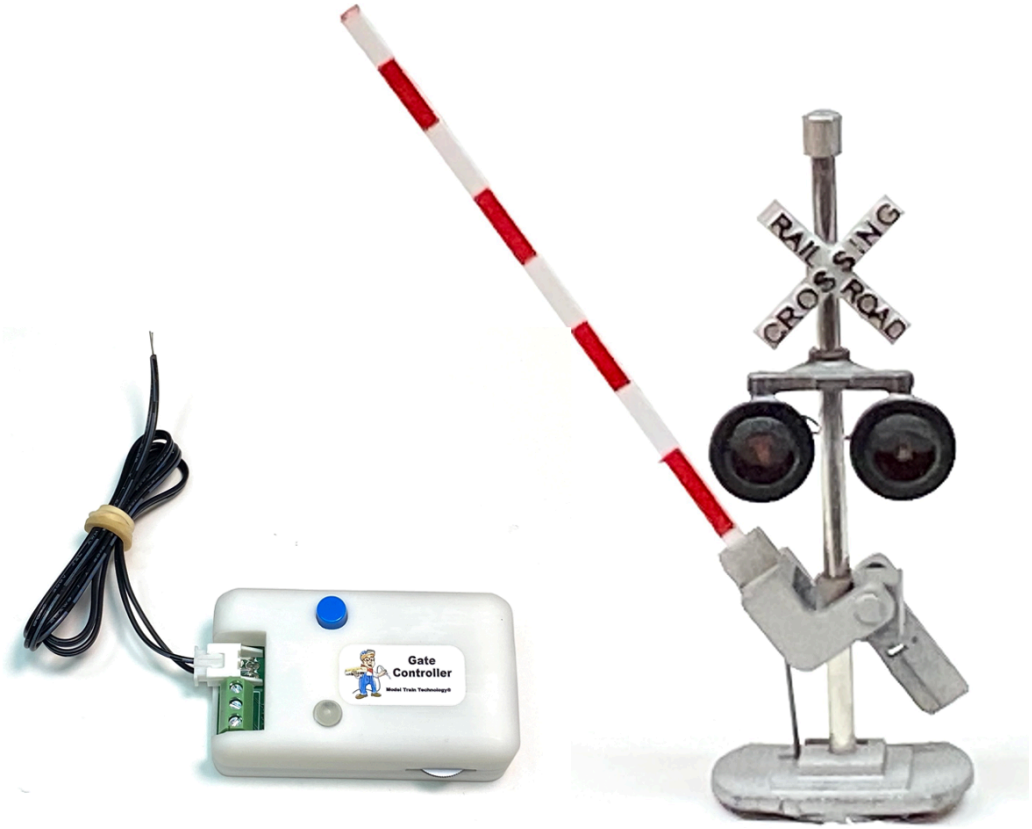
Model Train™ TECHNOLOGY

N & HO Gate Controller ™

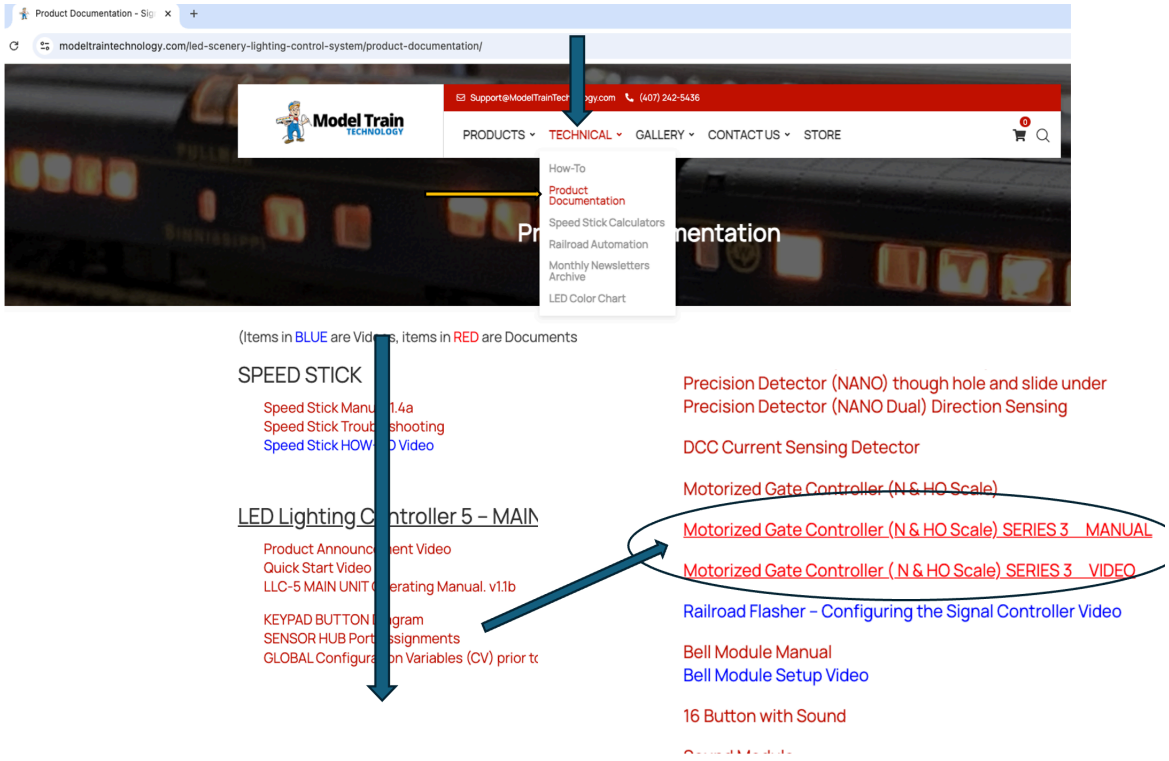
OPERATIONS MANUAL – SERIES 3

Version 3.1b



Gate Crossing Installation and Operation Video

For this product we put the bulk of the information in videos because it would have taken 1000's of words to explain. (and who reads the manual anyway?) The basics are covered here in print. The videos explain the setup and use of system as well as installation instructions.



Version 3 Upgrades:

This version of the small-scale for N and HO Motorized Gate Crossing system is better than ever! There are several new features that makes the system easier to install and simpler to operate. Here are the primary improvements:

- Non-touch detection of top-dead-center motor system
- Smoother and quieter motor movement
- Simplified controller/motor wiring system
- Upgraded 3D parts to prototypical scale.

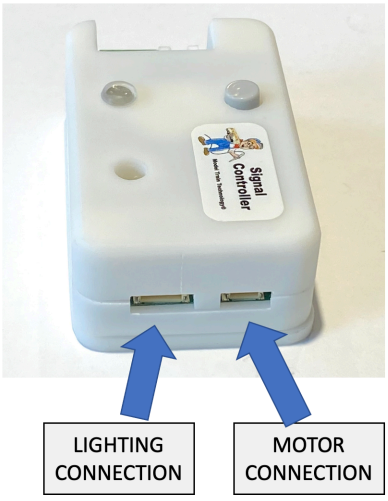
Note: The metal pad for the motor magnet is larger (and round). The magnet is strong enough to hold the motor to the metal pad but the self-stick glue on the pad is not strong enough to hold it to plywood. Coating the plywood with varnish helped, but not enough. Therefore, please use a few drops of super glue in the middle of the pad on the STICKY SIDE to help hold the pad. We suggest the middle, and not the entire surface, of the pad so that you can pry off the pad from the edge if needed.

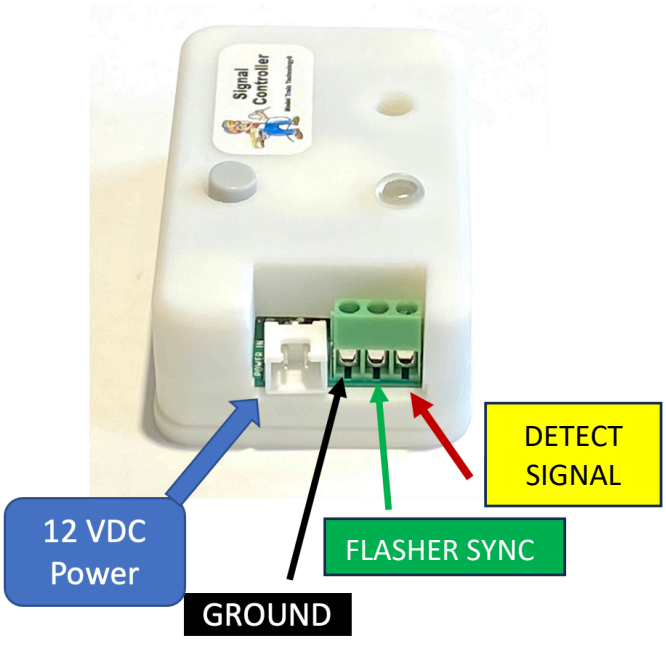
We attach a slice of cellophane type double-stick tape to the motor magnet to stop it from sliding around on the pad, but not sticky enough to prevent moving the motor.

We use a MAGNET system to attach the motor as a FAIL SAFE to avoid damaging the flasher which is fragile. If there is improper force on the gate, the motor will DETATCH from the metal pad. That is why the following advice is critical:

Using an eye hook and small piece of thread or wire, attach the wire bundle to the underside of the layout so that if the motor does fall it will not pull the FLASHER wires (being the last thing to hold the motor up).**BE VERY CAREFUL NOT TO PULL THE FLASHER WIRES – OR LET THE MOTOR FALL AND PULL THEM**

The Model Train Technology™ ***Gate Controller™*** is a simple to use and flexible system for controlling the Model Train Technology™ N and HO Scale Motorized Railroad Crossing gate.





OVERVIEW

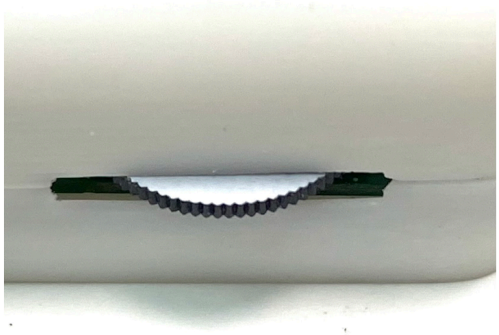
When power (12VDC only) is first applied to the ***Gate Controller™*** the blue LED will light. After three seconds the LED will flash 5 times and then go out. This indicates that the controller has completed its startup test and is ready to operate. If the gate arm was not in the UP position, the motor will automatically activate to turn the motor wheel and move the gate arm to the TDC (Top Dead Center) position. From this fixed position, the arm's down position can then be adjusted so the arm is parallel to the ground. Use MANUAL mode to accomplish this.

Once this is set, you never have to adjust it again even If the power goes out. When power is restored, the arm will move back to the TDC position ready for operation. You will know the arm is at that TDC when the red LED on the gate motor lights.

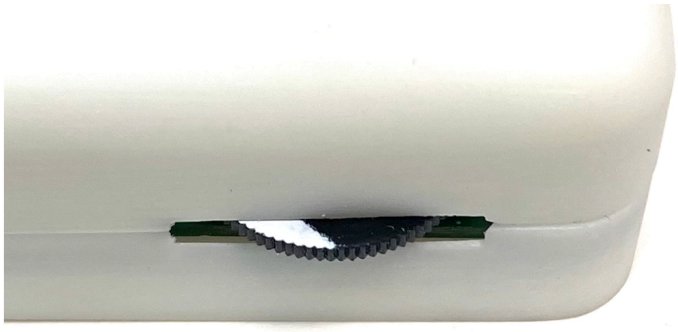
INSTALLED MOTOR ASSEMBLY (TDC)

TRIM WHEEL

The trim wheel is OFF and in its centered position when the white mark on the wheel is evenly balanced as shown on the left below. Simply move the wheel so that the white part is evenly displayed and then the LED will extinguish.



Trim Wheel Centered (OFF)



Trim Wheel NOT Centered (ON)

TRIGGERING THE GATES

A trigger condition from an MTT Precision Detector will trip the controller and cause the gate closing sequence to begin. Once started the gate will move down regardless of whether the trip condition is released. If it is release while the arm is

moving down, the arm will immediately go up once it has completed its travel going down.

There are three options for when the gate will move after it is triggered. Press the SELECT button #n times for the options shown below. The gate must be in the UP and non-triggered position to change settings.

#4 Immediately
#5 After 5 seconds after the lights start flashing.
#6 After 10 seconds after the lights start flashing.

When the controller is tripped the flashers will flash but the gate will not move (*unless it is set to immediate mode* #4). (This simulates the prototype).

After five seconds (default setting) the gate will lower.

(In the prototype this time is longer than five seconds and is designed to let vehicles crossing the tracks to exit before the gate begins to close)

The gate will stay down while the DETECT line is tripped. Once the DETECT signal is released the gate will open immediately but the flashers will still flash unit the arm is full up.

DETECT SIGNAL terminal

Connect this terminal to the yellow SIGNAL wire from any Precision Detector. Do not use a device (like an Arduino) that has a positive voltage of more than 2.8v to activate the DETECT line. This will void the warranty.

FLASHER SYNC terminal

If you have more than one gate and would like the flashers on each unit to flash in unison:

First set the controllers as follows:

Gate Controller 1 (MASTER) – press the select button 9 times.
Gate Controller 2 (SLAVE) – press the select button 10 times.

Next, connect a wire between Gate Controller 1 Flasher Sync Terminal and Gate Controller 2 Flasher Sync Terminal. The Flasher Sync terminal is the middle of the LEFT side group of three green terminals.

The flashers only synch when the MASTER controller is tripped by a sensor via the DETECT signal and, there is a signal wire between both DETECT terminals on Controller 1 and 2.

Flasher sync does not work in MANUAL mode.

HEARTBEAT

While the gate is sleeping the blue LED will flash every three seconds. We call this the heartbeat, and it lets you know that the Controller is alive and well.

You can disable this flashing if you like.

CONFIGUATION OPTIONS:

On the following page is the list of options and settings that are available. To use the top half chart options, simply push the select button the number of times indicated.

To set the CONFIG MODE options, press and hold the select button until the blue LED lights. Then release the select button. The blue LED will begin to blink once per second to indicate the unit is in CONFIG mode.

While the unit is in CONFIG mode, press the select button according to the chart. To save the brightness and speed options press the select button once.

The Trim wheel must be recentered to fully exit CONFIG MODE.

BUTTON	Action
1	Save/Exit
2	MANUAL MODE
	Left blank
4	Immediate
5	5 second delay
6	10 second delay
7	Swap Flashers
8	Demo Mode
9	Flasher Sync MASTER
10	Flasher Sync SLAVE
13	Reset
CONFIG MODE	Action
1	Save/Exit
5	Adjust Brightness
7	Adjust Flasher speed
10	Heartbeat On/Off

RECOMMENDED SETUP PROCEDURE

1. Build a test “bench” for your flashers. We can’t stress this enough!

2. Plug in the wiring harness between the controller and motor system before connecting power. The harness will only connect in one way. Do not connect the flashers

3. Plug in the 12VDC power cord. The blue Led will light, flash four times, and if the motor is not in the TDC position, the motor will turn until it is. When the motor in the TDC position the red LED on the motor assembly will be lit.

4. Follow the video instructions on how to bend and install the wire actuator.

5. Attach the metal motor pad to the underside of your layout.

6. Put the motor into place and insert the wire actuator.

7. Test the operation with the default motor settings by using Manual Mode (option 2).

8. Adjust the Arm Down position by repeated use of Manual Mode and using the trim wheel to adjust.

TESTING

To test the operation of the gate, with the DETECT signal off (recommend DETECT wire disconnected), press the SELECT button twice. After one second the gate flashers will activate and after the delay period (which could be zero, 5 or 10 seconds) the motor will move the arm down.

The arm will stay down and the lights flashing until you press the SELECT button again twice. Then the arm will raise to the stop position and the lights will shut off.

ADJUSTING THE GATE ARM POSITION

The gate arm in the down position can be adjusted up and down slightly so that it is level. This is accomplished by means of the trim potentiometer located on the side of the Gate Controller.

How it works: Press the SELECT button to move the gate to the down position. Use the trim wheel to make the adjustment

THIS WILL NOT WORK WITH THE DETECT TRIGGER ACTIVE.

This is easy but it will help if you watch the video. The position of the trim pot is set at the mid-range from left to right (or counterclockwise to clockwise). <u>This "center" position is OFF</u>. The range of the trim pot is 1000, therefore the center position is 500. If you turn the wheel to the left to less than 300 the motor turns on at ¼ speed and starts moving the arm. To stop this movement, adjust the trim pot back to the center (500 approx.). Turning the wheel in the other direction, above 700 cause the motor to turn in the opposite direction. To stop, again move the trim pot back to center. The numbers mentioned are for reference only.

- It takes VERY little motion to activate the motor.

- Turning more does not make it go faster or slower.

- WHILE the motor is running in this adjustment mode, the blue LED will be on. You know the trim wheel is back at center when the LED is off.

Once you stop the motor after you have made an adjustment, the Gate Controller will remember the new setting.

MOTOR WHEEL DESCRIPTION

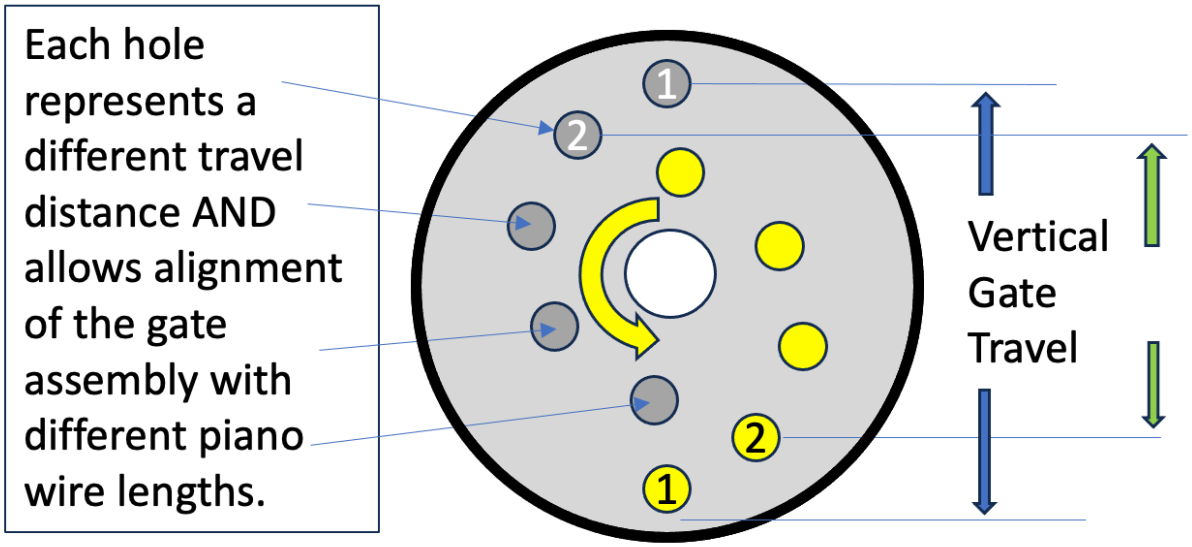
The motor wheel has a set of holes that gives almost unlimited options and flexibility to set and adjust the motion of your crossing gate. The hole closest to the center will travel the LEAST distance and the outside hole will travel the furthest.

You can use any hole for the wire actuator AS LONG AS you set TOP STOP position to match the ARM in the UP position.

To avoid damaging the gate mechanism, Do the following BEFORE inserting the wire into the motor wheel. In other words, get it close “by eye” and then insert the wire and fine tune.

Start with moving the hole that you want to use to MATCH the location of the wire actuator when the gate is TDC UP. Then use manual mode to let the motor run to stop in the Arm down position. THEN, using the trim wheel, adjust the motor wheel to match the wire actuator when the gate is down.

Check out the HOW2 videos for more information.


Each hole represents a different travel distance AND allows alignment of the gate assembly with different piano wire lengths.
1
2
2
1
Vertical Gate Travel

ELECTRONICS AND STATIC ELECTRICITY

The ***Gate Controller™*** circuit board and components are exposed when the cover is off. Electricity can be dangerous. Static electricity can cause component failure. Scuffing along a carpet and then touching one of the component connectors can cause a static spark. These components are fairly rugged – some designed for the automotive industry. Just be mindful of the risk. The current on the board will not harm you if the board is powered and operated as per the instructions.

ONE YEAR MANUFACTURER WARRANTY:

We warrant this product to be free from defects in workmanship and materials, under normal residential use and conditions, for a period of one (1) year for the original invoice date. Shipping and handling fees are to be paid for by the customer. The full text of the warranty can be found on the CART page of the online store.

LIMITATION OF LIABILITY

UNDER NO CIRCUMSTANCE SHALL COMPANY OR ITS AFFILIATES, PARTNERS, SUPPLIERS OR LICENSORS BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENCIAL, SPECIAL OR EXEMPLARY DAMAGES ARRISING OUT OF OR IN CONNECTION WITH YOUR USE, OR INABILITY TO USE THE PRODUCT, WHETHER OR NOT THE DAMAGES WERE FORESEEABLE AND WHETHER OR NOT COMPANY WAS ADVISED OF THE POSSIBLITY OF SUCH DAMAGES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, COMPANY'S AGGREGATE LIABILITY TO YOU SHALL NOT EXCEED THE AMOUNT OF THE PRODUCT. THE FOREGOING LIMITATION WILL APPLY EVEN IF THE ABOVE STATED REMEDY FAILS OF ITS ESSENTIAL PURPOSE.

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