

# 5 Piece

## RGB LED light controller manual

# Important Information

## Warnings

- Connect this unit's power cord only to an AC outlet of the type stated in this Owner's Manual or as marked on the unit. Failure to do so is a fire and electrical shock hazard.
- Be sure to connect to an appropriate outlet with a protective grounding connection. Improper grounding can result in electrical shock.
- Do not allow water to enter this unit or allow the unit to become wet. Fire or electrical shock may result.
- Do not place heavy objects, including this unit, on top of the power cord. A damaged power cord is a fire and electrical shock hazard. In particular, be careful not to place heavy objects on a power cord covered by a carpet.
- Do not place a container with liquid or small metal objects on top of this unit. Liquid or metal objects inside this unit are a fire and electrical shock hazard.
- This unit is equipped with a dedicated ground connection to prevent electrical shock. Before connecting the power plug to an AC outlet, be sure to ground the unit. If the power cord has a three-pin plug, it will provide sufficient grounding so long as the AC outlet is grounded correctly.
- Do not scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.
- Do not remove the unit's cover. You could receive an electrical shock. If you think internal inspection, maintenance, or repair is necessary, contact your dealer.
- Do not modify the unit. Doing so is a fire and electrical shock hazard.
- If lightning begins to occur, turn off the power switch of the unit as soon as possible, and unplug the power cable plug from the electrical outlet.
- If there is a possibility of lightning, do not touch the power cable plug if it is still connected. Doing so may be an electrical shock hazard.
- Use only the included power supply for this unit. Using other types may be a fire and electrical shock hazard.
- If the power cord is damaged (i.e., cut or a bare wire is exposed), ask your dealer for a replacement. Using the unit with a damaged power cord is a fire and electrical shock hazard.
- If you notice any abnormality, such as smoke, odor, or noise, or if a foreign object or liquid gets inside the unit, turn it off immediately. Remove the power cord from the AC outlet. Consult your dealer for repair. Using the unit in this condition is a fire and electrical shock hazard.
- Should this unit be dropped or the cabinet be damaged, turn the power switch off, remove the power plug from the AC outlet, and contact your dealer. If you continue using the unit without heeding this instruction, fire or electrical shock may result.

## Cautions

- Keep this unit away from the following locations:
  - Locations exposed to oil splashes or steam, such as near cooking stoves, humidifiers, etc.
  - Unstable surfaces, such as a wobbly table or slope.
  - Locations exposed to excessive heat, such as inside a car with all the windows closed, or places that receive direct sunlight.
  - Locations subject to excessive humidity or dust accumulation.
- Hold the power cord plug when disconnecting it from an AC outlet. Never pull the cord. A damaged power cord is a potential fire and electrical shock hazard.
- Do not touch the power plug with wet hands. Doing so is a potential electrical shock hazard.
- To relocate the unit, remove the power plug from the AC outlet, and remove all connecting cables. Damaged cables may cause fire or electrical shock.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- If you know you will not use this unit for a long period of time, such as when going on vacation, remove the power plug from the AC outlet. Leaving it connected is a potential fire hazard.

**The material in this manual is for information purposes only and is subject to change without notice. BrightBeats LLC assumes no responsibility for any errors or omissions which may appear in this manual.**

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## **Interference**

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## **5 PIECE Exclusion of Certain Responsibility**

Manufacturer, importer, or dealer shall not be liable for any incidental damages including personal injury or any other damages caused by improper use or operation of the 5 Piece.

# Thank you for purchasing the BrightBeats 5 Piece RGB LED system. This is our most advanced system yet and is loaded with features!

The **5 Piece** system has the following specifications:

- Lumen Radio CRMX wireless DMX module
- Bluetooth radio for device control
- 5 Channels with full RGB color control
- DMX integration for control of all outputs
- RDM integration for device settings
- 250 watts continuous output at 12 volts
- Global power supply with standard IEC connector
- 2 year warranty

## Static Electricity precautions (ESD):

Even though the **5 Piece** controller has built in protection for ESD discharge, damage can still occur. Care should be taken to ground your body before touching any of the connectors. The best method would be to touch some part of the chassis to discharge any voltage before working with it.

## Warranty Term

BrightBeats, LLC warrants each new product (except for spare parts or products BrightBeats, LLC does not manufacture) for a period of TWO (2) years from date of shipment to correct by repair or replacement any part defect due to faulty material or workmanship.

BrightBeats, LLC warrants for NINETY (90) days any spare part it manufactures. On spare parts or products BrightBeats, LLC does not manufacture, BrightBeats, LLC will grant the same warranty given BrightBeats, LLC by its vendors. BrightBeats, LLC assumes no responsibility for damage or faulty performance caused by misuse, improper installation, careless handling or where repairs have been attempted by others.

This warranty is in lieu of all warranties or guarantees expressed or implied and no representative or person is authorized to assume BrightBeats, LLC any other liability with the sale of BrightBeats, LLC products.

## Warranty Service

In order to request warranty service, you must receive a Return Material Authorization (RMA) number prior to return.

Return shipments must be visibly marked with the RMA number; the product must be returned (*shipping prepaid*)

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## Setting up your system

Depending on what type of drums and LED's you have, the installation will vary. A typical system will consist of the **5 Piece** controller, a trigger for each drum to be lit and a length of LED's to be driven for that channel.

## Input Connections

Each input channel of the **5 Piece** is a ¼ inch TRS jack. Inputs 1 and 2 are on the first jack, inputs 3 and 4 are on the second jack. Input 5 is on the third jack.



In general, the safe input range is from 0-12 volts. These inputs can be connected to various devices depending on how you wish to trigger the LED's. In addition to triggers, musical instruments, audio outs and similar devices can be used to trigger **but care must be taken not to overdrive the input or damage may occur.**

This system has also been tested with Roland VDrum controllers as well as 2Box. You can split the trigger output from a drum or cymbal with a "Y" cable and feed both the drum controller and the **5 Piece**. If the drum is a dual zone with a TRS connector, you will have to choose which trigger to use from the splitter and make a custom cable that only connects to one of the outputs.

## Trigger Placement

The **5 Piece** inputs can be set to be very sensitive. This allows for many options when triggering. Typically triggers can be placed in the traditional way directly on the head of the drum or they can be placed on the shell of the drum if a stick-on model is used. The recommended location for live performances is directly on the drum shell with the only exception being the bass drum which should always be on the beater side head.

Every situation is different so a test should be conducted to determine what the best method is to achieve the best response and to reduce cross triggering.

# Output Connections

The output panel of the unit has 5 4-pin Molex output connectors. Each connector will drive up to 4.5 amps at 12 volts for your LED's. The maximum draw from all channels at the same time must not exceed 20 amps.

The pinouts are as follows:

- Pin 1: Red output (neg)
- Pin 2: Green Output (neg)
- Pin 3: Blue Output (neg)
- Pin 4: +12 volts



**If you are making your own cables be sure to use the proper gauge to minimize voltage drop and have the ampacity to safely carry the current for your LED's!**

## Molex connector notes

If you choose to make you own LED cables the following part numbers are for the connector body

Channel output connector	Molex 46992-0410
Pins	Molex 39000060
Pin removal tool	Molex 0011030044
Power input connector	Molex 46992-0610 (Pins are the same as above)

## DC Input

The controller can also be powered by a battery. Maximum input voltage should be  $\leq 14.5\text{vdc}$ . Minimum input voltage is  $\sim 4\text{vdc}$ . **OBSERVE INPUT POLARITY OR DAMAGE WILL OCCUR.**

The TOP 3 pins of the DC input connector are NEG(-). The BOTTOM 3 pins are POS(+).

# Software configuration

All software settings are stored in non-volatile flash and are accessed either through RDM commands over DMX or through the serial port on the unit.

## Channel Input Gain (Trigger Gain)

Trigger gain can make a huge difference in responsiveness from the LEDs. When adjusting the trigger input levels, try to set them so that they are just slightly **above** the point at which they trigger. Try playing different things and see if you get the response you like. Setting the input higher will give a different response depending on what is being played and how the output settings are configured. When triggers are placed directly on the drum heads they can trigger multiple times due to the head resonating. This is mostly undesirable. This can either be controlled by reducing the gain or a better solution would be to put triggers on the drum shell closer to the top head. This tends to be the best way to trigger the LEDs unless it's a low volume situation. The only exception to this tends to be the bass drum which tends to work better with the trigger on the beater head.

## Output Settings

### Channel Hold Time

This sets how long the LED's will remain lit after a strike is detected. If the fade is enabled on the channel it will start to fade out AFTER this timer expires.

Hint: For very fast snare rolls set the hold time to 10 and disable fading to get quick bright flashes.

### Channel Fade Speed

Sets how fast the LEDs fade out AFTER the hold time setting expires. The higher the value, the faster the LEDs will fade out.

Lots of different combinations can be achieved with these settings. You can also use the fade to achieve a color blend during the fade. If you set one color level at 100% brightness and then set the others at a lower percentage, the LEDs at the lower brightness setting will fade out first leaving the higher ones fading out last.



# Wireless Radio

The **5 Piece** controller includes one of the most advanced CRMX radio modules available. The TimoTwo CRMX radio module is manufactured by Lumen Radio. The radio can either be a transmitter which can have other fixtures bind to it to create one DMX universe or it can be a receiver. The module also includes a BlueTooth radio which allows tablet and phone based lighting apps to connect and send DMX data direct to the module with no other hardware needed. This section covers how to program and use this module.

Currently supported BlueTooth lighting apps:

Luminair: <https://luminair.app/>

StageLight: <https://www.stagelighting.app/>

To manage the radio module, you will need to download the CRMX Toolbox app. It can be downloaded from here:

[App Store – CRMX Toolbox app](#)

[Google Play – CRMX Toolbox app](#)

Link to Lumen Radio support page for CRMX Toolbox app: <https://lumenradio.com/products/crmx-toolbox/>

**Note:** When using the CRMX app make sure your device is not connected to the radio module with BlueTooth.

## LED indicator guide (See figure 1)

**SYS:** System LED. Flashes every 1 seconds when processor is running normally.

Depending on the radio modules Flex mode setting, the LED indicators can have different functions.

### Receiver mode:

**RDM:** Lights whenever RDM data packets are sent or received

**DMX:** Lights whenever DMX data packets are sent or received

**UNIVERSE:** Lights with the color of the universe of the transmitter it is binded to

**X:** Lights up red when the signal strength is below 10%

**RF LINK:** Lights when there is an active wireless link established with the transmitter

**Linked:** Lights when the receiver is linked to a transmitter

**Status:** Off-Not linked to any transmitter

Flashing-Off for 100ms/on for 100ms: Linked to a transmitter, but no active radio link

Flashing-Off for 900ms/on for 100ms: Active radio link, no DMX present

Constant On: Active radio link and DMX data is present

**Bottom LED Row:** Wireless signal strength indicator

Amber	above 20%
Green	above 40%
Green	above 60%
Green	above 80%

Figure 1:



### Transmitter mode:

**RDM:** Not used in Transmitter mode. RDM is only supported in receive mode

**DMX:** Lights whenever DMX data packets are sent or received

**UNIVERSE:** Lights with the color of the universe assigned to the radio module

**X:** Not used in Transmitter mode

**RF LINK:** Lights when there is an active wireless link established

**Linked:** Lights when there is ongoing linking activity

**Status:** Off-Not linked to any transmitter

Flashing-Off for 100ms/on for 100ms: Linking receivers

Flashing-Off for 200ms/on for 200ms: Unlinking receivers

Flashing-Off for 900ms/on for 100ms: Active radio link, no DMX present

Constant On: Active radio link and DMX data is present

**Bottom LED Row:** Not used in Transmitter mode

### Link Switch Operation:

The link switch is located under the antenna connector. This switch has different functions depending on the radio modules mode:

**Link to another receiver (Only in transmitter mode):** Press the button for < 1 second

**Unlink:** Hold the button in for > 3 seconds. In transmitter mode this unlinks all devices from the transmitter

**Force Firmware update mode:** Hold button in during power up

The switch can also be used to change the radio module Flex mode (transmitter or receiver).

Five (5) short pushes followed by one (1) long push will enter Flex mode selection.

The status LED will start flashing to indicate the currently selected Flex mode (refer below for details).

Flashing-Off for 50ms/on for 50ms: Receiver mode selected

Flashing-Off for 500ms/on for 500ms: Transmitter mode selected

Each short push will toggle the currently selected Flex mode.

To save the selection, perform a long push. This will save the selection and re-initialize the module.

If no selection is made within 15 seconds from the last push, mode selection will be cancelled and normal operation will resume in the previously selected Flex mode.

# RDM control and Tables

The 5 Piece controller is fully RDM compliant. Channel settings are accessed using the RDM parameters below.

## RDM Product Parameters IDs

Model ID	Manufacturer	Model	Product Category
BrightBeats Five Piece	BrightBeats, LLC	5	DIMMER_CS_LED

## RDM UID

UID					
0x20	0xC1	0x--	0x--	0x--	0x--

## Manufacturer Specific PID's

Get Allowed	Set Allowed	Parameter ID (Hexadecimal)	Min Value (Decimal)	Max Value (Decimal)	Default Value (Decimal)	Description
YES	YES	8000	0	1023	870	CH1 Input Gain
YES	YES	8001	0	1023	870	CH2 Input Gain
YES	YES	8002	0	1023	870	CH3 Input Gain
YES	YES	8003	0	1023	870	CH4 Input Gain
YES	YES	8004	0	1023	870	CH5 Input Gain
YES	YES	8005	0	100	80	CH1 Fade Speed
YES	YES	8006	0	100	80	CH2 Fade Speed
YES	YES	8007	0	100	80	CH3 Fade Speed
YES	YES	8008	0	100	80	CH4 Fade Speed
YES	YES	8009	0	100	80	CH5 Fade Speed
YES	YES	800A	10	1280	10	CH1 Hold Time
YES	YES	800B	10	1280	10	CH2 Hold Time
YES	YES	800C	10	1280	10	CH3 Hold Time
YES	YES	800D	10	1280	10	CH4 Hold Time
YES	YES	800E	10	1280	10	CH5 Hold Time
YES	YES	800F	3	100	30	LED PWM Rate

## Channel Input Gain

Trigger sensitivity setting. Setting this to zero disables the trigger input.

## Channel Fade Speed

This sets how fast the LED's fade out AFTER the hold time setting expires.

## Channel Hold Time

This sets how long the LED's will remain lit after a strike is detected. If the fade is enabled on the channel it will start to fade out AFTER this timer expires.

## LED Refresh Rate info

This allows adjustment of the refresh rate of the LEDs to stop issues with screen flicker when the performance is being videoed.

The LED refresh rate can be calculated with the following formula (round to the nearest):

$$\text{Refresh Rate(Hz)} = \frac{25000000}{4096 * (\text{PWM Rate Setting} + 1)}$$

The maximum PWM frequency is 1526 Hz when the setting is set to 3.

The minimum PWM frequency is 60 Hz when the setting is set to 100.

Default setting of 30 gives a 200 Hz refresh rate.

# DMX Settings

DMX control provides full control from lighting software or hardware for all of the **5 Piece** channels.

**RGB Strike level:** Sets the color for each output when the drum is struck and for the duration of the fade if enabled.

**Trigger Enable:** Allows the triggers to be turned on or off remotely allowing the drummer to have the LED's trigger only during the parts of the show they want them to. When the DMX channel is set above 128 the trigger is enabled. Fade timing settings must be configured either through RDM or the serial port.

**Fade Enable:** Turns the LED fade option on or off for each LED output. When the DMX channel is set above 128 the fade is enabled.

**RGB Constant Level:** Sets the output color for each drum when idle (no hit detected on the triggers)

The **5 Piece** uses 40 DMX channels. The channel map is below:

Description	DMX ch	Description	DMX Ch
CH1 R Strike Level	1	Ch1 Fade enable (>128 = ON)	21
CH1 G Strike Level	2	Ch2 Fade enable (>128 = ON)	22
CH1 B Strike Level	3	Ch3 Fade enable (>128 = ON)	23
CH2 R Strike Level	4	Ch4 Fade enable (>128 = ON)	24
CH2 G Strike Level	5	Ch5 Fade enable (>128 = ON)	25
CH2 B Strike Level	6	Ch1 R Constant Level	26
CH3 R Strike Level	7	Ch1 G Constant Level	27
CH3 G Strike Level	8	Ch1 B Constant Level	28
CH3 B Strike Level	9	Ch2 R Constant Level	29
CH4 R Strike Level	10	Ch2 G Constant Level	30
CH4 G Strike Level	11	Ch2 B Constant Level	31
CH4 B Strike Level	12	Ch3 R Constant Level	32
CH5 R Strike Level	13	Ch3 G Constant Level	33
CH5 G Strike Level	14	Ch3 B Constant Level	34
CH5 B Strike Level	15	Ch4 R Constant Level	35
Ch1 trig enable (>128 = ON)	16	Ch4 G Constant Level	36
Ch2 trig enable (>128 = ON)	17	Ch4 B Constant Level	37
Ch3 trig enable (>128 = ON)	18	Ch5 R Constant Level	38
Ch4 trig enable (>128 = ON)	19	Ch5 G Constant Level	39
Ch5 trig enable (>128 = ON)	20	Ch5 B Constant Level	40

# Programming the 5 Piece controller from a serial port

The **5 Piece** controller is an advanced controller that was designed to have its channel settings programmed via RDM commands over the DMX bus. However, it can also be programmed via the serial port if you are not using an advanced DMX system or just want to use an iPad over Bluetooth for lighting control.

Depending on what hardware you prefer to use (computer, iPad, iPhone, Android phone) the connection method and cables will differ.

## Method-1: Program using iPad, iPhone, Android phone using the Get-Console app and a Get-Console cable/Adapter (Preferred method)

### You will need:

1. **One** of the following: [Redpark Lightning to serial adapter cable](#), [Airconsole Mini 2.0](#) or [Airconsole Standard 2.0](#).
2. Download and install [Get-Console App](#) (iOS) or for Android use [Get-Console from here](#).
3. DB-9 to 1/8" TRS serial adapter cable (**supplied with the 5 Piece controller**).
4. [DB-9 to RJ-45](#) adapter for Airconsole adapter (not needed for RedPark cable).

Notes on above adapters:

The AirConsole Standard 2.0 is the best as far as convenience since it has a rechargeable battery and supports wireless Bluetooth as well as WIFI connections to your device. It can be left plugged into the **5 Piece** and changes can be made on the fly without going to the **5 Piece** controller.

The AirConsole Mini 2.0 requires power from a USB charger in order to operate but has all the same features as the Standard model.

The RedPark Lightning adapter cable is great if you make changes infrequently and don't mind having to plug directly into your controller every time.

Now that you have the above hardware setup and you have plugged in the serial cable to the **5 Piece** controller, you can open the Get-Console App and start a session with the port settings as follows: speed **9600** (No Parity, 8 data bits, 1 Stop bit). Press **enter** in the terminal app and the menu will appear. See image at end of this guide for details.

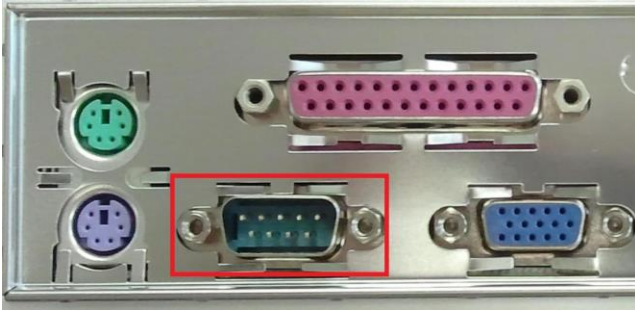
## Method-2: Program via the serial port from a PC or laptop.

### You will need:

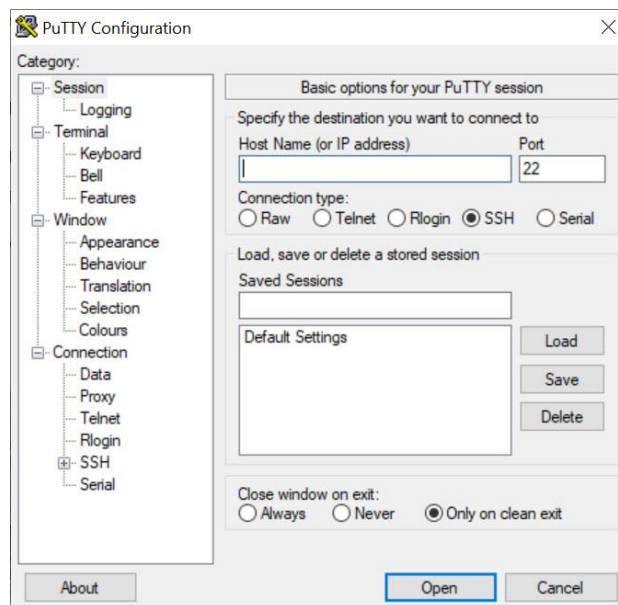
1. Desktop Computer/Laptop with a RS232 serial port adapter.
2. DB-9 to 1/8" TRS serial adapter cable (**supplied with the 5 Piece controller**).
3. Terminal software like PuTTY to connect.

Notes on serial ports:

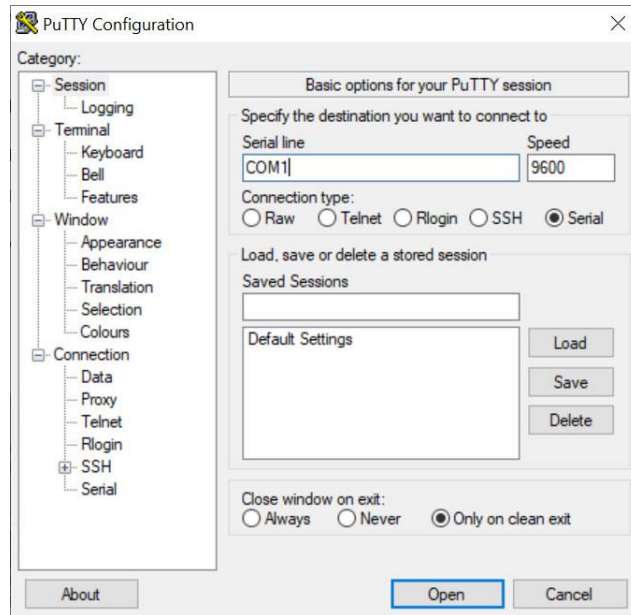
Most computers now do not have a serial port. You can check to see if it has one by looking for a DB-9 connector as shown in the image below:



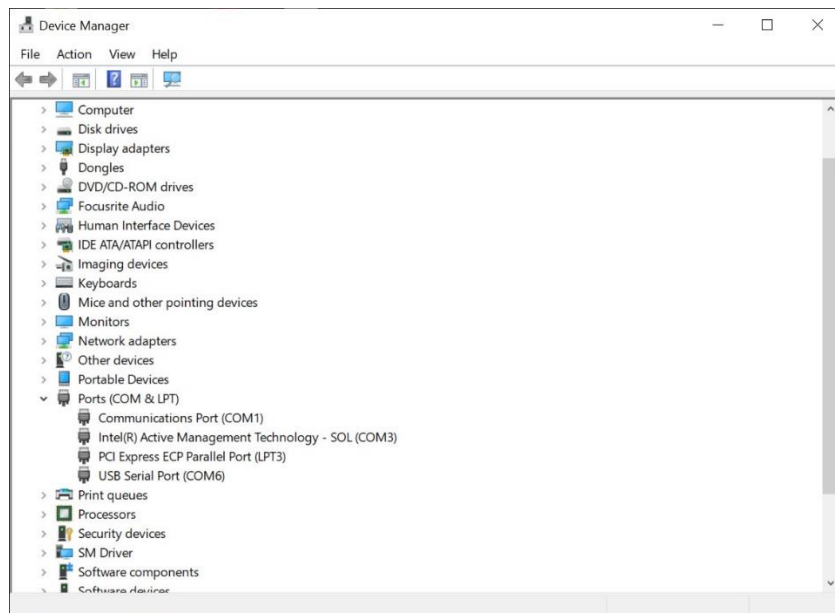
If you do not have a serial port there are many readily available USB to RS232 serial adapters on the market. Once you have your serial port identified you need to obtain a terminal emulation app. For the PC, we use PuTTY. It can be downloaded from here: <https://www.putty.org/>. After the software is downloaded and installed, open the app (see screenshot below).



Now click the radio button on the right for “**Serial**” (see screenshot below).



Next, you need to change the serial port to the correct COM port. In the screenshot above we have typed **COM1**. The speed is **9600** (No Parity, 8 data bits, 1 Stop bit). Generally, if there is only one COM port on a PC it will be COM1. However, there are times when other devices use a COM port such as a motherboard management controller. If you are using a PC and have a USB serial adapter, you can identify what the COM number is by typing “**Device Manager**” in the Windows 10 search box. Open the Device Manager and scroll down to “**Ports (COM & LPT)**” (see screenshot below). Expand this and look for any COM ports. If you are unsure which one is the USB adapter, unplug the adapter and see which one disappears.





## For both Method-1 and Method-2:

Now that you have everything set up, connect the supplied cable to your serial port and plug the other end into the **5 Piece** controller serial port located next to the power connector (see image below).



Next, in the terminal program, press “**Enter**”, and the menu (see screenshot below) will appear.

```
COM1 - PuTTY
*****BrightBeats Five Piece*****
1 CH1 Input Gain: 870
2 CH2 Input Gain: 870
3 CH3 Input Gain: 870
4 CH4 Input Gain: 870
5 CH5 Input Gain: 870
6 CH1 Fade Speed: 80
7 CH2 Fade Speed: 80
8 CH3 Fade Speed: 80
9 CH4 Fade Speed: 80
10 CH5 Fade Speed: 80
11 CH1 Hold Time: 10
12 CH2 Hold Time: 10
13 CH3 Hold Time: 10
14 CH4 Hold Time: 10
15 CH5 Hold Time: 10
16 LED PWM Rate: 30
17 DMX Address: 1
18 Factory Reset
Enter Line Number to change: █
```

From this menu, you can change any of the **5 Piece** settings. They will be saved to flash after you hit Enter.

### Settings Guide:

Input Gain Range: 0-1023 (0 is off)

Fade Speed: 0-100

Hold Time: 10-1280

PWM Rate: 3-100

DMX Channel: 1-473

## Additional Information

Serial cable pinouts are as follows:

DB9 connector	TRS connector
Pin-2	Tip
Pin-3	Ring
Pin-5	Shield (GND)

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