



INSTRUCTION MANUAL: DCC Accessory Decoders for COBALT

DCC Accessory decoders for Cobalt

Stall motor or motor drive are phrases that cover many turnout/point motor types that use a DC motor to move the point blades, and all of them are quite different - in design, in how they operate electro-mechanically and importantly, in how they manage power!

“Stall motor” covers several brands which do not actually ever turn their internal power off .

This type of point motor is designed to run on reversing DC and stall quite safely at the end of the throw. This is the most reliable type of DC turnout motor. The biggest / most obvious differences among them are their noise level, actual throw power, current draw & how power is managed. Critical issues are current draw/voltage used.

Cobalt is among this category. It is more compact than most and is definitely the quietest by a very long way.

Cobalt also has the most powerful drive because it chose a very strong gear ratio. It has the ONLY lifetime warranty too. Check specifically model by model, but in general Cobalt uses the following voltage & power levels.

(original Cobalt range) 7~12v DC for Cobalt Classic Analog, 10~14.5v DCC or DC for Cobalt Digital

(2014 Cobalt range) 7~18v DC for Cobalt Omega Ω, 7~23v DC for Cobalt iP Analog & 7~23v DCC for iP Digital.

Cobalt current draw varies model by model. Most are around 20mA at recommended voltages, but Cobalt iP is different - it draws less than 5mA while static, with a short 35~45mA only while changing. (The peak current draw is still less than that of a high brightness white LED)

“Limit switch type” covers the other types of motor drive turnout/point motors - these stop the motor power totally and have an in-built switch that turns off power at the end of throw.

They are often marked for AC power because that is the “European habit” for accessory power, but they actually use internal diodes to rectify inside them for DC. They can in fact ALL be operated with DC quite easily. Generally these are horribly noisy & less reliable as their internal switches fail or go out of alignment. Brands like Lemaco, Tillig, Fulgurex, Hoffmann and Conrad fall into this category. ALL OF THEM. Whether limit switch or stall type, all have different current draw needs, need specific voltages and, in some cases, specific switching to work properly.

HOWEVER, no matter which you choose, you MUST remember that Accessory DCC decoders for point motors need to match the motor they are operating with or they will NOT going to work properly or be up to the task. One type will NOT do all DC point motors, many claim to be “Stall motor” decoders however they are designed with inadequate power outputs or wrong characteristics making them work with only ONE of the many brands.

UNFORTUNATELY - Many retailers now tend to be less skilled, or take less time learning about what they sell than they should. Web retailers often just do not care... so be careful.

So: Remember, always. Before shopping or making a buy decision - READ what the maker of your point motor recommends. Know what's needed. Check that what you are looking at WILL work before you commit to it.

Cobalt is the most sophisticated turnout motor made. DO not assume that it will work with any old brand of accessory decoder because it will not! Cobalt works best with DCCconcepts accessory decoders which also have the best features and lowest cost per output, making them exceptional value. Please use ONLY decoder models we recommend here as we will NOT be able to help you if you make bad accessory decoder decisions.

A reminder - Cobalt Warranty: All Cobalt motor models are supplied with a “Lifetime warranty” for the original owner. The lifetime warranty is managed by DCCconcepts directly after the initial warrant period (dealer responsibility) has passed. Lifetime Warranty is only for the initial purchaser and is not transferrable, however DCCconcepts care about ALL Cobalt owners, so we'll provide customer service for all Cobalt motors, always. We repair or replace at our discretion. We always have all spare parts for all Cobalt motor variants.



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What DCCconcepts recommend, what works - and what will not work with Cobalt point motors

(If you find this chart hard to read, click on the chart and download a copy in PDF form please. 2014 prices are shown to illustrate comparison)

Decoder Brand	Decoder Model	List price RRP (local currency)	Comparison in USD	Number of outputs	\$US COST per output	Power delivery ability	With Cobalt Classic & Cobalt Ω Omega	Use with Cobalt IP?	Comment after testing
DCCconcepts	AD-2fx	AU 22.95	20.31	2	10.15	350mA	OK with full crossover or scissors!	YES, best value, best performance and best features!	Designed from DAY 1 to have the best performance among stall decoders. Best usability and highest feature level!
DCCconcepts	AD-8fx	AU 79.95	70.75	8	8.84	350mA	OK with full crossover or scissors!	YES, best value, best performance and best features!	Designed from DAY 1 to have the best performance among stall decoders. Best usability and highest feature level!
DCCconcepts	AD1-HP	AU 14.95	13.23	1	13.23	300mA	OK with full crossover or scissors!	YES, for a 1x install... but Cobalt-IP Digital would be best choice!	Designed for multiple Original Cobalt use (ie full scissors crossing change) as well as Beta IP testing, Fulgurex, Lemaco, Tillig etc
THESE accessory decoders are 3-wire solenoid types, but work with ALL Cobalt if the low cost DCCconcepts SDC adapters are added to each output.									
Hornby	R8247	UK 39.99	64.38	4	16.10	Use with DCCconcepts SDC adapters	Plenty of power	OK if already owned, but better to buy the correct AD decoder!	Designed for solenoids - BUT ... set it to about 3 seconds on-time, it will work when used with the DCCconcepts SDC adapter
MRC	1628	US 72.95	72.95	4	18.24	Use with DCCconcepts SDC adapters	Plenty of power	OK if already owned, but better to buy the correct AD decoder!	Designed for solenoids - BUT ... set it to about 3 seconds on-time, it will work when used with the DCCconcepts SDC adapter
Gaugemaster	DCC30	UK 59.95	96.52	4	24.13	Use with DCCconcepts SDC adapters	Plenty of power	OK if already owned, but better to buy the correct AD decoder!	Designed for solenoids - BUT ... set it to about 3 seconds on-time, it will work when used with the DCCconcepts SDC adapter
Lenz	LS150	UK 49	78.89	6	13.15	Use with DCCconcepts SDC adapters	Plenty of power	OK if already owned, but better to buy the correct AD decoder!	Designed for solenoids - BUT ... set it to about 3 seconds on-time, it will work when used with the DCCconcepts SDC adapter
Lenz	LS100	UK 72	115.92	4	28.98	Use with DCCconcepts SDC adapters	Plenty of power	OK if already owned, but better to buy the correct AD decoder!	Designed for solenoids - BUT ... set it to about 3 seconds on-time, it will work when used with the DCCconcepts SDC adapter
ESU	51820	UK 30.5	49.11	4	12.28	Use with DCCconcepts SDC adapters	Plenty of power	OK if already owned, but better to buy the correct AD decoder!	Designed for solenoids - BUT ... set it to about 3 seconds on-time, it will work when used with the DCCconcepts SDC adapter
Accessory decoders below are NOT recommended for ANY Cobalt use & are NOT usable with Cobalt Classic Ω or Cobalt IP									
DCCconcepts	AD-1	AU 14.95	13.23	1	13.23	50mA	OK with 1~2	NOT usable	Designed for the original Cobalt ONLY. ALSO really effective for multiple tortoise too
DCCconcepts	AD-4	AU 54.95	48.63	4	12.16	50mA	OK with 1~2	NOT usable	Designed for the original Cobalt ONLY. ALSO really effective for multiple tortoise too
Digitrax	D552	US 24.95	24.95	2	12.48	15~20mA	Marginal	NOT usable	low cost design, underpowered
Digitrax	D544	US 39.99	39.99	4	10.00	15~20mA	Marginal	NOT usable	Tends to overheat at anything above 15mA
Digitrax	D564	US 59.95	59.95	4	14.99	15~20mA	No go (see note)	Not recommended	No go without pull-up resistors added
NCE	Switch-it	US 29.95	29.95	2	14.98	20~25mA	OK with 1	Not recommended	Marginal with two
NCE	Switch 8	US 69.95	69.95	8	8.74	15~20mA	Marginal	NOT usable	NO switch ability built in
Wangrow	SM4-104	US N/A		4	0.00	more than 100mA	OK with multiple	OK with several	What a shame - It is by far the best of the US made accessory decoders power-wise, but it is no longer available...
DCCspecialities	Wabbit	US 29.95	29.95	2	14.98	~20mA	Marginal	Not recommended	Inadequate power ability
DCCspecialities	Wabbit FB	US 34.95	34.95	2	17.48	~20mA	Marginal	Not recommended	Inadequate power ability
DCCspecialities	Hare	US 29.95	29.95	1	29.95	~20mA	Marginal	Not recommended	Inadequate power ability
DCCspecialities	Hare 2 FB	US 34.95	34.95	1	34.95	~20mA	Marginal	Not recommended	Inadequate power ability
CML Electronics	DAC-20	UK 65	104.65	8	13.08		No go (see note)	Not recommended	No go without pull-up resistors added
Team Digital	SM084	US 99.95	99.95	8	12.49	~8mA	NOT usable	NOT usable	really inadequate power ability

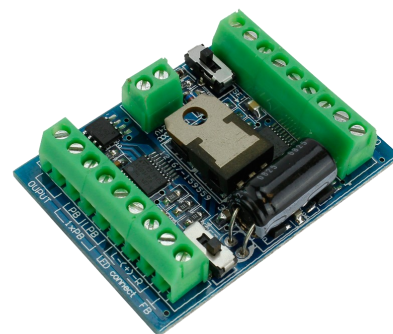
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The Decoders that DO work perfectly... by DCCconcepts

These are the 2 & 8 way accessory decoders designed to work best with Cobalt iP - yet they are also totally usable with all brands! They will drive multiple Cobalt. They will also drive ALL versions of all brands of Stall motors.

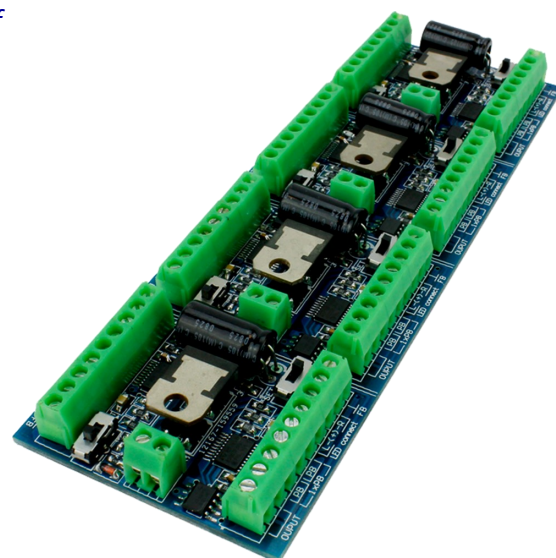
AD-S2fx and AD-S8fx are also able to comfortably drive all types including higher current brands of limit switch type motors. There's more than enough power for more than 2 of any type, so crossovers are taken care of easily.

Because the power output of AD-fx decoders is managed and applies effort ONLY when changing, the power used by these Accessory decoders is low and so they do not load the DCC power bus as other stall-motor decoders do.



AD-2fx and AD-8fx features.

- Works perfectly and simplifies operation for DC users as well as those using digital control or DCC.
- Perfectly stabilised power deliver is even OK for coreless motors
- Enough power for multiple stall or limit switch dc motor decoders or accessories.
- Super-low power load between operations.
- Feedback via a Computer IO output that can be either high or low to match any feedback system.
- Direct connection for panel LEDs or signals if needed frees-up switches on turnout motor for other things (enough power for 6 or more LEDs on each output)
- Versatile dual pushbuttons or momentary toggle switching (normal on-on is usable if DC-powered)
- Optional direct connection of detectors or other trigger devices to control switch outputs
- Usable with diode matrix, computer control or any other form of automation.
- Direct address setting via "learn/run" switch - ZERO need for complex CV settings
- Includes special software for self-centering Cobalt-iP and for the flipping of change direction, accessed via the address area and "learn/run" switch.
- Protected lower PCB for safe mounting on any surface.
- Solder-free screw terminals for easy wiring at any time.
- Wiring details are also clearly printed on the PCB so you will never forget how to wire them.
- Lowest "cost per output" among all brands available (see the comparison chart next page)
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AD-S2fx & AD-S8fx are the most powerful & strongest reversing-DC accessory decoders ever made. They offer a huge range of advanced features, yet remain the lowest cost, per output of ANY current offering from any brand. You'd be crazy to use anything else!

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The things that make the others work... by DCCconcepts

SDC adapters are extremely economical but very clever wee things that can make difficult problems go away without needing to spend too much money. They are in 3, 6 or 12 packs.

They were designed because many DCC modellers already have been using solenoids with the traditional 3-wire solenoid decoder, but they want to move away from H&M, NJ International, Atlas, Fleishmann, Marklin, Peco, Seep or Hornby solenoids to greatly improve the quality and reliability of their turnout control by using Cobalt point motors.

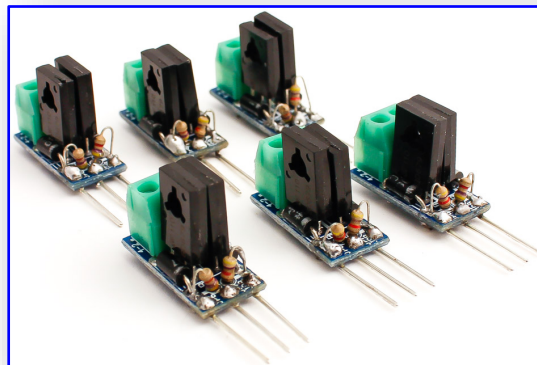
The SDC adapter lets them do that without having to spend lots and change their decoders!

As a bonus, we then found that the DCCconcepts SDC adapter was also the perfect way for you to convert these same 3-wire solenoid decoders to operate Kato and LGB solenoids!

Using them is simplicity itself. The 3 pins of the SDC are at the same pitch as the accessory decoder connections. Just plug them in and tighten the screw!

Once that is done... set the accessory decoder to an appropriate time length for each operating pulse, and that's the prep work done. Now just connect the 2 wires to the SDC's outputs (they are also convenient screw terminals) and add the cobalt motor. Job done!

SDC is simple, easy and affordable. It will save you LOTS of time and LOADS of money!



DCCconcepts SDC Adapter
The simple answer for solenoid users