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N-HO-O Gauge Crossing Gate Installation Instructions

Every install situation will vary according to how you choose to mount the gates. The instructions below are general installation suggested information that might be helpful. Please read these first. There are some steps that need to be done as explained here. You will need needle nose pliers, hot glue gun, 3/32" drill, Wood glue, paint or lock screw liquid, small Philips and straight screw driver, and your best modeling skills.

1. Make sure all parts are there.
2. Before you begin you need to center the servo shaft rotation. Plug the servo into the card with the yellow (or white) wire to the inside of the board. Then plug the board into a 5V DC wall power converter. Do not set the card on a metal surface. If the servo shaft jumps that is OK.
3. To center the shaft rotation we need to go into the calibrate functions on the board. Press the calibrate button and reset button simultaneously. Continue to hold the calibrate button and release the reset button. Both traffic signal lamps should be green. Release the calibrate button and you are ready to calibrate.
4. To enter the center servo calibrate function, momentarily push the calibrate button once. The yellow lights will echo one flash to confirm your selection and the servo will jump to the center of its rotation. You are done. Unplug the power and the servo from the board. You are ready to install the gates.
5. Pick location for your gates and mount them. Drill a 3/32" hole ¼" behind the gate for the push rod we will connect latter. The plastic tube on the piano wire provided should fit in this hole. Test it.
6. Under the table draw a line between the two gates holes. Measure and mark the center of that line.
7. If you are using a single servo as came with the kit mount it here. The channel aluminum is used to hold the servo. Mount it so when you put the servo in the channel, the servo shaft centers on the center point you marked in step 3. Just the shaft must align to the center point. It is best to mount the channel perpendicular to the line.
8. Mount the screw eyes to the bending blocks. Mount the blocks between the motor mount and the gate such that they direct the plastic tube toward the right of the motor as you look up at it. Counter clock wise rotation is the gate up position.
9. Mount two push rod clamps onto the top of the servo cross arm. You may need to enlarge the holes you choose. The inner pair of holes are for N scale. Second pair of holes from center is for HO and third pair of holes from center is for O gauge gates. Make them snug but not tight. Use paint or thread lock on the clamp nut being careful not to get any lock on any other parts. The clamp needs to rotate in the hole. Some choose to use the push rod clamps along the rod and not mount it on the cross arm. They connect a shortened rod with a Z bend to the cross arm and use the clamps to connect to the piano wire that connects to the back of the gate.
10. Depending what method of connection you choose you should have enough piano wire to reach from the back of the gate and the blocks curve, to pass the servo cross arm shaft one on both sides. Make a small loop on the end that will connect to the back of the gate. Give the wire a slight bend to the curve and put the straight end through the hole through the plastic tube and the screw eyes on the bending blocks. The plastic tube is for the piano wire bend and the hole in the table. Hot glue the plastic tube to the screw eyes so that one end goes flush with the table top toward the back of the gate.
11. Mount cross arm to the servo sliding the cross arm clamps onto both piano wires. Set the cross arm such that it is perpendicular to the line drawn in step 3. Screw down the cross arm to the servo.
12. Prop the gate at 45 degrees. That is half ways between up and down. That is where we left the servo in step 3 at mid travel. Tighten the clamps on to the piano wire. Remove the props.
13. Mount the controller board where the wires will reach and you can access the calibration pots. Connect servo. Make sure there is nothing in the way of the gates.
14. Apply 5V DC power to the board. The gates may jump to a position. That is ok. That means you did everything ok. I intentionally left values for all calibration settings for starters.
15. Let's do your calibration.

a.) Hold the reset and calibrate button simultaneously. Release the reset button first then release the calibrate button. Both intersection sides should be green. This indicates you are in the calibrate mode. At this point you can jump to any calibration function by pushing the calibrate button a number of times to enter any of the following functions. Let's start with step one however.

b.) Select the first calibrate function by pushing the calibrate button once. The yellow traffic lights will echo your choice by blinking once and the red lights will be on. We did this in step #3 above. This is the "center the rotation" function. Both gates should be at 45 degrees. Make your mechanical adjustments if needed. To exit push the calibrate button once and you will exit this function. Both traffic lights should be green.

c.) Push the calibration button twice. The yellow lights will echo your selection by blinking twice and the red lights will be on. This is the gates down position calibration. Adjust VR2 pot so that the gates are in the most down position without the servo motor buzzing. Find the peak and back off the pot. Push the calibrate button once to exit this function. Both traffic lights should be green.

d.) Push the calibrate button three times. The yellow traffic signal lights will echo your selection of the third function. This is the up position of the gates. Adjust VR2 pot to set this down position. Similarly back the down position pot off so that the servo motor is not buzzing. Push the calibrate button once to exit this function. Both traffic lights should be green.

e.) Push the calibrate button four times. The yellow traffic lights will echo your choice of the fourth function by blinking 4 times and the red lights will be on. This is the travel speed and test of travel of the gates. Adjust VR1 pot to change the speed of the gates travel. This is a cyclic function and the changes come at the end of a cycle. To exit this function you need to hold the calibrate button until it reaches the end of the cycle. Both traffic lights should be green an exit.

f.) Push the calibrate button five times. The yellow traffic lights will echo 5 flashes and then only the green lights will be on if ports #7 and #8 are not grounded. This function gives you visual feedback on adjusting your sensor beams so they are spot on. When not grounded that means your sensors are not sensing a train present. Any of our sensors like the laser beam and sensor has a yellow or white wire that is connected to the port 7 or 8 that drives that port to ground signaling a train is present. When the transmitter and sensor are aligned only the green traffic lights will be on. If all lights are on it means your sensors are out of alignment. Test each sensor by connecting them one at a time. To exit this function press the calibrate button once. Only the green light should be on.

g.) Push the calibrate button six times and if you have the latest software you will have accessed the dwell function. This is the time the gates stay down after a train passes. It also helps just in case a glimmer of light sneaks between a car and the gates go up while train is present. Adjust VR2 to increase or decrease this. Minimum time is 1 second to maximum of 10 seconds. To exit this function press the calibrate button once. You have completed all the steps.

You have completed all calibration steps. You can jump to any step to readjust any of them by pushing the calibrate button the function number you want to reset. Note that when you enter mode 2, 3, or 4 you will have erased the previous set value and need to reset its value. To exit and save all your work you can push the calibrate button seven times and the yellow traffic lights will confirm your selection, or just hit reset to resume normal operations.. Everything should be working. Any questions call ken at 248-557-8276

Laser Setup:

Pick area you want to cover with the laser sensor system. The laser is a narrow beam of light requiring accuracy to hit properly hit the targeted receiver. Once the emitter, receiver and mirrors are mounted, use a piece of white paper to reflect the beam starting at the emitter. Your Iphone can be used to help see the beam. Focus the beam by rotating the lens tip being careful not to unscrew it totally. (Clockwise is for distance, counter clockwise is for close up)

As you move the white paper away from the source continue adjusting the focus and the position so that the beam falls onto the next mirror or receiver at the end of beam travel. More than one mirror requires you to travel along

the beam path repeating adjusting focus and mirror angles. Do this repeatedly until you reach your final target. You are now ready to test it with the control module.
Connect the white or yellow trigger wire on the receiver to port #8 or #7. Go to function #5 on the controller card and the traffic lamps will assist you in fine tuning the laser path. When you extinguish the yellow and red traffic lamps you are on target. Let me suggest even though the input ports #8 and #7 can handle multiple open collector sensor triggers, do one sensor calibration at a time. For the cross track type of sensors moving them back and forth will help you discover the ideal hot spot center between the emitter and receiver.