Our Famous GOOF PROOF NO Questions Asked Warranty

WOWSteam

1600 WOW501 Steam

Scale	Functions	Function Rating	Continuous/Peak
S/O/G	8	1A	5/10 Amp

Dimensions: 3” x 1.41” x .54” or 76.2mm x 36.83mm x 13.716mm

Main Features of this Decoder

- **Steam Sounds** this decoder includes light, medium, heavy, and Reading and Northern Railroad #425, and 5 Narrow Gauge locomotive sound chuff sets.
- **True CD Quality Audio** Enjoy rich, full audio with true to life 16bit 44,100Hz sounds. No one else even comes close.
- **Proto Chuff** for dynamic chuff intensity, volume, and tone.
- **5 Amp Power** This decoder provides a full 5 Amps of total power for motor and lights.
- **Back EMF Load Compensation** for superior slow speed control in excellent synchronization with the chuffs.
- **Tons of Sounds!** 15+ different bells and 40+ whistles plus much more.
- **Audio Asisst™** (Patent Pending) With Audio Assist™ the decoder comes alive and talks you through configuring sounds and volumes.
- **Optimized for 8Ω Speakers** Two separate 8 ohm audio outputs.
- **Built in Keep-Alive™**
- **Screw Terminals**
- **12v Regulated output** for consistent lighting circuits.
- **Auxillary input** for triggered sound effects.

Version 4

8 79508 00522 6

1600 WOW501 Steam

Operation and Button Mappings

In the TCS WOWSound decoders we have reinvented the way we think about model locomotive operation to reflect that of the prototype. Currently, most model trains operate without a brake seperate from the throttle speed. We call this kind of operation **"Traditional"** because your locomotive operates like a slot car (directly controlled by throttle). With our new default **"Prototype"** operation users are expected to apply and release brakes seperately from adjusting the throttle just like the real thing, though the brakes will automatically release when the throttle is increased.

All of the sounds in this decoder can be remapped to any function except the toggle between light and sound mode, and the Audio Assist™ mapping.

Function Button	Feature
0	Generator
1	Bell
2	Whistle - Long Toot
3	Whistle - Short Toot
4	Whistle - Pre-Recorded Quill
5	Cylinder Cocks
6	Brake Release
7	Apply Brakes (20% Per Press)
8	1x Press: Mute/Unmute 2x Presses: Toggle between light and sound mode 4x Presses: Enter Audio Assist
9	Rotate Whistle (Switch Whistle Set)
10	Johnson Bar Down
11	Johnson Bar Up
12	Injector
13	Air Pump
14	Blower
15	Idling Sounds
16	Horn
17	Shovelling
18	Blow Down

NOTE: Functions 19-28 are supported but there are no sounds mapped to these functions by default.

BASIC CONFIGURATION

NOTE: Cells highlighted in grey identify the default value for that CV.

CV 29 Configuration

A	**0**	**1**	Reverse the direction the engine runs.
B	**2**	**2**	Use 28/128 speed step mode.
C	**0**	**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	**2**		← **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	**2**		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.

Back EMF and Rule 17 Dimming Options

Button braking = 8			Dims when stopped = 16	Opposite light dim = 32
CV 61	**9**		BEMF, Brake, and Dimming Control	Dims when stopped+Opposite dim = 48
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)

Consist Lighting Control

CV 21	**255**		Extra Functions (F1-F8)	F1 = 1, F2 = 2, F3 = 4, F4 = 8, F5 = 16 F6 = 32, F7 = 64, F8 = 128 (Add together for multiple functions)
CV 22	**255**		Headlight Functions	White and Yellow Wire = 3

Cam Wire - Program the following CV values IN ORDER to enable cam wire.

CV 201	**1**	This selects CV programming from the 4 CV programmer
CV 202	**12**	This selects the cam wire CV
CV 203	**56**	This is the high value for enable the cam wire
CV 204	**249**	This is the low value for enabling the cam wire.

Sound Set Version

CV 248	**3**	This is a read only CV with the version number of the sound set.

For more information on decoder features or programming visit:
www.tcsdcc.com and check out the **Comprehensive 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	**32**		**Acceleration --** Larger values add time to each speed step.
CV 4	**96**		**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	**128**		Forward Trim	Values above 128 increase speed, values below 128 decrease speed.
CV 95	**128**		Reverse Trim	

Brake Rate With each brake application the decoder moves to the next brake rate.

CV 183	**32**		Brake Rate 1 (1 Press)	The larger the number the longer it will take to come to a complete stop.
CV 184	**26**		Brake Rate 2 (2 Presses)	
CV 185	**16**		Brake Rate 3 (3 Presses)	
CV 186	**8**		Brake Rate 4 (4 Presses)	
CV 187	**3**		Brake Rate 5 (5 Presses)	

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
CV 53	**32**	**Brown Wire**	F3
CV 54	**32**	**Pink Wire**	F4
CV 55	**32**	**Pink/Purple Wire**	F5
CV 58	**32**	**Green/Brown Wire**	F6

Set CV58=9 to enable smoke unit with synchronized chuffing output on F5 & F6.

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 on the literature section of www.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

Sound CV's

Please visit the WOWSound section of the TCS website for the WOWSound programming tool.

CV 202	Action	CV 203 Default Value	CV 204 Default Value
1	Cylinder Cocks Shut Off Speed Step	0	16
2	Random Sound 1 Frequency	0	215
3	Random Sound 2 Frequency	0	96
4	Random Sound 3 Frequency	0	64
5	Random Sound 4 Frequency	0	16
6	Random Sound Overall Timer	3	0
7	Random Sound Cutout Speed	0	15
8	Default Whistle Set	0	6
9	Proto-Chuff Start Speed Step	0	0
10	Global Volume	0	100
11	Steam Locomotive Type	0	0
12	Automatic Sounds	15	135
13	Brake Grinding Noise Start Speed	0	15
14	Dual Enabled Functions	2	3
16	Chuff Rate Adjustment Value	0	100
18	Cylinder Cocks Auto Turn On Time	1	0
19	User Options CV	56	248
20	Articulated Chuff Slip Rate	0	240
21	Audio Auto Shut-Off Time	4	176

Sound and Light Mode Operation

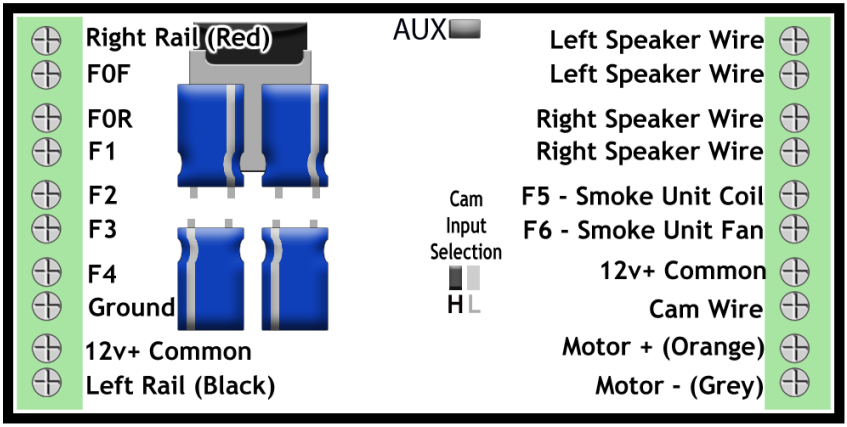
To maximize the amount of control you have with the limited number of function buttons we have created two distinct control modes: **Sound Mode** and **Light Mode**. In **Sound Mode** the function buttons will play the sound mapped to them without effecting any lights mapped to the same function button. In **Light Mode** the function button will perform any lighting operation that is mapped to it, but it won't effect the sounds being played.

For certain applications it may be desirable to play a sound at the same time a lighting function changes (for instance illuminating the headlight when the generator turns on). To setup your own dual-mode functions visit the WOWSound section of the TCS website for more information.

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. Please use small box, no envelopes.

WIRING DIAGRAM



AUX Input Pad

- The AUX input pad can be used to trigger a sound effect.
- Use a reed switch connected to the AUX input and decoder ground.
- Use Audio Assist (Patent Pending) to select a triggered sound to play.

Video Tutorials

Important! First time users should view our instructional videos in the WOWSound section of the TCS website for a full range of information on using this decoder.

Compatible with NMRA DCC standards. Made 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**