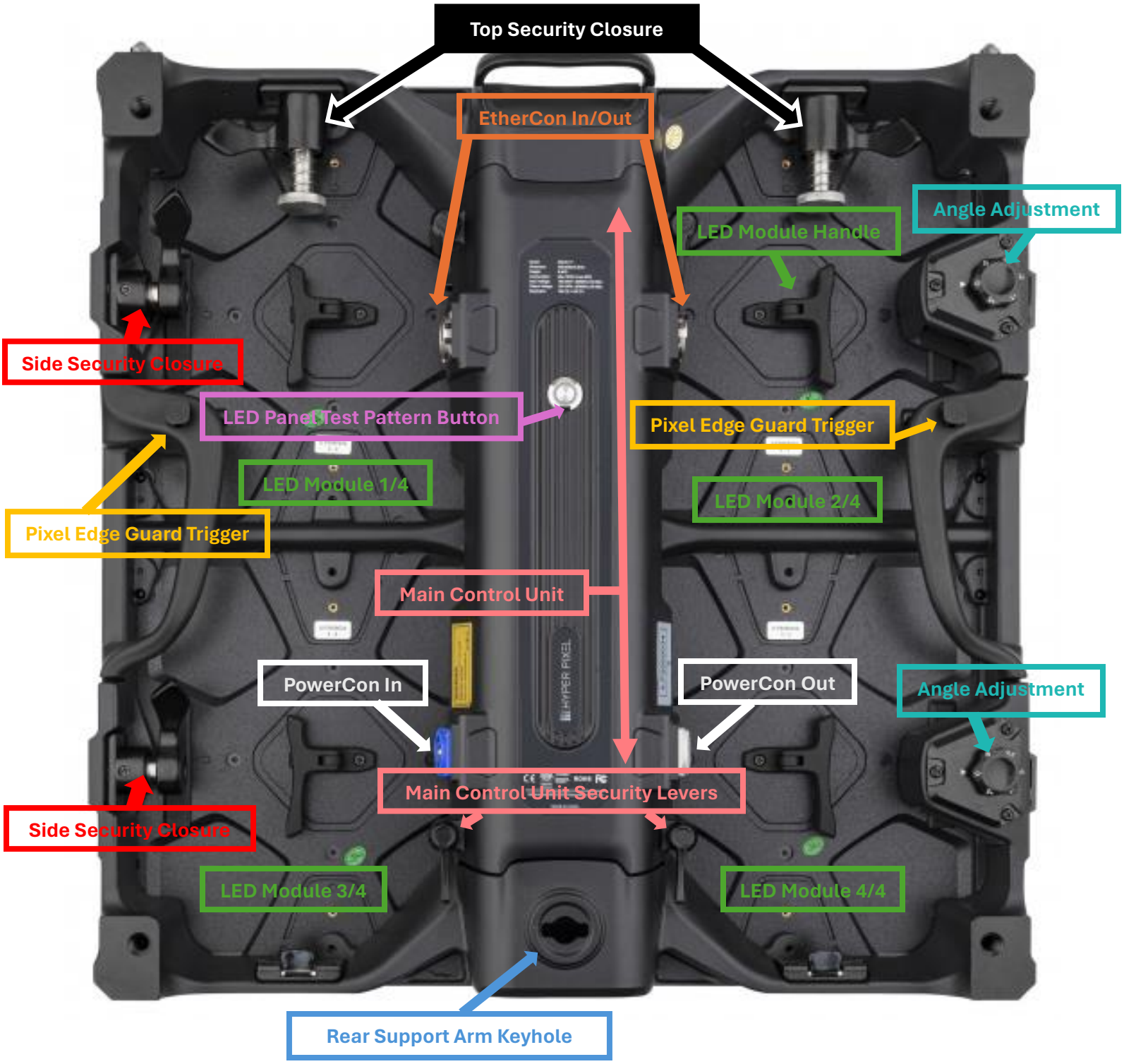
LED Panel Anatomy



LED Panel Anatomy

The above picture is a breakdown of the major components that make up each individual LED panel. Please see below for detailed information about each component and or part.

Angle Adjustment – The angle adjustment wheel allows you to set angled connections between each of your LED panels to create a continuous or abstract curvature. A 0-degree setting is considered standard and provides a flat LED wall configuration.

EtherCON In/Out – The EtherCON connections on your LED panel are used to transport information from the LED processor to the LED panels. These connections carry multiple types of signals including video and control information. The input and output connections are bi-directional meaning that the signal input and output can be from either the left or right side depending on your wiring configuration. EtherCON cables are a type of Ethernet cable designed for professional audio, video, and networking applications. They utilize the EtherCON connector, which combines the ruggedness of a traditional XLR connector with the ubiquitousness of an RJ45 connector.

Main Control Unit – The Main Control Unit is a modular part that contains the LED panel's power supplies, receiving card, and main circuit boards. There are 2 circuit boards within the main control unit. The "top hub board" sends and receives information related to the top left and right modules and the "bottom hub board" relates to the bottom left and right modules. The receiving card is responsible for maintaining the LED panel's function and content processing from the LED processor. The main control unit is held into place with four security latches that make replacement simple.

LED Module – Each LED panel is made up of four individual LED modules. An LED module is a self-contained unit that integrates multiple light-emitting diodes (LEDs) on a single printed circuit board (PCB) or substrate. The LED modules connect to the LED panel frame using strong magnetic connections. When properly aligned, the LED module's circuitry pins mate with the corresponding pins on the top and bottom hub boards. The LED module handles are secured to the back of each module to aid in the removal of the individual module.

LED Panel Test Pattern Button – The silver button located centrally at the top of the main control unit is the test pattern button for the individual LED panel. This button allows you to toggle through different colors and patterns to test your LED panel's function. To operate the test pattern button: with the LED panel plugged into power - press and hold the test pattern button for 3 seconds and then release it. You will see your LED panel light up as a solid primary color. Continue to single press the test panel button to toggle through all available colors and patterns. To exit the test pattern function, continue to press the test panel button until you see nothing on the front of LED panel.

LED Panel Anatomy

Pixel Edge Guard Trigger – The edge guard is a useful tool when handling your LED panels outside of their storage cases. The pixel guards help to protect against damage to the outer edges of pixels during LED wall construction or packaging. To activate the pixel edge guards, press the trigger on the bottom side of each of the left and right-side frame handles. When building an LED wall be sure to release the edge guards by pressing down on the trigger located on top of the left and right-side frame handles.

Rear Support Arm Keyhole – The rear support arm keyhole is the female receiver for the support arm. The support arm is a part of the ground support kit that gives your LED wall stability and strength. The rear support arm attaches to a series of support ladders or truss pieces. This keyhole is the part of the physical connection that ties your LED panels to the ground support structure.

PowerCON In and Out – PowerCON is an electrical connector manufactured by Neutrik for connecting mains power to equipment in a small space. It looks and works similarly to the Speakon connector, with the line connector inserted in the chassis connector and twisted to make contact and lock. Both line and chassis connectors are fully insulated even when disconnected. The PowerCON In connection on your LED panel carries power to the LED panel power supplies. The PowerCON output allows you to link additional LED panels to one power home run. PowerCON cable ends are color coded and must be connected to the corresponding female end on the main control unit.

Side Security Closure – The side security closure is a locking system used to connect LED panels together horizontally when building a wall or structure. When two LED panels are side by side, the spring-loaded locking mechanism can be pushed in, allowing the locking pin to enter the side of the adjacent LED panel frame. Once the locking pin is fully inserted into the adjacent LED panel frame the lever can be pushed down and tightened to lock the two LED panels together and close any visible gaps between the LED panels.

Top Security Closure – The top security closure is a locking system used to connect LED panels together vertically when building a wall or structure. When two LED panels are stacked vertically on top of one another, the spring-loaded locking mechanism can be pushed up, allowing the locking pin to the bottom of the above LED panel frame. Once the locking pin is fully inserted in the above LED panel frame the lever can be pushed to either side and tightened to lock the two LED panels together and close any visible gaps between the LED panels.

LED Module Swap

The LED module swap process is an easy, yet necessary process used to maintain the integrity of your LED's image.

When to replace an LED module:

You should look to replace an LED module when one of the following issues occur:

1. You have a single pixel or multiple pixels missing on an LED module (typically a result of something physically hitting the LED wall).
2. You have a pixel that is losing its connection to the main module board and has turned solid green or red.
3. You have a small section of a module that presents an off-colored set of squares, typically yellow and blue.
4. You have a small vertical line of pixels that are solid red, pink, yellow, or green (typically called a "worm" or "caterpillar") on one of the LED modules.

How to replace an LED module:

The **FIRST STEP** when attempting to replace an LED module is to identify the module from the backside of the LED wall (This step will require the help of another person).

- Have one person on the front side of the LED wall and one person on the back side of the LED wall.
- The person on the front side will tap on the module, with their hand or fingers, that needs to be replaced.
- The person on the backside of the LED wall will listen for the tapping and locate the module.
- It is a best practice to have the person on the backside of the LED wall tap on the module that they believe to be the correct module and have the person on the front of the LED wall tap back to confirm.
- Once the module has been identified, the person on the back side of the LED wall can use a piece of tape to mark the module that needs to be replaced.

The **SECOND STEP** will be to remove the damaged or faulty module from the LED wall and its frame. This step does not require a second person but can be useful if they are available.

LED modules can be "hot swapped" meaning that you do not need to remove the power source or turn the power to the LED module off.

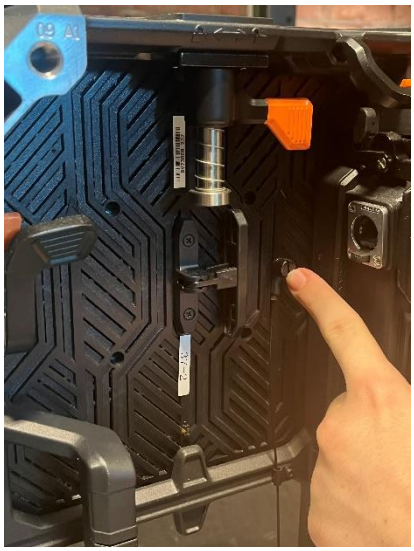
LED Module Swap

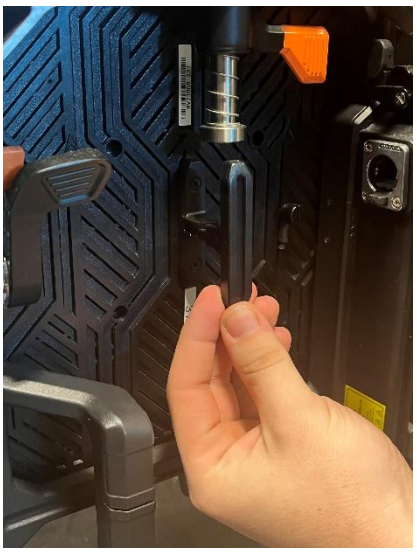
There are two methods that can be used to remove and replace an LED module:

Module Swap – Method 1

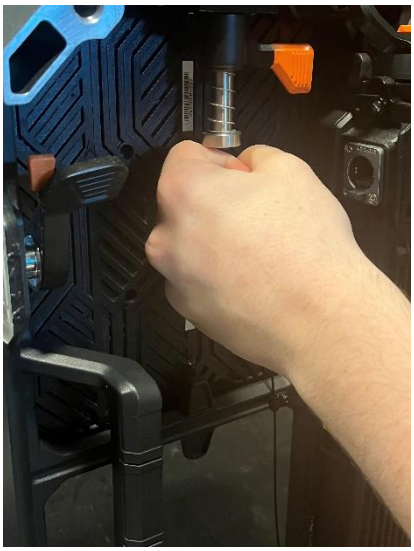
The first removal method would require a second person so that one person is in front of the LED wall and the other is behind the LED wall.

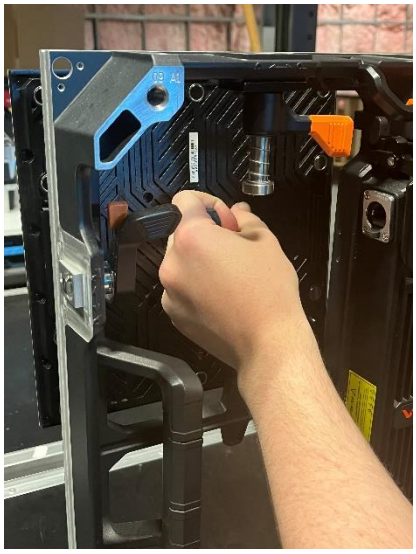
- With one person positioned on the backside and one person positioned on the front side of the LED module, that needs to be replaced (one person in front of the LED wall and one person behind the LED wall), the person on the backside of the LED wall will locate the “LED module handle” and fold it so that it is in the straight position instead of the folded down position.





- Grip the handle with one hand and push the module towards the front of the LED wall with strong and consistent pressure.

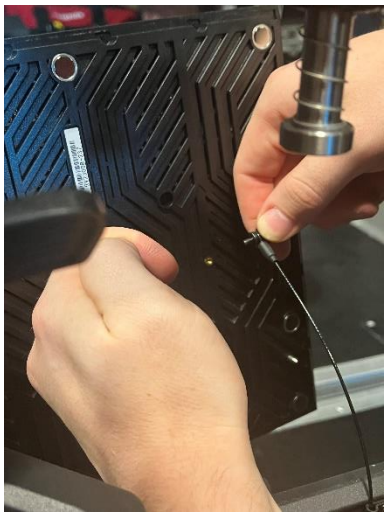




LED Module Swap

- The LED module will release from its magnetic grip and become unseated. The person on the front side of the LED wall will be there to help secure the module once it has been unseated so that the person behind the LED wall can release their grip on the LED module handle.

- Once the person behind the LED wall has released their grip on the LED module handle (the person on the front side of the LED wall is now holding the module) they can safely detach the module safety line. Depending on your LED module, the module safety line will be attached to the module with either a thumb screw (like the example below) or a carabiner clipped to a molded loop on the module or LED frame.



LED Module Swap

- When the module safety line is disconnected, the person on the front of the LED wall, that is holding the LED module can fully remove the LED module and put it in a safe location.

Module Swap – Method 2

The second method can be accomplished by one person but will need the special “module vacuum” that either came with your LED wall or you purchased separately.

- Locate the LED module, that is needing to be removed, on the front side of the LED wall.

- With the module vacuum in the power off state, place the suction face of the module vacuum against the module that is needing to be removed – Placement of the vacuum face is important – make sure no edges of the module vacuum have crossed over or are on the separation of the individual modules (four modules make up one LED panel).

- Once your module vacuum is pressed against the LED module, turn the module vacuum to the one position. You will feel suction against the LED module.

LED Module Swap

- With even and steady force pull back towards yourself to unseat the module from its magnetic holders. The module vacuum must stay on during this entire process.

- Once the LED module is detached from the LED panel frame, use your free hand to hold the module to prevent it from falling.
  If you turn the vacuum off before you have a firm hold of the LED module it is liable to drop and become more damaged or could fall and damage the LED wall

- With the LED module securely in your hand, turn the module vacuum to the “off” position and set the module vacuum down.

- Remove the module safety line and place the module in a safe location.

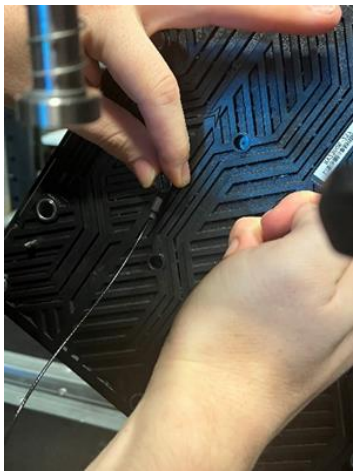
LED Module Swap

The **THIRD STEP** when replacing an LED module is to install the new LED module in place of the damaged or faulty LED module that was just removed.

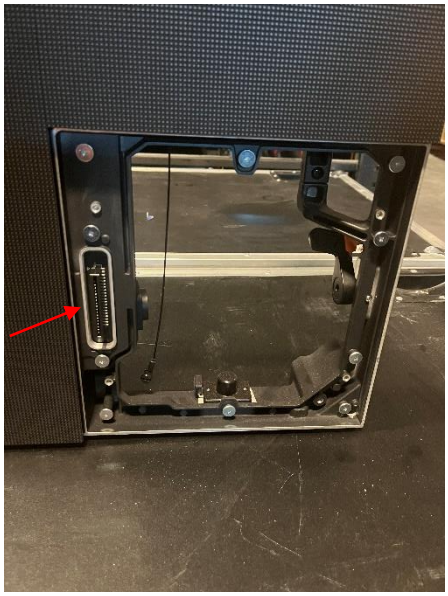
Installation of new LED Module

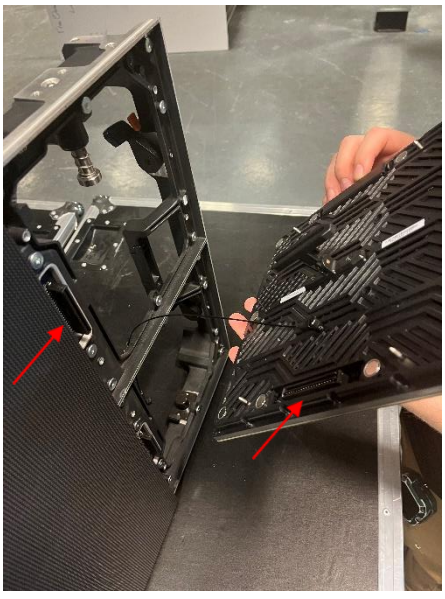
The installation of a new LED module can be accomplished by just one person and does not require a second person to assist.

- Retrieve a new LED module from your spare parts bin or box that came with your LED wall
- Working from the front side of the LED wall, secure the module safety line to the new LED module that you will be installing so that it is secure and will not fall.



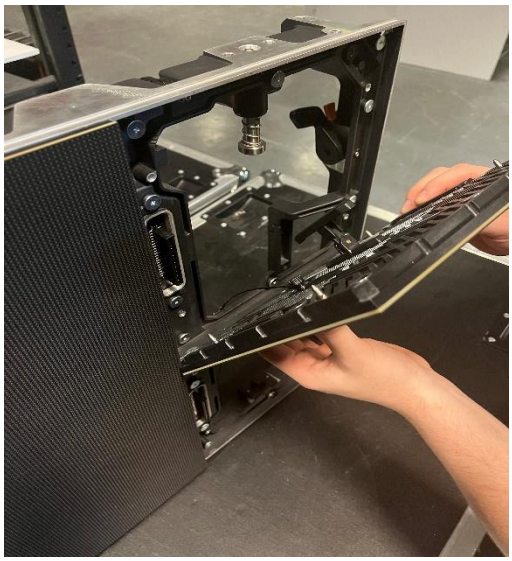
- While continuing to work from the front side of the LED wall, carefully align the contact pins on the outer edge of the LED modules backside with the pin receiving block located on the LED panels main control unit.



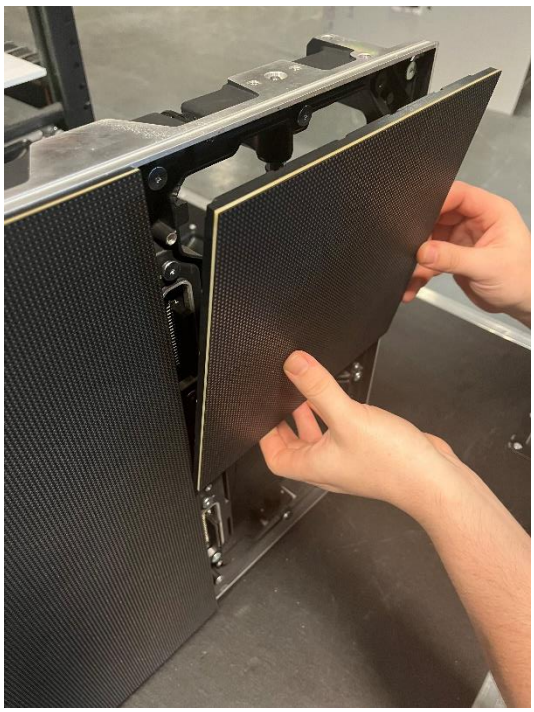


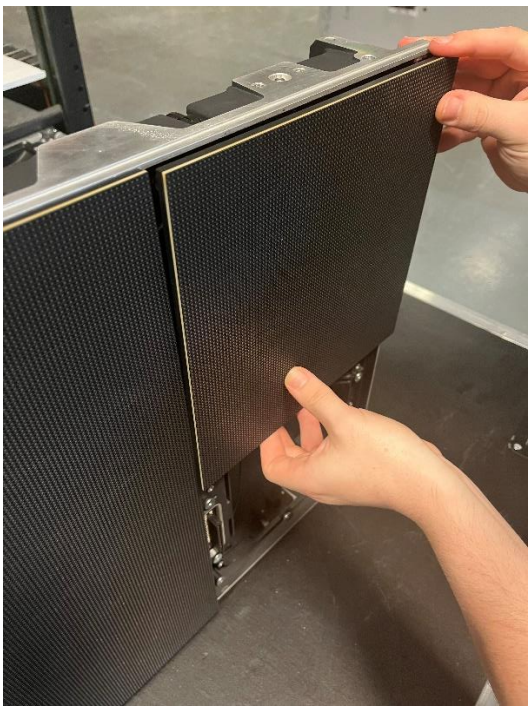
LED Module Swap

- Place the lower edges of the LED module in place making sure to align them with the top edge of the LED module below.



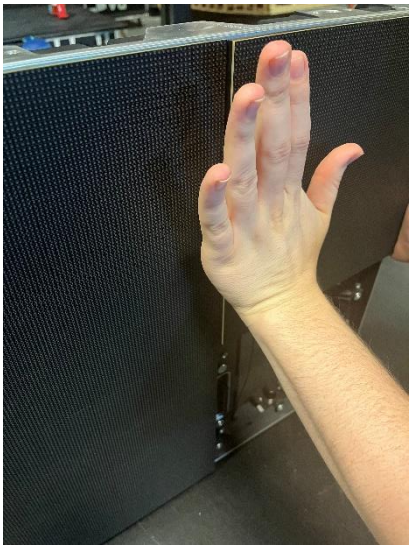
- Slowly raise the LED modules top half towards the LED panel frame. You will feel the magnetics begin to engage and guide the LED module into its correct position.





LED Module Swap

- Once the LED module is fully seated you may notice that one or several of its edges are not flush with the adjacent modules. In this instance you will want to gently “slap” it into position. This technique requires you to use an open hand to strike the LED module with your palm near the edge that is not flush. The idea is a broad/flat strike that disperses energy across the LED module so that no damage is incurred by a focused or narrow impact.



- Once you confirm that the module is flush, check the module to make sure that it does not have any damaged pixels or issues and matches the module around it. When the visual check is completed, you are finished.

Please collect and keep all bad or damaged modules in a designated space to await RMA and repair

Main Control Unit Swap

The Main Control Unit, or “MCU” on your LED panels is a single housing that contains many of the vital components that make up your LED panel. Some of the more important items are:

LED Receiving Card
LED Power Supplies
LED Processing boards

When to replace the LED Main Control Unit:

You should look to replace an LED main control unit when one of the following issues occur:

1. Your LED panel is not showing an image.
2. Your LED panel image flickers on and off.
3. Your video is not displaying properly on one panel.

Do not replace a receiving card or main control unit unless confirmed and authorized by a Vu Service and Support specialist

How to replace an LED module:

The **FIRST STEP** when replacing a main control unit is to identify the LED panel from the backside of the LED wall (This step will require the help of another person).

- Have one person on the front side of the LED wall and one person on the back side of the LED wall.
- The person on the front side will tap on the LED panel, with their hand or fingers, that needs its MCU replaced.
- The person on the backside of the LED wall will listen for the tapping and locate the desired LED panel and MCU.
- It is a best practice to have the person on the backside of the LED wall tap on the LED panel that they believe to be the correct one and have the person on the front of the LED wall tap back to confirm.
- Once the correct LED panel has been identified, the person on the back side of the LED wall can use a piece of tape to mark the MCU that needs to be replaced.

The **SECOND STEP** will be to remove the damaged or faulty MCU from the LED panel. This step does not require a second person.

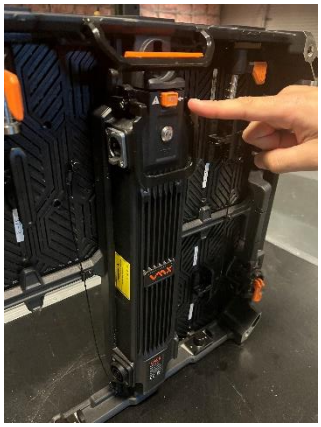
> *LED Main Control Units CAN NOT be “hot swapped” meaning that you will HAVE to remove the power source to the LED panel by disconnecting the PowerCon cables going into the LED panel. *

Main Control Unit Swap

When you have removed the power source from the LED panel that you will be working on, follow these steps to complete the Main Control Unit swap.

In this example the main control unit is released using a push button and latch system. Your LED panel may look a little different, but the process is essentially the same.

- Locate the latch or the release push button and latch handle.



- With one hand, push the release button in with your thumb and grip the latch with your fingers.

- Depress the release button with your thumb and pull the latch handle upwards with your fingers. You will see the top of the main control unit start to disconnect from the back of the LED panel.

Main Control Unit Swap

- Continue to pull upwards on the latch handle until the latch catch is no longer engaged with the latch pins.

- If the previous steps were completed correctly, you will be able to pull the latch handle back towards your body and the MCU will begin to separate fully from the LED panel.

- Continue your downward movement while still holding the latch handle. The main control unit will become fully disconnected as you move to a horizontal position.

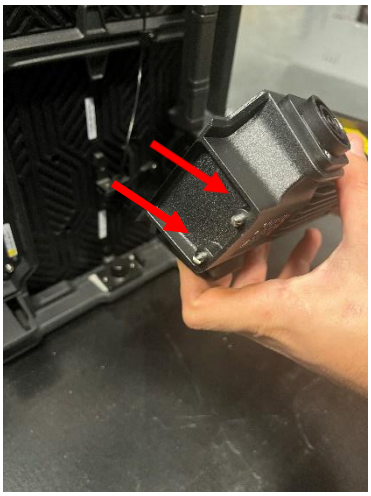
- Once your faulty main control unit is removed it can be placed in a safe location to await an RMA.

Main Control Unit Swap

The THIRD STEP to replacing the main control unit will be to install a new MCU in place of the bad or faulty unit that was just removed.

Make sure that the power to the LED panel that you are working on is still disconnected. We will reconnect the power once the new main control unit is installed.

- Retrieve a new MCU from your spare parts bin.
- Do a visual inspection of the new main control unit to ensure there is nothing loose or broken before installing it into your LED panel.
- Locate the set pins on the bottom of the new MCU.



- While holding the MCU vertically, place the set pins into the receiving slots located at the bottom center of the LED panel frame.

Main Control Unit Swap

- Once the set pins are securely inserted into the receiving slots, push the top of the MCU towards the top latch pins located at the top of the LED panel frame.

- When the top of the main control unit is near its final position, pull the latch handle up so that the latch hooks move past the latch pins on the LED panel.

- The MCU will now be able to be pushed all the way in. You will know that it is seated properly when you hear the release push button click into place.

- Grab the latch handle and push it down towards the bottom of the LED panel. The latch will move until it reaches the front of the MCU front plate.

Main Control Unit Swap

- When you are confident that the new main control unit is securely in place, you may reconnect both PowerCon cables.

- If the installation is done correctly, your LED panel will now turn on and display an image.