Summary of Configuration Variables:

| CV#	Function/Default Value	
1	Base Address	1
2	Reserved	-
3	Output 1 Configuration	0
4	Output 2 Configuration	0
5	Reserved	-
6	Reserved	-
7	Manufacturer Version No.	-
8	Manufacturer ID	-
9	Base Address Adder	0
10	Reserved	-
11	Reserved	-
12	Reserved	-
13	Reserved	-
14	Reserved	-
15	Output 2 Alternate Address	0
16	Output 2 Alternate Address Adder	0
17	Both Outputs close Address	0
18	Both Outputs close Address Adder	0
19	Both Outputs throw Address	0
20	Both Outputs throw Address Adder	0
21	Output 1 close/ Output 2 throw Address	0
22	Output 1 close/ Output 2 throw Address Adder	0
23	Output 2 close/ Output 1 throw Address	0
24	Output 2 close/ Output 1 throw Address Adder	0
25	Reserved	-
26	Reserved	-
27	Reserved	-
28	Reserved	-
29	Decoder Configuration	0

6 PIN Output Connections:
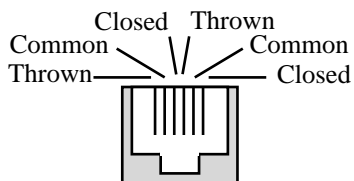
Note: The common connection is intended only to provide power to solenoid type switch machines. Other uses will result in improper operation.

SMD2
Switch Machine Driver

> DCC compatible accessory decoder
> Drives two solenoid and/or stall type machines
> Voltage step-up capacitor discharge
> Separate address for each output
> Separate address for output combinations
> Operates on low current from track power

Each outputs can be configured for a solenoid or stall type switch machine.
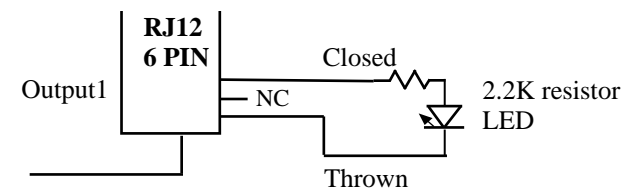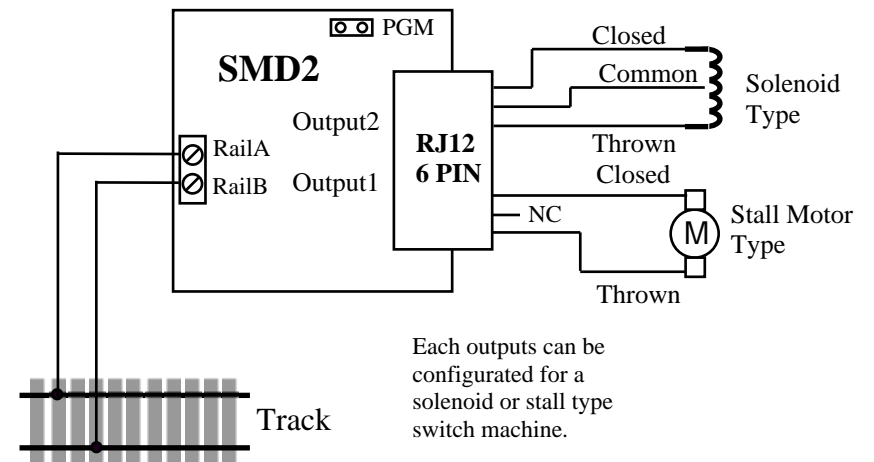
Optional connection for visual indication of successful programming.

2.12.03

Operation:
The SMD2 is capable of driving two solenoid and/or stall motor type switch machines. It contains a voltage step-up Capacitor Discharge Unit to store energy. A discharge of this energy is used to drive the solenoid type machine. Using a CDU reduces the current drawn from the track to a small level sufficient to recharge the CDU. However, once the CDU has been discharged, a time period is required for the CDU to recharge. This is typically about three seconds. Since more than one switch may be requested to change state at the same time, as in a local route, the requests are queued so that each switch may change state in turn. A stall motor type does not use the CDU and therefore, no recharge time is required when activated.
Caution: The CDU retains a voltage charge several minutes after power is removed.

The outputs of the SMD2 may be configured to any combination of one of four types: short high energy pulse for solenoid type (default setting), continuously on for stall type, five second on pulse and manual on/off control.

The SMD2 can be addressed in groups of two (sequential addresses) by programming the base address and base address adder, CV1 and CV9. For example, if the base address is set to three, then output one's address is 3 and output two's address is 4. Alternately, each output may be addressed individually (non sequential addresses). Output two's address may be independantly set using it's alternate address and alternate address adder, CV15 and CV16. Output one's address is still determined by CV1 and CV9.

Output combinations are possible were both output are activated by a single address. Four separate addresses are available to set the outputs to any of the four possible combinations: both outputs close, output one close/output two throw, output two close/output one throw and both outputs throw. These combination addresses are separate from the base address.

Any of 2040 addresses may be used to address the SMD2.

Quick Start using "Smart" Programming:
For this type of programming using the programming track is not required.
1. Be sure track power is off. Connect the SMD2 to track power.
2. Install the programming jumper.
3. Turn on track power
4. Using the throttle, select the switch address you want to assign to output one. Operate the switch (close or throw). This sets the address of output one and two (sequential addresses). If an alternate address is desired for output two (non sequential addresses) continue. Otherwise goto step 5. Select the switch address you want to assign to output two and operate the switch.
5. Turn off track power.
6. Remove the programming jumper.

Configuration Variables (CVs):
The SMD2 supports **Paged Mode Programming in Service Mode**. This means that, for this type of programming, it will need to be connected to the programming track. Also, the programming terminal (PGM) and the ground terminal (GND) must be connected together before power is applied. To enter normal operation, power must be removed, the connection between (PGM) and (GND) removed and power reapplied. Programming CV7 with 170 will "reset" all CV's to the default value. If desired, a resistor and LED may be connected to output one as shown in the diagram on the front page. The LED will flash confirming successful programming.

SMD2 Address
These CVs determine the sequential addresses for outputs 1 and 2.
CV1 - Base Address, value 1 to 255   CV9 - Base Address adder, value 0 to 7
Address = value of CV1 + address adder
If an address greater than 255 is needed then use the address adder. The following table shows the CV value to use for the adder.

Address Adder								
CV value	0	1	2	3	4	5	6	7
Adds	0	256	512	768	1024	1280	1536	1792

Example: Output 1 address of 20 & output 2 address of 21, set CV1 = 20 & CV9 = 0
Output 1 address of 524 & output 2 address of 525, set CV1 = 12 & CV9 = 512

Output Configuration
CV3, 4 - Output configuration
Set the CV value = 0 for solenoid type operation (queued).
Set the CV value = 1 for stall motor (continually on) type operation (not queued).
Set the CV value = 2 for 5 seconds motor on type operation (not queued). If the motor doesn't have to be continually powered, use this type to reduce track current draw.
Set the CV value = 4 for manual output on/off control type operation. This type doesn't response to a combination address.

Output 2 Alternate Address
These CVs determine the alternate address for output 2. Use this address when non sequential addressing of output 1 & output 2 is desired. CV1 & CV9 determines the address of output1 when the alternate address is non zero.
CV15 - Address, value 1 to 255   CV16 - Address adder, value 0 to 7
Example: Output 1 address of 80 & output 2 address of 90, set CV1 = 80 & CV9 = 0 and CV15 = 90 & CV16 = 0

Output 1 & 2 Combination Addresses
These CVs determine the address for each of the four possible switch state combinations.
Set both outputs to close
CV17 - Address, value 1 to 255   CV18 - Address adder, value 0 to 7
Set both outputs to throw
CV19 - Address, value 1 to 255   CV20 - Address adder, value 0 to 7
Set output 1 to close and output 2 to throw
CV21 - Address, value 1 to 255   CV22 - Address adder, value 0 to 7
Set output 2 to close and output 1 to throw
CV23 - Address, value 1 to 255   CV24 - Address adder, value 0 to 7
Example: Set both outputs to close with address 260, set CV17 = 5 & CV18 = 1
Note: since the state of the outputs are already defined, operate swtich 260 from the throttle with either the close or throw command.

Decoder Configuration
This CV determines the configuration options.
CV29 - Configuration, value 0 or 1
Option 1, CV29 = 1   The SMD2 will remember each outputs state at power off. Then at power on, after the CDU charges, each output will be set to the same state.

Applications
For information on how to use the SMD2 with two wire solenoid machines and enable a local input, see Team Digital's SMD2 application web page.