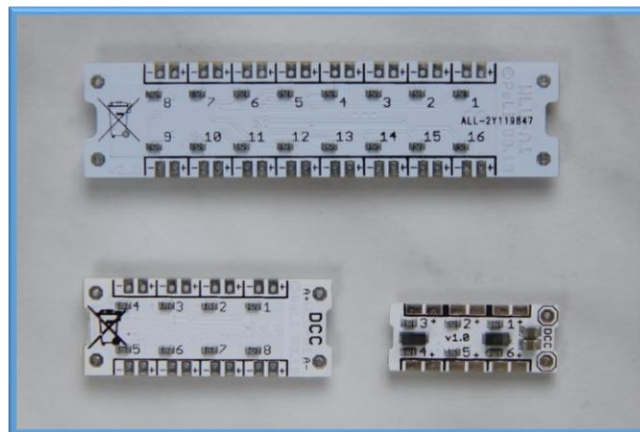


Universal lighting module

WLU-A1, WLU-B1, WLU-D1 for firmware 4.x

Module properties:

- 16 / 8 / 6 LED outputs
- Function / accessory decoder
- adjusting 31 light effects
- individual and global brightness adjustment
- set the switch-on delay time
- set the switch-off delay time
- selects random switching on and off
- setting a random generator delay
- assigning a random generator to the Fn
- speed setting global effects
- support of function keys F0 - F28



LEDs can be connected directly to outputs on the decoder. However, it is always necessary to properly use the wires to each LED, avoiding damage to individual outputs or the destruction of the entire module. When you first connect the supply voltage to illuminate all LEDs (test in functionality the lighting) and the decoder is reset to the factory settings (TAB1, RST column). To manually set the decoder you can set individual CV in table TAB1. After you set the decoder, it is possible to lock the write to the CV. Entry is locked by entering a value of 248 in CV8 and unlocked by entering the decoder address from CV1 to CV8 (TAB8). Reset the decoder by writing the value 246 to CV8 (TAB8). Write any value to CV8 to make the setting in Table 8, but CV8 (manufacturer) does not change.

The decoder can be set for a short or a long address with bit 5 in CV29 (TAB2). The ideal is to set the same address as the locomotive (CV1 or CV17 + CV18) or use consist address, that can be changed during use CV19 (programming POM). Then, you can fully take advantage of features that are dependent on the movement of the sets (CV150-CV157). For the correct functioning of the Fn0 on the 14 speed steps, it is necessary to reset the bit 1 in CV29 (TAB2). Switching on the lights according to the polarity of the DCC can be set in the CV158 to CV161. The module can be used with the restrictions on the analog track by setting the kill bit 2 in CV29 (TAB2). This bit is set in the factory. In the same way it is possible to use the module for a variety of lighting model of the country, buildings, street, etc. Setting bit 7 in CV29 (TAB2a) switches the module to the accessory decoder. CV13, CV14, CV17-19, CV119, CV128-CV145 and CV150 to CV161 are not used in this setting and will be ignored. In table TAB1b, there is a CV listing that is different than in a functional decoder mode. If bit 0 in CV27 (TAB2b) is set, the decoder will remember the output settings. Bit 3 in CV27 (TAB2b) determines how the decoder will respond to received packets (straight / turn, or turn / straight). The decoder will occupy 4 consecutive addresses. The addressing for accessories depends on the manufacturer (Lenz / Roco). The decoder hardware address is set by writing 6 lower bits to CV1 and writing 3 upper bits to CV9, or by the following procedure:

1. Write value 255 to CV9 via DCC programmer
2. Set the address in to DCC command station to be programmed
3. Send accessory command (switchover)
4. When the module receives a signal, it is programmed and the outputs flash
5. The programming mode is terminated automatically

For all the outputs it is possible to adjust the brightness levels to 31 values (CV46-CV61). A value 0 and 31 represents the maximum brightness value 1 represents the minimum brightness. Writing the value 0 to 31 to CV8 is brightness output set globally for all outputs. Assign each a functional keys F0-F12 is configured in CV120-CV145. For each function key is reserved for a pair of CV (TAB4). If necessary, you can change the assignment of the function keys F5 - F28 by changing the CV119 (TAB9).

Power-on delay time (CV66, CV68) and off delay (CV67, CV69) sets up in seconds (0-255 seconds). Outputs are dependent on the delays are set in CV166 to CV173. Outputs that randomly switch when stops are set in CV154 and CV155. Outputs that randomly switch on while driving are set in CV156 and CV157. The rate of generation of random switching on and switching off can be set up in seven levels in CV70 and in CV71 (TAB6). The ratio of random output on / off can be set in the CV72 and CV73 (TAB7). If the value is set to 10, then the lights will only randomly switch on . If the value is 0, the lights will then only randomly switch off . CV154 to CV165 shall be subject to the relevant output up by turning on the CV120 CV145. Identical output on/off setting with a delay of 1 and 2 is not appropriate. Via CV74 to CV77 shall be assigned a random generator to the individual functions F0 to F12 (TAB5). CV78 and CV79 are used to delay the startup of a random generator. The value is entered in seconds. It is possible to make sure that when switched on, all lights turn on and, after a set time, they will randomly turnoff. The value 0 means that this function is off.

TABI List all CVs

CV	range	RST	description CV
1	1..127	3	decoder address
7		35	version SW (only read)
8	13	13	manufacturer (only read)
9	0..7	0	decoder address
10	0..7	3	global effect speed
13	0..255	0	function F1 - F8 analog
14	0..63	3	function F0, F9 - F12 analog
17	192..231	192	extended (long) address
18	0..255	3	extended (long) address
19	1..127	0	consist address
27		0	setting the decoder (TAB2b)
29		6	setting the decoder (TAB2a)
30	0..23	0	selecting the output effect 1
31	0..23	0	selecting the output effect 2
32	0..23	0	selecting the output effect 3
33	0..23	0	selecting the output effect 4
34	0..23	0	selecting the output effect 5
35	0..23	0	selecting the output effect 6
36	0..23	0	selecting the output effect 7
37	0..23	0	selecting the output effect 8
38	0..23	0	selecting the output effect 9
39	0..23	0	selecting the output effect 10
40	0..23	0	selecting the output effect 11
41	0..23	0	selecting the output effect 12
42	0..23	0	selecting the output effect 13
43	0..23	0	selecting the output effect 14
44	0..23	0	selecting the output effect 15
45	0..23	0	selecting the output effect 16
46	0..31	31	output brightness 1
47	0..31	31	output brightness 2
48	0..31	31	output brightness 3
49	0..31	31	output brightness 4
50	0..31	31	output brightness 5
51	0..31	31	output brightness 6
52	0..31	31	output brightness 7
53	0..31	31	output brightness 8
54	0..31	31	output brightness 9
55	0..31	31	output brightness 10
56	0..31	31	output brightness 11
57	0..31	31	output brightness 12
58	0..31	31	output brightness 13
59	0..31	31	output brightness 14
60	0..31	31	output brightness 15
61	0..31	31	output brightness 16
62	0..255	12	flashing A - positive period effect 15,16
63	0..255	12	flashing A - negative period effect 15,16
64	0..255	24	flashing B - positive period effect 17,18
65	0..255	24	flashing B - negative period effect 17,18
66	0..255	0	on delay 1 CV154 and 155
67	0..255	0	off delay 1 CV156 and 157

CV	range	RST	description CV
68	0..255	0	on delay 2 CV158 and 159
69	0..255	0	off delay 2 CV160 and 161
70	0..7	0	range of random generator when stop
71	0..7	0	range of random generator when driving
72	0..10	0	ratio on/off in random generator when stop
73	0..10	0	ratio on/off in rand. generator when driving
74	0..31	0	functions for a random generator when stop
75	0..255	0	functions for a random generator when stop
76	0..31	0	functions for a rand. generator when driving
77	0..255	0	functions for a rand. generator when driving
78	0..255	0	delay for a random generator when stop
79	0..255	0	delay for a random generator when driving
119		0	mapping function (TAB9)
120	0..255	255	F0 output 1-8 (TAB4)
121	0..255	255	F0 output 9-16 (TAB4)
122	0..255	0	F1 output 1-8 (TAB4)
123	0..255	0	F1 output 9-16 (TAB4)
124	0..255	0	F2 output 1-8 (TAB4)
125	0..255	0	F2 output 9-16 (TAB4)
126	0..255	0	F3 output 1-8 (TAB4)
127	0..255	0	F3 output 9-16 (TAB4)
128	0..255	0	F4 output 1-8 (TAB4)
129	0..255	0	F4 output 9-16 (TAB4)
...			
144	0..255	0	F12 output 1-8 (TAB4)
145	0..255	0	F12 output 9-16 (TAB4)
150	0..255	255	outputs for driving forward 1-8 (TAB4)
151	0..255	255	outputs for driving forward 9-16 (TAB4)
152	0..255	255	outputs for driving backwards 1-8 (TAB4)
153	0..255	255	outputs for driving backwards 9-16(TAB4)
154	0..255	255	outputs when stop 1-8 (TAB4)
155	0..255	255	outputs when stop 9-16 (TAB4)
156	0..255	255	outputs when driving 1-8 (TAB4)
157	0..255	255	outputs when driving 9-16 (TAB4)
158	0..255	255	DCCa output 1-8 (TAB4)
159	0..255	255	DCCa output 9-16 (TAB4)
160	0..255	255	DCCb output 1-8 (TAB4)
161	0..255	255	DCCb output 9-16 (TAB4)
166	0..255	0	delay on 1 output 1-8 (TAB4)
167	0..255	0	delay on 1 output 9-16 (TAB4)
168	0..255	0	delay off 1 output 1-8 (TAB4)
169	0..255	0	delay off 1 output 9-16 (TAB4)
170	0..255	0	delay on 2 output 1-8 (TAB4)
171	0..255	0	delay on 2 output 9-16 (TAB4)
172	0..255	0	delay off 2 output 1-8 (TAB4)
173	0..255	0	delay off 2 output 9-16 (TAB4)
180	0..255	0	random outputs when stop 1-8 (TAB4)
181	0..255	0	random outputs when stop 9-16 (TAB4)
182	0..255	0	random outputs when driving 1-8 (TAB4)
183	0..255	0	random outputs when driving 9-16 (TAB4)

TAB1b Description of changed CVs for accessories decoder

CV	range	RST	description CV
1	0..63	3	decoder address for accessories
9	0..7	0	decoder address for accessories
70	0..7	0	range of random generator 1
71	0..7	0	range of random generator2
72	0..10	0	ratio on/off in random generator 1
73	0..10	0	ratio on/off in random generator 2
74	0..31	0	functions for a random generator 1

CV	range	RST	description CV
76	0..31	0	functions for a random generator 2
78	0..255	0	delay for a random generator 1
79	0..255	0	delay for a random generator 2
180	0..255	0	random outputs 1 1-8 (TAB4)
181	0..255	0	random outputs 1 9-16 (TAB4)
182	0..255	0	random outputs 2 1-8 (TAB4)
183	0..255	0	random outputs 2 9-16 (TAB4)

TAB2a CV29

bit	description		
0	train direction	0 = unchanged	1 = in reverse
1	speed steps	0 = 14	1 = 28
2	analog	0 = off	1 = on
5	decoder address	0 = in CV1	1 = in CV17+18
7	decoder mode	0 = function	1 = accessory

TAB2b CV27

bit	description		
0	remember last state	0 = off	1 = on
2	ACK boost	0 = off	1 = on
3	inverted commands	0 = off	1 = on

TAB3 effects CV30 - CV45 can be set for each output

value	effect CV30 až CV45	value	effect CV30 až CV45
0	without effect	16	negative flashing by CV62 and CV63
1	light bulb	17	flashing by CV64 and CV65
2	beacon	18	negative flashing by CV64 and CV65
3	flash	19	gas lamp 1
4	double flash	20	gas lamp 2
5	fluorescent lamp type1-with starter	21	gas lamp 3 weak gas pressure
6	fluorescent lamp type2-with new starter	22	gas lamp 4 weak gas pressure
7	fluorescent lamp type3-with inverter	23	sodium - vapor lamp 1
8	fluorescent lamp type4-new with inverter	24	sodium - vapor lamp 2
9	fluorescent lamp type5-new with inverter	25	bad sodium - vapor lamp 1
10	broken fluorescent functional over time	26	bad sodium - vapor lamp 2
11	broken fluorescent lamp	27	welding 1
12	faulty fluorescent, end of life	28	welding 2
13	faulty fluorescent with inverter 1	29	intermittent welding
14	faulty fluorescent with inverter 2	30	fire 1
15	flashing by CV62 and CV63	31	fire 2 (TV)

TAB4 assign individual bits to output

	7	6	5	4	3	2	1	0
output 1-8	8	7	6	5	4	3	2	1
output 9-16	16	15	14	13	12	11	10	9

TAB5 assign individual bits to functions Fn0 – Fn12

	7	6	5	4	3	2	1	0
CV74 CV76				F0	F4	F3	F2	F1
CV75 CV77	F12	F11	F10	F9	F8	F7	F6	F5

TAB6 CV70 and CV71

	generated random time
0, 1	2-4sec
2	2-6sec
3	2-10sec
4	2-20sec
5	2-35sec
6	2-70sec
7-255	2-130sec

TAB8 CV8

value	description
1 - 31	brightness of all lights
246	initialization (reset)
248	locked writing

To activate the analog functions (CV13 and CV14)

bit	7	6	5	4	3	2	1	0
CV13	F8	F7	F6	F5	F4	F3	F2	F1
CV14		F12	F11	F10	F9	F0r	F0f	

TAB7 CV72 and CV73

	ratio ON / OFF
0	0% / 100%
1	10% / 90%
2	20% / 80%
3	30% / 70%
4	40% / 60%
5	50% / 50%
6	60% / 40%
7	70% / 30%
8	80% / 20%
9	90% / 10%
10 ...	100% / 0%

TAB9

CV119		0	16	17	18	19	32	33	34	35	49	50	51	66	67	83
Mapping function	CV120 CV121	F0	F0	F0	F0	F0	F0	F0	F0	F0	F0	F0	F0	F0	F0	F0
	CV122 CV123	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
	CV124 CV125	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2
	CV126 CV127	F3	F3	F3	F3	F3	F3	F3	F3	F3	F3	F3	F3	F3	F3	F3
	CV128 CV129	F4	F4	F4	F4	F4	F4	F4	F4	F4	F4	F4	F4	F4	F4	F4
	CV130 CV131	F5	F5	F5	F5	F5	F9	F9	F9	F9	F13	F13	F13	F17	F17	F21
	CV132 CV133	F6	F6	F6	F6	F6	F10	F10	F10	F10	F14	F14	F14	F18	F18	F22
	CV134 CV135	F7	F7	F7	F7	F7	F11	F11	F11	F11	F15	F15	F15	F19	F19	F23
	CV136 CV137	F8	F8	F8	F8	F8	F12	F12	F12	F12	F16	F16	F16	F20	F20	F24
	CV138 CV139	F9	F13	F17	F21	F25	F13	F17	F21	F25	F17	F21	F25	F21	F25	F25
	CV140 CV141	F10	F14	F18	F22	F26	F14	F18	F22	F26	F18	F22	F26	F22	F26	F26
	CV142 CV143	F11	F15	F19	F23	F27	F15	F19	F23	F27	F19	F23	F27	F23	F27	F27
	CV144 CV145	F12	F16	F20	F24	F28	F16	F20	F24	F28	F20	F24	F28	F24	F28	F28

Technical specifications:

Number of outputs: WLU-A1 (16 outputs), WLU-B1 (8 outputs), WLU-D1 (6 outputs)
 Dimensions : WLU-A1 (15 x 62 x 4mm), WLU-B1 (13 x 34 x 3mm), WLU-D1 (9 x 23 x 4mm)
 Power DCC : 10-20V
 Power analog : 4-20V (full brightness at 5.3V)
 Energy consumption: WLU-A1 (max 0,05A), WLU-B1 (max 0,03A), WLU-D1 (max 0,02A)
 Output Load: 3mA
 Operating temperature: 5 - 50 °C




 DIGITÁLNE VLÁČIKY

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Záručné podmienky sa vzťahujú na poruchy spôsobené pri výrobe a poruchy osadených súčiastok. Na poruchy vzniknuté hrubým zaobchádzaním, nesprávnou montážou, nevhodným uskladnením a pôsobením okolitého prostredia sa záruka nevzťahuje. Po životnosti odovzdajte do zberne elektro odpadu!


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