# **DP16 Motor Quick Start Guide:**

Thanks for trying a DP16 DCC Controlled switch motor with local control! Here are a couple of things to remember:

- 1. The DP16 draws power and control information from a DCC bus. We recommend you use a separate power station (booster) or at least a separate circuit breaker bus so that a locomotive running a switch won't short out the motor power, preventing you from clearing the short.
- 2. The rigid actuating pin requires very precise alignment and, in many cases, moving the cam travel adjustment pin (factory setting is 6mm). I strongly recommend using music wire (0.032, 0.039 or 0.047) in place of the supplied rigid "rod-needle" pin. (See the one-sheet instructions or the back of our brochure on MP4 and MP10). K&S Metals sells music wire which is available at most hobby shops and hardware stores. <a href="https://ksmetals.com/collections/music-wire">https://ksmetals.com/collections/music-wire</a>
- 3. Your shipment should include a "goodie bag" that includes the "rod needle", spare cam pin(s) and the connector. These may be included in the bag with the switch motor. Do not lose the goodie bag: we have very limited supplies of extras and may not be able to get more until our next shipment. Note the cam pins must be griped carefully or they will fly off into Kadee-coupler-spring land or get eaten by the "carpet monster" <g>.
- 4. There is no "center off" position on MP/DP Motors, so when mounting the motor, check which end you're aligned with and position the motor so it's at one rail or the other. Using music wire (see 3 above) will make this easier. We also make mounting adapters with slots to aid this process. These adapters can be used as rigid drilling templates.
- 5. If you can position the motor so that you can get at the screw in the middle of the slider (that is: not up against a joist), you can finish alignment and then drop the pin to the desired height without having to cut anything. You can also adjust the side-to-side position by loosening and then tightening the two outboard screws on the slider. You might want to loosen the two screws in advance if you are planning to adjust the slider position in place. Retighten the screws when everything is aligned.
- 6. The big issue you need to address with local control is that any controls you use have to deal with the possibility that the motor can be commanded at any time by the other means of control (there is no lock-out function): that is DCC commands override the local switch even if it is putting out a permanent to signal to BiDir. Likewise, a command to BiDir will cause the motor to move regardless of the last DCC command. A controlling computer (JMRI) or any DCC bus monitor (LocoNet) will NOT be aware of a local command to move the turnout. If knowing the state of the turnout (other than by inspection) is important to you, you'll need to sense the AUX1 contact to determine the actual state of the switch (for fascia displays, dwarf signals, computer feedback etc.) likewise you probably DON'T want to use a toggle switch which will be confusing as its position may have no relation to the actual position of the turnout. A latching relay controlled by push buttons is a good (but somewhat complex) solution.
- 7. Best practice is to provide DCC power to the motors from a separate booster (or at least a separate breaker district -- one for each) from the track. Without DCC power the DP16 is a brick! if a train runs a switch and derails causing a short (this can happen even with a dead frog, especially if the loco has a keep-alive -- with the short neither the motor or the errant loco can "hear" DCC commands and the loco will merrily plow along derailing everything in its consist until it runs out of keep-alive power or you physically remove all the shorts from the track: only then you can throw the switch or command the loco to stop. (Also be sure to have some kind of mechanical interlock protection for any bridges so "zombie kept alive" locos don't run off the end and crash to the floor). This means you really can't use the Aux2 lead for frog power as it gets power from the motor power. (Kevin Hunter suggests that you can wire an 1156 tail light bulb in series with the frog if so use a real incandescent bulb not an LED replacement-- I think that's a kludge, still it will probably

work. You need to decide if you want dead frogs (with limitations on short wheelbase locos and/or the need for keep-alives -- see above) or use frog juicers powered by the track power (not the motor power). You could also use an additional relay (something like <a href="https://www.modelrailroadcontrolsystems.com/omron-relay-breakout/">https://www.modelrailroadcontrolsystems.com/omron-relay-breakout/</a>) as a contact multiplier so you've got a dedicated isolated contact for frog power (from the track not the motor power) and another for indicators, etc.

- 8. If you are not familiar with these concepts or are uncomfortable adding external circuitry to your motor, the DP16 is probably not your best choice.
- 9. If you have more questions, please contact us at <a href="mailto:sales@modelrailroadcontrolsystems.com">sales@modelrailroadcontrolsystems.com</a>
- 10. If you encounter a DCC control failure with a DP16 Motor (this is still a new product), please notify us immediately and we will send you a replacement in kind. I'll send you a return label (use the box the replacement came in) and please return the failed motor as soon as possible so we can inspect it and forward it to MTB. Please let us know what DCC system you are using, how far from the booster the motor is and anything that you feel may be impacting the DP's ability to respond to DCC commands.

## Function and setting of DP16 switch motors

DP16 Switch Motors are equipped with both manual control inputs and DCC interface receiving command from master station and power for motion. They have one independent auxiliary contact AUX1. Second contact AUX2 can be used for supply switch frog by DCC signal. When the DCC signal is turned On, the LED flashes one time to indicate the DP16 is functioning correctly.



2 wire mode



DCC commands have priority over manual inputs. If the DP receive DCC command during manual movement, after finishing this "manual initiated" movement, it will start to move to DCC desired position.

For basic function testing, a DC power supply of 9-16V, with marked polarity, can also be used, only for functional test by button, or using with biDir inputs.

### LED indicator function:

#### <u>1 short flash</u>

- when turning on the power or DCC signal (verification that DP is alive)
- reception of the DCC command for switching position (or the versatile DCC command RESET)
- while you press the button for >2.5 seconds
- while you press the button for >2.5sec, indicating polarity change

Fast flashing after button press of >5 Seconds – entry to address configuration mode.

#### **Button Function:**

short press (0.1-1 sec) run test, the switch changes position. This also works with DC power

**medium press (2.5-max 4 sec)** – <u>change of polarity</u>. the switch will respond to DCC commands in the opposite direction. The new polarity is immediately permanently stored in memory.

**long press >5 sec**<u>-learning new DCC accessory address</u>, reset to original address. The LED will flash and DCC address is set to the default value (ex LENZ ADR=9). As soon as it receives the first accessory decoder command via DCC (sent to any switch), it store the address of this command and accept it as its permanent one. During learning mode , it only responds to accessory/turnout DCC commands, not DCC commands for loco decoders. After saving the address, the LED stops flashing and the address learning mode is finished.

#### Default Accessory Addresses:

RocoMouse, Roco Z21 etc: addr = 9 LENZ, DigiKeys, Digitrax, NCE: addr= 5



Figure 1 - DP16 with local control – BiPolar Control



Figure 2- DP16 with local control – 3 Wire using included 2.2K pull up resistors