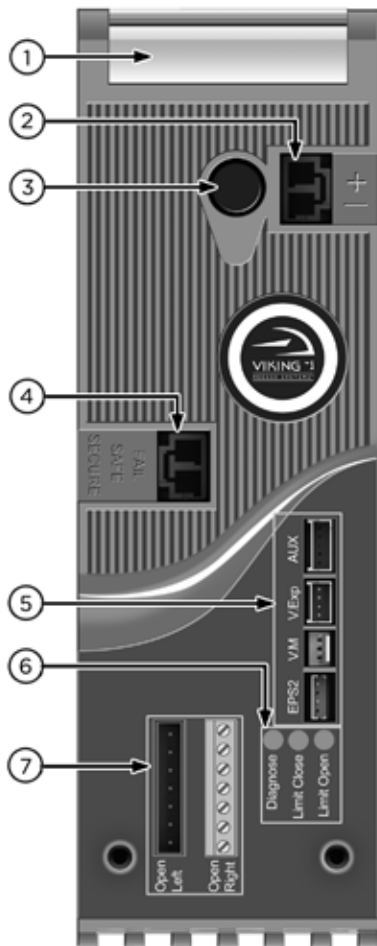


| Item | Description   | Part No.    |
|------|---|-------------|
| 1    | Solar Control Board                                   | VSPCB       |
| 2    | Motor Connector - Master                              | VEUCMCM     |
| 3    | Slave Power Harness <i>(Dual Controller only)</i>     | VECUSPH     |
| 4    | Master/Slave Comm Cable <i>(Dual Controller only)</i> | VECUMSC     |
| 5    | Slave Solar Module <i>(Dual Controller only)</i>      | VSSMPCB     |
| 6    | Board Mounting Plate                                  | VECUBMP     |
| 7    | Solar Battery Breaker                                 | VASBB25     |
| 8    | Solar Panel Switch                                    | DUMRS5      |
| 9    | Solar Terminal Block Assembly                         | VSTBAECU    |
| 10   | Solar Charger   | VSCHARGEUCU |
| 11   | Power Switch  | DUMRS10     |
| 12   | ECU Cabinet Chassis                                   | VNXCUBB     |
| 13   | Alarm Reset Switch                                    | ECURW       |
| 14   | ECU Key Cylinder & Key(s)                             | ECUKEYC20   |
| 15   | ECU Access Key  | ECUKEY20    |
| 16   | Fuse Kit  | DUFSK10     |
| 17   | Radio Antenna Kit                                     | VARAK       |
| 18   | Strain Relief (ECU)                                   | DH3/4NMCC   |
| 19   | Alarm   | DUAL10      |
| 20   | 6 Conductor Cable, 16 awg Shielded                    | VA-CB16     |



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# CONTROL BOARD REFERENCES:



1. HEAT SINK - SLAVE MODULE  
secures the control board and dissipates heat.
2. SLAVE MODULE POWER HARNESS CONNECTOR  
provides power to the Slave Module. pg 18
3. FUSE HOLDER - 15 AMP  
for the Slave motor circuit.
4. "FAIL SAFE/SECURE" Jumper - SLAVE MODULE  
power failure option. pg 21
5. M/S COMM CABLE CONNECTION - SLAVE MODULE  
for master/slave (dual) gate applications. pg 18
6. STATUS LEDs - SLAVE MODULE  
provides diagnostic information.
7. SLAVE MOTOR CONNECTION  
provides power to the Slave motor. pg 18
8. HEAT SINK - MASTER/SINGLE  
secures the control board and dissipates heat.
9. FUSE HOLDER - 4 AMP  
not applicable to this model.
10. FUSE HOLDER - 15 AMP  
for the Master motor circuit.
11. LIMIT SETUP BUTTONS  
available for future developments.
12. LCD DIAGNOSTICS DISPLAY  
provides error messages, diagnostics settings  
and operator status information. pg 34-36

13. M/S COMM CABLE CONNECTION - MASTER BOARD  
for master/slave (dual) gate applications. pg 18
14. "DIAGNOSE" LED  
informs that errors have been detected and  
available on LCD Display. pg 34-36
15. "DIAGNOSE" Button  
allows you to navigate through the  
Diagnostics LCD Display. pg 34-36
16. FEATURE ACTIVATION PIN HEADERS  
activate features by placing a jumper onto the  
pin headers. pg 21
17. "AUX. PWR" Terminal Block  
used for solar applications & in-motion  
warning devices. pg 16, 21
18. ON-BOARD 3 BUTTON STATION  
controls the gate during set up.
19. "Siren" TERMINAL BLOCK  
Vikings UL Siren is connected here. pg 12, 22
20. CONTROL BOARD MOUNTING HOLES  
secures and grounds the control board.
21. POWER HARNESS CONNECTOR  
provides power to the control board. pg 16
22. MASTER or SINGLE MOTOR CONNECTION  
provides power to the motor. pg 17
23. "FAIL SAFE/SECURE" Jumper  
power failure option. pg 21

24. FEATURE ACTIVATION TRIM POTS  
activate and set features. pg 20
25. "EPS1" CONNECTOR  
communication for Viking Solar Charger.
26. "EPS2" CONNECTOR  
available for future developments.
27. "EMI" CONNECTOR  
not applicable to this model.
28. "CHECK MOTOR" Status LED  
indicates motor power status. pg 32
29. "BATTERY LOW" Status LED  
indicates battery power status. pg 32
30. "POWER" Status LED  
control board power status. pg 32
31. "MAGNETIC LOCK Relay" Status LED  
status of this on-board relay. pg 32
32. "MAGNETIC LOCK Relay" Terminal Block  
connect electric locks here. pg 32
33. INPUT STATUS LEDs  
indicates input status. pg 32-33
34. ACCESS CONTROL TERMINAL BLOCKS  
accessory connections. pg 24-27, 38-40

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# IMPORTANT SAFETY INFORMATION

**⚠ WARNING! Not Following these instructions may cause severe injury or death.**

## IMPORTANT SAFETY INSTRUCTIONS

**⚠ WARNING! To reduce the risk of severe injury or death.**

1. READ AND FOLLOW ALL INSTRUCTIONS.
2. Never let children operate or play with gate controls. Keep the remote away from children.
3. Always keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.**
4. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or when an object activates the non-contact sensors. After adjusting the force or the limit travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the emergency release only when the gate is not moving.
6. **KEEP GATES PROPERLY MAINTAINED.** Read the user's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles only. Pedestrians must use a separate entrance.
8. **Every gate operator installation MUST have secondary protection devices against entrapment, such as edge sensors and photo beams more in particular in places where the risk of entrapment is more likely to occur.**
9. SAVE THESE INSTRUCTIONS.

## IMPORTANT INSTALLATION INSTRUCTIONS

1. Install the gate operator only when:
  - a. The operator is appropriate for the construction of the gate and usage Class of the gate (refer to page 9),
  - b. All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 6 feet (1.83 m) above the ground to prevent a 2-1/4 inch (57.2 mm) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position,
  - c. ALL EXPOSED PINCH POINTS ARE ELIMINATED OR GUARDED, AND
  - d. GUARDING IS SUPPLIED FOR EXPOSED ROLLERS.
2. The Operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come into contact with the vehicular gate during the entire path of travel of the vehicular gate.
3. The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not open in to the public access areas.
4. The gate must be properly installed and work freely in both directions prior to the installation of the gate operator. Do not over-tighten the operator clutch or pressure relief valve to compensate for a damaged gate.
5. The gate operator controls must be placed so that the user has full view of the gate area when the gate is moving **AND AWAY FROM THE GATE PATH PERIMETER.**



# IMPORTANT SAFETY INFORMATION

 **WARNING! Not Following these instructions may cause severe injury or death.**

## IMPORTANT INSTALLATION INSTRUCTIONS (Continued)

6. Controls intended for user activation must be located at least six feet (6') away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls.  
*Exception:* Emergency access controls only accessible by authorized personnel (i.e. fire, police, EMS) may be placed at any location in the line-of-sight of the gate.
7. The Stop and/or Reset button must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.
8. A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.
- 9. For gate operators using non-contact sensors (Photo Beams or like) in accordance with section 31.1.1 of the UL standard:**
  - a. See instructions on the placement of non-contact sensors for each type of application (refer to page 10).
  - b. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle, trips the sensor while the gate is still moving, and
  - c. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier (refer to page 10).
  - d. Use only Omron E3K-R10K4 photoelectric eye to comply with UL 325
- 10. For a gate operator utilizing a contact sensor (Edge sensor or like) in accordance with section 31.1.1 of the UL 325 standard:**
  - a. One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as a the leading edge, trailing edge, and post mounted both inside and outside of a vehicular horizontal slide gate.
  - b. One or more contact sensors shall be located at the bottom of a vehicular vertical lift gate.
  - c. One or more contact sensors shall be located at the pinch point of a vehicular vertical pivot gate.
  - d. A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subject to mechanical damage.
  - e. A wireless contact sensor such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstructions. A wireless contact sensor shall function under the intended end-use conditions.
  - f. One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6 inches (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located at the bottom edge (refer to page 11).
  - g. One or more contact sensors shall be located at the bottom edge of a vertical barrier (arm).
  - h. Only Use Miller Edge Model MGR20 or MGS20 edge sensor to comply with UL325.

# IMPORTANT SAFETY INFORMATION

 **WARNING! Not Following these instructions may cause severe injury or death.**

## MAINTENANCE

Remove the Power Harness from the Control Board. (refer to page 16)

- Clean and lubricate the turning pins and gate hinges using the recommended lubricant.
- Check that all mounting hardware of the gate operator is properly tighten.
- Ensure that the gate moves freely.
- Check for corroded parts and replace if necessary.
- Check the battery for the following:
  - Battery connections must be free of corrosion.
  - Battery voltage must be 13VDC (fully charged battery).

Reconnect the Power Harness for the Control Board. (refer to page 16)

- Check and confirm the proper operation of all safety devices (photoelectric eye, edge sensors or like).
- Check and confirm the operation of all installed accessories.
- Check and confirm the operation of all special features such as the Intelligent Obstruction Sensor, Hold Open Timer. (refer to page 20 and 22)
- Check and confirm the operation of the manual release.

## GENERAL SAFETY PRECAUTIONS

The following precautions are an integral and essential part of the product and must be supplied to the user. Read them carefully as they contain important indications for the safe installation, use and maintenance.

- These instruction must be kept and forwarded to all possible future users of the system.
- This product must be used only for that which it has been expressly designed.
- Any other use is to be considered improper and therefore dangerous.
- The manufacturer cannot be held responsible for possible damage caused by improper, erroneous or unreasonable use.
- Avoid operating in the proximity of the hinges or moving mechanical parts.
- Do not enter the path of the moving gate while in motion.
- Do not obstruct the motion of the gate as this may cause a situation of danger.
- Do not allow children to play or stay within the path of the moving gate.
- Keep remote control or any other control devices out of the reach of children, in order to avoid possible involuntary activation of the gate operator.
- In case of break down or malfunctioning of the product, disconnect from the main power source. Do not attempt to repair or intervene directly, contact only qualified personnel for repair.
- Failure to comply with the above may create a situation of danger.
- All cleaning, maintenance or repair work must be carried out by qualified personnel.
- In order to guarantee that the system works efficiently and correctly it is important to have the manufacturer's instructions on maintenance of the gate and operator carried out by qualified personnel.
- In particular, regular checks are recommended in order to verify that the safety devices are operating correctly.

**All installation, maintenance and repair work must be documented and made available to the user.**

# IMPORTANT SAFETY INFORMATION

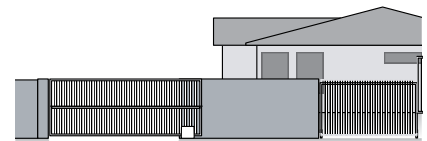
**⚠ CAUTION: To Reduce the Risk of Fire or Injury to Persons:**

## UL325 Gate Operator Classifications

### GLOSSARY

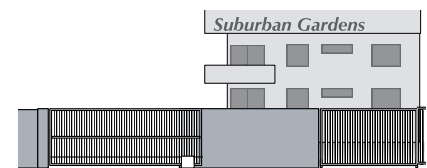
#### RESIDENTIAL VEHICULAR GATE OPERATOR

**CLASS I** - A vehicular gate operator (or system) intended for use in garages or parking areas associated with a residence of one-to four single families.



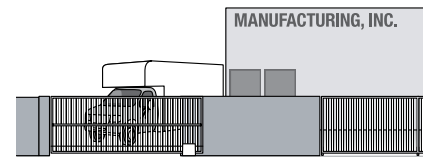
#### COMMERCIAL/GENERAL ACCESS VEHICULAR GATE OPERATOR

**CLASS II** - A vehicular gate operator (or system) intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units), hotel, garages, retail store, or other building servicing the general public.



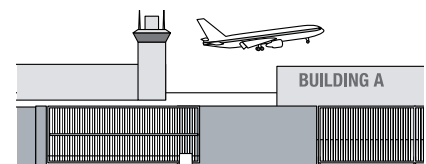
#### INDUSTRIAL/LIMITED ACCESS VEHICULAR GATE OPERATOR

**CLASS III** - A vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not accessible by or intended to service the general public.



#### RESTRICTED ACCESS VEHICULAR GATE OPERATOR

**CLASS IV** - A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.



#### Install the gate operator only when:

The operator is appropriate for the construction of the gate and the Usage Class of the gate.

# IMPORTANT SAFETY INFORMATION

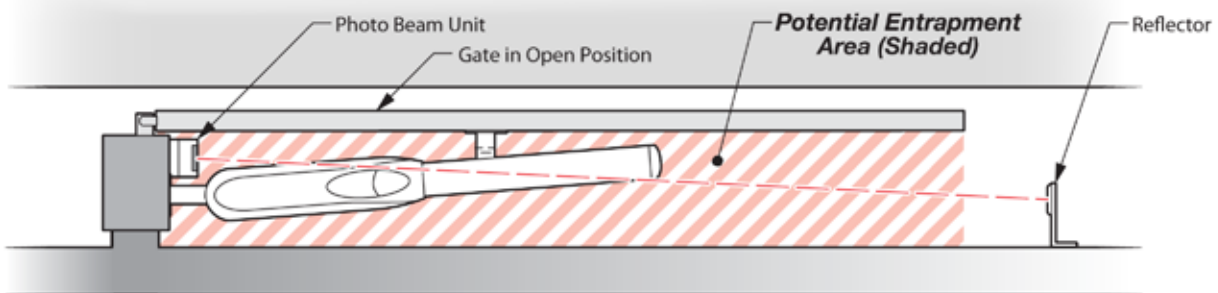
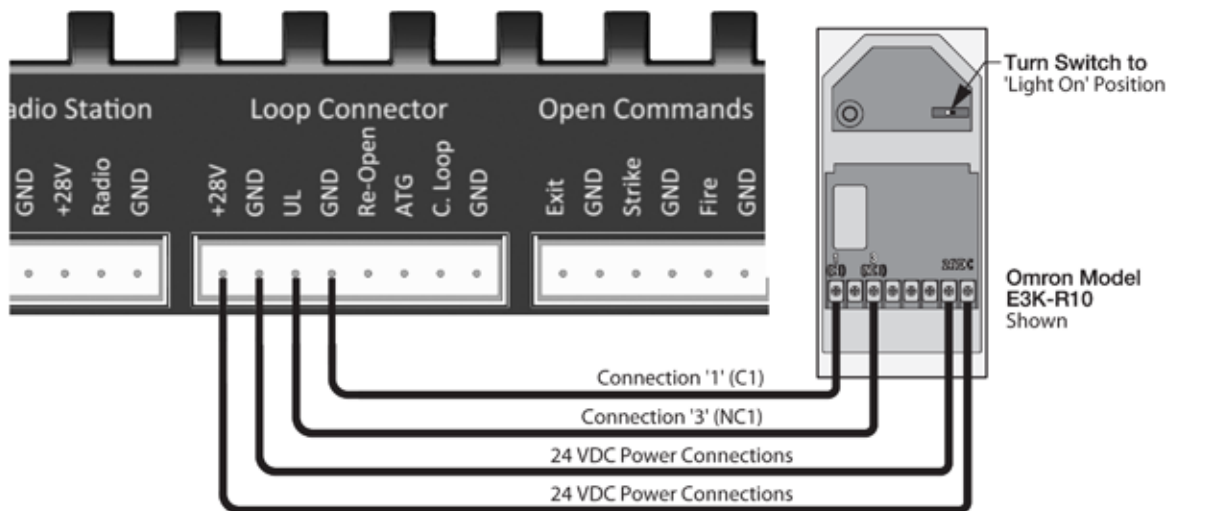
**⚠ WARNING! Not Following these instructions may cause severe injury or death.**

**NOTE:** This type on installation DOES NOT reverse the gate all the way back to its limits when the photo beam is obstructed. This installation is only to protect against entrapment and to comply with UL325.

## Secondary Entrapment Protection

### Photo Beam (non-contact sensor) Installation

- **Photo beams or like must be installed to reduce the risk of entrapment.**
- Use only Omron E3K-R10K4 photoelectric eye to comply with UL325
- Make the electrical connections of the photoelectric sensor as described here in this page.
- Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle, trips the sensor while the gate is still moving, and;
- One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.



Consult the installation manual for the UL325 device (photo beam or like) for detail information about the usage, installation and maintenance.

# IMPORTANT SAFETY INFORMATION

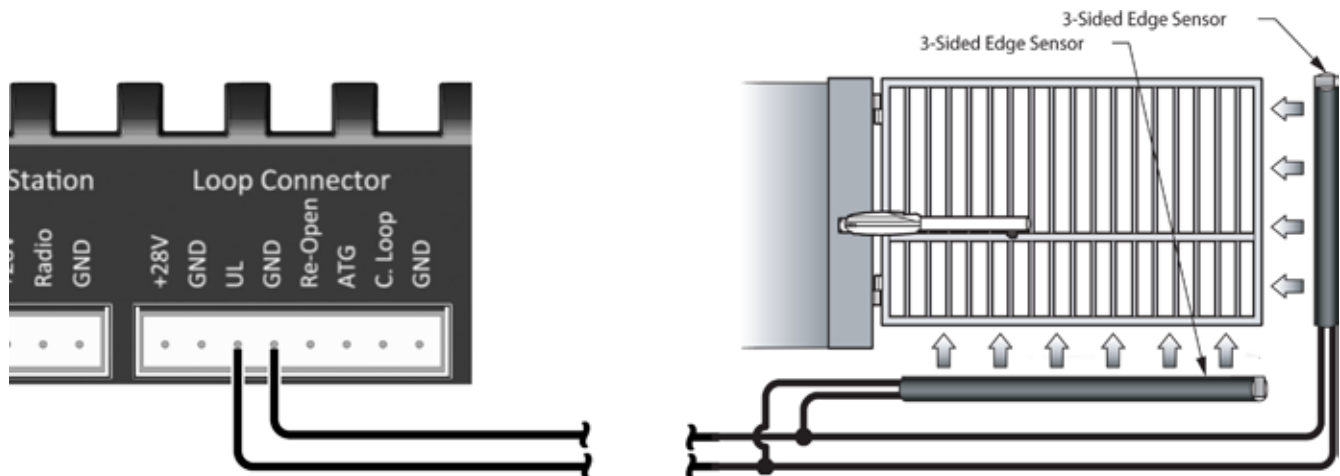
**⚠ WARNING! Not Following these instructions may cause severe injury or death.**

**NOTE:** This type on installation DOES NOT reverse the gate all the way back to its limits when the edge sensor is obstructed. This installation is only to protect against entrapment and to comply with UL325.

## Secondary Entrapment Protection

### Edge Sensor (contact sensor) Installation

- **Edge Sensors or like must be installed to reduce the risk of entrapment.**
- Use only Miller Edge 3-sided activation type MGR20 or MGS20 to comply with UL325.
- One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6 inches (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.
  1. A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subjected to mechanical damage.
  2. A wireless contact sensor such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.



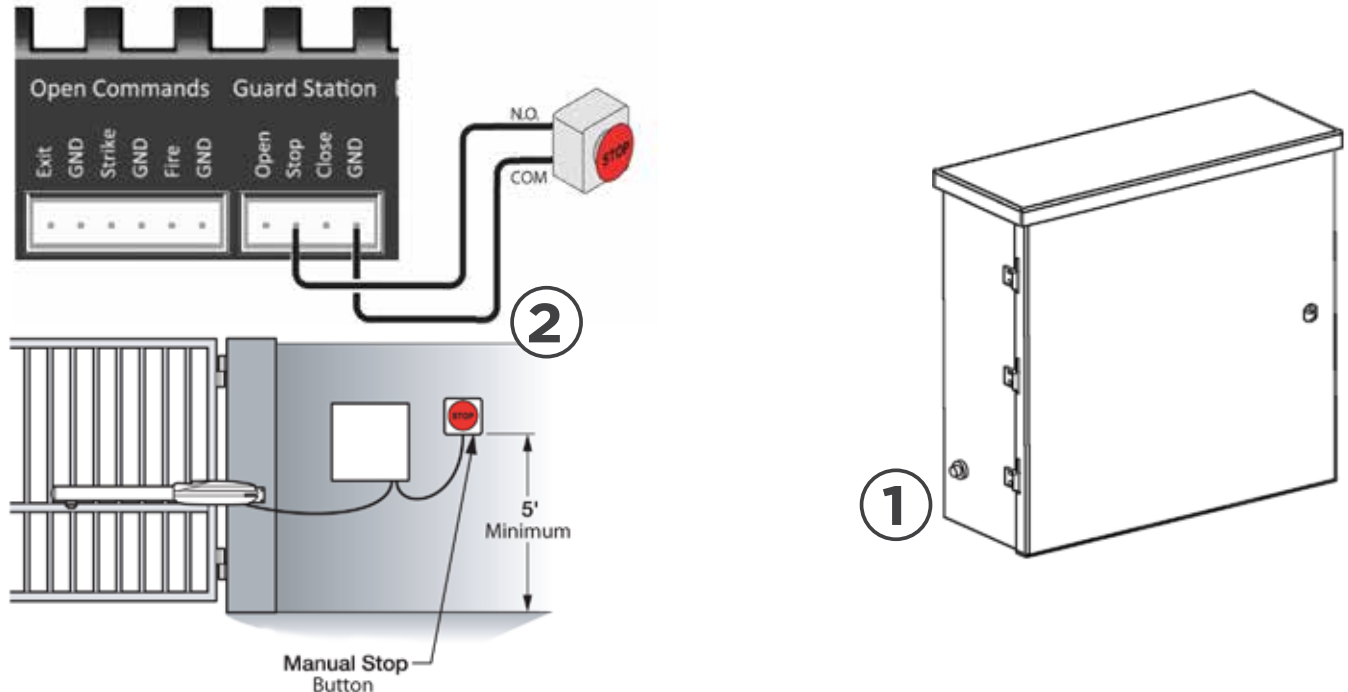
# IMPORTANT SAFETY INFORMATION

**⚠ WARNING! Not Following these instructions may cause severe injury or death.**

## Audible Alarm Reset Switch Installation

### Manual Reset for the Audible Alarm

- UL325 standard requires an audible alarm to sound after two consecutive events detected by the primary entrapment protection of the gate operator (obstruction sensor).
- The audible alarm will continue to sound for 5 minutes or until a stop command gets actuated.
- The Stop command can be actuated in three different forms:
  1. Using the Built in Stop switch on the Control Board; or
  2. Using an External Stop button within the sight of the gate, away from moving parts of the gate and out of reach of children.
    - a. Controls intended for user activation must be located at least six feet (6') away from any moving part of the gate and where the user is prevented from reaching over, under, around, or through the gate to operate the controls. Outdoor or easily accessible controls shall have a security feature to prevent unauthorized use.
    - b. The Stop and/or Reset button must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.
  3. Using the Reset Button on the Electronic Control Unit that is externally accessible on the left side of the cabinet.



## Warning Placard Installation

- All Warning Placards must be installed where visible in the area of the gate.
- A minimum of two placards shall be installed.
- A placard is to be installed in the area of each side of the gate and be visible.



# IMPORTANT INSTALLATION INFORMATION

**⚠ WARNING: DO NOT allow pedestrian use of this gate.**

## Locate Control Buttons:

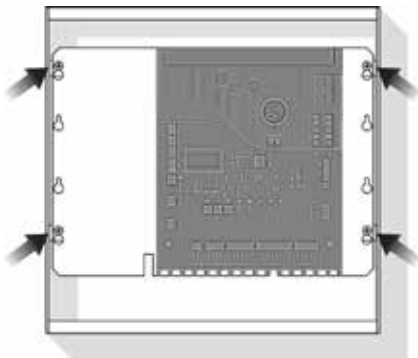
1. Within sight of the gate,
2. At a minimum height of 5 feet so small children are not able to reach it; and
3. At least 6 feet away from all moving parts of the gate.



## ECU Box Installation

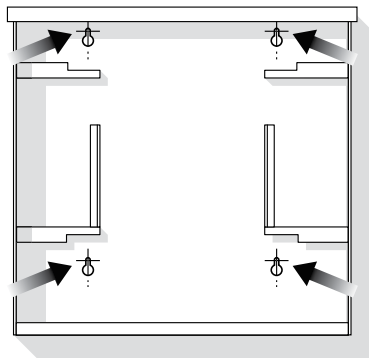
### STEP 1

Disconnect the Siren, Stop Button and EMI Harness from the Control Board. Remove the Control Board Mounting Plate. The plate is held in the box by four screws.



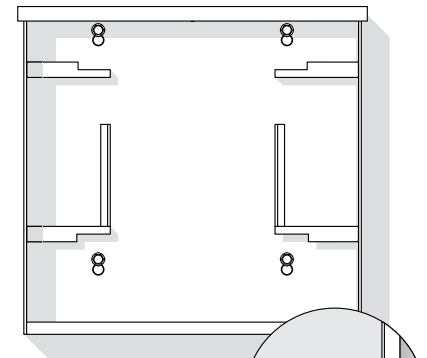
### STEP 2

Position the ECU Box in the desired place and mark the mounting holes. Prepare the holes to receive the anchors/fasteners. NOTE: Anchors are Not Supplied.

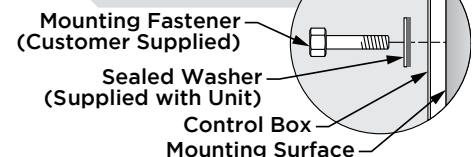


### STEP 3

Position the ECU Box and secure it to the mounting surface using the Sealed Washers provided (rubber side of the washers against the inside of the control box).



**⚠ WARNING: If the control box is not mounted properly it may fall, causing damage and/or injury. The Electronic Control Unit (ECU) weight is approximately 40 lbs. Be sure that the substrate being mounted to and the fasteners being used are appropriate to support the weight of the control box.**





# ELECTRICAL INSTALLATION

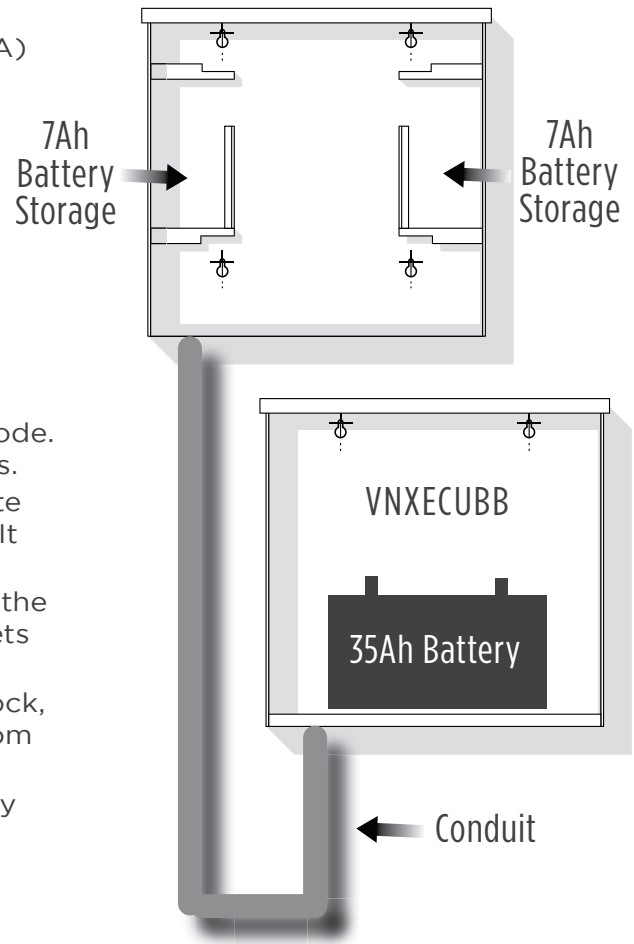
SAVE THESE INSTRUCTIONS - This manual contains important instructions for the ECUs model gate operator that shall be followed during installation and maintenance of the charge controller.

## Battery Selection

- Battery is sold separately.
- Use only UL recognized 12V Sealed Lead Acid (SLA)
- 35Ah Maximum battery capacity.

## Battery Care and Location

- Use at least 12AWG wire, rated 90°C or better.
- Two 7Ah batteries can be stored within the ECU's battery compartments.
- **Alternatively**, a 35Ah battery can be stored in a sperate BOX such as Viking part# VNxECUBB
- Ensure the battery terminals will maintain a 1/4" spacing from all other circuits and metal parts.
- Do not dispose of the battery in fire. The cells may explode. Check with local codes for possible disposal instructions.
- Do not open or mutilate the battery. Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.
- Exercise care in handling batteries in order not to short the battery with conducting materials such as rings, bracelets and keys.
- CAUTION - A battery can present a risk of electrical shock, burn from high short circuit current, fire or explosion from vented gasses. Observe proper precautions.
- Observe proper polarity orientation between the battery and charging circuit.



## Solar Panel Selection

- Solar panel(s) are sold separately.
- Use only UL Listed 12V solar panel(s), such as Viking part #s:

| Wattage  | Viking Part# | Open-Circuit Voltage | Short-Circuit Current |
|----------|--------------|----------------------|-----------------------|
| 20 Watts | VA-SO20W     | 21.7V                | 1.25A                 |
| 40 Watts | VA-SO40W     | 21.8V                | 2.57A                 |

## Ratings

|                              |      |  |
|------------------------------|------|--|
| System Voltage:              | 12V  |  |
| Max. Solar Wattage:          | 40W  |  |
| Max. Solar Voltage:          | 29V  |  |
| Max. Battery Capacity:       | 35Ah |  |
| Min. Battery Voltage:        | 8V   |  |
| Max. Charger Load Current:   | 3A   |  |
| Output Voltage for Controls: | 24V  | This is the voltage the control board will provide |

**⚠ Important:** The number of cycles achieved daily is dependent on many factors, including current draw of the motor and accessories, and local solar radiation data. **If more specific information is needed please consult with Viking Access Systems. For more information regarding solar energy refer to: <http://rredc.nrel.gov/solar/pubs/redbook/>**

# ELECTRICAL INSTALLATION

## Solar Panel Care and Location

- Where it will receive maximum sunlight throughout the year.
- Avoid trees and buildings or obstructions, which could cast shadows on the panel.
- South facing and tilted at an inclined angle that is equal to latitude.
- If dirt build-up becomes excessive, clean the glass with a soft cloth using a mild detergent and water.
- Install solar panels in the following conditions:
  - Operating temperature: -40°F to 185°F
  - Humidity: Below 85RH%
  - Wind pressure: Below 50.12lb / ft<sup>2</sup> (2400Pa)
  - Snow load pressure: Below 112.76lb / ft<sup>2</sup> (5400Pa)
- DO NOT install the solar panel near open flames or flammable materials.
- DO NOT install the solar panel where there is a risk of being immersed in water or continually exposed to water from a sprinkle, fountain, etc..

## Solar Panel Safety Precautions

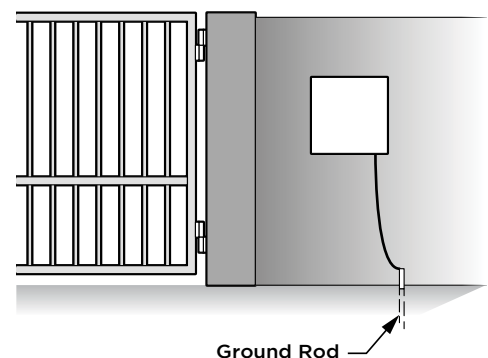
- ⚠ Installation must be performed by a qualified technician.
- Before installing your system, contact local authorities and determine the necessary permit, installation and inspection requirements.
- Follow all local codes and guidelines.
- To reduce the risk of electrical shock or burns, the solar panel must be covered with an opaque material during installation.
- Do not touch live terminals with bare hands as they can present a risk of electrical shock, burn or fire.

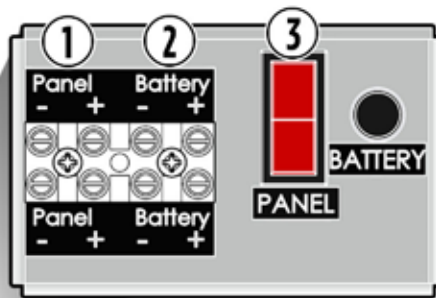
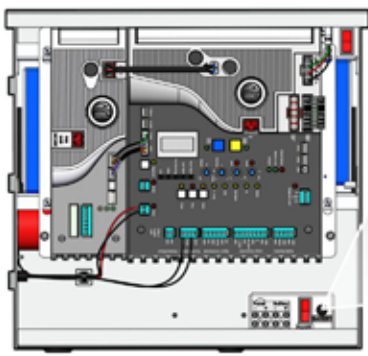
## Solar Panel Installation (per article 690 of ANSI/NFPA 70)

- Use appropriate methods to mount the solar panel. Fall of the panel from high places will cause death, injury or damage.
- The solar panel must be mounted on a post with a supporting structure to support wind and snow loads rated for use by the appropriate local or civil codes.
- Use stainless steel washers between the panel and the supporting frame to prevent electrolysis corrosion.
- Use conduit and the appropriate wire type for outdoor applications.
- Properly ground solar panel and operator according to NEC code.
- Use the appropriate wire size according to distance and the maximum power (Watt) rating of the solar panel, or panels combined.
- Use at least 16 AWG photovoltaic cable or 90°C, sunlight and moisture resistant direct burial cable or better.
- WARNING - This charge controller must be used with an external GFDI device as required by article 690 of the National Electric Code for the installation location.

### Tips for proper ground installation:

- Use a ground rod to provide a ground reference.
- Consult your city code and be aware of under-ground services in the site of the gate operator to prevent inconveniences.
- Always use a single bonding point for grounding.
- All ground wires must be as short and as thick as possible.
- Prevent unnecessary turns or loops in all ground wires.





## Power Connections

**⚠ Caution: Ensure correct polarity**

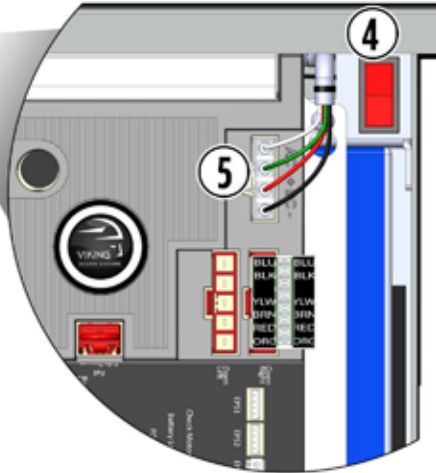
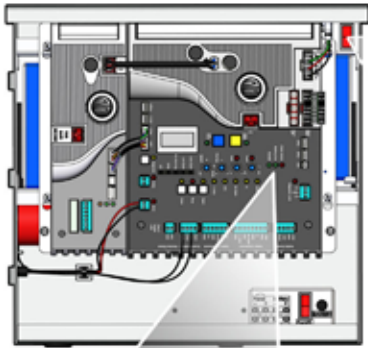
**Step 1:** Connect the 12V Solar Panel to the terminals labeled "PANEL". ①

**Step 2:** Connect the 12V Battery to the terminals labeled "Battery". ②

**Step 3:** Turn the "PANEL" switch to the "RESET" position. ③

**Step 4:** Turn the "POWER" Switch to the "RESET" position. ④

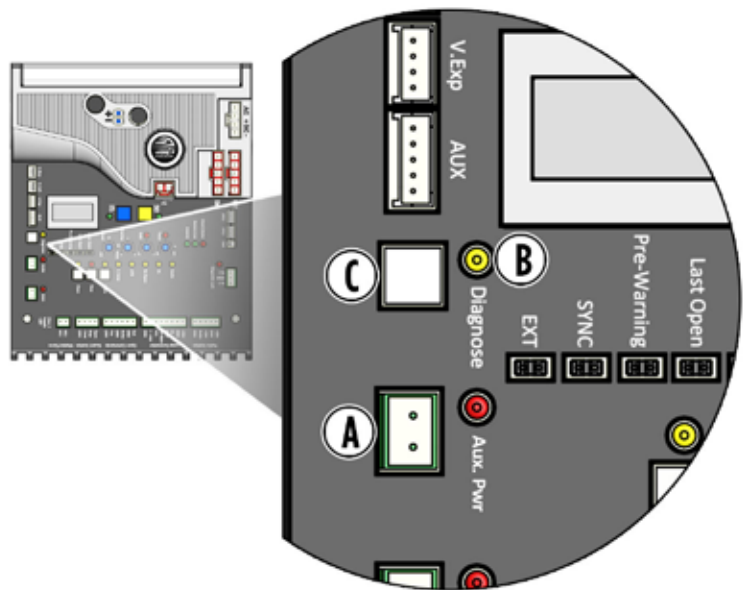
**Step 5:** Connect the Power Harness ⑤ and verify the "POWER" indicator ⑤a is illuminated solid.



## Power Saving Tip:

The solar VFlex "control board" shuts down the power at the "Aux. Pwr" Terminal ① when the board is in sleep mode.

To save energy, get the power for your non-essential devices (such as photo beams) from this terminal.



## LCD Display References

### Solar Related Error Messages

|                    |   |
|--------------------|---|
| ERR PANEL LOW      | Indicates that the voltage being provided from the solar panel is too low.  |
| ERR PANEL HIGH     | Indicates that the voltage being provided from the solar panel is too High. |
| ERR SOLAR NO PANEL | Indicates that there is no voltage being provided from the solar panel.     |
| ERR NO SOL UNIT    | Solar board can't detect a solar gate operator.                             |
| ERR CHRG HIGH      | Potential problem with the Solar Charger.                                   |
| ERR BAT LOW        | The battery is low  |

### Diagnostics steps

If errors are detected the "Diagnose" indicator ① starts flashing.

Error messages will display automatically, otherwise press and release the "Diagnose" button ② until the error messages appear.

# ELECTRICAL INSTALLATION

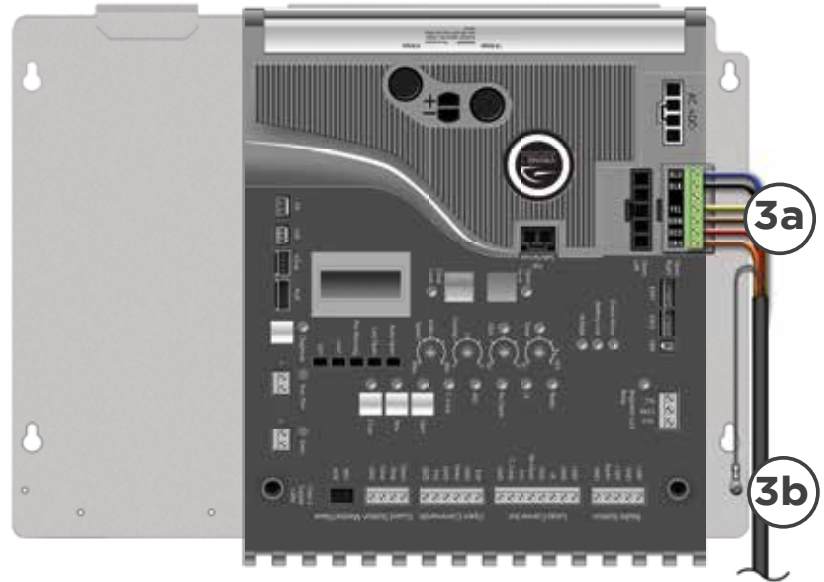
## Motor Cable - Master (Single)

**NOTE:** The Single Electronic Control Unit (VA-ECUSNX) is equipped to operate a single gate motor only, and does not include a Slave Module. The steps described on page 18 do not apply for this type of application.

### STEP 3

#### Master Motor:

- Connect motor cable to the Motor Connector at the Master Control Board as illustrated, according to the printed color code.



### STEP 4

#### Master Open Left or Open Right:

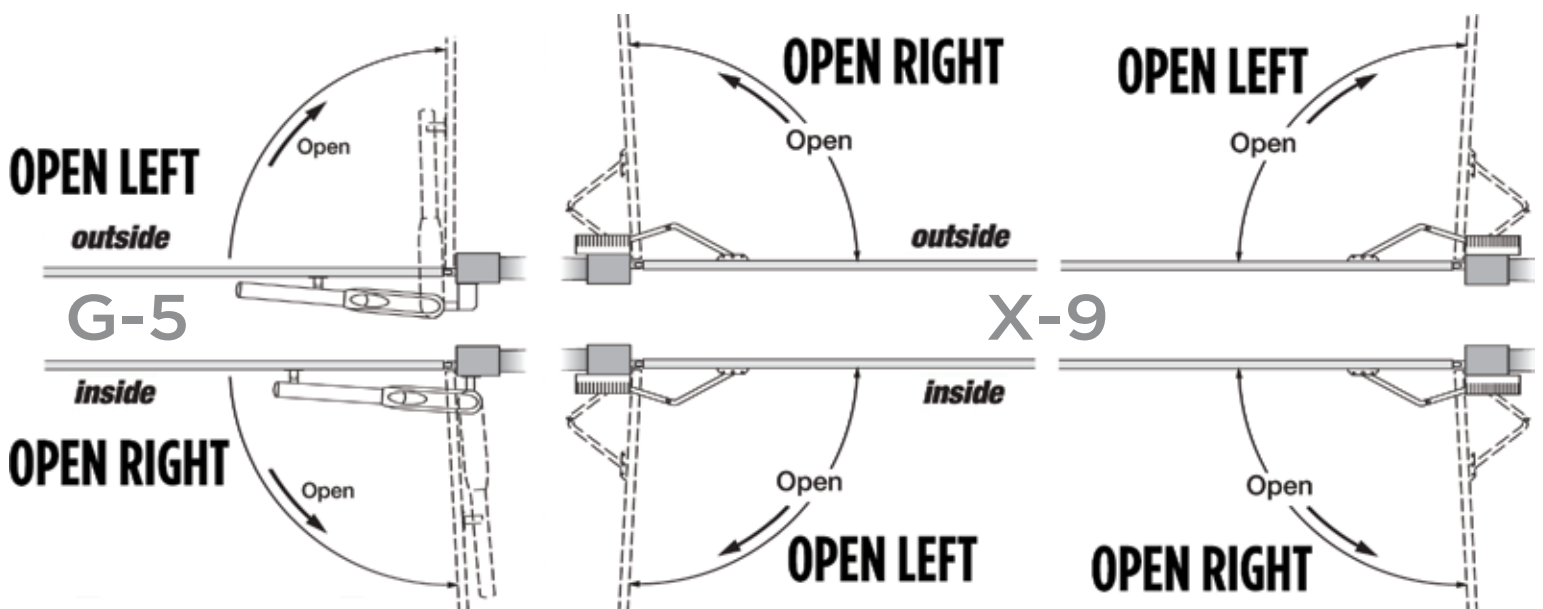
Place the terminal block in the proper location for the gate opening direction.

#### For G-5 operator

- “OPEN RIGHT” Connector if the gate opens to the **INSIDE (pull to open)**.
- “OPEN LEFT” Connector if the gate opens to the **OUTSIDE (push to open)**.

#### For X-9 operator

- “OPEN RIGHT” Connector if the gate opens **Inside to the Right** or **Outside to the Left**.
- “OPEN LEFT” Connector if the gate opens **Inside to the Left** or **Outside to the Right**.



# ELECTRICAL INSTALLATION

## Motor Cable - Slave (Dual)

**NOTE:** The Master/Slave, or Dual, Electronic Control Unit (VA-ECUMSNX) is equipped with both the VFlex Control Board (Master) and a Slave Module, both are required to operate two gate motors in tandem.

### STEP 5

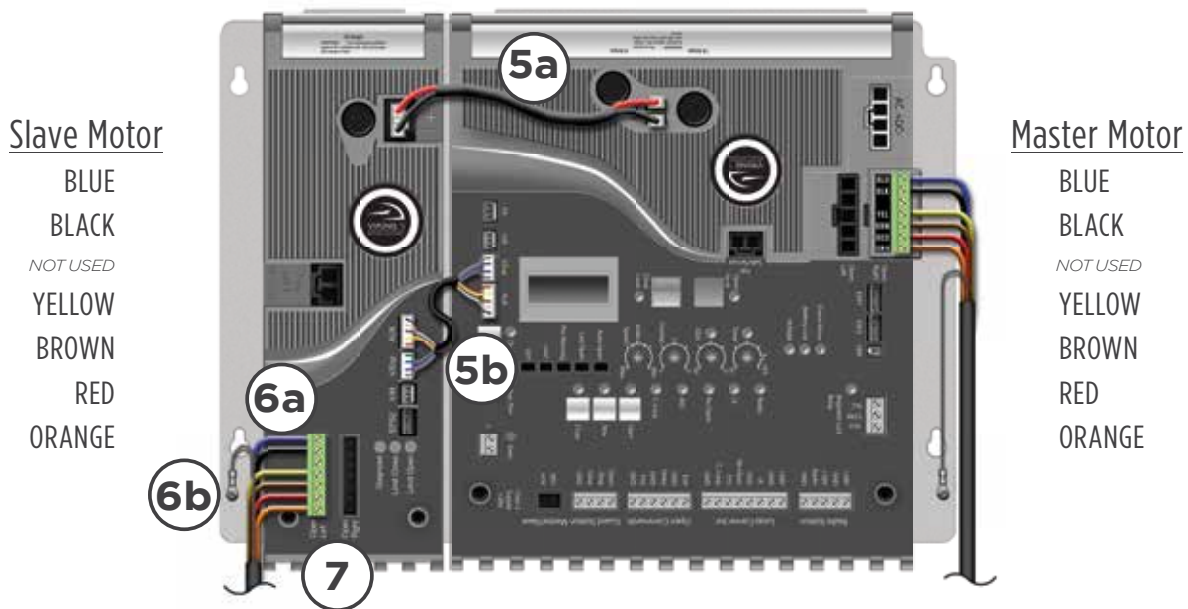
#### Slave to Master Connections:

- Ensure that the Slave Power Harness is connected as illustrated. Polarity is important!  
**Red to “+” Black to “-”**
- Ensure that the Master/Slave Communication Cable is connected as illustrated.

### STEP 6

#### Slave Motor:

- Connect motor cable to the terminal block at the Slave Module as illustrated, according to the color code provided.
- Attach the grounding wire (non insulated) to the Board Mounting Plate using the screw provided.



### STEP 7

**Slave Open Left or Open Right:** Refer to the illustration on page 17.

Place the terminal block in the proper location for the gate opening direction.

#### For G-5 operator

- “OPEN RIGHT” Connector if the gate opens to the INSIDE (**pull to open**).
- “OPEN LEFT” Connector if the gate opens to the OUTSIDE (**push to open**).

#### For X-9 operator

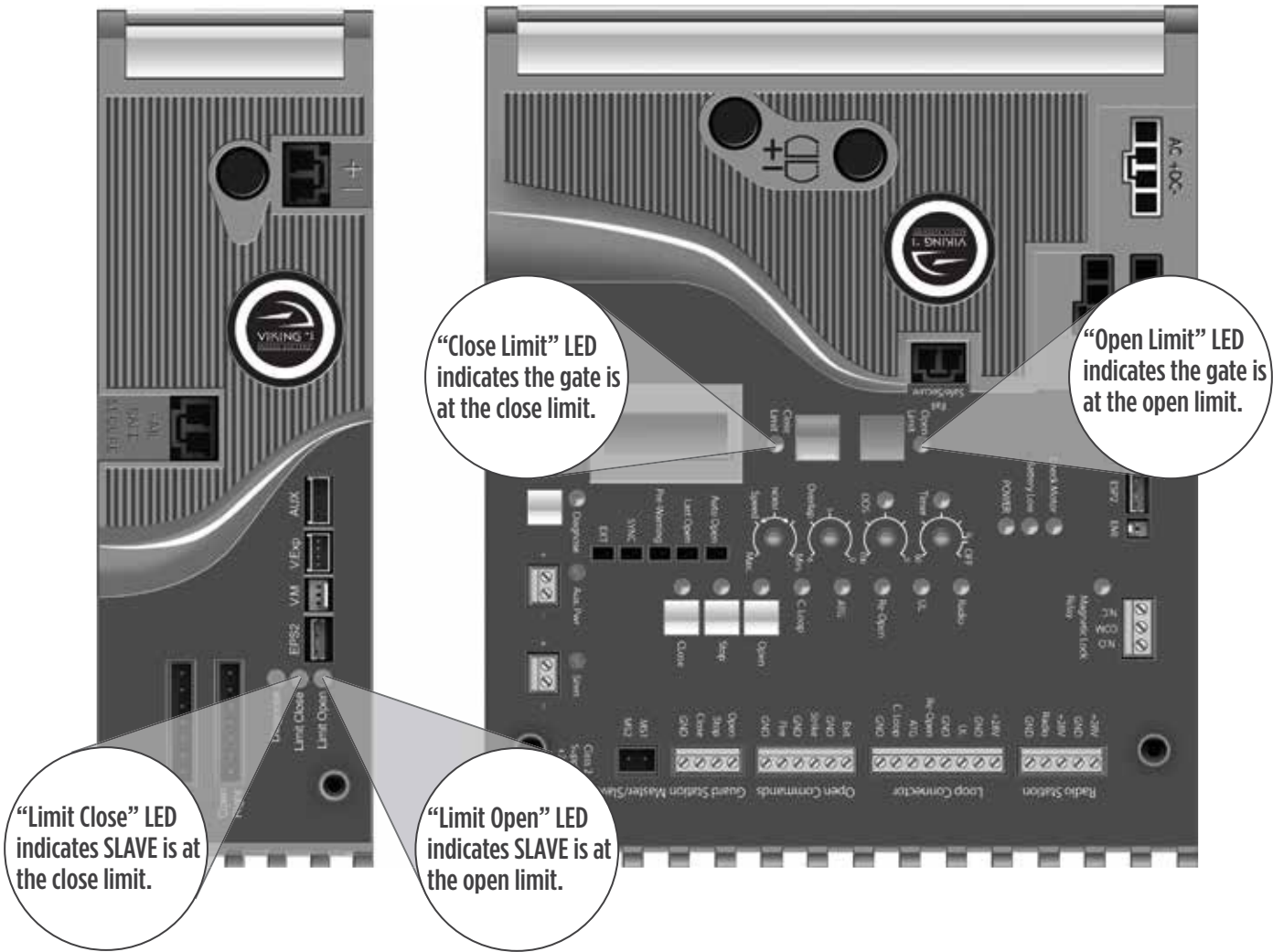
- “OPEN RIGHT” Connector if the gate opens **Inside to the Right** or **Outside to the Left**.
- “OPEN LEFT” Connector if the gate opens **Inside to the Left** or **Outside to the Right**.



# LIMIT INDICATIONS

**⚠ IMPORTANT:** The gate operator uses mechanical limits. Therefore, the limits cannot be set electronically by this controller. The Limit Buttons on the control board have been rendered inactive by the controller. Refer to the gate operator’s Installation Manual (G-5, X-9 or i-8) for specific instructions on how to set the limits for the gate operator model chosen.

**⚠ TECHNICAL TIP:** The Limit LEDs will illuminate solid when the gate reaches the corresponding limit switch on the gate operator. Both LEDs will flash, indicating a problem with the limit switches or wires.



# CONTROL BOARD SETUP

## Initial Settings

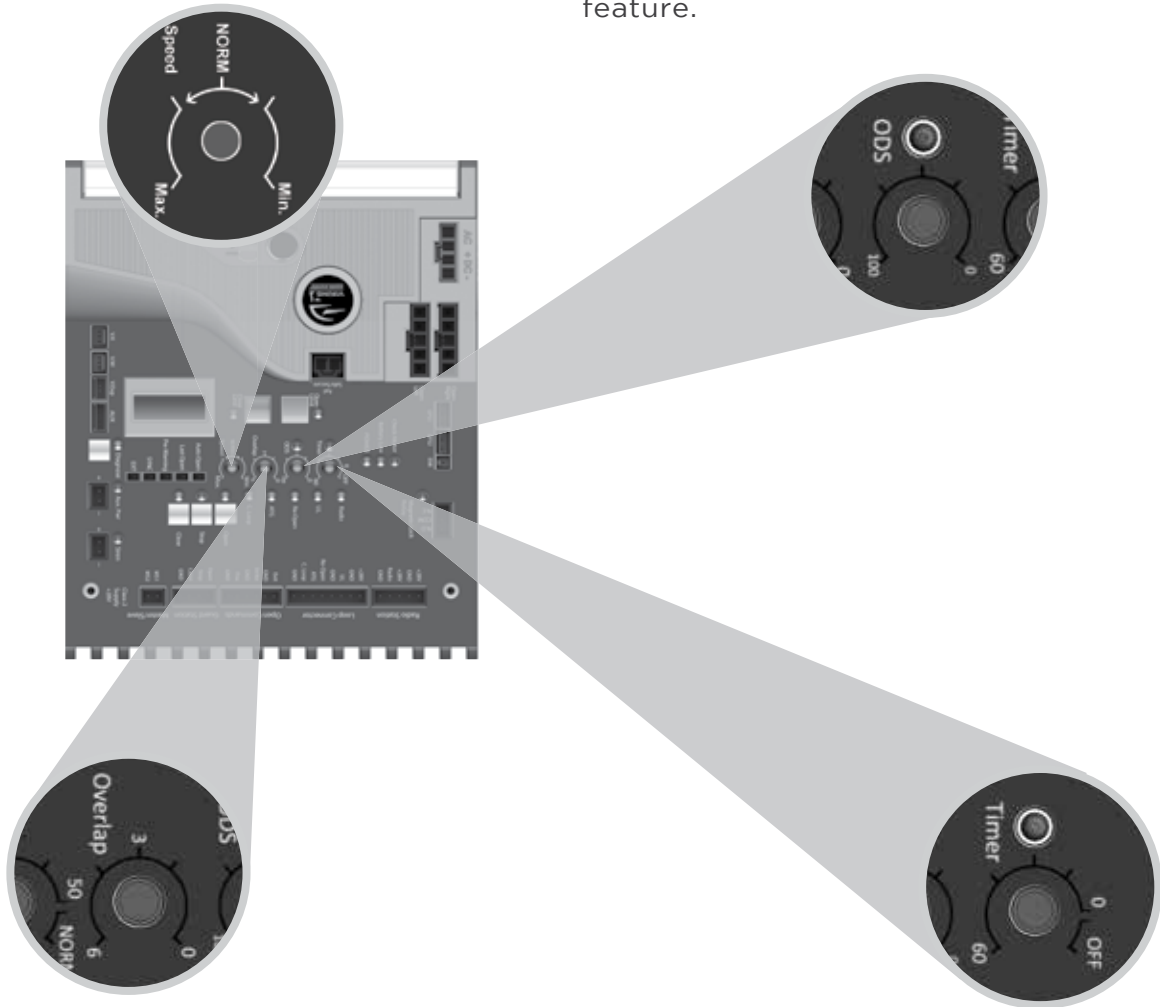
### “Speed” Motor Speed

Increases or decreases the speed of gate travel.

### “ODS” Obstruction Detection Sensor

Sets the amount of force required to trip the inherent obstruction sensor.

See page 22 for more details about this feature.



### “Overlap” Overlap Delay

Delays the gate from opening for the selected amount of time from 1-6 seconds.

⚠ Typically not used on slide gates. For Master/Slave application, the control board that has this feature turned on is the master and will close first.

### “Timer” Hold Open Timer

Automatically closes the gate after the selected amount of time from 1-60 seconds.

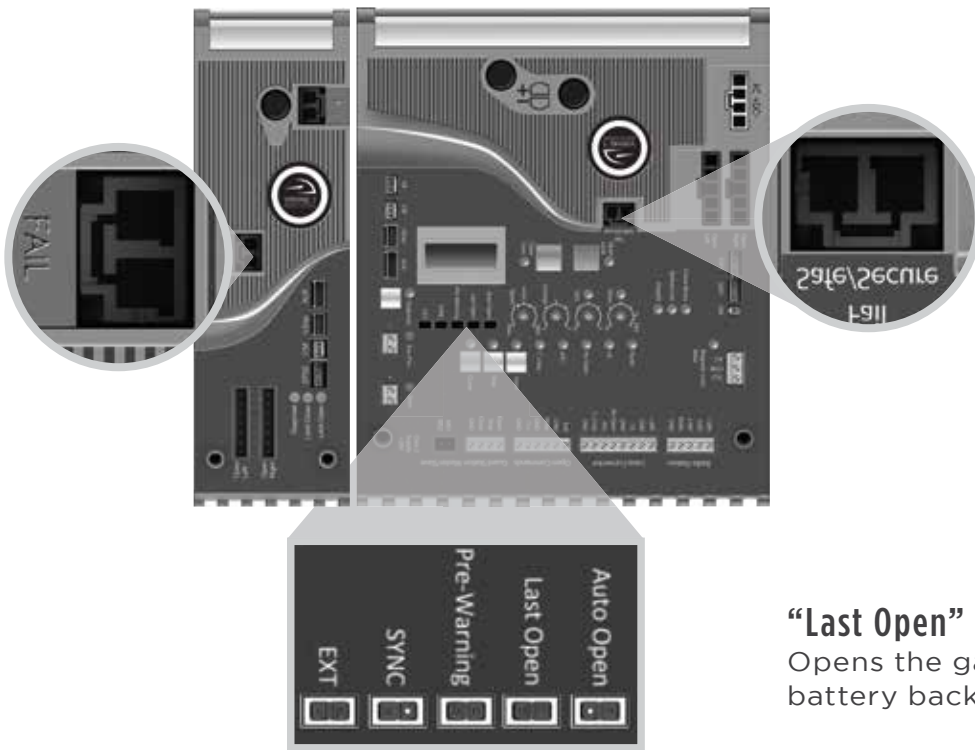
Turning the dial between “0” and “OFF” will disable this feature, requiring a close command to close the gate.



# CONTROL BOARD SETUP

## Initial Settings

**NOTE:** Installing a shunt, or jumper, on the pins will activate the feature.



### “Fail Safe/Secure”

During complete power failure, including battery power; determines the force required to manually move the gate.

- **Fail Safe Mode: (G-5 Only)**  
By removing the wire-jumper plug from the “Fail Safe/Secure” connector:  
The gate can move manually with a relatively low amount of force.
- **Fail Secure Mode:**  
By inserting the wire-jumper plug into the “Fail Safe/Secure” connector:  
The gate will not move manually.

### “Last Open” - Power Failure Option

Opens the gate automatically when the battery backup voltage is critically low.

“Pre-Warning” Initiates two options for an audio or visual warning, 3 seconds prior to gate motion, and will continue:

1. **Until gate reaches closed limit:**  
“Magnetic Lock” terminals provide a contact between “COM” and “N.O.”.
2. **Until gate reaches either limit:**  
“AUX. PWR” terminals provide 24VDC.

“Sync” Used only in conjunction with the Viking Barrier gate operator model B-12. Activating this feature allows for synchronized operation with the B-12 operator. See page 30.

“EXT” Available for future developments.

# CONTROL BOARD SETUP

## Obstruction Sensor (Primary Entrapment Protection)

**⚠ IMPORTANT:** The appropriate “ODS” setting is dependant upon the gate installation and construction. Set this feature accordingly. Additional Safety equipment should be used to reduce possible risk of injury or vehicle damage.

### “ODS” Obstruction Detection Sensor

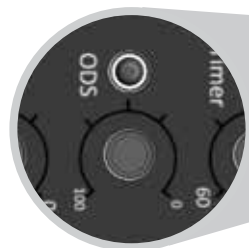
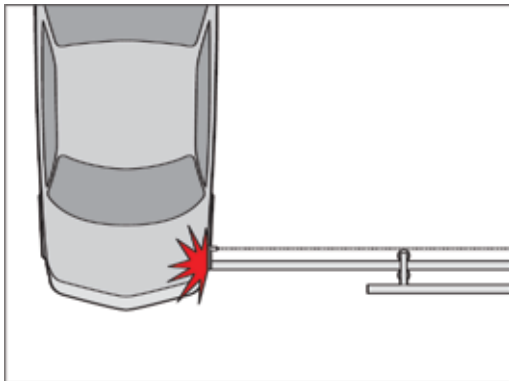
The Obstruction Sensor detects obstructions in the path of the traveling gate. The dial sets the amount of force required to activate the operators inherent obstruction detection.

Setting the dial to “0” will require the least amount of force to activate;

Setting the dial to “100” will require the maximum amount of force to activate.

**UL325 standard requires** an audio alarm to go off after two consecutive entrapment events sensed by the Inherent Entrapment Protection of the Gate Operator.

The audio alarm will sound for a period of 5 minutes or until a Stop command or the “Alarm Reset” switch has been actuated. (refer to page 12)



### When the Obstruction Sensor detects an obstruction it will:

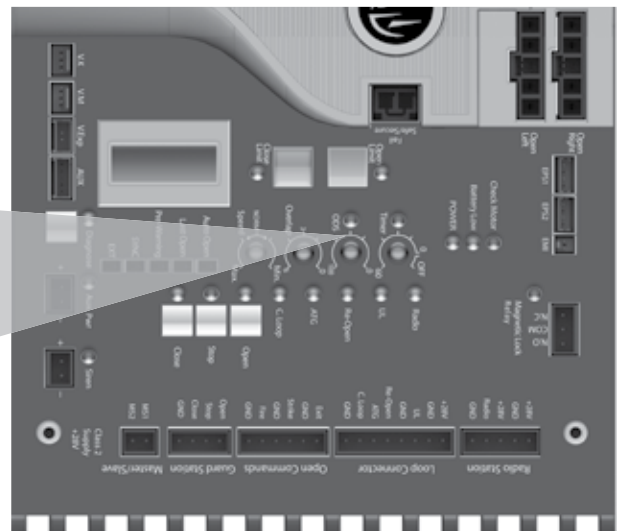
1. Stop the gate’s movement and reverse it momentarily.
2. Bring the gate to a resting position.
3. Disable the Hold Open Timer feature until the Gate Operator receives a new command.

### If second obstruction is detected before the gate reaches either limit it will:

1. Stop the gate’s movement.
2. Disable the Gate Operator.
3. Sound the UL Alarm
4. A STOP command must be provided to disable the alarm and continue operation.

**⚠ TECHNICAL TIP:** The Status LED for the “ODS” will indicate the following when it has been triggered.

- A. Solid:** Obstruction.  
Detected a sudden or abrupt increase in gate resistance.
- B. Flashing:** Overload.  
Detected a more subtle, but sustained increase in gate resistance.

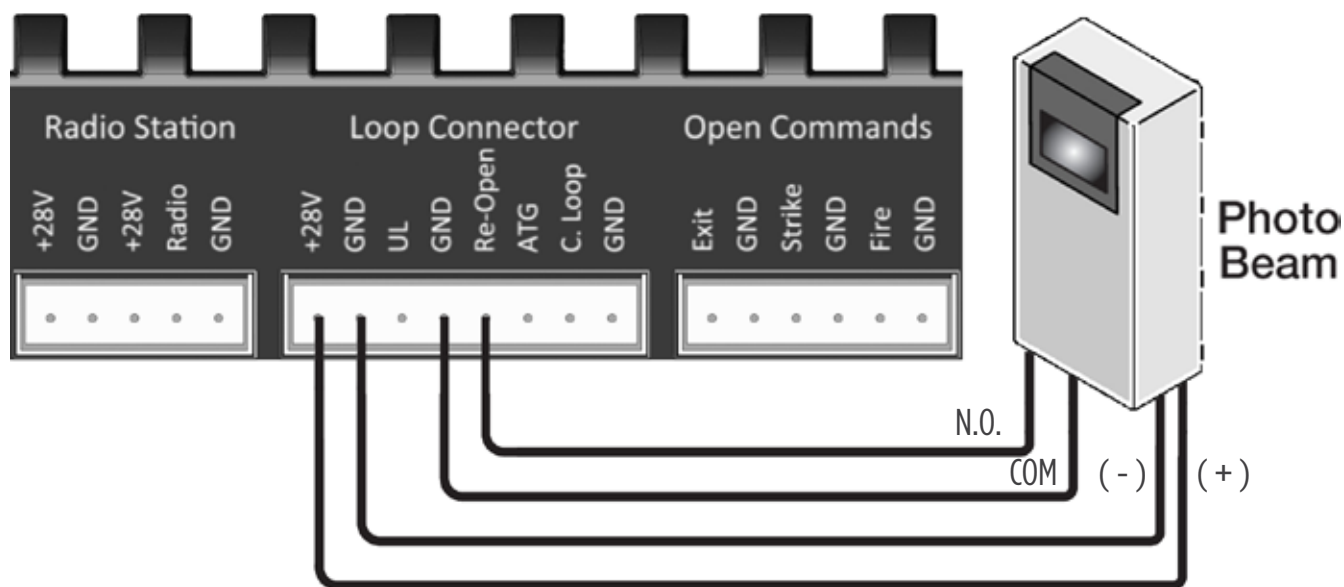


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# ACCESSORY CONNECTIONS

## Re-Open Photo Beam (vehicular Safety)

**NOTE:** This type of photo-beam installation will stop then RE-OPEN the gate all the way to the open limit when the beam is obstructed. Intended for vehicular safety ONLY. For the purpose of pedestrian entrapment, see pages 10-11.



### Power Saving Tip:

To save energy, get the power for your non-essential devices (such as photo beams) from the “Aux. Pwr” terminal block. Detailed on page 16.

### Note regarding Photo Beam types:

**Fail-Safe type** - connect the “N.C.” terminal of the photo beam to the “Re-Open” terminal on the control board. Typically, these are the reflective type photo beams.

**Fail -Secure type** - connect the “N.O.” terminal of the photo beam to the “Re-Open” terminal on the control board. Typically, these are the transmitter/receiver type photo beams.

### Check for proper operation:

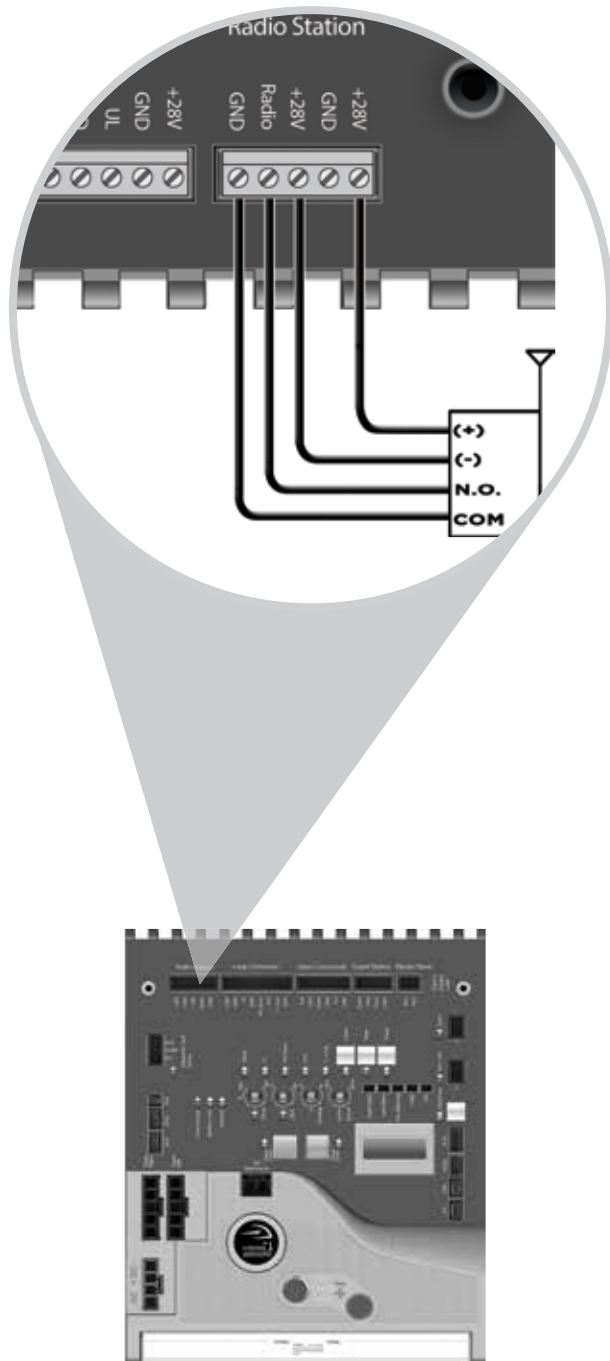
The “Re-Open” LED will illuminate solid while the beam is obstructed and remain off when the beam is unobstructed.

**⚠ TECHNICAL TIP:** For more information regarding accessory connections to the control board and individual input terminal functions, refer to “Appendix (A)”, pages 38-39.

# ACCESSORY CONNECTIONS

## Radio Receiver (Typical)

**⚠ IMPORTANT:** The Hold Open “Timer” setting (page 20) affects how the gate will respond to the radio receiver command.



**⚠ TECHNICAL TIP:** For more information regarding accessory connections and terminal functions, refer to “Appendix (A)” on pages 38-39. See “Appendix (B)” on page 40 for connecting common radio receiver models.

The control board provides two modes of operation that a radio receiver can control the gate:

### Open-Stop-Close

1. By having the radio receiver connected as illustrated and with the Hold Open Timer OFF (see page 20):

Every command of the radio transmitter will control the gate as follows:

- First command opens the gate,
- Second command stops the gate and
- Third command closes the gate
- Any subsequent commands will continue in the same order to control the gate.

This type of configuration is not recommended for commercial installations.

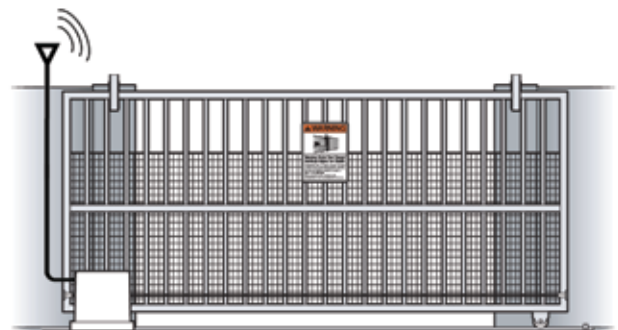
### Open Only

2. By having the radio receiver connected as illustrated and with the Hold Open Timer ON (see page 20):

Each command of the radio transmitter is **ALWAYS AN OPEN COMMAND** to the gate.

### For maximum reception range:

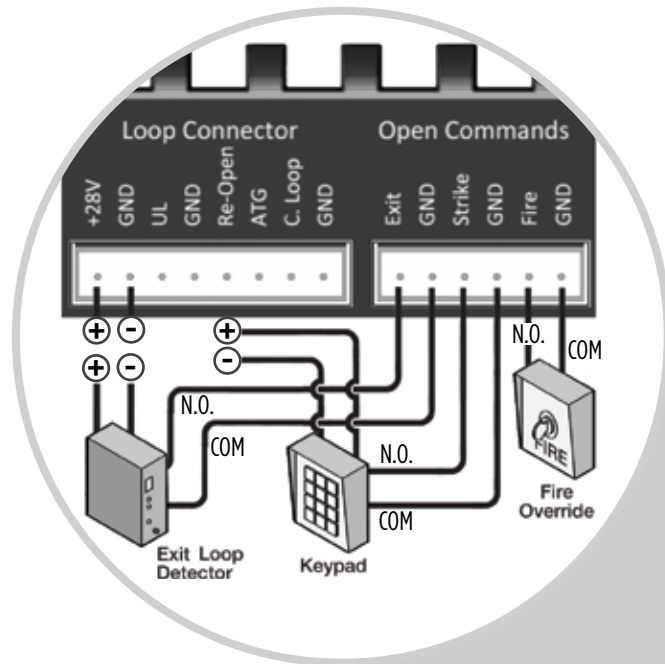
Locate the radio antenna to the top of the gate column.



# ACCESSORY CONNECTIONS

## Anti-Tailgate, Open Commands & Guard Station

**⚠ TECHNICAL TIP:** For more information regarding accessory connections and terminal functions, refer to “Appendix (A)” on pages 38-39.



### Open Commands

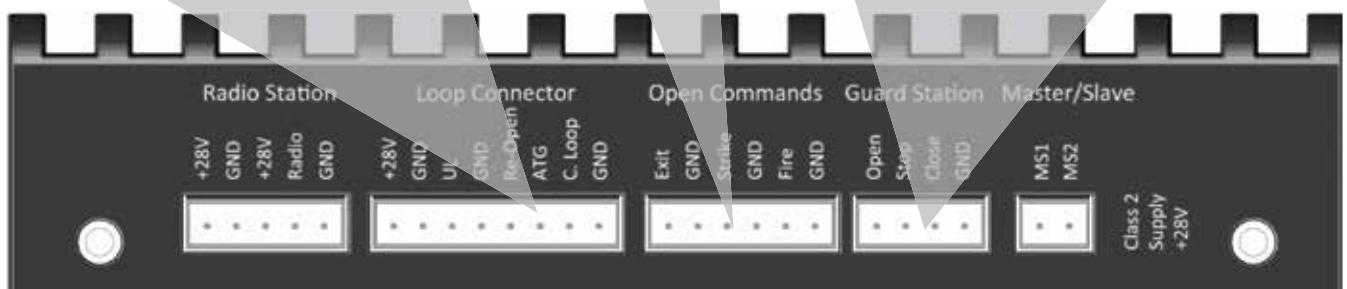
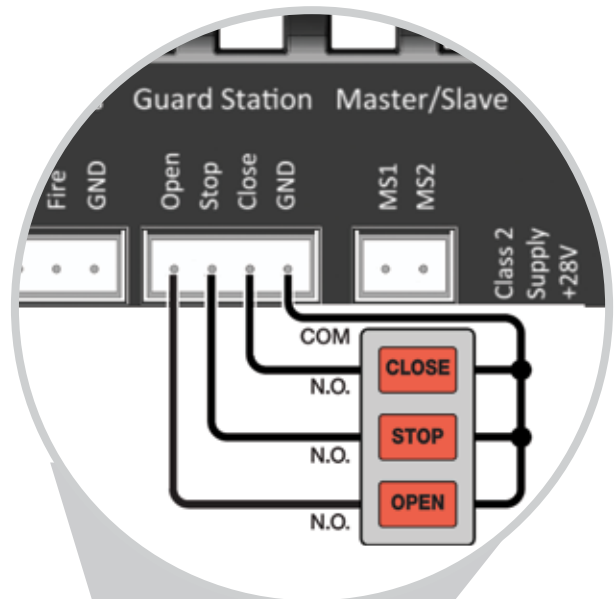
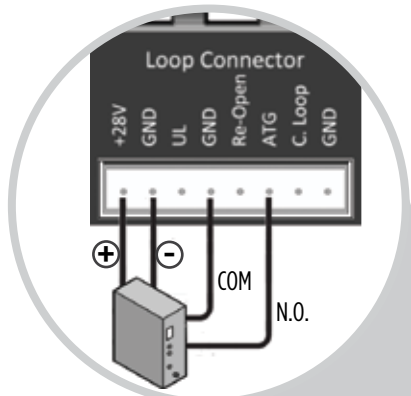
“Exit”, “Fire” and “Strike” input terminals all provide an open command to the control board. Any device connected as shown will open the gate.

### Guard Station

**⚠** All three buttons must be a Normally Open “N.O.” type of switch, and can share the same common “C” connection to “GND”.

### “ATG” Anti-Tailgate

This input will stop the gate when the vehicle triggers the sensor, then closes the gate when the vehicle leaves the sensor, preventing unauthorized vehicles from entry.



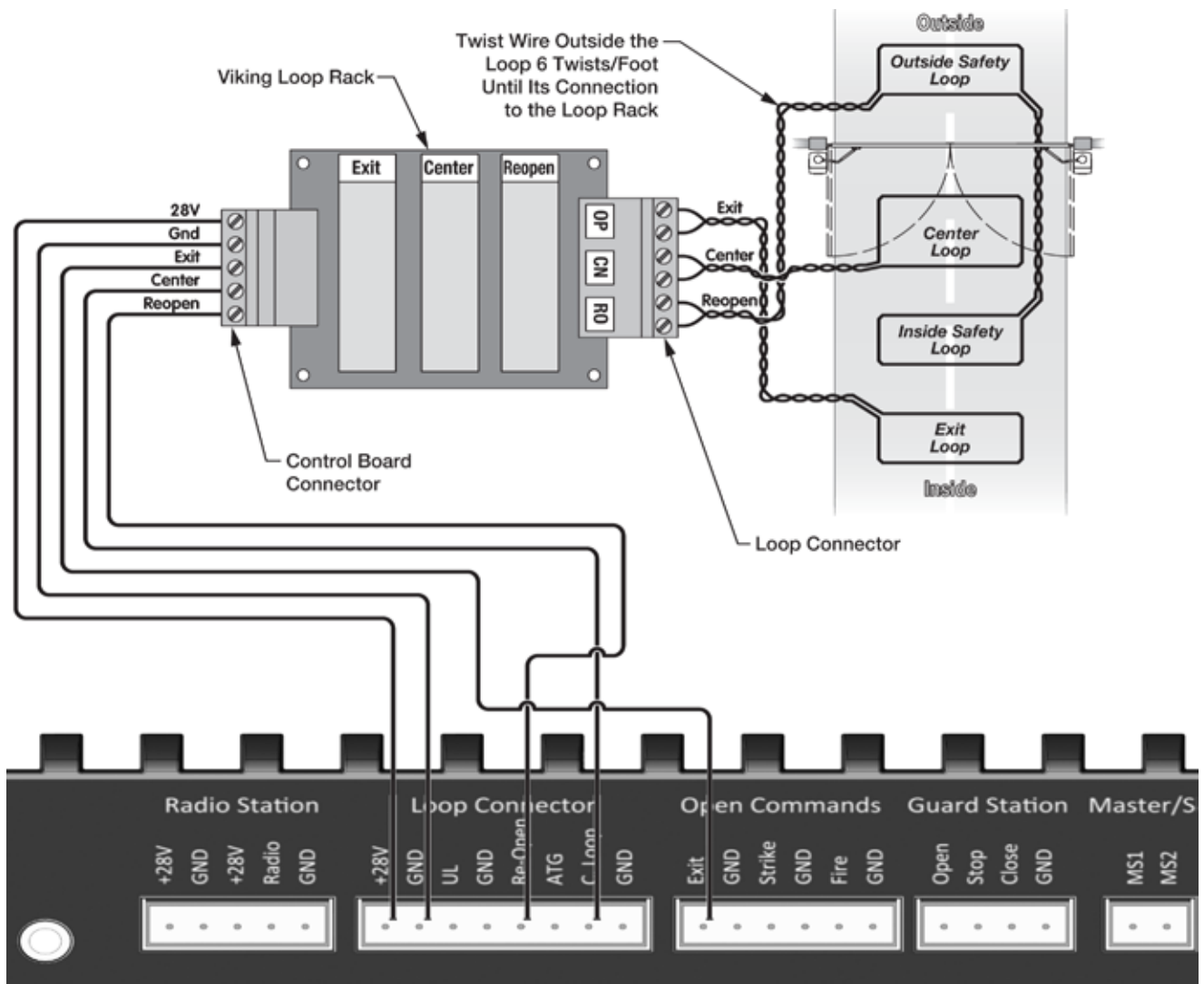
# ACCESSORY CONNECTIONS

## Viking Loop Rack

**TIP:** This operator may be equipped with a pre-wired **Loop Rack** that plug-in type loop detectors can be connected to. This provides a convenient alternative to the box type loop detectors that would need to be wired to the control board. Viking does not provide either type of loop detectors.

**Loop Rack: Part # VA-LR**

**Loop Rack Wiring Harness: Part # VA-LRH**





# ACCESSORY CONNECTIONS

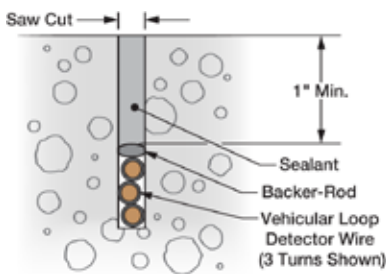
## Guidelines for Loop Installation

1. Prevent sharp corners in the geometry of the loop sensor.
2. Install the appropriate number of turns for your loop geometry based on the loop perimeter. Use Table C (below) as a guide.
3. Use XLP (cross-linked-polyethylene) type of wire. This wire reduces the effects of moisture and other environmental events in altering the functionality of the vehicular loop detector.
4. Twist the lead wire at least 6 turns per foot.
5. Use BACKER-ROD to minimize damage to the loop detector wire prior to using the sealant.
6. Place the loop detector wire and adjust the sensitivity of the vehicular loop detector unit in a way to minimize the effects of the gate over the loop detector wire.

**⚠ IMPORTANT!** Some of the following parameters may affect the proper functionality of the vehicular loop detector.

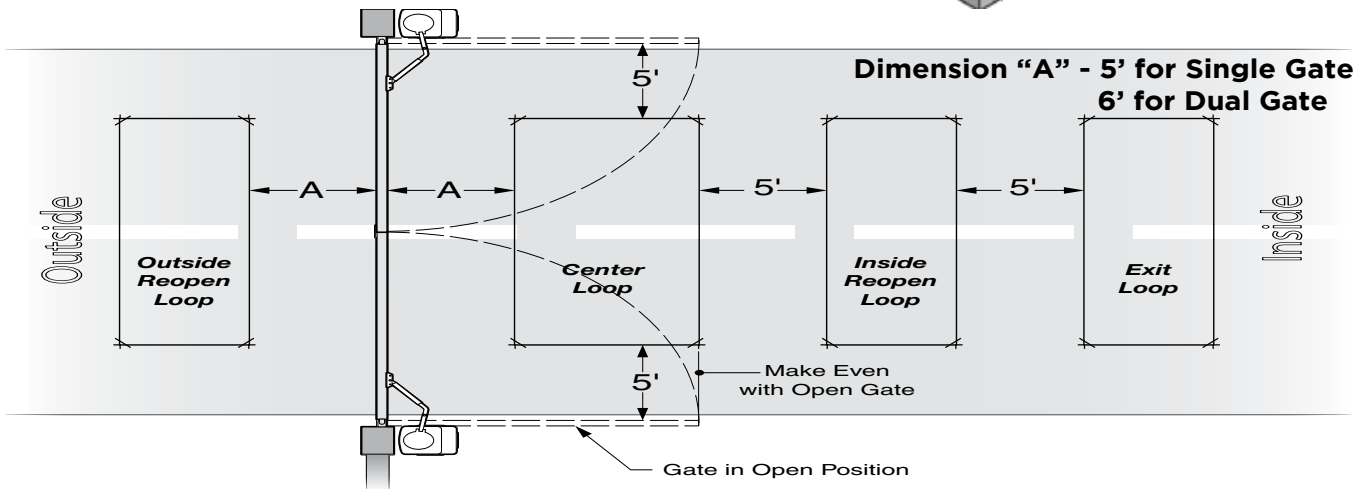
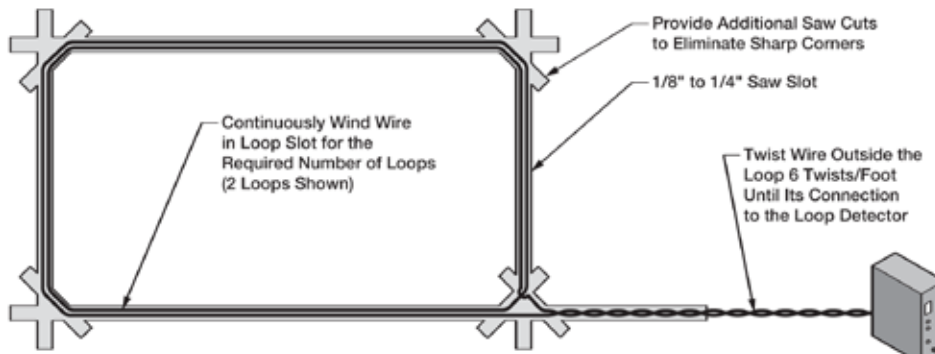
**Consult the manufacturer of the vehicular loop detector and/or loop wire.**

- Gate size
- Number of turns in the loop sensor wire
- Distance of the loop sensor wire to the gate at either at the open or close position



**Table C - Recommended Number of Turns**

| Perimeter (ft.) | Number of Turns |
|-----------------|-----------------|
| 10              | 5               |
| 20              | 4               |
| 30-40           | 3               |
| 50-100          | 2               |



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# SYNCHRONIZATION WITH B-12

## Barrier Arm (B-12) Synchronization Option

**NOTE:** The Control Board provides a convenient solution for applications that require synchronized operation with the Viking Barrier Arm Operator model B-12.

This type of application opens and closes in the following pattern:

1. Open Command is provided only to the Viking B-12 Barrier Arm Operator.
2. The Barrier Arm will delay to open until this Gate Operator reaches its Open Limit.
3. The Gate Operator will delay to close until the Barrier Arm reaches its Close Limit.

### STEP 1 (Figure A & B)

Connect the Gate Operator to the Viking B-12 Barrier Arm Operator as illustrated.

### STEP 2 (Figure A)

At the B-12 Barrier Arm Operator, connect the primary device that will be used as the OPEN input.

### STEP 3 (Figure B)

On the Gate Operator Control Board, activate Sync Mode by placing a jumper on to the pin headers labeled "SYNC".

Figure A

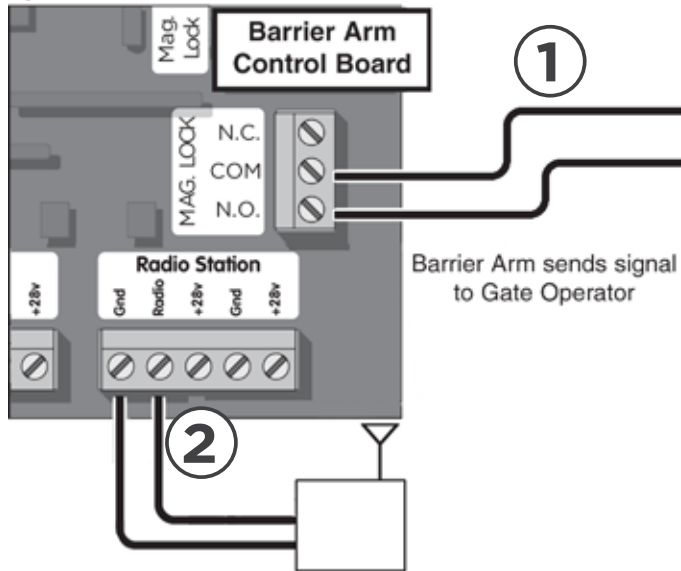
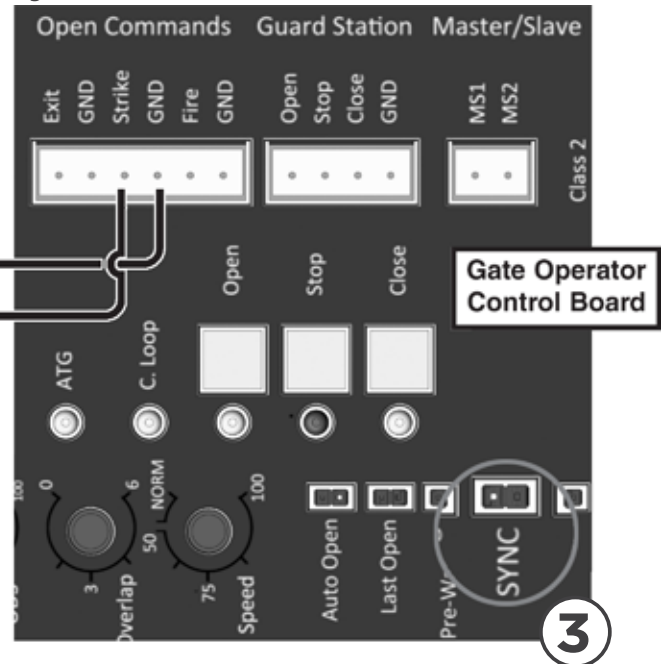


Figure B



### STEP 4 (Figure C & D)

Connect Viking B-12 Barrier Arm Operator to the Gate Operator as illustrated.

Figure C

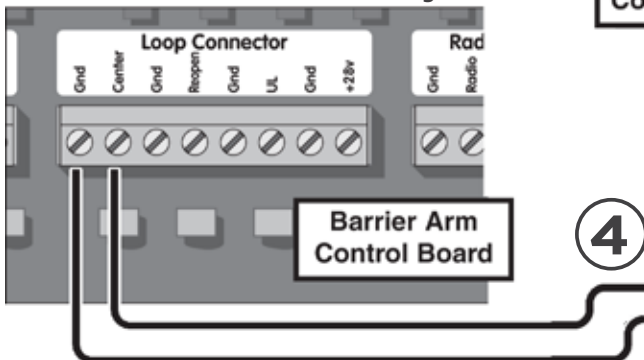
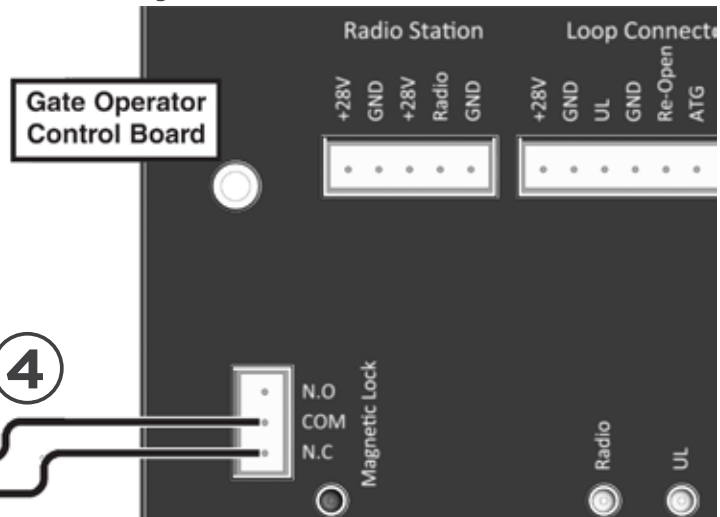


Figure D

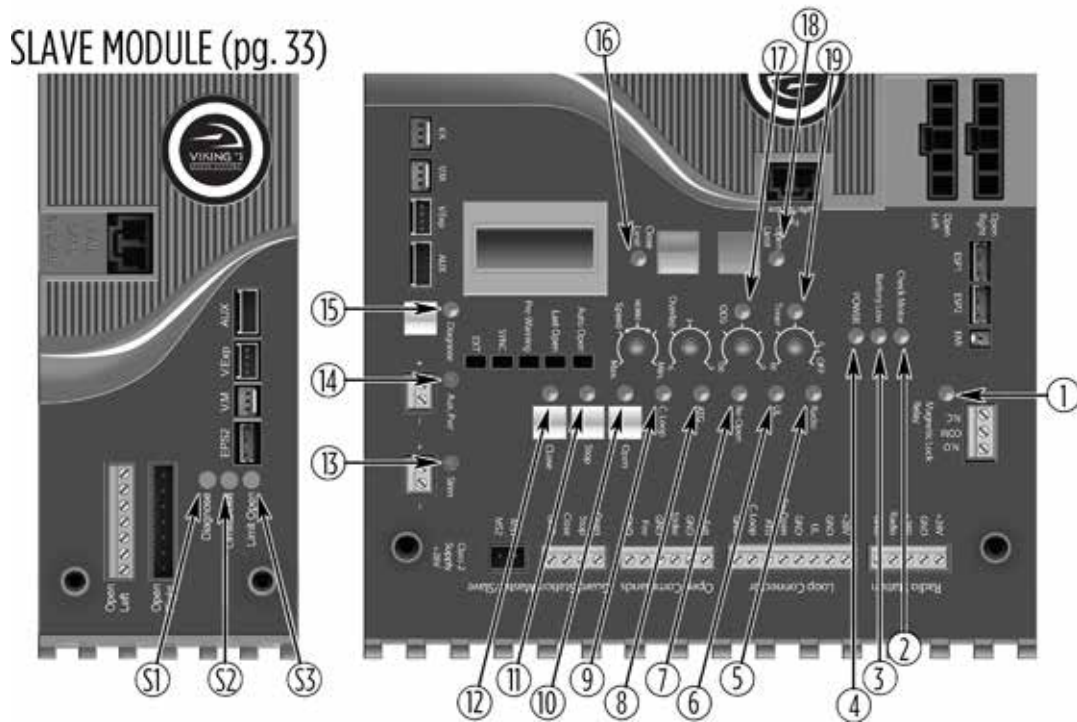


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# TROUBLESHOOTING

## LED References

In addition to the LCD Display, the control board LEDs monitor the various circuits of the control board. Use the table below to identify the corresponding “TS Ref#” and refer to pages 34-37 for further troubleshooting.



| # | LED                   | Status   | Meaning  | TS Ref#(s) |
|---|-----------------------|----------|--|------------|
| 1 | "Magnetic Lock Relay" | OFF      | At Closed Limit and Magnetic Lock Relay state is closed across "COM" & "N.C.". Gate should be at the Close Limit.        |            |
|   |                       | SOLID    | Not at Closed Limit and Magnetic Lock Relay state is closed across "COM" & "N.O.". Gate should not be at the Close Limit |            |
| 2 | "Check Motor"         | OFF      | Normal Condition.  |            |
|   |                       | SOLID    | The control board is sending power to the motor but the circuit is open.   | 7, 8       |
| 3 | "Battery Low"         | OFF      | Normal Condition.  |            |
|   |                       | SOLID    | Does not apply to Solar Units.   |            |
|   |                       | FLASHING | Batteries critically low. Check power supply to the operator. (pg 16).   |            |
| 4 | "POWER"               | OFF      | No power to control board (pg 16) or board is in sleep mode.   | 5          |
|   |                       | SOLID    | Normal Condition.  |            |
| 5 | "Radio"               | OFF      | Normal Condition.  |            |
|   |                       | SOLID    | Control Board is receiving an input from a device connected to the Radio terminal (pg 25, 38).                           | 9, 10      |
| 6 | "UL"                  | OFF      | Normal Condition.  |            |
|   |                       | SOLID    | Control Board is receiving an input from a device connected to the UL terminal (pg 10-11, 38).                           | 9, 10      |
| 7 | "Re-Open"             | OFF      | Normal Condition.  |            |
|   |                       | SOLID    | Control Board is receiving an input from a device connected to the Re-Open terminal (pg 24, 27, 38).                     | 9, 10      |
| 8 | "ATG"                 | OFF      | Normal Condition.  |            |
|   |                       | SOLID    | Control Board is receiving an input from a device connected to the ATG terminal (pg 26, 38).                             | 9, 10      |

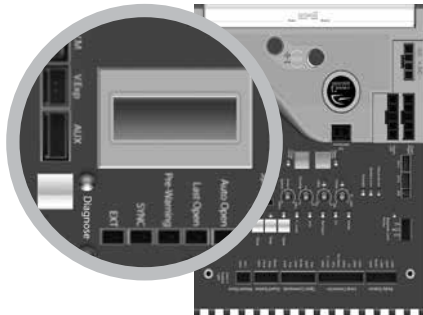
# TROUBLESHOOTING

| #  | LED                    | Status     | Meaning   | TS Ref#(s) |
|----|------------------------|------------|---|------------|
| 9  | “C Loop”               | OFF        | Normal Condition.   |            |
|    |                        | SOLID      | An input from a device connected to the C Loop terminal (pg. 27, 38)        | 9, 10      |
| 10 | “Open”                 | OFF        | Normal Condition.   |            |
|    |                        | SOLID      | An input from a device to Exit, Fire, Strike or Open terminal (pg. 26, 38)  | 9, 10      |
| 11 | “STOP”                 | OFF        | Normal Condition.   |            |
|    |                        | SOLID      | An input from a device connected to the Stop terminal (pg. 12, 26, 38)      | 9, 10      |
| 12 | “Close”                | OFF        | Normal Condition.   |            |
|    |                        | SOLID      | An input from a device connected to the Close terminal (pg. 26, 38)         | 9, 10      |
| 13 | “Siren”                | OFF        | Normal Condition.   |            |
|    |                        | SOLID      | Second consecutive obstruction has been detected. (pg. 20, 22)              | 11, 13     |
|    |                        | FLASHING   | Batteries are critically low.   |            |
| 14 | “Aux. Pwr”             | OFF        | No voltage output on these terminals at the moment.                         |            |
|    |                        | SOLID      | There is 24VDC output on these terminals at the moment.                     |            |
| 15 | “Diagnose” (master)    | OFF        | Normal Condition  |            |
|    |                        | FLASHING   | Errors have been detected; Check LCD Display for ERR messages (pg. 36)      |            |
| 16 | “Close Limit” (master) | OFF        | Gate is not at the close limit position.                                    |            |
|    |                        | SOLID      | Gate is at the close limit position.  |            |
|    |                        | FLASHING   | Indicates a problem with the limit switches or wires.                       | 6          |
| 17 | “Open Limit” (master)  | OFF        | Gate is not at the open limit position.                                     |            |
|    |                        | SOLID      | Gate is at the open limit position.   |            |
|    |                        | FLASHING   | Indicates a problem with the limit switches or wires.                       | 6          |
| 18 | “ODS”                  | OFF        | Normal Condition.   |            |
|    |                        | SOLID      | Obstruction event has been detected on the MASTER motor. (pg. 20, 22)       | 11, 13     |
|    |                        | FLASHING   | Overload event has been detected on the MASTER motor. (pg. 20, 22)          | 11, 13     |
| 19 | “Timer”                | OFF        | If gate is at the open limit, the Timer to close is turned OFF. (pg. 20)    |            |
|    |                        | SOLID      | Timer to close is ON and counting down to close the gate. (pg. 20)          |            |
|    |                        | FLASHING   | Timer is ON but is not timing out due to a conflicting command. (pg. 20)    | 9, 10      |
| S1 | “Diagnose” (slave)     | OFF        | Normal Condition  |            |
|    |                        | FLASHING   | Errors have been detected; Check LCD Display for ERR messages. (pg. 36)     |            |
|    |                        | SOLID      | Obstruction event has been detected on the SLAVE motor. (pg. 20, 22)        | 11, 13     |
|    |                        | RAPID FLSH | Overload event has been detected on the SLAVE motor. (pg. 20, 22)           | 11, 13     |
| S2 | “Limit Close” (slave)  | OFF        | Slave gate is not at the close limit position.                              |            |
|    |                        | SOLID      | Slave gate is at the close limit position.                                  |            |
|    |                        | FLASHING   | Indicates a problem with the limit switches or wires on the slave operator. | 6          |
| S3 | “Limit Open” (slave)   | OFF        | Slave gate is not at the open limit position.                               |            |
|    |                        | SOLID      | Slave gate is at the open limit position.                                   |            |
|    |                        | FLASHING   | Indicates a problem with the limit switches or wires on the slave operator. | 6          |

# TROUBLESHOOTING

## LCD Display References

The control board is equipped with a LCD Display that provides operator information, current conditions, settings, diagnostics and error messages. Use the table below to identify the corresponding “TS Ref#” and refer to page 37 for further troubleshooting.



1. Error Messages will be displayed first.
2. The "Diagnose" LED will flash consecutively indicating how many Error Messages are available.
3. Press the Diagnose button to manually scroll through all of the Messages.

Page 37  
TS Ref #s

| LCD MSG                       | Meaning   |               |
|-------------------------------|---|---------------|
| VIKING<br>ACCESS              | Welcome Message   |               |
| MODEL<br>GSS                  | Indicates the Model of the unit. G-5, X-9 or i-8  |               |
| <b>System Status Messages</b> |   |               |
| GATE IS<br>IDLE               | Gate is stopped between limits.   |               |
| GATE IS<br>OPENING            | Gate is opening.  |               |
| GATE IS<br>CLOSING            | Gate is closing.  |               |
| GATE IS<br>OPENED             | Gate is at the limit open position.   |               |
| GATE IS<br>CLOSED             | Gate is at the limit close position.  |               |
| STOP BY<br>OBSTRUCT           | Master or Single motor has stopped due to an obstruction of the gate system. Also refer to the "ODS" LED. (pg. 22, 32, 33 @ 18)         | 11, 12,<br>13 |
| STOP BY<br>OVERLOAD           | Master or Single motor has stopped due to an overload of the gate system. Also refer to the "ODS" LED. (pg. 22, 32, 33 @ 18)            | 11, 12        |
| OVERLAP<br>TIMING             | Gate is waiting for the overlap time.   |               |
| HOLDING<br>... SEC            | Gate is at the limit open position and timing to close - The display shows the actual time left before closing.                         |               |
| STOP BY<br>ODS S              | Slave motor has stopped due to an obstruction sensor event. Also refer to the "DIAGNOSE" LED on the Slave Module. (pg. 22, 32, 33 @ S1) | 11, 12,<br>13 |



## LCD Display References

LCD MSG    Meaning

### Multi Meter Displays

MOT AMP  
---- A      This is the motor current amperage during operation.

MOT VOLT  
---- VDC    This is the actual motor voltage during operation.

SOL VOLT  
---- VAC    This is the actual voltage from the solar panel.

CHARGER  
---- VDC    Indicates the voltage being supplied to the Control Board from the Viking Solar Charger.

BAT VOLT  
---- VDC    This is the actual voltage from the Battery

### Board Settings Messages

SPEED  
...%        Shows the percentage of speed set by the Speed adjustment on the control board. (pg. 20)

OVERLAP  
... SEC     Shows the number of seconds set by the Overlap Adjustment on the control board.

ODS SENS  
----%       Shows the force setting selected to trip the obstruction sensor. (pg. 20, 22)

TIMER  
... SEC     Shows the amount time set or remaining to hold the gate at the Open Limit position, before the gate starts to close. (pg. 20)

# TROUBLESHOOTING

## LCD Display References

Page 37  
TS Ref #s

| LCD MSG               | Meaning   |           |
|-----------------------|---|-----------|
| <b>Error Messages</b> |   |           |
| ER PANEL<br>LOW       | Indicates that the voltage being provided from the solar panel is too low.                            | ?         |
| ER PANEL<br>HIGH      | Indicates that the voltage being provided from the solar panel is too High.                           | ?         |
| ER SOLAR<br>NO PANEL  | Indicates that there is no voltage being provided from the solar panel.                               | ?         |
| ERR NO<br>SOL UNIT    | Solar board can't detect a solar gate operator.   | ?         |
| ERR CHRG<br>HIGH      | Potential problem with the Solar Charger.   | ?         |
| ERR BAT<br>LOW        | The battery is low  | ?         |
| ERR FUSE<br>15 AMP    | 15 Amp motor fuse is blown on the Master or Single Control Board.                                     | 7, 11, 12 |
| ERR FUSE<br>15A S     | 15 Amp motor fuse is blown on the SLAVE Module.   | 7, 11, 12 |
| ERR REFV<br>WRONG     | One, or more, of the internal reference voltages from the VFlex (Master) Control Board are incorrect. | ?         |

# TROUBLESHOOTING

## Solutions

Begin the troubleshooting process by referring to the error messages on the LCD Display and/or the Status LEDs on the control board. Use pages 32-36 to identify the Troubleshooting Reference # (TS Ref#) then reference the table below.

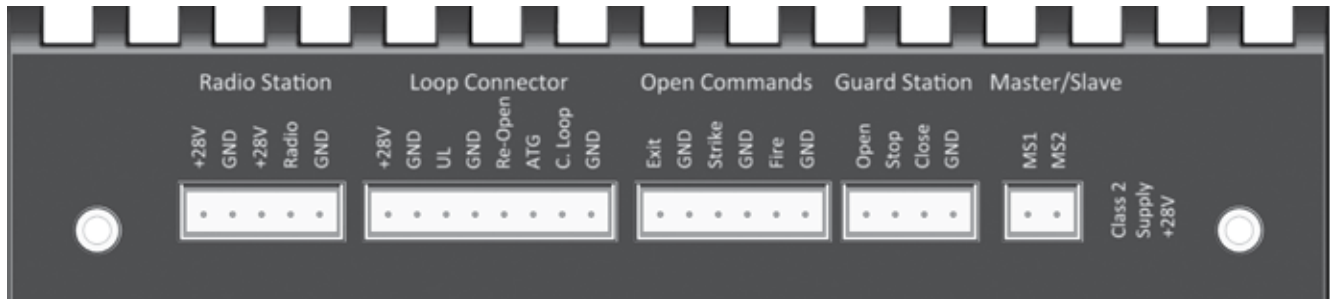
| TS Ref# | CHECK   | Page Ref#           |
|---------|---|---------------------|
| 1       | Not applicable to this model  |                     |
| 2       | Not applicable to this model  |                     |
| 3       | Not applicable to this model  |                     |
| 4       | Not applicable to this model  |                     |
| 5       | Check that the Power Harness is connected to the control board.   | pg. 4, 16           |
| 6       | Check that the limit circuits are Normally Closed (N.C.). Check the limit switch.   |                     |
| 7       | Check the Motor Fuse on the control board.  | pg. 4               |
| 8       | Check that the operator is not in Manual Release mode   |                     |
| 9       | Check the Status LEDs and LCD Display to determine if the control board is receiving an input from any external devices or if the "ODS" has been triggered.   | pg. 20, 22<br>32-34 |
| 10      | Remove the external devices from the control board to determine if the control board is responding to an input or problem with the external device or wiring. | pg. 24-27,<br>32-33 |
| 11      | Check the "ODS" setting on the control board.   | pg. 22              |
| 12      | Check that the gate can be moved manually with low resistance throughout its full range of motion.  | pg. 8               |
| 13      | Check the limit position.   |                     |
| 14      | Not applicable to this model  |                     |
| 15      | Not applicable to this model  |                     |
| 16      | Check the LCD Display for Error Messages  | pg. 36              |
| 17      | Not applicable to this model  |                     |
| 18      | Not applicable to this model  |                     |
| 19      | Manually adjust any setting on the Control Board to clear all wireless override settings  |                     |
| 20      | Not applicable to this model  |                     |
| 21      | Not applicable to this model  |                     |
| ?       | Call Viking Technical Support for further assistance  |                     |

# Appendix (A)

## Access Control Connections

### Power Connections

The control board provides a 24VDC output to power external devices and controls. Alternatively, for devices that require a power supply other than 24VDC, the operators Power Box contains a convenient 120VAC receptacle to connect a plug-in transformer.



|        |   |               |
|--------|---|---------------|
| “C”    | = | Common        |
| “N.O.” | = | Normally Open |

### Terminals Connections and Input Functions:

| Viking Terminal                   | Function  | Device Terminal |
|-----------------------------------|---|-----------------|
| “+28v”                            | DC Positive   | “+”             |
| “GND”                             | DC Negative   | “-”             |
| “GND”                             | Relay Common  | “C”             |
| “Radio”                           |   | “N.O.”          |
|                                   | If “Timer” OFF: Open - Stop - Close                   |                 |
|                                   | If “Timer” ON: Open / Reopen if closing               |                 |
| “UL” (see pages 10 & 11)          |   | “N.O.”          |
|                                   | If input is brief: Stops gate then Reverses 12 inches |                 |
|                                   | If input is longer: Stops gate, does not reverse      |                 |
| “Re-Open”                         |   | “N.O.”          |
|                                   | If stopped: No function                               |                 |
|                                   | If closing: Stops then Opens gate                     |                 |
| “ATG” Anti-Tailgate               |   | “N.O.”          |
|                                   | Input is received: Stops gate if closing              |                 |
|                                   | Input is released: Closes gate to prevent tailgating  |                 |
| “C. Loop”                         |   | “N.O.”          |
|                                   | If not at open limit: No function                     |                 |
|                                   | If at open limit: Prevents gate from Closing          |                 |
| “Open”, “Exit”, “Fire” & “Strike” |   | “N.O.”          |
|                                   | If stopped: Opens gate                                |                 |
|                                   | If closing: Stops then Opens gate                     |                 |
| “Stop”                            |   | “N.O.”          |
|                                   | If traveling: Stops gate                              |                 |
| “Close”                           |   | “N.O.”          |
|                                   | If stopped: Closes gate                               |                 |
|                                   | If traveling: No function                             |                 |

**⚠ TECHNICAL TIP:** Each input Terminal (i.e. Radio, Exit, Re-Open, UL) has a corresponding Status LED that when illuminated indicates an input is currently being provided to the terminal and the gate is responding accordingly. (See pages 32-33 LED References)

## Relays In General

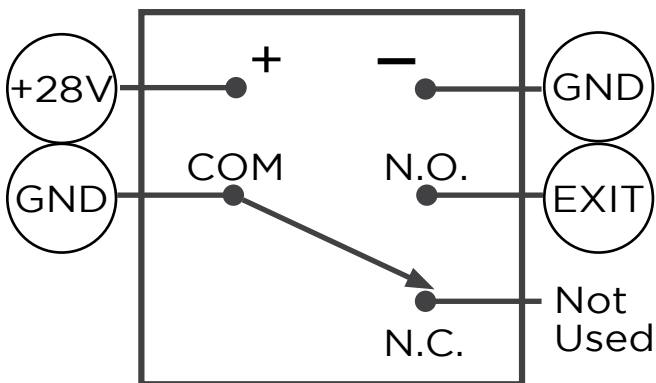
**NOTE:** Viking Access Systems does not provide the external safety devices and access controls. These items can be purchased from your dealer or distributor.

### In General

In regards to the Viking control board, all external safety devices and access controls contain, and are, simple relays that provide an input to the Viking control board when the device is activated.

When these devices are activated, their internal relays create a contact, or short, between the “C” and “N.O.” terminals. This contact is what provides the command to the Viking control board.

**▲ TECHNICAL TIP:** Viking uses the Normally Open “N.O.” contact from the device, excluding “fail-safe” type photo beams. In such instances, the Normally Closed “N.C.” will be used instead.



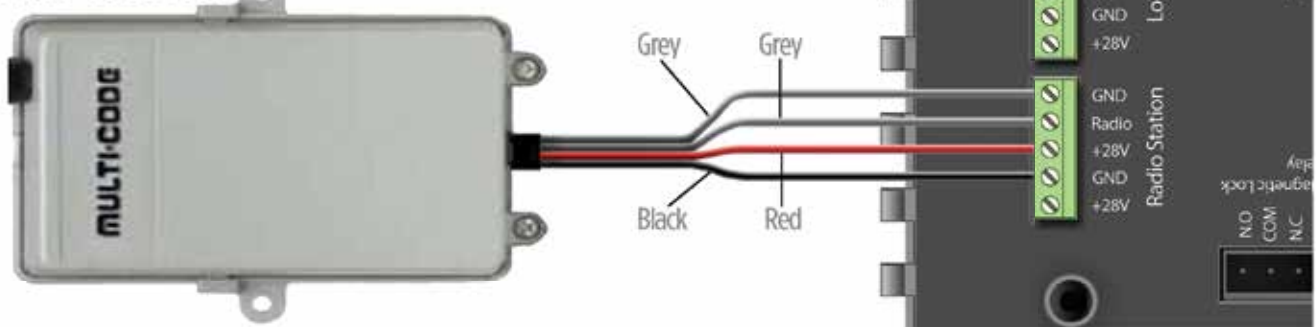
### Glossary of Terms

- 1. Terminal:** Wire Connections.
- 2. Input Terminal:** On the Viking control board, the terminal which is labeled for a specific command (Re-Open, Exit, Radio, etc.). The N.O. contact from the access control device is to be connected to the Input Terminal.
- 3. Terminal Block:** On the Viking control board, a removable block containing multiple terminals.
- 4. Relay:** The component of an access control or safety device that provides an input or command to the Viking control board.
- 5. “C” Relay Common Terminal:** This is the relay terminal that makes contact (a short) to the N.O. terminal when the device is activated. *Always wire this relay terminal to any “GND” terminal at the control board.*
- 6. “N.O.” Relay Normally Open Terminal:** The relay terminal that has an open contact to “C” while the relay is not activated, and a closed contact when the relay is activated. *Almost always wire this relay terminal to an “Input Terminal” at the control board,*
- 7. “N.C.” Relay Normally Closed Terminal:** The relay terminal that has a closed contact to “C” while the relay is not activated, and an open contact when the relay is activated. *This terminal is rarely used.*
- 8. Relay Coil:** Contains the terminals that provide power at the relay.
- 9. “+” Relay Positive Terminal:** The positive power pole for the relay coil. *Always wire this relay terminal to any “+28v” terminal at the control board.*
- 10. “-” Relay Negative Terminal:** The negative power pole for the relay coil. *Always wire this relay terminal to any “GND” terminal at the control board.*

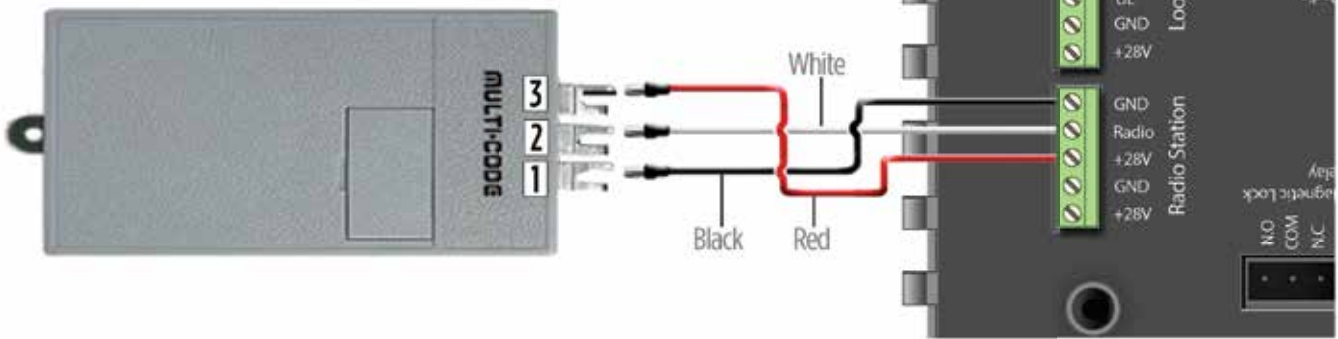
# Appendix (B)

## Common Radio Receivers - Connections

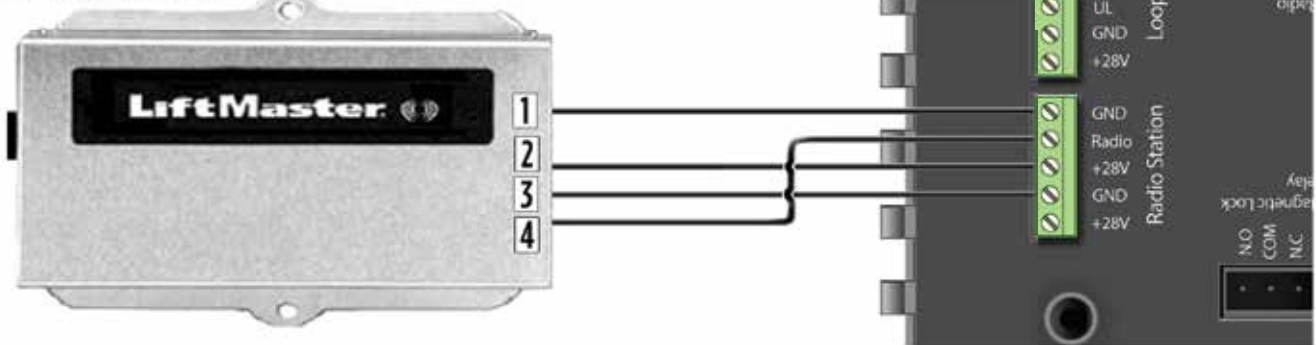
Multi-Code 1099



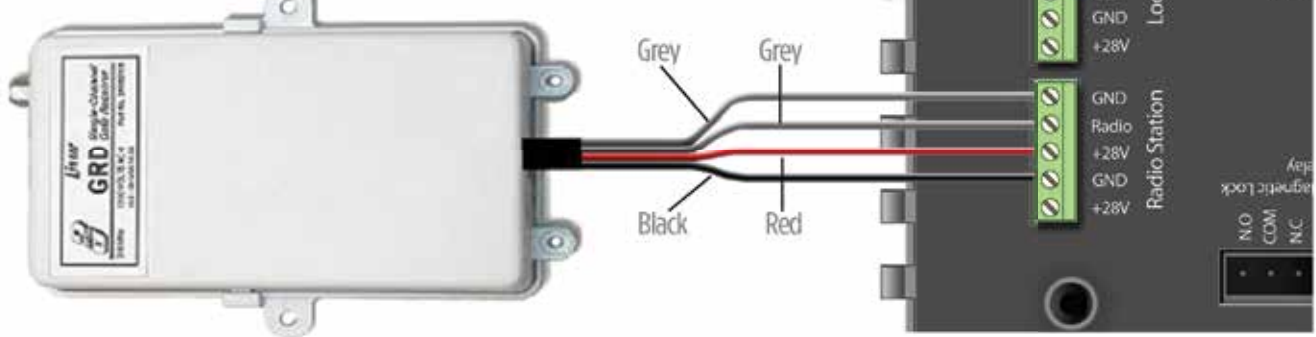
Multi-Code 1090



Liftmaster 312HM



Linear Delta 3 GRD



# VIKING EXPANSION PRODUCTS



**VIKING KONNECT Master/Slave Kit** Secure and reliable Master/Slave communication between two single ECU's using Viking's Konnect technology. Paired with the Viking App, each module also doubles as a diagnostic tool.

**Part# VA-KONNECT-MS**

*\*\*\*Q-7, B-12 & ECU Operators require (2) Antenna Extension Cables (part# VA-RPSMA)\*\*\**



**VIKING KONNECT Diagnostic Tool** On-site remote access to the operator from the convenience of a compatible hand held device. With the Viking App, this tool becomes a wireless extension of the control board allowing you to view and change settings, review diagnostic information, operate the gate for testing and update the control boards firmware. **Part# VA-KONNECT-D**

*\*\*\*Q-7, B-12 & ECU Operators require (1) Antenna Extension Cable (part# VA-RPSMA)\*\*\**



**VIKING MONITOR** Off-site access to operator diagnostics and perform firmware updates from just about anywhere with cellular service. With the Viking App, this tool allows you to monitor and label multiple operators by site and location for quick reference. Provides error notifications, operator status, settings and diagnostic information.

**Part# VA-MONITOR**

*\*\*\*Q-7, B-12 & ECU Operators require (1) Antenna Extension Cable (part# VA-RPSMA)\*\*\**



**VIKING APP** Mobile device user interface application for Viking Konnect and Viking Monitor. Available for iOS, Android and Windows operating systems. Free for download from your mobile device application store or [www.vikingaccess.com](http://www.vikingaccess.com)



## **VIKING SOLAR Related Components:**

**12V 40W Solar Panels** Part# VA-S040W

**12V 35Ah batteries** Part# DUBA35

**⚠ NOTE:** The number of cycles achieved are dependent upon the following and may require increased panel and battery capacities:

- Power consumption of all accessories being used
- Average solar radiation of geographic location

# OUR CONTINUOUS COMMITMENT TO EXCELLENCE

Viking Access Systems is continuously working hard to identify and design products that will appeal to the industry and its needs. As technology continues to advance, we have developed a completely efficient and intelligent line of gate operators to meet the changing demands. These machines offer: full UL325 and UL991 compliance, soft-start and soft-stop, intelligent obstruction sensors and extreme power efficiency. Innovative features include: adaptive and self-learning algorithms, redundancy design in both hardware and software to ensure operation and functionality, protection from lightning, short circuit and power surges, and our exclusive drive-train design offering the highest efficiency rating in the industry. Our entire product line is continually modified and improved based on the latest technology and our customer's valuable feedback. The results are products that offer accuracy, efficiency, reliability and performance, all in sleek, high-tech designs.

We pledge to continue establishing ourselves as the leader in high quality, innovative gate operators by developing "Next Level" technology. We are committed to providing safety and convenience with innovative solutions for every security gate need.





# STANDARD FEATURES

- Single 12V battery and single 12V solar panel operation.
- Most Advanced Charging System in the industry.
- Power Saving Technology minimizes current draw.
- Viking Solar Power Management System maximizes the number of cycles per day
- Sleep Mode for non-essential accessories minimizes current draw on stand-by.
- High Efficiency Electro-Mechanical Design increases the number of cycles per day.
- Twice, or more, the number of cycles per day, with a 10W solar panel, compared to other manufacturers.
- Real Time Status Display of the solar panel voltage, charging voltage and battery voltage.
- 4 years limited warranty (Visit our website for more details)
- Built-in protection against lightning strikes or similar electrical surges
- Inherent Overload Protection; Redundancy Design with multiple types of protection.
- Powder Coated Aluminum Enclosure.
- Easy access to manual operation, allowing the gate to be move by hand, independently of the operator.
- Fast and easy installation process.
- Modular connectors for easy access control and accessory installation.
- LCD display for monitoring and diagnostic purposes.
- Self Diagnose Features conveniently displays any errors in the system.
- Made in USA.

INSTALLATION DATE: \_\_\_\_\_

COMPANY / INSTALLER: \_\_\_\_\_

CONTACT: \_\_\_\_\_

SERIAL NUMBER(S): \_\_\_\_\_

ALL INSTALLATION, MAINTENANCE AND REPAIR WORK MUST BE DOCUMENTED AND MADE AVAILABLE TO THE USER.



## VIKING ACCESS SYSTEMS

631 Wald Irvine, CA 92618

Phone 800.908.0884

Fax 949.753.1640

[www.vikingaccess.com](http://www.vikingaccess.com)