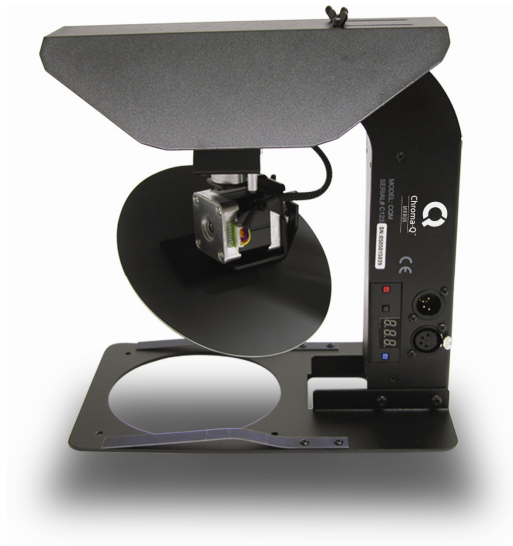


# Chroma-Q™ Mirror

## User Manual



**Chroma-Q™**  
BRILLIANT SOLUTIONS

**Version 1.3 September 2012**  
PN: 123-0500



## Warranty Statement

Chroma-Q warrants to the original purchaser, with proof of purchase, that its delivered products shall be free from defects in material and workmanship under normal use for a period of 12 months from date of shipment.

Chroma-Q will repair, or at its option, provide an equivalent item or replace, the defective product during the stated warranty period. This warranty applies only to the repair or replacement of the product and only when the product is properly handled, installed and maintained according to Chroma-Q instructions. This warranty excludes defects resulting from improper handling, storage, installation, acts of God, fire, vandalism or civil disturbances. Purchaser must notify Chroma-Q in writing within 14 days of noticing the defect. This warranty excludes field labour or service charges related to the repair or replacement of the product.

The warranty contained herein shall not extend to any finished goods or spare parts from which any serial number has been removed or which have been damaged or rendered defective (a) as a result of normal wear and tear, willful or accidental damage, negligence, misuse or abuse; (b) due to water or moisture, lightning, windstorm, abnormal voltage, harmonic distortion, dust, dirt, corrosion or other external causes; (c) by operation outside the specifications contained in the user documentation; (d) by the use of spare parts not manufactured or sold by Chroma-Q or by the connection or integration of other equipment or software not approved by Chroma-Q unless the Customer provides acceptable proof to Chroma-Q that the defect or damage was not caused by the above; (e) by modification, repair or service by anyone other than Chroma-Q, who has not applied for and been approved by Chroma-Q to do such modification, repair or service unless the Customer provides acceptable proof to Chroma-Q that the defect or damage was not caused by the above; (f) due to procedures, deviating from procedures specified by Chroma-Q or (g) due to failure to store, install, test, commission, maintain, operate or use finished goods and spare parts in a safe and reasonable manner and in accordance with Chroma-Q's instructions (h) by repair or replacement of engines without factory training.

The warranty contained herein shall not apply to finished goods or spare parts which are sold "as is", as "second-hand", as used", as "demo" or under similar qualifications or to Consumables ("Consumables" is defined as any part(s) of goods or part(s) for use with goods, which part(s) of goods or part(s) for use with goods are consumed during the operation of the goods and which part(s) of goods or part(s) for use with goods require replacement from time to time by a user such as, but not limited to, light bulbs).

The warranty contained herein shall not apply, unless the total purchase price for the defective finished goods or spare parts has been paid by the due date for payment.

The warranty contained herein applies only to the original purchaser and are not assignable or transferable to any subsequent purchaser or end-user.

This warranty is subject to the shipment of the goods, within the warranty period, to the ChromaQ warranty returns department, by the purchaser, at the purchasers expense. If no fault is found, ChromaQ will charge the purchaser for the subsequent return of the goods.

Chroma-Q reserves the right to change the warranty period without prior notice and without incurring obligation and expressly disclaims all warranties not stated in this limited warranty.

## Disclaimer

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Chroma-Q products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent. Chroma-Q sole warranty is that the product will meet the sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

Chroma-Q reserves the right to change or make alteration to devices and their functionality without notice due to our on going research and development.

The Chroma-Q Mirror has been designed specifically for the professional entertainment lighting industry. Regular maintenance should be performed to ensure that the products perform well in the entertainment environment.

If you experience any difficulties with any Chroma-Q products please contact your selling dealer. If your selling dealer is unable to help please contact [support@chroma-q.com](mailto:support@chroma-q.com). If the selling dealer is unable to satisfy your servicing needs, please contact the following, for full factory service:

**Outside North America:**

Tel: +44 (0)1494 446000

Fax: +44 (0)1494 461024

[support@chroma-q.com](mailto:support@chroma-q.com)

**North America:**

Tel: 416-255-9494

Fax: 416-255-3514

[support@chroma-q.com](mailto:support@chroma-q.com)

For further information please visit the Chroma-Q website at [www.chroma-q.com](http://www.chroma-q.com).

Chroma-Q is a trademark, for more information on this visit [www.chroma-q.com/trademarks](http://www.chroma-q.com/trademarks).

The rights and ownership of all trademarks are recognised.

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## 1. Product overview

The Chroma-Q Mirror improves the functionality of a profile fixture by adding the remote capability of re-positioning the beam of a single fixture in a fixed position to multiple varied locations. It is designed to give years of trouble free use, providing that it is regularly maintained and used in accordance with the instructions detailed in this manual.

The Mirror is a motorised mirror attachment which mounts onto fixed position profile fixture to achieve many of the effects traditionally only available with high priced intelligent moving lights. The compact and stylish design is equally at home in a theatre, exhibition centre, shopping mall, or car showroom.

The moving mirror accurately redirects a fixed position beam of light through a pan of 230° and a tilt of 57°, making it a very cost-effective and space-saving option for illuminating multiple locations using just a single profile fixture. As well as being compatible with most standard medium and narrow beam profile fixtures, the unit can be daisy chained with Chroma-Q colour changers and gobo rotators to provide moving colour and beam rotation effects.

The Chroma-Q Mirror is designed to operate either on the ANSI E1.11 USITT DMX 512-A protocol or in automatic mode. The DMX serial data system allows for the individual addressing of multiple units on one data cabling system. The unit is addressed by using the three push button switches and LED display. The unit equipped with a diagnostic section on the LED display showing power, DMX signal and level presence.

When operating in automatic mode the Chroma-Q Mirror only requires a 24 VDC supply to operate.

**Note:** The quantity of Chroma-Q Mirror Mirrors used and the maximum cable length per power supply output is dependant upon the size of PSU/splitter box used (see later in this manual for details).

## 2. Section Name

- 2.1 Unpacking the unit
- 2.2 Control and power cables
- 2.3 Mounting the unit
- 2.4 Operating the unit
- 2.5 Modes of operation
- 2.6 Troubleshooting
- 2.7 Technical overview
- 2.8 Technical specifications

### 2.1 Unpacking the unit

The Chroma-Q Mirror package comes with the following items:

- Chroma-Q Mirror
- User manual

The unit is shipped in a specially constructed shipping carton to provide protection to the unit. Carefully open the carton and remove the unit by grasping the support arm in the middle and lifting the unit vertically out of the carton. Next, carefully remove the rubber restraint band used to stabilise the mirror unit during shipment.

The front light shield had been designed so that it can act as a shipping support and must be repositioned before using the unit. Loosen the two M4 wing screws on the front of the unit and reposition the light shield by moving the shield downward to the position necessary to prevent light leaks depending on the beam angle and focusing.

**Note:** The packing material protects the fixture during shipment; always use it to transport the fixture.

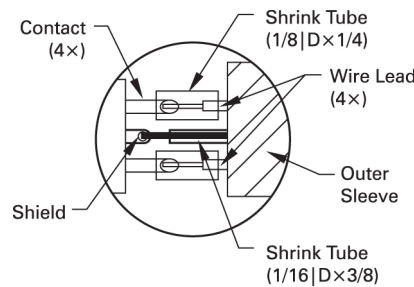
## 2.2 Control and power cables

The Chroma-Q Mirror utilises an XLR 4-pin cable system to supply power and data. Pins 1 and 4 supply 24V DC power, pins 2 and 3 supply ANSI E1.11 USITT DMX 512-A control protocol and the connector shells should be connected via the ground/drain wire.

For use in automatic mode the unit only requires a suitable 24V DC connected to pins 1 and 4).

Damage will occur if power connections short to data or ground/shield connections. When assembling XLR 4-pin cables, heat shrink should be used on each individual pin to prevent short circuits (see diagram overleaf).

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



Detail of connector wiring (typical)

The correct wiring between male and female connectors is 'one to one'.

Pin #	Function	Minimum Cable size
1	Ground (-ve)	2.50mm <sup>2</sup> (14 AWG)
2	Control data minus (-)	0.35mm <sup>2</sup> (22 AWG)
3	Control data plus (+)	0.35mm <sup>2</sup> (22 AWG)
4	24V DC (+ve)	2.50mm <sup>2</sup> (14 AWG)
Chassis	Cable shield/drain wire	0.25mm <sup>2</sup> (24 AWG)

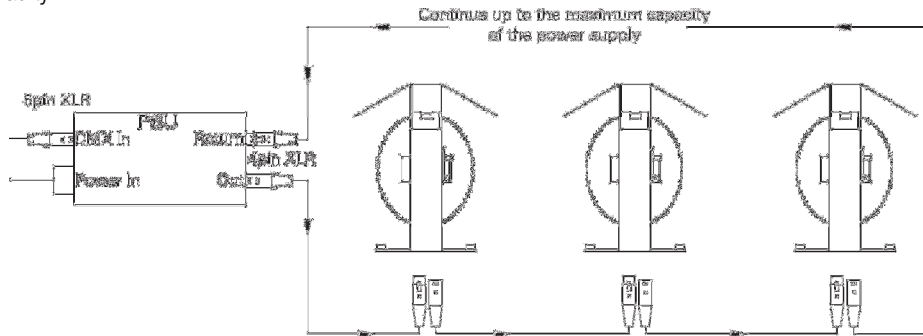
**Note:** Cable length should not exceed more than 60m /200' with return line.

### Connections:

Correct connection of the units to the power supply will decrease the chances of units malfunctioning due to cabling problems. Please follow these basic rules:

- Use the correct and gauge type of cable and connectors.
- Keep cable runs as short as possible to reduce line loss.
- Always use a return cable for each run.

This will ensure balanced DC power to all units that the line is correctly terminated and all units receive power if one link of the chain is faulty.



**Note:** Cable length should not exceed more than 60m (200') with return line.

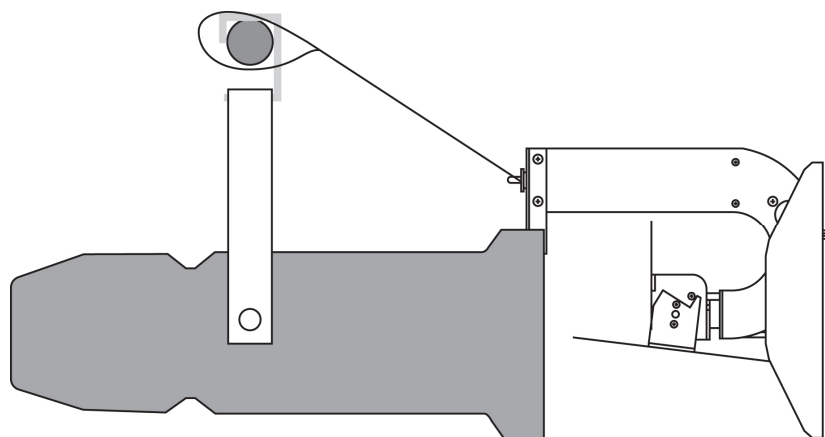
## 2.3 Mounting the unit

For proper operation the unit must be firmly attached to the light fixture. To achieve this, the mounting plate of the unit has two flat springs at the outer edge. The back plate should be inserted in the rear colour slot and gently pushed down until the unit is firmly seated in the bottom of the slot. The safety wire supplied with the fixture should then be attached as a means of secondary fixing.

Power and DMX should be brought to the unit by Tourflex Datasafe Ultra XLR-4 cable. If daisy chaining is desired, a XLR-4 cable should be run from the output connector on the unit to the next device in the chain.

When DMX is first applied to the unit it will go through a homing sequence which will cause the mirror to momentarily move around.

**Note:** If the rear slot is not available for mounting of the unit because of the use of a gel holder in this slot, the front slot may be used for mounting instead.

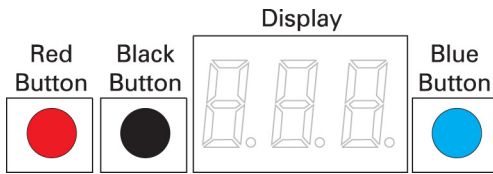


Chroma-Q Mirror mounted on a lighting fixture.

**Note:** Ensure the safety wire is used as a means of secondary attachment.

## 2.4 Operating the unit

All unit functions are accessed using the LED display and the three push-button switches on the left side panel.



Control	Function
Red Button	Mode access and record
Black Button	Decreases (-) the mode level or value
Blue Button	Increases (+) the mode level or value
3 digit display	Displays mode, monitor or blank display

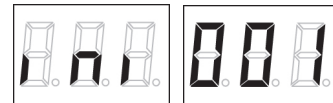
### Push button operation:

The RED button is used to scroll through the different modes of operation and the BLUE or BLACK buttons used to select the level or value in that mode. If any mode or value is changed, the last digit of the display will flash until the RED button is pushed to acknowledge (or record) the change.

### Display operation:

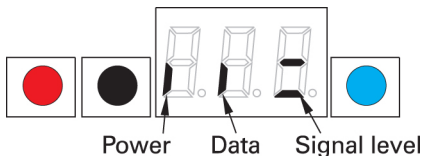
#### Power-up Display

On power-up, the display will show 'ini' during the initialisation sequence, and then show the DMX address.



#### Monitor Display

The display will revert to 'Monitor Mode' if left undisturbed for 5-7 seconds.



The first vertical bar indicates that there is Power (24V DC).

The second vertical bar indicates that there is Data (DMX).

The horizontal bars indicate the data Signal Level (DMX).

See also: 'Troubleshooting' section of this manual.

#### Display Flip

The display can be flipped through 180° by pressing and holding the RED button then pressing the BLACK button.

## 2.5 Modes of operation

### a. Effect (automatic) mode

In this mode the unit can be used without a DMX control signal; only a 24V DC supply is required.

To use the automatic mode;

- Connect a suitable 24V DC power supply to the unit.
- Press the RED button to scroll through the menu until the display reads 'At0'.
- Press the BLUE button once, so that the display reads 'At1' (Auto mode) and press the RED button.



- Press the RED button to scroll through the menu until the display reads 'Pn'. This accesses the mirror panning movement in the auto mode. Using the BLUE/BLACK buttons select the either range of movement you require Pn0 - Pn7, continuous back and forth sweep Pn8, or mirror held at the centre position Pn9. Press the RED button to store the pan value and change the display to 'tL', the mirror tilting movement in the auto mode.
- Repeat the above process to set a tilt movement value.
- When the desired effect is selected, press the RED button.

#### **b. DMX Control Mode**

In this mode, the unit can be fully controlled using two or four DMX channels (see below). A combined DMX and 24V DC supply cabling system is required in this system.

Press the RED button to move between modes, and to record any changes made.

#### **DMX channel address mode**

This mode is used to set the DMX start address in the range of 1-511 (2 channels, 8-bit resolution) and 1-509 (4 channels, 16-bit resolution).

The display shows the current DMX address.

(To alter the address, press BLUE or BLACK button once to increment/decrement the value; hold down the BLUE or BLACK for fast increments/decrements of the value.)

#### **Pan/tilt movement modes**

These modes allow the user to reverse the direction of the pan, tilt, or pan and tilt motion, when the configurations of the lighting fixture/mirror unit dictate.

The display shows either the pan movement or the tilt movement ('Pn' pan/ 'tL' tilt) and the current direction ('0' = normal/'1' = reverse) of travel.

(Press BLUE or BLACK button to switch directions, and the RED button to change modes.)

#### **DMX resolution**

This mode is used to set the movement resolution, or accuracy, of the unit between two or four DMX control channels.

The display shows the current DMX mode ('r0' = 8-bit or 'r1' = 16-bit resolution).

(Press BLUE or BLACK to switch between modes.)

#### **Display mode**

This mode is used to switch the display on or off. This feature can be used to blank displays that may be an unwanted distraction. The display will re-activate when any button is pressed.

The display shows the current display mode ('dP0' = display off or 'dP1' = display on),

(Press BLUE or BLACK to switch between on and off.)

#### **DMX/Automatic Mode**


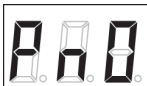

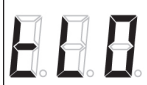

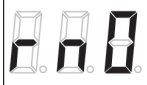
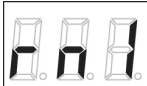




This mode is used to select either DMX control or automatic (stand-alone) operation of the unit.

The display shows the current mode ('At0' = DMX control, or 'At1' = automatic mode).

(Press BLUE or BLACK to switch between modes.)

#### **Summary of control functions:**

**Note:** Press the RED button to move between modes, and to record any changes made.

Mode	Description	Actions required	Display	
DMX channel address mode	Sets the units DMX address.	To alter the address, press BLUE or BLACK button once to increase or decrease the value; hold down the BLUE or BLACK for fast increments or decrements.	The display shows the current DMX address. In the range of 1-511 (2 channel, 8-bit resolution) In the range of 1-509 (4 channel, 16-bit resolution).	
Pan movement mode	This mode allows the user to reverse the direction of the pan motion.	To alter the mode, press BLUE or BLACK button once to switch between modes.	The display shows that the PAN movement is set for normal direction.	
			The display shows that the PAN movement is set for reverse direction.	
Tilt movement mode	This mode allows the user to reverse the direction of the tilt motion.	To alter the mode, press BLUE or BLACK button once to switch between modes.	The display shows that the TILT movement is set for normal direction.	
			The display shows that the TILT movement is set for reverse direction.	
DMX resolution mode	Sets unit operating with 2 or 4 DMX control channels, with 8 or 16-bit resolution.	To alter the mode, press BLUE or BLACK button once to switch between modes.	The display shows the unit is set for 8-bit resolution.	
			The display shows the unit is set for 16-bit resolution.	
Display mode	This mode is used to switch the display on or off.	To alter the mode, press BLUE or BLACK button once to switch between modes.	This shows that the display is set for auto-blanking.	
			This shows that the display is set to be permanently on.	
DMX/Automatic mode	This mode allows the user to select to between DMX and Automatic modes.	To alter the mode, press BLUE or BLACK button once to switch between modes.	The display shows that the unit is set for DMX control.	
			The display shows that the unit is set for automatic operation.	

### Default Settings:

#### 'Factory' default settings

If the unit is reset, using the RED button (held down) and the BLUE button pressed for 2 sec's, the unit will revert to the factory default settings.



The 'Factory' default settings put the unit in its normal operating mode.

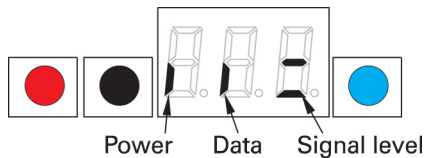
DMX Address = 001  
 Pan/tilt direction = Normal  
 Resolution = 8-bit  
 Display = On  
 DMX/Auto = DMX  
 Display Flip = Normal

**'User' default settings**

Each time the RED record button is pressed, the unit will save that change and these 'user defaults' will take precedence on the next power cycle. These 'User' defaults can be reset to the 'factory' defaults using the method detailed above.

## 2.6 Troubleshooting

The LED display aids in the troubleshooting of the system. These indicators are located on the on the side panel of each unit.



The first vertical bar indicates that there is Power (24V DC).  
 The second vertical bar indicates that there is Data (DMX).  
 The horizontal bars indicate the data Signal Level (DMX).

**Note:** The signal level changes during normal operation of the unit and is present during automatic operation. 1st bar = 25%, 2nd bar = 50% and 3rd bar = 75%.

Symptom	Possible Cause	Solution
Unit does not respond to DMX control, but display indicator is on.	Unit set to wrong or different DMX address.	Check DMX address settings.
Unit doesn't respond to DMX, DMX display indicator is off.	Bad cable. No DMX at splitter/PSU.	Check cable and DMX run from the console.
Units run at different speeds.	Cable lengths are too long.  No cable return line.	Check the cable length and configuration.  Ensure there is a cable return line in the system.
Units have dim LED indicators and run slowly.	Overloading of chain or cable runs too long. PSU overloaded.	Check voltage levels on last unit. Should not be below 20VDC.
Display indicators appear OK but unit does not move.	Mechanical (or electrical) failure in the unit.	Turn unit on and off. Return unit for repair.
The tilt doesn't respond to DMX.	16-bit mode setting when 8-bit control is intended, or vice versa.	Check and reset.
Mirror panning/tilting in opposite direction.	Pan/tilt reverse switch with improper setting.	Check and reset.
The mirror vibrates in one place when it is supposed to move.	Broken motor cable Popped out motor connector.	Contact distributor for service Reconnect and check.

## 2.7 Technical overview

The electronics card consists of four key components: a motor driver (x 2), transceiver, and a processor. The transceiver operates in the receive configuration to convert serial protocol to a TTL level. All data relevant to the operation of the unit is stored onboard in flash memory.

The majority of electronics problems are usually created by external factors such as shorted cables etc. The transceivers are susceptible to damage if 24VDC is present on the DMX signal lines.

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

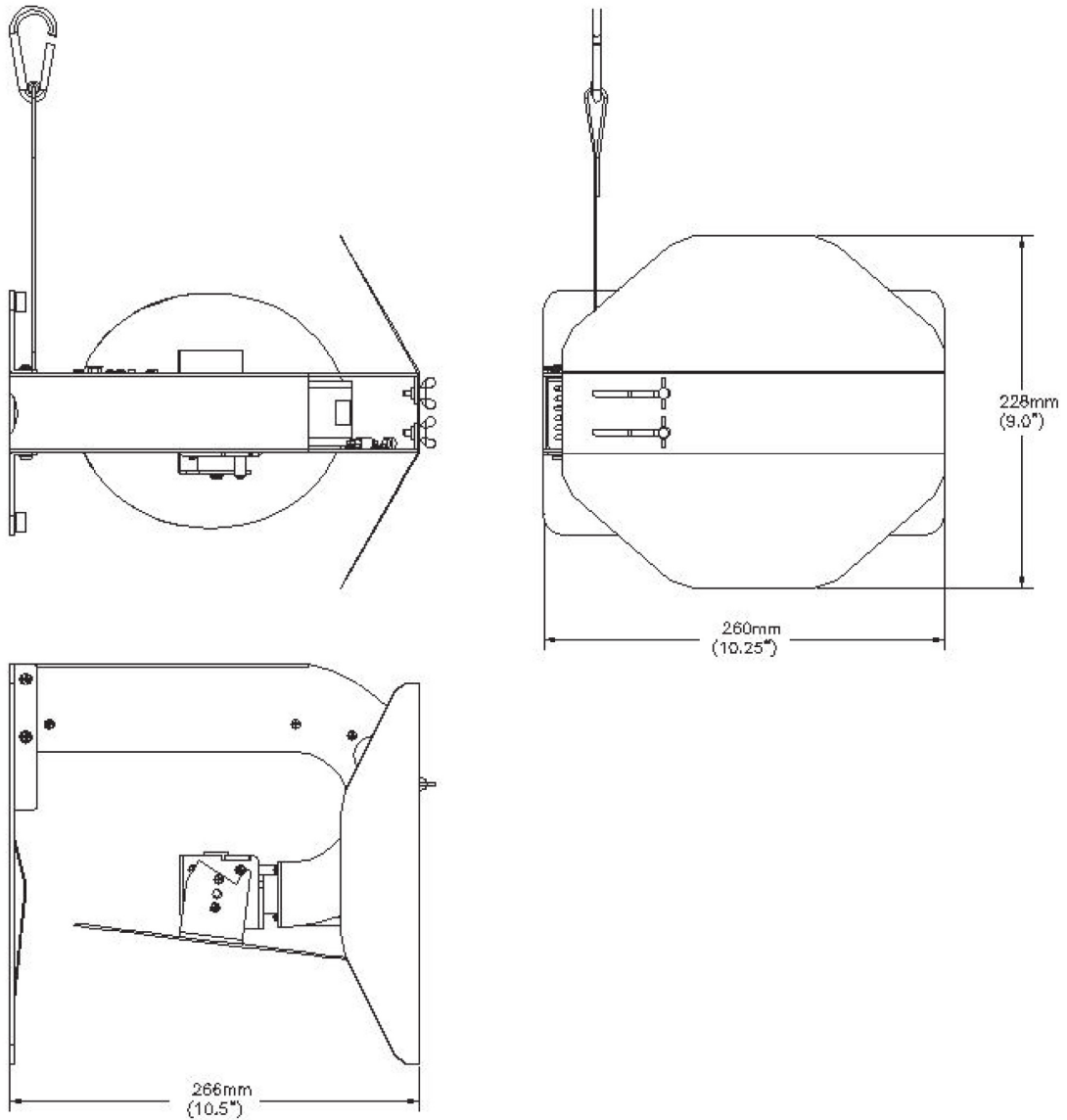
## 2.8 Technical specifications

Dimensions:	260 x 228 x 266 mm / 10.25" x 9" x 10.5"		
Weight:	1.6kg (3.5 lbs)		
Resolution:	8 or 16 bit		
Accuracy:	Pan (230° Max.)	0.9°	8-bit mode
		0.028°	16-bit mode
	Tilt (57.3° Max.)	0.225°	8-bit mode
		0.028°	16-bit mode
Movement speed:	0-100% pan (max)	= 2 sec	
	0-100% tilt (max)	= 1 sec	
DMX protocol:	ANSI E1.1 USITT DMX 512-A		
DMX addressing:	Digitally, via push buttons (3) and LED display		
Working Voltage:	24 VDC (+/- 10%)		
Power consumption:	1PU (see note below)		
Connectors:	XLR-4 (male) in and XLR-4 (female) through		
Body material:	Aluminium		
Body color:	Black powder coat (other colours available, P.O.A.)		
Mounting plate:	Integral mounting plate, designed for use in any ellipsoidal fixture with a 160 mm (6.25") gel slot		
Max. ambient temperature:	40° C (104° F)		
Cooling:	Convection (natural)		
European approvals:	Yes		
North American approvals:	N/A		

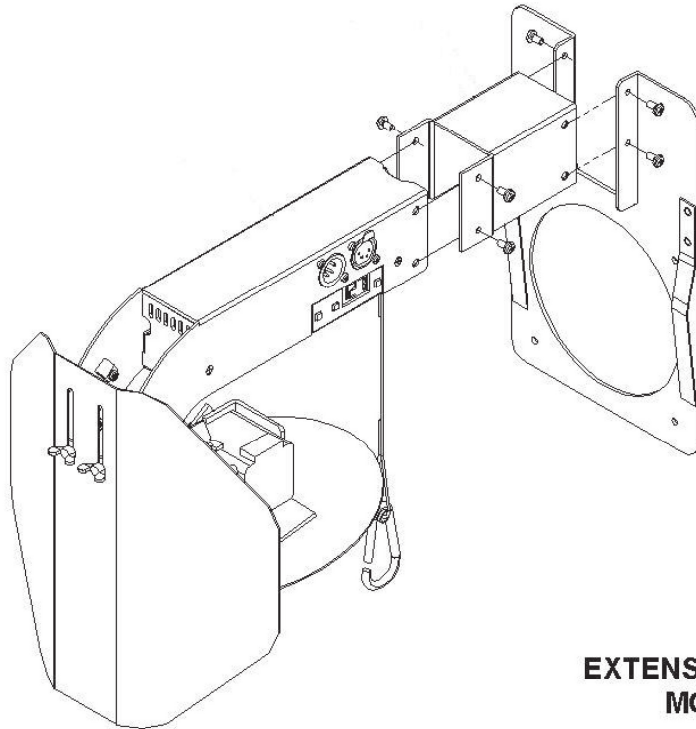
**Note:** We use the Power Unit (PU) to simplify the load calculation on any given Chroma-Q power supply. For example a PSU-12 will supply up to 12 PU, so you can plug-in 12 Chroma-Q Mirror or a combination of 6 Chroma-Q Mirrors and 6 Broadway scrollers on one PSU-12.



3. Drawings  
3.1 Outside dimensions

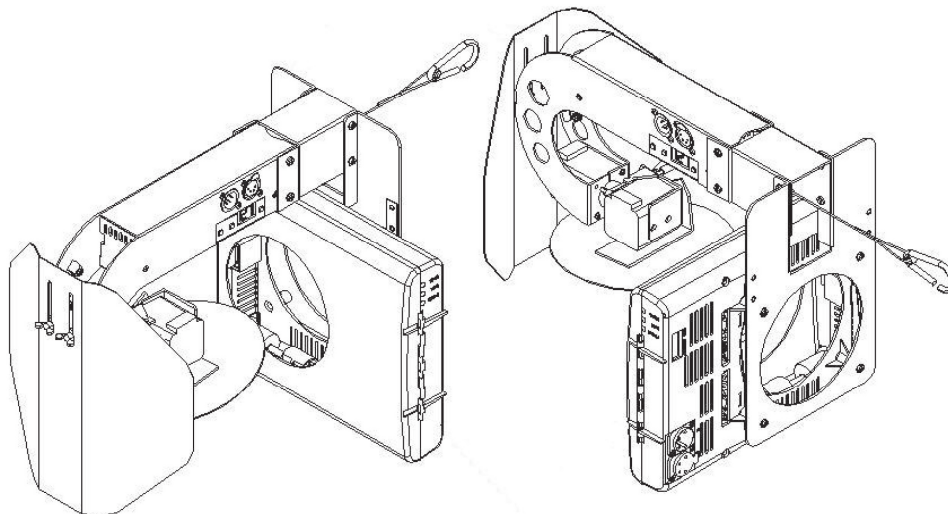


### 3.2 Extension bracket



**EXTENSION BRACKET  
MOUNTING**

### 3.3 Chroma-Q Broadway and Mirror combined



**CHROMA-Q MIRROR USED WITH  
BROADWAY SCROLLER**