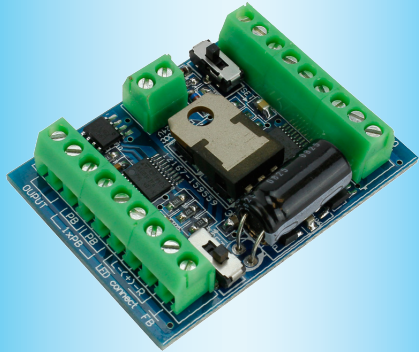


# Cobalt AD-2fx Stall Motor Decoders

## OWNERS MANUAL



### Overview: Cobalt AD-2fx Decoders

Please be sure to read these instructions before installing your AD-2fx Decoder. DCCconcepts AD-2fx decoders have been designed from the outset to work perfectly on both DC & DCC controlled layouts and each output is able to very reliably change one or several Cobalt-type or similar point motors. AD-2fx can be used with DC or DCC power.

AD-2fx Decoders can be connected directly to the DCC track power or DCC accessory power bus and need no added power supply or wiring when used with DCC (15v DC is required for DC layouts).

Unlike other Accessory decoders which have very limited power drive ability and no added features, AD-2fx decoders are able to reliably change several DC-motor point motors simultaneously.

AD-2fx decoders also offer parallel pushbutton + digital control. They also incorporate computer IO indication and feedback and offer connection of control panel LEDs should you need them.

Power use is intelligently managed on-board, so you don't need a big power supply even when used on DC layouts - any regulated 15V DC supply that can deliver above 1.5 amps should be just fine!

**AD-2fx also has some exclusive added features:**

AD-2fx has all the features that Cobalt users could wish for.

- \* Computer IO and DCC system feedback directly from decoder.
- \* LED outputs ready for you to add lights to your control panel.
- \* Dual momentary contact switch option so you can have both digital & manual control of your points - switching contacts are triggerable with hall, diode matrix or detectors for automation.

**Important: Be careful when powering up your AD-2fx decoder. Allowing the lower face of the PCB to contact conductive areas, metal tools etc. will cause serious damage to onboard electronics.**

### Overview: Cobalt AD-2fx Connection

DCCconcepts AD-2fx decoders have screw terminals for all of the common connections to make wiring easier for you.

The use of all terminals is marked clearly on the PCB.

Please do NOT tin the wire ends when using screw connectors - it's less reliable long term. Just strip the wires carefully and twist them tightly.

We recommend the following wire choices for AD-2fx;

- (1) Power-in wiring: 16x 0.2 is recommended. (Your choice may be different depending on where you put your AD-2fx decoders. Heavier 6-core (alarm) wire can be an excellent choice as it gives you 3 wires for switches and 3 more LED etc in one tidy cable).
- (2) Switch, LED & IO wiring: 7x0.2 to 16x 0.2 is OK (light wire is OK). (Your choice may be different depending on where you put your AD-2fx decoders. Heavier 6-core (alarm) wire can be an excellent choice as it gives you 3 wires for switches and 3 more LED etc in one tidy cable).
- (3) Other wiring to/from Cobalt etc to track: 16x 0.2 recommended. (Please keep frog power wires as short as possible. We suggest you adopt a consistent colour for frog wires - green is the usual choice).

AD-2fx has all wiring positions clearly marked on the PCB. Before wiring your AD-2fx decoder please read these instructions from start to finish and then take note of the following advice:

- \* Plan your wiring colour codes. A little forethought makes it much easier to maintain your layout as time goes on.
- \* Make sure your soldering iron is ESD safe. A soldering iron with voltage or mains leakage is dangerous and WILL damage electronics.
- \* Make sure the mounting or work surface is clean. Also make sure it is clear of metal objects that can cause accidental short circuits.
- \* Make sure layout power is turned off before connecting AD-2fx
- \* While the LED outputs are already current limited, we recommend that you do add a resistor as panel lights should not be too bright!

### Example: Cobalt AD-2fx Set-up

#### Setting the Address

Giving your DCCconcepts AD-2fx decoder its own address is very easy. Just remember to use ONLY these DCCconcepts instructions as all other DCC manufacturer instructions are valid only for their own accessory decoders.

You do NOT ever need to connect AD decoders to a programming track. For ALL handset and console based products that use a simple and direct "Press-the-button" routine to change a point or turnout, do as follows:

- \* Connect the AD-2fx to the track power bus or the dcc accessory power bus.
- \* Decide on the number that you wish to give each AD-2fx Decoder output
- \* Carefully move the "Set/Run" switch of that output to the "SET" position
- \* Follow your control systems instructions for Operating a point at that address. Use just the number only - do not add any leading zeros. (3 = 3, not 0003) (Complete the operation totally - from "select address" to "changing the point").
- \* Return the "Set/Run" switch to the Run position and your AD-2fx decoder will now respond to that address - it really IS that simple!

For ALL Screen-based products such as ESU, Z21, Hornby E-link and similar products you may first have to set up a track diagram or add a new point (turnout) to the controller system's accessory control library.

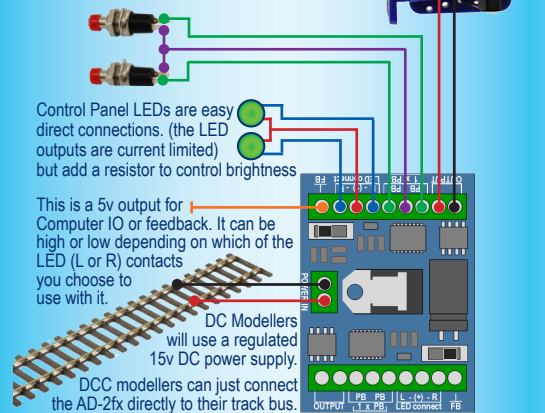
Using your controller instructions, first complete the on-screen track plan or enter any information needed for the new accessory. Once that is done, and you have chosen which turnout on your on-screen display you want to control, follow the instructions above.

- \* Need help? please email us at: [sales@dccconcepts.com](mailto:sales@dccconcepts.com)
- \* Or visit our website at: [www.dccconcepts.com](http://www.dccconcepts.com)
- \* Or call us on +61 8 9437 2470 (10am - 5pm, GMT + 8 hours)

### Overview: Cobalt AD-2fx Connection

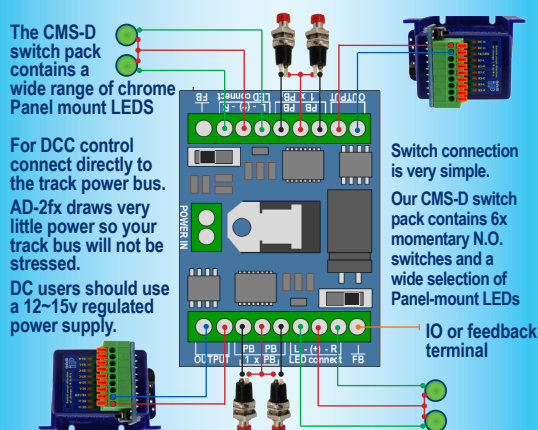
As you can see, each of the AD-2fx accessory decoder outputs will provide you with everything you could need for perfect control and operation of Cobalt or other DC point motors. This leaves the switches on your Cobalt Motor free for signals, interlocking, frog power & other things

You can control AD-2fx with Push-button switches, Diode Matrixes, Stud and Probe or link them to other things such as Hall devices reed switches or detectors for auto-control... DCCconcepts CMS-D switch pack includes all you need, including chrome-mount LEDs to let you create a professional looking panel



### Example: Cobalt AD-2fx Connection

#### POWER, LED and SWITCHES



#### Cobalt AD-2fx Special software commands

**Self-Centering ON:** This self-centres Cobalt IP Analog motors automatically. To activate, follow standard addressing procedure to set the address to 199. Cycle the power by turning the DCC system on and off (pause before turning on). Now when you apply power again, the Cobalt IP Analog will center its throw-bar.

**Self-Centering OFF:** As above, but use address 198 to turn self-centering off.

**Swap Change Direction:** This changes the direction of change to let you easily match computer programs, screen based track layouts etc. To change the throw direction using AD-2fx software, proceed as above but set the address to 197.

*NOTE: Some DCC systems have slow responses - when using command 199/8/7 take your time and press buttons firmly but slowly. Pause during the power cycling.*

### Example: Cobalt AD-2fx Connection

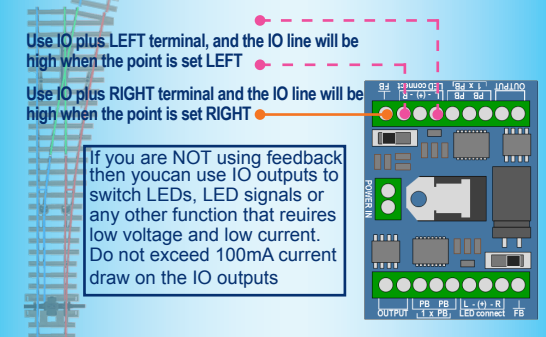
#### Feedback (IO output) explained

Some DCC systems such as Lenz make use of simple feedback systems to let the DCC system know which way a point (turnout) is set. This approach is also common with many forms of DCC control software.

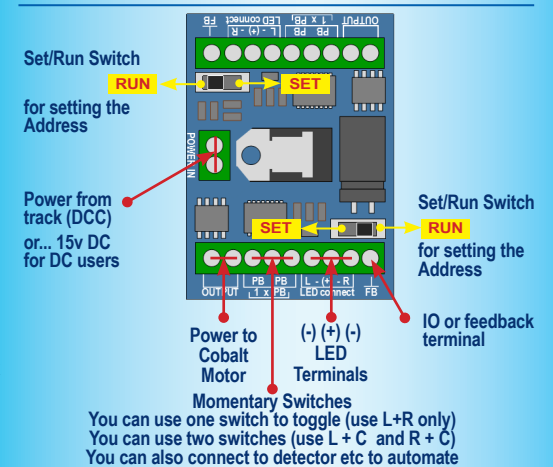
While the various brands may choose to give it a fancy name, it really is just a simple 2-wire control circuit that is switched on/high (typically 3-5v) or off/low (0v) depending on which way the point is thrown.

As this will depend on whether the left or right branch of the pointwork is the main line, we have linked the feedback/IO terminal of the AD-2fx decoder to the left/right LED terminals. Connection logic is very simple:

- \* Use the IO line plus the LED right terminal and the IO will be "ON" when the point is set to the right route. (LED indicators repeat the IO setting)
- \* Use the IO line plus the LED left terminal and the IO will be "ON" when the point is set to the left route. (LED indicators repeat the IO setting)



### Overview: Cobalt AD-2fx Connection



With all AD-2fx wiring able to be done by screw connector and with spring connectors on all Cobalt Classic, Cobalt IP & Cobalt Ω Omega motors plus clear instructions printed onto the PCB... wiring just couldn't get any easier.

Adding LED's is also super-easy. Just remember that the centre connection pad is (+) Positive (for all common LEDs, the long lead is the positive lead).

Having so much wired up to your AD-2fx decoder will not limit your other abilities either - even with everything connected you'll still have three spare SP2T switches on each Cobalt motor ready for other things