

Main Features of this Decoder

Back EMF Load Compensation for superior slow speed control even with heavy loads.

- **Quiet Drive** creates SUPER QUIET engine performance.
- **Autodetect** for realistic throttle response when using DC power.
- **Dimmed Brightness** of bulbs or LEDs is adjustable.
- **Variable Momentum** lets you make custom acceleration curves.
- **Ditch Lights:** control alternating ditch lights with realistic pulsing.
- **Mars, Gyra, and Rotary Beacon** are adjustable.
- **Decoder Lock** for programming same address decoders independently.
- **Function Remapping:** 13 buttons for most lights, 7 buttons for operations.

Other Features of This Decoder: This decoder has too many features that could be listed on this page. For the complete list of available features, print out the "Additional Programming Guide" that can be found in the literature section of our website (www.tcsdcc.com). Some of the features include: Function Remapping, 3 Point Acceleration/Deceleration Curves, Button Control of the Motor, Loadable Speed Tables, Various lighting effects, decoder lock and many more.

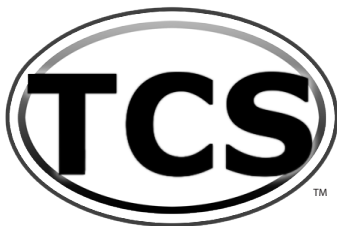
WARRANTY PROCEDURE: All decoders are covered by a one year goof proof, no questions asked warranty. **Please return in a small box.**

1. You MUST register the failed decoder on our website at www.tcsdcc.com. If you do not have access to a computer you MUST call to register your warranty at: (267) 733-3408
2. Print out a copy of the Warranty Registration and include it in the box with the decoder(s).
3. Return decoder(s) directly to us using the address below.

Compatible with NMRA DCC standards.

Made by TCS in the USA.

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



Phone 215-453-9145
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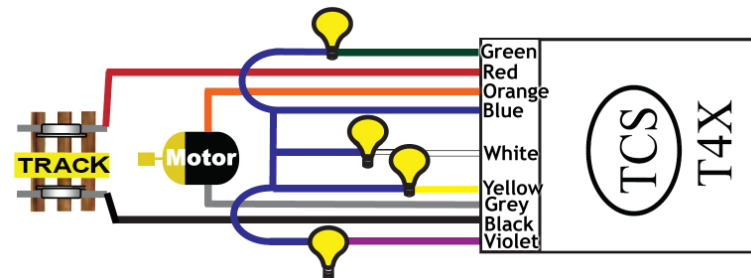
Our Famous GOOF PROOF NO
Questions Asked Warranty

| | | | | | |
|------|-----|-------|-----------|-----------------|-----------------|
| 1024 | T4X | Scale | Functions | Function Rating | Continuous/Peak |
| | | HO | 4 | 100 mA | 1.3 /2.0 Amp |

Dimensions: 0.661" x 0.969" x 0.193" or 16.79mm 24.61mm 4.9mm

This full featured, 4 function, hardwire or harnessed decoder is a robust workhorse, capable of taking almost anything you can throw at it. Included is our auto-adjusting BEMF for outstanding slow speed performance and hassle free set up. Also includes Quiet Drive for super quiet engine performance.

WIRING DIAGRAM



INSTALLATION

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



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 | 16 | Make the Loadable Speed Tables active. |
| E | 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 | | Enter 2 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 | |
| Turn on BEMF and button control of it make CV 61 = 3 | | BEMF button control = 3 | |
| | | Dims when stopped = 16 | |
| | | 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® | | | |
| CV 178 | 0 | | CV address pointer |
| CV 180 | 0 | | RailCom® Transmit Options |
| CV 181 | 0 | | RailCom® Transmit Options |
| CV 28 | 0 | | Broadcast enable |
| For more information on decoder features or programming visit: www.tcsdcc.com and check out the Complete Programming Guide . | | | |

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

LIGHTING CONTROL

| Lighting Features | | | | | | | |
|---|----|--------------|--|-------------------------------|-----|------|-----|
| Light Function Wires | | Light Effect | | fwd | rev | both | |
| CV 49 | 0 | White Wire | F0F | Constant Bright Light | 0 | 16 | 32 |
| CV 50 | 16 | Yellow Wire | F0R | Random Flicker (fire box) 1 | 1 | 17 | 33 |
| CV 51 | 32 | Green Wire | F1 | Mars Light | 2 | 18 | 34 |
| CV 52 | 32 | Violet Wire | F2 | Flashing Light | 3 | 19 | 35 |
| Rule 17 Dimming Control | | | | Single Pulse Strobe 1 | 4 | 20 | 36 |
| 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 on the literature section of www.tcsdcc.com for more info. | | | | Double Pulse Strobe 1 | 5 | 21 | 37 |
| | | | | Rotary Beacon | 6 | 22 | 38 |
| | | | | Gyra Light | 7 | 23 | 39 |
| | | | | Rule 17 (dimnable 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 violet and green ditch lights. Button 1 turns them on and Button two makes them blink. | | | | |
| | 11 | | Program a value of 11 for default trolley settings. | | | | |
| | 12 | | Program a value of 12 for standard trolley settings and tail lights. | | | | |
| Note: For more information on Quick Presets visit the Comprehensive Programming Guide at www.tcsdcc.com | | | | | | | |