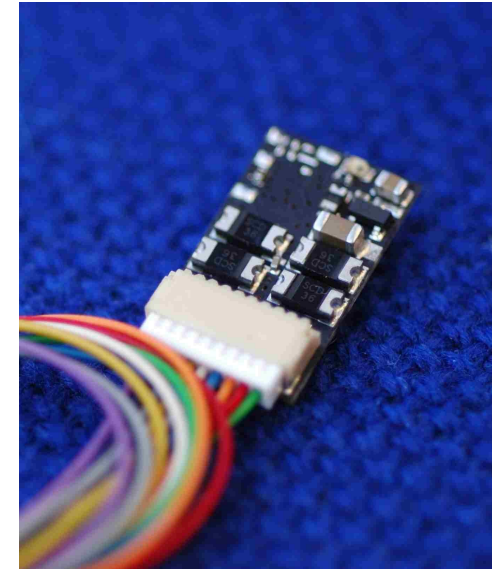# ZTC 4005 Decoder

ZTC 4005 Decoder
The Diamond Range

- 2 Amp Motor Drive
- 4 Function outputs
- Short circuit protection
- Feedback motor control
- Auto DC running
- One command reset
- Feature rich functions
- NMRA Compatible
- Auto Braking
- Software Upgradeable
- ZTC Talkback ready

ZTC offer a replacement warranty on this decoder. If you find the decoder does not work for any reason, please call ZTC on **0870 241 8730**.

The ZTC System is only intended for controlling model railways by experienced modelers over the age of 14. It should only ever be operated by young persons under competent adult supervision.

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CE

The ZTC 4005 is the second decoder in the new Diamond Range. This product includes many of the proven features of our previous decoders such as extended addressing and feedback along with some new and exciting ones such as ZTC Talkback.

The ZTC 4005 will work with all NMRA compliant and compatible command stations.
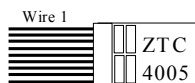
IMPORTANT
The ZTC 4005 is rich in features. It is not practical to try and fit all the instructions on a few sheets of paper. We have taken a lot of time to work out the best solution to help you get the most from this decoder. This sheet gives you a brief introduction to the decoder. We have also provided comprehensive instructions on the website along with tutorials, video instructions and a forum for you to chat with fellow enthusiasts. Please access our website www.ztccontrols.com

Installation Instructions

Please visit www.ztccontrols.com for detailed information on installing a wire-ended decoder.

Wiring details
1. Purple — Output4
2. Black — Track Left Rail
3. Grey — Motor Left
4. Yellow — Read Headlight
5. White — Front Headlight
6. Blue — Common(+V)
7. Orange — Motor Right
8. Red — Track Right Rail
9. Green — Output 3

Wire 1 — ZTC 4005

Pin 1 Orange wire

NMRA socket on DCC ready loco

Default values - The decoder is set with a default address of **3.**

Reseting a decoder to default values

If you change some settings and need to reset the decoder to default values, write value **8** to **CV8**. The decoder will then reset all CVs to factory defaults. The key presses to achieve this from a ZTC Command station are:

POINT   LOCO   8   PRESET   8   ENTER R   ENTER R

Recommendations

The finest control will come from running in 128 step mode. The decoder will automatically accept 128 step commands. The decoder will also accept 14 or 28 step commands. See CV29 below for details.

Turning function **0** ON/OFF enables/disables directional lighting.

How to enable/disable the common features

The value in **CV29** enables/disables a few common features and the table below can be used to calculate its value according to the features you want to enable and disable

FEATURE	VALUE	Comments
Invert loco forward direction	+1	Changes forward running direction.
28 STEPS mode	+2	Enables 28 step mode else 14 steps used
Enable AUTO DC MODE	+4	Enable loco to run on a DC layout
Enable ZTC TALKBACK	+8	Advanced feature.
Use custom speed table	+16	Advanced feature.
CV29 =	_____	

Example - To enable invert direction and 28 step mode

Invert direction	+1	
28 step mode	+2	
Total	3	*This value is programmed into CV29*

Feedback is enabled as default. The default settings usually work well. If you need to set it up further please read the advanced sections on the website. Setting **CV56** to **0** turns this off. Setting **CV56** to **1** turns it on.

CV Summary

cv name	cv #	default value	value range	comments
Primary Address	1	3	1 - 127	loco address between 1 - 127
Vstart	2	0	0 - 255	voltage level applied for step one
Acceleration	3	1	0 - 255	Speed acceleration rate
Deceleration	4	1	0 - 255	Speed deceleration rate
Vhigh	5	0	0 - 255	Speed at max step
Vmid	6	0	0 - 255	Speed at mid step
Manufacturer's ID	8	132	8	Used to reset the decoder
Total PWM Period	9	216	0 - 255	Motor drive frequency
EMF Feedback Cutout	10	0	0 - 128	Indicates the step above which feedback is not used
Alternate Mode Function Status	13	0	0 - 255	Functions F1 – F8 status in DC mode
Alternate Mode Function 2 Status	14	0	0 - 255	Functions F9 - F12 and FL status in DC mode
Extended Address	17+18	0	0 - 255	Used for address > 127
Consist Address	19	0	0 - 127	Holds the address of the loco if it is part of a consist. 0 means it is not
Consist Address Active for F1-F8	21	0	0 - 255	Defines whether the functions are controlled by the consist address
Consist Address Active for FL, F9 - F12	22	0	0 - 63	Defines whether the functions are controlled by the consist address
Automatic Stopping Configuration	27	0	0 - 3	Used to configure which actions will automatically stop the loco
Bi-Directional Communiucation Configuration	28	0	0 - 255	Used to configure ZTC Talkback
Configurations Supported	29	0	0 - 255	Used to enable/disable various features
Kick Start	65	0	0 - 255	Specifies the amount of extra Kick that will be supplied to the motor when transitioning between stop and the first speed step

For complete details of these CVs and a full list of CVs supported please see the online manul.

ZTC Talkback allows you, with the right equipment to read information back from the decoder whilst it is moving. Please read the advanced manual for this.