LED CREATIVE

**CUSTOM DESIGNED LED SYSTEMS & SOLUTIONS**

# BYTE – SIMPLE INTELLIGENT PIXEL CONTROL
# USER GUIDE

**VERSION 5.3**

## Power up

The Rental Byte controllers are configured as standard for a 230v Ac supply input and 7Vdc on each of the 8 low voltage Outputs. [1]
On start up the LCD display should read – Byte Firmware Version No. LED Creative.

## LED Pixel types

Byte is capable of driving;

WS2811, 2812 & 2812B. Pixel Type [WS2811] on controller.
2903 (Also referred to as 1904). Pixel Type [1904] on the controller.
943. Pixel Type [943] on controller.

## Which Product? / Which Voltage?

Sigma – all densities of LED tape, RGB and single colour – 7 volts.
Sigma Neon – 15 Volts.
Sigma Fairground – 24 Volts.

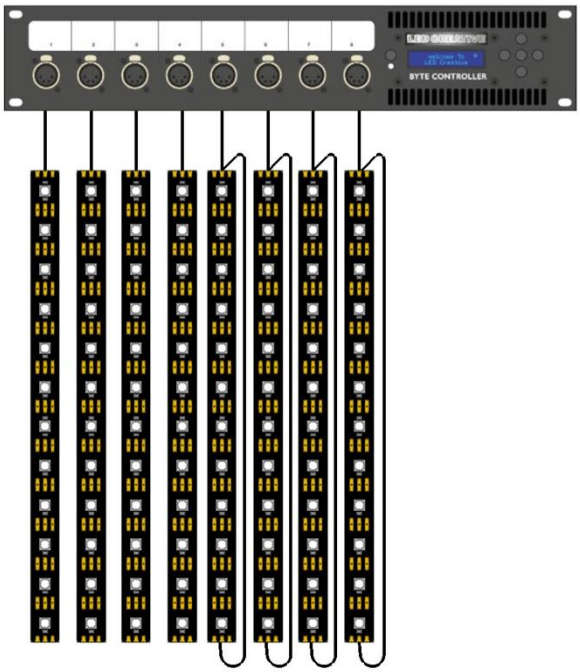



*Figure 1 Byte 7 Volt Controller showing Sigma 60 RGB LED Ribbon connected. Each controller can power upto 40 metres of Sigma 60 Product.*

[1] Controllers with low voltage outputs of 15Vdc and 24Vdc are also available.

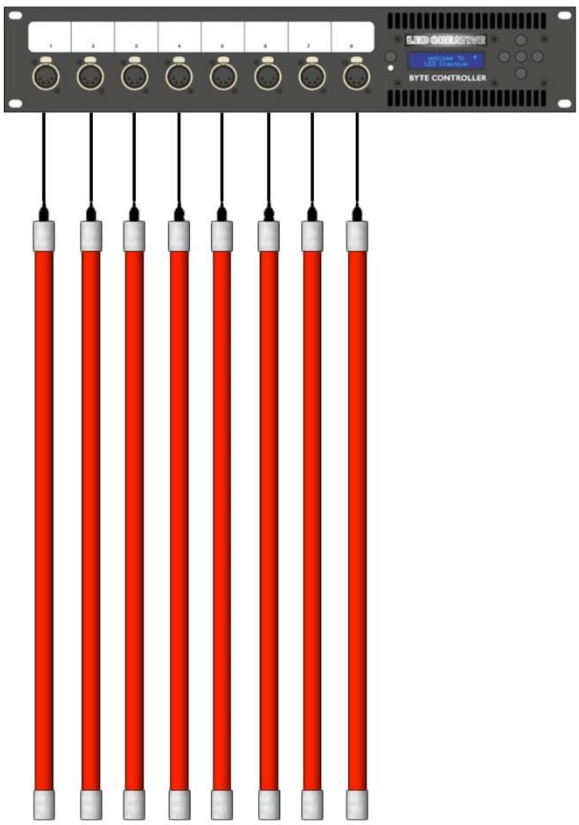



*Figure 2 Byte 7 Volt Controller showing Sigma Pulse Wands connected. Each controller can power up to 8 Sigma wands.*

## Note about pixels and data.

If an active DMX cable is unplugged the last received DMX frame that was received will continue to be output by the LEDs. Power cycling the box (with no DMX data connected) will clear data from all outputs.

## Test Mode

To test controller outputs with no DMX present. Active Test Pattern will override DMX signal for that controller.

Settings [Enter]
Left / Right to scroll through options.
None
All white 20%
All white 50%....
Rainbow Ouputs
RGB alternating with white chasing pixel.

## DMX Presence / Absence

Presence / absence of DMX is indicated in top right corner of LCD screen as;

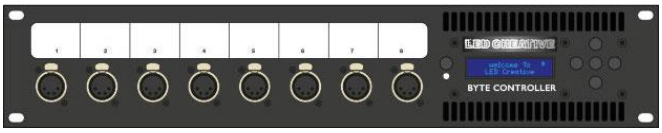
| | |
|---|---|
| No DMX detected | (->x) |
| DMX detected | (->d) |
| DMX present & new DMX packet received | (->->) |

## Output fusing

*Hardware v1.*


Each output has an inline 5 x 20mm fuse for short circuit protection with in-line green LED indicator. The units are fitted with 10 fuses as standard.

*Hardware v2*




Each output has active current monitoring and short circuit protection for quick diagnosis of faults.
A LED to the bottom right of each XLR output indicates the status of the output.

Green = Normal function
Amber = Danger of current overload to this controller output.
Red = Presence of overload or short circuit. Removing the excess or faulty load and re-applying 230v to the controller will clear the fault.

## Navigating Menus


*Figure 3 Menu navigation buttons.*

UP / DOWN Buttons navigate through menus.
ENTER [Centre Button] to access sub menus.
LEFT / RIGHT Buttons are used to select options or to increase/decrease a numerical value. For all Digit Menus LEFT/RIGHT buttons can be used to select which digit to change. Flashing the Colon ":" Symbolises that you are scrolling menus
There is no requirement to press ENTER to confirm user selection. The interface remembers the last value.

When in lowest menu level e.g. DMX START ADDRESS, pressing ENTER will escape up a level.
To exit from the Main Menu (OUTPUTS 1-8 & SETTINGS), pressing LEFT exits to home screen.

## Output Menu Options

### Start Address
Sets the DMX start address between 001-512 for each output.

### Total Pixels
Sets the number of pixels to illuminate on the output from 1-300 pixels.

### Virtual Canvas Start / End **(VirtCanv)**
Sets the number of buffer pixels to add to the start or end of the output.[2]

### Offset
Sets the start point of the first pixel to illuminate between the 1st and 290$^{th}$ pixel. Used for Aligning the Lit Pixels on the LED Strip.

### Direction
Fwd or Rev. Rev Inverts the numbering of the pixels so that the last pixel is nearest the XLR connector end of the LED fixture Note that this Flips other Settings that refer to Start and End (Pixel Count, Offset, Virtual Canvas). See Figure 8.

### Colour Order
Re-orders the RGB values for the output, with options; RGB, RBG, GRB, GBR, BRG, BGR. [3].

### Footprint
Specifies the number of DMX channels required to control each output or group of outputs from a selection of predefined personalities. See
Figure 9.

Master Brightness (Separate Intensity Patch Point) – Allows user to patch the Master Brightness channel of each output to a dedicated channel in the DMX range 1-512. See Figure 10 for examples of how to use this feature.

### Group
Assign one or more controller outputs to a group to control as one continuous output. The default for all outputs is to not be assigned to a group. A controller has a maximum of 8 groups, with 8 slots available in each group. Users can assign individual or multiple outputs to any slot within any group. Note that all outputs that are part of the same group must be set to the same DMX Start Address to function correctly.

[2] Note that start and end Virtual Canvases may be only virtual pixels, a combination of virtual and physical pixels is considered as Total Canvas.

[3] Default for all products is GRB, except for Sigma Fairground which are RGB.

## Global settings

Quick patch – Addresses All Outputs on the Controller Based on user selectable settings. User can Select: Start Address for Output 1, Whether the outputs are addressed Sequentially (SEQ), or all addressed as a Single Address (SNG) and the Channel Mode that the Outputs are being addressed as (16,20,34 Channel modes).

### Speed Sync

Sync on – Outputs sync (works across multiple controllers).
Sync off – Outputs do not sync (default).
Speed sync used for accuracy when running FX's. With speed sync set to ON a change in FX speed parameter restarts the FX. This allows for multiple controllers to all run-in sync for pixel accuracy. With sync off it is possible to change the FX speed on the fly without effects re-starting, but over time a small amount of pixel drift (1-2 pixels) is possible.

### Global offset

Creates a new control channel for the controller [as a separate patch point from lighting console] which offsets the starting point for all FX's on all layers incrementally across each output. The Global offset is not contained within the fixture personality and should be patched as an additional dimmer channel on the lighting console. See Figure 4 for an example setup.

| DMX Value | Output 1 | Output 2 | Output 3 | Output 8 |
|---|---|---|---|---|
| 000 | FX start = Pixel 1 | FX start = Pixel 1 | FX start = Pixel 1 | FX start = Pixel 1 |
| 001 | FX start = Pixel 1 | FX start = Pixel 2 | FX start = Pixel 3 | FX start = Pixel 8 |
| 002 | FX start = Pixel 1 | FX start = Pixel 3 | FX start = Pixel 5 | FX start = Pixel 15 |

*Figure 4 Global Offset*

See Figure 11 for examples of setups where this feature is useful. Note that this feature works per output per controller – there is no link between multiple controllers, and it does not apply to groups.

### DMX Snapshot

Takes a snapshot of the incoming DMX universe for replay later. The controller captures only the DMX data relevant to its outputs – it cannot be used for replaying data to other fixtures. A DMX signal is needed in order to record a snapshot.

Scroll LEFT/RIGHT
SAVE (1-8). Press ENTER to save.
LOAD (1-8) Press ENTER to load.
To revert to live DMX Select LIVE RX.

**Factory defaults** – press & hold left and right arrows for 3 secs to restore to defaults.
As shipped from the warehouse default settings for all byte controllers are.

Output 1-8
DMX start address:001
Total Pixels:300
Virt Canv Start:0000
Virt Canv End:0000
Offset:000
Pixel Direction: FWD
Colour order: GRB
Footprint: 34 channels
Master Brightness: Def (Unassigned)
Group: None

Global Settings
Test: None
Patch: 001-034 Sequential is the first option but is uninitialized.
Speed Sync: Off
LED Type: WS2811
Snapshot: Live DMX
Global: Disabled

# Uses and Applications

## How to use the Group function.

The controller allows for multiple outputs to be assigned to positions within a group. A group is treated by the controller as if it is a single output, meaning that as much as 2400 individual LED sources may be controlled using just a single Byte fixture profile. 2400 pixels would require 7200 DMX channels using a conventional LED controller. The Byte controller requires just 34. The ability to dynamically assign Outputs to groups and reduce the channel count for either individual Outputs or Groups of LED fixtures across an installation makes the Byte controller exceptionally versatile.

## Virtual Canvas Concept

The Virtual Canvas size as calculated by the user provides the basis for the calculation of the onboard FX's. The formula for Virtual Canvas is;

Virtual Canvas for individual output [not assigned to a group] **= Virt Canv Start + Total Pixels+ Virt Canv End.**
Virtual canvas for a group **= Sum (Virt Canv Start + Total Pixels + Virt Canv End) for all outputs in the group.**

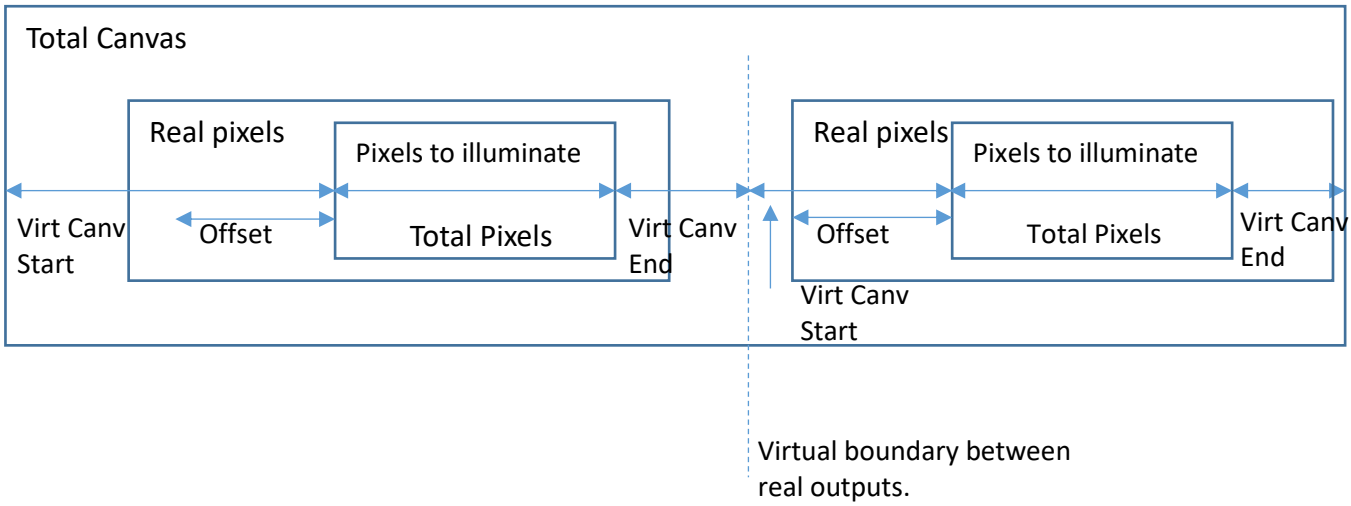



*Figure 5 Explaining calculation of the Virtual Canvas*

The configuration of each output, or group determines the size of the Virtual Canvas. This is important to note as setting up several groups with different virtual canvas sizes will result in a difference of how each group displays FX's. For most scenarios it will be necessary to setup all virtual canvas sizes to be the same size. One example of where different sized virtual canvasses would be useful is a show that has both groups containing multiple outputs and individual outputs controlling LED wands. For LEDs on circular set pieces, or other shape that is a closed loop, the ability to employ different sized virtual canvases means that an effect can be set to run continuously without gaps or overlaps.

## Useful Tips for setting up the controller outputs.

Start by enabling the Rainbow test pattern on each controller and use this to test that each LED fixture functions correctly. The rainbow test pattern illuminates each output of the controller in a distinct colour, with a white block that chases in a continuous loop on each output. Using this test pattern, the order in which the LED fixtures have been connected to the controller outputs, as well as the physical orientation of the LED fixtures can be quickly determined.

The colour displayed on each output of the controller when set to Rainbow Test is given in Figure 6 below.

| Output | OP 1 | OP 2 | OP 3 | OP 4 | OP 5 | OP 6 | OP 7 | OP 8 |
|---|---|---|---|---|---|---|---|---|
| Colour | Red | Green | Blue | Cyan | Magenta | Yellow | Amber | Pink |

*Figure 6 Colour order of rainbow Test*

- Decide on how many different virtual canvas sizes will be used for the project. Calculate the size of your chosen Virtual Canvas[ses].
- On each output still in test mode, set the Direction, Total Pixels and the Offset so that the correct number of pixels are illuminated and in the correct position and Direction.
- Set Group Number and Group Slot for each output or leave unassigned.
- Set start and end Virtual Canvases for each output. Remember that unless you need to have physical gaps or delays between outputs within a group, only the first member of the group requires a Virt Canv Start and only the last member of the group a Virt Canv End.

- If re-assigning group values with a DMX signal present it is a good idea to re-start the controller once all settings have been adjusted to avoid confusion.

## Group and Virtual Canvas Examples

Figure 7 below shows an example of how 2 groups can be setup to have the same sized Virtual Canvas. In this example, not only does setting the same Virtual Canvas mean that FX's are displayed consistently, but also that two horizontal groups of outputs can be setup in alignment. The number of total pixels and the size of the start and end canvases can be different values for each output within the group, making this feature truly versatile for any real-world setup that is encountered.

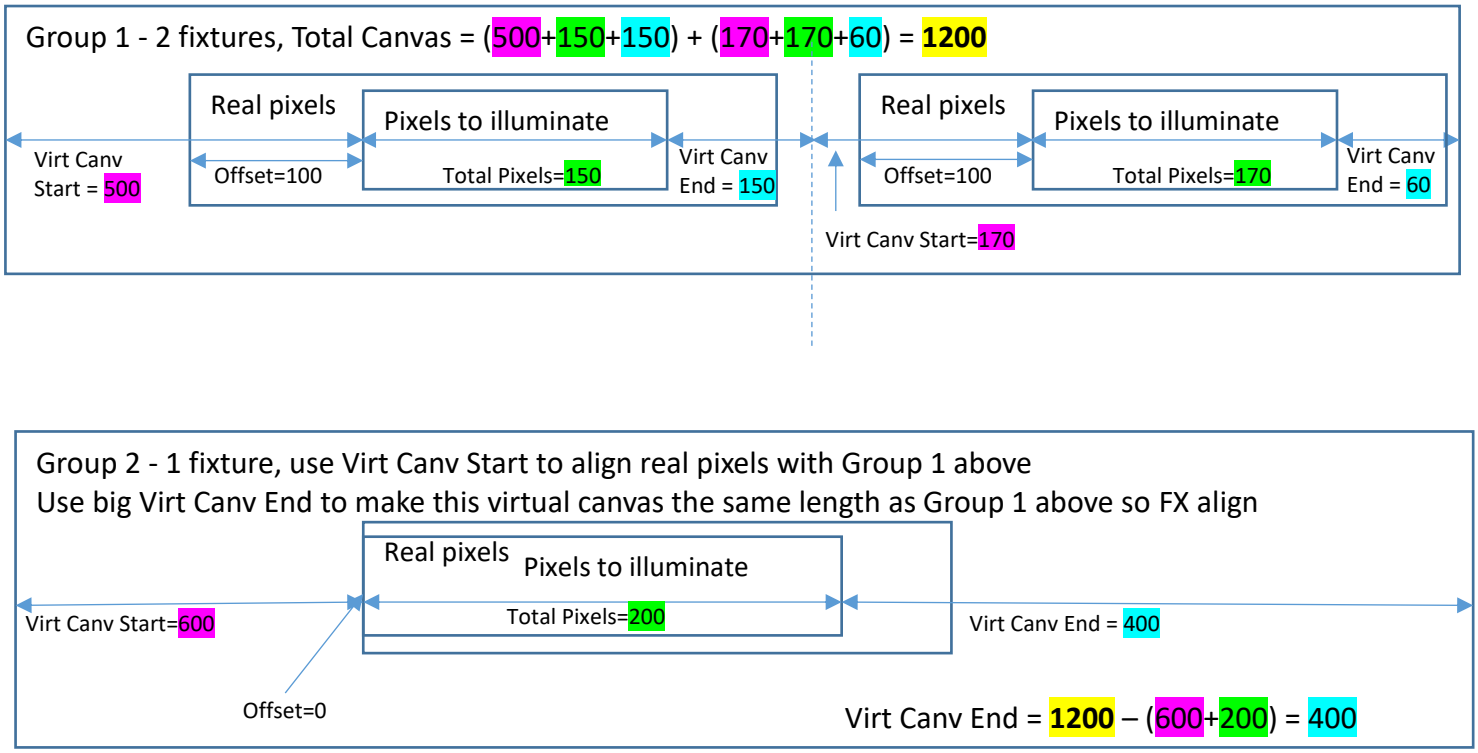



*Figure 7 Examples of setting up Virtual Canvas sizes.*

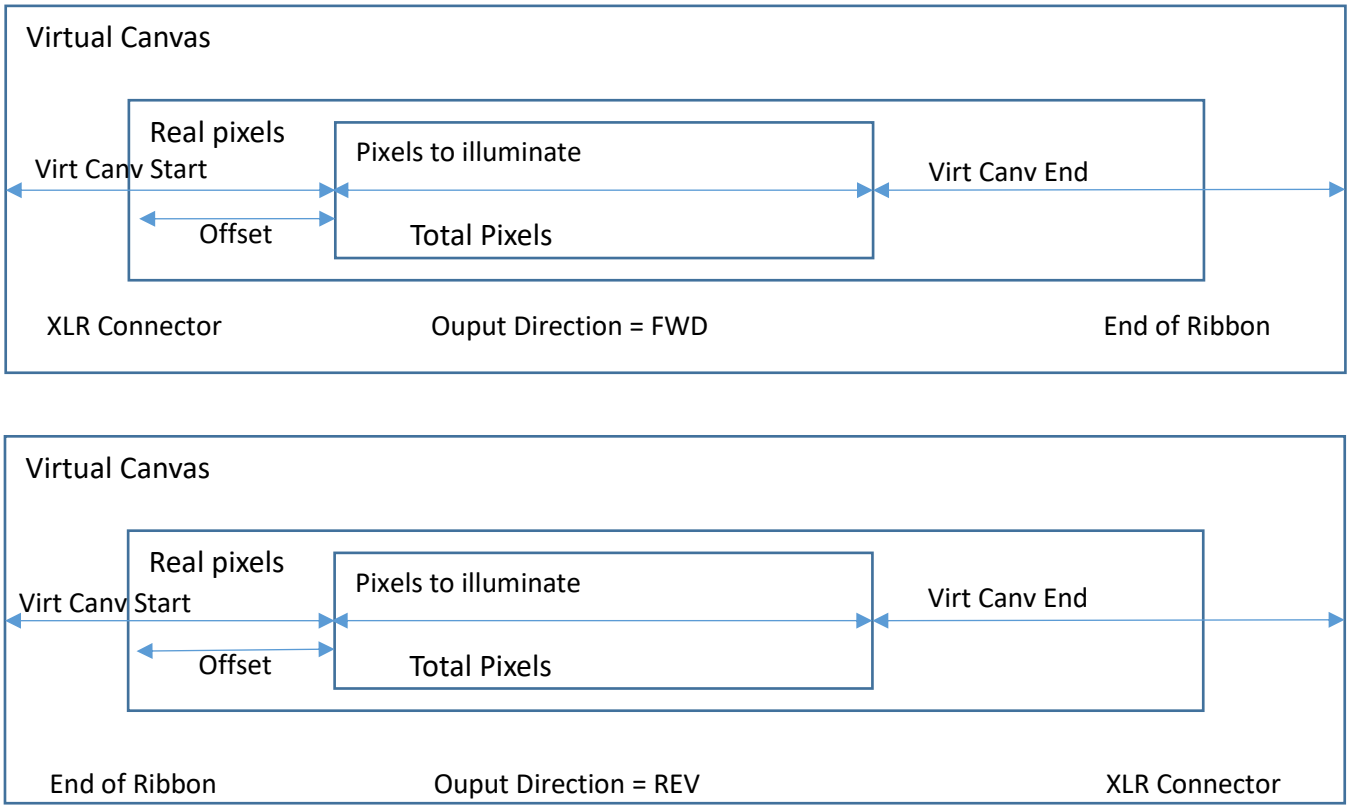
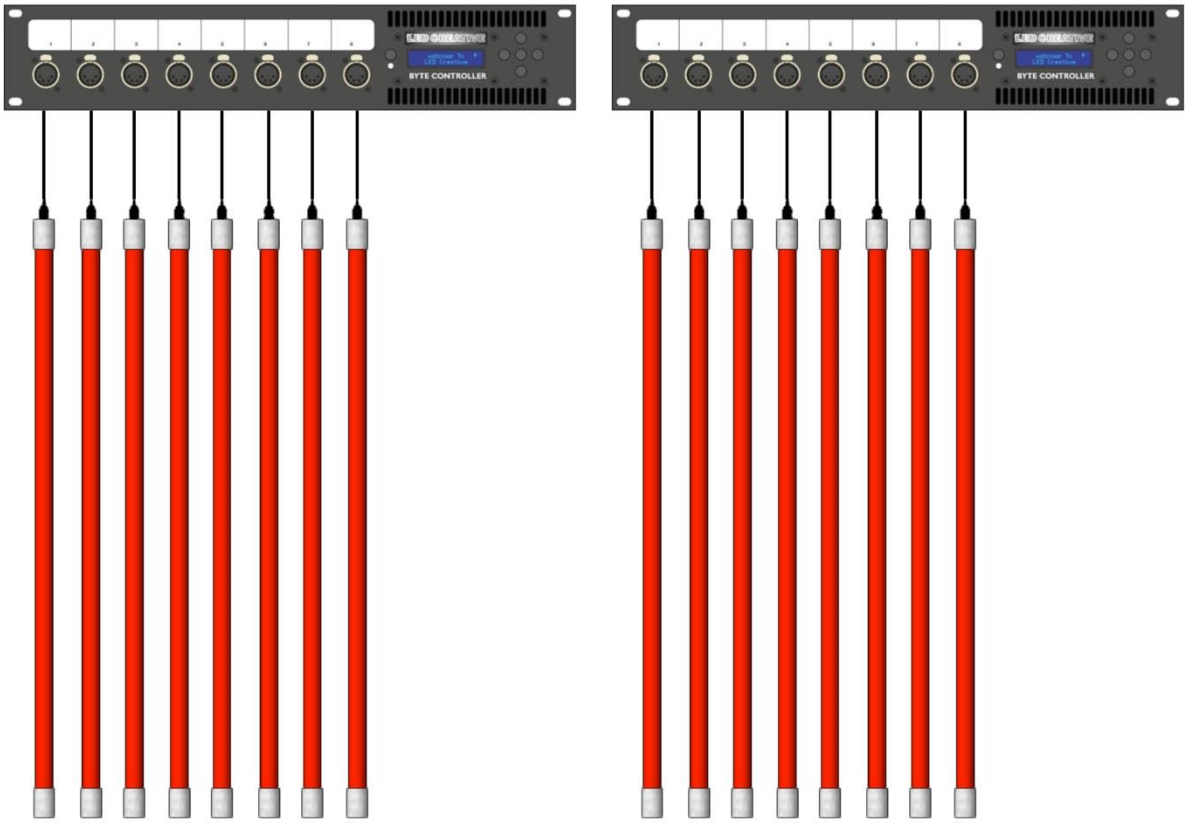



*Figure 8 Output Directions Explained*

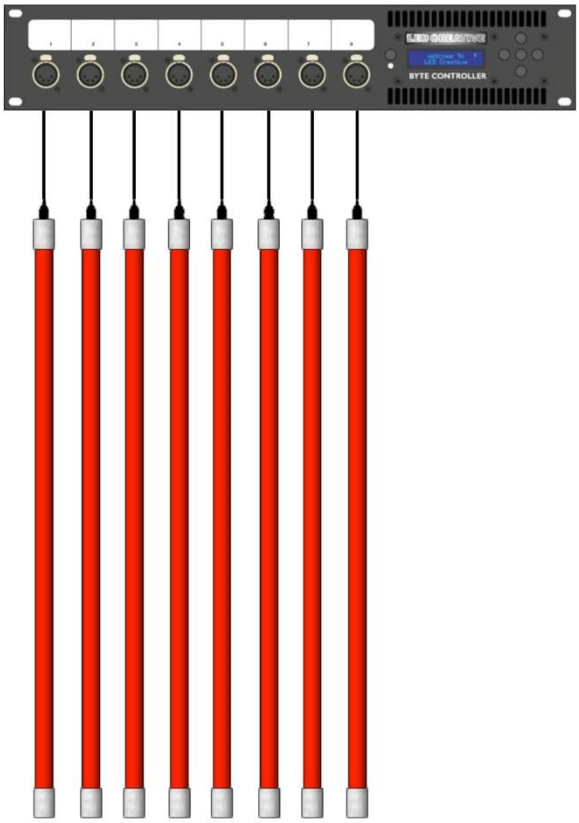
| | DMX Channel Assignment | | | | | | |
|---|---|---|---|---|---|---|---|
| Profile Name | 1-2 | 3-6 | 7-16 | 17-20 | 21-30 | 31-34 | |
| 16 Channel | Master Layer | Layer 1 IRGB | Layer 1 FX | | | | |
| 20 Channel | Master Layer | Layer 1 IRGB | Layer 1 FX | Layer 2 IRGB | | | |
| 34 Channel | Master Layer | Layer 1 IRGB | Layer 1 FX | Layer 2 IRGB | Layer 2 FX | Layer 3 IRGB | |

*Figure 9 Output Profile Options*




| | DMX Channels | | |
|---|---|---|---|
| Wand No | Global | Master B Address | IRGB, FX Address |
| 1 | 35 | 36 | 1 |
| 2 | 35 | 36 | 1 |
| 3 | 35 | 36 | 1 |
| 4 | 35 | 36 | 1 |
| 5 | 35 | 37 | 1 |
| 6 | 35 | 37 | 1 |
| 7 | 35 | 37 | 1 |
| 8 | 35 | 37 | 1 |
| 9 | 35 | 38 | 1 |
| 16 | 35 | 39 | 1 |
| DMX Channel Footprint = 39 Channels total. Total Pixel Count = 1600 | | | |

*Figure 10 Example of Byte Controllers in 34 Channel mode using Master Brightness and Global Patch Point Feature. In this example the intensities are in groups of 4 fixtures.*




| | DMX Channels | | |
|---|---|---|---|
| Wand No | Global | Master B | IRGB, FX |
| 1 | 35 | 36 | 1 |
| 2 | 35 | 37 | 1 |
| 3 | 35 | 38 | 1 |
| 4 | 35 | 39 | 1 |
| 5 | 35 | 40 | 1 |
| 6 | 35 | 41 | 1 |
| 7 | 35 | 42 | 1 |
| 8 | 35 | 43 | 1 |
| DMX Channel Footprint = 43 Channels total. Total Pixel Count = 800 | | | |

*Figure 11 Example of Byte Controller in 34 Channel mode using Master Brightness and Global Patch Point Feature.*