Main Features of this Decoder:

BEMF Load Compensation: Provides superior slow speed control performance under load.

Quiet Drive: Super-quiet motor control for “buzz” free motor performance.

DC Mode: Decoder will automatically detect DC power. You can also configure how your lighting effects function on DC.

Variable Momentum: Allows you to make custom acceleration and deceleration curves.

LED Lighting: This decoder has on-board resistors for use with LED’s on all lighting function outputs.

Function Remapping: Buttons 0 through 12 may be used to control the lighting functions of this decoder.

Programmable Lighting Effects: Choose from 20 separate user-programmable lighting effects!

Decoder Lock: Feature which prevents accidental/unwanted programming

Speed Tables: Configure custom speed curves and set speed limits.

RailCom®: This feature allows the decoder to talk to the command station. RailCom supports expansion for new features.

Other Features of This Decoder: This decoder has more features than could be listed in this pamphlet. For the complete list of available features, visit our website tcsdcc.com to download the “Comprehensive Programing Guide” found in the Documentation section of our website.

WARRANTY PROCEDURE: All decoders are covered by a one-year warranty. **This decoder must be returned in a small box.**

1. For registration, more details, and disclaimers, visit tcsdcc.com/warranty
2. Print out a copy of the Warranty Registration and include it in the box
3. Return decoder(s) directly to TCS using the address below.

Compatible with NMRA DCC standards *Designed and Built by TCS in the USA*

Train Control Systems
P.O. Box 341
845 Blooming Glen Rd.
Blooming Glen, PA 18911

Phone **215-453-9145**
Fax **215-257-0735**
Email **tcs@tcsdcc.com**
Web **www.tcsdcc.com**

Backed by our famous “GOOF-PROOF” Warranty

1560 AZL1D4

Scale	Functions	Function Rating	Continuous/Peak
Z	4	100 mA	1.3 /2.0 Amp

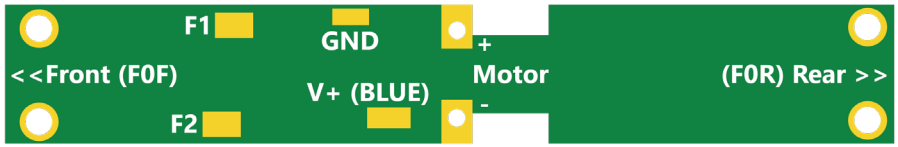
Dimensions: 1.65” x 0.27” x 0.1” or 42mm x 6.9mm x 2.54mm

The AZL1D4 is the first drop-in decoder designed for the latest generation of American Z Line diesel locomotives. The design features a screw-down design, unlike previous designs which relied on slide-on contacts.

The AZL1D4 can support up to four lighting functions. This decoder includes on-board LED’s with no soldering required. Solder pads for two additional lighting functions are also available.

WIRING DIAGRAM

(Diagram drawn for clarity as viewed from TOP)



INSTALLATION

For detailed installation examples visit our website where we maintain a constantly growing database of a wide range of locomotives and decoders.

1560 AZL1D4

BASIC CONFIGURATION

CV 29 Configuration

A	0	1	Reverse the direction the engine runs.
B	2	2	Use 28/128 speed step mode.
C	4	4	Enable analog (DC) operation.
D	0	8	Enable RailCom® Bi-Directional Communication (If Supported)
E	0	16	Make the Loadable Speed Tables active.
F	0	32	Make the decoder address 128 or higher.
CV 29	6		← **Program the sum of the values you choose into CV 29**

2 Digit Address

Use if the address is 127 or less.

CV 1	3		← Record your choice here.

4 Digit Address

Make sure 4-digit Addressing is enabled in CV29

CV 17	0		← Record your four digit address here
CV 18	0		Your command station will assign the values of CV 17 and CV18

Consist Address

Add 128 to reverse the loco when in consist.

CV 19	0		Use a 2 digit address when in a consist (Multiple units).

Decoder Lock

CV 15	0		All unlocked = **0**	Decoder to unlock = **1 - 6**			All locked = **7**	
CV 16	1		Mobile = 1	Sound = 2	Light Only = 3	4	5	6

To unlock a decoder, make CV 15 = 0 or CV 15 = CV 16. To lock a decoder, make CV 15 not equal to CV 16. To lock all same address decoders, make CV 15 = 7.

Factory Reset

CV 8	153	Program a value of 2 or 8 to perform a Factory Reset.

Back EMF and Rule 17 Dimming Options

Even number OR 0= BEMF OFF Odd number = BEMF ON

BEMF disabled =0	BEMF enabled = 1	BEMF button control= 3		Dims when stopped = 16
Turn on BEMF and button control of it make CV 61 = 3				Opposite light dim = 32
CV 61	1		BEMF and Dimming Control	BEMF+Stopped + Opposite dim = 49
CV 136	2		Function button control of BEMF	Bits 0-7 designates buttons 5-12
CV 64	15		Dimmed Brightness	(2 - 6 for LEDs, 12 - 18 for Bulbs)
CV 10	0		BEMF Cut Out	

RailCom® (If Supported)

CV 28	0	RailCom Options

RailCom® is a registered trademark of Lenz Elektronik Gmbh

For more information on decoder features or programming visit:
www.tcsdcc.com

MOTOR CONTROL

Speed Graph

CV 2	0		**Start Volts** -- Set the voltage when the throttle is first applied.
CV 6	0		**Mid Volts** -- Set the voltage when the throttle is at midpoint.
CV 5	0		**Top Volts** -- Set the voltage when the throttle is at full speed.

Momentum

CV 3	1		**Acceleration --** Larger values add time to each speed step.
CV 4	1		**Deceleration --** Larger values add time to each speed step.
CV 23	0		***Acceleration Adjustment when in Consist**
CV 24	0		***Deceleration Adjustment when in Consist**

*Values above 128 increase the adjustment * Values below 128 decrease the adjustment

Motor Trim

CV 66	0		Forward Trim	Values above 128 increase speed, values below 128 decrease speed.
CV 95	0		Reverse Trim	

LIGHTING CONTROL

Lighting Features

Light Function Wires

CV 49	0	White Wire	F0F
CV 50	16	Yellow Wire	F0R
CV 51	32	Green Wire	F1
CV 52	32	Violet Wire	F2

Rule 17 Dimming Control

Rule 17 Dimming is turned on and off by button 4 as the default, but this value can be remapped via CV 123. See the Function Remapping guide in the lighting section of docs.tcsdcc.com for more info.

Light Effect	fwd	rev	both
Constant Bright Light	0	16	32
Random Flicker (fire box) 1	1	17	33
Mars Light	2	18	34
Flashing Light	3	19	35
Single Pulse Strobe 1	4	20	36
Double Pulse Strobe 1	5	21	37
Rotary Beacon	6	22	38
Gyra Light	7	23	39
Rule 17 (dimmable light)	8	24	40
Ditch Light (Left or Right)	10	26	42
Ditch Light (Other side)	11	27	43
Constant Dim 1	12	28	44
*Auto-Mars	13	29	45
Brake Light(s)	14	30	46
Single Pulse Strobe 2	15	31	47
Double Pulse Strobe 2	64	80	96
Random Flicker 2	65	81	97
Constant Dim 2	66	82	98
Constant Dim 3	67	83	99
Constant Dim 4	68	84	100

Consist Lighting Control

CV 21	0		Extra Functions	Green and Purple wire = 3
CV 22	0		Headlight Functions	White and Yellow Wire = 3

Lighting Quick Presets

CV 8	10	Program a value of 10 to make F1 and F2 ditch lights. Button 1 turns them on and Button 2 makes them blink.