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All rights reserved. No part of this manual may be reproduced in any means: graphics, electronics or mechanical, including photocopying without the expressed written permission of the publisher. Materials, components and specifications are subject to change without notice.
**UL 325 Class of Operation** - Class I, II, III, IV

**Gate Type** - Vehicular Slide Gate

**Max Gate Length** - 50 ft

**Max Gate Weight:**
- MAX 1500 - 1500 lbs Level Gate; 1000 lbs Uphill Gate - 5° Max
- MAX 2200 - 2200 lbs Level Gate; 1500 lbs Uphill Gate - 5° Max

**Opening Time** - Selectable speed control (MAX - 12 inch per second)

**Cycles per Hour AC Power** - Continuous

**Battery Back-Up Cycles** (Batteries fully charged):
- MAX 1500 - approximately 100 cycles
- MAX 2200 - approximately 100 cycles

**Input AC Power** - Switchable: 115VAC or 230VAC single phase

**Motor:**
- MAX 1500 - 1/2 HP 24VDC Brushless (6 million cycles)
- MAX 2200 - 1 HP 24VDC Brushless (6 million cycles)

**Chain Size** - #40

**Operating Temperature**: -4°F to 158°F (-20°C to 70°C)

**Entrapment Protection:**
- UL 325 Type A Inherent (ERD sensor)
- Inputs for **NORMALLY CLOSED (N.C.)**
  - UL 325 Type B1 (photo cell)
  - and Type B2 (sensing edge)

---

**IMPORTANT SAFETY INFORMATION**

**WARNING** – To reduce the risk of injury or death:

1. **READ AND FOLLOW ALL INSTRUCTIONS.**

2. Never let children operate or play with gate controls. Keep the remote control 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 stop when an object activates the non-contact sensors. After adjusting the force or the limit of 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 owner’s manual. Have a qualified service person make repairs to gate hardware.

7. The entrance is for vehicles only. Pedestrians must use separate entrance.

8. **SAVE THESE INSTRUCTIONS**
CL ASS I
Residential Vehicular Gate Operator - A vehicular gate operator (opener or system) intended for use in a home of one to four single family dwellings, or a garage or parking area associated therewith.

CL ASS II
Commercial/General Access Vehicular Gate Operator - A vehicular gate operator (opener 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.

CL ASS III
Industrial/Limited Access Vehicular Gate Operator - A vehicular gate operator (opener or system) intended for uses in an industrial location, loading dock area or other location not intended to service the general public.

CL ASS IV
Restricted Access Vehicular Gate Operator - A vehicular gate operator (opener or system) intended for use in a guarded industrial location or buildings such as airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

UL 325 REQUIRED ENTRAPMENT PROTECTION

This vehicular gate operator must be installed with at least two independent entrapment protection means as specified in the table and definitions below. The same type of device shall not be used for both entrapment protection means. Use of a single device to cover both the opening and closing directions is in accordance with the requirement, however, a single device is not required to cover both directions. This operator has been provided with type A entrapment protection. The installer is required to install additional entrapment protection devices in each entrapment area.

<table>
<thead>
<tr>
<th>Gate Type</th>
<th>Class I &amp; II</th>
<th>Class III &amp; IV</th>
</tr>
</thead>
</table>

A - Inherent entrapment protection system.
B1 - Provision for connection of a non-contact sensor (photoelectric sensor or the equivalent).
B2 - Provision for connection of a contact sensor (edge device or the equivalent).
* B1 and B2 means of entrapment protection must be MONITORED.

C - Inherent adjustable clutch or pressure relief device.
D - Provision for connection of an actuating device requiring continuous pressure to maintain opening or closing motion of the gate.
E - An audio alarm.
A Install the gate operator only when:

1 The operator is appropriate for the construction of the gate and the usage Class of the gate,
2 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,
3 All exposed pinch points are eliminated or guarded, and
4 Guarding is supplied for exposed rollers.

B 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 in contact with the vehicular gate during the entire path of travel of the vehicular gate.

C 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 into public access areas.

D 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.

E For gate operators utilizing Type D protection:

1 The gate operator controls must be placed so that the user has full view of the gate area when the gate is moving,
2 A gate operator shall additionally be provided with a placard that is marked in letters at least 1/4-in (6.4-mm) high with the word "WARNING" and the following statement or the equivalent: "Moving Gate Has Potential of Inflicting Injury or Death - Do Not Start Gate Unless Path is Clear".
3 An automatic closing device (such as a timer, loop sensor, or similar device) shall not be employed, and
4 No other activation device shall be connected.

F 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.

G 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.

H A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.

I For gate operators utilizing a non-contact sensor:

1 See instructions on the placement of non-contact sensors for each Type of application,
2 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
3 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.

J For a gate operator utilizing a contact sensor:

1 One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as at the leading edge, trailing edge, and post mounted both inside and outside of a vehicular horizontal slide gate.
2 One or more contact sensors shall be located at the bottom edge of a vehicular vertical lift gate.
3 One or more contact sensors shall be located at the pinch point of a vehicular vertical pivot gate.
4 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.
5 A wireless device 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 device shall function under the intended end-use conditions.
6 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.
7 One or more contact sensors shall be located at the bottom edge of a vertical barrier (arm).
INTENDED USE OF
SLIDE GATE OPERATOR

The operator is intended for use on a VEHICULAR slide gate ONLY. It is intended to be used WITH appropriate entrapment protection safety devices and in-ground vehicle loop detection system. This operator has an inherent entrapment protection system and requires additional external monitored entrapment protection devices (Non-contact Photocells or contact sensing edges) for each entrapment area prior to gate operation.

Opening Direction 10K Sensing Edge: Helps guard against the opening gate from entrapment. (Wireless)

Gate Pickets: The space between the gate pickets should be LESS than 2 1/4" or wire mesh should be installed.

Wire Mesh: 2" x 2" at least 6 ft high. Installed on gate when the space between the gate pickets is MORE than 2 1/4". See "A2" on previous page for more information.

Warning Signs: Should be installed on both sides of gate area and easily visible.

Guide Rollers: Must be installed for safety.

Closing Direction 10K Sensing Edge: Helps protect the gate operator from accidentally closing on vehicles in the gate’s closing path. (Wireless)

Opening Direction 10K Sensing Edge: Helps guard against the opening gate from entrapment between wall and gate.

Pedestrians MUST use a separate entrance.

Physical Stops: Install on both ends of gate rail to limit the travel of gate to the fully open and fully closed positions.

In-Ground Loops: Help protect the gate operator from accidentally opening and/or closing on vehicles in the gate’s path.

NOTE: sensors MUST be MONITORED and NORMALLY CLOSED (N.C.)
Read and understand this entire manual before installation. Check with the local building department prior to installing this gate operator to comply with local building code requirements. 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.

**Operator in Front Mounting Position (Standard)**

The gate must be properly installed and work freely in both directions prior to installation of the gate operator.

### Operator Position on Concrete Pad

- **Outside Property**
- **Operator in Front Position**
- **Inside Property**
- **Concrete Pad**
- **Gate in Closed Position**

#### Conduit Guidelines and Suggestions

- REQUIRED - AC input power wire.
- Entrapment protection photocell. See page 14.
- Entrapment protection sensing edge. See page 15.
- In-ground loop wires. See page 16.

**ONE** Entrapment protection sensor MUST installed or operator will **NOT** function. It **MUST** be **MONITORED** and **NORMALLY CLOSED (N.C.)**

---

**Concrete Pad**

- **Conduit Area**
- **Concrete Frame**
- **V-Rail**
- **Physical Stop**

**Concrete Depth Note:** The heavier the gate, the deeper the concrete pad should be. At least **two feet** recommended for heavier gate.

---

**Optional** Input Power Note:

24VDC low voltage power wires can be run from a remote power supply (MAX Magic Box) to power the gate operator if desired. See page 11 for more information.
Top View of Operator

NOTE: 25 ft of #40 nickel plated chain included.

Minimum distance between the drive gear and gate is 4”.

IMPORTANT: Operator and chain MUST be parallel to gate or the idler wheels could fail. Use the “Fine Tune” adjustment on the gate bracket connection bolt and make sure the chain runs through the idler wheels without binding on the side chain guides.

Back View of Operator

Chain brackets MUST remain same height as idler wheels.

NOTE: The chain should sag no more than one (1) inch per 10 feet of travel. Do not over tighten the chain.
The gate must be properly installed and work freely in both directions prior to the installation of the gate operator. The chain is not visible when looking from outside of the property.

**Operator Position on Concrete Pad**

**Conduit Guidelines and Suggestions**
- **REQUIRED** - AC input power wire.
- Entrapment protection photocell. See page 14.
- Entrapment protection sensing edge. See page 15.
- In-ground loop wires. See page 16.

**ONE** Entrapment protection sensor MUST installed or operator will **NOT** function. It **MUST** be **MONITORED** and **NORMALLY CLOSED (N.C.)**

**Operator in Rear Position**

- Guide rollers **MUST** be installed to keep gate upright.
- Secure gate operator to concrete pad with four (4) 1/2” x 3” (min) sleeve anchors.
- Install positive stops on **BOTH** ends of rail to keep gate from traveling off of rail.
- Check local building codes in your area for depth of concrete before installation.
- See page 9 for chain information.
- See page 11 for more information.

**Concrete Depth Note:** The heavier the gate, the deeper the concrete pad should be. At least **two feet** recommended for heavier gate.

---

**“Optional” Input Power Note:**
24VDC low voltage power wires can be run from a remote power supply (MAX Magic Box) to power the gate operator if desired.
**Installation**

**Connect Chain to Gate - Rear Mounting Position**

**NOTE:** 25 ft of #40 nickel plated chain included.

![Top View Diagram](image1)

**NOTE:** The chain should sag no more than one (1) inch per 10 feet of travel. Do not over tighten the chain.

![Back View Diagram](image2)

**IMPORTANT:** Make sure that chain is parallel to gate. Incorrect installation will cause excessive noise, idler and pulley wheel wear and chain stretching.

Limit sensors will need to be relocated to align with rear chain configuration. See page 38 for more information.

**Modify Cover for Rear Mounting Position**

- Drill 2" dia. hole for upper chain exit.
- Approx. 1.5" - 16.5"
- Existing chain exit slot.

- Cut out cover between new hole and existing chain exit slot.
- Make sure cuts are plumb with existing chain exit slot.

**IMPORTANT:** Gray Limit sensor **MUST** be in the OPEN position.
The gates must be properly installed and work freely in both directions prior to the installation of the dual gate operators. See “Operator in Front Mounting Position” on page 6 for operator positions.

Conduit Guidelines and Suggestions

- REQUIRED - AC input power wire to EACH gate operator.
- REQUIRED - RS-485 wires CONNECT operators together.
- Entrapment protection photocell wired to EACH Corresponding OPERATOR. See below & page 14.
- Entrapment protection sensing edge wired to EACH Corresponding OPERATOR. See below & page 15.
- Normally open photocell safety protection wires to MATRIX 1 See below & page 14.
- In-ground loop wires to MATRIX 1. See page 16.
- Optional external OPEN/CLOSE key switch wires from EACH OPERATOR to key switch. See page 37.

Each entrapment protection device MUST be connected to corresponding gate operator.

Dual Gates CLOSING direction Thru-Beam Photocell ONLY:
See separate wiring instruction sheet.

See pages 14-15 for installation instructions.
See pages 19-20 for wiring instructions.
A remote power supply is for installations where it is too costly or difficult to trench a 115/230 VAC power line to the operator but instead run a low voltage power line to the operator. A **MAX Magic Box** Kit (sold separately) is required to remotely install a **MAX Toroid 15 Amp Box**.

Install **MAX Magic Box** near the 115 VAC or 230 VAC input AC power source. See tables for MAX distance away from operator. See page 22 for **MAX Magic Box** wiring instructions.

**NOTE:** A **MAX Magic Box** kit is required for EACH gate operator when using dual gate operators.
**SOLAR - OPTIONAL**

Refer to Solar application guide.

**MAX Solar Power Kit:** MUST be used when using solar power, sold separately.

**Solar Panel:** must be mounted facing south. It must get full sunlight throughout the day, **NO** shadow obstructions.
INSTALL WARNING SIGNS

A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.
Install photocells to help protect against entrapment during cycling of the gate (entrapment protection). **ONE** entrapment protection sensor **MUST** be installed and connected to “Edge 1 CLOSING direction” on MC-200 motor controller or operator will **NOT** function. Entrapment protection sensors **MUST** be **MONITORED** and **NORMALLY CLOSED (N.C.)**.

**OPENING Direction**

**IMPORTANT:** Entrapment Protection Photocells **MUST** be Monitored Normally Closed Type. See page 20.

**IMPORTANT:** Photocells **MUST** be in alignment or fault will occur.

**Photocell Beam Height**

Install photocells on either side of gate, as close as practical to the gate but no further away than 5”.

**Beam Height:** 21” for most installations but No higher than 27.5” above ground.

**IMPORTANT:** Photocells **MUST** be in alignment or fault will occur.

**NOTE:** Photo input on Matrix 1 is **NOT** MONITORED (Normally OPEN) and is **NOT** UL 325 entrapment protection.

**CLOSING Direction**

**IMPORTANT:** Photocells **MUST** be in alignment or fault will occur.

See pages 19-20 for wiring instructions.
Install sensing edges to help protect against entrapment during cycling of the gate (entrapment protection).

**ONE** entrapment protection sensor **MUST** be installed and connected to “**Edge 1 CLOSING direction**” on MC-200 motor controller or operator will **NOT** function. Entrapment protection sensors **MUST** be **MONITORED 10K NORMALLY CLOSED (N.C.) TYPE and a GEM-104 module MUST be installed.**

**OPENING Direction**

**IMPORTANT:** Sensing edges **MUST** be Monitored 10K Normally Closed Type and a GEM-104 module **MUST** be installed. See page 20.

**SENSING EDGE ENTRAPMENT PROTECTION**

See pages 19-20 for wiring instructions.

**SELF-SUPPORTING POST**

If a self-supporting post is being used, then sensing edges need to be installed on **EACH** side of the post to protect against entrapment in the OPENING and CLOSING direction of gate travel.
Install in-ground loops to help protect vehicles from a moving gate. See pages 27 & 31 for wiring instructions.

Refer to loop manufacturer’s instructions to determine specific loop dimensions. **It is recommended that a licenced installer perform this work.**

**Safety Loops**
Are placed on each side of the gate to prevent the gate from closing on a vehicle in its path. They will stop or reverse the cycling of the gate while a vehicle is in or near the gate’s pathway.

**Exit Loop**
Automatically opens the gate for exiting vehicles without having to use a radio transmitter (remote control). The exit loop can be placed a minimum of 4 feet away from the safety loop or far enough away from the gate so it has opened by the time the vehicle approaches it.

**Side View of Saw Cut**

- Sealant
- Backer Rod
- Loop Wire
- 1 1/2" Typical
- 1/4" Saw Cut
- Pavement
- Saw Cut
- Safety Loop
- Exit Loop
- Inside Property
- Outside Property

Run in-ground loops conduit to **Matrix 1**.

Loop lead wires are twisted 6 twists per foot minimum inside conduit.

**Matrix 1 Wiring**

- Lead Wires
- Safety loops need to be wired in series.
Check with local building department prior to installing any permanent wiring on this gate operator. Make sure all wiring complies with local code requirements.

**Gate Operator System Overview**

**Gate Operator**

1. **Matrix 1**: Manages control panel operations. Manages inputs/outputs, loops and reports problems with gate operator. See Matrix 1 Section starting on page 26.

2. **Audible Alarm**: Sounds when there is a problem with cycling the gate. Push the alarm reset button on the operator to shut off alarm (see below). Alarm can sound every time operator is cycled using ONLY battery back-up power when turned ON. See page 44.

3. **24VDC Brushless Motor (6 million cycles)**

4. **Gate Shut-Off / Alarm Reset / Electronic Gate Open/Close**: Located on front of operator cover. See A, B, C below.


6. **MAX Toroid 15 Amp Box**: AC power management for the AC input power to the gate operator. See pages 21, 22 & 25.

7. **MAX BC-7 Battery Module**: Battery Back-Up and DC power management for the gate operator. See page 28.

8. **Limit Sensors**: Communicates gate cycling positions with Matrix 1. See pages 32, 38 & 43.

9. **Limit Sensor Activators (Magnets)**: MUST be mounted on chain in the desired OPEN and CLOSE gate positions to activate the limit sensors. LED will light when activated. See page 38.


11. **Additional Gang Box**: Single gang box to wire a GFCI outlet for additional power outlets if desired. See page 21.

**Gate Shut-Off / Alarm Reset / Electronic Gate Open/Close**

**A Gate Shut-Off Switch**: If turned ON, prevents any control devices from operating gate when servicing operator. Only the Jog left, Jog right buttons on MC-200 motor controller will operate gate. See pages 34 and 41 for complete information about Gate Shut-Off Switch functions.

**B Alarm Reset Button**: Push to shut off alarm and/or reset Matrix 1. See pages 33, 39 & 44.

**C Electronic Gate Open/Close**: Electronically move the gate open or closed by turning removable key. See page 43.
WIRING OPERATOR

GATE OPERATOR SYSTEM OVERVIEW CONTINUED

MAX BC-7 Battery Module

- BATTERY Plug: MUST be plugged into BATTERY IN port BEFORE use.
- POWER/SOLAR IN Port: MAX Toroid 15 Amp Box connection.
- Battery Voltage LEDs: Show amount of battery power available. LEDs are always ON when using AC power. Test battery button must be pressed to show battery power when using battery power ONLY.
- ON/OFF Battery Button:
  - IMPORTANT: Battery power automatically turns ON when MAX Toroid 15 Amp Box AC POWER Switch is turned ON.
  - To turn OFF ALL POWER to operator:
    1. Turn OFF AC POWER Switch on MAX Toroid 15 Amp Box. Battery power remains ON.
    2. WAIT for 15 seconds.
    3. Press and HOLD (approx. 5 seconds) the RED ON/OFF BATTERY button until MAX BC-7 LEDs turn ON, then release button. LEDs will turn OFF.
- Replace Battery LED: Replace battery when lit.
- TEST Battery Button: Press to show amount of battery power available when using battery power ONLY (Battery voltage LEDs will light respectively).
- Battery IN Error LED: Lights when there is a battery connection problem. Make sure battery plug #1 is plugged into BATTERY IN port or there are no damaged or loose wires.

MAX MC-200 Motor Controller

- Motor OVERLOAD LED: Excessive current being drawn by motor when lit.
- ERD LED: ERD sensor has been activated when lit.
- ERD Sensitivity LED: MAX sensitivity reached when lit.
- Jog LEFT/RIGHT Buttons:
  - Push and HOLD buttons accordingly to move the gate (release the button to stop gate). WARNING: Avoid moving gate while using Jog buttons.
- Inputs:
  - Jog LT/RT inputs: Can connect to an External Open/Close Key switch. Connect a single key switch to control dual gate operators, see page 37.
  - GND input: Low Voltage Common connection.

### Entrainment Protection Sensor Inputs

- Edge 1-MONITORED CLOSING direction ONLY input: Connects to a NORMALLY CLOSED (N.C.) Sensing Edge or Photocell.
- Edge 2-LEARNED MONITORED OPENING/CLOSING direction input: Connects to a NORMALLY CLOSED (N.C.) Sensing Edge or Photocell. Input MUST be “LEARNED” before it can MONITOR a connected sensor (see page 20).
- Photocell LED: Photocell input has been activated when lit.
- Power LED: Low voltage power is connected when lit.
- RS-485 input: Factory wired for Primary operator. Wire to Matrix #1 “SEC GATE” for Secondary operator ONLY.
- 24V Power Input: 24V Power for Matrix 1 ONLY.
- 12V Entrainment Protection Sensor Power Out: 12V Power that ALL Entrainment protection sensors MUST use PWR 12V power.

Dual Gate Operators Note: Connect EACH photocell/sensing edge to the corresponding gate operator’s MC-200. See page 10.
Typical Wiring For:

a 10K Normally Closed (N.C.) Sensing Edge......AND/OR........ a Normally Closed (N.C.) Photo Cell

**Important:** Sensing devices **MUST** be powered by MC-200 or they will **NOT** be **MONITORED.**
Normally Closed Definition: When Power is off, relay contacts are OPEN. When Power is on, relay contacts are CLOSED.

Inputs ② & ③ MUST be “LEARNED” to MONITOR OPENING/CLOSING direction sensors.

To LEARN inputs ② & ③:

1. MONITORED Sensors MUST be wired to inputs BEFORE they can be learned. Any unused inputs MUST be jumpered, see previous page.
2. A Sensing Edge or Photo Cell can be wired to either input 2 or 3.

3. Press and HOLD the STOP button & then the OPEN button together on Matrix 1 until beep is heard, learn mode begins. **NOTE: DO NOT** press the OPEN button before the STOP button or learn mode will NOT function.

4. LEDs WILL be ON for each detected sensor on MC-200. LEDs WILL be ON for BOTH MC-200s when dual operators are used. If an LED is not on and it should be, wiring to sensor is bad, photocells are out of alignment, photocells are wired wrong - N.C. or N.O. depending on which photocells are used (see below) or sensor is bad etc. and must be corrected. When all LEDs are ON that should be ON, proceed to next step.

5. Press STOP button again within 5 min. to learn sensors and end learn mode, beeping stops. Wired Inputs are now MONITORED.

If STOP button is not pressed within 5 min. learn mode terminates.
If no sensors are detected then factory default setting (Edge 2 and Photo Cell are NOT Monitored) is restored.

**UL 325 2016 Compliant MONITORED Normally Closed Entrapment Protection Devices:**

- Photo Cells:
  - Model RG Miller Edge Reflecti-GUARD Reflective-Beam Type (Normally Closed)
  - Model PG Miller Edge Prime-GUARD Thru-Beam Type with battery operated transmitter (Normally Closed)
  - Model EMX-IRB-MON EMX Thru-Beam Type (Normally Closed)
  - Model EMX-IRB-RET EMX Reflective-Beam Type (**MUST be wired to Normally Open**)
  - Model E3K-R10K4-NR OMRON Photo Electric Sensor Reflective-Beam Type (**MUST be wired to Normally Open**) will work with 12V
  - Model 60-2728-1 Allen Bradley Reflective-Beam Type (**MUST be wired to Normally Open**)
- Direct-wired 10K Sensing Edge:
  - Model 10K Sensing Edge with GEM-104 Module Miller Edge (Normally Closed)
  - MAX 10K Mini Edge Maximum Controls (Normally Closed) requires a Miller Edge GEM-104 module
  - MAX 10K Edge 1 Maximum Controls (Normally Closed) requires a Miller Edge GEM-104 module
- Sensing Edge Wireless Transmitter/Receiver:
  - Model MGL-K20 Miller Edge Monitored Gate Link Transmission and Receiver
Choose either 115V or 230V setting on input AC power selector switch. Wire desired input AC power wire to power terminal. A additional single gang box is provided to install power outlets if desired. **NOTE:** AC power wire is required for EACH gate operator when using dual gate operators.

**CAUTION:** MAKE SURE CIRCUIT BREAKER IS OFF AT AC POWER SOURCE BEFORE WIRING

**Input AC Power Options**

- **Single Phase 115VAC Only**
- **Single Phase 230VAC Only**

**Operator MUST be Properly GROUNDED**

Any of the THREE Chassis Grounds can be used. They are located next to the gear reducer. **DO NOT** remove any existing green ground wires.

**WARNING**

Connect chassis to ground rod for lightning protection. Proper grounding of this gate operator is a requirement for LIGHTNING PROTECTION in lightning prone areas. To be effective, ground connections should be made with a minimum 12 AWG, 600 volt insulated wire to a ground point within 10 feet of the gate operator. The ground point must be at an electrical panel, a metallic cold water pipe that runs in the earth, or a grounding rod.

**NOTE:** Consult city codes for AC line wiring. Beware of existing ground connections should be made with a metallic cold water pipe that runs in the earth, or a grounding rod.
A MAX Magic Box Kit (sold separately) is required to remotely install a MAX Toroid 15 Amp box at the AC power source. Plug in Remote Toroid 15 Amp connector to **Power In** at MAX Magic Box. Wire input AC power to the Toroid 15 Amp box. Choose either 115V or 230V setting on input AC power selector switch. Run 24V low voltage wires (not included) from the MAX Magic Box connection to the gate operator and wire to **POWER/SOLAR IN connector** (Polarity Matters!). Remove the MAX Toroid 15 Amp connector from the BC-7 battery module **POWER/SOLAR IN** port. Plug the Magic Box **POWER/SOLAR IN** connector into the **POWER/SOLAR IN** port.

**NOTE:** A MAX Magic Box kit is required for **EACH** gate operator when using dual gate operators.

**At MAX Magic Box**

**DO NOT TURN POWER ON AT THIS TIME.**

**DANGER**

**HIGH VOLTAGE!**

**Input AC Power Selector Switch**

**CAUTION:** If power selector switch is set for 115V but input power is actually 230V, 7 Amp Fuse will blow.

**NOTE:** Consult city codes for AC line wiring.

**CAUTION:** MAKE SURE CIRCUIT BREAKER IS OFF AT POWER SOURCE BEFORE WIRING

**IMPORTANT NOTE:** Maximum Control’s remote power supply technology does **NOT** utilize the battery power from the MAX BC-7 Battery Module during **NORMAL** gate operation. Battery power is reserved for back-up power **ONLY when an AC power failure occurs**. As a result, battery life is **NOT** shortened. This low voltage system can **CONTINUOUSLY** cycle the gate during **NORMAL** gate operation, perfect for high traffic gate applications.

**At Gate Operator**

**MAX Magic Box MUST be Properly GROUNDED**

**IMPORTANT:** MAX Magic Box and Gate Operator **MUST EACH** be Properly GROUNDED. Proper grounding is a requirement for **LIGHTNING PROTECTION** in lightning prone areas. To be effective, ground connections should be made with a **minimum 12 AWG, 600 volt** insulated wire to a ground point within **10 feet** of the MAX Magic Box and gate operator. The ground point must be at an **electrical panel**, a **metallic cold water pipe** that runs in the earth, or a **grounding rod**.

**NOTE:** Beware of existing underground services.
SOLAR POWER CONNECTION - OPTIONAL

Refer to Solar application guide.

NOTE: Cover solar panel from sunlight BEFORE wiring plug to solar panel to prevent a shock from occurring.

Remove the MAX Toroid 15 Amp connector from the BC-7 battery module POWER/SOLAR IN port. Connect the power/solar plug into the POWER/SOLAR IN port.

Pos + Red
Polarity Matters!
GND Black
Unplug 4-Pin plug from the back of the MAX MC-200 motor controller and connect RS-485 wires as shown below.

Connect (3) three RS-485 wires from the SECONDARY operator's MAX MC-200 motor controller to the Matrix 1 - SEC GATE. DO NOT connect PWR 24V.
Operator should have Input AC power wired to MAX Toroid box, 24V & RS-485 wired between Matrix 1 and MC-200 and “Optional” External Jog switch wired to MC-200. TURN POWER ON. Certain LEDs should normally turn ON accordingly:

Turn AC Power Switch ON
Battery power automatically turns ON.

DO NOT CYCLE GATE OPERATOR AT THIS TIME
Open and Close Limit Sensor Activators MUST be installed on chain BEFORE cycling gate or DAMAGE CAN OCCUR!

MAX Toroid 15 Amp Box
A AC IN LED:
Normal - Turns ON.
Error - Not ON. Check AC power.
7 Amp Fuse blown. Replace fuse.
Input AC selector switch MUST be set to CORRECT input AC power.

B MAX MC-200 Motor Controller
POWER LED:
Normal - Turns ON.
Error - Not ON. Check POWER IN plug on back of MC-200.

C Matrix On-Line LED:
Normal - Turns ON.
Error - Not ON. Check RS-485 wiring to Matrix 1.

D Limit SW On-Line LED:
Normal - Turns ON.
Error - Not ON. Check LIMIT SWITCH plug.

E Matrix 1
POWER LED:
Normal - Turns ON.
Error - Not ON. Check 24V wiring from MC-200 Primary/Single.

F Motor On-Line PRIMARY LED (Secondary LED if installed):
Normal - Turns ON.
Error - Not ON. Check RS-485 wiring to Primary/Single MC-200.

G Limit SW On-Line PRIMARY LED (Secondary LED if installed):
Normal - Turns ON.

H PRIMARY GATE OPEN RIGHT OPEN LEFT LED:
Normal - Turns ON either LED according to switch setting.
Error - Not ON. Check LIMIT SWITCH plug on back of MC-200.

I BATTERY IN USE LED:
Normal - Not ON.
Error - Flashes on and off. Battery not plugged in to BATTERY IN port on BC-7 Battery Module.

J MAX BC-7 Battery Module
BATTERY VOLTAGE LED:
Normal - 3 LEDs turn ON - Fully charged batteries.
Batteries need charging - LEDs will turn on in sequence until batteries are fully charged. Batteries are NOT necessary when AC power is available.

K BATTERY IN ERROR LED:
Normal - Not ON.
Error - Turns ON. Battery not plugged in to BATTERY IN port.

To turn OFF ALL POWER:
1. Turn OFF AC POWER Switch on MAX Toroid 15 Amp. Battery power remains ON.
2. WAIT for 15 seconds.
3. Press and HOLD (approx. 5 seconds) the RED ON/OFF BATTERY button until MAX BC-7 LEDs turn ON, then release button. LEDs will turn OFF.
1. Battery Back-Up Mode - Page 28
2. Primary Gate - Page 28
3. Maglock - Page 31
4. Gate Tamper - Page 32
5. In-Ground Loop Connection - Page 31
6. Anti Tailgate - Page 29
7. Loop Detectors - Page 31
8. UL Entrapment LEDs - Page 32
9. Close Timer - Page 28
10. ID Plug & ID Plug Error LED - Page 32
11. UL Alarm Strobe Light Input - Page 33
   Gate Shut-Off Switch (Factory Installed) - Page 36
12. Radio Power - Page 30
13. Partial Open - Page 33
14. OBD Port Black Box - Page 30
15. Selectable Gate Speed Control - Page 28
16. Motor Motion LEDs - Page 34
17. Gate Status - Page 34
18. Radio Relay - Page 30
19. Emergency Vehicle/Max Open Inputs - Page 32
20. Normal Opening Devices - Page 27
21. Close direction Photocell (N.O.) - Page 34
22. Operators Communication LEDs - Page 24 & 35
23. OPEN/STOP/CLOSE Connection - Page 34
24. Gate Disable - Page 33
25. Matrix 1 Power - Page 35
26. Battery in Use - Page 35

A. Gate in Motion Alarms - Page 30
B. Single Pass Anti-Tailgate - Page 29
C. Radio Safety Pause - Page 30

Beeper Alert sounds in Battery Back-Up Mode while gate is in motion
Beeper Alert OFF

Gate Shut-Off Switch

A new radio signal will open the gate.

When turned "ON", after a vehicle clears the Safety Loop, a closing gate will PAUSE if a second vehicle attempts to tailgate. The second vehicle must then back off the safety loop for the gate to continue closing. A new radio signal will open the gate.

When turned "ON" a moving gate will pause if a radio input signal is received. The next radio signal will cause the gate to continue in the original direction.
Set the Primary/single gate operator with Primary Gate setting. Secondary operator will automatically be set to the opposite opening direction as the primary gate operator when using dual gates.

Rear Installation NOTE: The Gray Limit sensor MUST be in the gate’s OPEN position to allow this switch to function as shown. See page 38 for more information.

The Close Timer has 16 selectable settings for automatic gate close time. Knob at OFF position: close timer OFF. 1st click clockwise - Knob at MIN position: 1/2 sec... 2nd click clockwise: 1 sec... 3rd click: 4 sec... 4th click: 8 sec... 5th click: 12 sec (4 sec increments for each successive click up to 60 sec MAX) NOTE: 1/2 sec MIN position is recommended for High Traffic areas.

The Gate Speed knob has 16 selectable settings to choose from, with maximum speed of 12 in/sec and minimum speed of 8 in/sec. Make sure gate speed is appropriate for the weight and length of the gate. Limit sensor activators MUST be installed and gate positions learned BEFORE gate speed can be selected, see page 38.

NOTE: The Auto Gate Sync feature provides synchronous opening and closing between bi-parting gates (dual gate operators).

The Battery Back-Up Mode setting will determine how the gate operator will function during an AC power failure. The number of gate cycles on a fully charged battery, using only battery power depends on the weight and length of the gate.

LEAVE OPEN - The gate operator will continue to cycle the gate normally until the battery power can no longer cycle the gate. When this happens, the gate operator will open the gate and leave it in the FULL OPEN position until power is restored.

LEAVE CLOSED - The gate operator will continue to cycle the gate normally until the battery power can no longer cycle the gate. When this happens, the gate will close if not already in the CLOSE position, where it will remain until power is restored. Enough battery power is retained for a LIMITED time to operate emergency vehicle entry (Using opening devices connected to FIRE DEPT and/or MAX OPEN inputs to FULLY open gate).

OPEN 1 TIME - The gate operator will automatically FULLY OPEN gate once and leave it in the OPEN position until power is restored.
**ANTI TAILGATE**

Turned OFF - Close timer will close the gate. If an in-ground safety or exit loop gets activated during the close cycle, gate will REVERSE to the open position.

Turned ON - (In-ground loops required) Gate will close after all the in-ground loops have been cleared no matter how long the close timer is set for. If an in-ground safety loop gets activated during the close cycle, gate will REVERSE to the open position.

**SINGLE PASS ANTI-TAILGATE**

Turned ON - (In-ground loops required) Gate will close after all the in-ground loops have been cleared no matter how long the close timer is set for. When an in-ground safety loop gets activated during the close cycle, gate will PAUSE and NOT reopen. When loop is cleared, gate will continue to close preventing UNAUTHORIZED entry.

---

**VALID open command was given. When last Safety Loop is cleared, gate will close.**

**NOTE:** If a VALID open command is received at this point, gate will stop and reopen.

---

**NO VALID open command is given. Vehicle is attempting to activate safety loop before the gate’s close cycle is complete, expecting gate to reopen.**

---

**NO VALID open command. Safety Loop gets activated and PAUSES the closing gate. Gate will NOT reopen. Vehicle MUST back up for loop to clear, then gate continues to close. NO unauthorized entry.**
**RADIO RECEIVER**

Connect a 3-wire or 4-wire radio receiver to Matrix 1. Choose 12V or 24V, 250 ma max. power.

CLOSE TIMER ON - Each time the remote button is pressed during the Close Timer countdown (gate is open) causes the timer to reset and begin again. When close timer countdown is complete, gate will close.

CLOSE TIMER OFF - Sequence when pressing remote button:
- Press One Time - gate OPENS . . .
- Press Again - gate STOPS . . .
- Press Again - gate CLOSES . . .
- Press Again - gate STOPS . . .

Sequence repeats when button is pressed again.

**NOTE:** Signal range is significantly decreased when receiver antenna remains inside operator cover.

**RADIO SAFETY PAUSE**

Turned ON - The radio transmitter (remote control) can PAUSE a MOVING gate by pressing the remote button. Pressing the remote button again will cause the gate to CONTINUE in the SAME direction. This process can be repeated as many times as desired.

**GATE IN MOTION ALARMS**

MODE 0 - Turned ON - Alarm will sound BEFORE and DURING gate cycle to alert surrounding area.

NOTE: A strobe light can be connected to UL ALARM connection that will flash ON and OFF when the alarm is sounding. See page 33.

MODE 1 - Turned ON - Alarm will beep when using ONLY battery power DURING gate cycling. This brings to attention that only battery power is being used and NOT normal AC power.

**OBD PORT BLACK BOX**

On Board Diagnostics (OBD) port will download a simple .txt file to troubleshoot gate operator errors and to view normal transaction logs. Plug a USB flash drive into port. LED will flash while file is downloading. When LED stops flashing, remove flash drive and plug it into any computer with an available USB port and simple text reader software (ie: notepad, word for PC or textedit for Mac).

The operator’s event history is stored as a simple .txt file. Contained in the file is a log of the most recent 1000 events. Quickly identify and diagnose a complex or intermittent problem. The file can even be e-mailed to the factory for on site diagnosis if necessary. The files will be stored as an ongoing event history of the transactions that occur at the gate operator.

**NOTE:** See page 50 for more information about this unique feature.
Maglock MUST be connected as shown.

**MAGLOCK DELAY:** You MUST select a time delay when using a maglock.
Maglock power disengages 1.5 sec or 2 sec before gate starts opening.

**MAGLOCK LED (Monitors Maglock):**
- ON - Locked
- OFF - Unlocked
- Flashing - Problem with Maglock

**Loop Detectors**
Matrix 1 will accept third party loop detectors in the 2 ports (center loop is NOT used). Each loop detector has a corresponding in-ground loop that must be connected for the loop system to operate (see below). Power down Matrix 1 BEFORE plugging in loop detectors. Refer to the chosen loop detector instruction manual for more information.

**Plug-In Loop Detectors**
- Reno Loop Detector (Plug-In)
- EDI Loop Detector (Plug-In)

**External Loop Detectors**
Third party external loop detectors can be used if desired with the **MAX External Loop Detector Cable Adapter.** (1) One is included with the operator but more can be purchased if needed.

**In-Ground Loop Connection**
Connect each in-ground loop wires to the appropriate input. Lead wires should be twisted together 6 twists per foot minimum. See page 16 for in-ground loop installation.
Safety loop wires must be wired in series.
Each LED will light when the corresponding loop detector gets activated by a vehicle passing over its in-ground loop. LEDs will flash when there is an error with the corresponding loop detector.
ID Plug

An ID Plug comes standard on Matrix 1. It identifies the model of gate operator and must be plugged in or the Matrix 1 will not function. Yellow plug must be used for the MAX 1500. Red plug must be used for the MAX 2200.

ID Plug Error LED: Will light when ID Plug is missing.

Gate Tamper

The Gate Tamper can be used for various functions such as turning a warning light, siren or camera on when the gate is tampered with (Vandalized Gate). The gate operator defines a “Vandalized Gate” as unauthorized movement of the gate. This can occur if the chain is dropped and gate is manually moved from the closed position or the gate is forced open from the closed position without authorization.

Tamper NO/Com Relay: Connect a warning light, siren, camera or an existing alarm system to relay.

Tamper IN/GND Input: Connect a sensor device to input. When Tamper In/GND gets triggered, device that is wired to Tamper relay (NO/Com) will activate.

UL Entrapment LEDs

UL Entrapment LEDs will indicate when a opening direction photocell and/or sensing edge(s) have been activated. If alarm gets triggered, press reset button on side of operator to turn alarm off.

NOTE: UL safety approved devices are wired to the MC-200 motor controllers only. Do not wire them to the Matrix 1.

Reverse Sensitivity LED: Will light when the gate encounters an obstruction triggering the ERD sensor.

Emergency Vehicle/Max Open Inputs

Fire Dept Input: Should be connected to a knox box device to allow the proper authorities to gain emergency access when necessary. The input will override the Gate Disable input and allow Emergency personnel full 24/7 access. Gate FULLY opens.

Max Open Input: Can be connected to a key switch and used as an additional input from the Fire Dept input. The input will override the Gate Disable input and allow Security personnel full 24/7 access. Gate FULLY opens.
GATE DISABLE

An ON/OFF switch or 7-Day timer devices can be connected to the GATE DISABLE input. When these devices are turned ON, they will DISABLE normal opening devices such as keypad, exit loop etc. The FIRE DEPT/ MAX OPEN and RADIO inputs will remain enabled when GATE DISABLE has been turned ON. This is useful when the gated area needs to be secured from ALL but emergency or authorized vehicle entry. Some examples are: Residential home vacation period or during closed hours of a business when no one can monitor the property.

When GATE DISABLE is turned ON: The operator will beep for 3 minutes BEFORE arming itself. This allows time to turn ON GATE DISABLE and leave the property before it is armed.

When FIRE DEPT/MAX OPEN gets activated: Gate opens and GATE TAMPER relay will activate immediately.

When RADIO Input gets activated: Gate opens and GATE TAMPER relay will activate after 3 min. This allows time to turn OFF GATE DISABLE or disarm an existing building alarm system if connected.

IMPORTANT: It is NOT recommended activating the GATE DISABLE device while persons are present inside the property.

PARTIAL OPEN

A gate can set to partially open by recording the PARTIAL OPEN gate cycle. LED will stay lit when PARTIAL OPEN is ON. The gate MUST open a minimum of 6 ft for a single vehicular gate and 10 ft for dual vehicular gates. If the opening distance you record is less than the minimum allowed, the operator will beep, NO recording will register and the LED will turn OFF. Retry recording with a greater opening distance. LED remains ON when recording is successful.

IMPORTANT: Limit sensor activators MUST be learned BEFORE Partial Open can be recorded.

To RECORD PARTIAL OPEN:
2. Press Motor Motion OPEN button to start gate’s open cycle.
3. Press Motor Motion STOP button when gate gets to desired partial open position.
4. Press PARTIAL OPEN button AGAIN to STOP recording. LED stops flashing, open position has been successfully recorded. LED remains ON.

To ERASE PARTIAL OPEN recording:
Press and HOLD PARTIAL OPEN button for 5 sec. Blue LED turns OFF.

NOTE: The FIRE DEPT and/or MAX OPEN connected devices will always FULLY open gates even when the partial open is being used.

UL ALARM WARNING LIGHT INPUT

A UL ALARM (strobe light) can be connected. It will turn ON when the GATE IN MOTION - Mode 0 and/or Mode 1 are turned ON (see page 30).

Press ALARM RESET BUTTON to turn OFF activated strobe light.

STROBE LIGHT: 12VDC - 250 mA max.
**GATE STATUS MONITORING**

GATE STATUS LEDs will turn **ON** when gate is in the **OPEN** or **CLOSED** position.

Connect a gate monitoring device to GATE STATUS relays to show if gate is in the **OPEN** or **CLOSED** position.

**OPEN/COM Relay:** Activates when gate gets to the **OPEN** position.

**CLOSE/COM Relay:** Activates when gate gets to the **CLOSED** position.

---

**OPEN/STOP/CLOSE CONNECTION**

The OPEN/STOP/CLOSE inputs will allow a standard 4-wire 3-Button Station or an additional External RESET Button to be connected. Corresponding LEDs will light when each button is activated.

---

**CLOSING PHOTOCELL CONNECTION**

The Normally OPEN PHOTOCELL input will allow a CLOSING DIRECTION Normally OPEN PHOTOCELL to be connected. 12V or 24V power can be supplied for the photocells.

**IMPORTANT:** This input is **NOT UL 325 entrapment protection**.

**NOTE:** This input is typically used when an existing normally open photocell needs to be retro-fitted to this operator when this operator is replacing an obsolete operator.

---

**MOTOR MOTION LEDS**

**REVERSE SENSITIVITY LED:** Will light when the gate encounters an obstruction triggering the ERD sensor.

**MOTOR OVERLOAD LED:** Will light when excessive current is being drawn by motor caused by damaged gate hardware or gate is too heavy.

**NO LIMIT SWITCH/CLAMP SLIPPING LED:** Will light when either limit sensor does NOT activate from it's learned positions.
**GATE OPERATORS COMMUNICATION LEDS**

**PRIMARY/SINGLE** operator’s MC-200 has been wired to the PRIMARY GATE (Factory Wired).

**SECONDARY** operator’s MC-200 gets connected to the SEC GATE (+, GND, -). See page 24.

**LIMIT SWITCH ON-LINE LEDs:** will light for each gate operator’s limit switch that the Matrix 1 is successfully communicating with.

**MOTOR ON-LINE LEDs:** will light for each gate operator’s MC-200 Motor Controller that the Matrix 1 is successfully communicating with.

---

**24V POWER FOR MATRIX 1**

24VDC POWER from PRIMARY/SINGLE operator ONLY.

POWER LED: Will light when 24V low voltage power is connected.

**NOTE:** DO NOT power external devices using this connection. This power is reserved for Matrix 1 and UL opening cycle entrapment photocells ONLY.

---

**BATTERY IN USE LED**

BATTERY IN USE LED will light when operator is using ONLY battery back-up power. The GATE IN MOTION Alarm can be set up to sound alarm when operator is using ONLY battery power DURING gate cycling. This brings to attention that only battery power is being used and NOT normal AC power. See page 30.

**LED Flashing NOTE:** BATTERY IN USE and POWER LEDs flash together when the battery is not plugged into the BATTERY IN port of the MAX BC-7 Battery Module. Make sure battery plug is correctly installed and there is no damaged or loose wires.
**GATE SHUT-OFF SWITCH**

This factory installed switch will disable the normal opening devices when turned **ON**, such as keypad, exit loop etc. Only the **Jog Left** or **Jog Right** buttons on the MAX MC-200 motor controller will operate gate when Gate Shut-Off switch is **ON**.

**IMPORTANT:** When the Gate Shut-Off switch is turned **ON**, operator will be disabled and it will “**BEEP**” for a few seconds to indicate that Gate Shut-Off switch is **ON**.

**Dropping the Chain**

If an existing alarm system (Building alarm system) is connected to the **GATE TAMPER** relay, notify proper authorities **BEFORE** dropping the chain.

**PROPER Dropping of Chain (Normal Operator Servicing):**
1. Turn Gate Shut-Off switch **ON** to disable operator alarm.
2. Drop the Chain.
3. **GATE TAMPER** relay **WILL** be activated.
4. Service operator.
5. Reconnect the chain to gate.
6. Turn Gate Shut-Off switch **OFF**.
7. Reconnect the chain to gate.

**IMPROPER Dropping of Chain (Vandalize):**
Gate Shut-Off switch is **NOT** turned **ON**.
When the chain is improperly dropped (Vandalized), the **OPERATOR ALARM** and **GATE TAMPER** relay will activate. The operator will shut down all operating functions. The alarm reset button **MUST** be pressed to turn **OFF** the alarm and reset the operator. If **GATE TAMPER** relay is connected to an existing building alarm system, then they will get a triggering of their alarm system and should be notified of the situation.
An Optional External Open/Close Key Switch can be connected that allows dual gate operators to be electronically moved open or closed at the same time by wiring both operators to the external key switch. Connect (3) three wires from each MAX MC-200 Motor Controllers to an External Open/Close Key Switch depending on your specific installation, see below.

**Primary/Single Open LEFT**

**Primary/Single Open RIGHT**

**IMPORTANT:**
The External Open/Close Key Switch WILL override GATE DISABLE switch/timer device when turned ON but the GATE TAMPER relay WILL be activated.
The limit sensor activators MUST be installed on BOTH ends of chain to indicate the OPEN and CLOSE positions of the gate or DAMAGE will occur. They will activate the corresponding LIMIT SENSOR (Gray or Black) when they move within range, stopping the gate at the desired positions. The limit sensors have been FACTORY INSTALLED for front mounting position. If rear mounting position is being installed, make sure the limit sensors have been moved to the correct positions (see below).

IMPORTANT: Cycle the gate OPEN and CLOSED AFTER the limit sensor activators have been installed. Operator will cycle slowly to LEARN the open and closed gate positions. After the operator learns the gate positions, it will cycle at the GATE SPEED selected for normal operation, see page 28.

“Fine Tune” Limits Adjustment

Push and HOLD the JOG LEFT or JOG RIGHT buttons accordingly on the MAX MC-200 motor controller to move the gate (release the button to stop gate). This allows gate to be moved back and fourth without leaving the operator to “fine tune” the open and close gate positions if desired.

WARNING: Avoid moving gate while “Fine Tune” adjusting.

IMPORTANT: LEDs MUST light up when gate reaches OPEN and CLOSE positions or operator WILL NOT learn gate positions. If gate positions are not learned, gate cycling speed will remain slow during normal operation.
The MAX 1500 / MAX 2200 is equipped with an **ERD Sensor - Electronic Reversing Device** (Type A) that functions as entrapment protection according to UL 325 standards. The gate will reverse direction after encountering an obstruction in either the OPEN or CLOSE gate cycle.

When the gate encounters an obstruction during the **CLOSE** cycle, it will reverse to the open position and **PAUSE** the gate. An input command (press remote button or exit loop activation) is needed **BEFORE** the gate will reset and close again.

When the gate encounters an obstruction during the **OPEN** cycle, it will reverse approximately 6 inches and **PAUSE** the gate. An input command (press remote button or exit loop activation) is needed **BEFORE** the gate will reset and open again.

For the **ERD Sensitivity** to function correctly:

- Limit sensors **MUST** be learned **BEFORE** adjusting the ERD Sensitivity. See previous page if you have questions about how limit sensors are learned.

**Adjusting ERD Sensitivity**

A. Turn knob until blue LED lights up. Max sensitivity reached, Position 1.
- “1” - Maximum sensitivity setting. Too sensitive for most gates. (LED lights)
- “16” - Minimum sensitivity setting. Not sensitive enough for most gates. (LED is off)

B. Turn knob **counter-clockwise** to reduce sensitivity during ERD testing as needed. (LED remains OFF for all but position 1)

**Testing ERD Sensitivity**

Allow the gate to strike an immobile object while **OPENING** and **CLOSING**. The gate **MUST** reverse direction after striking the object. Increase or decrease the **ERD Sensitivity** as needed. Repeat this process until the correct sensitivity is achieved. If alarm sounds while preforming this procedure, press **STOP BUTTON** on Matrix 1 or externally mounted **Alarm Reset button** to shut-off alarm.

**“Min” ERD Position 16 Setting**

When solid gates are installed in:
- **Unusually high wind areas**
- **Uphill opening gate**
- **Heavy gate**
- **Cantilever type gate**

ERD sensor can be set to **Min** (position 16) to keep the gate cycling normally in such extreme conditions.

**CAUTION**: Minimum sensitivity setting (position 16) results in gate exerting **MAXIMUM force** before reversing direction.

**IMPORTANT**: When satisfied with ERD adjustment, cycle the gate 3 or 4 times to make sure that the ERD sensor does not **falsely trigger** during normal gate operation. Readjust if this happens.
MAINTENANCE

QUALIFIED GATE OPERATOR TECHNICIAN

Maintenance and repair of the gate operator must be performed by a qualified professional gate operator technician. The following services need to be periodically performed:

• Turn ON the Gate Shut-Off Switch BEFORE performing any maintenance.
• Check and adjust the gate operator's force, speed, and sensitivity.
• Make sure all power (AC/DC) connections are corrosion free.
• Check all batteries for proper voltage.
• Check the incoming line voltage and confirm it is within 10% of its rating (115 or 230 volts).
• Verify battery backup functionality by turning off the power source (115 VAC and 230 VAC). Restore power after testing.
• Check that chain is not too loose and remove chain links if necessary. DO NOT make chain too tight.
• Check wheels, guide rollers and chain and lubricate with heavy-duty, high-performance lubricant where needed.
• Check V rail for signs of cracking or separation from ground.
• Test all contact and non-contact sensors, in-ground vehicle loop detectors, keypad, telephone entry system or any other access control devices that are used to control the gate operator.
• Test the manual release feature.

MAKE SURE END USER/HOME OWNER KNOWS HOW TO PROPERLY REMOVE GATE OPERATOR FROM SERVICE AND WHO TO CONTACT FOR PROFESSIONAL ASSISTANCE.

Date Installed: ___________________________________________________________________

Installer/Company Name: ___________________________________________________________

________________________________________________________________________________

Phone Number: ____________________________ Operator Serial Number: _________________________

END USER/HOMEOWNER

Any repairs and modifications must be performed by a qualified professional gate operator technician. If the gate or gate operator ever malfunctions, end user/home owner needs to immediately remove the gate operator from service (manually position gate (see manual release) in a desired prolonged position and turn ALL power OFF to the gate operator). End user/home owner must call a qualified professional gate operator technician for any repairs and modifications.

The gate operator is virtually maintenance free to an end user/home owner, minimal maintenance is recommended to ensure reliable operation.

End user/home owner:
• Scheduled maintenance should be performed approximately every six months by a qualified professional gate operator technician, or when unusual noises are heard from the wheels, chain, guide rollers and/or gate operator.
• DO NOT remove the operator cover to perform any normal maintenance.
• Lubricate wheels, chain, guide rollers periodically with heavy-duty, high-performance lubricant and clean up all excess lubricant.
• Make sure there are no vehicles or pedestrians in the path of the gate while performing maintenance.
• Make sure the person performing maintenance is the only person in control of all control devices in order to avoid possible involuntary activation of the gate operator. Gate operator MUST be removed from service while maintenance is performed.
• Keep any water from landscape watering hoses or sprinkler systems away from the gate and gate operator area.
• Keep the area around the gate and gate operator as clean as possible.
• Keep any debris away from the gate's moving path.
• Test periodically (use caution) all safety sensors, in-ground vehicle loop detectors, keypad, telephone entry system or any other access control devices that are used to control the gate operator. Make sure everything is working properly.
• Solar panel must be cleaned periodically if solar power is being used.
**ELECTRONIC GATE OPEN/CLOSE**

1. Slide door open and insert key.

2. Turn and HOLD key either way for reversible gate directions.

**CAUTION:** Keep pedestrians and vehicles clear of the gate while it is moving.

**NOTE:** The gate cannot be manually pushed open.

**MECHANICAL GATE RELEASE (MANUAL RELEASE)**

The chain is mechanically dropped to manually release the gate. The **GATE SHUT-OFF SWITCH MUST** be turned **ON** before dropping the chain (See 1 below). **Dropping the chain without turning the Gate Shut-Off switch ON will activate the ALARM and GATE TAMPER feature,** See page 36 for complete information about Gate Shut-Off switch operation.

1. Slide cover door open.
   - Turn Gate Shut-Off switch **ON**.
   - Gate chain can be dropped without the **ALARM** activating.

   - The **GATE TAMPER** relay WILL be activated.

**Optional MAX Chain Release**

Preform 1.

- Insert key and turn to unlock chain.

- Press down lever to release chain.

See page 51 for more information about MAX chain drop mechanism.
If the Alarm Sounds During Normal Gate Operation: When the gate encounters TWO consecutive obstructions before completing a gate cycle, the alarm will sound and the gate will PAUSE in the position where the second obstruction occurred. CHECK THE GATE AREA FOR ANY PROBLEMS BEFORE pressing the alarm reset button on the operator to shut off the alarm and reset the gate. NOTE: Alarm will automatically shut-off after five minutes but will not allow gate to operate until the alarm reset button is pressed.

Some reasons why the alarm sounds:

• A FOREIGN OBJECT is on the gate frame while the gate is moving.

• The gate is TOO HEAVY.

• Debris is on the gate rail such as mud, rocks dirt etc. and gate CANNOT move freely.

• WHEELS are NOT ON GATE RAIL and gate CANNOT move freely.

• WHEELS are BROKEN and gate CANNOT move freely.

• The gate is HITTING a VEHICLE.

• The gate operator tries to close the gate but gate gets CAUGHT on an object and cannot complete a gate cycle.
## REPLACEMENT PARTS LIST

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAX 1500/2200 Cover with Lock and access door</td>
</tr>
<tr>
<td>2</td>
<td>MAX 1500 1/2 HP Brushless DC Motor</td>
</tr>
<tr>
<td>3</td>
<td>MAX 2200 1 HP Brushless DC Motor</td>
</tr>
<tr>
<td>4</td>
<td>MAX 1500 Gear Reducer for 1/2 HP Motor</td>
</tr>
<tr>
<td>5</td>
<td>MAX 2200 Gear Reducer for 1 HP Motor</td>
</tr>
<tr>
<td>6</td>
<td>Cover Locking Bracket</td>
</tr>
<tr>
<td>7</td>
<td>Output Sprocket</td>
</tr>
<tr>
<td>8</td>
<td>Roller Sprocket/ Idler Wheels</td>
</tr>
<tr>
<td>9</td>
<td>BLACK Limit Switch Sensor</td>
</tr>
<tr>
<td>10</td>
<td>GRAY Limit Switch Sensor</td>
</tr>
<tr>
<td>11</td>
<td>Matrix 1 Control Board Assembly</td>
</tr>
<tr>
<td>12</td>
<td>MAX MC-200 Motor Controller Assembly</td>
</tr>
<tr>
<td>13</td>
<td>MAX Toroid 15 Amp Box</td>
</tr>
<tr>
<td>14</td>
<td>Main Chassis</td>
</tr>
<tr>
<td>15</td>
<td>MAX BC-7 Battery Module (7 Ahr)</td>
</tr>
<tr>
<td>16</td>
<td>Single Gang Electrical Boxes</td>
</tr>
</tbody>
</table>

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**Maintenance**: Replacement parts list.

**Replacement Parts List**

- MAX 1500/2200 Cover with Lock and access door
- MAX 1500 1/2 HP Brushless DC Motor
- MAX 2200 1 HP Brushless DC Motor
- MAX 1500 Gear Reducer for 1/2 HP Motor
- MAX 2200 Gear Reducer for 1 HP Motor
- Cover Locking Bracket
- Output Sprocket
- Roller Sprocket/ Idler Wheels
- BLACK Limit Switch Sensor
- GRAY Limit Switch Sensor
- Matrix 1 Control Board Assembly
- MAX MC-200 Motor Controller Assembly
- MAX Toroid 15 Amp Box
- Main Chassis
- MAX BC-7 Battery Module (7 Ahr)
- Single Gang Electrical Boxes
Maximum Controls LLC ("Manufacture") warrants the original purchaser of this product, for the purpose to which this product is originally installed, that the product is free from defect in materials and/or workmanship for a period of 8 years for the Brushless DC Motor and cover, 5 years for everything else with the exception of the batteries which are limited to a 1 year warranty. The performance of this product is dependent on compliance to the instructions, maintenance, operation, and testing clearly outlined in the user manual. Failure to comply completely with those instructions will void this warranty in its entirety. This warranty does not cover damage to the product caused by vandalism, water damage, direct hit lightning strike, or installation errors. This warranty does not include any labor charges that might be needed to troubleshoot, replace, or repair a problem.

If, during the limited warranty period, one of the components exhibits a defect in material and/or workmanship, please call 949-699-0220 before dismantling the product. Shipping instructions and an RMA (Return Material Authorization) Number will be issued by the factory service center when contacted. Do not send any product in for service without an RMA number. Shipping charges to and from the factory service center for warranty repairs are the responsibility of the customer. Repair or replacement of any warranty items is made at the sole discretion of the Manufacturer.

ALL IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY AND SUITABILITY FOR A PARTICULAR PURPOSE, ARE LIMITED TO 8 YEARS FOR THE BRUSHLESS MOTOR DC AND COVER, 5 YEARS FOR EVERYTHING ELSE WITH THE EXCEPTION OF THE BATTERIES WHICH ARE 1 YEAR. NO IMPLIED WARRANTIES WILL EXTEND BEYOND THE WARRANTIES LISTED ABOVE. Some states do not allow limitations on how long an implied warranty last so this limitation might not apply to you.

This Limited warranty does not cover any problems with or relating to, the gate, the gate hardware, including but not limited to hinges, rollers, brackets, entry devices etc. Any service call that determines the cause of a problem to be external to the product could result in a fee. Under no circumstances shall the manufacture be liable for consequential, incidental or special damages arising in connection with the use, or inability to use, this product. Under no circumstances will the Manufacture’s liability for breach of warranty, breach of contract, negligence or strict liability exceed the cost of the product covered other liability in connection with the sale of this product.
The GATE TAMPER feature will activate the relay when a number of security circumstances occur, making illegal entry almost impossible when the gate operator is connected to an existing building/home alarm system. The GATE TAMPER relay will activate when:

- The gate is PHYSICALLY moved with EXTREME force from closed gate position.
- The chain is disconnected and dropped when the gate is in the closed position.
- The FIRE switch is turned ONLY if the GATE DISABLE has been turned ON.

"Like NO other Gate Operator in the World"
OPTIONS / UNIQUE FEATURES

“Like NO other Gate Operator in the World”

MAGNETIC DYNAMIC BRAKE SYSTEM

This unique built-in feature controls the gate’s open and close stopping positions. When a gate is installed on a slight incline or decline, gate coasting can be a concern. When the motor stops, the momentum of a heavy gate can continue coasting beyond the gate’s stopping position. This can be a problem, especially when closing bi-parting gates meet. The MAX 1500 / 2200 WILL NOT ALLOW gate coasting beyond it’s learned stopping position, even when the gate is installed on a slight incline or decline.

Other Gate Operators

Other gate operators can coast when motor stops, causing gates to hit each other.

MAX 1500 / MAX 2200

MAX 1500 / 2200 WILL NOT ALLOW gate coasting. Gates stop at the same position every time.

GEAR REDUCER

This feature does NOT allow the gate to be manually pushed open by multiple people. It takes several thousand pounds of force to physically move the gears on the gear reducer. Even if several people try and push the gate open, the gear reducer ratio will prevent gate movement. If the gate does move, the GATE TAMPER feature will activate and the proper authorities can be automatically notified if desired.

The gate WILL NOT move using human force.
This feature controls a long gate’s normal open and close stopping positions compared to emergency situations that require the gate to **ALWAYS FULLY OPEN**. It is important to have FULL ACCESS in time of emergency but this occurs much less than the normal daily operations. MAX operators will EASILY operate in either circumstance. A long gate may not need to fully open to allow normal access, especially in high traffic areas where gate cycling time can be reduced between vehicles and still allow normal daily operations to occur. Time between vehicles can be greatly reduced, not to mention all of the benefits that occur when using **PARTIAL OPEN**.

- Less wear and tear on the gate operator.
- Less maintenance and repairs.
- Less power consumption.
- Less time between gate cycles.
- Better access control of the area.
- Better security of the area.

**Partial Open turned ON**

**Normal Daily Access**

*Any Normal Opening Input on Matrix 1*

**Partial Open turned ON**

**Emergency Access**

*FIRE DEPT Input or MAX Input on Matrix 1*
This unique GATE DISABLE feature is useful when the gated area needs to be secured from ALL but emergency and/or authorized vehicle entry. Some examples are:

- Residential home vacation period.
- During closed hours of a business.

The GATE DISABLE feature will allow the FIRE DEPT/MAX and RADIO inputs to operate but nothing else. It helps with some major security problems that can occur when no one is available to monitor the property.

**GATE DISABLE**

prevents breaking into a keypad box and trying to trigger the wires to get the gate to open.

---

**IMPORTANT:** It is **NOT** recommended activating GATE DISABLE while persons are present inside the property.

---

This unique EVENT HISTORY feature has an On Board Diagnostics (OBD) port to download a simple .txt file to troubleshoot gate operator errors and to view normal transaction logs. This file will log intermittent problems with the gate operator that can be difficult to solve. This file can even be e-mailed to the factory from out in the field at the job site for additional technical support if necessary.

The event history can store up to 1000 transactions.

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**Event History Text Document Sample**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fri 07/11/2014 10:59:37</td>
<td>INFO: Radio Input Deactivated</td>
</tr>
<tr>
<td></td>
<td>Fri 07/11/2014 10:59:36</td>
<td>INFO: Radio Input Activated</td>
</tr>
<tr>
<td></td>
<td>Fri 07/11/2014 10:57:40</td>
<td>INFO: PRI_CID: Communication Established</td>
</tr>
<tr>
<td></td>
<td>Fri 07/11/2014 10:57:34</td>
<td>ENTRAP: PRI_MC: Photo Cell Activated</td>
</tr>
<tr>
<td></td>
<td>Fri 07/11/2014 10:56:46</td>
<td>WARNING: PRI_MC: Tamper Reported</td>
</tr>
<tr>
<td></td>
<td>Fri 07/11/2014 10:56:33</td>
<td>WARNING: PRI_MC: Tamper Reported</td>
</tr>
</tbody>
</table>

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The event history can store up to 1000 transactions.
Maximum Controls offers a **MAX** chain release mechanism that can provide an easy **MANUAL** gate release for slide gate operators. It can be installed on any sliding gate that uses a chain drive. This allows a user to quickly drop the chain without any tools to **MANUALLY** move the sliding gate to an open position.

**MAX Chain Release\nInstallation Position**

Installs on the end of the gate nearest the gate operator when the gate is closed. Bolt to the gate bracket.

Insert key and turn to unlock chain. Press lever down to release the chain.
SAFETY SENSORS REQUIRED

Conforms to UL STD 325
UL CLASS - I, II, III, IV
Certified to CAN/CSA STD
C22.2 NO. 247

Residential/Commercial
Brushless DC Slide Gate Operators
Made in USA

Maximum Controls LLC.
27211 Burbank
Foothill Ranch, Ca 92610
Tel: (949) 699-0220

MAX 1500/2200 Slide Version 7.3.16