



Chroma-Q Broadway User Manual

Version 1.0 April 1999

Table of DMX Binary Address Settings 385-512

DMX ADDRESS	BINARY SWITCH SETTING										DMX ADDRESS	BINARY SWITCH SETTING									
	1	2	4	8	16	32	64	128	256		1	2	4	8	16	32	64	128	256		
385	ON							ON	ON	449	ON						ON	ON	ON		
386		ON						ON	ON	450		ON					ON	ON	ON		
387	ON	ON						ON	ON	451	ON	ON					ON	ON	ON		
388			ON					ON	ON	452			ON				ON	ON	ON		
389	ON		ON					ON	ON	453	ON		ON				ON	ON	ON		
390		ON	ON					ON	ON	454		ON	ON				ON	ON	ON		
391	ON	ON	ON					ON	ON	455	ON	ON	ON				ON	ON	ON		
392				ON				ON	ON	456				ON			ON	ON	ON		
393	ON			ON				ON	ON	457	ON			ON			ON	ON	ON		
394		ON		ON				ON	ON	458		ON		ON			ON	ON	ON		
395	ON	ON		ON				ON	ON	459	ON	ON		ON			ON	ON	ON		
396			ON	ON				ON	ON	460			ON	ON			ON	ON	ON		
397	ON		ON	ON				ON	ON	461	ON		ON	ON			ON	ON	ON		
398		ON	ON	ON				ON	ON	462		ON	ON	ON			ON	ON	ON		
399	ON	ON	ON	ON				ON	ON	463	ON	ON	ON	ON			ON	ON	ON		
400					ON			ON	ON	464					ON		ON	ON	ON		
401	ON				ON			ON	ON	465	ON				ON		ON	ON	ON		
402		ON			ON			ON	ON	466		ON			ON		ON	ON	ON		
403	ON	ON			ON			ON	ON	467	ON	ON			ON		ON	ON	ON		
404			ON		ON			ON	ON	468			ON		ON		ON	ON	ON		
405	ON		ON		ON			ON	ON	469	ON		ON		ON		ON	ON	ON		
406		ON	ON		ON			ON	ON	470		ON	ON		ON		ON	ON	ON		
407	ON	ON	ON		ON			ON	ON	471	ON	ON	ON		ON		ON	ON	ON		
408				ON	ON			ON	ON	472				ON	ON		ON	ON	ON		
409	ON				ON	ON		ON	ON	473	ON				ON	ON	ON	ON	ON		
410		ON		ON	ON			ON	ON	474		ON		ON	ON		ON	ON	ON		
411	ON	ON		ON	ON			ON	ON	475	ON	ON		ON	ON		ON	ON	ON		
412			ON	ON	ON			ON	ON	476			ON	ON	ON		ON	ON	ON		
413	ON		ON	ON	ON			ON	ON	477	ON			ON	ON		ON	ON	ON		
414		ON	ON	ON	ON			ON	ON	478		ON	ON	ON	ON		ON	ON	ON		
415	ON	ON	ON	ON	ON			ON	ON	479	ON	ON	ON	ON	ON		ON	ON	ON		
416						ON		ON	ON	480						ON	ON	ON	ON		
417	ON					ON		ON	ON	481	ON					ON	ON	ON	ON		
418		ON				ON		ON	ON	482		ON				ON	ON	ON	ON		
419	ON	ON				ON		ON	ON	483	ON	ON				ON	ON	ON	ON		
420			ON			ON		ON	ON	484			ON			ON	ON	ON	ON		
421	ON		ON			ON		ON	ON	485	ON		ON			ON	ON	ON	ON		
422		ON	ON			ON		ON	ON	486		ON	ON			ON	ON	ON	ON		
423	ON	ON	ON			ON		ON	ON	487	ON	ON	ON			ON	ON	ON	ON		
424				ON		ON		ON	ON	488				ON		ON	ON	ON	ON		
425	ON			ON		ON		ON	ON	489	ON					ON	ON	ON	ON		
426		ON		ON		ON		ON	ON	490		ON		ON		ON	ON	ON	ON		
427	ON	ON		ON		ON		ON	ON	491	ON	ON		ON		ON	ON	ON	ON		
428			ON	ON		ON		ON	ON	492			ON	ON		ON	ON	ON	ON		
429	ON		ON	ON		ON		ON	ON	493	ON		ON	ON		ON	ON	ON	ON		
430		ON	ON	ON		ON		ON	ON	494		ON	ON	ON		ON	ON	ON	ON		
431	ON	ON	ON	ON		ON		ON	ON	495	ON	ON	ON	ON		ON	ON	ON	ON		
432					ON			ON	ON	496					ON		ON	ON	ON		
433	ON				ON	ON		ON	ON	497	ON				ON		ON	ON	ON		
434		ON			ON	ON		ON	ON	498		ON			ON	ON	ON	ON	ON		
435	ON	ON			ON	ON		ON	ON	499	ON	ON			ON		ON	ON	ON		
436			ON		ON	ON		ON	ON	500			ON		ON	ON	ON	ON	ON		
437	ON		ON		ON	ON		ON	ON	501	ON		ON		ON	ON	ON	ON	ON		
438		ON	ON		ON	ON		ON	ON	502		ON	ON		ON	ON	ON	ON	ON		
439	ON	ON	ON		ON	ON		ON	ON	503	ON	ON	ON		ON	ON	ON	ON	ON		
440				ON	ON	ON		ON	ON	504				ON	ON	ON	ON	ON	ON		
441	ON				ON	ON		ON	ON	505	ON				ON	ON	ON	ON	ON		
442		ON			ON	ON		ON	ON	506		ON			ON	ON	ON	ON	ON		
443	ON	ON			ON	ON		ON	ON	507	ON	ON			ON	ON	ON	ON	ON		
444			ON	ON	ON	ON			ON	508			ON		ON	ON	ON	ON	ON		
445	ON				ON	ON		ON	ON	509	ON			ON	ON	ON	ON	ON	ON		
446		ON	ON	ON	ON	ON			ON	510		ON	ON	ON	ON	ON	ON	ON	ON		
447	ON		ON	ON	ON	ON			ON	511	ON	ON	ON	ON	ON	ON	ON	ON	ON		
448							ON	ON	ON	512											

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 E-mail: sales@aclighting.co.uk

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Table of DMX Binary Address Settings 257-384

DMX ADDRESS	BINARY SWITCH SETTING									DMX ADDRESS	BINARY SWITCH SETTING								
	1	2	4	8	16	32	64	128	256		1	2	4	8	16	32	64	128	256
257	ON								ON	321	ON						ON		ON
258		ON							ON	322		ON					ON		ON
259	ON	ON							ON	323	ON	ON					ON		ON
260			ON						ON	324			ON				ON		ON
261	ON		ON						ON	325	ON		ON				ON		ON
262		ON	ON						ON	326		ON	ON				ON		ON
263	ON	ON	ON						ON	327	ON	ON	ON				ON		ON
264				ON					ON	328				ON			ON		ON
265	ON			ON					ON	329	ON			ON			ON		ON
266		ON		ON					ON	330		ON		ON			ON		ON
267	ON	ON		ON					ON	331	ON	ON		ON			ON		ON
268			ON	ON					ON	332			ON	ON			ON		ON
269	ON		ON	ON					ON	333	ON		ON	ON			ON		ON
270		ON	ON	ON					ON	334		ON	ON	ON			ON		ON
271	ON	ON	ON	ON					ON	335	ON	ON	ON	ON			ON		ON
272					ON				ON	336					ON		ON		ON
273	ON				ON				ON	337	ON				ON		ON		ON
274		ON			ON				ON	338		ON			ON		ON		ON
275	ON	ON			ON				ON	339	ON	ON			ON		ON		ON
276			ON		ON				ON	340			ON		ON		ON		ON
277	ON		ON		ON				ON	341	ON		ON		ON		ON		ON
278		ON	ON		ON				ON	342		ON	ON		ON		ON		ON
279	ON	ON	ON		ON				ON	343	ON	ON	ON		ON		ON		ON
280				ON	ON				ON	344				ON	ON		ON		ON
281	ON			ON	ON				ON	345	ON			ON	ON		ON		ON
282		ON		ON	ON				ON	346		ON		ON	ON		ON		ON
283	ON	ON		ON	ON				ON	347	ON	ON		ON	ON		ON		ON
284			ON	ON	ON				ON	348			ON	ON	ON		ON		ON
285	ON		ON	ON	ON				ON	349	ON		ON	ON	ON		ON		ON
286		ON	ON	ON	ON				ON	350		ON	ON	ON	ON		ON		ON
287	ON	ON	ON	ON	ON				ON	351	ON	ON	ON	ON	ON		ON		ON
288						ON			ON	352						ON	ON		ON
289	ON					ON			ON	353	ON					ON	ON		ON
290		ON				ON			ON	354		ON				ON	ON		ON
291	ON	ON				ON			ON	355	ON	ON				ON	ON		ON
292			ON			ON			ON	356			ON			ON	ON		ON
293	ON		ON			ON			ON	357	ON		ON			ON	ON		ON
294		ON	ON			ON			ON	358		ON	ON			ON	ON		ON
295	ON	ON	ON			ON			ON	359	ON	ON	ON			ON	ON		ON
296				ON		ON			ON	360				ON		ON	ON		ON
297	ON			ON		ON			ON	361	ON			ON		ON	ON		ON
298		ON		ON		ON			ON	362		ON		ON		ON	ON		ON
299	ON	ON		ON		ON			ON	363	ON	ON		ON		ON	ON		ON
300			ON	ON		ON			ON	364			ON	ON		ON	ON		ON
301	ON		ON	ON		ON			ON	365	ON		ON	ON		ON	ON		ON
302		ON	ON	ON		ON			ON	366		ON	ON	ON		ON	ON		ON
303	ON	ON	ON	ON		ON			ON	367	ON	ON	ON	ON		ON	ON		ON
304					ON	ON			ON	368					ON		ON		ON
305	ON				ON	ON			ON	369	ON				ON		ON		ON
306		ON			ON	ON			ON	370		ON			ON		ON		ON
307	ON	ON			ON	ON			ON	371	ON	ON			ON		ON		ON
308			ON		ON	ON			ON	372			ON		ON		ON		ON
309	ON		ON		ON	ON			ON	373	ON		ON		ON		ON		ON
310		ON	ON		ON	ON			ON	374		ON	ON		ON		ON		ON
311	ON	ON	ON		ON	ON			ON	375	ON	ON	ON		ON		ON		ON
312				ON	ON	ON			ON	376				ON		ON	ON		ON
313	ON			ON	ON	ON			ON	377	ON			ON		ON	ON		ON
314		ON		ON	ON	ON			ON	378		ON		ON		ON	ON		ON
315	ON	ON		ON	ON	ON			ON	379	ON	ON		ON		ON	ON		ON
316			ON	ON	ON	ON			ON	380			ON	ON		ON	ON		ON
317	ON		ON	ON	ON	ON			ON	381	ON		ON	ON		ON	ON		ON
318		ON	ON	ON	ON	ON			ON	382		ON	ON	ON		ON	ON		ON
319	ON	ON	ON	ON	ON	ON			ON	383	ON	ON	ON	ON		ON	ON		ON
320							ON		ON	384								ON	ON

Product Overview

The Chroma-Q Broadway is designed to be one of the most reliable colour changers available. The utilisation of digital circuitry and high technology composite materials, produces an affordable colour changer which is capable of scrolling gel strings of various lengths from 2 to 16 colours.

The Chroma-Q Broadway is designed to give years of trouble free use, providing that it is regularly adjusted and used in accordance with the instructions detailed in this manual. If you should experience any problems which fall outside of the scope of this manual, contact the selling dealer for further details. Like any electro-mechanical product the Chroma-Q Broadway is not designed to operate in wet or humid conditions.

If the selling dealer is unable to satisfy your servicing needs, contact A.C. Lighting directly for full factory service:

Outside USA:
A.C. Lighting Ltd
Unit 3, Spearmast Industrial Park
Lane End Road, Sands
High Wycombe, Bucks
HP12 4JG England
Tel: +44 (0)1494 446000
Fax: +44 (0)1494 461024

USA:
A.C. Lighting Inc
5308 Derry Avenue, Unit R
Agoura Hills, CA 91301
USA
Tel: 1 818 707 0884
Fax: 1 818 707 0512

Product Description

The Chroma-Q Broadway will read USITT DMX512 (1990) protocol, which enables individual addressing of each unit. This allows for easy grouping of multiple units. The units are individually addressed by setting the 10 pin binary dip switch, as displayed in the Rear Panel View on page 4 and the instructions on page 8 section g.

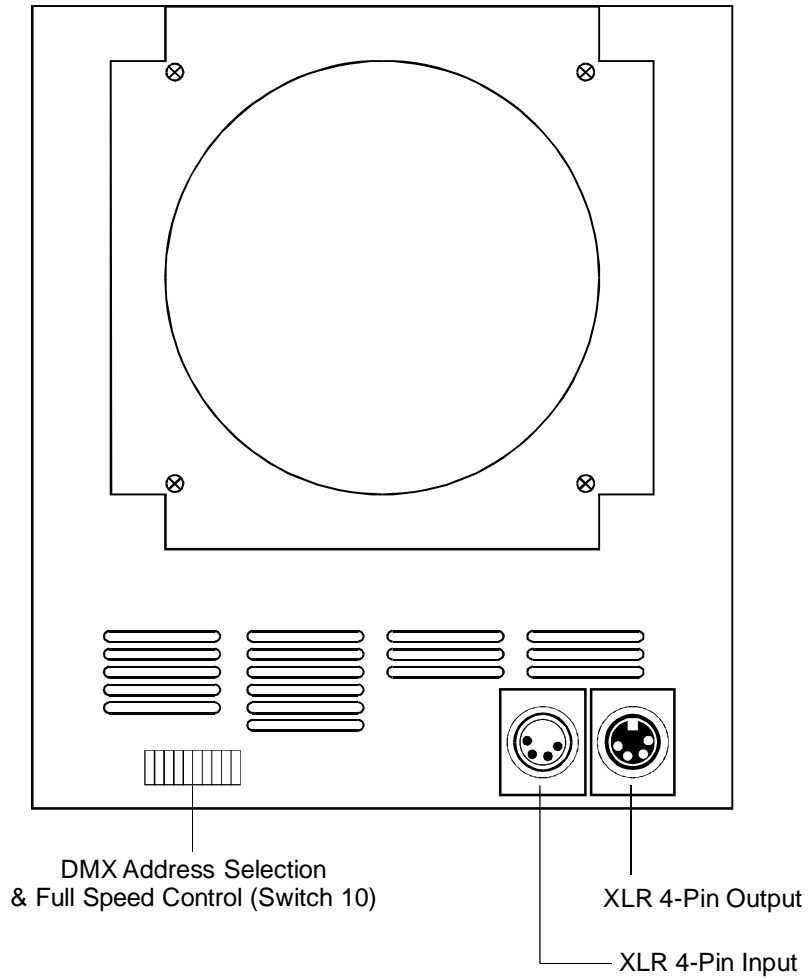
The Chroma-Q Broadway is supplied power and control signals by means of a XLR 4-pin input connector. The XLR 4-pin output may then be used to connect other units in turn to the same line. Each chain line must be terminated by patching the output from the last unit in the chain to its corresponding return connection on the PSU / Splitterbox, as shown in the System Diagram on page 7.

Note: The quantity of Chroma-Q Broadway colour changers and maximum cable length per distribution line is dependent upon the size of PSU / Splitterbox used and the collective amperage draw of the units connected (see page 7 for full details).

The Chroma-Q Broadway is equipped with 3 integral cooling fans. Each unit is also equipped with three diagnostic LED indicators (found on the underside of the unit); showing Power, DMX signal and DMX level (see section m - Troubleshooting on page 10 for full details).

The unit also has a safety feature, which will shut the motor off if the gel string should become jammed.

Rear Panel View



Note: A range of mounting plates are available to suit most fixtures (see Price List for current selection).

Table of DMX Binary Address Settings 129-256

DMX ADDRESS	BINARY SWITCH SETTING									DMX ADDRESS	BINARY SWITCH SETTING								
	1	2	4	8	16	32	64	128	256		1	2	4	8	16	32	64	128	256
129	ON							ON		193	ON						ON	ON	
130		ON						ON		194		ON					ON	ON	
131	ON	ON						ON		195	ON	ON					ON	ON	
132			ON					ON		196			ON				ON	ON	
133	ON		ON					ON		197	ON		ON				ON	ON	
134		ON	ON					ON		198		ON	ON				ON	ON	
135	ON	ON	ON					ON		199	ON	ON	ON				ON	ON	
136				ON				ON		200				ON			ON	ON	
137	ON			ON				ON		201	ON			ON			ON	ON	
138		ON		ON				ON		202		ON		ON			ON	ON	
139	ON	ON		ON				ON		203	ON	ON		ON			ON	ON	
140			ON	ON				ON		204			ON	ON			ON	ON	
141	ON		ON	ON				ON		205	ON		ON	ON			ON	ON	
142		ON	ON	ON				ON		206		ON	ON	ON			ON	ON	
143	ON	ON	ON	ON				ON		207	ON	ON	ON	ON			ON	ON	
144					ON			ON		208					ON		ON	ON	
145	ON				ON			ON		209	ON				ON		ON	ON	
146		ON			ON			ON		210		ON			ON		ON	ON	
147	ON	ON			ON			ON		211	ON	ON			ON		ON	ON	
148			ON		ON			ON		212			ON		ON		ON	ON	
149	ON		ON		ON			ON		213	ON		ON		ON		ON	ON	
150		ON	ON		ON			ON		214		ON	ON		ON		ON	ON	
151	ON	ON	ON		ON			ON		215	ON	ON	ON		ON		ON	ON	
152				ON	ON			ON		216				ON	ON		ON	ON	
153	ON			ON	ON	ON		ON		217	ON			ON	ON		ON	ON	
154		ON		ON	ON			ON		218		ON		ON	ON		ON	ON	
155	ON	ON		ON	ON	ON		ON		219	ON	ON		ON	ON		ON	ON	
156			ON	ON	ON			ON		220			ON	ON	ON		ON	ON	
157	ON		ON	ON	ON	ON		ON		221	ON		ON	ON	ON		ON	ON	
158		ON	ON	ON	ON			ON		222		ON	ON	ON	ON		ON	ON	
159	ON	ON	ON	ON	ON			ON		223	ON	ON	ON	ON	ON		ON	ON	
160						ON		ON		224						ON	ON	ON	
161	ON					ON		ON		225	ON					ON	ON	ON	
162		ON				ON		ON		226		ON				ON	ON	ON	
163	ON	ON				ON		ON		227	ON	ON				ON	ON	ON	
164			ON			ON		ON		228			ON			ON	ON	ON	
165	ON		ON			ON		ON		229	ON		ON			ON	ON	ON	
166		ON	ON			ON		ON		230		ON	ON			ON	ON	ON	
167	ON	ON	ON			ON		ON		231	ON	ON	ON			ON	ON	ON	
168				ON		ON		ON		232				ON		ON	ON	ON	
169	ON			ON	ON	ON		ON		233	ON			ON		ON	ON	ON	
170		ON		ON		ON		ON		234		ON		ON		ON	ON	ON	
171	ON	ON		ON	ON	ON		ON		235	ON	ON		ON		ON	ON	ON	
172			ON	ON		ON		ON		236			ON	ON		ON	ON	ON	
173	ON		ON	ON	ON	ON		ON		237	ON		ON	ON		ON	ON	ON	
174		ON	ON	ON		ON		ON		238		ON	ON	ON		ON	ON	ON	
175	ON	ON	ON	ON		ON		ON		239	ON	ON	ON	ON		ON	ON	ON	
176					ON	ON		ON		240					ON		ON	ON	
177	ON				ON	ON		ON		241	ON				ON		ON	ON	
178		ON			ON	ON		ON		242		ON			ON		ON	ON	
179	ON	ON			ON	ON		ON		243	ON	ON			ON		ON	ON	
180			ON		ON	ON		ON		244			ON		ON		ON	ON	
181	ON		ON		ON	ON		ON		245	ON		ON		ON		ON	ON	
182		ON	ON		ON	ON		ON		246		ON	ON		ON		ON	ON	
183	ON	ON	ON		ON	ON		ON		247	ON	ON	ON		ON		ON	ON	
184				ON	ON	ON		ON		248				ON	ON		ON	ON	
185	ON			ON	ON	ON		ON		249	ON			ON	ON		ON	ON	
186		ON		ON	ON	ON		ON		250		ON		ON	ON		ON	ON	
187	ON	ON		ON	ON	ON		ON		251	ON	ON		ON	ON		ON	ON	
188			ON	ON	ON	ON		ON		252			ON	ON	ON		ON	ON	
189	ON		ON	ON	ON	ON		ON		253	ON		ON	ON	ON		ON	ON	
190		ON	ON	ON	ON	ON		ON		254		ON	ON	ON	ON		ON	ON	
191	ON	ON	ON	ON	ON	ON		ON		255	ON	ON	ON	ON	ON		ON	ON	
192							ON	ON		256									ON

Table of DMX Binary Address Settings 1-128

DMX ADDRESS	BINARY SWITCH SETTING								
	1	2	4	8	16	32	64	128	256
1	ON								
2		ON							
3	ON	ON							
4			ON						
5	ON		ON						
6		ON	ON						
7	ON	ON	ON						
8				ON					
9	ON			ON					
10		ON		ON					
11	ON	ON		ON					
12			ON	ON					
13	ON		ON	ON					
14		ON	ON	ON					
15	ON	ON	ON	ON					
16					ON				
17	ON				ON				
18		ON			ON				
19	ON	ON			ON				
20			ON		ON				
21	ON		ON		ON				
22		ON	ON		ON				
23	ON	ON	ON		ON				
24				ON	ON				
25	ON			ON	ON				
26		ON		ON	ON				
27	ON	ON		ON	ON				
28			ON	ON	ON				
29	ON		ON	ON	ON				
30		ON	ON	ON	ON				
31	ON	ON	ON	ON	ON				
32						ON			
33	ON					ON			
34		ON				ON			
35	ON	ON				ON			
36			ON			ON			
37	ON		ON			ON			
38		ON				ON			
39	ON	ON	ON			ON			
40				ON		ON			
41	ON			ON		ON			
42		ON		ON		ON			
43	ON	ON		ON		ON			
44			ON	ON		ON			
45	ON		ON	ON		ON			
46		ON	ON	ON		ON			
47	ON	ON	ON	ON		ON			
48					ON	ON			
49	ON				ON	ON			
50		ON			ON	ON			
51	ON	ON			ON	ON			
52			ON		ON	ON			
53	ON		ON		ON	ON			
54		ON			ON	ON			
55	ON	ON	ON		ON	ON			
56				ON	ON	ON			
57	ON			ON	ON	ON			
58		ON		ON	ON	ON			
59	ON	ON		ON	ON	ON			
60			ON	ON	ON	ON			
61	ON		ON	ON	ON	ON			
62		ON	ON	ON	ON	ON			
63	ON	ON	ON	ON	ON	ON			
64							ON		

DMX ADDRESS	BINARY SWITCH SETTING								
	1	2	4	8	16	32	64	128	256
65	ON						ON		
66		ON					ON		
67	ON	ON					ON		
68			ON				ON		
69	ON		ON				ON		
70		ON	ON				ON		
71	ON	ON	ON				ON		
72				ON			ON		
73	ON			ON			ON		
74		ON		ON			ON		
75	ON	ON		ON			ON		
76			ON	ON			ON		
77	ON		ON	ON			ON		
78		ON	ON	ON			ON		
79	ON	ON	ON	ON			ON		
80					ON		ON		
81	ON				ON		ON		
82		ON			ON		ON		
83	ON	ON			ON		ON		
84			ON		ON		ON		
85	ON		ON		ON		ON		
86		ON	ON		ON		ON		
87	ON	ON	ON		ON		ON		
88				ON	ON		ON		
89	ON			ON	ON		ON		
90		ON		ON	ON		ON		
91	ON	ON		ON	ON		ON		
92			ON	ON	ON		ON		
93	ON		ON	ON	ON		ON		
94		ON	ON	ON	ON		ON		
95	ON	ON	ON	ON	ON		ON		
96						ON	ON		
97	ON					ON	ON		
98		ON				ON	ON		
99	ON	ON				ON	ON		
100			ON			ON	ON		
101	ON		ON			ON	ON		
102		ON	ON			ON	ON		
103	ON	ON	ON			ON	ON		
104				ON		ON	ON		
105	ON			ON		ON	ON		
106		ON		ON		ON	ON		
107	ON	ON		ON		ON	ON		
108			ON	ON		ON	ON		
109	ON		ON	ON		ON	ON		
110		ON	ON	ON		ON	ON		
111	ON	ON	ON	ON		ON	ON		
112					ON	ON	ON		
113	ON				ON	ON	ON		
114		ON			ON	ON	ON		
115	ON	ON			ON	ON	ON		
116			ON		ON	ON	ON		
117	ON		ON		ON	ON	ON		
118		ON	ON		ON	ON	ON		
119	ON	ON	ON		ON	ON	ON		
120				ON	ON	ON	ON		
121	ON			ON	ON	ON	ON		
122		ON		ON	ON	ON	ON		
123	ON	ON		ON	ON	ON	ON		
124			ON	ON	ON	ON	ON		
125	ON		ON	ON	ON	ON	ON		
126		ON	ON	ON	ON	ON	ON		
127	ON	ON	ON	ON	ON	ON	ON		
128								ON	

Operation

A summary of Chroma-Q's operations has been divided into the following sections:

- a) **Technical Overview** - page 5
- b) **Gel Description** - page 5
- c) **Gel Dimensions** - page 6
- d) **Gel String Assembly** - page 6
- e) **Control and Power Cables** - page 7
- f) **Loading Gel Strings and Calibration** - page 8
- g) **Setting the Address** - page 8
- h) **PSU / Splitterbox Options** - page 9
- i) **Mounting Position** - page 10
- j) **Safety Wire** - page 10
- k) **F.C.C. Regulations (USA)** - page 10
- l) **Routine Maintenance** - page 10
- m) **Troubleshooting** - page 10

a) Technical Overview

The Chroma-Q Broadway colour changer employs an electronic feedback system for accurate positioning of the gel. When the unit initially receives power, it will go through a calibration sequence. The purpose of the initial calibration sequence during power up is to determine the total length of the gel.

A patented constant tension system (CTS) is employed to ensure that the gel string is kept under a constant and even tension.

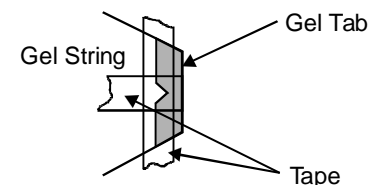
The motor has two optical encoders and a slotted gear wheel mounted to it. The purpose of this is to convert motor revolutions into electronic pulses, and also to determine which the direction the motor is turning.

The electronics card consists of three key components; L298 motor driver, 75176 transceiver and the PIC16C63 processor. The L298 is a true digital device receiving two PWM signals to operate speed and direction. The 75176 transceiver operates in the receive configuration to convert serial protocol to a TTL level. The processor is an OTP part containing a proprietary instruction set.

There is a slim metal plate located below the electronics card that acts as a shield against any unwanted voltages. The majority of electronics problems are usually created by external factors such as shorted cables, etc. The 75176 transceivers are susceptible to damage if 24VDC is present on the DMX signal lines.

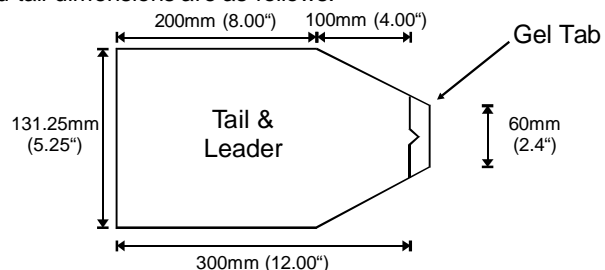
b) Gel Description

The standard gel string consists of a leader, gel frames and a tail. Pro Color, Lee, Rosco Supergel and GAMcolor are the recommended brands. The leader and tail are taped to gel tabs which are inserted into the slots on each of the rollers.



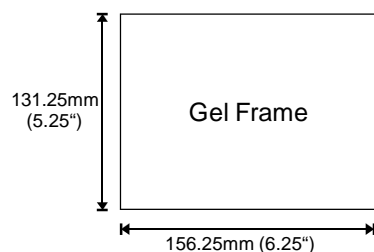
c) Gel Dimensions

The leader and tail dimensions are as follows:



Note: The tail and leader include the first/last frame.

The gel frame dimensions are as follows:

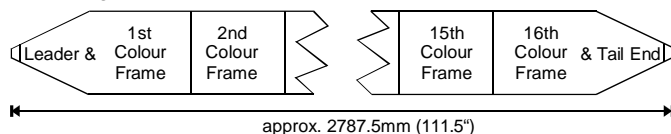


d) Gel String Assembly

To join a leader, tail, gel and tab together, a high temperature, clear gel tape is recommended (see Product Ordering List on page 15).

To join leader and tail to rollers, gel tabs are required (see Product Ordering List on page 15).

The completed string should look like this:



Note: A range of completed gel strings are available (see Product Ordering List on page 15). Custom gel strings are available upon request. Contact the selling dealer for details.

When ordering gel strings please ensure you state which type of Chroma-Q you require them for.

Product Ordering List

CQB	Chroma-Q Broadway Colour Changer
MP10	Mounting Plate for Source 4 / Shakespeare
PS08	6.5 Amp PSU / Splitterbox
PS18/2	13 Amp PSU / Splitterbox
GST16/B	16 frame "Theatre" Gel String for Chroma-Q Broadway
GSR16/B	16 frame "Rock & Roll" Gel String for Chroma-Q Broadway
GTI	Gel tabs
ST	High Temperature Clear Tape

Chroma-Q Data Safe Cables

CQC3	1m / 3ft Chroma-Q Colour Changer Cable
CQC5	1.5m / 5ft Chroma-Q Colour Changer Cable
CQC10	3m / 10ft Chroma-Q Colour Changer Cable
CQC25	7.5m / 25ft Chroma-Q Colour Changer Cable
CQC50	15m / 50ft Chroma-Q Colour Changer Cable
CQC100	30m / 100ft Chroma-Q Colour Changer Cable

DMX Data Safe Cables

DS10	3m / 10ft Data Safe 5 pin DMX Cable
DS25	7.5m / 25ft Data Safe 5 pin DMX Cable
DS50	15m / 50ft Data Safe 5 pin DMX Cable
DS100	30m / 100ft Data Safe 5 pin DMX Cable
TP	5 pin DMX Termination Plug

Chroma-Q PS18/2 PSU/Splitterbox Specification

Dimensions:	300mm (w) x 68.75mm (h) x 281.25mm (d) 12" (w) x 2.75" (h) x 11.25" (d)
Weight:	3.3kg / 7.3 lbs
Power Requirements:	115 / 230V AC (internally switchable, isolate from mains before removing cover). This power supply must be connected to ground
Power Consumption:	6.4 Amperes at 115V AC with 13 Amps at 24V DC 3.2 Amperes at 230V AC with 13 Amps at 24V DC
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	Powder-coated Aluminium
Mounting Options:	Either freestanding or can be hung from a bolt
Colour:	Black
Circuit Out Connector:	XLR 4-pin female (power and control protocol)
Return Connector:	XLR 4-pin male (power and control protocol)
Power Input Connector:	IEC 10A, UL rated supplied with detachable power cord
Control Out Connector:	XLR 5-pin female (DMX link)
Control Input Connector:	XLR 5-pin male (protected with clamping diodes)
European Approvals:	Complies with EU directives: EMC 89/336/EEC and LVD 73/23/EEC. Harmonized standards applied in order to verify compliance with directives: EN 50081-1 & EN 50082-1: 1992
North American Approvals:	Radiated Emissions: Complies with FCC part 15, subpart B, class A for unintentional radiators

e) Control and Power cables

Only genuine Tourflex Data Safe cable is recommended for use with the Chroma-Q colour changing System (see Product Ordering List on page 15).

The Chroma-Q Broadway utilises an XLR 4-pin cable system. This is used for power and data transfer. Pins 1 and 4 serve as 24VDC power. Pins 2 and 3 are used for USITT 1990 DMX512 control protocol.

Note: It is very important to ensure that the drain wire from the cable shield is connected to **both** connector cases.

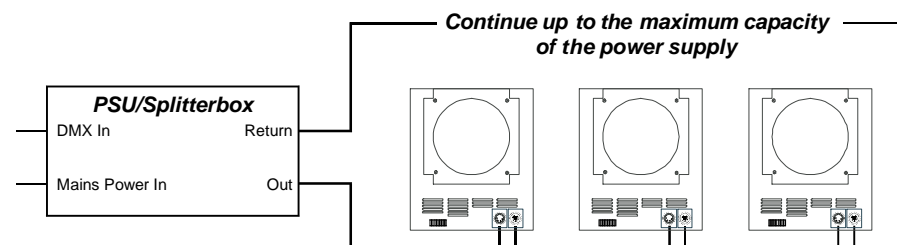
When assembling XLR 4-pin cables, heat shrink should be used on each individual pin to prevent short circuits.

Note: Damage will occur if power connections short-circuit to control protocol or ground shield connections.

The pins are wired one to one, in the following format:

Pin	Function
1	0V DC
2	Control Data Minus
3	Control Data Plus
4	Plus 24V DC
Chassis	Ground Bonding

System Diagram



Note: Total cable length per circuit must not exceed 60m / 200' on the PS08 PSU / Splitterbox and 105m / 350' on the PS18/2 PSU / Splitterbox.

The total amperage draw, at 24V DC, of the connected units must not exceed 6.5 Amps on the PS08 unit PSU / Splitterbox and 13Amps on the PS18/2 PSU / Splitterbox.

f) Loading Gel Strings and Calibration

With the unit front facing you:

- 1) Open the unit by depressing the catch located on the top of the unit and pulling the front towards you.
- 2) Attach the gel tab at the end of the lead to the left take up reel. (Diagram 1)
- 3) Wind the string onto the left take up reel by turning the left gear with your thumb. (Diagram 2)
- 4) When the string is fully wound on the left take up reel, apply tension to the right take up reel by turning the right gear counter clockwise (to the left) applying four to five complete turns (rotation through 360°). (Diagram 3)

Note: Keep hold of the gel string throughout.

- 5) Attach the tail to the right take up reel. (Diagram 4)
- 6) Close the unit.
- 7) Power up the unit and a self calibration procedure will be completed to set the 100% and 0% gel string settings (it is advisable to have control protocol at the zero level to verify the gel string is properly loaded).

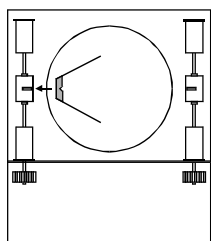


Diagram 1

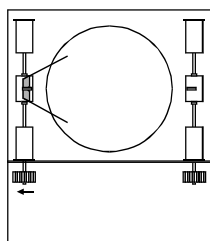


Diagram 2

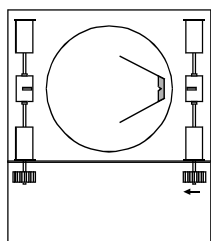


Diagram 3

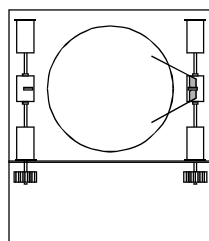


Diagram 4

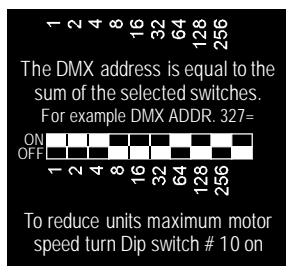
g) Setting the Address

The Chroma-Q Broadway can be addressed easily by setting the binary dip switches located on the rear panel (see diagram page 4). To set your desired address, move the appropriate switches to either the on (up) position or the off (down) position.

Note: All switches in the down position is 0.

For example:

Switch position = ☐



A complete chart of dip switch settings for DMX channels 1-511 is available on pages 16-19.

The Chroma-Q Broadway can also be set to a second default motor speed. By moving switch 10 on the binary dip switch to the on (up) position, the inherent speed of the Chroma-Q will decrease by approximately 50% (ideal for environments that are particularly noise sensitive).

Chroma-Q PS08 PSU/Splitterbox Specification

Dimensions:	185mm (w) x 65mm (h) x 240mm (d) 7¼" (w) x 2½" (h) x 9½" (d)
Weight:	2.05kg / 4.5lb
Power Requirements:	115 / 230 V AC (internally switchable - isolate from mains before removing cover). This power supply must be connected to ground
Power Consumption:	3.2 Amperes at 115V AC with 6.5 Amps at 24V DC 1.6 Amperes at 230V AC with 6.5 Amps at 24V DC
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	Powder-coated Aluminum
Mounting Options:	Either freestanding or can be hung from a bolt
Colour:	Black
Circuit Out Connector:	XLR 4-pin female (power and control protocol)
Return Connector:	XLR 4-pin male (power and control protocol)
Power Input Connector:	IEC 10A, UL rated, supplied with detachable power cord
Control Out Connector:	XLR 5-pin female (DMX link)
Control Input Connector:	XLR 5-pin male (protected with clamping diodes)
European Approvals:	Complies with EU directives: EMC 89/336/EEC and LVD 73/23/EEC. Harmonized standards applied in order to verify compliance with directives: EN 55022 (class B), EN 50082-1 & EN 60950
North American Approvals:	Radiated Emissions: Complies with FCC part 15, subpart B, class A for unintentional radiators

Limited Warranty

Your Chroma-Q colour changers and PSU / Splitterbox are covered by a 12 month warranty against defects in manufacture. The warranty covers parts and labour but excludes the cost of freight. In the case of any warranty claims, please contact your selling dealer. If the selling dealer is unable to assist you, please contact A.C. Lighting directly at the appropriate address as detailed on page 3.

Chroma-Q Broadway Colour Changer Specification (CQ1/B)

Dimensions:	205mm (w) x 240mm (h) x 75mm (d) (w/o mounting plate) 8.2" (w) x 9.6" (h) x 3.0" (d)
Aperture:	127mm / 5" diameter
Weight:	1.05kg / 2.3lb (without mounting plate)
Gel Frame Capacity:	between 2 - 16 frames
Speed:	2 seconds with dip switch 10 to Off
Speed 2:	5 seconds with dip switch 10 to On
Address:	10 pin binary dip switch address up to 512 channels
Power Requirements:	24VDC
Power Consumption:	0.45 Amps peak at 24V DC with dip switch 10 to On 0.90 Amps peak at 24V DC with dip switch 10 to Off
Protocol Requirements:	USITT DMX512 (1990)
Body Material:	UL94 V0 rated reinforced PBT compound
Mounting Plate:	Mounting plates are available to suit numerous fixtures (see separate price list for current selection)
Colour:	Black
Input Connector:	XLR 4-pin male (power and control protocol)
Output Connector:	XLR 4-pin female (power and control protocol)
European Approvals:	Complies with EU directives: EMC 89/336/EEC Class A. Harmonized standards applied in order to verify compliance with directives: EN 56022:1994, EN 50082-1: 1992 & EN 60950
North American Approvals:	Radiated Emissions: Complies with FCC part 15, subpart B, class A for unintentional radiators. Low Voltage Directive: Complies with CSA 22.2 950, UL 1950

h) PSU / Splitterbox Options

The Chroma-Q PSU / Splitterboxes are the only units suitable to be connected to Chroma-Q series of colour changers. Connection to other units will invalidate the warranty and may cause serious damage to Chroma-Q colour changers and / or Chroma-Q PSU / Splitterbox.

The Chroma-Q PSU / Splitterbox is available in 2 sizes: One suitable for 6.5 Amps DC and the other suitable for 13 Amps DC total load.

Each Chroma-Q PSU / Splitterbox is equipped with the following:

- 1) DMX input and thru sockets
- 2) DMX data indicator
- 3) Mains power indicator
- 4) XLR 4-pin output sockets
- 5) XLR 4-pin return sockets
- 6) AC mains input

The basic purpose of the PSU / Splitterbox is to combine the DMX control signal and the 24VDC power into individual lines. There are separate circuit outputs for distribution on each PSU / Splitterbox, each capable of supplying power and data for Chroma-Q colour changers. The maximum total cable length for each output circuit is 60M / 200' on the PS08 PSU / Splitterbox and 105M / 350' on the PS18/2 PSU / Splitterbox.

All outputs are independent of one another, and each line has its own return. The purpose of the return socket is to maintain a constant voltage level across all units on each line, to prevent line loss and to provide DMX signal termination.

The PS08 PSU / Splitterbox has two Chroma-Q circuits and produces 24VDC at 6.5 Amps maximum output. This means a total of 7 Chroma-Q Broadway colour changers can be powered through a single PS08 PSU / Splitterbox. The power consumption is approximately 3.2 Amps at 115VAC.

To change the operating voltage on the PS08 PSU / Splitterbox, first isolate the unit from the mains supply, then remove the main body cover by unscrewing the four screws on the side of the cover. Set the voltage selection switch to the desired setting and refit the cover using the four screws.

The PS18/2 PSU / Splitterbox has two Chroma-Q circuits and produces 24VDC at 13 Amps maximum output. This means that a total of 14 Chroma-Q Broadway colour changers can be powered through a single PS18/2 PSU / Splitterbox. The power consumption is approximately 6.4 Amps at 115VAC.

To change the operating voltage on the PS18/2 PSU / Splitterbox, first isolate the unit from the mains supply, then remove the main body cover by unscrewing the four screws on the side of the cover. Set the voltage selection switches (two) to the desired setting and refit the cover using the four screws.

i) Mounting Position

The Chroma-Q Broadway is designed to be mounted in an upright position with the base of the unit below the fixture. Do not mount in an inverted position with the base of the unit above the fixture, as the effect of the rising heat from the fixture may cause gel string damage.

Always ensure that the Chroma-Q Broadway is powered up before the fixture and that you follow the reverse procedure at the end of the show. Failure to do so may cause gel string damage.

j) Safety Wire

The safety wire supplied with your Chroma-Q Broadway should always be used to attach the unit to the fixture.

The safety wire has a safe working load (SWL) of 22.67kg/50lb and a copy of the testing report is available on request.

k) F.C.C. Regulations (USA)

This device complies with part 15 of the F.C.C. rules. Operation is subject to the following two conditions:

- (i) This device may not cause harmful interference, and
- (ii) This device must accept any interference that may cause undesired operation

l) Routine Maintenance

Routine maintenance can prevent most mechanically based problems. The motor mounting plate can be adjusted to control tension on the belt.

Excessive belt tension is often the cause of noise. Conversely, loose motor belts will cause accuracy problems. The optical sensors can also be adjusted if they are hitting the motor wheel. Occasionally, the take up reels will exhibit slight noise due to the plastic flange rubbing against the top of the take up reel. A very small amount of white lithium grease applied to the flange will eliminate this noise.

m) Troubleshooting

Troubleshooting of the Chroma-Q is aided by the indications provided by the 3 diagnostic LED's located on the underside of the Chroma-Q.

All troubleshooting procedures should begin with a LED check.

This section is a guide to solving common problems.

Symptom	Possible Cause	Solution
All Chroma-Qs show no power indicator (Red LED).	24V DC power supply is not providing power to Chroma-Q.	Check if mains power is on and red 24VDC LED is on.
Single Chroma-Q power indicator is off (Red LED).	4-pin XLR cable has broken connection.	Replace 4-pin XLR cable.
Power indicator light in flashing. (Red LED).	Gel string is jammed.	Readjust or replace faulty gel string and/or turn power off and then on again. This will reset the unit.
Chroma-Q has dim power light (Red LED).	Voltage has dropped below acceptable level.	Check that the return line has been installed. Check maximum cable length has not been exceeded.
DMX indicator on all Chroma-Q are off (Green LED).	No DMX is present at the Splitterbox.	Check that the DMX cable is properly connected to DMX input on the Splitterbox. Check that DMX indicator light, located on the Splitterbox, is on.
DMX indicator light on one group of Chroma-Q's are off (Green LED).	One output of the Splitterbox has failed. Faulty XLR 4-pin cable at Splitterbox output.	Call selling dealer. Test cables.
Level indicator does not respond to DMX control signal (Yellow LED).	Improper address.	Reassign unit addressing.
Level indication changes intensity, but gel string does not move (Yellow LED).	Mechanical failure.	Call selling dealer.

Note: A high percentage of problems are caused by corrupt DMX control protocol. We highly recommend the use of genuine Tourflex Data Safe cables for all Chroma-Q colour changer and DMX control protocol cables.

Troubleshooting is a process of elimination. First, rule out other field factors (i.e. faulty cables, power sources). If an electronics problem is suspected try replacing the electronics card first. If accuracy problems should occur and mechanical problems have been ruled out, replace optical sensors. For technical advice and/or parts, please contact your selling dealer or the offices listed in this manual.