

Digitrax Decoder Index

CV29: Configuration Register

Characteristics Controlled by CV29:

1. Speed step control: Advanced Mode (28/128 speed steps) or Standard Mode (14 speed steps).
2. Speed table On or Off
3. Analog mode conversion On or Off
4. Normal Direction of Travel (NDOT)
5. 2 digit addressing or 4 digit addressing

Speed Step Control. There are two modes for speed step control: Standard or 14 speed step mode and Advanced or 28/128 speed step control.

Because of differences in the capabilities of DCC compatible command stations and decoders, you may have to set CV29 in your decoders to different values to match the mode of the command station you are using. If your command station is sending standard 14 speed step mode commands, your decoders must be programmed for standard mode in CV29. If your command station is sending advanced 28/128 speed step commands, your decoders must be programmed for advanced mode in CV29. All Digitrax decoders are 128 speed step capable and we recommend that for best performance you run them in 128 speed step mode. If you are using non-Digitrax decoders are not able to be programmed for advanced mode and you want to run your command station in advanced mode, you can "status edit" the standard decoders so that they can be run with your command station. See your starter set manual for the specifics of status editing.

Speed tables can be enabled or disabled with CV29. Speed tables are used to customize the throttle response curve of each decoder equipped locomotive. The speed table values can be stored in the decoder and then the table can be turned on or off with CV29. See the section on CVs 65-93 below for a complete description of how speed tables work.

Analog mode conversion is very convenient if you plan to run your Digitrax decoded locomotive on regular DC layouts. With analog mode conversion enabled, the decoder will automatically begin operating as a DC locomotive when no DCC signal is detected by the decoder. This means that if you place your Digitrax decoder equipped loco, with analog mode conversion enabled, on a regular DC layout, it will run on the DC layout. Disabling analog mode conversion can be useful too as the following example illustrates:

Brake Generator Example: If you disable the analog mode conversion feature in a

decoder, when DC power is present the locomotive will stop. This gives you a very inexpensive way of generating a "brake section" for stopping DCC locomotives in front of red signals. By NOT allowing analog conversion in the decoder, a relay can supply DC voltage to a track section in front of a red signal to slow and stop a locomotive in the brake section. When the signal turns green, the relay can restore the DCC track signal, and the locomotive will restart. The decoder will slow to a stop and restart at its programmed deceleration and acceleration values. In addition, if you are using an FX decoder with CV13 programmed to keep functions running on DC, the loco's lights and functions will remain active when stopped on the DC brake section as long as DC power is supplied to the track while the loco is stopped!

Normal Direction of Travel, or NDOT for short, lets you set up your locos to run either long hood forward or short hood forward. Because with DCC the decoder determines which way the loco will move independent of track polarity, you can set up either direction as forward depending on the prototype. (Not all decoders have this feature so be sure to check the card that came with your decoder.)

2 Digit or 4 Digit Addressing all current production Digitrax decoders are capable of both 2 & 4 digit addressing. Some older decoders can only use 2 digit addressing.

Determining CV Value To Program Into CV29

The value you will program into CV29 will affect many important decoder characteristics. Each of these characteristics is controlled by a "software switch." This switch is either on or off depending on the CV value programmed. Following are two methods to determine the value to program into CV29.

Use Table 29 to select which features you want to activate and the related CV29 value to program into your decoder.

Look Up Table Method

The look up table below shows the effects of different CV values that you can program into CV29. CV values are shown in both hex & decimal.

TABLE 29: CV29 Values

CV Value For CV29		Speed Steps/ Speed Table	Analog Mode Conversion	Normal Direction Of Travel	2 or 4 Digit Address
Hex	Dec				
x00	000	14	OFF	Forward	2
x01	001	14	OFF	Reverse	2

x02	002	28/128	OFF	Forward	2
x03	003	28/128	OFF	Reverse	2
x04	004	14	ON	Forward	2
x05	005	14	ON	Reverse	2
x06	006	28/128	ON	Forward	2
x07	007	28/128	ON	Reverse	2
x10	016	14 Speed Table	OFF	Forward	2
x11	017	14 Speed Table	OFF	Reverse	2
x12	018	28/128 Speed Tbl	OFF	Forward	2
x13	019	28/128 Speed Tbl	OFF	Reverse	2
x14	020	14 Speed Table	ON	Forward	2
x15	021	14 Speed Table	ON	Reverse	2
x16	022	28/128 Speed Tbl	ON	Forward	2
x17	023	28/128 Speed Tbl	ON	Reverse	2
x20	032	14	OFF	Forward	4
x21	033	14	OFF	Reverse	4
x22	034	28/128	OFF	Forward	4
x23	035	28/128	OFF	Reverse	4
x24	036	14	ON	Forward	4
x25	037	14	ON	Reverse	4
x26	038	28/128	ON	Forward	4
x27	039	28/128	ON	Reverse	4
x30	048	14 Speed Table	OFF	Forward	4
x31	049	14 Speed Table	OFF	Reverse	4
x32	050	28/128 Speed Tbl	OFF	Forward	4
x33	051	28/128 Speed Tbl	OFF	Reverse	4
x34	052	14 Speed Table	ON	Forward	4
x35	053	14 Speed Table	ON	Reverse	4
x36	054	28/128 Speed Tbl	ON	Forward	4
x37	055	28/128 Speed Tbl	ON	Reverse	4

The factory default value for CV29 is 06.

The Addition Method

The table below shows each switch and its value if it is on or off. Notice that if the switch is off the value is zero. To determine the hexadecimal* value to program for your decoder just go down the list and add up the numbers for all the switches you want to set as ON. If you want to convert the hex value to decimal, a chart is provided at the end of this manual.

CV29 Examples of CV Values:

Switch #	Characteristic if OFF	Value if OFF	Characteristic if ON	Value If ON
01	NDOT forward	00	NDOT reverse	01
02	14 speed steps	00	28/128 speed steps	02
03	Analog mode conversion off	00	Analog mode conversion on	04
04	Speed table off	00	Speed table on	10
05	2 digit addressing	00	4 digit addressing	20

All Digitrax decoders are shipped with a factory programmed value of 06 in CV29. This gives the decoders the characteristics highlighted.

Switch #	Characteristic if OFF	Value if OFF	Characteristic if ON	Value If ON
01	NDOT forward	00	NDOT reverse	01
02	14 speed steps	00	28/128 speed steps	02
03	Analog mode conversion off	00	Analog mode conversion on	04
04	Speed table off	00	Speed table on	10
05	2 digit addressing	00	4 digit addressing	20
Total "ON" Value to Program in CV29				x06 hex

Note: 06 hex is the same as 06 decimal

A value of 27 programmed into CV29 will give you a decoder that has a normal direction of travel in reverse, operates in advanced 28/128 speed step mode, has analog mode conversion enabled, does not use a speed table and has 4 digit addressing.

Switch #	Characteristic if OFF	Value if OFF	Characteristic if ON	Value If ON
01	NDOT forward	00	NDOT reverse	01
02	14 speed steps	00	28/128 speed steps	02
03	Analog mode conversion off	00	Analog mode conversion on	04
04	Speed table off	00	Speed table on	10
05	2 digit addressing	00	4 digit addressing	20
Total "ON" Value to Program in CV29				x27 hex

*The values shown on both tables are hexadecimal values. As you turn the throttle right hand knob to the right on a throttle that is using hexadecimal numbers, you will see 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0b, 0c, 0d, 0E, 10, 11, 12 etc. Because the 6 & b look very similar

on the display, be careful. If you use 0b, for example, as the value for CV29 you won't get the 06 effects you are expecting!

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