

# CITY THEATRICAL

NEW YORK • LONDON

## QolorFLEX® 4x10A Dimmer (5750) User's Manual

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## **System Compliance Information**



The QolorFLEX® 4x10A Dimmer is CE Certified.  
Standards applied:

EN 55203-1: 2009  
EN 55203-2: 2009  
EN 301 489-1 V1.8.1  
EN 301 489-3 V1.4.1  
EN 60950-1:2006 / A1:2010  
FCC Rules, Part 15, Subpart B, Sections 15.107 and 15.109

Products Conform to CE Marking Directive 93/68/EEC

All models are RoHS compliant

## **Safety Notices, Ratings and Power Requirements**

Please read this entire manual before using your new equipment. Please keep the manual in a safe place so you can refer to it in the future as required.

The QolorFLEX 4x10A Dimmer is intended for use only by qualified professionals. Connection, installation and hanging of this equipment must be performed in accordance with all pertinent local, regional and national safety codes and regulations.

The QolorFLEX 4x10A Dimmer is intended for indoor use.

The unit enclosure is rated NEMA 1 / IP20.

Rated operating voltage; 100~240 VAC, 10A max

Maximum operating temperature: 0°C - 40°C.

## **Introduction**

Thank you for using City Theatrical's QolorFLEX 4x10A Dimmer. The QolorFLEX 4x10A Dimmer represents new benchmarks for control features and affordability in a dimmer for use with LEDs, incandescent fixtures, relays, or other devices.

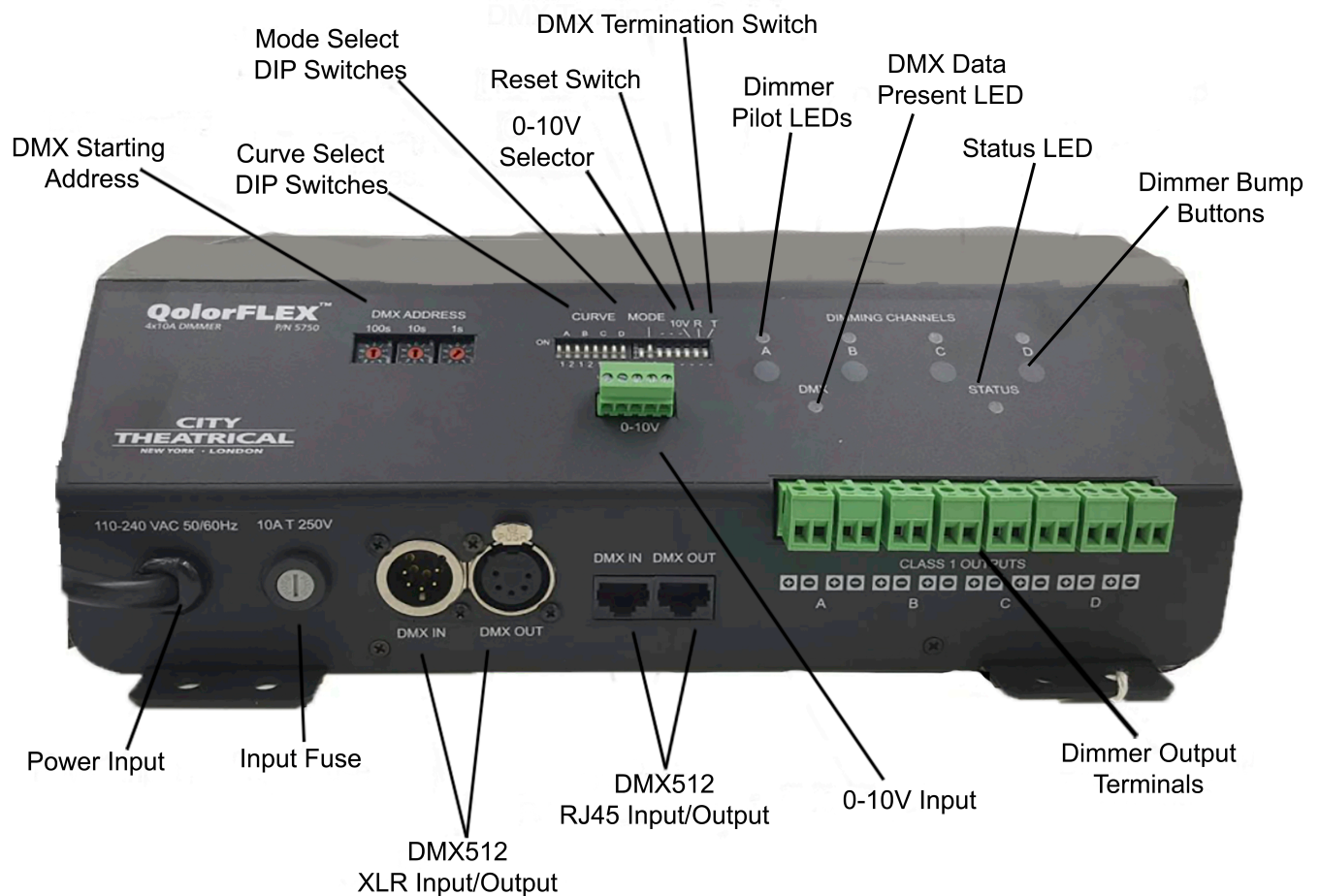
The QolorFLEX 4x10A Dimmer features include:

- Built-in 600W power supply.
- Rotary DMX selector switches.
- Bump buttons
- Channel output indicator lights.
- DMX termination switch.
- DMX present light.
- Status light
- Replaceable input fuse.
- Fuseless outputs.
- XLR DMX512-A and RJ-45 DMX512-A Input/Pass-Thru (Only one input, and one output may be used at the same time).
- RDM responder functions.
- 0-10V control input.

- Detachable terminal block outputs
- Five TV/Film modes
- Six smoothing rates
- NEMA 1 / IP 20 rated enclosure (indoor use)
- Four channel DC Dimmer with two outputs per channel (10 Amps per channel).
- FCC and CE Certified
- Fan Cooled
- Attached power cord
- Mounting

Every effort has been made to anticipate your questions in this manual, but if you have any questions that are not answered here, or you want to discuss a special application, please feel free to contact us directly at City Theatrical.

### **QolorFLEX® 4x10A Front View**





## **Setting up the QolorFLEX® 4x10A Dimmer**

### **Installation**

Install the QolorFLEX 4x10A Dimmer in a suitable location, following the instructions below.

### **Power Connections**

Connect 100 - 240VAC power to the Dimmer using the front facing power input. The Input power is fed to an internal power supply that is protected by the 10A T 250V fuse located next to the power input.

### **Dimmer Output Connections**

The four dimmer channels are labeled "A", "B", "C", and "D". Each channel supports up to two load outputs. If the QolorFLEX 4x10A Dimmer has terminal blocks, connect +VDC to the + (plus) Terminal, and – (minus) VDC to the – Terminal. These terminals will accommodate up to 14 AWG / 1.5mm<sup>2</sup> wire.

### **Overcurrent Protection**

The QolorFLEX 4x10A Dimmer is provided with an external 10A 250V fuse for AC input protection. This fuse is user serviceable. Each dimmer output is provided with fuseless hardware-based overcurrent protection that functions automatically when an overcurrent condition exists. When overload condition is removed, normal operation resumes.

### **DMX512 Input / Output / Termination**

This is a PLASA/ANSI compliant DMX512-A Input / Output. The QolorFLEX 4x10A Dimmer supports five-pin XLR DMX512-A input as well as RJ-45 input which is a lower cost alternative to DMX cable. Once connected, the DMX start address can be changed using the three rotary switches on the front panel of the unit. A single position DIP switch is provided as a DMX termination switch if the unit is at the end of the DMX line. The Termination switch is located at the far right of the DMX Address DIP Switch array and is marked "T". Only one DMX input and one DMX output per 4x10A is permitted.

### **0-10V Input**

The QolorFLEX 4x10A Dimmer supports 0-10V input control. If your 0-10V control supplies voltage, leave the 10V DIP switch in the OFF position. Otherwise put the DIP switch in the ON position so the QolorFLEX 4x10A Dimmer supplies the current to your device. This device is set so the highest input level takes precedence to control the output on the load. Make sure to leave the 10V DIP switch in the off position if you are not using this function. Otherwise your load will be set to maximum because there will be nothing pulling down the current being supplied on the 0-10V screw terminals.

### **User interface**

The QolorFLEX 4x10A Dimmer is provided with a set of switches and LED indicators for configuration and status monitoring:

1. DMX Present LED: Indicates DMX512 Data is being received, blinks if no data is present.
2. Dimmer Pilot Light LEDs: Fade up and down with the dimmer to permit easy monitoring and testing
3. Status LED: Indicates the following error/fault conditions:

Condition	Blink Pattern	Blinks followed by 1sec pause
UNDER VOLTAGE	. . .	1
INVALID DMX ADDRESS	.. ..	2
OUTPUT OVER CURRENT	.... ....	4
INPUT OVER CURRENT	.....	5
OVER TEMP	.....	6
OVER VOLTAGE	.....	7
OUTPUT SHORT CIRCUIT	.....	8

4. Bump Buttons: A bump button is provided for each channel output.
5. Curve Selection DIP Switch (eight position): Select the dimming curve for each of the individual dimmer outputs in the unit. (See page 8)
6. MOD (Mode) Selection DIP Switch (two position): Select the PWM modulation frequency for dimmer channels set to the LED Curve. (See page 8)
7. 10V Dip Switch (one position): Set this to OFF if this function is not in use or if your device provides the voltage for 0-10V control. Otherwise set this to ON.
8. R DIP Switch (one position): Setting this reset switch to ON resets the Dimmer and holds in reset until set to OFF.
9. T Dip Switch (one position): Setting this termination switch to ON connects end-of-line DMX termination.

#### **QolorFLEX® 4x10A Dimmer RDM Parameter IDs**

The QolorFLEX 4x10A Dimmer supports all the mandatory RDM Parameter IDs (PIDs) plus the following PIDs:

PROXIED\_DEVICE\_COUNT  
 PROXIED\_DEVICES\_ENHANCED  
 SUPPORTED\_PARAMETERS  
 PARAMETER\_DESCRIPTION  
 DEVICE\_MODEL\_DESCRIPTION  
 MANUFACTURER\_LABEL  
 DEVICE\_LABEL  
 FACTORY\_DEFAULTS  
 SOFTWARE\_VERSION\_LABEL  
 DMX\_BLOCK\_ADDRESS  
 SENSOR\_DEFINITION  
 SENSOR\_VALUE  
 RECORD\_SENSORS  
 OUTPUT\_RESPONSE\_TIME  
 OUTPUT\_RESPONSE\_TIME\_DESCRIPTION

MODULATION\_FREQUENCY  
MODULATION\_FREQUENCY\_DESCRIPTION  
DMX\_START\_ADDRESS  
SLOT\_INFO  
SLOT\_DESCRIPTION  
SENSOR\_DEFINITION  
SENSOR\_VALUE  
RECORD\_SENSORS  
CURVE  
CURVE\_DESCRIPTION  
IDENTIFY\_DEVICE

To learn more about RDM, a good place to start is the Wikipedia article on RDM (lighting) at: [http://en.wikipedia.org/wiki/RDM\\_\(lighting\)](http://en.wikipedia.org/wiki/RDM_(lighting))

### **DMX addressing**

Set the starting address for the QolorFLEX® 4x10A Dimmer using the DMX Address rotary switch. The switches are labeled as 100's, 10's, and 1's. To set the starting address, simply twist the rotary switches to match the desired starting address, and the remaining three slots are addressed contiguously. The highest starting address that can be set by the rotary switches is limited to 509 in the 4x10A Dimmer.

DMX addressing may also be set using RDM. When RDM is used, the individual dimmer channels may be set independently, and to any DMX address.

Whichever method is used, last takes precedence. The unit maintains the last used setting over power cycles, and checks on power up to see if switches have been changed while the unit was off.

### Selecting Dimmer Curves

The dimming curve can be set individually for each 10A channel output. The QolorFLEX 4x10A Dimmer has an eight position DIP Switch with two positions for each channel output.

Dimmer	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8	Function
A	OFF	OFF	#						Normal Dimming, ISL Curve
	OFF	ON	#						NON - DIM
	ON	OFF	#						Linear Dimming Curve
	ON	ON	#						LED Curve
B			OFF	OFF	#				Normal Dimming, ISL Curve
			OFF	ON	#				NON - DIM
			ON	OFF	#				Linear Dimming Curve
			ON	ON	#				LED Curve
C					OFF	OFF	#		Normal Dimming, ISL Curve
					OFF	ON	#		NON - DIM
					ON	OFF	#		Linear Dimming Curve
					ON	ON	#		LED Curve
D						#	OFF	OFF	Normal Dimming, ISL Curve
						#	OFF	ON	NON - DIM
						#	ON	OFF	Linear Dimming Curve
						#	ON	ON	LED Curve

The LED Curve is the default mode, and is intended for controlling LEDs but may be used for other specialized loads.

The LED Curve Modes have been optimized for flicker free performance in TV and Film applications. All settings have been camera tested with motion picture film and digital cinema cameras. The settings are different to allow compensation for variations in shutter speed and shutter angle. A camera test is recommended to confirm the correct setting has been selected.

The ISL (Inverse Square Law) Curve is intended for incandescent lamp dimming and is similar to a conventional mains-powered lighting dimmer curve. The PWM period for ISL is 60Hz. The NON-DIM function is intended for relays and other devices requiring switched power without PWM dimming.

The Linear Curve is a simple linear scale that can be used to drive DC integrators or other devices where linear response needed. The Linear PWM period is 60Hz.

### **Mode Settings**

The Mode Settings include TV/Film Mode 1 - 4 which are DIP selectable, and TV/Film Mode five which is selectable via RDM only using the MODULATION\_FREQUENCY RDM parameter.

OFF	OFF	TV/Film Mode 1
ON	OFF	TV/Film Mode 2
OFF	ON	TV/Film Mode 3 (Default)
ON	ON	TV/Film Mode 4

The settings are also provided to allow control of other specialized loads (see below). Dimmer curves and Modes may be set manually using the Dimmer Curve and Mode DIP switches or using RDM. Whichever method is used last takes precedence. The unit maintains the last used setting over power cycles, and checks on power up to see if switches have been changed while the unit was off.

### **Smoothing (Dimmer Response Time)**

When the LED Curve is selected, one of six different smoothing settings can be selected using RDM. The smoothing setting determines how quickly the dimmer responds to changes in DMX level. With the fastest smoothing setting (5ms) the dimmer and connected LED loads will respond immediately to any level change. As longer smoothing settings are selected, the dimmer and connected LED loads will “ramp” more smoothly between DMX levels, simulating the delayed response of an incandescent filament lamp. The six Smoothing settings are:

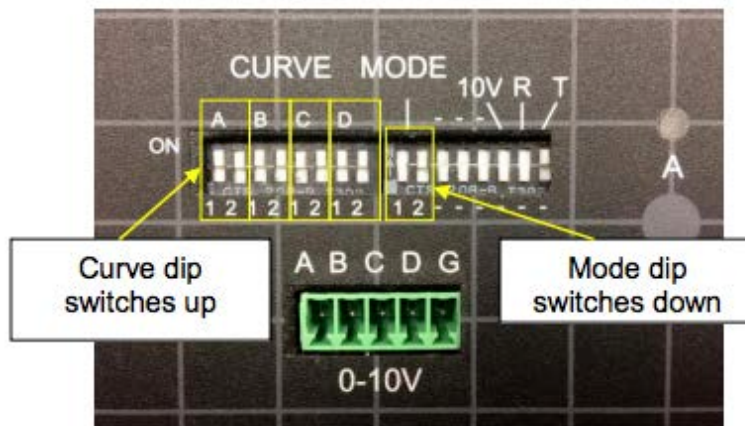
- 5ms
- 10ms
- 50ms
- 100ms (default)
- 200ms
- 400ms

The selected Smoothing setting affects all channels configured with the LED Curve. The default setting is 100ms. The Smoothing (Dimmer Response Time) setting is selected via RDM using the DIMMER\_RESPONSE\_TIME Parameter.

### **Using 4x10A Dimmer with CTI Flicker Candles**

Curve: The Curve must be set to LED, which is both switches 1 & 2 set to ON.

Mode: Must be in TV/Film Mode 1, which is both mode switches in off position.



**Note**

The 4x10A Dimmer is a constant voltage PWM dimmer and so will work with any size LED load that is within the Dimmer's 40A current and 12VDC voltage range. Note that constant voltage dimmers do not compensate for voltage drop in load wiring so care should be taken to optimize load wiring designs by minimizing run length, assuring termination quality, and assuring adequately sized wire is used.

**Appendix A: Using QolorFLEX™ Dimmers with LED Tape**

The CTI 5700 QolorFLEX™ Dimmers have been optimized for use with 12V LED tape. The 4x10A Dimmer can be used with single color, two color (variable white), three color (RGB), or four color (RGBW, RGBA) tape.

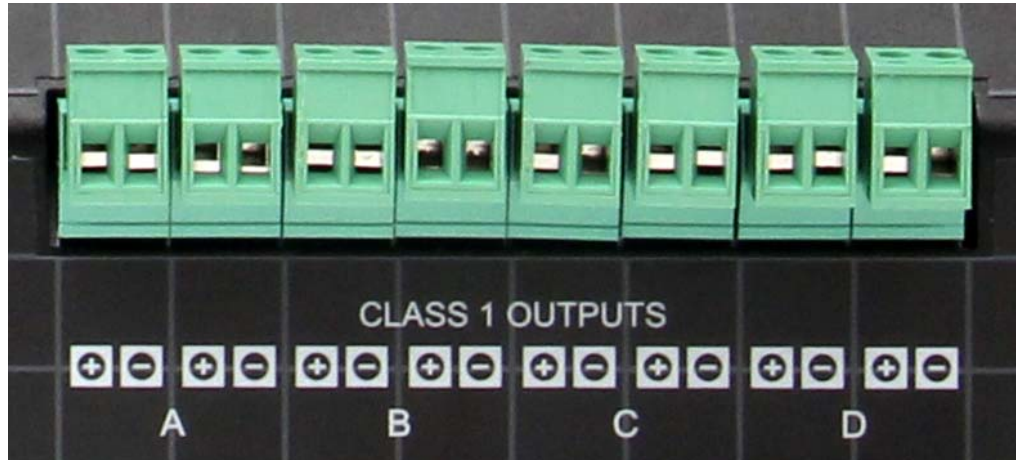
**How much Tape can I use with one QolorFLEX® 4x10A Dimmer?**

LED tape load current varies by brand and style. Use the manufacturer's mA/meter specification figure to determine your load, and distribute your load to assure no more than 10A per 4x10A Dimmer. Consult your tape manufacturer for more information.

**Connecting Single Color Tape**

12 Volt single color tape is provided with a single +VDC circuit and a –VDC circuit.

1. Connect the +VDC circuit to one of the four + output terminals and connect the -VDC circuit to the accompanying – output terminal.
2. Select the LED Curve for each dimmer channel used.
3. If you wish to change the PWM frequency, use RDM or the MOD DIP switch to select the frequency desired.



5750 Output Terminals

### **Connecting Three Color (RGB) or Four Color (RGBW, RGBA) LED Tape**

12 Volt three color LED tape is provided with a single +12VDC circuit and a –VDC circuit for each color.

1. Connect the +12VDC circuit to any one of the eight + output terminals. The + terminals are bussed and provide constant voltage. Note that some tape comes pre-wired with Black wire for the +12VDC circuit while other tape comes pre-wire with White wire.
2. Connect the R, G, and B circuits each to one the eight – output terminals (in the case of four color tape, connect the A or W circuit to the fourth – output terminal).  
– The terminals are the PWM dimmed outputs of the Dimmer. **\*Note that some tape comes with the R, G, and B (and A or W) circuits in a different order than others.**
3. – Output terminals located on the same channel will be controlled by the same DMX address.
4. Select the LED Curve for each dimmer channel used.
5. If you wish to change the PWM frequency, use RDM or the MOD DIP switch to select the frequency desired.

### **QolorFLEX 4x10A Dimmer Specifications**

#### **DMX Control Features**

The QolorFLEX 4x10A Dimmer Includes:

- Rotary switches for DMX addressing.
- 0-10V input control.
- DMX 5-pin XLR terminals for input/Pass-Thru.
- Ethernet Terminals for DMX In/Pass-Thru.
  - **\*Note: a total of one input and one output may be used per 4x10A.**
- Termination switch for end-of line DMX termination.
- RDM Responder functions.

#### **Mechanical**

- Rugged NEMA one Aluminum enclosure surface mounting tabs for wall or deck mounting

#### **Electronic/ Functional**

**Features** All units include:

- Bump buttons
- Rotary switch, DMX Addressing
- DIP Switch, Curve Selection (four choices)
- DIP Switch, LED TV and Film Modes (five choices)
- DIP Switch, 0-10V Input Control Enable (on-off)
- DIP Switch, DMX Termination (on-off)
- LED indicators:
  - Dimmer pilot lights (one for each channel)
  - DMX (data present)
  - Status
- Fan cooled

#### **Other Features**

All units include:

- Four dimmer output channels with two outputs per channel.
  - Max output per dimmer channel 10A ( shared between two outputs).
  - screw terminals

- Max total output per device 40A
- Fully RDM enabled
- Individual DMX addresses
- 100 - 240 VAC input
- 10A T 250V fuse for protection
- Internal power supply (12V, 40A)
- Self healing over current protection
- Individually protected against over-temperature
- Individual bump buttons
- PWM resolution 16-bit
- Dimming Curves
  - Linear, 60Hz
  - ISL, 60Hz
  - Non-Dim
- LED Features:
  - Six variable LED smoothing rates
  - Five TV/Film Modes

**Compliance:**

- ETL Listed to UL508-A
- CE Certified
  - Emissions/Immunity
  - Electrical Safety
  - WEEE
  - Sustainability
  - RoHS Compliant

**CTI Part #s:** 5750 QolorFLEX 4x10A Dimmer

**Power:** 100 - 240 VAC 10A Max Power Input

**Weight:** 6.7 lbs. (3 kg)

**Dimensions:** 12.25" (L) x 8.00" (W) x 4.062" (H) 311mm (L) x 203mm (W) x 103mm (H)