

CV 33-42 FUNCTION MAP

General Discussion

CVs 33-42 allow the user to customize which DSD outputs or sound effects are controlled by which function keys. Each function input, F0 thru F8, is assigned a unique CV that allows the corresponding function control to be redirected to up to eight different DSD Function outputs or sound effects. This allows a single function key to control more than one output if desired.

This feature is especially useful when the DSD is used with a controller that has less than eight function keys as the user can select which DSD outputs and sounds are important and remap them to the available function keys. Some outputs or sounds can be sensibly tied to another output thus freeing up a function. For example, the F5 and F6 lighting outputs could be configured to turn on whenever the headlight or backup light was on.

It is also possible to control a given output with more than one function key. In this case, the output will be turned on when any of the corresponding function inputs are active. The output will turn off only when all relevant inputs have also been turned off.

You will have to re-assign function mapping values to gain access to the manual engine notching controls, RPM+ and RPM-. This may mean giving up the use of an existing function and/or doubling up on function outputs assigned to a function key.

Note that all function inputs cannot be mapped to all outputs. The matrix below graphically indicates which inputs can control which outputs:

CV	FUNCTION INPUT	DIESEL DSD OUTPUT													
		*	*	Mute	Dimmer	Dynamic Brakes	Coupler	F6 Out	F5 Out	RPMs -	RPMs +	Horn	Bell	Reverse Light	Forward Light
33	FL (Fwd) Function														d
34	FL (Rev)Function													d	
35	Function 1												d		
36	Function 2											d			
37	Function 3						d								
38	Function 4					d									
39	Function 5							d							
40	Function 6						d								
41	Function 7				d										
42	Function 8			d											

Note: * = function output undefined
d = default setting.

CV 33

FL(f) OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the FL(fwd) function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7	bit 0						
F6	F5	RPMs -	RPMs +	HORN	BELL	BL	HL

- Bit 0:** HL, Head light output
0 = Output is unaffected by FL(fwd).
1 = Output is activated when FL(fwd) is on.
- Bit 1:** BL, Backup light output
0 = Output is unaffected by FL(fwd).
1 = Output is activated when FL(fwd) is on.
- Bit 2:** BELL, Bell Sound Effect
0 = Sound is unaffected by FL(fwd).
1 = Sound is activated when FL(fwd) is on.
- Bit 3:** HORN, Horn Sound Effect
0 = Sound is unaffected by FL(fwd).
1 = Sound is activated when FL(fwd) is on.
- Bit 4:** RPM +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by FL(fwd).
1 = RPMs are advanced one notch when FL(fwd) is on.
- Bit 5:** RPM -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by FL(fwd).
1 = RPMs are reduced one notch when FL(fwd) is on.
- Bit 6:** F5, Function 5 Output
0 = Output is unaffected by FL(fwd).
1 = Output is activated when FL(fwd) is on.
- Bit 7:** F6, Function 6 Output
0 = Output is unaffected by FL(fwd).
1 = Output is activated when FL(fwd) is on.

A value of 00, sets FL(fwd) to control HL output.

Default Value: 01

Related CVs: See also CVs 33-42.

CV 34

FL(r) OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the FL(rev) function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7	bit 0						
F6	F5	RPMs -	RPMs +	HORN	BELL	BL	HL

Bit 0: HL, Head light output
 0 = Output is unaffected by FL(rev).
 1 = Output is activated when FL(rev) is on.

Bit 1: BL, Backup light output
 0 = Output is unaffected by FL(rev).
 1 = Output is activated when FL(rev) is on.

Bit 2: BELL, Bell Sound Effect
 0 = Sound is unaffected by FL(rev).
 1 = Sound is activated when FL(rev) is on.

Bit 3: HORN, Horn Sound Effect
 0 = Sound is unaffected by FL(rev).
 1 = Sound is activated when FL(rev) is on.

Bit 4: RPMs +, Engine Exhaust Sound RPM Increase
 0 = Sound is unaffected by FL(rev).
 1 = RPMs are advanced one notch by FL(rev).

Bit 5: RPMs -, Engine Exhaust Sound RPM Decrease
 0 = Sound is unaffected by FL(rev).
 1 = RPMs are reduced one notch by FL(rev).

Bit 6: F5, Function 5 Output
 0 = Output is unaffected by FL(rev).
 1 = Output is activated when FL(rev) is on.

Bit 7: F6, Function 6 Output
 0 = Output is unaffected by FL(rev).
 1 = Output is activated when FL(rev) is on.

A value of 00 sets FL(rev) to control BL output.

Default Value: 02

Related CVs: See also CVs 33-42.

CV 35

F1 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F1 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7	bit 0						
F6	F5	RPMs -	RPMs +	HORN	BELL	BL	HL

- Bit 0:** HL, Head light output
0 = Output is unaffected by F1.
1 = Output is activated when F1 is on.
- Bit 1:** BL, Backup light output
0 = Output is unaffected by F1.
1 = Output is activated when F1 is on.
- Bit 2:** BELL, Bell Sound Effect
0 = Sound is unaffected by F1.
1 = Sound is activated when F1 is on.
- Bit 3:** HORN, Horn Sound Effect
0 = Sound is unaffected by F1.
1 = Sound is activated when F1 is on.
- Bit 4:** RPMs +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by F1.
1 = RPMs are advanced one notch when F1 is on.
- Bit 5:** RPMs -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by F1.
1 = RPMs are reduced one notch when F1 is on.
- Bit 6:** F5, Function 5 Output
0 = Output is unaffected by F1.
1 = Output is activated when F1 is on.
- Bit 7:** F6, Function 6 Output
0 = Output is unaffected by F1.
1 = Output is activated when F1 is on.

A value of 00 sets F1 to control the Bell sound effect.

Default Value: 04

Related CVs: See also CVs 33-42.

CV 36

F2 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F2 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7	F6	F5	RPMs -	RPMs +	HORN	BELL	BL	HL	bit 0
-------	----	----	--------	--------	------	------	----	----	-------

- Bit 0:** HL, Head light output
0 = Output is unaffected by F2.
1 = Output is activated when F2 is on.
- Bit 1:** BL, Backup light output
0 = Output is unaffected by F2.
1 = Output is activated when F2 is on.
- Bit 2:** BELL, Bell Sound Effect
0 = Sound is unaffected by F2.
1 = Sound is activated when F2 is on.
- Bit 3:** WHSTL, Whistle Sound Effect
0 = Sound is unaffected by F2.
1 = Sound is activated when F2 is on.
- Bit 4:** RPMs +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by F2.
1 = RPMs are advanced one notch when F2 is on.
- Bit 5:** RPMs -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by F2.
1 = RPMs are reduced one notch when F2 is on.
- Bit 6:** F5, Function 5 Output
0 = Output is unaffected by F2.
1 = Output is activated when F2 is on.
- Bit 7:** F6, Function 6 Output
0 = Output is unaffected by F2.
1 = Output is activated when F2 is on.

A value of 00 sets F2 to control the HORN sound effect.

Default Value: 08

Related CVs: See also CVs 33-42.

CV 37

F3 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F3 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7								bit 0
DIM	DYN BRK	CPLR	F6	F5	RPMs -	RPMs +	HORN	

- Bit 0:** HORN, Horn Sound Effect
0 = Sound is unaffected by F3.
1 = Sound is activated when F3 is on.

- Bit 1:** RPMs +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by F3.
1 = RPMs are advanced one notch when F3 is on.

- Bit 2:** RPMs -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by F3.
1 = RPMs are reduced one notch when F3 is on.

- Bit 3:** F5, Function 5 Output
0 = Output is unaffected by F3.
1 = Output is activated when F3 is on.

- Bit 4:** F6, Function 6 Output
0 = Output is unaffected by F3.
1 = Output is activated when F3 is on.

- Bit 5:** CPLR, Coupler Sound Effect
0 = Sound is unaffected by F3.
1 = Sound is activated when F3 is on.

- Bit 6:** DYN BRK, Dynamic Brake Sound Effect
0 = Sound is unaffected by F3.
1 = Sound is activated when F3 is on.

- Bit 7:** DIM, Headlight Dimmer Function
0 = Lighting outputs are unaffected by F3.
1 = Lighting outputs setup as "Dimmable Headlights" are dimmed when F3 is on.

A value of 00 sets F3 to control the COUPLER sound effect.

Default Value: 32 (0X20)

Related CVs: See also CVs 33-42.

CV 38

F4 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F4 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7	bit 0						
DIM	DYN BRK	CPLR	F6	F5	RPMs -	RPMs +	HORN

- Bit 0:** HORN, Horn Sound Effect
0 = Sound is unaffected by F4.
1 = Sound is activated when F4 is on.
- Bit 1:** RPMs +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by F4.
1 = RPMs are advanced one notch when F4 is on.
- Bit 2:** RPMs -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by F4.
1 = RPMs are reduced one notch when F4 is on.
- Bit 3:** F5, Function 5 Output
0 = Output is unaffected by F4.
1 = Output is activated when F4 is on.
- Bit 4:** F6, Function 6 Output
0 = Output is unaffected by F4.
1 = Output is activated when F4 is on.
- Bit 5:** CPLR, Coupler Sound Effect
0 = Sound is unaffected by F4.
1 = Sound is activated when F4 is on.
- Bit 6:** DYN BRK, Dynamic Brake Sound Effect
0 = Sound is unaffected by F4.
1 = Sound is activated when F4 is on.
- Bit 7:** DIM, Headlight Dimmer Function
0 = Lighting outputs are unaffected by F4.
1 = Lighting outputs setup as "Dimmable Headlights" are dimmed when F4 is on.

A value of 00 sets F4 to control the DYNAMIC BRAKE sound effect.

Default Value: 64 (0x40)

Related CVs: See also CVs 33-42.

CV 39

F5 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F5 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7	bit 0						
DIM	DYN BRK	CPLR	F6	F5	RPMs -	RPMs +	HORN

- Bit 0:** HORN, Horn Sound Effect
0 = Sound is unaffected by F5.
1 = Sound is activated when F5 is on.
- Bit 1:** RPMs +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by F5.
1 = RPMs are advanced one notch when F5 is on.
- Bit 2:** RPMs -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by F5.
1 = RPMs are reduced one notch when F5 is on.
- Bit 3:** F5, Function 5 Output
0 = Output is unaffected by F5.
1 = Output is activated when F5 is on.
- Bit 4:** F6, Function 6 Output
0 = Output is unaffected by F5.
1 = Output is activated when F5 is on.
- Bit 5:** CPLR, Coupler Sound Effect
0 = Sound is unaffected by F5.
1 = Sound is activated when F5 is on.
- Bit 6:** DYN BRK, Dynamic Brake Sound Effect
0 = Sound is unaffected by F5.
1 = Sound is activated when F5 is on.
- Bit 7:** DIM, Headlight Dimmer Function
0 = Lighting outputs are unaffected by F5.
1 = Lighting outputs setup as "Dimmable Headlights" are dimmed when F5 is on.

A value of 00 sets F5 to control the F5 function output.

Default Value: 08

Related CVs: See also CVs 33-42.

CV 40

F6 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F6 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7				bit 0			
DIM	DYN BRK	CPLR	F6	F5	RPMs -	RPMs +	HORN

- Bit 0:** HORN, Horn Sound Effect
0 = Sound is unaffected by F6.
1 = Sound is activated when F6 is on.
- Bit 1:** RPMs +, Engine Exhaust Sound RPM Increase
0 = Sound is unaffected by F6.
1 = RPMs are advanced one notch when F6 is on.
- Bit 2:** RPMs -, Engine Exhaust Sound RPM Decrease
0 = Sound is unaffected by F6.
1 = RPMs are reduced one notch when F6 is on.
- Bit 3:** F5, Function 5 Output
0 = Output is unaffected by F6.
1 = Output is activated when F6 is on.
- Bit 4:** F6, Function 6 Output
0 = Output is unaffected by F6.
1 = Output is activated when F6 is on.
- Bit 5:** CPLR, Coupler Sound Effect
0 = Sound is unaffected by F6.
1 = Sound is activated when F6 is on.
- Bit 6:** DYN BRK, Dynamic Brake Sound Effect
0 = Sound is unaffected by F6.
1 = Sound is activated when F6 is on.
- Bit 7:** DIM, Headlight Dimmer Function
0 = Lighting outputs are unaffected by F6.
1 = Lighting outputs setup as "Dimmable Headlights" are dimmed when F6 is on.

A value of 00 sets F6 to control the F6 output.

Default Value: 16 (0x10)

Related CVs: See also CVs 33-42.

CV 41

F7 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F7 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:

bit 7								bit 0
		MUTE	DIM	DYN BRK	CPLR	F6	F5	

- Bit 0:** F5, Function 5 Output
0 = Output is unaffected by F7.
1 = Output is activated when F7 is on.
- Bit 1:** F6, Function 6 Output
0 = Output is unaffected by F7.
1 = Output is activated when F7 is on.
- Bit 2:** CPLR, Coupler Sound Effect
0 = Sound is unaffected by F7.
1 = Sound is activated when F7 is on.
- Bit 3:** DYN BRK, Dynamic Brake Sound Effect
0 = Sound is unaffected by F7.
1 = Sound is activated when F7 is on.
- Bit 4:** DIM, Headlight Dimmer Function
0 = Lighting outputs are unaffected by F7.
1 = Lighting outputs setup as "Dimmable Headlights" are dimmed when F7 is on.
- Bit 5:** MUTE, Audio Mute Function
0 = Sound is unaffected by F7.
1 = Sound is muted when F7 is on.
- Bit 6:** Reserved
- Bit 7:** Reserved

A value of 00 sets F7 to control the Dimmer Light effect.

Default Value: 16 (0x10)

Related CVs: See also CVs 33-42.

CV 42

F8 OUTPUT LOCATION

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

Maps the F8 function to any of eight DSD auxiliary function outputs as defined by a 1 in the corresponding bit position:



- Bit 0:** F5, Function 5 Output
0 = Output is unaffected by F8.
1 = Output is activated when F8 is on.
- Bit 1:** F6, Function 6 Output
0 = Output is unaffected by F8.
1 = Output is activated when F8 is on.
- Bit 2:** CPLR, Coupler Sound Effect
0 = Sound is unaffected by F8.
1 = Sound is activated when F8 is on.
- Bit 3:** DYN BRK, Dynamic Brake Sound Effect
0 = Sound is unaffected by F8.
1 = Sound is activated when F8 is on.
- Bit 4:** DIM, Headlight Dimmer Function
0 = Lighting outputs are unaffected by F8.
1 = Lighting outputs setup as "Dimmable Headlights" are dimmed when F8 is on.
- Bit 5:** MUTE, Audio Mute Function
0 = Sound is unaffected by F8.
1 = Sound is muted when F8 is on.
- Bit 6:** Reserved
- Bit 7:** Reserved

A value of 00 sets F8 to control the MUTE effect.

Default Value: 32 (0x20)

Related CVs: See also CVs 33-42.

CV 49-52

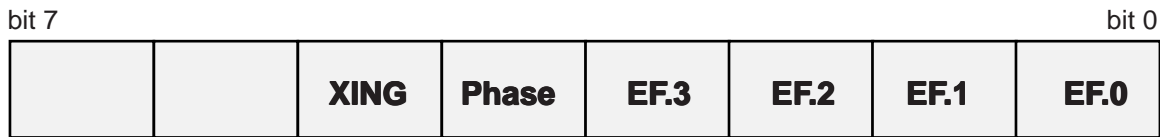
HYPERLIGHT EFFECT SELECT

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

These CVs are used to set the Hyperlight effect and control mode for their respective output:

- CV 49, Headlight Effect Select
- CV 50, Backup Light Effect Select
- CV 51, F5 Effect Select
- CV 52, F6 Effect Select



- Bit 0-3:** EF[3..0] Effect Type Select
- 0000 (0x00) = On/Off output
 - 0001 (0x01) = Rule 17 Dimmable headlight
 - 0010 (0x02) = Mars Light
 - 0011 (0x03) = Pyle Gyalite
 - 0100 (0x04) = Oscillating Headlight
 - 0101 (0x05) = Single Flash Strobe
 - 0110 (0x06) = Double Flash Strobe
 - 0111 (0x07) = Western Cullen D312 Rotary Beacon
 - 1000 (0x08) = Prime Stratolite
 - 1001 (0x09) = Type I Ditch Light
 - 1010 (0x0A) = Type II Ditch Light
 - 1011 (0x0B) = FRED (End of Train flasher)
 - 1100 (0x0C) = Engine Exhaust Flicker
 - 1101 (0x0D) = reserved
 - 1110 (0x0E) = reserved
 - 1111 (0x0F) = reserved

Most of the effects are self-descriptive. However a few need some additional notes:

Dimmable Headlight- The function output is normally an on/off output. If the output is on, the output level will be reduced about 60% whenever the dimmer function (Function 4) is on.

Type I and Type II Ditch lights. These are identical when operating. However, if the grade crossing logic is enabled, the Type I ditch light will revert to a steady on state when it is not flashing whereas the Type II lights will turn off.

Engine Exhaust - This effect produces a random flicker whose intensity is proportional to the engine RPMs. It is best used by placing a red/orange lamp under the model's exhaust port out of direct view. As the engine is revved up, it will glow brighter imitating unmuffled exhaust gases and sparks.

- Bit 4: Phase, Phase Select Bit
- 0 = Phase A
 - 1 = Phase B

The Phase Select bit alters the timing of the effect so that it is 180 degrees out of phase with the other effects. This allows you to have two light effects that blink back and forth if desired. Set one effect to phase A and the other to phase B.

Bit 5: XING, Grade Crossing Logic Enable
0 = Crossing Logic disabled
1 = Crossing Logic enabled when Horn function is on.

The Grade Crossing Logic bit causes the lighting effect to become active only when the horn has been sounded (and the corresponding lighting function key is also on). A typical use would be to cause the ditch lights to flash at a grade crossing. The grade crossing logic can be used with almost all the Hyper-light effects. The on/off, dimmable headlight, FRED and engine exhaust will not be affected. The other effects will either turn off (stobes and beacons) or revert to a steady on state (mars light, ditch lights, etc) as appropriate to prototype practice.

Bit 6: Reserved.

Bit 7: Reserved.

Default Value: 0

Related CVs: See also CV 55.

CV 55

FLASH RATE AND CROSSING HOLD TIME

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

CV55 is used to adjust both the Hyperlight effect's flash rate and also the hold time for grade crossing logic.



Bit 0-3: FR0-3, Flash Rate Select
Sets the overall flash rate of the Hyperlight effects.
0000 = Maximum Flash Rate
:
1111 = Minimum Flash Rate

Bit 4-7: HT0-3, Hold Time Select
Sets the time an effect will stay on after the horn button is released (if it is set up to do so) and has a range of zero to 15 seconds.
0000 = Minimum Hold Time = 0
:
1111 = Maximum Hold Time = 15 Seconds

Default Value: 02

Related CVs: See also CVs 49-52.

CV 56

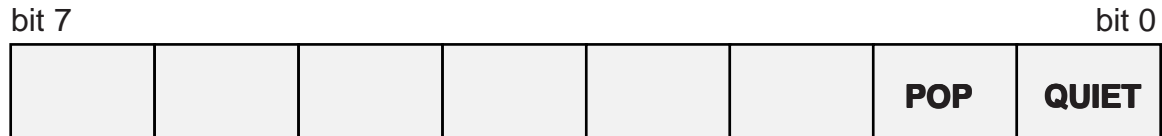
SOUND CONFIGURATION

BYTE #1

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

This CV is used to set the quiet mode and enable/disable background sounds:



Bit 0: QUIET, Quiet Mode Enable
 0 = Sound turns on a few seconds after power is turned on.
 1 = Sound turns on only when the DSD receives a packet with a matching address.

Bit 1: POP = Compressor Pop Valve Sound effect Enable
 Used to enable or disable the airtank pop valve effect.
 0 = Effect Off
 1 = Effect On

The Quiet bit is used for 'noise control' when many DSD equipped engines are on a layout. When set to 1, locomotives not in use will remain quiet until they are called into service. Similarly, if the locomotive is de-commissioned, it will also cause the sound to be turned off after a period of time as set by CV 11. *Note:* the Quiet bit will work only when auto notching is disabled (see CV 58).

Bits 2-7: Reserved.

Default Value: 3

Related CVs: See Also CV 11.

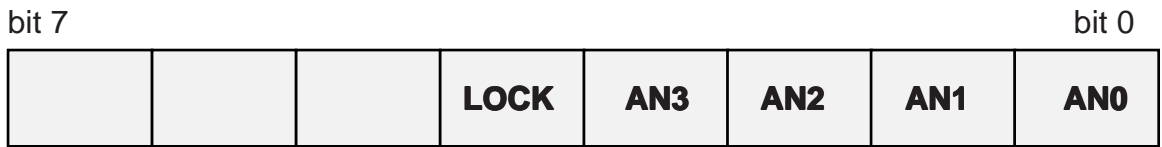
CV 58

ENGINE CONTROL CONFIGURATION BYTE

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

This CV specifies the number of speed steps needed to advance the engine rpm notches, as well as selecting between manual or automatic engine notching:



BIT 0-3: AN0-3, Auto Notching Enable
 0000 = Auto Notching Disabled
 0001 = One Speed Step per Throttle Notch (for 128 speed step mode)
 1111 = 15 Speed Steps per Throttle Notch (for 128 speed step mode)

These bits specify the percentage of throttle needed to advance or retard the engine exhaust sound one throttle 'notch'.

When auto notching is enabled, engine will startup when throttle is first increased. It will increase in proportion to the throttle speed. The engine RPMs may be shutoff by pressing emergency stop once.

When auto notching is disabled, the Engine RPMs+ (Function 3) and RPMs- Function 4) are used to manually increase/decrease the engine RPM sound.

Bit 4: LOCK = Engine RPM Interlock
 0 = Interlock disabled
 1 = Interlock enabled

This bit is used to interlock the engine RPMs and the throttle setting when manual notching is used such that:

1. Locomotive cannot be moved unless engine has been started.
2. Engine cannot be shutoff unless throttle is zero.

Besides the fun of forcing the engineer to follow an operating protocol, this bit is also useful in preventing inadvertent engine shutoff while the train is moving.

Bit 5: Reserved.

Bit 6: Reserved.

Bit 7: Reserved.

Default Value: 7

CV 59

BELL RING RATE

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

This CV is used to control the bell ringer speed:



Bit 0-3: RNG2:RNG1, Bell Ring Rate
Controls the ringing rate of the bell sound.
0000 = Fastest Ring Rate
:
1111 = Slowest Ring Rate

Bit 4: Reserved.

Bit 5: Reserved.

Bit 6: Reserved.

Bit 7: Reserved.

Default Value: 4

Related CVs: See Also Bell Volume Control, CV 60

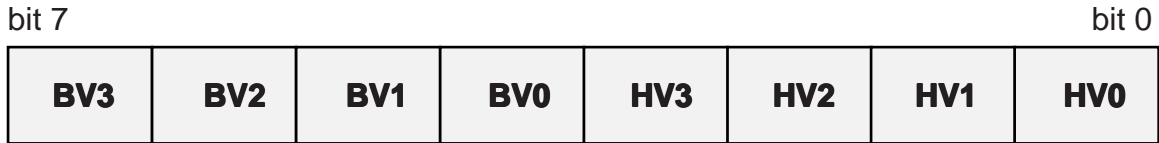
CV 60

HORN AND BELL VOLUME CONTROL

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

This CV is used to independently set the volume level of the Horn and Bell/Background sounds. The upper four bits set the sound level of the bell, coupler, and compressor sounds and has a range of 0 - 15. The lower four bits set the Horn volume level over a range of 0-15.



Bits 0-3: HV0-HV3, Horn Volume Control
0000 = Minimum Volume
:
1111 = Maximum Volume

Bits 4-7: BV0-BV3, Bell & Background Sound Volume Control
0000 = Minimum Volume
:
1111 = Maximum Volume

Default Value: 104 (0x68), Bell Volume = 40%, Horn Volume = 50%

CV 61

ENGINE EXHAUST AND DYNAMIC BRAKE VOLUME CONTROL

<input type="checkbox"/> Address Mode	<input checked="" type="checkbox"/> Direct Mode
<input type="checkbox"/> Register Mode	<input type="checkbox"/> Ops Mode Short Form
<input checked="" type="checkbox"/> Paged Mode	<input checked="" type="checkbox"/> Ops Mode Long Form

Description

This CV is used to independently set the volume level of the exhaust and dynamic brake sounds. The upper four bits set the dynamic brake level and has a range of 0 - 15. The lower four bits set the exhaust sound level over a range of 0-15.

bit 7

bit 0

DBV3	DBV2	DBV1	DBV0	EV3	EV2	EV1	EV0
-------------	-------------	-------------	-------------	------------	------------	------------	------------

Bits 0-3: EV0-EV3, Engine Exhaust Volume Control
0000 = Minimum Volume
:
1111 = Maximum Volume

Bits 4-7: DBV0-DBV3, Dynamic Brake Volume Control
0000 = Minimum Volume
:
1111 = Maximum Volume

CAUTION: High volume levels of the exhaust may cause excessive distortion and ultimately burn out smaller speakers. User is advised to start at a low volume setting and test the setting over the full throttle range before turning up the volume to the next level.

Default Value: 102 (0x66), Engine Volume = 40%, Dynamic Brake Volume = 40%