



Ver.5.3

CONCEPT OF DMX CONTROLLER PROG1

DMX Controller PROG1 is dedicated to fully management of many (up to 255) light sources with unique identification and much more with repeating identification (but in different space locations) at illumination of any objects, special light effects for show programs, interior light, architectural mood lights and etc.

DMX Controller PROG1 work in 4 general modes:

- **normal mode 1**: execute, edit and compose play list – functions of series **F1** ;
- **normal mode 2**: execute, edit and compose group – function of series **F2**;
- **service mode 1**: read, program and test separate light device – function of series **F3**;
- **service mode 2**: display / adjust clock, date and day of week – function of series **F4**

Description of terms, common for all modes

Light source

Separate light emitting device with only **one** color and own power supply unit. Color and power may be any.

Member

Separate light source in concrete space location with own unique identification number, power and color. This approach permits common control of many members, connected together by dedicated network. Each member may be in state 'off' or in state 'on'. In state 'off' member stay always dark, in state 'on' member light by intensity depended from running program. It is important to **note**, that member with **number '0'** play special role an here is always with intensity '0' i.e. he really is unusable and absent from multitude of members. Also is important to note, that one LED DMX controller may be control unlimited quantity of members with identical (equal) numbers. For this small DMX controller number of members is limited to 255 and may be any in range 1-255.

Light device

Light device is space combination from separate members with one or more colors and power and placed with in common space and used some common hardware and software. For DMX Controller PROG1 no limitations to attitude colors and power. A concrete light device may be having only one member or more members. DMX Controller PROG1 includes **red**, **green** and **blue** control buttons to perform synthesis of any color by their correlation in accordance of colorimetric laws. Necessary electrical power to concrete light device must be ensure by its own driver, fully controlled by DMX Controller PROG1.

Group

Group is community of members, distributed in different light devices with common, uniform and simultaneously controlled intensity. DMX Controller PROG1 supports up to 255 groups. Actually number of controlled groups may be any in range 0-255. Every member may belong to any group without limitation.

Light intensity

In DMX Controller PROG1, intensity is present with relative values in range 0 – 255. Value '0' correspond to dark (turn-off) light source, value '255' – to maximal possible light source intensity. All other values ensure intermediate intensities from dark to full light. Take notice that light sources with different power will ensure different illumination at same begin or end intensity.

Play position

This is completed program units what may be realizing full control of group of light devices by user definite parameters.

Play list

This is **list** from already existing play positions, played sequentially **FROM-TO**. This play list system is designed to play unlimited times sequentially all positions included between “**BEGIN POSITION**” and “**END POSITION**” (until stop button will be press). To be play, any included in list position must be meet **begin time**, **end time** and **day of week**, otherwise the position is skipped. When play of **last position** of play list is done, automatically begin play of first position of same play list. This process is time unlimited. If play list contain only one position, she will be also repeated unlimited times. This is usefully for non-standards use of DMX Controller PROG1, as example need of static illumination.

NORMAL MODE 1

Function to support **normal mode 1** are:

Composing of play list is done by function F1/1.

Setting or editing of position items is done by functions F1/2 to F1/9.

Saving of new or edited items is done by function F1/10.

Components of play position

Full amount of components of play position with their default values and permitted ranges are given in table 1.

Table 1

No	Play position components	Set by function	Default value	Permitted range
1.	Position identification number	F1/2	000	000 - 255
2.	Group (assigned to position)	F1/3	000	000 - 255
3.	Program type	F1/4 left	000	000 - 005
4.	Repeat times	F1/4 right	001	001 - 255
5.	Begin intensity	F1/5	RED - 040	000 - 255
			GREEN - 050	000 - 255
			BLUE - 060	000 - 255
6.	End intensity	F1/6	RED - 100	000 - 255
			GREEN - 110	000 - 255
			BLUE - 120	000 - 255
7.	Hold time *	F1/7 left	00.1 *	00.0 – 25.5
8.	Off time *	F1/7 right	10.0 *	00.0 – 25.5
9.	Begin time (by system clock)	F1/8 left	00 : 00 : (00)	00 : 00 to 23 : 59
10.	End time (by system clock)	F1/8 right	23 : 59 : (59)	00 : 00 to 23 : 59
11.	Active days of week (♯)	F1/9	127	000 - 127

* 1 unit of hold and off times is 0.1 sec, that the range of 0 - 255 is equal to times 0 – 25.5 sec.

Note: All values and numbers in Table 1 are show as they are displays on DMX Controller – 2 or 3 digits without suppress of leading zeroes.

1. Position identification number

Number in limits 0 – 255, used as unique name of position. This range here is limited by volume of used non volatile memory to store all positions.

2. Group (assigned to position)

Group is community of members, distributed in different light devices with common, uniform and

simultaneously controlled intensity. DMX Controller PROG1 supports up to 255 groups. Actually number of controlled groups may be any in range 0-255. Every member may belong to any group without limitation.

3. Program types

This notion is invoked from this, that very different programs used equally or similar parameters by different manners. Independently of type, each program is responsible only for one own execution, after this program is accept as finished. Here existing types of play programs are:


- **Type 0:** All members unconditionally are turned-off;
- **Type 1:** - Light with **constant intensity**, equal to '**begin intensity**' for time '**hold time**'.
 - Control members of active group.
 - Before luminous members retain their intensities.
- **Type 2:** - Same as type 1.
 - Control members of active group;
 - Turn-off all before luminous members.
- **Type 3:** - Light with **constant intensity**, equal to **begin intensity** for 'hold time' and are **dark** (turned-off) for 'off time'.
 - Control members of active group;
 - Before luminous members retain their intensities.
- **Type 4:** - Same as type 3.
 - Control members of active group.
 - Turn-off all before luminous members.
- **Type 5:** - **Light alternative with two constant intensities** (as meander with different levels)
 - First intensity is equal to **begin intensity** for 'hold' time and second intensity is equal to **end intensity** for 'off' time.
 - Control members of active group;
 - Before luminous members retain their intensities.
- **Type 6:** - Same as type 5.
 - Control members of active group.
 - Turn-off all before luminous members.
- **Type 7:** - Light process contains **two phases**. (as saw)
 - In phase 1** all members of active group light with **smoothly changed intensity** from begin intensity to end intensity. **In phase 2** all members of active group are dark (turn-off) for 'off time'.
 - Control members of active group;
 - Before luminous members retain their intensities.
- **Type 8:** - Same as type 7.
 - Control members of active group;
 - Turn-off all before luminous members.
- **Type 9:** - light process contains **two phases**. (as sequentially orderly triangles)
 - In phase 1** all members of active group light with **smoothly changed intensity** from begin intensity to end intensity for hold time.
 - In phase 2** all members of active group light with **smoothly changed intensity** from end intensity to begin intensity for 'off-time'.
 - Control members of active group;
 - Before luminous members retain their intensities.
- **Type 10:** - Same as type 9
 - Control members of active group;
 - Turn-off all before luminous members.


10. Active days of week

Active days of week are these, though whose concrete play position is enabled to execution and by default through other days of week same play position is disabled for execution. The process of setting active days of week uses special, but very simple coding scheme, dictated by this, that user may have a desire for playing a position of already composed play list in non-consecutive days of week, for example only at Monday, Tuesday and Friday. In accordance with implemented here coding scheme each day of week has own weight and multiplier, shown in Table 2. Each day of week has multiplier as follows:

0 - if day of week is **inactive**; **1** - if day of week is **active**


Table 2

Day of week	Saturday	Friday	Thursday	Wednesday	Tuesday	Monday	Sunday
Weight	64	32	16	8	4	2	1
multiplier	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
							


In row  must be written **number**, equal to the **sum** of (**weight * multiplier**) for each day. This number normally is in the range 0 – 127 if **no** calculation errors.

Example: (as above) active day of week for selected position of play list must be Monday, Tuesday and Friday. For these days multiplier is '1', for all other days multiplier is '0' (Table 3).

Table 3

Day of week	Saturday	Friday	Thursday	Wednesday	Tuesday	Monday	Sunday
Weight	64	32	16	8	4	2	1
multiplier	0	1	0	0	1	1	0
 38							

Calculation: $(64 \cdot 0) + (32 \cdot 1) + (16 \cdot 0) + (8 \cdot 0) + (4 \cdot 1) + (2 \cdot 1) + (1 \cdot 0) = 38$

This value must be written in row .

More complete notation for components of play list may be obtained by **examples** from **Table 2**, **Table 3**, **Table 4** and **Table 5** together with graphical presentation of its collaborations in working process.

Attention:

Here it is strongly recommended that user must perform a compose of tables from **Table 3** to **Table 6** in its **full sizes**, carefully fill all rows and columns and preserve these tables for later use. The tables act as maintenance documentation of this illumination system.

Positions

Table 4 (example)

Position	Group	Program type	Repeat times	Begin intensity			End intensity			Hold time (s)	Off time (s)	Begin time	End time	Days of week
				R	G	B	R	G	B					
000	054	001	025	100	120	150	200	180	220	10.0	01.3	12 : 34	16 : 30	127
001	023	002	030	020	030	040	080	090	100	20.0	00.3	13 : 15	14 : 30	032
002	033	004	040	200	100	150	050	060	070	05.0	00.5	19 : 30	20 : 30	040
...
025	011	002	010	030	050	040	100	120	150	01.0	01.0	19 : 30	20 : 30	001
...
036	007	001	022	255	200	190	200	100	100	02.0	00.2	13 : 15	18 : 16	065
...
255	003	003	011	120	140	130	255	200	230	02.2	01.1	18 : 25	22 : 00	033

Table 5 (example)

Group	MEMBERS															
	001	002	003	004	005	006	102	253	254	255
000	♦		♦	♦			♦					♦	♦	♦		
001							♦							♦	♦	
002						♦	♦						♦			
003						♦		♦	♦	♦						
...
...
254						♦	♦					♦		♦		
255	♦	♦	♦													

Legend ♦ - member is attached to group
 blank - member is disconnected from group

Note: Any member may be independently attached to any group in unlimited combinations.

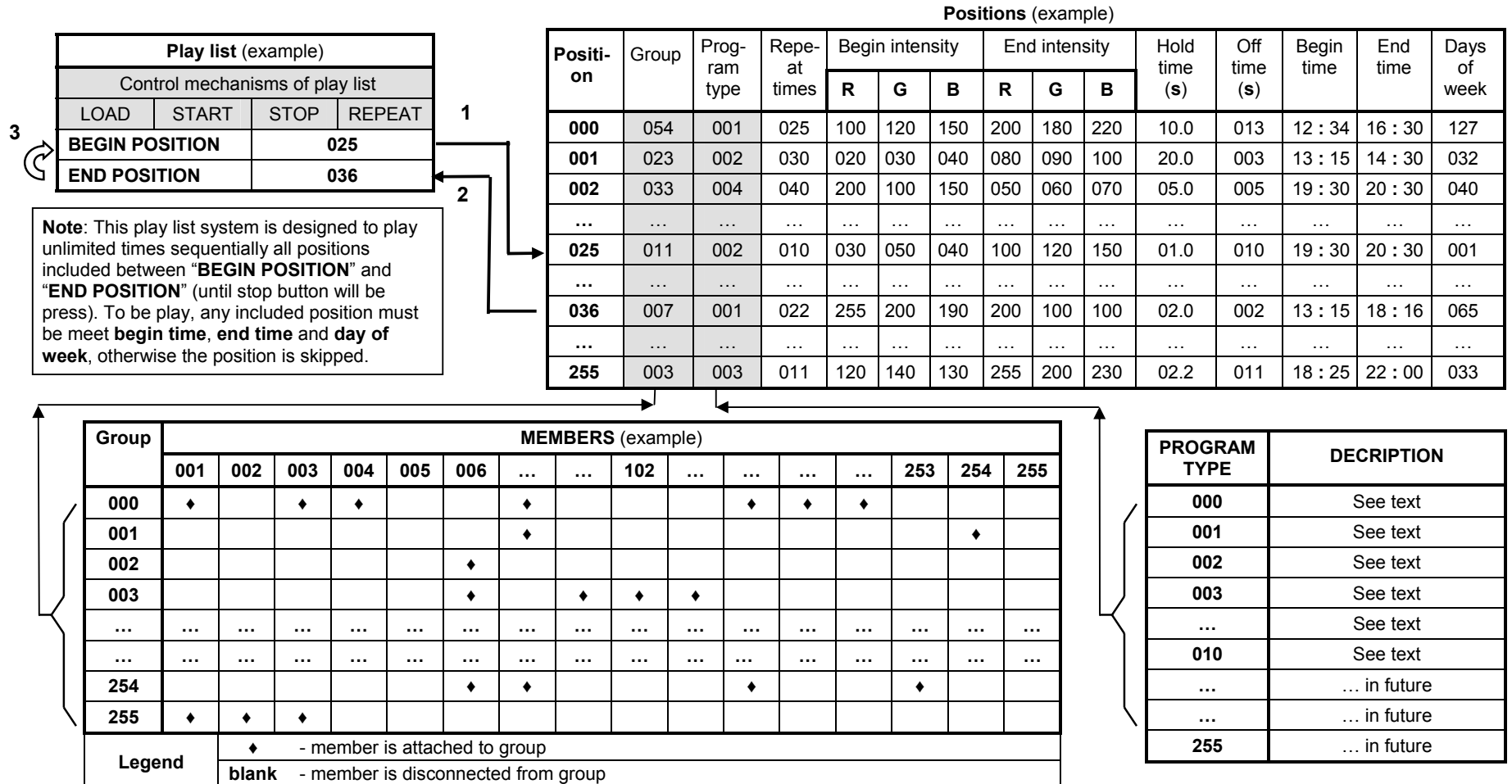
Table 6 (example)

Play list			
Control mechanisms			
LOAD	START	STOP	REPEAT
BEGIN POSITION		025	
END POSITION		032	

Table 7

PROGRAM TYPE	DESCRIPTION
000	See text
001	See text
002	See text
003	See text
...	See text
010	See text
...	... in future
...	... in future
255	... in future

The play list items collaboration



NORMAL MODE 2

Normal mode 2 is supported by function from series **F2**, as follow:

Composing of new group by function F2/1.

Edit existing group by function F2/2.

Use existing group as template for another groups by function F2/3.

The **Function F2/1** create new group and beforehand by default automatically remove all members from this group (i.e. create an empty group). By **RGB up/down** arrows is done a composing of the number of desired current member. By **right arrow** this member may be **add** to group (display show 'yes') and by **left arrow** same member may be **remove** from group (display show 'no'). This process is displayed in real time from community of members, placed within object and connected to DMX controller by network. Note that members to be light, must be powered. When member is not included (new group) or removed, he is dark, when is included or added, he light by lowered intensity. This is very comfort at creating new group process in real environment / object.

At end of process of ad / remove members must be press button "**ALL**". He 'say' of system that **ALL** necessary members are included in group or removed from her and act as initiator of write process to external EEROM.

The **Function F2/2** is designed for **edit** already existing group. This function is very similar to function F2/1, but no remove (clear) any member from selected group. All manipulations and display process are same as at function F2/1. At end of this process of editing by ad / remove members also must be press button "**ALL**".

The **Function F2/3** is designed only for insurance **short time** and **less trouble** to create a **new group** (if need), similar of appropriate degree of already existing group, used as suitable template. This function require assigning numbers of source and destination groups and perform easy copying of all members from source group to destination group. Lather-on destination group may be edited by function F2/2. To complete this process must be pres button "ENTER"

Note: In all processes of composing, editing or coping groups, it is desirable to take in mind a **color schemes**, that directly definite relations between work of DMX controller and colors of light members.

COLOR SCHEMES

DMX Controller PROG1 is designed to control up to **255 members** with separate **red, green** and **blue** colors. The intensity of each color by DMX controller have 256 grades - from 0 to 255. Intensity with grade 0 is equal to dark (turn-off) member and intensity with grade 255 is equal to light at full bright. By one light device containing only one red, only one green and only one blue member in very close space, by combining of intensities of these members, in accordance to laws of colorimetric science may be obtaining up to **16,777,216 different colors** (256 **red** grades x 256 **green** grades x 256 **blue** grades).

In working process the DMX controller continuously and very speedily change intensity grade of each member. Easy calculations sown that is possible by use of DMX Controller PROG1 and connected to him **255 members with no identical numbers** that may be obtain up to **4,278,190,080** different **space-color combinations** (16,777,216 colors multiplied by 255 members). If are used more than 255 members, some from it with repeated numbers, a possible combinations are vastly more. This is very big number of variants and for comfort (but not obligatory) here are used the color schemes. DMX Controller PROG1 is designed to use of 3 color schemes – one main and two rotated. All color schemes used **base addresses**.

Main color scheme is dedicated for standard use (**Table 4**). In accordance with scheme, base address of light device is address of "**red**" member. Rotated color schemes are dedicated for use from skilful artist-designers of light effects. Thing more, may be use any combination between standard and rotated schemes, for example one part of all light devices use the standard color scheme, second part use the first rotated scheme and third part use the second rotated scheme.

Rotated color scheme 1 is obtained from main color scheme when as base address of light device is assign address of "**green**" member (**Table 5**). This sign that **RED up/down** arrows of DMX controller will be

controlled **BLUE** members, **GREEN up/down** arrows of DMX controller will be controlled **RED** members and **BLUE up/down** arrows of DMX controller will be controlled **GREEN** members.

Rotated color scheme 2 is obtained from main color scheme when as base address light device is assign address of “blue” member (**Table 6**). This sign that **RED up/down** arrows of DMX controller will be controlled **GREEN** members, **GREEN up/down** arrows of DMX controller will be controlled **RED** members and **BLUE up/down** arrows of DMX controller will be controlled **GREEN** members.

MAIN (STANDARD) COLOR SCHEME

Table 6

BASE ADDRESS	Member addresses		
	RED	GREEN	BLUE
1	1 (R)	2 (G)	3 (B)
4	4 (R)	5 (G)	6 (B)
7	7 (R)	8 (G)	9 (B)
10	10 (R)	11 (G)	12 (B)
13	13 (R)	14 (G)	15 (B)
16	16 (R)	17 (G)	18 (B)
19	19 (R)	20 (G)	21 (B)
22	22 (R)	23 (G)	24 (B)
25	25 (R)	26 (G)	27 (B)
28	28 (R)	29 (G)	30 (B)
31	31 (R)	32 (G)	33 (B)
34	34 (R)	35 (G)	36 (B)
37	37 (R)	38 (G)	39 (B)
40	40 (R)	41 (G)	42 (B)
43	43 (R)	44 (G)	45 (B)
46	46 (R)	47 (G)	48 (B)
49	49 (R)	50 (G)	51 (B)
52	52 (R)	53 (G)	54 (B)
55	55 (R)	56 (G)	57 (B)
58	58 (R)	59 (G)	60 (B)
61	61 (R)	62 (G)	62 (B)
64	64 (R)	65 (G)	66 (B)
67	67 (R)	68 (G)	69 (B)
70	70 (R)	71 (G)	72 (B)
73	73 (R)	74 (G)	75 (B)
76	76 (R)	77 (G)	78 (B)
79	79 (R)	80 (G)	81 (B)
82	82 (R)	83 (G)	84 (B)
85	85 (R)	86 (G)	87 (B)
88	88 (R)	89 (G)	90 (B)
91	91 (R)	92 (G)	93 (B)
94	94 (R)	95 (G)	96 (B)
97	97 (R)	98 (G)	99 (B)
100	100 (R)	101 (G)	102 (B)
103	103 (R)	104 (G)	105 (B)
106	106 (R)	107 (G)	108 (B)
109	109 (R)	110 (G)	111 (B)
112	112 (R)	113 (G)	114 (B)

BASE ADDRESS	Member addresses		
	RED	GREEN	BLUE
130	130 (R)	131 (G)	132 (B)
133	133 (R)	134 (G)	135 (B)
136	136 (R)	137 (G)	138 (B)
139	139 (R)	140 (G)	141 (B)
142	142 (R)	143 (G)	144 (B)
145	145 (R)	146 (G)	147 (B)
148	148 (R)	149 (G)	150 (B)
151	151 (R)	152 (G)	153 (B)
154	154 (R)	155 (G)	156 (B)
157	157 (R)	158 (G)	159 (B)
160	160 (R)	161 (G)	162 (B)
163	163 (R)	164 (G)	165 (B)
166	166 (R)	167 (G)	168 (B)
169	169 (R)	170 (G)	171 (B)
172	172 (R)	173 (G)	174 (B)
175	175 (R)	176 (G)	177 (B)
178	178 (R)	179 (G)	180 (B)
181	181 (R)	182 (G)	183 (B)
184	184 (R)	185 (G)	186 (B)
187	187 (R)	188 (G)	189 (B)
190	190 (R)	191 (G)	192 (B)
193	193 (R)	194 (G)	195 (B)
196	196 (R)	197 (G)	198 (B)
199	199 (R)	200 (G)	201 (B)
202	202 (R)	203 (G)	204 (B)
205	205 (R)	206 (G)	207 (B)
208	208 (R)	209 (G)	210 (B)
211	211 (R)	212 (G)	213 (B)
214	214 (R)	215 (G)	216 (B)
217	217 (R)	218 (G)	219 (B)
220	220 (R)	221 (G)	222 (B)
223	223 (R)	224 (G)	225 (B)
226	226 (R)	227 (G)	228 (B)
229	229 (R)	230 (G)	231 (B)
232	232 (R)	233 (G)	234 (B)
235	235 (R)	236 (G)	237 (B)
238	238 (R)	239 (G)	240 (B)
241	241 (R)	242 (G)	243 (B)

115	115 (R)	116 (G)	117 (B)
118	118 (R)	119 (G)	120 (B)
121	121 (R)	122 (G)	123 (B)
124	124 (R)	125 (G)	126 (B)
127	127 (R)	128 (G)	129 (B)

244	244 (R)	245 (G)	246 (B)
247	247 (R)	248 (G)	249 (B)
250	250 (R)	251 (G)	252 (B)
253	253 (R)	254 (G)	255 (B)

FIRST ROTATED COLOR SCHEME

Table 7

BASE ADDRESS	Member addresses		
	RED	GREEN	BLUE
2	255 (B)	1 (R)	2 (G)
5	3 (B)	4 (R)	5 (G)
8	6 (B)	7 (R)	8 (G)
11	9 (B)	10 (R)	11 (G)
14	12 (B)	13 (R)	14 (G)
17	15 (B)	16 (R)	17 (G)
20	18 (B)	19 (R)	20 (G)
23	21 (B)	22 (R)	23 (G)
26	24 (B)	25 (R)	26 (G)
29	27 (B)	28 (R)	29 (G)
32	30 (B)	31 (R)	32 (G)
35	33 (B)	34 (R)	35 (G)
38	36 (B)	37 (R)	38 (G)
41	39 (B)	40 (R)	41 (G)
44	42 (B)	43 (R)	44 (G)
47	45 (B)	46 (R)	47 (G)
50	48 (B)	49 (R)	50 (G)
53	51 (B)	52 (R)	53 (G)
56	54 (B)	55 (R)	56 (G)
59	57 (B)	58 (R)	59 (G)
62	60 (B)	61 (R)	62 (G)
65	62 (B)	64 (R)	65 (G)
68	66 (B)	67 (R)	68 (G)
71	69 (B)	70 (R)	71 (G)
74	72 (B)	73 (R)	74 (G)
77	75 (B)	76 (R)	77 (G)
80	78 (B)	79 (R)	80 (G)
83	81 (B)	82 (R)	83 (G)
86	84 (B)	85 (R)	86 (G)
89	87 (B)	88 (R)	89 (G)
92	90 (B)	91 (R)	92 (G)
95	93 (B)	94 (R)	95 (G)
98	96 (B)	97 (R)	98 (G)
101	99 (B)	100 (R)	101 (G)
104	102 (B)	103 (R)	104 (G)
107	105 (B)	106 (R)	107 (G)
110	108 (B)	109 (R)	110 (G)
113	111 (B)	112 (R)	113 (G)
116	114 (B)	115 (R)	116 (G)

BASE ADDRESS	Member addresses		
	RED	GREEN	BLUE
131	129 (B)	130 (R)	131 (G)
134	132 (B)	133 (R)	134 (G)
137	135 (B)	136 (R)	137 (G)
140	138 (B)	139 (R)	140 (G)
143	141 (B)	142 (R)	143 (G)
146	144 (B)	145 (R)	146 (G)
149	147 (B)	148 (R)	149 (G)
152	150 (B)	151 (R)	152 (G)
155	153 (B)	154 (R)	155 (G)
158	156 (B)	157 (R)	158 (G)
161	159 (B)	160 (R)	161 (G)
164	162 (B)	163 (R)	164 (G)
167	165 (B)	166 (R)	167 (G)
170	168 (B)	169 (R)	170 (G)
173	171 (B)	172 (R)	173 (G)
176	174 (B)	175 (R)	176 (G)
179	177 (B)	178 (R)	179 (G)
182	180 (B)	181 (R)	182 (G)
185	183 (B)	184 (R)	185 (G)
188	186 (B)	187 (R)	188 (G)
191	189 (B)	190 (R)	191 (G)
194	192 (B)	193 (R)	194 (G)
197	195 (B)	196 (R)	197 (G)
200	198 (B)	199 (R)	200 (G)
203	201 (B)	202 (R)	203 (G)
206	204 (B)	205 (R)	206 (G)
209	207 (B)	208 (R)	209 (G)
212	210 (B)	211 (R)	212 (G)
215	213 (B)	214 (R)	215 (G)
218	216 (B)	217 (R)	218 (G)
221	219 (B)	220 (R)	221 (G)
224	222 (B)	223 (R)	224 (G)
227	225 (B)	226 (R)	227 (G)
230	228 (B)	229 (R)	230 (G)
233	231 (B)	232 (R)	233 (G)
236	234 (B)	235 (R)	236 (G)
239	237 (B)	238 (R)	239 (G)
242	240 (B)	241 (R)	242 (G)
245	243 (B)	244 (R)	245 (G)

119	117 (B)	118 (R)	119 (G)
122	120 (B)	121 (R)	122 (G)
125	123 (B)	124 (R)	125 (G)
128	126 (B)	127 (R)	128 (G)

248	246 (B)	247 (R)	248 (G)
251	249 (B)	250 (R)	251 (G)
254	252 (B)	253 (R)	254 (G)

SECOND ROTATED COLOR SCHEME

Table 8

BASE ADDRESS	Member addresses		
	RED	GREEN	BLUE
	-	-	1 (R)
3	2 (G)	3 (B)	4 (R)
6	5 (G)	6 (B)	7 (R)
9	8 (G)	9 (B)	10 (R)
12	11 (G)	12 (B)	13 (R)
15	14 (G)	15 (B)	16 (R)
18	17 (G)	18 (B)	19 (R)
21	20 (G)	21 (B)	22 (R)
24	23 (G)	24 (B)	25 (R)
27	26 (G)	27 (B)	28 (R)
30	29 (G)	30 (B)	31 (R)
33	32 (G)	33 (B)	34 (R)
36	35 (G)	36 (B)	37 (R)
39	38 (G)	39 (B)	40 (R)
42	41 (G)	42 (B)	43 (R)
45	44 (G)	45 (B)	46 (R)
48	47 (G)	48 (B)	49 (R)
51	50 (G)	51 (B)	52 (R)
54	53 (G)	54 (B)	55 (R)
57	56 (G)	57 (B)	58 (R)
60	59 (G)	60 (B)	61 (R)
62	62 (G)	62 (B)	64 (R)
66	65 (G)	66 (B)	67 (R)
69	68 (G)	69 (B)	70 (R)
72	71 (G)	72 (B)	73 (R)
75	74 (G)	75 (B)	76 (R)
78	77 (G)	78 (B)	79 (R)
81	80 (G)	81 (B)	82 (R)
84	83 (G)	84 (B)	85 (R)
87	86 (G)	87 (B)	88 (R)
90	89 (G)	90 (B)	91 (R)
93	92 (G)	93 (B)	94 (R)
96	95 (G)	96 (B)	97 (R)
99	98 (G)	99 (B)	100 (R)
102	101 (G)	102 (B)	103 (R)
105	104 (G)	105 (B)	106 (R)
108	107 (G)	108 (B)	109 (R)
111	110 (G)	111 (B)	112 (R)
114	113 (G)	114 (B)	115 (R)
117	116 (G)	117 (B)	118 (R)

BASE ADDRESS	Member addresses		
	RED	GREEN	BLUE
129	131 (G)	129 (B)	130 (R)
132	134 (G)	132 (B)	133 (R)
135	137 (G)	135 (B)	136 (R)
138	140 (G)	138 (B)	139 (R)
141	143 (G)	141 (B)	142 (R)
144	146 (G)	144 (B)	145 (R)
147	149 (G)	147 (B)	148 (R)
150	152 (G)	150 (B)	151 (R)
153	155 (G)	153 (B)	154 (R)
156	158 (G)	156 (B)	157 (R)
159	161 (G)	159 (B)	160 (R)
162	164 (G)	162 (B)	163 (R)
165	167 (G)	165 (B)	166 (R)
168	170 (G)	168 (B)	169 (R)
171	173 (G)	171 (B)	172 (R)
174	176 (G)	174 (B)	175 (R)
177	179 (G)	177 (B)	178 (R)
180	182 (G)	180 (B)	181 (R)
183	185 (G)	183 (B)	184 (R)
186	188 (G)	186 (B)	187 (R)
189	191 (G)	189 (B)	190 (R)
192	194 (G)	192 (B)	193 (R)
195	197 (G)	195 (B)	196 (R)
198	200 (G)	198 (B)	199 (R)
201	203 (G)	201 (B)	202 (R)
204	206 (G)	204 (B)	205 (R)
207	209 (G)	207 (B)	208 (R)
210	212 (G)	210 (B)	211 (R)
213	215 (G)	213 (B)	214 (R)
216	218 (G)	216 (B)	217 (R)
219	221 (G)	219 (B)	220 (R)
222	224 (G)	222 (B)	223 (R)
225	227 (G)	225 (B)	226 (R)
228	230 (G)	228 (B)	229 (R)
231	233 (G)	231 (B)	232 (R)
234	236 (G)	234 (B)	235 (R)
237	239 (G)	237 (B)	238 (R)
240	242 (G)	240 (B)	241 (R)
243	245 (G)	243 (B)	244 (R)
246	248 (G)	246 (B)	247 (R)

120	119 (G)	120 (B)	121 (R)
123	122 (G)	123 (B)	124 (R)
126	125 (G)	126 (B)	127 (R)

249	251 (G)	249 (B)	250 (R)
252	254 (G)	252 (B)	253 (R)

SERVICE MODE 1

Service mode 1 is supported by functions from series **F3**, as follow:

- Read number of light device by function F3/1.**
- Write new number of light device by function F3/2.**
- Test light device by function F3/3.**

Each light device has a "BASE ADDRESS", here shortly named '**number**' and shared out to included members. Use of this mode obligatory requires unplug male device connector from distributive board and plug this same connector in female connector "J5" on DMX controller. In this mode may be performed next tasks:

Read light device number by function **F3/1**. By select of function F3/1 and press button 'ENTER' DMX controller begin communication process with only one light device (obligatory plugged in J5) to read it own identification number. When this process end successfully DMX controller display 3 decimal digits, presented number of device. When this process end unsuccessfully DMX controller display 3 chars 'minus' (---). No other actions from user are necessary.

Write new light device number by functions **F3/2**. This function is dedicated to set new or change old identification number of device. By select function F3/1 and press button 'ENTER' user get prompt to compose desired device number by RGB up/down pointers. When number is ready, new pressing of button "ENTER" invoke process to write this number to device. When this process end successfully DMX controller display chars '**OK**'. When this process end unsuccessfully DMX controller display 3 chars 'minus' (---). No other actions from user are necessary.

Test light device by function **F3/3**. This function is dedicated to functionality test of separate device. This is versatile in field or similar conditions. To perform a test first is necessary set on DMX controller identification number of device by RGB up/down pointers and then pressing of "ENTER". From this moment that way by RGB up/down pointers may be control colors and their intensities for display from device.

SERVICE MODE 2

Service mode 2 is supported by functions from series **F4**, as follow:

- Show current time by function F4/1.**
- Show current date by function F4/2.**
- Show current day of week by function F4/3.**
- Set new time by function F4/4.**
- Set new date by function F4/5.**
- Set new day of week by function F4/6.**

Main component of **service mode 2** is "**CLOCK/CALENDAR**". Term "**CLOCK/CALENDAR**" denotes dedicated hardware, assigned to ensure to DMX Controller PROG1 every moment actual information for current time, date and day of week. This information is strongly necessary for correct work of all system. Used here hardware ensures automatically correction of February-days for leap year. In case of un-powered DMX controller, clock/calendar hardware use power from built-in battery. When this battery is removed or failure and then inserted back or replace with new, displayed time, date and day of week are unpredictable.

In **service mode 2** may be performed next tasks:

Show current time by function **F4/1**. By selecting of this function current system time is displayed with delay to begin new second. Display format is 24 hour, **HH : MM : SS** , respective to hours, minutes and

seconds. Display is refreshed automatically every second. No other user actions are necessary.

Show current date by functions **F4/2**. By selecting of this function current system date is displayed with delay to begin new second. Display format is **DD : MM : YYYY** , respective to day, month and all digits of year. Display is refreshed automatically every second. No other user actions are necessary.

Show current day of week by function **F4/3**. By selecting of this function current system day of week is displayed with delay to begin new second. Display format is first three letters of day name (**Sun ... Sat**). Display is refreshed automatically every second. No other user actions are necessary.

Set new time by function **F4/4**. By selecting of this function is made setting or correction of system time. After pressing button "ENTER" will be displayed sample of current system time. This is made only for short and comfort process of correction. Composing of new time is by RGB up/down arrows, as follow:

- **RED** up/down arrows composed hours in limits 00 – 23;
- **GREEN** up/down arrows composed minutes in limits 00 – 59;
- **BLUE** up/down arrows composed seconds in limits 00 – 59;

New time is accepted from DMX controller after pressing of button "ENTER" and stays system time.

Set new date by function **F4/5**. By selecting of this function is made setting or correction of system date. After pressing button "ENTER" will be displayed sample of current system date. This is made only for short and comfort process of correction. Composing of new date is by RGB up/down arrows, as follow:

- **RED** up/down arrows composed days in limits 01 – 31;
- **GREEN** up/down arrows composed months in limits 01 – 12;
- **BLUE** up/down arrows composed years in limits 2000 – 2099;

New date is accepted from DMX controller after pressing of button "ENTER" and stays system date.

Set new day of week by function **F4/6**. By selecting of this function is made setting or correction of system day of week. After pressing button "ENTER" will be displayed sample of current system day of week. This is made only for short and comfort process of correction. Composing of new date is by Green up/down arrows.

- **GREEN** up/down arrows composed months in of day name limits **Sun ... Sat**;

- **RED** up/down arrows are not used;
- **BLUE** up/down arrows are not used;

New date is accepted from DMX controller after pressing of button "ENTER" and stays system date.

If you have any questions or find some errors or misunderstandings in present documentation, do not hesitate to contact us on the next E-mails: hsd@ledspotline.com or support@ledspotline.com and we try to answer you as soon as possible.



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