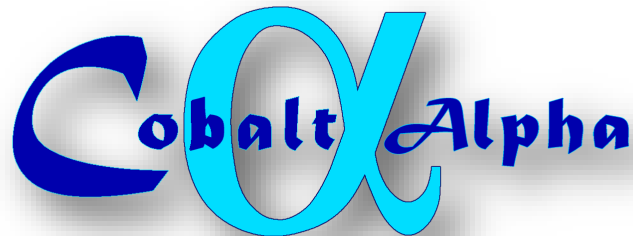




**Product Overview: Cobalt  $\alpha$  Alpha digital encoder**

**The Evolution of Cobalt continues with...**



**SIMPLICITY IS THE ULTIMATE SOPHISTICATION.**  
***Leonardo Da Vinci***

Cobalt Alpha makes simple yet sophisticated control possible  
Cobalt Alpha offers simpler wiring for both DC and DCC modellers.  
Cobalt Alpha needs only one wire between the control panel and layout.  
Cobalt Alpha is the missing link between digital simplicity and traditional control.  
***DCCconcepts - 2015***

**When DCC was first promoted, the phrase “Just two wires” was common.**

**It never was just two wires of course, and while DCC wiring gives great control and is certainly much simpler than wiring was in DC-days, it still needs lots of wire to keep things connected.**

DC or DCC layout - Nowhere is the problem of wiring complexity more obvious than when a control panel is added, because as well as track wiring we now need to add wires for switches and accessory decoders, LEDs and switches for turnout position etc., as... well as for feeding power to various places.

Think about it: at least 2 or 3 for switch connections to any point, signal or other item... Add power wires and LED indicators and switches and it doubles. It really adds up!

Even a smaller layout with any form of electric point control is usually going to have 100 or more wires linking a control panel to the layout... and lots more in the control panel and under the baseboards.

Perhaps it's fun for some, but it is a nightmare to others and always, it can be a maintenance problem!

It affects DC or DCC modellers equally so we've been thinking about this: Quite a lot in fact!

Most modellers simply find wiring a chore, DC modellers need far too many wires anyway... and while many DCC modellers (most in fact) want the refined control of DCC for trains, they also almost always want or need to retain simple control of points and trackwork, because driving trains is easy, but doing accessory control via the handset is to be honest, a clumsy and frustrating process.

Yes, we do understand that you could use a computer touch-screen, but time and time again we talk to modellers who have enough of that at work... and really want a traditional approach. A challenge, but one we think we have met!

Inspired by a question from a customer (Why do I still need all these wires?) and couple of quotes you may like, a year or so ago we set out to create something... anything, that could just make it easier!

**We think we have succeeded, so please read on!**

## Product Overview: Cobalt $\alpha$ Alpha digital encoder

First: The quotes.... Just to keep in context with our development approach.

### Quote #1

***“Some things you miss because they’re so tiny you overlook them. But some things you don’t see because they’re so huge.”***

*\* Robert M. Pirsig - Zen and the Art of Motorcycle Maintenance*

*We like this guy! He thinks like us. Basically DCC manufacturers have been so focussed in adding things that they forgot that the objective was to enjoy the trains, not the technology.*

*With technology it’s all too easy to “not see the wood for the trees” and we can all lose sight of simplicity because of it.*

### Quote #2

***It seems that perfection is attained not when there is nothing more to add, but when there is nothing more to remove.***

*\* Antoine de Saint Exupéry, L'Avion*

*The academics among you will understand that this is really a “re-interpretation of “Occam’s razor”.*

*But - it’s also a pretty good summary of how DCCconcepts think DCC product development should make future progress...*

*(These next two are really adaptations of this same quotation made by others)*

***Fools ignore complexity. Pragmatists suffer it. Some can avoid it. Geniuses remove it.***

*\* Alan Perlis, Epigrams in Programming*

***Simplicity — the art of maximizing the amount of work not done — is essential.***

*\* Principles behind the Agile Manifesto (2001).*

### Quote #3

***Simplicity is the ultimate sophistication.***

*\* Leonardo Da Vinci*

*What else can we say? He is after all Leonardo Da Vinci – and he is right!*

So, the objective was:

- To simplify the structure of layout control.
- To do this for both DC and DCC modellers.
- To keep the traditional control panel but reduce the wiring complexity.
- To find a way to actually remove most of the wiring if possible.
- To make it simple to have full layout control, without locking in either DC or DCC.
- To reduce modeller frustration, worry, stress ...and to reduce wiring maintenance.

**It has taken us lots of thought and a year of experiments... but we have succeeded!**

## Product Overview: Cobalt $\alpha$ Alpha digital encoder

# Cobalt $\alpha$ Alpha is the answer to many problems!

Cobalt  $\alpha$  Alpha can independently control 12 different items needing an SPDT type switch for their control... It does not care how many devices are linked to its outputs so just ONE can control all 24 turnouts in a 13 track fiddle yard!

Cobalt  $\alpha$  Alpha takes over the job that all those wires used to do

Cobalt  $\alpha$  Alpha is equally usable on either DC or DCC layouts.

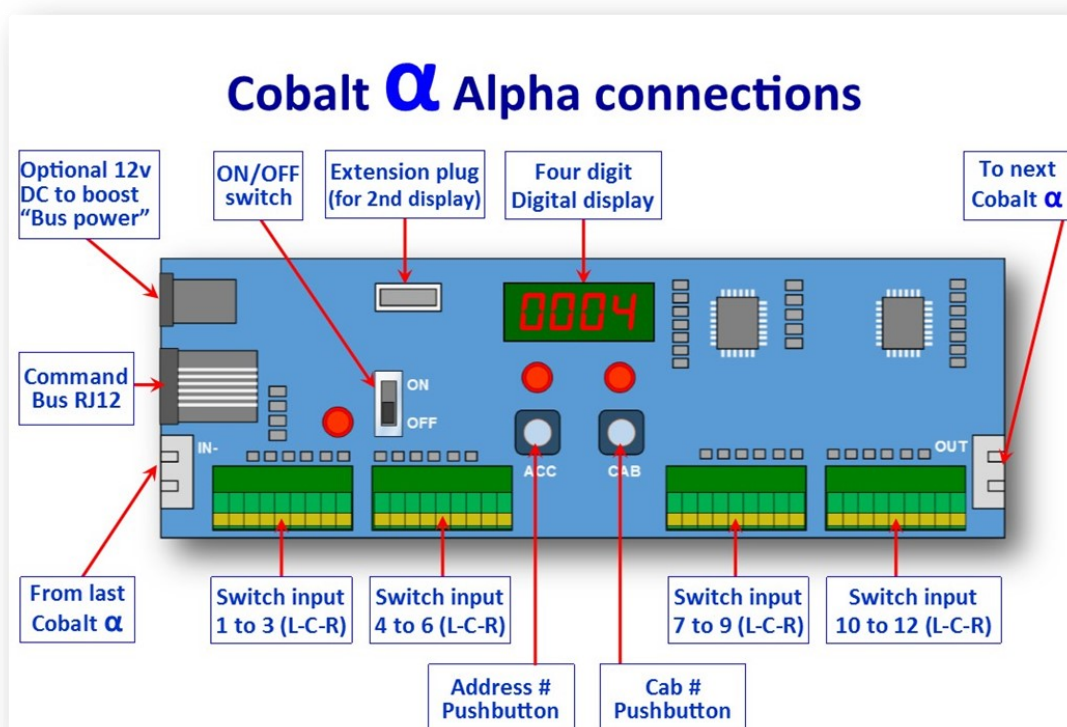
Cobalt  $\alpha$  Alpha is simply placed between any kind of control panel switch and any DCC accessory decoder located at, on or in the accessory being controlled.

Cobalt  $\alpha$  Alpha works equally well with Cobalt-S levers or simple push-button switches as well as stud-and-probe systems or any imaginable form of switch.

Cobalt  $\alpha$  Alpha can be connected directly to detectors or similar items to add completely automatic operation commands or to trigger actions on the layout.

Because it is effectively a "robot interface" for digital systems. Cobalt  $\alpha$  Alpha can be interconnected with a simple cable to create a continuous series of hundreds of outputs, or it can be used in an individually "cab addressed" parallel arrangement only limited by ability of the interface that you will use for driving the Accessory bus.

Cobalt  $\alpha$  Alpha connects your control panel to the layouts accessory control bus or accessory power bus via ONE cable. There is almost no limit to how many you use:





## Product Overview: Cobalt $\alpha$ Alpha digital encoder

# A journey around Cobalt $\alpha$ Alpha

The overall PCB size is approximately 180mm long, 58mm wide. It is intended to live in your control panel, as once it is set up, you do not need to worry about it.

Many of them can be connected together, with the only real limit being imposed by the DCC “Accessory decoder address limit” of 2044 numbers.

Cobalt  $\alpha$  Alpha is therefore able to give massive added opportunity to DC modellers, extend the usability of all “full feature” DCC systems AND it is also a VERY useful way of adding useful extended ability to those DCC systems that have limited control ability.

(It is also great for DCC systems with no accessory control like GM/MRC’s “entry level system”)

While it is quite complete “as bought” we have also realised that modellers might like to be able to see it work each time, so we have also added an “Extension display” socket to the PCB, and will make an extended display with 450mm cable and mounting bezel available.

## Cobalt $\alpha$ Alpha: The controls and connections, one at a time:

### The 12v DC connection:

Cobalt  $\alpha$  Alpha connects to the control bus. Each one will use approximately 100mA – This is about the same power level that is used by your existing DCC system handset.

If you add several Cobalt Alpha or Control handsets to the control bus, or if you have a long control bus, there may be voltage drop as current draw reaches the limits of the controller’s ability to deliver enough power for all of them.

This is the same for ALL DCC brands using handsets (see your system manuals) and it is easily corrected by adding an external regulated 12v DC power source to boost the control bus power.

We recommend you do this when the total load reaches any combination of 5 or more Control handsets + Cobalt Alpha units.

### The Command bus RJ12 socket:

Cobalt  $\alpha$  Alpha communicates by sending information over a digital command bus. This is the connector that allows this to happen. The cable you will use needs to have an RJ12 connector at the Cobalt Alpha end and an appropriate system connector at the other end.

- When Cobalt Alpha connects to an NCE system, a standard NCE cable can be used.
- When a Cobalt Alpha “Black box” is purchased by a DC modeller or a DCC modeller who wishes to have a totally separated Accessory power bus, the correct cable is included with the Cobalt Alpha black box.
- Other DCC brand users will need to add an adapter to interface Cobalt Alpha with their DCC systems. Each individual DCC system we cater for will have a “Dongle type” adapter provided. This will also be equipped with the correct connector for that DCC system.

### Connections from One Cobalt Alpha to the next:

Cobalt  $\alpha$  Alpha can be daisy-chained in series. When this is done, all you need do is turn them all on, then set output address #1 to 1, and no matter how many you’ve connected together, they will all automatically set addresses in sequence. Input and output are clearly marked.

Example: connect 3 x Cobalt Alpha together for 36 outputs. Set address 1 to 1. The rest of them will automatically re-address themselves from 1 to 36.

(If you wish to, you can of course address them in individual groups of 12 too)

## Product Overview: Cobalt $\alpha$ Alpha digital encoder

### Connecting control switches to Cobalt Alpha:

Cobalt  $\alpha$  Alpha uses the same high quality connectors that we fit to Cobalt point motors. That means no need to solder & no need for small screwdrivers or other inconveniences.

- Every switch, sophisticated or simple, becomes a digital switch once it is connected!
- There are four separate terminal blocks, each with 9 terminals.
- Each block is clearly labelled and each will allow the connection of 3 Single pole double throw switches. The layout of all connections is Left, Common, Right.
- We have spaced the 4 blocks apart a little to keep it simple to work with (close together would have made it confusing with all 36 terminals occupied).

### Using the additional “Display Extension” connector point:

Cobalt  $\alpha$  Alpha will live inside the control panel, but we felt that Cobalt  $\alpha$  Alpha users may also want to have a display in the face of their panel.

This has now been added to the range as Part number DCD-ADX. The additional display simply plugs into the socket beside the display and we’ve provided a fascia panel to make installation both neat and tidy... and easy.



### The on/off switch:

As you would expect: This simply turns Cobalt  $\alpha$  Alpha on or off. Initial setup requires use of this switch, however once set, it just remains on until set-up changes are wanted.

### The CAB switch:

Hold this button down as you turn Cobalt  $\alpha$  Alpha on and the display will flash, ready for you to change the cab number. Default cab number is 4. (A full operational description follows) (Note: The Cab switch also “confirms and saves” settings. Once you’ve set the cab address or accessory address, hold it down for several seconds until it flashes “Yes” to confirm saving)

### The ACC switch:

Hold this button down as you turn Cobalt  $\alpha$  Alpha on and the display will flash, ready for you to change the input address. You only need to choose and set up an address for input number 1, as all other addresses are set automatically.

The ex-factory default setting for address number 1 is 1. (A full operational description follows)

## Initial set-up for Cobalt $\alpha$ Alpha

Cobalt  $\alpha$  Alpha is incredibly easy to set up and prepare for use.

### Connection:

Make all required connections as shown above.

If you are using more than 1, just link them together using the lead that is provided. (make sure that you only connect “output to input” so they are in series – see below)

Add input switches (for points etc.) as per the system architecture drawing below.

You may need to assign a new “Cab address” to Cobalt  $\alpha$  Alpha:

### If you are a DCC user:

Cobalt  $\alpha$  Alpha is effectively a “control cab” for the DCC system, so:

- If you are a DCC modeller You will need to set it to an address that is appropriate for your DCC system. (your DCC manual will tell you if you need do it, and what the # range is)
- Check your handset addresses first, and then start the addresses for Cobalt Alpha at any unused number range within the acceptable cab # range for your system.
- If you use one “Series string” of Cobalt  $\alpha$  Alpha units. You should set all of the Cobalt  $\alpha$  Alpha units in any series string to the same address.
- If you want to use several Cobalt  $\alpha$  Alpha units in parallel (for example because you have more than one control panel) you should connect them in parallel.  
(Parallel is when the RJ12 outputs are all directly linked to the command bus).

If you are a DC modeller OR a DCC modellers and use the “Black box”

- If you wire them all in series you can leave the Cab address at its default value.
- If you make several parallel strings each string needs its own address. Because there is no other digital system linked to the accessory bus 1, 2, 3 will be fine.

Assigning the “Cab address” to Cobalt  $\alpha$  Alpha is very simple:

- Hold down the “CAB” button while you switch on the power. (The last two digits of the display will now be flashing. In a new unit they will flash the default number 04)
- Selecting the new cab address is simple: First press the “CAB” button momentarily to choose which of the two digits will be changed .
- To change the value of the digit, press the “ACC” key repeatedly until the number you want is displayed.
- When you have set the display the number you want the address to be, hold down the “Cab” button for several seconds. It will then flash “Yes” and the cab number is set.



## Product Overview: Cobalt $\alpha$ Alpha digital encoder

### Assigning an "Output address range" to Cobalt $\alpha$ Alpha is simple to do too!

- Hold down the "ACC" button while you switch on the power.  
(It will show the current address. The 1st digit of the display will flash. Default is #1)
- The number that will be changed will flash. To select which number will be changed, just use the "CAB" button. (It will cycle through them all if you press it repeatedly.)
- Select the value for each digit by pressing the "ACC" button.  
(It will cycle through 0~9, moving one step up for each press of the button.)
- When you have all four numbers set to the number you wanted it to be, hold down the "Cab" button for several seconds. It will then say "Yes" to confirm the setting.
- We built a "Cascading address" system into Cobalt  $\alpha$  Alpha, so setting address number 1 on any cobalt  $\alpha$  Alpha will set ALL of the addresses on that Cobalt  $\alpha$  Alpha . (For example, if the first address is #1, then the Addresses will be 1~12. If the first address is 25, then the numbers will be 25~36)
- To address a full string of Cobalt  $\alpha$  Alpha , turn on all except Cobalt Alpha #1. Now hold down the ACC switch on Cobalt #1 and turn it on. Set just the first address on the first Cobalt  $\alpha$  Alpha and all other Cobalt  $\alpha$  Alpha boards will then automatically re-address themselves into a running number sequence (for example, with 4 Cobalt Alpha in the series string and address 1 = 1, they will address 1~48)
- With the cab & output addresses set, Cobalt  $\alpha$  Alpha is good to go!

You only need to do this once of course. Cobalt  $\alpha$  Alpha will remember both its own cab address and any output addresses you have chosen until you decide to change them again. Easy wasn't it!

### The Cobalt $\alpha$ Alpha range.

Part #	Description
DCC- AEU	Cobalt Alpha main unit. (Directly connectible to the NCE system control bus)
DCC- ADX	Cobalt Alpha extension display. (remote display for Cobalt Alpha)
DCC- AUX	Cobalt Alpha black box unit for DC modellers or those DCC modellers who do not use NCE DCC and do not wish to share control with their DCC handsets. The DCC-AUX is supplied with a connection cable to link it to Cobalt Alpha, and it has a direct 2-wire output for the accessory power bus. It will need a regulated power supply @ 15v~18v DC. Power needed will be 2~3 A depending on your Accessory bus loading.
DCC-LZX	Lenz interface for Cobalt Alpha. (Will connect to Lenz control bus)
DCC-DTX	Digitrax interface for Cobalt Alpha. (Will connect to Loco-net control bus)
DCC-ECX	ESU interface for Cobalt Alpha. (Will connect to ESU control bus)
DCC-GMX	Gaugemaster Prodigy or MRC interface for Cobalt Alpha. (Will connect to Gaugemaster Prodigy or MRC control bus)
DCC-6CC	6 foot 6-wire RJ12 curly cord for Cobalt Alpha or NCE PowerCab/ProCab etc.
DCC-6FC	500mm 6-wire flat type RJ12 lead for Cobalt Alpha connection
DCC-3RC	5metre 3-wire ribbon cable for Cobalt Alpha (red/green/black)

## Product Overview: Cobalt $\alpha$ Alpha digital encoder

There's more...

**We have a NEW range of switch packs to use with Cobalt  $\alpha$  Alpha... making the creation of a control panel easier than it has ever been!**

Cobalt Alpha already reduces the wiring from control panel to layout from dozens or hundreds of wires to just ONE cable... and to make it easier still, DCCconcepts have now created two new "Switch packs" that make it incredibly easy to do the rest.

We've also made a matching 3-wire ribbon cable so even the "switch PCB to Cobalt  $\alpha$  Alpha" connections become ONE tidy connection instead of three hard to control wires!

**The part number for the 10 metre pack of 3-wire ribbon cable will be DCP-3RC**

- Switches and LEDS are integrated to create ONE elegant illuminated switch
- Each switch has one simple-to-connect 4-wire harness and just plugs into a PCB that manages led lighting, "last position memory" for when you turn the power off.
- The PCB does all of the work and also provides easy-to connect output terminals for linking of the switches to Cobalt Alpha... or directly to any digital device.

**There will be TWO variants of the Switch pack.**

As above, each will contain 12 x illuminated switches with 200mm harnesses, 1 x PCB with sockets for the switch harnesses and power input screw terminals that will allow them to be daisy-chained for power.

- There will also be easy-to-use screw terminals for output connections.
- The PCB has on-board power management of outputs & includes "last position memory".

**Switch pack # 1 – for digital devices**

**The part numbers will be DCP-DSG (green) DCP-DSR (red) and DCP-DSB (Blue).**

This pack will contain enough switches and have outputs appropriate for the control of SIX independent 3-wire digital devices such as Cobalt Alpha, AD-2 or AD8fx, Cobalt Digital or similar digital products that need a "Left-common-right" switch connection. It will be available with Red, Green or Blue illuminated switches as above...

**Switch pack # 2 – for Analog devices needing reversed DC power.**

**The part numbers will be DCP-ASG (green) DCP-ASR (red) and DCP-ASB (Blue).**

This pack will contain enough switches and have outputs appropriate for the control of up to SIX independent 2-wire Analog devices such as Cobalt  $\Omega$  Omega, Cobalt iP Analog or other low-current motor drive turnout motors needing reversible DC switching to operate.

- Each output will be around 100mA capable and able to cope with TWO Cobalt  $\Omega$  Omega or Cobalt iP Analog motors.
- The total power handling of the Control PCB's six outputs will be adequate for up to 12 motors assuming all are used in a crossover.

**~All switch packs will be available with either Red, Green or Blue illuminated switches~**



## Product Overview: Cobalt $\alpha$ Alpha digital encoder

### Cobalt $\alpha$ Alpha & Accessories: Release timing and availability

We will do our very best to meet this proposed delivery timetable:

#### 3rd quarter of 2015

DGP- AEU	Cobalt Alpha main unit. (Directly connectible to the NCE system control bus)
DGP- ADX	Cobalt Alpha extension display. (Remote display for Cobalt Alpha)
DGP- AUX	Cobalt Alpha black box unit for DC modellers! (or “sniffer port” use) (Also for those DCC modellers who do not use NCE DCC and also do not wish to share accessory control with their DCC handsets). <i>The DGP-AUX is supplied with a connection cable to link it to Cobalt Alpha, and it has a 2-wire output for the accessory power bus. It will need a regulated power supply @ 15v~18v DC. Power needed will be 2~5 A depending on bus loading.</i>
DCD-ACL	6 foot 6-wire RJ12 curly cord for Cobalt Alpha or NCE PowerCab/ProCab etc.
DCD-CAC	500mm 6-wire flat type RJ12 lead for Cobalt Alpha connection

#### 4th quarter of 2015:

DCD-LZX	Lenz interface for Cobalt Alpha. (Input socket RJ12, output socket to lenz bus standards. It will connect to the Lenz control bus). <i>(This adapter should also allow connection to Roco Z21, Hornby, ZTC and other “Xpress-net users” providing they consistently follow the standards)</i>
DCD-GMX	Gaugemaster Prodigy or MRC interface for Cobalt Alpha. (Input socket RJ12, output socket to GM Prodigy and MRC standards. It will connect to the Gauge master Prodigy or MRC control bus)

#### End of 2015:

DCD-DTX	Digitrax interface for Cobalt Alpha. ((Input socket RJ12, output socket to Digitrax standards. It will connect to Loco-net control bus) <i>(This adapter should also allow connection to other LocoNet users providing they consistently follow the standards)</i>
DCD-ECX	ESU interface for Cobalt Alpha. (Will connect to ESU control bus)

**Cobalt  $\alpha$  Alpha**