



Backed by our famous  
"GOOF-PROOF" Warranty

## 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.

**+12V Lighting:** This decoder uses an unregulated 12V supply for lighting. For use with LED's, you must include current-limit resistors (1KΩ recommended).

**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.

**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](http://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](http://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 & 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**  
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Email [tcs@tcsdcc.com](mailto:tcs@tcsdcc.com)  
Web [www.tcsdcc.com](http://www.tcsdcc.com)

1381 T4XA

Scale	Functions	Function Rating	Continuous/Peak
HO	2	100 mA	1.3 /2.0 Amp

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

The T4X is a multi-purpose HO-scale decoder. This decoder may be hard-wired or plugged directly into any locomotive with a 9-pin JST plug. The T4X may be used in locomotives which have ditch lights in addition to forward and reverse headlights.

**!!!WARNING!!!** This package does not include a wiring harness. This SKU number assumes you already have a wiring harness in your loco.

## WIRING DIAGRAM

Diagram drawn for clarity - wire decoder per the written wire colors. The wires on your decoder may not be lined up the same as the diagram.



## INSTALLATION

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



1381 T4XA

## 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		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 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: <a href="http://www.tcsdcc.com">www.tcsdcc.com</a> and check out the <b>Complete Programming Guide</b> .								

## 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.

### 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](http://www.tcsdcc.com)

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