

ETC Installation Guide

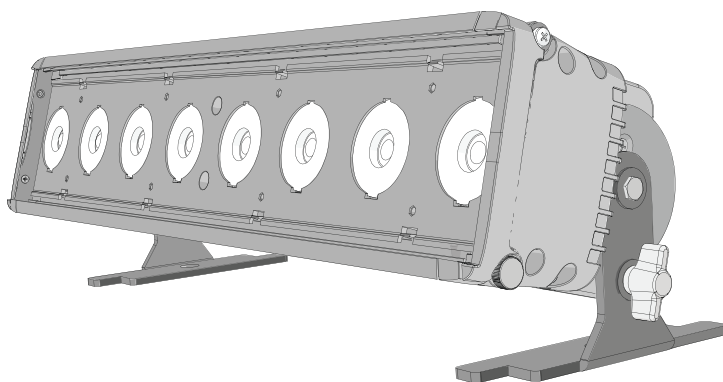
ColorSource Linear Pearl v1.7

Overview

The ColorSource Linear Pearl is an affordable LED fixture that provides a bright, variable white light.

The fixture is available in three lengths:

- ColorSource Linear Pearl 1 (0.5 meter)
- ColorSource Linear Pearl 2 (1 meter)
- ColorSource Linear Pearl 4 (2 meter)



Note: Features described in this document require the latest version of software. For information on updating fixture software, see [Update the Fixture Software on page 16](#).



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Safety

For professional use only. Read the entire manual before using this equipment.



CAUTION:

- *Risk of eye injury. Do not stare directly into the light.*
- *Do not operate in proximity to flammable materials.*



WARNING: Disconnect the fixture from power and DMX and allow it to cool before performing any cleaning and maintenance.

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- Do not use outdoors.
- Do not let power supply cords touch hot surfaces.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than intended use.

SAVE THESE INSTRUCTIONS



Note: *The light source in this luminaire is not user-replaceable, and must be replaced only by a qualified technician. Contact ETC Customer Support for assistance.*

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CAUTION: *Prolonged use of some lenses may cause the lenses to degrade. See the ColorSource Linear Pearl datasheet at etcconnect.com for more information.*

Environment

The ColorSource Linear Pearl operates in ambient temperatures of 0°C–40°C and comes with a variable-speed fan. The ColorSource Linear Pearl is for indoor use only.

- Maximum recommended ambient operating temperature: $T_a = 40^{\circ}\text{C}$ (104°F)
- Maximum anticipated external surface temperature at 40°C ambient: $T_{\text{max}} = 80^{\circ}\text{C}$ (176°F)
- External temperatures after 5 minutes of full-brightness operation at 25°C (77°F) ambient: 36°C (97°F) for Linear 1 and Linear 2; 37°C (99°F) for Linear 4
- External Temperature (steady state achieved) at 25°C (77°F): 58°C (136°F) for Linear 1; 53°C (127°F) for Linear 2 and Linear 4

Electrical

- Operates between 100 V and 240 VAC at a frequency of 50/60 Hz.
- Maximum power consumption:
 - Linear 1: 120 W
 - Linear 2: 240 W
 - Linear 4: 480 W
- Up to 9 cells (0.5 m segments) may be linked via power thru connector.
- Up to 10 cells (0.5 m segments) total per circuit when used with an R20 Relay Module or Unison Echo Relay Panel. Consult breaker trip curves when used with other equipment. Requires power from a non-dimmable source.
- Inrush (Linear 1/Linear 2/Linear 4):
 - 120 V: 35 A/35.6 A/67.5 A (first half-cycle)
 - 240 V: 49 A/85.6 A/153 A (first half-cycle)

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Typical Power Consumption

Linear 1	100 V		120 V		230 V	
	Power	Current	Power	Current	Power	Current
Idle	1.51 W	0.03 A	1.49 W	0.03 A	1.36 W	0.03 A
Direct at Full	114.6 W	1.15 A	113.6 W	0.95 A	111.6 W	0.50 A

Linear 2	100 V		120 V		230 V	
	Power	Current	Power	Current	Power	Current
Idle	2.87 W	0.06 A	3.01 W	0.06 A	2.58 W	0.06 A
Direct at Full	221 W	2.22 A	218.6 W	1.83 A	214.1 W	0.96 A

Linear 4	100 V		120 V		230 V	
	Power	Current	Power	Current	Power	Current
Idle	5.33 W	0.11 A	5.32 W	0.11 A	4.66 W	0.11 A
Direct at Full	447 W	4.53 A	443.8 W	3.74 A	431 W	1.92 A

Accessories

You can use several half-meter optional accessories with ColorSource Linear Pearl fixtures, including:

- Secondary lenses (horizontal, vertical, and round)
- Barn doors (7414K1020)
- Louver (7414K1019)

For information on installing secondary lenses, see [Install Secondary Lenses on page 17](#).

Accessories for Linear 2 and Linear 4

For the Linear 2 and Linear 4 fixtures, order one accessory for each 0.5 meter segment (cell) of the fixture. For example, for a Linear 2 fixture, order two barn door accessory kits to fit the full length of the fixture.

Spacers for secondary lenses are included with the fixture. Use these spacers to hold the accessories in position when multiple lenses are used in the Linear 2 and Linear 4 fixtures. The spacers are positioned between the 0.5 meter lenses.

Contact your local dealer for more information.

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Installation

Mounting

The ColorSource Linear Pearl ships with a pair of floor trunnions for mounting.



Note: *Ensure that the trunnions are installed with the feet inward so that fixtures can be lined up end-to-end, if needed.*

You also have the option of using clamps with the trunnions to hang the fixture. Attach the clamps to the holes in the trunnion feet (see figure on [page 5](#)).

The ColorSource Linear 1 has two additional mounting options. Contact your local dealer for more information.

- Yoke with C-clamp (7414K1017)
- Double yoke with C-clamp for mounting two fixtures (7414K1018)

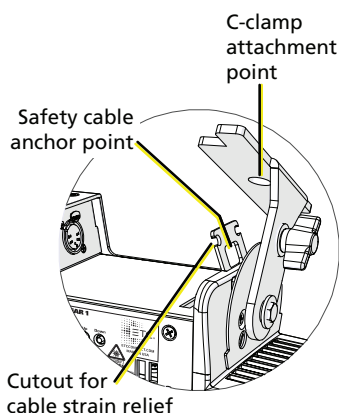
Safety Cable

Two safety cable anchor points are provided on the fixture housing.

The anchor points also include two cutouts that can be used for cable strain relief.

Connectors

- **Power:** Two powerCON[®] connectors for power in and thru
- **Data (DMX512/RDM):** Two five-pin XLR connectors OR two RJ45 connectors for data in and thru



Conversion cables are available from ETC. Please contact your ETC customer service representative and request part number W6538 for RJ45 to female XLR or part number W6539 for RJ45 to male XLR.

Connector locations

- **Linear 1:** Power connectors on one side of the fixture and data connectors on the other
- **Linear 2 and Linear 4:** Power and data connectors on each end (to facilitate daisy-chaining)

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Note: *This fixture is not Ethernet/data network compatible.*



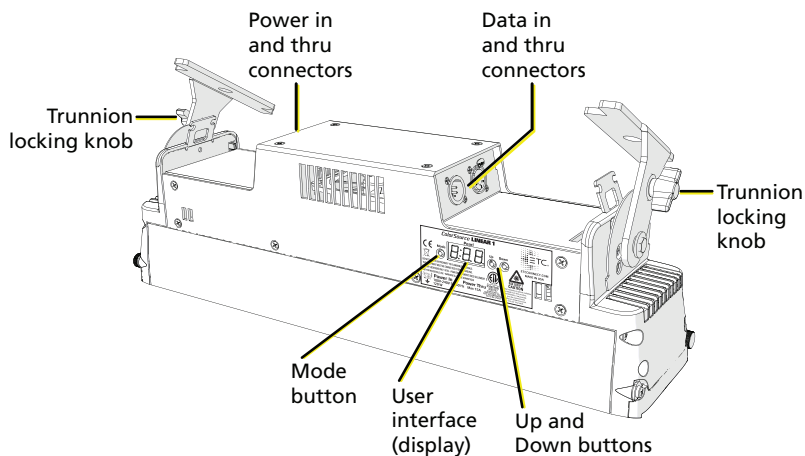
Note: *The ColorSource Linear Pearl is not self terminating. You must terminate the last fixture in line with a 120 Ohm resistor. XLR terminators are not available from ETC.*

To purchase an RJ45 terminator, please contact ETC customer service and request part number N4086.

Set Up the Fixture

See the fixture illustrations below and on the following page for reference.

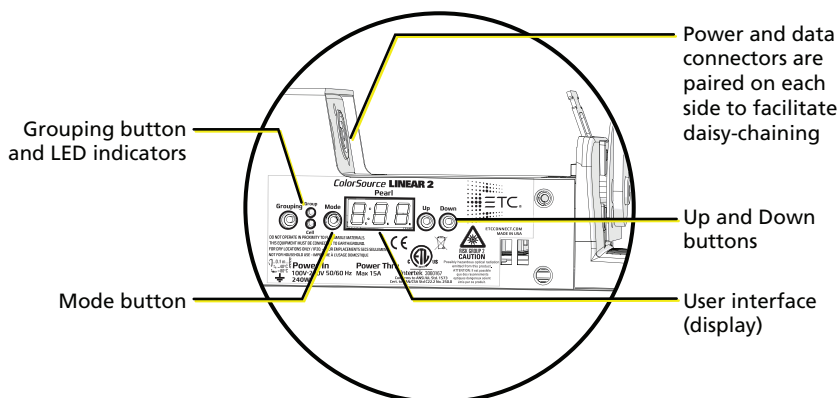
1. Plug the power cord into the powerCON In connector on the rear of the fixture.
2. Make any power-thru cable connections prior to applying a power source.
3. Make any DMX connections, and if the fixture is the last in a DMX line, terminate the fixture. See [Connectors on the previous page](#).
4. Plug the power cord into the power source.



Linear 1

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Linear 2 and Linear 4

Power Up

Press any button to wake the display. The display shows the DMX address. See [Set the DMX Address below](#).

You can press the **Mode** button to access the Presets menu. See [Play Presets on page 14](#).

Adjust the Tilt

The fixture can be tilted up and down as needed.

1. Loosen, but do not remove the two trunnion locking knobs.
2. Tilt the fixture to the desired angle.
3. Tighten the trunnion locking knobs.

Set the DMX Address

1. Press any button to wake the display. The display shows the DMX address.
2. Use the **Up** and **Down** buttons to select the DMX address for the fixture.

You can also use RDM for DMX addressing. See [Use RDM](#).

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Change the DMX Control Mode

You can set the DMX control mode for the fixture to one of three available mode options.

1. Press any button to wake the display. The display shows the DMX address.
2. Press and hold the **Mode** button for 3 seconds. The display shows the current DMX control mode.
3. Press the **Up** button or **Down** button to change the DMX control mode:
 - **ct**: Variable color temperature (intensity or color temperature). This is the default mode.
 - **d ir**: Direct emitter control (intensity, warm white, cool white, strobe).
 - **lch**: 1-channel mode controls the intensity of preset 1 (defaults to 3000 K White).
4. Press the **Mode** button to confirm your selection.

The display will automatically return to the DMX address after 10 seconds of inactivity, and edits to the DMX control mode will not be saved. This cancels unsaved changes.

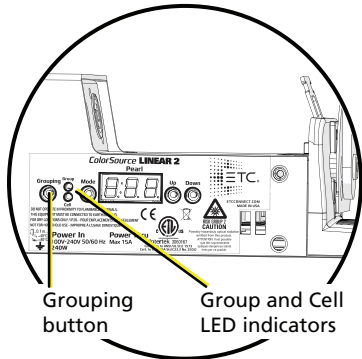
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Set the Grouping Mode

The ColorSource Linear 2 and the ColorSource Linear 4 fixtures have two Grouping modes:

- **Group:** Entire array functions as a single fixture.
- **Cell:** Each 0.5 m segment (or “cell”) of the array functions as a distinct fixture with a separate DMX start address.



To set the Grouping mode, press the **Grouping** button until the LED indicator for the chosen mode illuminates.

In Cell mode, each cell is assigned a DMX address based on the DMX address of the fixture (see [Set the DMX Address on page 7](#)) and the current DMX control mode (see [Change the DMX Control Mode on the previous page](#)). For example, if you set the DMX address on the fixture to 100, set the DMX mode to Variable Color Temperature, and set the Grouping mode to Cell, the starting DMX address of the first cell will be 100 and the starting DMX address of the second cell will be 102.

DMX Control Channels

Linear 1 and Linear 2/Linear 4 in Group Mode

DMX Channel	ct (Variable Color Temperature)	dir (Direct)	lch (1 Channel)
1	Intensity	Intensity	Intensity
2	Color temperature	Warm white	
3		Cool white	
4		Strobe*	

*Use DMX values of 0 or 255 for no strobe. Use values of 1–254 to increase the strobe rate from 1 per second up to 33 per second.

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Linear 2 in Cell Mode

DMX Channel	Cell (Variable Color Temperature)		Direct (Direct)	1 Channel (1 Channel)	
1	Cell 1	Intensity	Cell 1	Intensity	Cell 1 Intensity
2		Color temperature		Warm white	Cell 2 Intensity
3	Cell 2	Intensity		Cool white	
4		Color temperature		Strobe*	
5			Cell 2	Intensity	
6				Warm white	
7				Cool white	
8				Strobe*	

*Use DMX values of 0 or 255 for no strobe. Use values of 1–254 to increase the strobe rate from 1 per second up to 33 per second.

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Linear 4 in Cell Mode

DMX Channel	c t (Variable Color Temperature)		d ir (Direct)		lch (1 Channel)	
1	Cell 1	Intensity	Cell 1	Intensity	Cell 1	Intensity
2		Color temperature		Warm white	Cell 2	Intensity
3	Cell 2	Intensity		Cool white	Cell 3	Intensity
4		Color temperature		Strobe*	Cell 4	Intensity
5	Cell 3	Intensity	Cell 2	Intensity		
6		Color temperature		Warm white		
7	Cell 4	Intensity		Cool white		
8		Color temperature		Strobe*		
9			Cell 3	Intensity		
10				Warm white		
11				Cool white		
12				Strobe*		
13			Cell 4	Intensity		
14				Warm white		
15				Cool white		
16				Strobe*		

*Use DMX values of 0 or 255 for no strobe. Use values of 1–254 to increase the strobe rate from 1 per second up to 33 per second.

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Color Temperature DMX Values

The table below shows the color temperature value for each DMX value when using the **ct** DMX control mode. Note that although DMX address 0 = 3200 and DMX address 255 = 5600, the fixture supports a range of color temperatures from 2725 to 6450.

Color Temp	DMX Value	Color Temp	DMX Value	Color Temp	DMX Value
3200	0–1	3325	43	3950	85
2725	2–3	3350	44–45	3975	86–87
2750	4–5	3375	46–47	4000	88–89
2775	6	3400	48	4025	90
2800	7–8	3425	49–50	4050	91–92
2825	9–10	3450	51–52	4075	93–94
2850	11	3475	53	4100	95
2875	12–13	3500	54–55	4125	96–97
2900	14–15	3525	56–57	4150	98–99
2925	16	3550	58	4175	100–101
2950	17–18	3575	59–60	4200	102
2975	19–20	3600	61–62	4225	103–104
3000	21	3625	63	4250	105–106
3025	22–23	3650	64–65	4275	107
3050	24–25	3675	66–67	4300	108–109
3075	26	3700	68–69	4325	110–111
3100	27–28	3725	70	4350	112
3125	29–30	3750	71–72	4375	113–114
3150	31	3775	73–74	4400	115–116
3175	32–33	3800	75	4425	117
3200	34–35	3825	76–77	4450	118–119
3225	36–37	3850	78–79	4475	120–121
3250	38	3875	80	4500	122
3275	39–40	3900	81–82	4525	123–124

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Color Temp	DMX Value
3300	41–42
4575	127
4600	128–129
4625	130–131
4650	132–133
4675	134
4700	135–136
4725	137–138
4750	139
4775	140–141
4800	142–143
4825	144
4850	145–146
4875	147–148
4900	149
4925	150–151
4950	152–153
4975	154
5000	155–156
5025	157–158
5050	159
5075	160–161
5100	162–163
5125	164–165
5150	166
5175	167–168
5200	169–170

Color Temp	DMX Value
3925	83–84
5225	171
5250	172–173
5275	174–175
5300	176
5325	177–178
5350	179–180
5375	181
5400	182–183
5425	184–185
5450	186
5475	187–188
5500	189–190
5525	191
5550	192–193
5575	194–195
5600	196–197
5625	198
5650	199–200
5675	201–202
5700	203
5725	204–205
5750	206–207
5775	208
5800	209–210
5825	211–212
5850	213

Color Temp	DMX Value
4550	125–126
5875	214–215
5900	216–217
5925	218
5950	219–220
5975	221–222
6000	223
6025	224–225
6050	226–227
6075	228–229
6100	230
6125	231–232
6150	233–234
6175	235
6200	236–237
6225	238–239
6250	240
6275	241–242
6300	243–244
6325	245
6350	246–247
6375	248–249
6400	250
6425	251–252
6450	253
5600	254–255

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Data Loss Behavior

When DMX data is lost, the fixture does one of the following actions:

- If you selected a preset or sequence, that preset or sequence automatically plays.
- If no preset or sequence is active in the background, the fixture goes dark and the DMX start address flashes on the user interface.

Play Presets

When a Linear 2 or Linear 4 fixture is in Cell mode, you can re-record a preset with each cell having a distinct set of values. See [Set the Grouping Mode on page 9](#).

1. Press the Mode button to activate the Presets menu. The last active preset plays automatically.(If DMX data is present, the current preset plays in the background and DMX data continues to take priority.)
2. Press the Up button or Down button as needed to scroll through the available presets.
3. To stop the selected preset, press the Mode button a second time. The display will revert to show the DMX start address.

Pre-configured Presets

Preset	Name
1	3000 K White
2	3200 K White
3	3500 K White
4	4000 K White
5	4200 K White
6	4500 K White

Preset	Name
7	4700 K White
8	5000 K White
9	5200 K White
10	5600 K White
11	6000 K White
12	6450 K White

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Re-record Presets

1. Using DMX, set the desired levels for the new preset.
2. Press the Mode button to access the Presets menu.
3. Press the Up button or Down button to navigate to the preset number that you want to re-record.
4. Press and hold the Mode button for 3 seconds to confirm the preset selection. The user interface will show a 3-second countdown. The preset number blinks once to confirm that the preset has been recorded.



Note: *When the fixture is in Direct mode (**dir**) or 1-channel mode (**1ch**), you cannot re-record presets.*

See [Change the DMX Control Mode on page 8](#).

Adjust the Intensity of Presets

1. Ensure that DMX data is not present.
2. Press the Mode button to access the Presets menu, and then press the Up button or Down button to select the preset that you want to edit.
3. Press and hold the Mode button for 3 seconds. The display shows **L=** followed by either an intensity level from **0- 99** or **FL** for full.
4. Press the Up button or Down button to change the intensity level of the preset in real time.
5. Press the Mode button to confirm your selection and return to the Presets menu.

The display will automatically return to the Presets menu after 10 seconds of inactivity, and edits to the preset intensity will not be saved.

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Lock the User Interface

After you have set up the fixture, you can lock the user interface to prevent additional changes.

1. Press and hold the **Up** button and **Down** button simultaneously for 3 seconds. The display will show **Loc** to indicate that the user interface is locked.
2. To unlock the user interface, press and hold the **Up** button and **Down** button simultaneously for 3 seconds.

Update the Fixture Software

ETC recommends using UpdaterAtor software to manage software updates. For more information on UpdaterAtor, see the *UpdaterAtor Software Quick Guide*, which you can download for free from etcconnect.com.

When you add a ColorSource fixture running a newer software version or update a ColorSource fixture to a newer software version using UpdaterAtor, you can use that fixture to push the newer software version to all connected ColorSource fixtures, except for ColorSource Spot jr fixtures. ColorSource Spot jr fixtures can only update (and be updated by) other ColorSource Spot jr fixtures.

1. Remove power and DMX In from the master fixture that is running the software version that you want to push to other fixtures.
2. Press and hold the **Up** button and **Down** button simultaneously while restoring power.
3. The display will show **Udt rdy** to indicate the update mode is selected.
4. Press the **Mode** button to start the update process.
 - The display will alternate between **Udt** and the percentage complete while updating.
 - The master fixture will reboot once the update is complete.
5. Reconnect DMX In on the master fixture.

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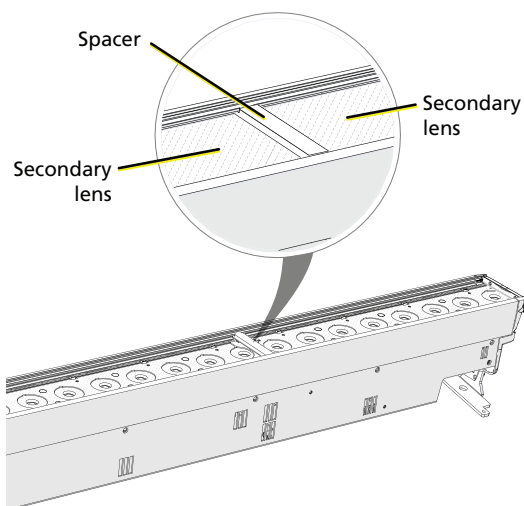
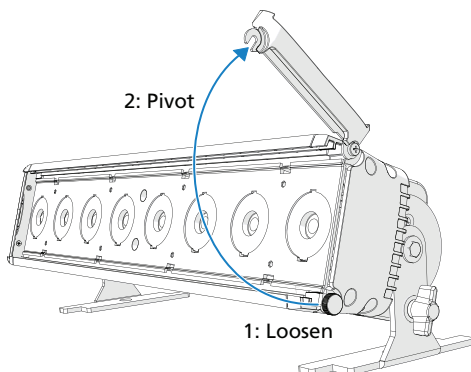
Install Secondary Lenses

You can use several optional accessories with the ColorSource Linear, including secondary lenses (horizontal, vertical, and round). You can use either a single lens or two lenses simultaneously, and you can install them from either end of the fixture.

For the Linear 2 and Linear 4 fixtures, order one accessory for each 0.5 meter segment (cell) of the fixture.

Spacers for secondary lenses are included with the fixture. Use these spacers to hold the accessories in position when multiple lenses are used in the Linear 2 and Linear 4 fixtures.

1. Loosen the thumbscrew on the access panel on either end of the fixture.
2. Pivot the access panel until you can access the slots above the LEDs.



3. Slide the secondary lens (or lenses) into either of the slots above the LEDs.
4. For the Linear 2 and Linear 4 fixtures, position spacers between the lenses for the cells (in the same slot as the lenses). See image at left.
5. Pivot the access panel back into place and tighten the thumbscrew.

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Restore Factory Defaults

Press and hold the **Mode** button, **Up** button, and **Down** button simultaneously for 5 seconds. The DMX start address will blink once to confirm that defaults have been restored.

Error Codes

There are three error codes that may be shown on the user interface.

- **CAL**: Screen toggles between **CAL** and **Err** to indicate a problem with the color calibration. The fixture will need to be returned to the ETC factory; contact your local dealer to set up a repair.
- **OLP**: Screen toggles between **OLP** and **Err** to indicate that the fixture has gone into over-temperature protection mode to avoid damaging the fixture. Once the fixture has self-cooled, the error will automatically clear.
- **CBL**: Screen toggles between **CBL** and **Err** to indicate that a control card or the internal cabling is damaged or unplugged. Verify that internal cables are properly connected. If the error persists, the fixture will need to be returned to the ETC factory; contact your local dealer to set up a repair.
- **no APP**: Screen toggles between **no** and **APP** to indicate that the upgraded fixtures have a software issue. Reload software to clear the error. If the error persists, contact ETC.

Use RDM

RDM and Grouping Modes

Linear 2 and Linear 4 fixtures in Cell mode contain 2 sub-devices (Linear 2) or 4 sub-devices (Linear 4). Use DMX_BLOCK_ADDRESS to set the DMX address of the first cell, and the remaining cells will be numbered sequentially from that starting value.

RDM also allows you to use nonsequential DMX addresses, if desired. The fixture displays "---" for the DMX address to indicate nonsequential DMX addressing. If you set up nonsequential DMX addresses and then change the DMX address at the fixture, however, the fixture will return to sequential DMX addressing.

Linear 2 and Linear 4 fixtures in Group mode do not use sub-devices.

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RDM Values

Parameter	Fixture	Value	Description
Manufacturer ID	All	0x6574	Electronic Theatre Controls
Model ID	Linear 1 Pearl	0x020B	
	Linear 2 Pearl	0x020F	
	Linear 4 Pearl	0x0213	
DMX Start Address	All	0x00F0	Range = 1–512
DMX Personality	Linear 1	0x00E0	1 = Variable Color Temp 2 = Direct 3 = 1 Channel
	Linear 2 in Group mode		
	Linear 4 in Group mode		
	Linear 2 in Cell mode		4 = Variable Color Temp Multi-Cell 5 = Direct Multi-Cell 6 = 1 Channel Multi-Cell
	Linear 4 in Cell mode		
Output Frequency	Linear 1	0x8123	0 = Standard (1.2 kHz) 1 = High (25 kHz)
	Linear 2 in Group mode		
	Linear 4 in Group mode		

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Quick Reference

DMX Control Channels

Linear 1 and Linear 2/Linear 4 in Group Mode

DMX Channel	ct (Variable Color Temperature)	dir (Direct)	lch (1 Channel)
1	Intensity	Intensity	Intensity
2	Color temperature	Warm white	
3		Cool white	
4		Strobe*	

*Use DMX values of 0 or 255 for no strobe. Use values of 1–254 to increase the strobe rate from 1 per second up to 33 per second.

Error Codes

There are three error codes that may be shown on the user interface.

- **CAL**: Screen toggles between **CAL** and **Err** to indicate a problem with the color calibration. The fixture will need to be returned to the ETC factory; contact your local dealer to set up a repair.
- **OTP**: Screen toggles between **OTP** and **Err** to indicate that the fixture has gone into over-temperature protection mode to avoid damaging the fixture. Once the fixture has self-cooled, the error will automatically clear.
- **CbL**: Screen toggles between **CbL** and **Err** to indicate that a control card or the internal cabling is damaged or unplugged. Verify that internal cables are properly connected. If the error persists, the fixture will need to be returned to the ETC factory; contact your local dealer to set up a repair.
- **no APP**: Screen toggles between **no** and **APP** to indicate that the upgraded fixtures have a software issue. Reload software to clear the error. If the error persists, contact ETC.