Technical Reference

for the

SWITCH-IT™
Accessory Decoder

FOR STALL MOTOR MACHINES ONLY

NOT FOR USE WITH TWIN COIL SWITCH MACHINES

such as Atlas, NJ, Kemtron, Rix, Kato, etc

Dimensions: 2.1" x 1.3" (54 x 33 mm)

Decoder version 1.0

$24.95

This is an accessory (switch machine) decoder

- ✓ Control for two Tortoise™ or SwitchMaster™ switch machines
- ✓ Switch-It remembers the position of switch during power outages
- ✓ Switch-It supports the full range of DCC accessory addresses (1-2044)
- ✓ Easy address programming, no need to connect it to programming track
- ✓ Each switch machine can have its own completely different address
- ✓ Simple hook up, 2 wires to the track, 2 wires to each switch machine
- ✓ Includes optional connections for "local" control push buttons

Every attempt has been made to ensure this decoder complies with all applicable NMRA Standards and Recommended Practices

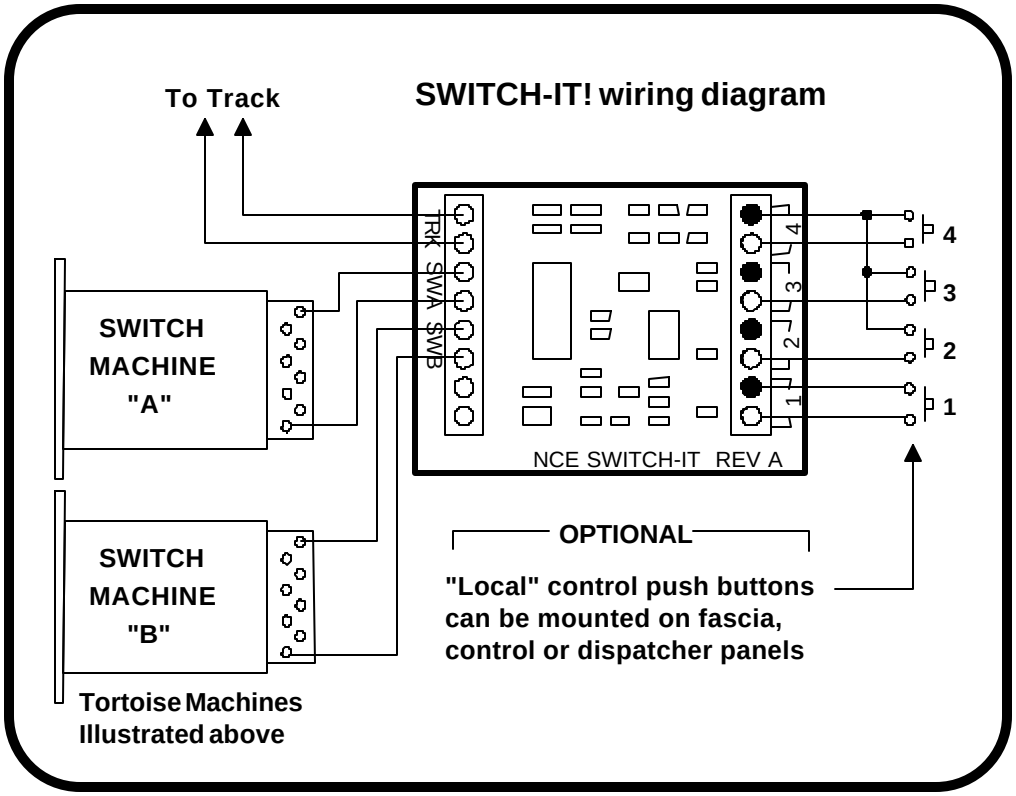
Last revised: 1 May 2000

Installation Notes:

This decoder is designed to control Tortoise, SwitchMaster or other low current "stall motor" switch machines. The outputs are rated for 50mA maximum. Most Tortoise and SwitchMaster machines draw 20 to 25mA with normal track voltage (about 13-15 volts). We use double sided foam tape (3M Photo Mount Squares) to mount the Switch-It to the side of a Tortoise or the flat bottom of a SwitchMaster machine. On Tortoise machines we find it's best to mount the Switch-It with the track wires up (toward the flange of the machine). This allows easier access to the push button terminal block later on.

Wiring:

See the diagram below for wiring particulars. Two wires to the track and two wires to each machine is the only wiring required. It is OK to use the Switch-It for control of only one machine.



Optional push buttons:

You may optionally add push buttons for local control of the switches. Buttons 1 and 2 control switch "A" and buttons 3 and 4 control switch "B". Use momentary contact switches for local control. Do NOT use a toggle switch (unless it is momentary), its continuous connection will prevent DCC control of the turnout. In the illustration below the push button terminals filled in black are all "common" with each other. Buttons 2, 3 and 4 are shown wired with a common wire to each push button. Button 1 is shown wired with a separate common wire. You can wire all buttons with either separate commons, one common or a mixture as shown below. You can have multiple buttons wired in parallel for operation of the machine from more than one location.

Switch machine mounting tip:

On our Tortoise machines we use hot glue to mount the machine. The glue stays liquid just long enough after application to allow alignment of the machine. We manually center the arm of the machine then slide the machine around while the glue sets to align the points to the middle of their throw. The low temperature hot glue is weak enough to allow removal of the machine later on by prying with a putty knife.

Factory default values for decoder

Output SWA is factory programmed to accessory address 1 (decoder addr 1, output 1)
Output SWB is factory programmed to accessory address 2 (decoder addr 1, output 2)
CV547 is set to 2 (Power up exercising of switch machine disabled)

Programming information

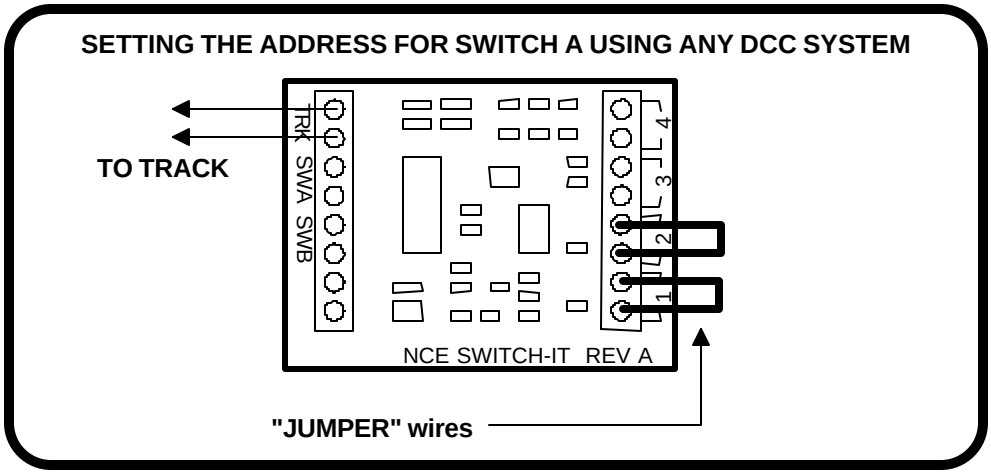
There are no provisions for programming Switch-It on the programming track but there are two ways to program it while connected to the mainline track. This decoder can be programmed by all systems that support accessory control using the procedure below. If you have a DCC system such as the Powerhouse Pro or Master Series that supports operations mode programming of accessories use the instruction for PH-Pro.

To program switch "A" to a new address using any DCC system:

1) Turn off track power or disconnect the TRACK wires to the decoder.
2) Connect a pair of short "jumper" wires across the number 1 and number 2 push button terminals as shown below in the illustration.
3) Turn on track power or reconnect the TRACK wires to the decoder.
4) Remove the jumper wires.
5) Use your DCC system to issue an accessory command to control the accessory number you wish the decoder to use as its address for the **SWA** output.
6) Remove power from the decoder for at least 15 seconds

To program switch "B" to a new address using any DCC system:

1) Turn off track power or disconnect the TRACK wires to the decoder.
2) Connect a pair of short "jumper" wires across the number 3 and number 4 push button terminals (as described in step 2 for output "A" above)
3) Turn on track power or reconnect the TRACK wires to the decoder.
4) Remove the jumper wires.
5) Use your DCC system to issue an accessory command to control the accessory number you wish the decoder to use as its address for the **SWB** output.
6) Remove power from the decoder for at least 15 seconds



NOTES: Do ***not*** leave the jumpers in place after programming or you won't be able to control the switch position.

To program switch "A" to a new address using PH-Pro or Master Series:

The following assumes the default addresses for the SWITCH-IT. If you have already programmed a different address for SWA, substitute that address in step 4. Likewise substitute SWB's address in step 4 of programming SWB on the next page.

1) Connect decoder to DCC track power
2) Momentarily connect the pushbutton #3 terminals to set **SWB** to the **OFF** position. This disables attempts to put this output in address programming mode.
3) Momentarily connect the pushbutton #2 terminals to set **SWA** to the **ON** position.
4) Use PROG ACCESORIES (push PROG followed by 7) to program accessory #1, **CV545** to a value of 1. This puts the SWA output in address programming mode.
5) Press PROG to escape from Accessory programming

Use SEL ACCY to control the accessory number you wish the decoder to use as its address for the **SWA** output.

To program switch "B" to a new address using PH-Pro or Master Series:

1) Connect decoder to DCC track power
2) Momentarily connect the pushbutton #1 terminals to set **SWA** to the **OFF** position. This disables attempts to put this output in address programming mode.
3) Momentarily connect the pushbutton #4 terminals to set **SWB** to the **ON** position.
4) Use PROG ACCESORIES (push PROG followed by 7) to program accessory #2, **CV546** to a value of 1. This puts the SWB output in address programming mode.
5) Press PROG to escape from accessory programming
6) Use SEL ACCY to control the accessory number you wish the decoder to use as its address for the **SWB** output.

NOTES: Due to the nature of NMRA DCC addressing for accessories it is important to set the outputs of any SWITCH-IT within 3 accessory numbers (higher *and* lower) to the OFF (reverse) position before programming as in step 2 above. Otherwise you will inadvertantly program those accessories as well the intended accessory. This is because operations mode programming only works on "blocks" of 4 addresses. Setting outputs OFF disables programming the address of that output on the SWITCH-IT.

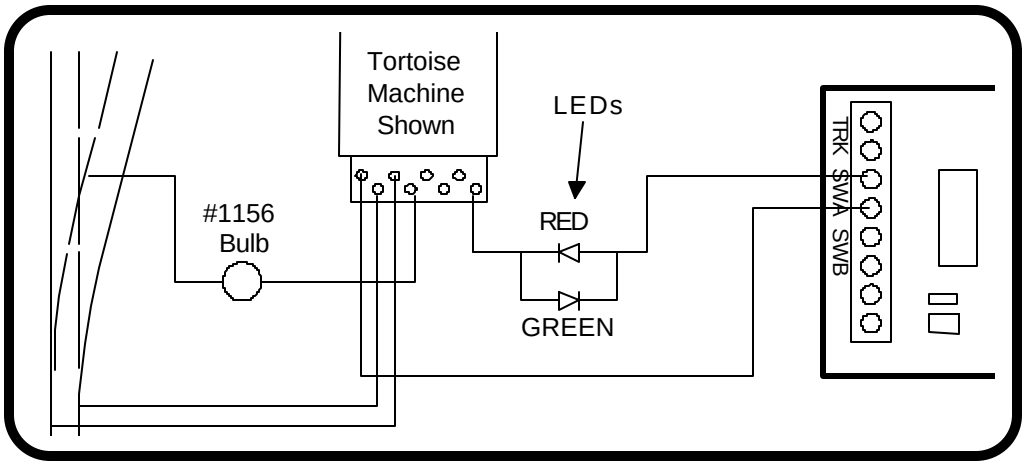
If jumper wires are installed in all 4 push button locations the decoder will reset to the factory defaults when power is applied then removed.

To program the decoder to "exercise" the switch points at each power up:

Use PROG ACCESORIES to program **CV547** of the accessory number SWA is programmed for to a value of 1. To disable this feature program **CV547** to a value of 2.

Other technical stuff:

- We have successfully controlled two Tortoise switch machines with one decoder output when used in a crossover. We can't guarantee this will work in all cases.
- The outputs of the decoder are always on to prevent the switch machine from backing off due to the springiness of the turnout throw mechanism.
- If CV547 is programmed to 1 the decoder will "back off" the switch (usually about halfway) then return the switch to its remembered position at power up. This is to make sure the points are fully thrown (solves "sticky" point problems).
- See the diagram below for turnout position indicator light wiring. LEDs are wired in series with the switch machine to indicate which position the turnout is thrown. Most LEDs will handle up to 25mA, the switch motor acts as the current limiting device for the LEDs. We use red and green LEDs but any color will do.



TIP:

If you use power routing turnouts such as Peco Electro-Frog, Shinohara or Walthers we suggest wiring a #1156 automotive taillight bulb in series with the points of the turnout (see above). This will prevent short circuits from shutting down your power booster in the event you enter the turnout from the frog end without aligning the points.

Warranty

This decoder is covered by our 7 year guarantee. Details of this guarantee are available from your dealer, in our product catalog or by writing to NCE Corporation.

The warranty is voided if the decoder the decoder is miswired, connected to more than 22 volts, or used with switch motors drawing more than 40mA.