Color Charmer! System

User's Manual

Quick Start

Tired of reading this manual already? In a world of quick serve food and microwave popcorn I am sure you are eager to get your color data broadcasting! Follow these steps to setup the Broadcaster and send your first RF color packets:

(1) Plug the DC barrel plug from the AC/DC adapter into the Color Charmer! Broadcaster DC port. This powers the Broadcaster unit and is required.
(2) Ensure the red power switch on the front face of the Broadcaster is in the off position.
(3) Plug the AC/DC adapter into a power AC outlet. Before plugging in, ensure the AC/DC adapter is rated for the AC power in your region.
(4) Turn the red power switch to the 'on' position. You should see the LCD screen come alive with a blue glow as the Broadcaster boots. The 'PWR OK' LED should also be on.
(5) Use the right, red button below the LCD and navigate to the 'RF Settings' page.
(6) Press the right (or left) button located to the right side of the LCD to turn the 'Enable' setting from 'OFF' to 'ON'.
(7) Press the down button located to the right of the LCD once to highlight 'Tx Power'. Press the right button until the setting is 'Max'. More power! (insert Tim the Tool Man grunt here)
(8) Use the right, red button below the LCD and navigate to the 'Live Painter Manual' page.
(9) Press the right (or left) button located on the right side of the LCD to turn the 'Pwr' settting from 'OFF' to 'ON'. Then navigate using the down button to one of the three colors. On the color of your choice, use the right (or left) button to set the desired intensity. You should see the RGB graph on the left side of the LCD change as you adjust the color values. If you have a Color Charmer! Pendant, turn it on and verify that the Pendant LED is setting to the color indicated on the RGB graph on the LCD.

Color Charmer! Broadcaster Hardware

The Color Charmer! Broadcaster controls from one to thousands of Color Charmer! Pendants via radio frequency signals. The Broadcaster must be setup and configured prior to initiating control of Pendants. If you have been through the Quick Start section, then you are already familiar with the first few tidbits of the setup.

Pop the Top

The Color Chamer! Broadcaster was design to be rugged. The Broadcaster is housed in a durable Pelican case. Unfortunately, our manufacturing process rendered the enclosure no longer waterproof (boo-hoo). When installing the Broadcaster in an environment with high moisture, please take proper precautions to protect the connections to the Broadcaster.

The clear window on the top of the unit allows you to see the LED activity and the current page without opening the lid. Enough gawking already – go ahead and open the lid. Use your thumbs to unlatch and rotate the locking clasp towards you.

LED & Label	What it indicates
Red LED – 'PWR OK'	When the LED is on, it indicates that the ON/OFF switch is in the on position and that the proper DC voltage for circuit operation is being regulated.
Yellow LED – 'DMX Tx/Rx'	Reserved for future use
Green LED – 'RF Tx'	When the LED is on, it indicates that the Broadcaster has turned on the RF transmitter and is sending RF data. This LED may flicker while sending RF data.
Red LED – 'Error'	When the LED is on, it indicates an error has occurred in the Broadcaster.

In the center of the front face is a 128 x 64 monochrome LCD screen with a blue backlight (all at once the crowd went ohhhhhh…..ahhhhh). To compliment the LCD screen, there are two buttons just below it. These buttons are used for turning the 'pages' of the LED screen left and right.

Color Charmer! Broadcaster Software

The Color Charmer! Broadcaster, in a nutshell, is responsible for sending cues to the pendant when the Broadcaster is triggered to send the cue. . There are different types of cue that can be sent to the Color Charmer! Pendant. Each cues describes an action for the Pendant to perform such as blink or solid color or morph from one color to another. These cues have parameters that can be set to adjust the color, the intensity, the speed, etc. When a cue is sent from the Broadcaster it is repeated multiple times to ensure the best probability of the pendant receiving the cue. Of course, for you to operate the Broadcaster you won't need to know the nitty gritty details regarding the inner workings of the device. You only need to be aware of each user controlled setting and how it affects the function of the Broadcaster and Pendant.

The following sections will detail the parameters and data that are displayed on the Broadcaster's LCD screen. Each LCD page consists of three sections. The top of the LCD page displays the title for identifying the settings and data shown. The bottom of the each LCD page has an icon bar for displaying system status at a glance. The center of each LCD page contains the user controlled parameters and the data displays.

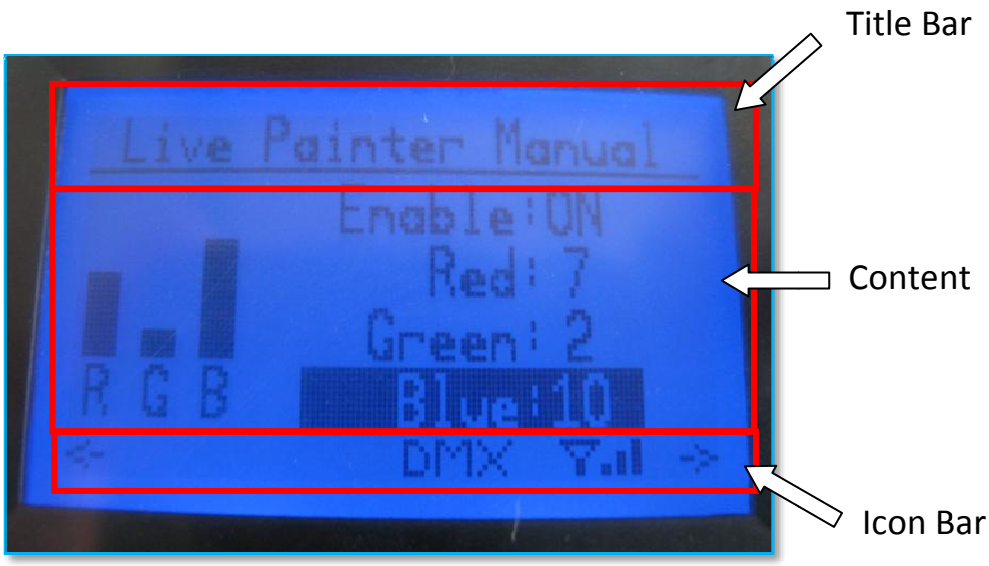

Image 1: 3 distinct area of the LCD screen

Note that there are various parameters that are set by the user. These parameters are stored in non-volatile memory. The parameters will be stored in the Broadcasters EEPROM even if power is removed from the device. Each time the Broadcaster is booted, the parameters are retrieved from the EEPROM and restored. If you would like to return the system to its default state, please see the System Settings Page.

Initialization Page & Title Page

When the Broadcaster is first turned on, the system will initialize. The Color Charmer! logo and progress bar will be display momentarily on the LCD screen. Once the progress bar is filled indicating that all initialization is complete, the title page will be displayed.

Image 2: Initialization Page, seen upon switching the Broadcaster on

Image 3: Title Page, seen once initialization has finished. Your software version number may vary.

The title page has two purposes. One purpose is to have a logical place to display the version of the firmware the system is running. The other purpose is to display the Color Charmer! logo so that we may burn the brand into your mind.

Pressing the right or left navigational buttons will turn the page to the respective right or left.

RF Settings

Navigating to the right of the Title page will be the RF Settings page.

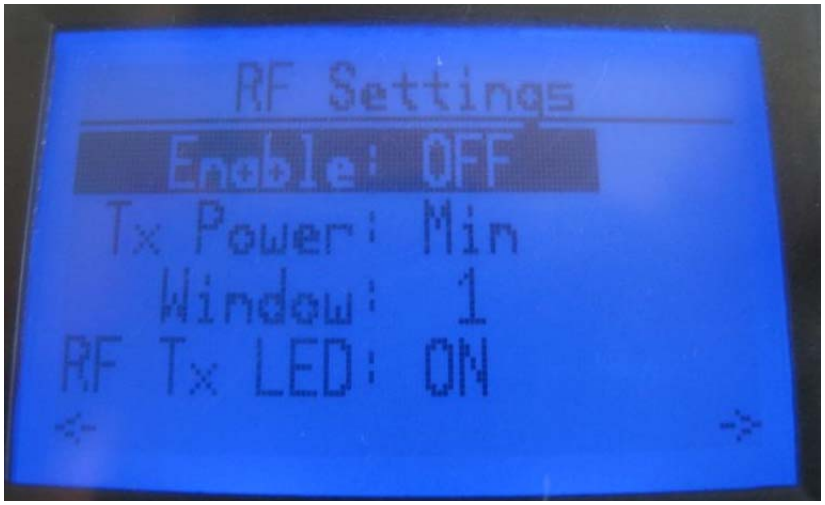

Image 4: RF Settings Page

The RF Settings page contains four user configurable parameters. Use the up/down buttons located to the right of the display to move the cursor up and down. Use the left/right buttons to manipulate the highlighted setting.

Setting Name	Setting Values: Function
Enable	OFF, ON: When the 'Enable' is turned on, the radio frequency transmitter will be enabled to send data to the Color Charmer! Pendant when there is data to send. Note that an antenna icon is shown on the icon bar at the bottom of the screen when the 'Enable' is 'ON'. Also note that the transmitter will only turn on when there is data to send, this can be seen from the RF Tx LED.

<table>
<tr><td>Tx Power</td><td>Min, Mid-lo, Mid-hi, Max: The radio frequency transmitter can be configured to four different power levels. The approximate range of each power level is described in the table below. Note that with any RF equipment, the range varies based on line of sight/physical obstructions and outside interference.

<table>
<tr><th>Power</th><th>~Range</th><th>Tolerance</th></tr>
<tr><td>Min</td><td>25 M</td><td>+20/-10 M</td></tr>
<tr><td>Mid-lo</td><td>50 M</td><td>+/- 15 M</td></tr>
<tr><td>Mid-hi</td><td>75 M</td><td>+/- 15 M</td></tr>
<tr><td>Max</td><td>105 M</td><td>+/- 15 M</td></tr>
</table>

Note that there are ‘bars’ shown on the icon bar at the bottom of the screen indicating the power level set by this parameter.</td></tr>
<tr><td>Window</td><td>1, 2, 3: Reserved for future use</td></tr>
<tr><td>RF Tx LED</td><td>This setting allows the user to ‘blackout’ the flickering RF Tx LED. When this setting is ON, the LED will flicker (or be solid) when sending RF packets. When off, the LED will be off even if RF packets are being sent.</td></tr>
</table>

Table 2: RF Settings user configurable parameters

System Settings Page

The last of the ‘settings’ pages is the System Settings page.

Image 5: System Settings Page

The System Settings page contains three user configurable parameters. Use the up/down buttons located to the right of the display to move the cursor up and down. Use the left/right buttons to manipulate the highlighted setting.

Setting Name	Setting Values: Function
Backlight	OFF, ON: When 'ON', the LCD will glow with a techno-cool blue color. When 'OFF' the LCD will not have any backlight and may only be readable in a well light environment.
Contrast	0 ->63: The contrast adjusts how dark the characters appear on the LCD screen. If you are having trouble reading the display at its default setting of 40, we recommend adjusting the contrast until the characters pop off the screen at you. Note that the contrast should be in the range of 32 to 50 for best viewing.
Defaults	NO, YES: changing this setting to 'YES'and leaving it on 'YES' for four seconds will cause all user configured parameters to restore to their default state.

Live Painter Manual Page

This page allows for manual control of the color intensity by the user (that's you)..

Image 6: Live Painter Manual Page

The Live Painter Manual page contains four user configurable parameters on the right and an RGB vertical bar graph on the left. Use the up/down buttons located to the right of the display to move the cursor up and down. Use the left/right buttons to manipulate the highlighted setting.

This page is titled 'Manual' because when the 'Enable' is turned to 'ON' the Broadcaster will only send cues when there is a new color value to update on the pendant. The color values are determined by what you enter for each corresponding parameter. The 'Enable' will remain 'ON' until it is turned to 'OFF' or until you navigate to a different page.

Setting Name	Setting Values: Function
Enable	OFF, ON: When 'ON', the Broadcaster will prepare to send a Live Painter RF packet. The packet will only be sent when the color parameters are changed and the packet will be sent with an ID Code of 0 (broadcast to all pendants) If you have a Pendant and it is turned on, the LED intensities should match that shown on RGB vertical bar graph.
Red	0 ->15: This parameter adjusts the intensity of the red LED on the Color Chamer! Pendant. When the color value is changed, a new Live Painter RF packet will be sent. 0 is off and 16 is max brightness.
Green	0 ->15: This parameter adjusts the intensity of the green LED on the Color Chamer! Pendant. When the color value is changed, a new Live Painter RF packet will be sent. 0 is off and 16 is max brightness.
Blue	0 ->15: This parameter adjusts the intensity of the blue LED on the Color Chamer! Pendant. When the color value is changed, a new Live Painter RF packet will be sent. 0 is off and 16 is max brightness.

Table 4: Live Painter Manual user configurable parameters

Note that configuration set on the Live Painter Manual page are *not* saved in non-volatile memory and will be reset when power is cycled on the Color Charmer! Broadcaster.

Solid Color Page

This page allows the user to test the solid color command that can be sent to the Pendant. This page is only used for testing purposes when DMX is not available and the Solid Color command is currently not able to be called from DMX. At first thought this command may seem similar to the Live Painter command. The main difference here is that instead of a red, green, blue value being specified, an 8-byte value is specified to call a color from a table of 256 values. In other words, there are preprogrammed colors in the Color Charmer! Pendant that can be called up. See further on in the manual for information regarding the table.

Image 7: Solid Color Page

The Solid Color page contains three user configurable parameters on the right and an RGB vertical bar graph on the left. Use the up/down buttons located to the right of the display to move the cursor up and down. Use the left/right buttons to manipulate the highlighted setting.

When this command has the 'Enable' turned 'ON' it will prepare to send RF packets to the Pendant. When a parameter is changed, an updated RF packet will be sent.

Setting Name	Setting Values: Function
Enable	OFF, ON: When 'ON', the Broadcaster will prepare to send a Solid Color RF packet. The packet will only be sent when the other parameters are changed. If you have a Pendant and it is turned on, the LED intensities should match that shown on RGB vertical bar graph. Note that only a table look up value is sent to the Pendant and the color table is contained inside the Pendant. There is a similar color table inside the Broadcaster that updates the RGB vertical bar graph.
ID Code	0 -> 200: This parameter is used to determine which Pendants will receive the Solid Color RF packet. 0 indicates a broadcast mode where all Pendants in receiving range will process and display the color data sent via RF. The value 1 to 200 represents a unique address and only Pendants with a corresponding ID Code will receive and process the packet. For example, if the ID Code is set to 4, only Pendants whose ID Code is 4 will process the message. Note that Pendant ID Codes are set at the factory.

Color Tbl	0 ->255: This parameter is the index of a table of 256 RGB color configurations. See further on in this manual for the color table.

Table 5: Solid Color user configurable parameters

Note that configuration set on the Solid Color page are *not* saved in non-volatile memory and will be reset when power is cycled on the Color Charmer! Broadcaster.

Blink 2 Colors Page

This command is similar to the Solid Color command in that it is used for testing the Color Charmer! Pendant when no DMX is available. This page is only used for testing purposes only. The Blink 2 Colors command takes various parameters and sends them to the pendant and the pendant begins blinking. If using the Live Painter command to achieve the same look, a constant stream of data for changing colors needs to be sent, with the Blink 2 Colors command only one command needs to be sent and the Pendant takes charge after that.

Image 8: Blink 2 Colors Page

The Blink 2 Colors page contains seven user configurable parameters. Use the up/down buttons located to the right of the display to move the cursor up and down. Use the left/right buttons to manipulate the highlighted setting.

When this command has the ‘Enable’ turned ‘ON’ it will prepare to send RF packets to the Pendant. When a parameter is changed, an updated RF packet will be sent.

Setting Name	Setting Values: Function
Enable	OFF, ON: When ‘ON’, the Broadcaster will prepare to send a Blink 2 Colors RF packet. The packet will only be sent when the other parameters are changed.
ID Code	0 -> 200: This parameter is used to determine which Pendants will receive the Blink 2 Colors RF packet. 0 indicates a broadcast mode where all Pendants in receiving range will process and display the color data sent via RF. The value 1 to 200 represents a unique address and only Pendants with a corresponding ID Code will receive and process the packet. For example, if the ID Code is set to 4, only Pendants whose ID Code is 4 will process the message. Note that Pendant ID Codes are set at the factory.
Clr On (Color On)	0 ->255: This parameter is the index of a table of 256 RGB color configurations that is display when the blink is considered to be on. See further on in this manual for the color table.
Clr Off (Color Off)	0 ->255: This parameter is the index of a table of 256 RGB color configurations that is display when the blink is considered to be off. See further on in this manual for the color table.

<table>
<tr><td>TOn (Time on)</td><td>0 ->15: This parameter is an index value into a table to specify how long to display the on color. The timing of the parameters is shown below.

<table><tr><th>TOn</th><th>Time (sec)</th></tr><tr><td>0</td><td>0.1</td></tr><tr><td>1</td><td>0.25</td></tr><tr><td>2</td><td>0.5</td></tr><tr><td>3</td><td>1.0</td></tr><tr><td>4</td><td>1.5</td></tr><tr><td>5</td><td>2.0</td></tr><tr><td>6</td><td>2.5</td></tr><tr><td>7</td><td>3.0</td></tr><tr><td>8</td><td>3.5</td></tr><tr><td>9</td><td>4.0</td></tr><tr><td>10</td><td>4.5</td></tr><tr><td>11</td><td>5.0</td></tr><tr><td>12</td><td>5.5</td></tr><tr><td>13</td><td>6.0</td></tr><tr><td>14</td><td>6.5</td></tr><tr><td>15</td><td>7.0</td></tr></table></td></tr>
<tr><td>TOff (Time off)</td><td>0 ->15: This parameter is an index value into a table to specify how long to display the off color. The timing of the parameters is shown below.

<table><tr><th>TOn</th><th>Time (sec)</th></tr><tr><td>0</td><td>0.1</td></tr><tr><td>1</td><td>0.25</td></tr><tr><td>2</td><td>0.5</td></tr><tr><td>3</td><td>1.0</td></tr><tr><td>4</td><td>1.5</td></tr><tr><td>5</td><td>2.0</td></tr><tr><td>6</td><td>2.5</td></tr><tr><td>7</td><td>3.0</td></tr><tr><td>8</td><td>3.5</td></tr><tr><td>9</td><td>4.0</td></tr><tr><td>10</td><td>4.5</td></tr><tr><td>11</td><td>5.0</td></tr><tr><td>12</td><td>5.5</td></tr><tr><td>13</td><td>6.0</td></tr><tr><td>14</td><td>6.5</td></tr><tr><td>15</td><td>7.0</td></tr></table></td></tr>
<tr><td>Rpt</td><td>0, 1->255: This parameter specifies how many times the blink pattern occurs. A value of 0 indicates that the blink pattern should occur indefinitely until another command is received. A value of 1 to 255 is the number of times to perform the blink pattern. Note, a value of 1 to 255 will cause the blink pattern to occur and ignore all other commands until the blink pattern is finished.</td></tr>
</table>

Table 6: Blink 2 Colors user configurable parameters

2 Color Morph Page

This command is similar to the Solid Color and Blink 2 Color command in that it is used for testing the Color Charmer! Pendant when no DMX is available. This page is only used for testing purposes only. 2 Color Morph command takes various parameters and sends them to the pendant and the pendant then handles the details of morphing or fading colors. If using the Live Painter command to achieve the same look, a constant stream of data for changing colors needs to be sent, with the 2 Color Morph command only one command needs to be sent and the Pendant takes charge after that.

Image 9: 2 Color Morph Page

The 2 Color Morph page contains eight user configurable parameters. Use the up/down buttons located to the right of the display to move the cursor up and down. Use the left/right buttons to manipulate the highlighted setting.

When this command has the 'Enable' turned 'ON' it will prepare to send RF packets to the Pendant. When a parameter is changed, an updated RF packet will be sent.

<table>
<tr><th>Setting Name</th><th>Setting Values: Function</th></tr>
<tr><td>Enable</td><td>OFF, ON: When ‘ON’, the Broadcaster will prepare to send a 2 Color Morph RF packet. The packet will only be sent when the other parameters are changed.</td></tr>
<tr><td>ID Code</td><td>0 -> 200: This parameter is used to determine which Pendants will receive the 2 Color Morph RF packet. 0 indicates a broadcast mode where all Pendants in receiving range will process and display the color data sent via RF. The value 1 to 200 represents a unique address and only Pendants with a corresponding ID Code will receive and process the packet. For example, if the ID Code is set to 4, only Pendants whose ID Code is 4 will process the message. Note that Pendant ID Codes are set at the factory.</td></tr>
<tr><td>Clr 1 (Color 1)</td><td>0 ->255: This parameter is the index of a table of 256 RGB color configurations that is display when the morph is in color 1 stage or the start of the morph. See further on in this manual for the color table.</td></tr>
<tr><td>Tim1c (Time to change from Color 1)</td><td>0 ->15: This parameter is an index value into a table to specify how long to take to change into Color 1. The timing of the parameters is shown below.
<table>
<tr><th>TOn</th><th>Time (sec)</th></tr>
<tr><td>0</td><td>0.5</td></tr>
<tr><td>1</td><td>1.0</td></tr>
<tr><td>2</td><td>1.5</td></tr>
<tr><td>3</td><td>2.0</td></tr>
<tr><td>4</td><td>2.5</td></tr>
<tr><td>5</td><td>3.0</td></tr>
<tr><td>6</td><td>3.5</td></tr>
<tr><td>7</td><td>4.0</td></tr>
<tr><td>8</td><td>4.5</td></tr>
<tr><td>9</td><td>5.0</td></tr>
<tr><td>10</td><td>5.5</td></tr>
<tr><td>11</td><td>6.0</td></tr>
<tr><td>12</td><td>6.5</td></tr>
<tr><td>13</td><td>7.0</td></tr>
<tr><td>14</td><td>7.5</td></tr>
<tr><td>15</td><td>8.0</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>Tim1w (Time to hold on Color 1 before changing)</td><td>0 ->15: This parameter is an index value into a table to specify how long to display color 1 before changing. The timing of the parameters is shown below.

<table><tr><th>TOn</th><th>Time (sec)</th></tr><tr><td>0</td><td>0.5</td></tr><tr><td>1</td><td>1.0</td></tr><tr><td>2</td><td>1.5</td></tr><tr><td>3</td><td>2.0</td></tr><tr><td>4</td><td>2.5</td></tr><tr><td>5</td><td>3.0</td></tr><tr><td>6</td><td>3.5</td></tr><tr><td>7</td><td>4.0</td></tr><tr><td>8</td><td>4.5</td></tr><tr><td>9</td><td>5.0</td></tr><tr><td>10</td><td>5.5</td></tr><tr><td>11</td><td>6.0</td></tr><tr><td>12</td><td>6.5</td></tr><tr><td>13</td><td>7.0</td></tr><tr><td>14</td><td>7.5</td></tr><tr><td>15</td><td>8.0</td></tr></table></td></tr>
<tr><td>Clr 2 (Color 2)</td><td>0 ->255: This parameter is the index of a table of 256 RGB color configurations that is display when the morph is in color 1 stage or the start of the morph. See further on in this manual for the color table.</td></tr>
</table>

FCC NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.