

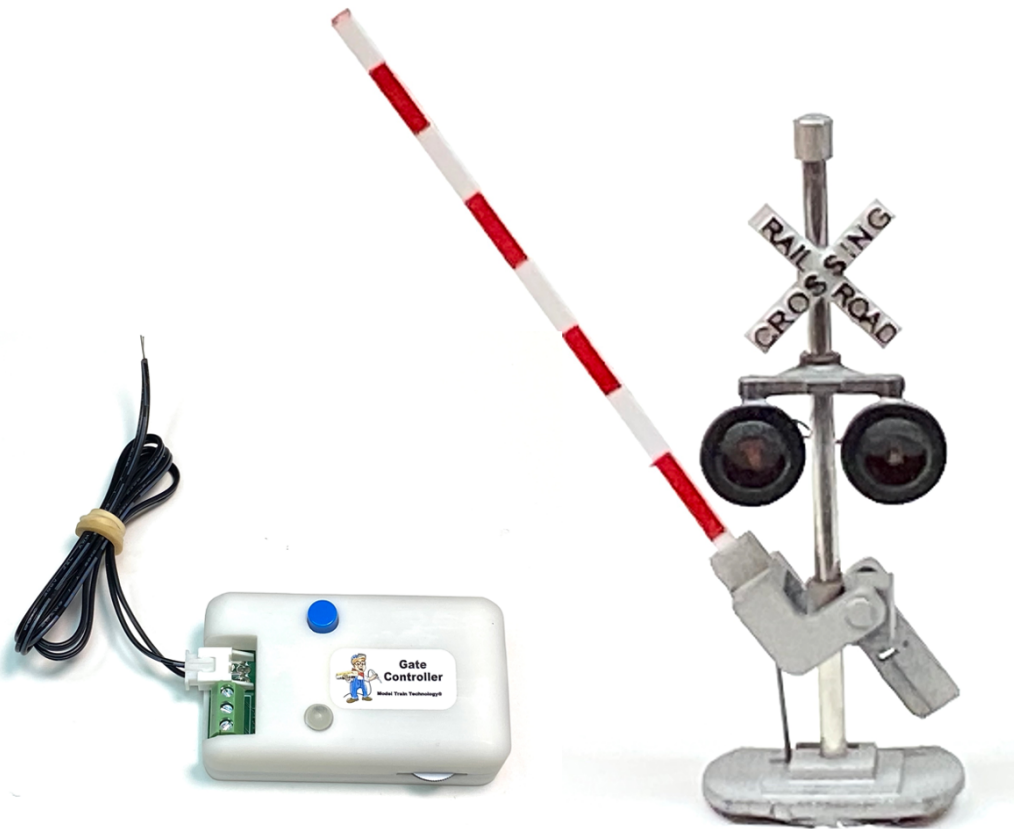


Model Train[™]
TECHNOLOGY

N & HO Gate Controller[™]

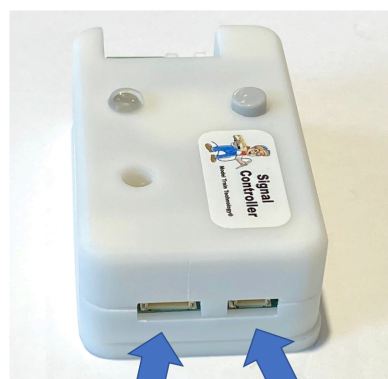
OPERATIONS MANUAL

Version 1.2a



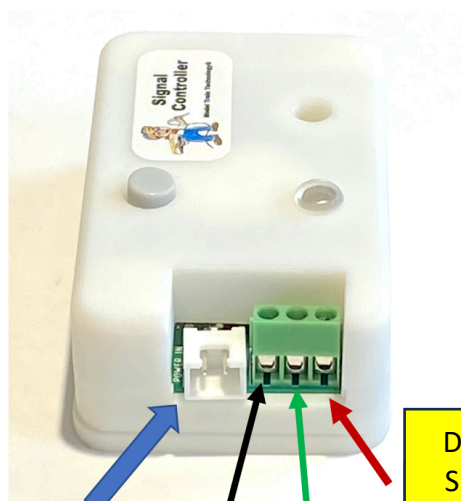
NEW FLASHER SYNC FUNCTION

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



LIGHTING
CONNECTION

MOTOR
CONNECTION



12 VDC
Power

GROUND

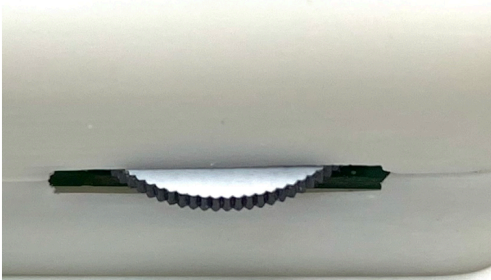
FLASHER SYNC

DETECT
SIGNAL

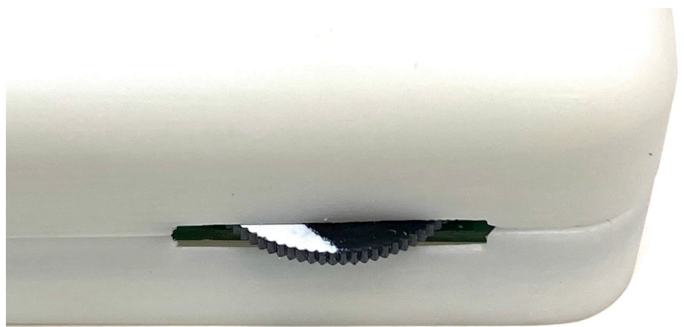
OVERVIEW

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 LED does NOT go out, it means that the trim wheel is not in its centered position (OFF). 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)

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.

For this product we put the bulk of the information in video form because it would have taken 1000's of words. Only the basics are covered in print. The following videos explain the setup and use of these settings as well as general installation instructions.

The follow page shows the QR code and the TinyURL link to the instruction videos: To use the QR code, aim your phone camera at the ink blot. That will cause a yellow box to appear – click that and you will be taken to the link automatically. If that doesn't work, type in the TinyURL.

You can always visit our YouTube Channel and go to the playlist section where all our How-To videos are collected.

Gate Crossing Installation and Operation Video

<https://tinyurl.com/MTT-HOW2-001>



Model Train Technology HOW-2 VIDEO LIST

<https://tinyurl.com/MTT-HOW2-VIDEOLIST>



Model Train Technology YouTube Channel

<https://tinyurl.com/MTT-VIDEO-CHANNEL>



DETECT SIGNAL terminal

Connect this terminal to the yellow SIGNAL wire from any Precision Detector. Do not use any device (like an Arduino) that has a positive voltage of more than 2.8v to active 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 1) Connect a wire between Gate Controller 1 Flasher Sync Terminal and Gate Controller 2 Flasher Sync Terminal. Then:

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

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

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.

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 use CONFIG mode, press and HOLD the SELECT button. The LED will go out. After a few seconds the LED will light. Then RELEASE the SELECT button. The LED will now blink a steady blink. This indicates you are in CONFIG mode. Press the SELECT button the number of times indicated for the option.

BUTTON	Action
1	Save/Exit
2	MANUAL MODE
3	Top Alignment
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 LED1 & LED2
6	Adjust LED3
7	Adjust Flasher speed
10	Heartbeat On/Off
Set DCC address via SWITCH Command	

RECOMMENDED SETUP PROCEDURE

1. Plug in power and check for blue LED flash multiple times and then turns off.
2. Plug in the 5-pin plug for the Crossing lights. Press SELECT twice to activate the light flashing. This will set the Controller to the ARM down position. Lights flashing? Yes, then press SELECT again twice. After about 5-6 seconds the lights will go out and the controller will be in the ARM UP position.
3. Plug in the 4-pin motor wire. Repeat the #2 sequence above. In addition to lights flashing, you should now see the motor turn. By default, the motor will turn 180 degrees. This can be adjusted as needed.
4. Set the Hole in the Motor gear to Top-Dead-Center relative to the magnet on the motor. Use Top Alignment (option 3) to have the motor turn counterclockwise to the T.D.C. position.
5. Follow the video instructions on how to bend and install the wire actuator.

6. Attach the metal motor pad to the underside of your layout.
7. Put the motor into place and insert the wire actuator.
8. Test the operation with the default motor settings by using Manual Mode (option 2).
9. Adjust the T.D.C. position and the Arm Down position by repeated use of Manual Mode and using the trim wheel to adjust.

NOTES:

** Top Dead Center (T.D.C.) is established by use of Option 3. You can fine tune this position with the Trim Wheel when the motor has stopped.

** if power goes out when the gate is NOT in the UP position, you must RE-ESTABLISH T.D.C. You may need to readjust the full arm movement but generally, if TDC is set as before, then the arm movement will be the same.

Option 13 resets all the adjustments back to factory defaults.

TESTING

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

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). This “center” position is OFF. The range of the trim pot is 1000, therefore the center position is 500. If you turn the screw to the left to less than 300 the motor turns on at $\frac{1}{4}$ speed and starts moving the arm. To stop this movement, adjust the trim pot back to the center (500 approx.). Turning the screw 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 and more turning does NOT make it go faster or slower.

WHILE the 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 remembers 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.

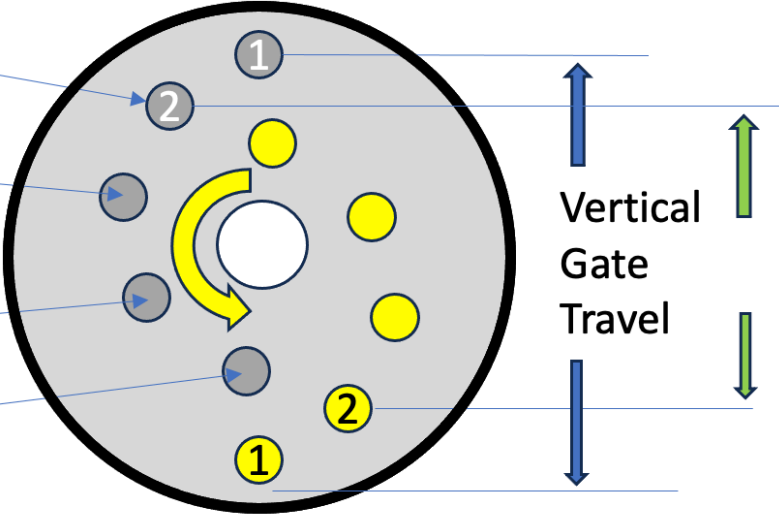
You can use any hole for the wire actuator AS LONG AS you set TOP STOP position to match the ARM in the UP position AND you adjust the rotation motion to the lowered position.

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 UP. This might NOT be TDC (Top Dead Center). 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 video for more information.

Each hole represents a different travel distance AND allows alignment of the gate assembly with different piano wire lengths.



DCC OPERATIONS

The **Controller** can respond DCC Accessory messages just like your turnout controllers. You can set the **Controller** to the SAME address as a turnout so that when you change the turnout, the **Controller** automatically changes the color of the signal. You can also configure several Controllers to the same switch address so that multiple but different signal lights will light according to your layout design. Since **routes** are a combination of turnout commands, the **Controller** can align the signal lights accordingly.

You can use any valid accessory switch address between 1 and 2044. When the **Controller** receives a DCC turnout command (thrown or closed) that matches the **Controller** address, it will activate the trip function of the **Controller** and start the aspect animation.

- Closed means that the gate is open (up).
- Thrown means that the gate is closed (down) (released).

The **Controller** uses the THROWN direction as a tripped condition.

To operate the **Controller** with DCC you must power and connect your DCC rails A & B to the **Controller**. For small and medium sized layouts this should not be a problem since the

Controller and LED require about 30ma each to run. For larger layouts or layouts with a lot of signals connected to you DCC track we suggest you create a separate Booster zone. This way, no current will be taken away from the rails to run the engines.

SETTING THE CONTROLLER ADDRESS

With the Controller in the non-tripped state, press and hold the select button for about 6-8 seconds. Within 1 second of beginning to press the button, all the signal lights will go out.

Continue to hold the select button until the light comes back on. Then release the button. The blue power light will begin to flash on and off. This indicates that the **Controller** is in CONFIG mode and is ALSO ready to accept a new DCC address.

To set a new address, select the Accessory/Turnout number that you want to use on your DCC hand controller. This can be a number from 1-2044. Using your DCC hand controller, enter the number and then press the appropriate command to set a CLOSED or THROWN switch event. Either closed or thrown will work. This will be slightly different depending on the brand of DCC system that you are using.

To exit setting the address mode WITHOUT changing it, press the select button once. The Controller will return to its ready state.

As soon as you select CLOSED or THROWN, the **Controller** will flash 4 times and the lights will go off. The **Controller** is now set to the new address.

Lastly, the **Controller** will enter the unoccupied/un-triggered state which usually means that the green light will go on.

While DCC is connected and active, DCC commands will override the input signal. In other words, you can use detectors OR DCC to trigger the Controller but not at the same time.

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, CONSEQUENTIAL, SPECIAL OR EXEMPLARY DAMAGES ARISING 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 POSSIBILITY 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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