Z-Stuff for Trains
making model railroading more fun
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DZ-2500 Switch Machine
W / TMCC Compatibility Ver. 02-21-05

Contents:
(1) DZ-2500 Switch Machine & (2) Mounting screws
(1) DZ-2502 Remote & (2) Mounting screws
(1) DZ-2503 Spring for GarGraves or Ross
(1) DZ-2504 Spring for Atlas

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Introduction:
The new DZ-2500 Switch Machine offers slow speed switching from the pushbutton, TMCC CAB-1 remote, or DCS remote with the AIU. It also features fast switching for non-derailing operation. The DZ-2500 is compatible with GarGraves, Ross, Curtis or Atlas switches.

Table 1
DZ-2500 Wires

Wire Color	TMCC / DCS Mode
RED	10-18 VAC
BLACK	COMMON
BLUE	Data INPUT / THRU
WHITE	ExtPB INPUT / OUT
GREEN	R INPUT
YELLOW	L INPUT

DZ-2500 Installation: (see Figure 1)
1. Connect the RED wire to 10-18VAC accessory power or fixed voltage track power (TMCC).
2. Connect the BLACK wire to accessory common or neutral.
3. Turn power ON. The RED and GREEN LEDs will alternately flash for about 2 seconds to indicate that the DZ-2500 is in TMCC mode. Then, either the RED or the GREEN LED on the DZ-2500 should light. Check the DZ-2500 by pressing the button on top of the switch machine. It should slowly move to the other position in about 2 sec. and the opposite LED will light up. Press it again to have it return. Turn off power.
4. Connect the DZ-2502 remote control as shown in Figure 2. When power is turned, on the DZ-2500 LEDs should light. Pressing the button should cause the switch machine to throw to the opposite position and the LEDs to change color.
5. To mount the switch machine, first insert the spring type (GarGraves / Ross / Curtis or Atlas.) for your switch into the throwbar and then the other end of the spring into the lever on the switch machine. Place the switch machine next to the switch so that the points are closed with slight pressure on them. With power restored, hold the switch machine in place and press the button on the switch machine to throw it to the opposite position. Check the pressure of the points against the rail in that position. If necessary move the switch machine to balance the pressure for each position of the throw bar. Using the supplied screws, attach the switch machine to the tie as shown.

Non-Derailing Operation
1. The switch machine should be mounted on the switch as described above.
2. Make sure that you have a section of isolated rail leading into each side of the frog of the switch as depicted in Figure 4.
3. Viewing the switch machine from the top with the lever at the top side, connecting the YELLOW wire to common, the BLACK wire, cuases the switch machine to rapidly throw to the LEFT side (as shown in Figure 1) and the GREEN wire will cause it to throw to the RIGHT side.
4. Connect the GREEN and YELLOW wires to the appropriate isolated rails to cause the switch machine to throw to the side that has it's isolated rail connected to the opposite outside rail. (The track common and switch machine common must be connected together. Initially, the switching speed will be a little slow. The switch machine will increase in speed with each actuation until it reaches optimum speed. To set the speed, actuate the non-derailing about (10) times on each side of the switch.

Changing LED Color
1. With the switch thrown so that the GREEN LED is lighted, press the button on the switch machine and hold it for 2 seconds after the switch machine has changed to the opposite position. This will cause the switch machine to throw to the opposite position, the LED to turn RED, and then after 2 seconds the LED will switch to flashing GREEN to indicate that it is set for the THRU position.
2. The position that was RED should now be GREEN and what was GREEN should show RED for both the switch machine and the remote. This works for both TMCC and DCS modes.

Programming the TMCC Address (this requires a DZ-2001 to generate a Data Wire, minimum 22AWG, as shown in Figure 3)
1. Connect the BLUE wire of the switch machine to the Data Wire as shown in Figure 3. Turn power on.
2. If necessary, press the button on the switch machine to throw it to the position with the RED LED on.
3. Now press the button on the switch machine and hold it for 4 seconds after the switch throws to the GREEN position. Green light will flash, then the RED and GREEN will alternately turn on and off. This is the state for setting the address, so release the button. The RED and GREEN should now flash rapidly and be ready to accept an address.
4. Using your CAB-1 Remote, press SW, then press the switch number (like '5'), then the THRU (AUX1) button. The RED LED on the DZ-2500 should flash continuously, indicating that the address has been successfully set. If the LED flashes and stops, then there was an error. Try pressing the THRU button on the CAB-1 again or holding it down for 2 seconds. (Pressing the SET button on the CAB-1 instead of the THRU will also work.)
5. To exit the programming mode, just press the button on the switch machine or rhe DZ-2502 remote.

This completes the setup and testing of the DZ-2500. It may be installed anywhere on your layout. Just run a DATA wire, accessory power and common around your layout.

Operation Options:
- **DUPLICATE ADDRESSES**

Each DZ-2500 can be programmed with an address from 1-99. Since the DZ-2500s are individual units, more than one DZ-2500 can be programmed with the same address. This can be useful for passing sidings. The switch machine at each end of the siding can be given the same address (like 6). When SW, 6, OUT is pressed both switches will operate.

- **ROUTES**

The switch machine can be programmed used just like the SC-2 and will accept Route Commands for routes 0-9. Follow the instructions for programming switches to be used in a ROUTE (RTE). The DZ-2500 must all ready be programmed with an address (1-99)

- **DCS or Two Button Mode (can be used with SC-2, ASC3000, or DZ-1002 Remote)**

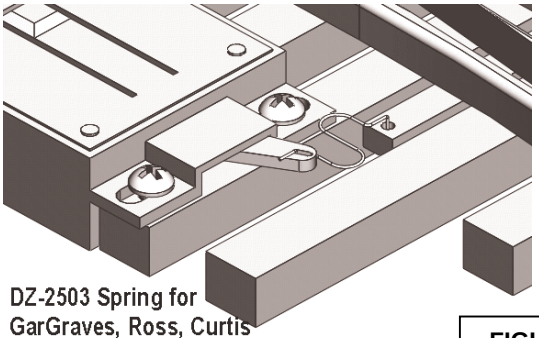
For maximum comatibility with DCS and its AIU, the DZ-2500 has a special DCS compatibility mode. This permits the BLUE and WHITE wires to be used as THRU and OUT control wires respectively, when connected to the AIU, SC-2, ASC3000 or a DZ-1002 remote.
1. As needed, press the button on the DZ-2500 to put it in the OUT position with RED LED on.

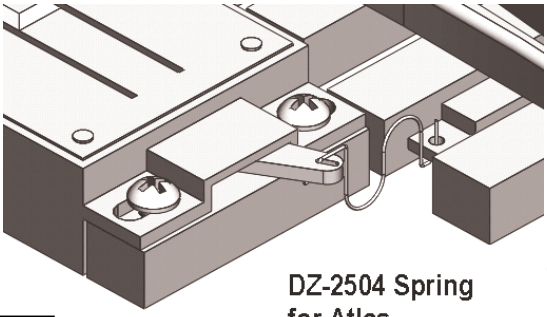
2. Then press and hold the button on the switch machine until both lights flash alternately and then about 2 more seconds until the GREEN LED is on and the RED is flashing. Release the button and the DZ-2500 is now ready for two wire control and can be connected to pins 1 and 2 of an AIU (its common terminal should connect to power common). If you want to go back to TMCC mode just repeat the process.
3. To be sure you have entered or left DCS mode, just touch the BLUE wire to the common or BLACK wire. In DCS mode, the switch machine will throw to the THRU position the when BLUE wire is connected to common and to the OUT position when the WHITE wire is connected to common.
4. When using the old DZ-1002, the center terminal or wire connects to common and the BLUE and WHITE wires of the DZ-2500 connect to the R and L terminals of the DZ-1002. The LED closest to the terminals will need to be reversed to light correctly. See Figure 5.

Power on Indicators
Each time the power is turned on the LEDs indicate the mode in use. RED and GREEN alternately flashing means TMCC mode, but no address set. RED ON and GREEN flashing means TMCC mode with an address set. RED and GREEN both ON means DCS mode.

SPECIAL TMCC Function
When the DZ-2500 receives a SW, (SW#), SET command in RUN mode (e.g. pressing SW, 5, SET), it will respond with a signal on the DATA WIRE indicating its current position using TMCC codes. This will include the SW ADDRESS number and the DATA will be 00000 for THRU and 11111 for OUT. This is useful for systems that are using a computer to control the trains and switches on a layout.

USE with DZ-1008A Relay Module
The DZ-2500 can easily be used with the DZ-1008A Relay Module. The wires of the DZ-1008A are used to connect to the wires of the DZ-2500 as shown in FIGURE 4. This can be done whether or not the DZ-2500 is wired for non-derailing. The DZ-1008A can then be used to control other signals or track power. Note – the older DZ-1008 can be used, but the GRN and YEL wires may need to be exchanged.





Important Difference
Atlas spring inserts in the top of the lever.

FIGURE 1

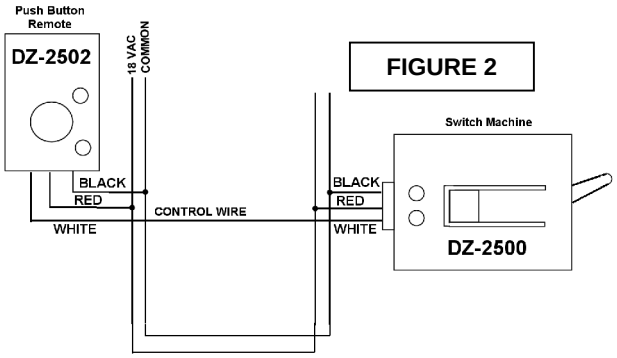


FIGURE 2

Basic wiring for DZ-2500 & DZ-2502

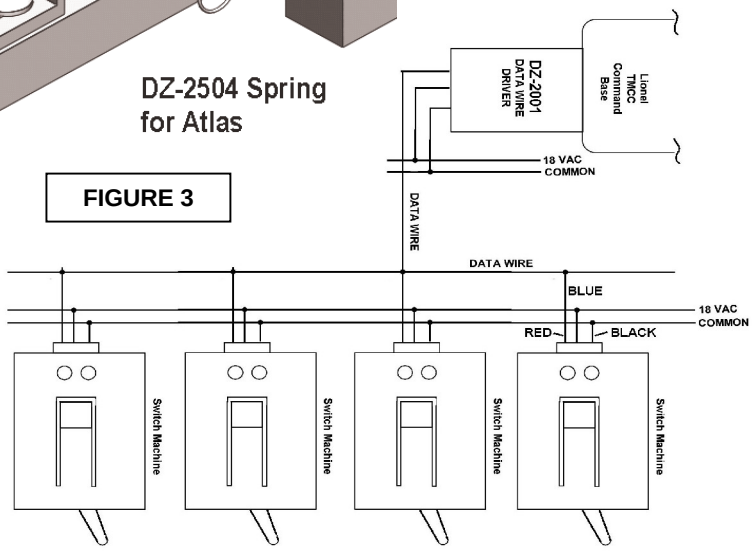


FIGURE 3

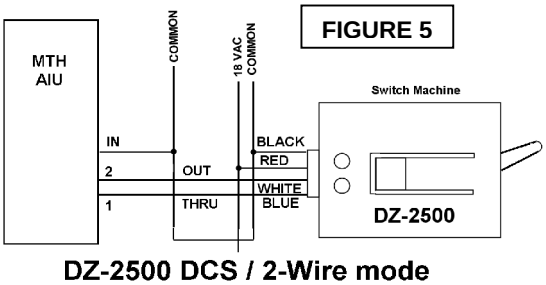


FIGURE 5

DZ-2500 DCS / 2-Wire mode

DZ-2500 WIRING FOR NON-DERAILING OPERATION

By isolating a section of rail on each direction of throw of the switch, you can wire the DZ-2500 for non-derailing operation. As the train approaches the switch it connects the L or R terminal to COMMON and causes the switch to throw in the direction to prevent a derailment of the train.

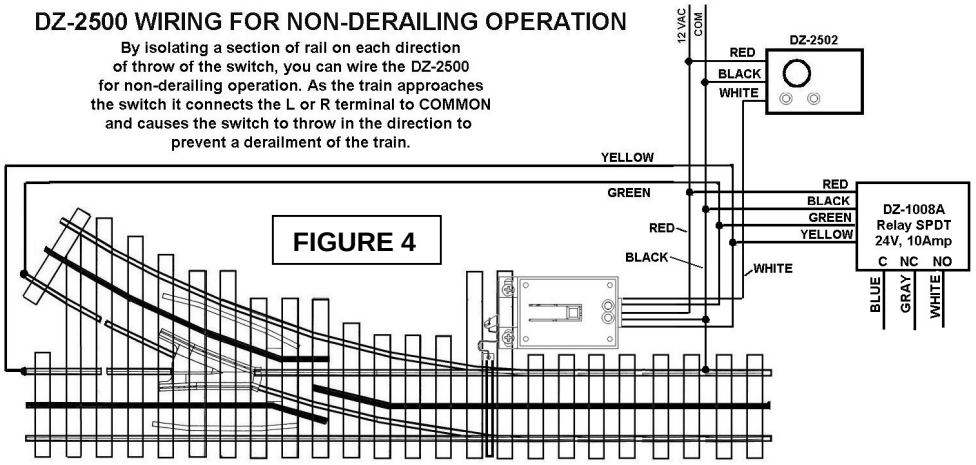


FIGURE 4

(see the website for more applications)