SPIKEMARK™ PENDANT

USER MANUAL V2.0

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GETTING STARTED

The Pendant works in conjunction with Spikemark software and the Showstopper 3 Base to bring the power of Spikemark anywhere in the theater. Once connected to Spikemark, you are no longer tied to the automation table!

Although the Pendant is portable, it is not indestructible - it's a little computer after all. Take care to avoid dropping the Pendant, spilling liquids on it, and scratching the touch screen.

FEATURES

- *7" Touchscreen*
- *Network connected device*
- *Rugged locking cable connectors*
- *Self-terminating Remote E-Stop button*
- *Hold To Run (HTR) functionality*
- *Jog paddle calibration*
- *Pendant Firmware V3*
- *Jog any motor manually or to a Spike*
- *Jog motor groups manually*
- *Jump into a group for individual axis control*
- *Move individual axes to any position within the Hard Limits*
- *Use the jog wheel for fine tuning position*
- *Adjust Spikes on the fly*
- *Reset position*
- *Activate and deactivate motors*
- *Bluetooth keyboard for adjusting default settings*

SETUP

The Pendant is not a standalone device, it is an arm of Spikemark. This means it must be connected to the same network as the PC running Spikemark. Setting up the Pendant is straightforward. With only two cable connections and a few IP Addresses you'll be up and running in no time.

MAKING THE CONNECTIONS

The Pendant has two physical connections:

- *Showstopper 3 Accessory input*
- *Network input*

The Accessory input provides power (+24VDC) to the Pendant as well as the Remote E-Stop capability. This connection is a standard Showstopper 3 Accessory cable connector, a male Harting style 6B locking connector. The Pendant is self terminating, meaning it will be the final accessory in

*that line. It can be connected to the system through the **Stage Manager** or any open Accessory port on a **Showstopper 3 Base** or **Showstopper 3 Hub**.*

Network connectivity is provided through a Neutrik EtherCon receptacle. We like these connectors due to their ruggedness. Don't worry if you only have a standard RJ45 cable - they plug right in as well. Once the physical connections are complete, it's time to set up the network properties.

The Pendant requires an active network connection in order to boot successfully – please confirm the Ethernet cable is connected and Spikemark is running prior to connecting the Showstopper 3 Accessory cable.

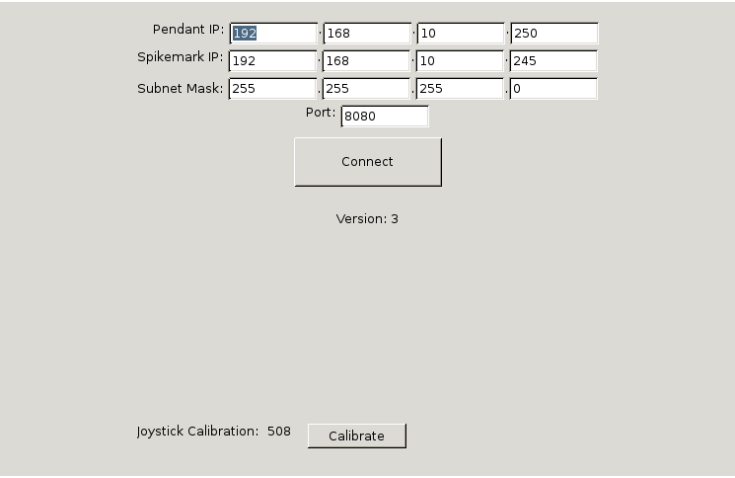
NETWORK SETTINGS

Because the Pendant is a networked device it needs to have a unique static IP address. This address must be set on both the Pendant and in Spikemark to allow communication to the Pendant.

> ***IMPORTANT NOTE:***
>
> *The Pendant will not function properly if there is an active DHCP Server on the network.*
>
> *It will connect and motor info will be displayed but you will not be able to select different motors. You will not be able to manually jog or jog to a Spike.*

PENDANT SETTINGS

Once the connections are made and there is power to the Showstopper 3 Base, the Pendant will power on. Once the boot up process is complete, the Pendant will be at the configuration screen.



The default IP Address values will be completed for both the computer running Spikemark as well as the Pendant:

- *Spikemark IP: 192.168.10.245*
    - *This is the default IP Address of the computer running Spikemark*
- *Pendant IP: 192.168.10.250*
    - *This is the default IP Address of the Pendant*
- *Subnet Mask: 255.255.255.0*
- *Port: 8080*

The default values are merely suggestions based on how we configure the Spikemark network. Have no fear, you can easily change these values to fit into your network settings. Select a value to change, either with your finger (it's a touch screen) or use the touchpad on the included Bluetooth keyboard. You can scroll through the values with the jog wheel or use the keyboard to delete and enter the value directly.

Any changes to the IP Addresses, Subnet or Port will be saved to the Pendant once the Connect button is pressed.

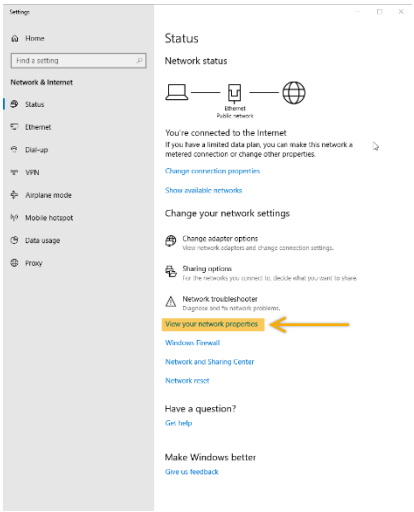
SPIKEMARK SETTINGS

If you have set up a Stagehand in the past, setting the Pendant IP Address will feel familiar enough.

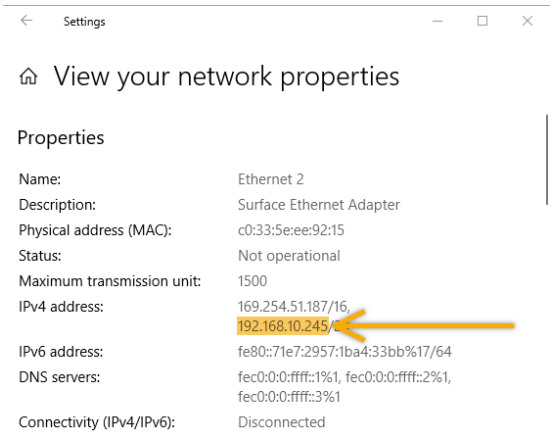
CONFIRM THE COMPUTER IP ADDRESS

Before moving forward you will need to confirm the Spikemark computer IP Address matches what is entered on the Pendant. To find your network settings in Windows 10:

- *Press the **Start** button, type Network Status then press **Enter***
- *On the **Network Status** window click on "View your network properties"*



- *Find your network adapter (if you have more than one) and find the IPv4 address*



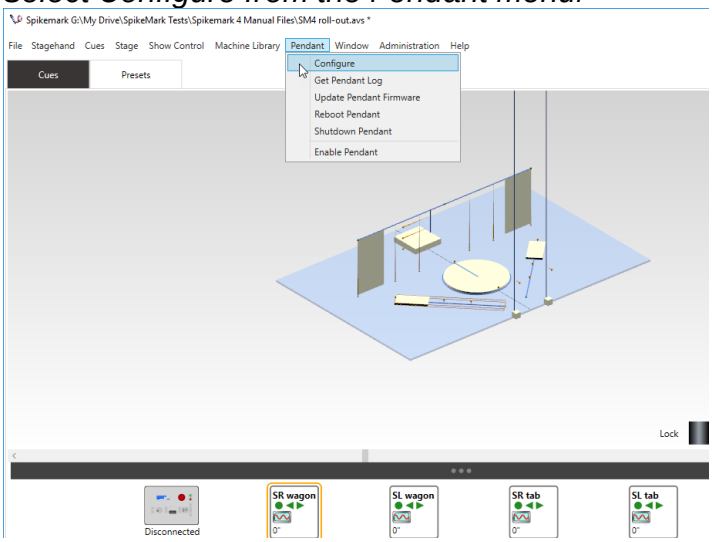
In this case I am using the Surface Ethernet Adapter with an IP address of 192.168.10.245. Remember this IP address. You might want to write this down because this is your Spikemark IP address and you will need to input this as you configure your Spikemark Pendant.

- *If you need to adjust your IP address, click the back arrow in the upper left corner, then click "Change adapter options"*
    - *Double click on your adapter from the list*
    - *Double click on Internet Protocol Version 4 (TCP/IPv4)*
    - *Click "Use the following IP address" radio button*
    - *Adjust the IP address*
    - *Confirm the Subnet mask is 255.255.255.0*
    - *Click OK to close the settings window*
    - *Click OK to close the adapter properties window*
    - *Close the Network Connections window*
    - *Close any additional windows*

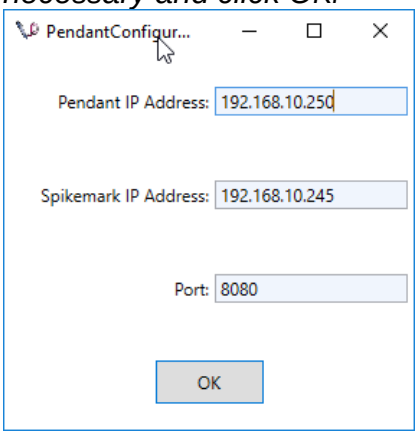
PENDANT CONFIGURATION

1. *Confirm Enable Pendant is unchecked in the Pendant menu.*

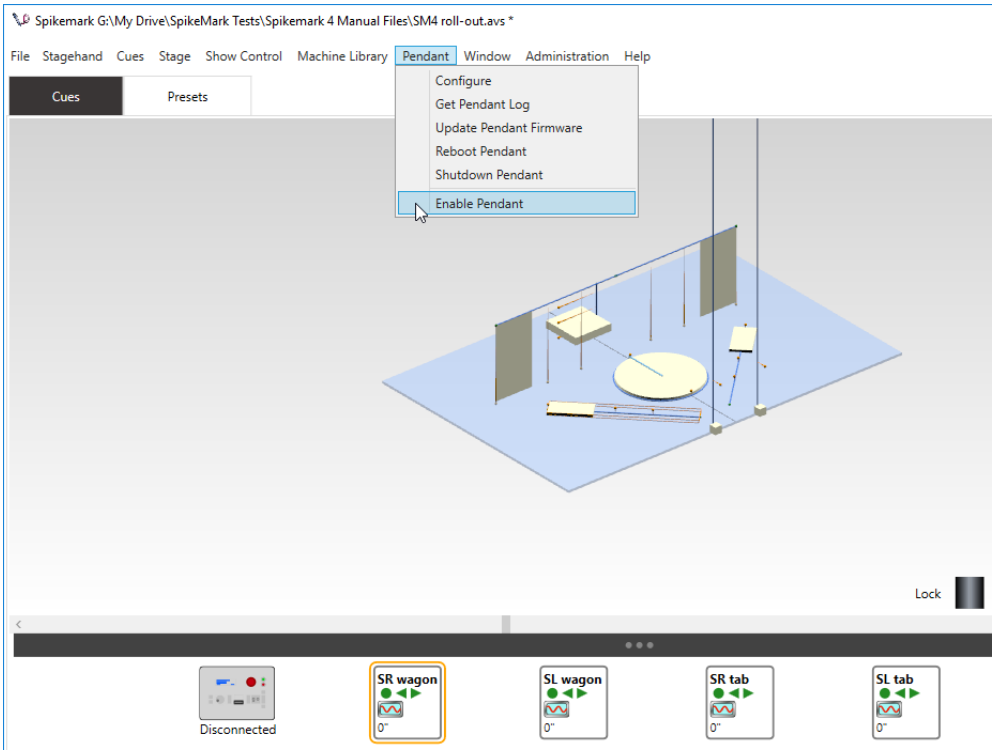
2. *Select Configure from the Pendant menu.*



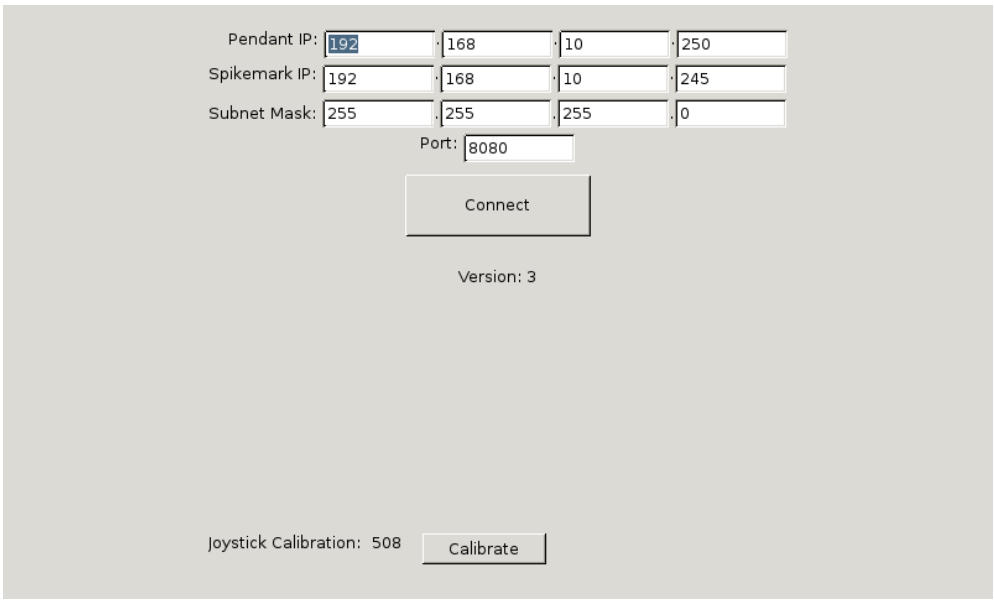
3. *In the Pendant Configuration window, update the computer and Pendant IP Addresses if necessary and click OK.*



4. *Select Enable Pendant from the Pendant menu. You know Spikemark is ready for the Pendant when there is a check mark next to **Enable Pendant** in the Pendant Menu.*



5. *Select Connect on the Pendant menu.*



6. *Once the Pendant is connected the display will change from the configuration screen to the operation interface.*

OPERATION

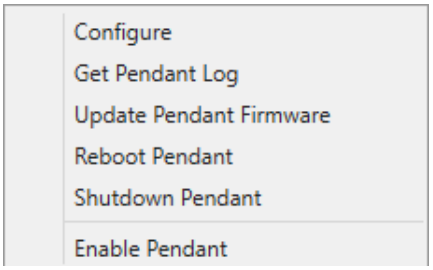
Once the Pendant and Spikemark are communicating you are ready to go. Before you Make It Move! let's take a look at the Pendant buttons, levers and knobs:

STARTUP AND SHUTDOWN

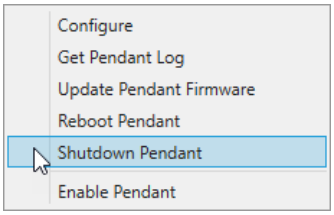
The Pendant will power up as soon as it is plugged into an active Showstopper 3 Accessory port. However it must be enabled within Spikemark every time Spikemark is started before it will be able to connect. Although the Pendant will shut off when the Accessory cable in unplugged, the recommended method is from within Spikemark. Let's take a look at the Spikemark options.

SPIKEMARK CONFIGURATION

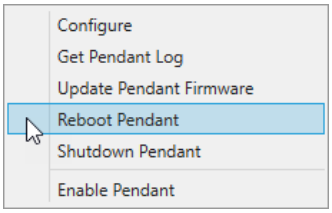
- ➔ *Configure*
  - ◆ *IP Address and Port configuration*
- ➔ *Get Pendant Log*
  - ◆ *Downloads the log to your PC*
- ➔ *Update Pendant Firmware*
  - ◆ *Firmware updates are executed from here*
- ➔ *Reboot Pendant*
  - ◆ *The preferred reboot method*
- ➔ *Shutdown Pendant*
  - ◆ *The preferred shut down method*
- ➔ *Enable Pendant*
  - ◆ *Enabling the Pendant in Spikemark*



*To shut down the Pendant, select **Shutdown Pendant** from Spikemark. Once the Pendant display is blank, it is safe to unplug the Pendant.*

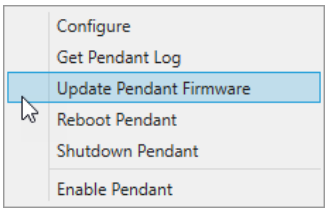


*Occasionally, the Pendant will need to be rebooted. Select **Reboot Pendant** from Spikemark. Once rebooted, reconnect from the Pendant display.*

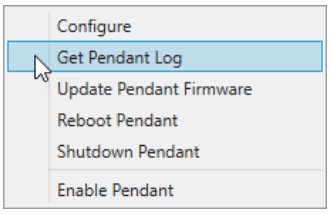


IMPORTANT NOTE:
If the Pendant is unresponsive, you will need to pull the accessory cable to restart it. This method requires the Pendant to be unplugged for approximately 45 seconds before it will restart.

When updated firmware is released, it is distributed through and can be installed from Spikemark by clicking ***Update Pendant Firmware****.*

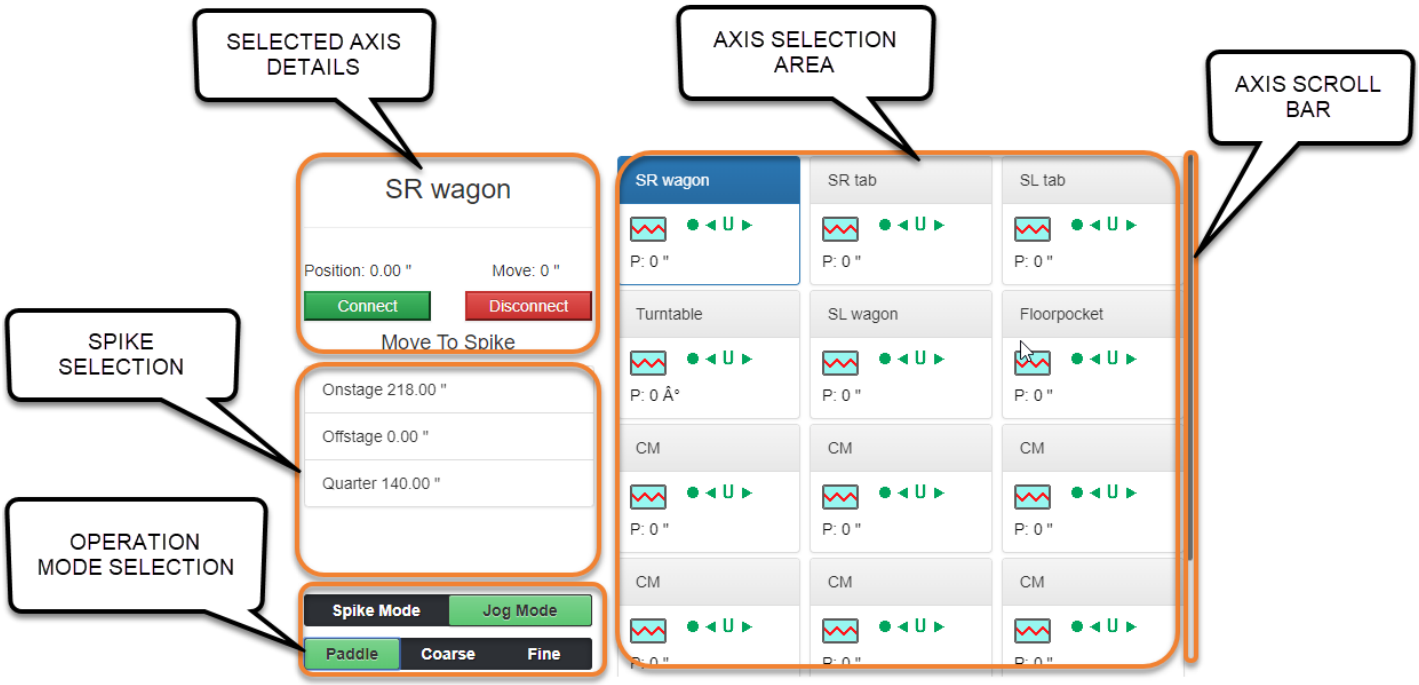


If you encounter issues while using the Pendant, select ***Get Pendant Log*** *and follow the prompts. Once downloaded to your computer, email the Pendant log along with the current show file, the last three Spikemark logs, and a description of the issues you are facing to support@creativeconners.com.*



UNDERSTANDING THE PENDANT DISPLAY

The Pendant screen displays a wealth of information to the operator and is easy to navigate with the touch of your finger. Let's take a look at the typical screen layout.



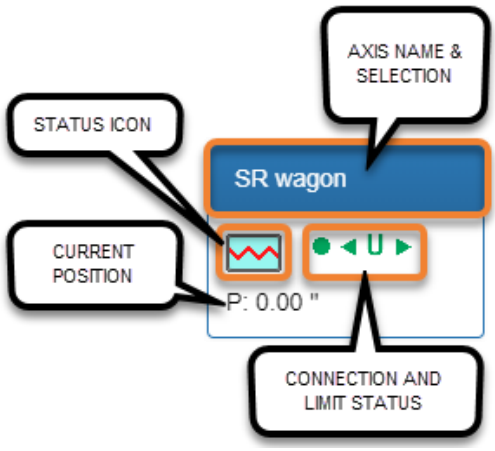
The Axis Selection area will be populated with any Stagehands or Motion Groups in your show file. If your show only has one axis, you will only see one motor displayed. If you are working with more than

12 axes or 12 groups, you can scroll down with the scroll bar or slide the axes up to see additional units.

Each axis is populated in the order which Spikemark connected to them. This means that each time you connect the Pendant, the display order of axes could be different. The easiest solution is to disconnect all motors from within Spikemark, then connect in the order you would like displayed.

STATUS ICONS AND AXIS DETAILS

Each Axis has several status icons which identify the connection state as well as the soft limits, initial and ultimate hard limit states.

<table>
<tr>
<td> 
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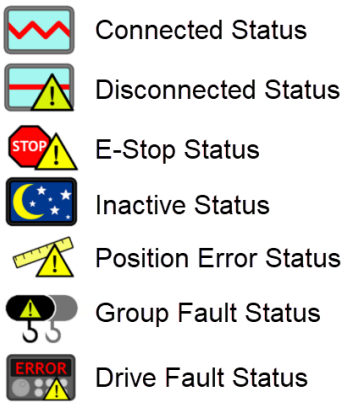
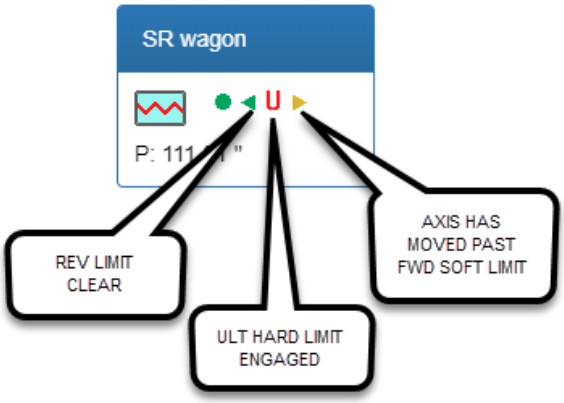
<td> 
</td>
</tr>
<tr>
<td>AXIS Display</td>
<td>AXIS Status ICONS</td>
</tr>
<tr>
<td> 
</td>
<td>Circle: Connection Status

Left Pointing Arrow: REV Limit Status

U: ULT Limit Status

Right Pointing Arrow: FWD Pointing Status</td>
</tr>
<tr>
<td colspan="2">AXIS LIMIT STATES</td>
</tr>
</table>

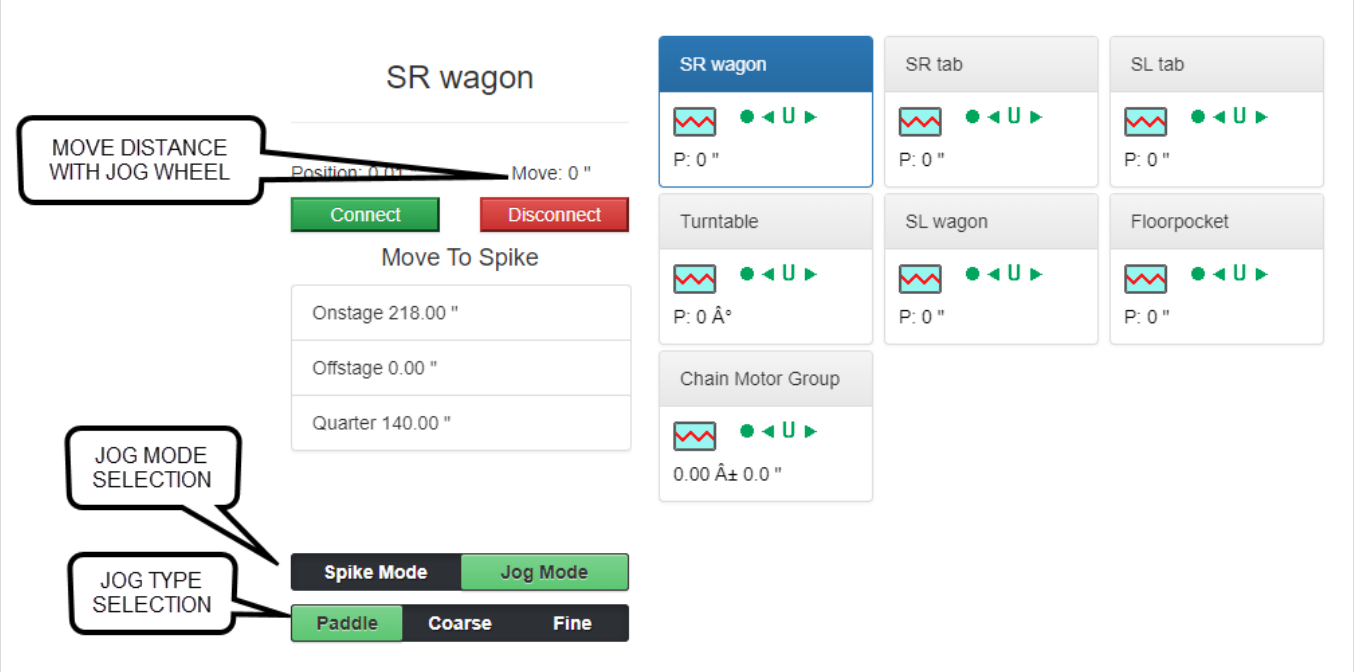
AXIS LIMIT STATES	Green	Yellow	Red
Circle	Axis Connected	Axis Attempting to Connect	Axis Disconnected
Left Pointing Arrow	REV Limit Cleared	Passed REV Soft Limit	REV Limit Engaged
U	ULT Limit Cleared	N/A	ULT Limit Engaged
Right Pointing Arrow	FWD Limit Cleared	Passed FWD Soft Limit	FWD Limit Engaged

MOVING REAL MACHINES

With Spikemark and the Pendant communicating and an understanding of the interface under your belt, it's time to Make It Move! Let's look at the options available to move real machines.

JOGGGING

The Pendant can manually jog any individual or grouped axis with the Paddle or the Jog Wheel. You can also dive into a Group to manually nudge a single motor as needed. See the images below for details.



MANUAL JOG SELECTION OPTIONS

No matter the manual jog method, the ENABLE button must be pressed to allow motion.

JOGGING WITH THE PADDLE

Jogging with the Paddle is the quickest way to move the selected axis or group. The Paddle offers proportional control of the selected axis or group - the further you move the paddle the faster the axis will move. This is really helpful when moving scenery on stage for spacing and placement. As with the Showstopper 3 Consolette and the Spikemark on-screen jog slider, the Paddle has a non-linear jog profile, making jog movements smooth through the full range of motion. Here's how to jog with the paddle:

- *Select the axis or group*
- *Select **Jog Mode** then select **Paddle***
- *Press and hold the green **Enable Button***
- *Move the jog paddle forward or reverse to move the selected axis in that direction*
- *When jogging a single axis, you should notice the position change in both the Axis Display, Selected Axis Display, and your machines on stage*

IMPORTANT NOTE:

*Releasing the **Enable Button** or the **Jog Paddle** will stop all jogging motion immediately.*

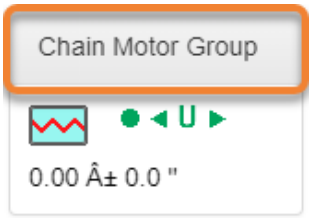
JOG WITH THE JOG WHEEL

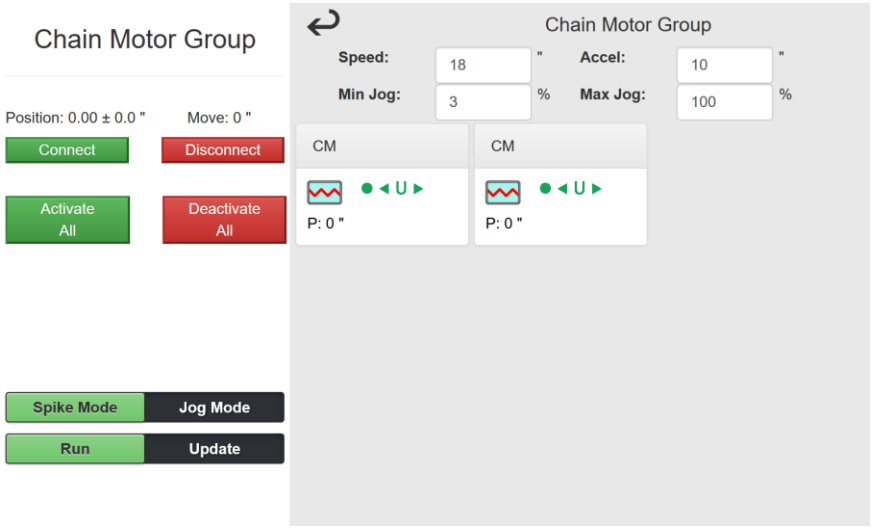
*Jogging with the Jog Wheel works the same way on the Pendant as it does with the Showstopper 3 Consolette. Depending on the setting, one click of the wheel will move the selected axis one scaled unit or 1/10th of one scaled unit. This means if you are jogging a Pushstick with a scaled position in inches, when **Coarse** is selected one click of the jog wheel will move the Pushstick 1". When **Fine** is selected the same click will move the Pushstick 0.1". Here's how to jog with the Jog Wheel:*

- *Select the axis or group*
- *Select **Jog Mode** then select **Coarse** or **Fine***
- *Press and hold the green **Enable Button***
- *Turn the jog wheel Clockwise to move forward and Counterclockwise to move reverse*
- *The status will show the move distance*

GROUP JOGGING

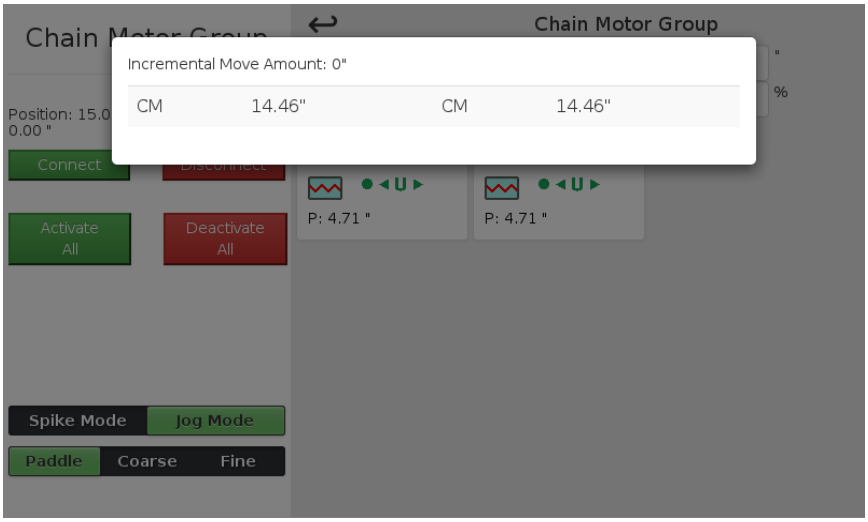
On its face jogging a group is very similar to jogging a single axis, though there is a lot happening in the background to make it seamless. To manually jog a group, simply select the group in the axis selection area and the screen will change to show details about the group.





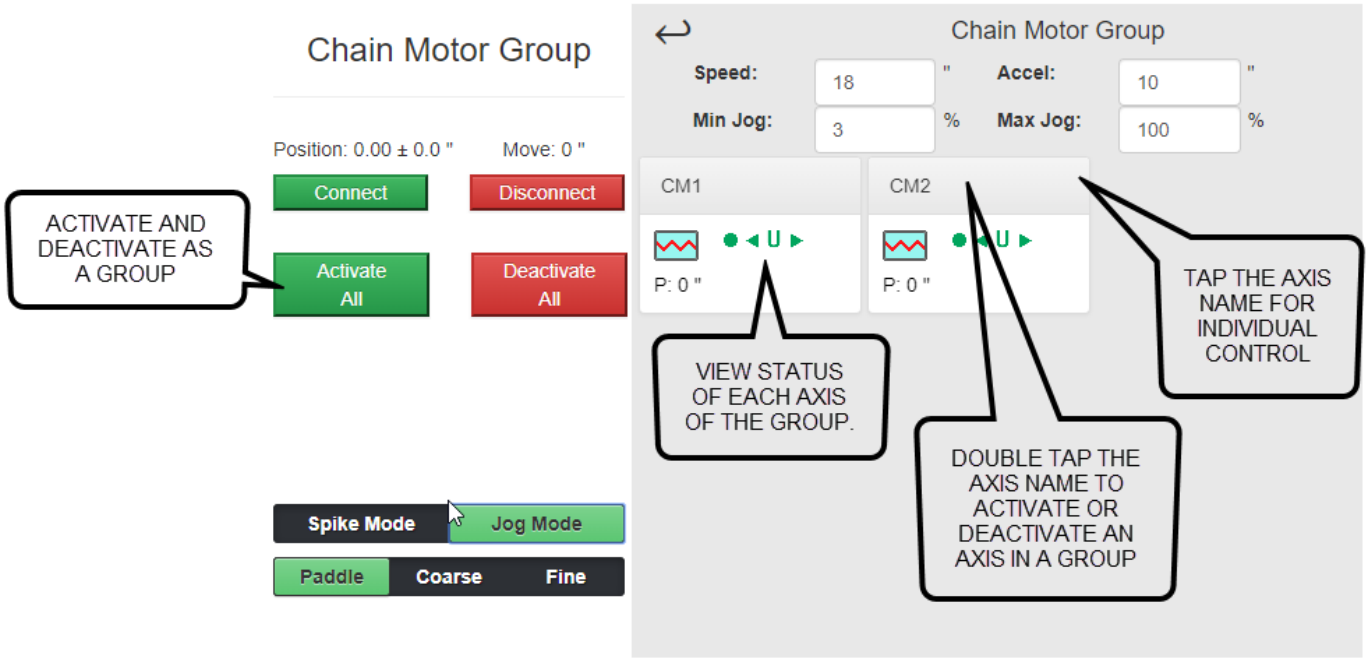
SELECT TO EXPAND *EXPANDED GROUP WINDOW*

*From the expanded group window select **Jog Mode** and **Paddle** to begin jogging the group with the jog paddle. Don't be alarmed when a new floating window appears as you begin to jog. The floating window displays the current position for all motors in the group. It will look something like this:*



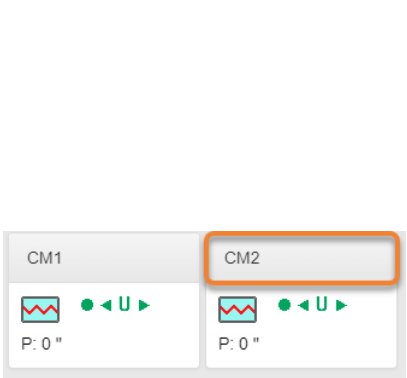
JOG FLOATING WINDOW

Just like with a single axis, you can also adjust group motion speed parameters.

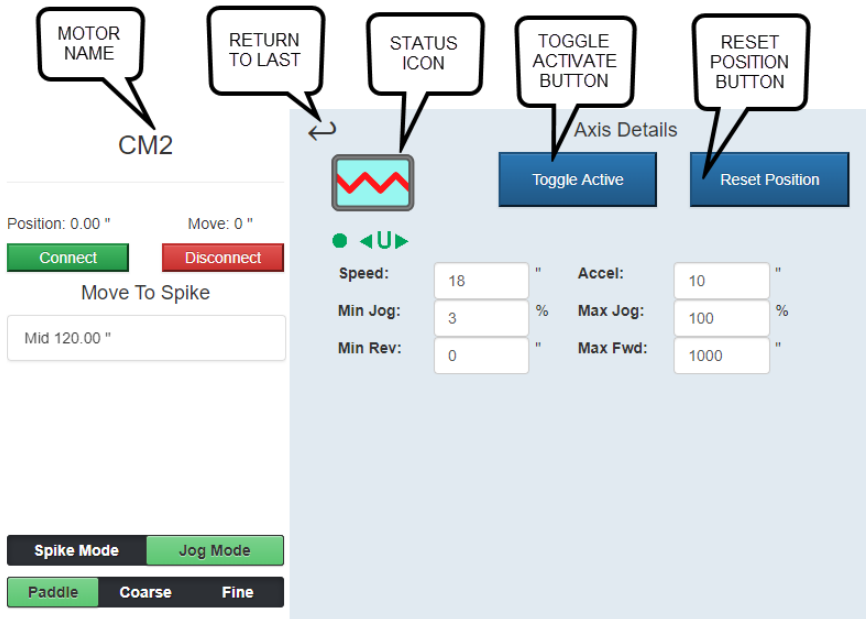


GROUP JOG WINDOW

Double clicking on the header of an individual axis in a group will open the axis details window for that motor. From this window you can Activate or Deactivate the motor, jog it independently from the group and reset position.



AXIS SELECTION



AXIS DETAILS SCREEN

SPIKE MODE

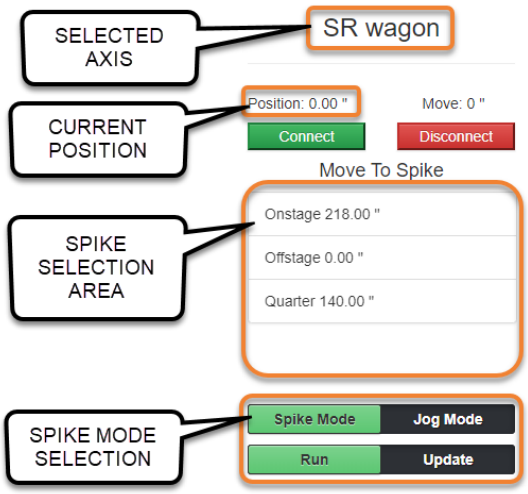
In addition to manual jog capabilities, the Pendant also allows jogging to a Spike as specified in Spikemark. If the selected axis doesn't have any spikes set, or if you have a Group selected, no spikes will be available. Spikes can be set outside the soft limits, however the machine will only travel to the soft limits. You will see an '!' inside a triangle if this is the case.

Keep in mind that jogging to a Spike utilizes the Default Speed and Acceleration values in Spikemark for that axis. You can adjust these values from Spikemark or directly from the Pendant.

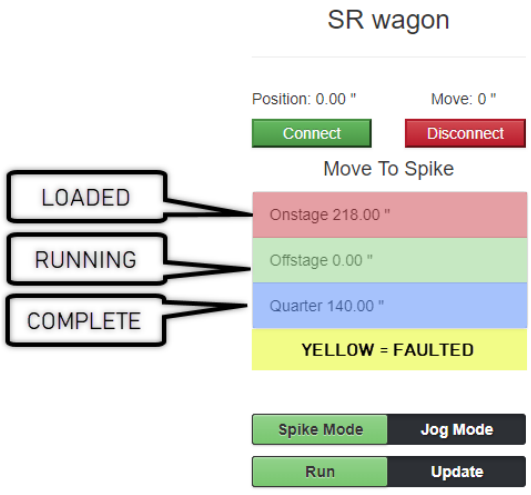
JOGGING TO A SPIKE

- *Select the axis*
- *Select the Spike to move to - it will highlight RED*
- *Press and hold the Enable button - motion will begin*
    - *The selected Spike will highlight GREEN while motion is active*
- *When the move is complete the Spike will highlight BLUE*
- *Jogging to a Spike is only supported on individual axes*

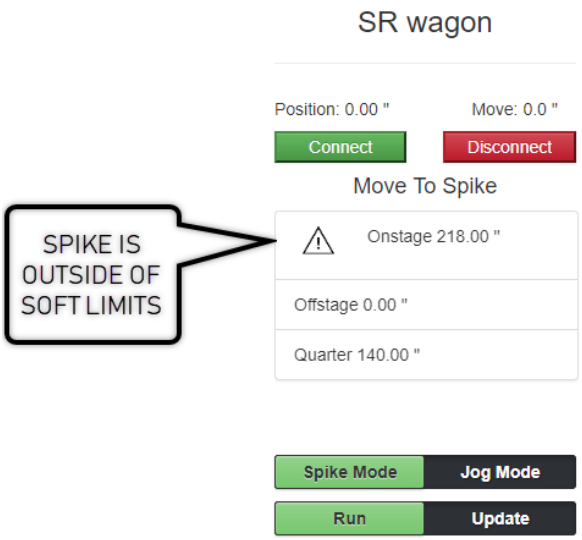
The Spikes section displays the state of the spikes.



SPIKES SELECTION AND DETAILS



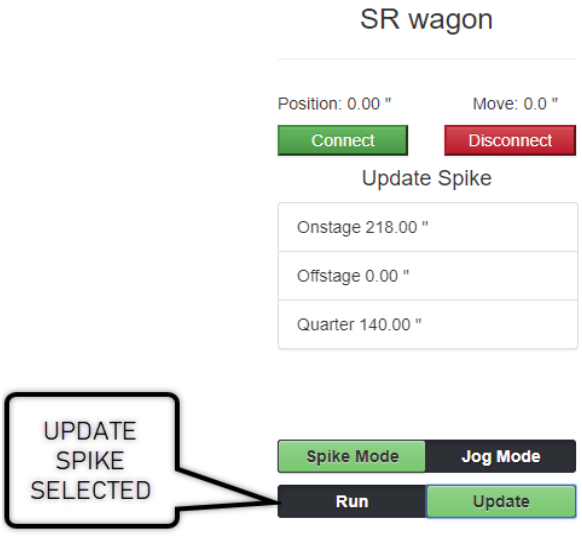
SPIKES HIGHLIGHT COLORS



SPIKE OUTSIDE OF SOFT LIMIT

UPDATING SPIKES

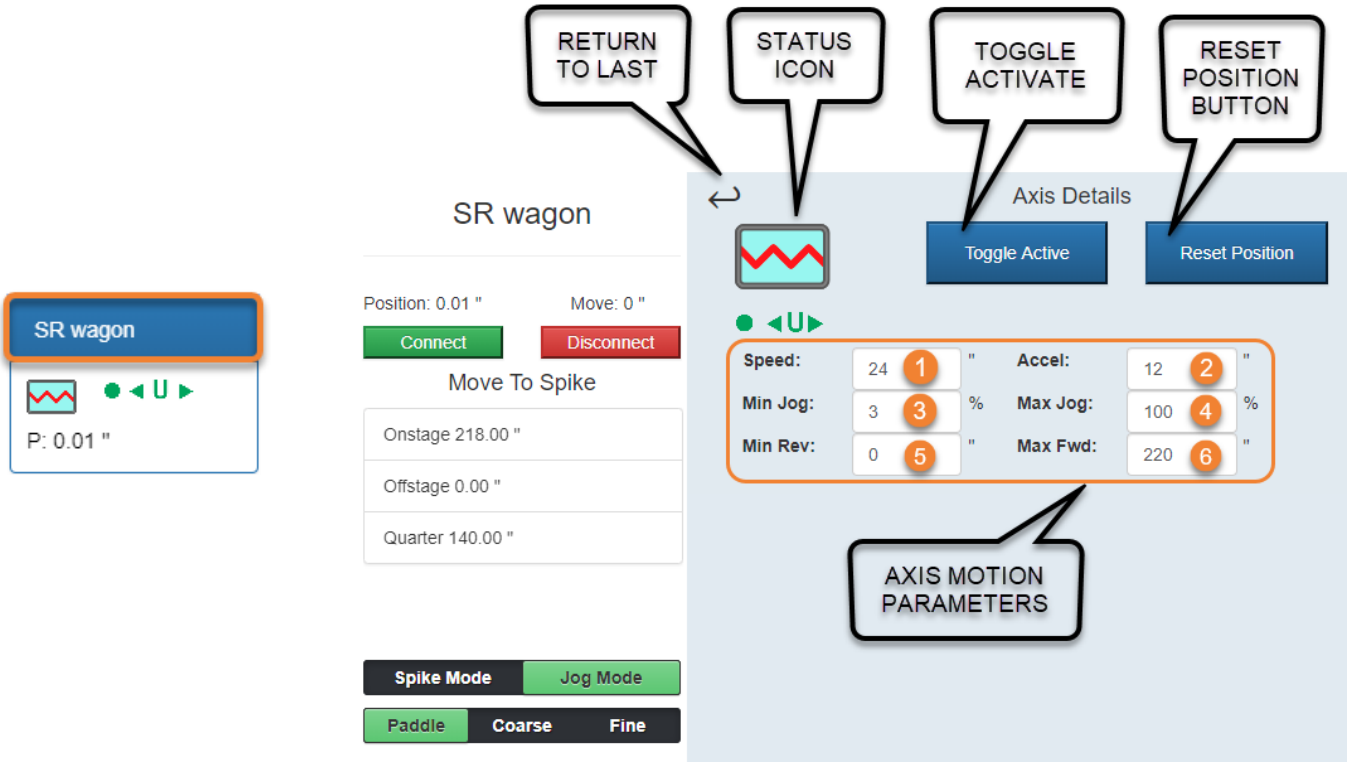
While Spikes are only able to be created in Spikemark, they can be updated from the Pendant while out and about on the stage. To update an existing Spike, simply Jog your motor to its new location and tap ***Update*** *followed by tapping the Spike you want to update. Your Spike is now updated on the Pendant and in Spikemark.*



UPDATING A SPIKE FROM THE PENDANT

AXIS DETAIL SCREEN

To access the Axis Detail Screen, double tap on the name of the axis you want to see more information about. In the Axis Detail Screen, you can activate or deactivate your motor, reset the position, and change speed, acceleration, and position values. You can also run your motors in ***Spike Mode*** *or* ***Jog Mode*** *from the Axis Detail Screen.*



AXIS SELECTION *AXIS DETAILS SCREEN*

1. ***Speed:*** *The speed at which the motor runs in* ***Spike Mode***
2. ***Accel:*** *The acceleration and deceleration at which the motor runs in* ***Spike Mode***
3. ***Min Jog:*** *The minimum speed percentage an axis will jog at*
4. ***Max Jog:*** *The maximum speed percentage an axis will jog at*
5. ***Min Rev:*** *Soft Reverse Limit*
6. ***Max Fwd:*** *Soft Forward Limit*

TECHNICAL SUPPORT

We strive to provide all the details required to operate and troubleshoot issues here. But if you are stuck and getting frustrated, have no fear, we are here to help! The best and quickest way to reach us is via email: support@creativeconners.com. Someone is on call, weekdays/evenings/showcall/ weekends and will get back to you quickly. We are also here to talk - call us at 401-289-2942 x2. If we don't answer leave a message, we'll call you back as quickly as we can.

TROUBLESHOOTING

OPERATIONAL ISSUES

IMPORTANT NOTE:

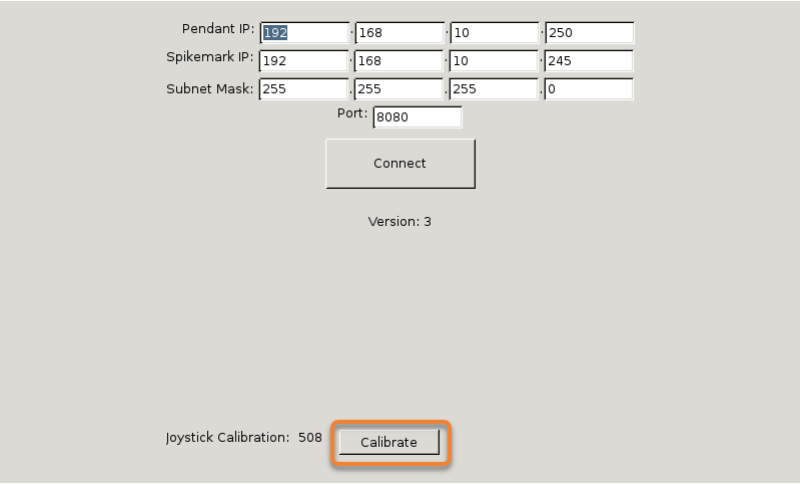
The Pendant will not function properly if there is an active DHCP Server on the network.

It will connect and motor info will be displayed but you will not be able to select different motors. You will not be able to manually jog or jog to a Spike.

CALIBRATING THE JOG PADDLE

Occasionally you may notice when the enable button is pressed and the Pendant is in Jog mode, the selected axis or group will begin to creep forward or reverse. This can be fixed by calibrating the paddle from the Configuration Screen

1. *Reboot your pendant from Spikemark.*
2. *Confirm the Jog Paddle is resting at the center of its range of motion*



3. *Tap the **Calibrate** button*

4. *Reconnect your Pendant to Spikemark following the steps explained above and test the calibration.*

WILL NOT MOVE TO A SPIKE

Occasionally you may not be able to jog to a Spike, yet you will still be able to manually jog. This is a communication issue between the Pendant and Spikemark. Rebooting Spikemark and reconnecting the Pendant will restore full functionality.

UNABLE TO MANUALLY JOG

- *Confirm jogging functionality from a Showstopper 3 Consollette or from the manual jog controls in Spikemark.*
- *Confirm the green ENABLE button is engaging.*
- *Restart Pendant.*
- *Restart Spikemark.*

TOUCHSCREEN

1. *Screen unresponsive*
    a. *Reboot Pendant from Spikemark*
    b. *Hard reset (remove power, wait three minutes)*
    c. *Email support@creativeconners.com*
2. *Screen damaged/broken*
    a. *Email support@creativeconners.com*

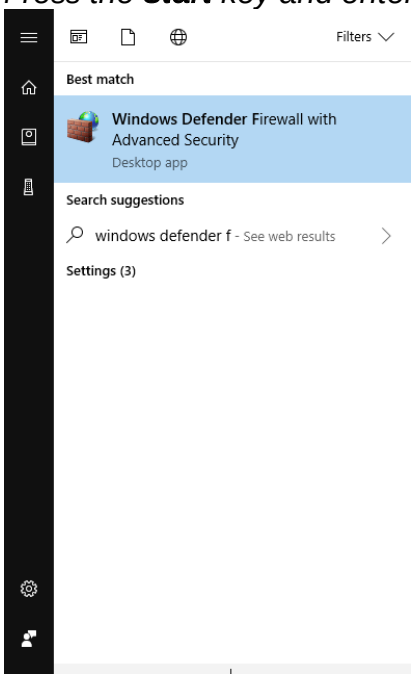
CASE, BUTTONS AND SWITCHES

1. *Case is broken*
    a. *Email support@creativeconners.com*
2. *Broken switch, knob or lever*
    a. *Email support@creativeconners.com*

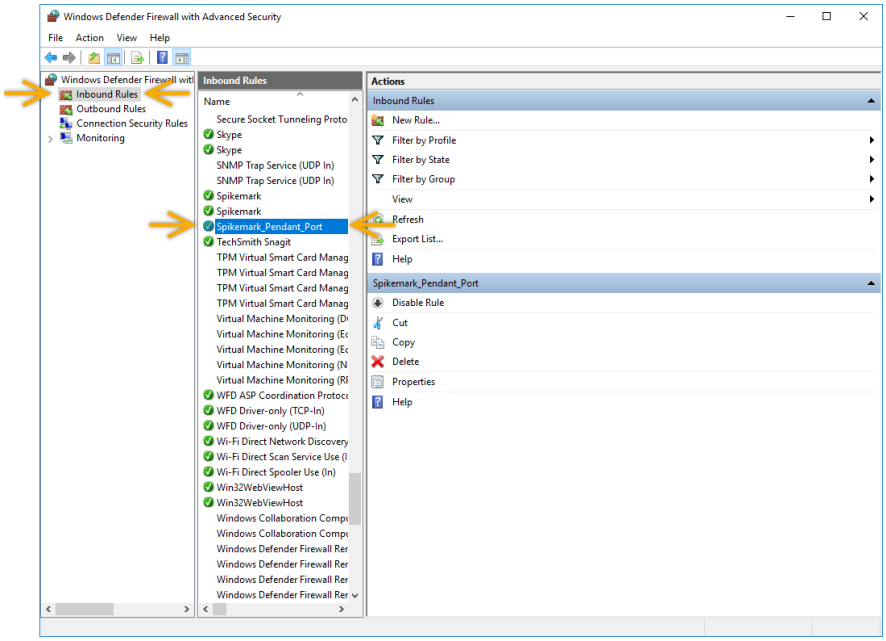
CONNECTION ISSUES

1. *Pendant connects but is not functioning properly*
    a. *No machine selection*
    b. *No jogging, manually or to a Spike*
        i. *There is a Router acting as a DHCP server on the automation network and is causing communication issues. Solution:*
            1. *Remove the Router from the system and try again*
2. *Showstopper Accessory connector is damaged*
    a. *Email support@creativeconners.com for instructions*
3. *EtherCon connector is damaged*
    a. *Email support@creativeconners.com for instructions*

4. *Pendant will not connect.*
    a. *Confirm the Pendant is enabled in Spikemark*
    b. *Confirm IP Address and Port settings match on Pendant and in Spikemark*
    c. *Confirm Ethernet Cable is connected*
        i. *The network connection must be present prior to boot up*
    d. *Confirm the port is open through any firewall*
    e. *Attempt reconnecting*
5. *Pendant screen displays "Enable Pendant in Spikemark"*
    a. *Follow all steps in steps in section 1 above*
    b. *Confirm the port is available and open thru Windows Defender Firewall*
        i. *See section 3 below for details*
    c. *Disable all 3rd party firewall programs*
        i. *Macfee and Norton firewalls are both known to block the Pendant communication*
6. *Pendant screen displays "Network error"*
    a. *Pendant screen will initially flash when attempting to connect, then displays "Network Error".*
        i. *On subsequent attempts to connect, status will switch to "Connecting" for approximately 1 second or less, then switch back to "Network Error."*
    b. *Open Windows Defender Firewall with Advanced Security*
        i. *Press the **Start** key and enter Windows Defender Firewall and press **Enter***

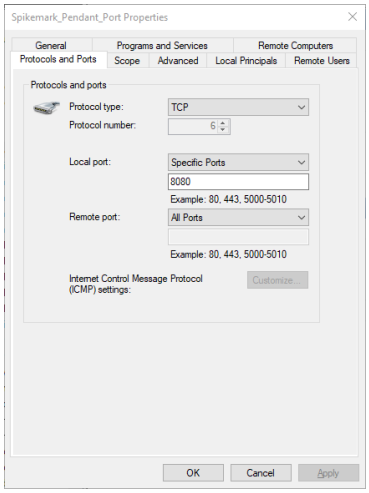


        ii. *Select Inbound Rules on the left and scroll through the Inbound Rules list to find "Spikemark_Pendant_Port"*

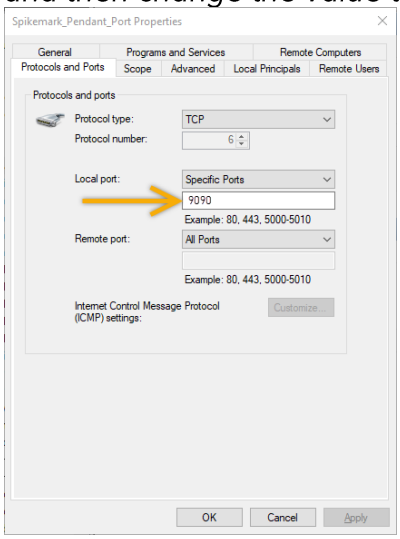


1. *If there are multiples, delete all but two of them.*
2. *If there is only one, right click on "Spikemark_Pendant_Port" and select "Copy", then right click on it again, and select "Paste". Can also left click to select and use Ctrl+C to copy and Ctrl+V to paste. It will paste at the top of the list, so either scroll up to find it, or resort via Name or Group by clicking on the corresponding column header.*

iii. *Double click the second "Spikemark_Pendant_Port" to open the Properties panel and select the "Protocols and Ports" tab at the top.*



iv. *After “Local port:” ensure that the drop down menu has “Specific Ports” selected, and then change the value to “9090”.*



v. *Click “Apply”, shutdown the Pendant, and close Spikemark.*

vi. *Reopen your show file and restart the Pendant.*

vii. *Configure both using “9090” in the “Port:” field and attempt to connect.*

viii. *If the same issue arises, repeat the process using another port number. Anything above 1000 is acceptable, but note that Windows may not display all ports that are currently in use, so you may need to try several if the same symptom is occurring.*

SPECIFICATIONS

ELECTRICAL

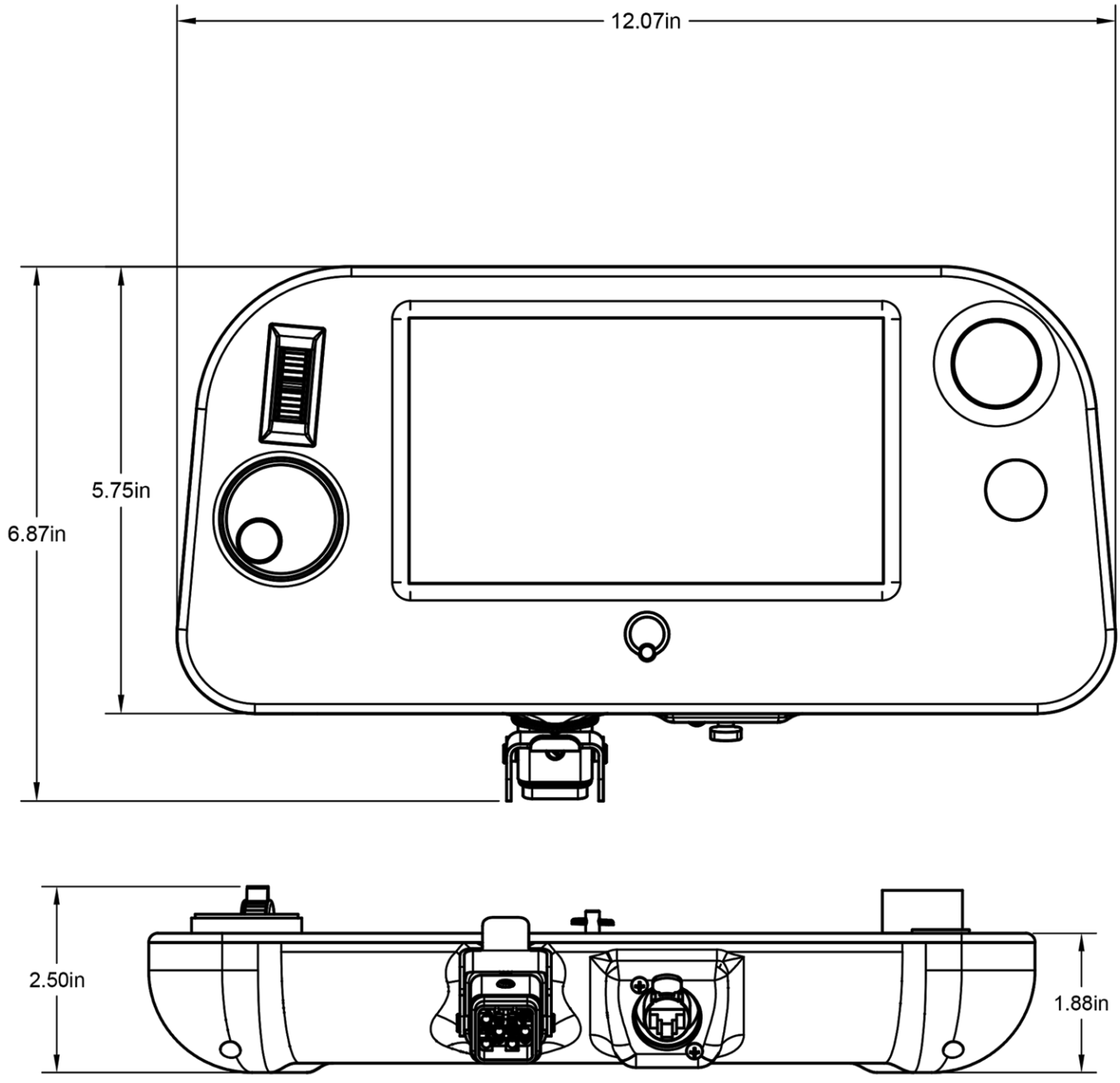
Description	Value
Input Voltage	*24 VDC*
Max Input Current	*1.25 A*
SCCR	*5000 A*
Emergency Stop Signal	*Dual-switched channels*
Communication	*Ethernet* *100mbs* *etherCON connector*
Processor	*Quad Core 1.2GHz Broadcom BCM2837 64-bit ARMv8*
Max Cable Length	*250 FT*

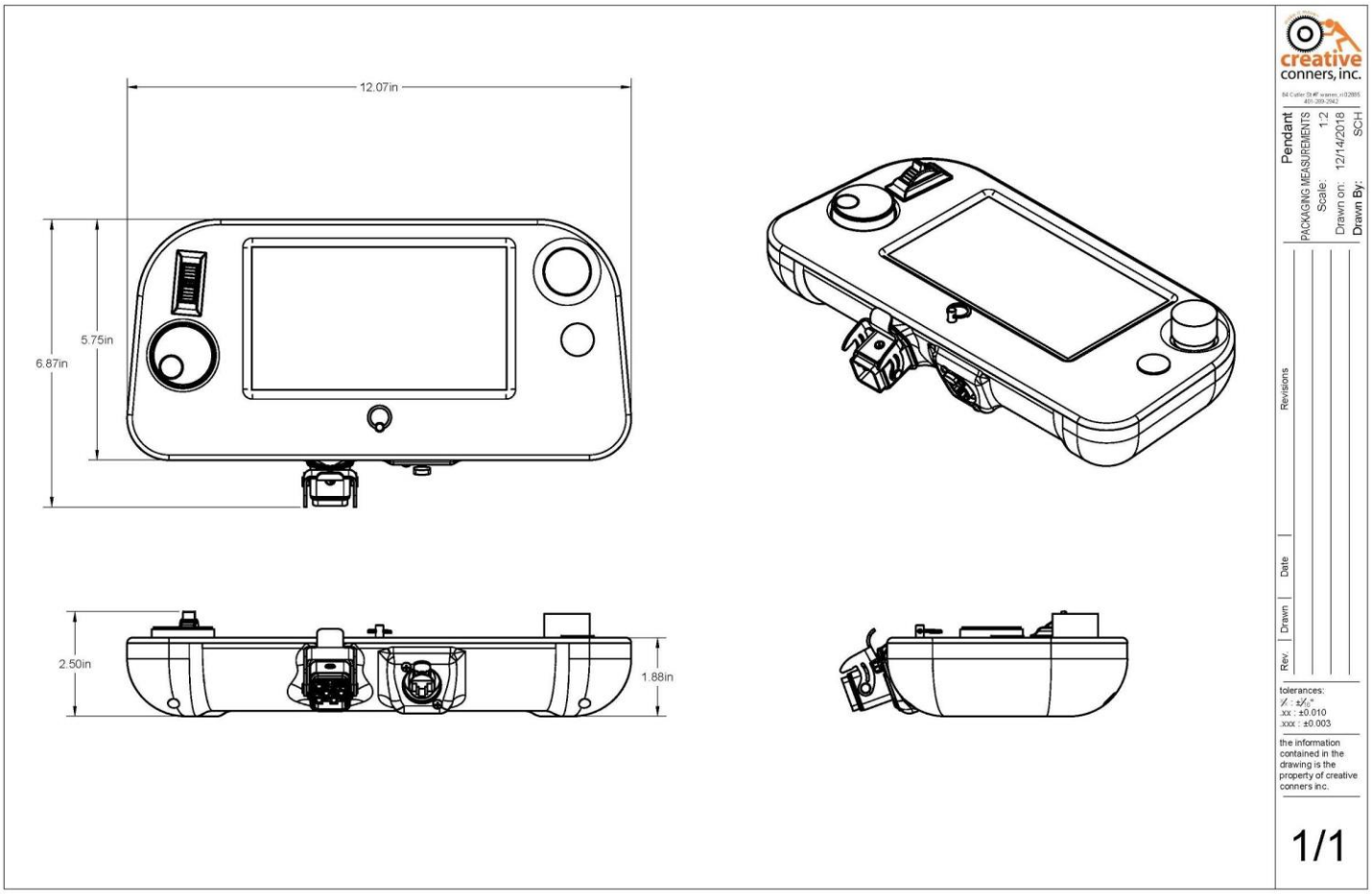
PHYSICAL

Weight

1.75 lb

Dimensions



DRAWINGS

Overview - https://creativeconners.com/files/Drawings/Pendant_Overview.pdf