The following table lists the various CVs supported in the Bachmann advanced decoder used in the N Scale EM-1. Both the NMRA DCC CV numbers and the older Register numbers are provided for cross reference.

*Please note: Some CVs (such as CV29) have specific meanings for each bit. The bit assignments in this table use a bit numbering scheme of 0-7 to correspond the NMRA convention for universal bit numbering. Many handhelds use a scheme of 1-8 to refer to the individual bits rather than 0-7. The bit numbers in **()** within these tables uses the 1-9 numbering convention.*

Table of supported CVs

CV	Meaning	Range	Factory setting
1	Basic locomotive address. This number is the short address used to control the locomotive. When writing this CV, CV19 (consist address) is automatically cleared and CV29 Bit 6 (use of extended address) is deleted is set to 0.	1-127	3
2	Minimum starting voltage	0-255	0
3	Starting delay	0-255	6
4	Braking delay	0-255	5
5	Maximum speed	0-255	255
6	Mid speed Vmid (a value of 60 will give a linear curve)	0-255	48
7	Version number	-	81
8	Manufacturer's ID (to reset all the decoder CVs to their factory setting, write a value of 8 into CV8)	-	101
9	Back EMF Repetition Rate	0-63	15
17	Extended locomotive address, high-order byte	192-231	192
18	Extended locomotive address, low-order byte	0-255	100
19	Consist address	1-99	0
29	Decoder Configuration, Byte 1:		6 (dec)
bit 0 (1)	Locomotive direction of travel: 0 = locomotive's direction is normal 1 = locomotive's direction is reversed	0,1 [1]	0
bit 1 (2)	Headlight mode: 0 = Operation with 14 or 27 speed step systems. 1 = Operation with 28, 55 or 128 speed steps. Note: your system must be set to the same mode.	0,1 [2]	1
bit 2 (3)	Usage on conventional DC layouts: 0 = locomotive operates in digital mode only 1 = locomotive can operate on either conventional DC and on DCC	0,1 [4]	1
bit 3 (4)	Not Used	0	0

bit 4 (5)	Speed Curve Selection:			0,1 [16]	0
	0 = factory pre-set speed curve is used				
	1 = user defined speed curve is used. Please enter the appropriate values into CV 67 to 94 before setting this bit.				
bit 5 (6)	Extended Addressing			0-1 [32]	0
	0= Normal addressing				
	1= Four digit extended addressing				
bit 6 bit 7 (7-8)	always 0			0	0

30	Fault indication				0 (dec)
bit 0 (1)	= 1	Light short-circuit		0,1 [1]	0
bit 1 (2)	= 1	Overheating		0,1 [2]	0
bit 2 (3)	= 1	Motor short-circuit		0,1 [4]	0

CV 33 – 46	Function mapping for function outputs: In order to allocate a function of the digital system to a function output, look for the section where the row of the desired function meets the column of the desired function output. Enter the number found in the respective CV. For the purpose of clarification, factory settings are shown in bold print.				Factory setting

CV	Function output:	A	B	C		
33	F0 forward	**8**	16	32		8
34	F0 backward	8	**16**	32		16
35	Function 1	8	16	**32**		0
36	Function 2	8	16	32		0
37	Function 3	8	16	32		0
38	Function 4	1	2	4		0
39	Function 5	1	2	4		4
40	Function 6	1	2	4		0
41	Function 7	1	2	4		0
42	Function 8	1	2	4		0

50	Motor configuration			37(dec)
bits 0-3 (1-4)	Select motor type 0-5, enter as decimal number		0,1 [0-5]	5
Bit 5 (6)	=0 EMF switch inactive =1 EMF switch active		0,1 [32]	1
Bit 6 (7)	=0 EMF Control switched on =1 EMF Control switched off		0,1 [64]	0
Bit 7 (8)	=0 High-frequency motor control (approx. 23 kHz) =1 Low-frequency motor control (approx. 19 Hz)		0,1 [128]	0

51	Braking configuration			0 (dec)
bit 0 (1)	= 1 Constant braking distance activated		0,1 [1]	0
Bits 1-4 (2-5)	Not used			0
bit 5 (6)	= 1 Stopping with DC independent of the polarity (only if Bit 3 is deleted in CV29).		0,1 [32]	
bits 6-7 (7-8)	Not used			0

52	Braking distance with activated constant braking distance	0-255	50
55	Sets brightness at function outputs A and C, 255=max	0-255	48
56	Sets brightness at function outputs B 255=max	0-255	48
57 - 59	Function mapping: Each bit of the CV stands for a function of the digital system: Bit 0(1) for function 1, Bit 1(2) for function 2 and so on up to Bit 7(8) for function 8. If you wish to allocate a function for dimming, the respective bit in CV 57 must be set.		
57	Dimming function	0-255	1
58	Switching speed function (factory setting F3)	0-255	4
59	acceleration and deceleration delay function (factory setting F4)	0-255	8
60	Lighting effect at function outputs A and B. The units digit of the value stands for function output A, the tens digit for function output B: 0 No effect 1 Marslight 2 Gyrolight 3 Strobe 4 Double strobe	0-255	0
61	Function mapping: lighting effect at function outputs A and B	0-255	0
62	Lighting effect at function outputs C. The units digit of the value stands for function output C: 0 No effect 1 Flashing 2 Flickering type 1 (smooth) 3 Dimming with value from CV55	0-255	3
63	Flashing frequency for function outputs C and D: default approx. 1 sec, f = 1 / (0.03 * (1 + CV63))		32
64	Function mapping: lighting effect at function output C		0
67.. 94	Values for user defined speed table, default = factory speed curve	0-255	
105	User Identification #1	0-255	255
106	User Identification #2	0-255	255
113	Minimum PWM value, control for motor types 4 or 5	0-255	1
114	Change duty cycle for motor type 4 or 5	0-255	1
128	Decoder Software Version – read only		1