



## **Docking Station** **Operational Description**

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Changes:

Ver 1.0, December 1, 2017, 1<sup>st</sup> release

Ver 1.1, January 11, 2018, add static IP setting information

Ver 1.2, August 2, 2018, add change to all utilizes

Ver 1.3, August 6, 2018, update screen shots, added section on unlocking Swing from dock when software unlock does not work. Add information on removing static IP from dock.

# Contents

<b>Docking Station .....</b>	<b>4</b>
Technical Overview .....	4
Power .....	4
USB Tablet Connection .....	4
USB 2.0 Ports.....	5
Ethernet .....	5
Serial .....	5
Cash Drawer.....	5
Electronics Unlocking Mechanism .....	5
Software Operation .....	6
Swing Unlock Utility .....	6
Manual Unlock.....	8
Non-Roaming Mode * .....	9
Roaming Mode * .....	9
Before Changing to Roaming Mode .....	9
Switch to Roaming Mode .....	10
Configuring Network Router .....	12
Using A Static IP Address .....	13
Swing Dock Configuration Software.....	13
Clear Static IP Address Dock .....	18
Roaming Mode Software .....	19
Exiting Roaming Mode.....	22
Docking Station USB/IP (Roaming Mode) .....	24

## Docking Station

Although this document is written for the Swing's Dock most of the information also applies to the Swing's Lite Box.

### Technical Overview

In some cases, customers may wish to use the tablet as a normal POS system the majority of the time and only use it as a roaming tablet sometimes such as for queue busting. When using the tablet as a fixed POS terminal it needs more I/O then provided by the charging station. This turns the tablet into a full standalone POS system but with the ability to remove from the docking station at any time and be used as a mobile device.

Tablet Docking Station Features	
<b>Ports</b>	
Wired Ethernet 1000/100/10 port	
5 X USB 2.0 ports 4 X I/O panel, 1 X Front Panel of Docking Station	
2 X RJ45 RS232 Serial Port with optional power +5V	
Cash Drawer Port RJ11	
Power in, +19V 65W	
<b>Features</b>	
Adjustable viewing angle from 0° to 40°	
Magnetic/Mechanical Tablet Lock	
Electronic activated Unlock mechanism	
Remove cable cover for easy cable access	
Though the counter or the rear cable routing	
Charging of tablet when docked	

All the I/O ports run off an internal USB hub with the exception of the electronic unlocking mechanism and roaming mode switch. With improvements in the Windows 10 USB enumeration using USB port in a hot-swap environment is no longer an issue. The tablet can be removed and place back on the docking stations without worrying about the OS assigning the ports correctly which was a problem with earlier versions of Windows.

The docking station shares the same docking connector as the charging station.

### Power

The power connector uses the same 4 pin power plug as used on most Aures products. The docking station uses of a 19V 65W supply, the same as already used on many Aures products. This is located external to the docking station.

### USB Tablet Connection

There is one USB connection from the tablet to the station. This connection is fed into a USB hub chips that has 9 ports available. Four ports connect to standard USB 2.0 connectors. Three ports are used for the serial ports, 2 normal RS-232 port one Device Controller for the cash drawer and other controls. One USB hub connection is used for the Ethernet controller.

## **USB 2.0 Ports**

There are four standard USB 2.0 ports on the I/O panel and one on the front panel. These are fused to support up to 1 amp the same as other Aures products and more than the standard 0.5 amps. This allows for just one cable connection to supply 5 Watts power and with two connections to supply 10 Watts of power. This allows the use of DVD or hard drives with only one cable,

## **Ethernet**

The Ethernet port supports 1000/100/10BASE-T. A wired network interface is a desirable feature on the docking station as the most common problems with tablets in a POS application is with Wi-Fi drop outs. By docking the tablet, a reliable connection can be established by a wired connection even if the wireless connection is acting up. This ethernet port is also required for the special roaming mode feature.

## **Serial**

Two external serial ports are supported. These can be mapped to whatever COM port is desired but by default are mapped to COM 1 and COM 2. These com ports use the same 10 pin RJ45 jack as used on other Aures products. Both ports can supply power, +5V at 1 amp. The port power is configured via jumpers. There is an additional serial port normally mapped to COM 5 that controls the switch from roaming mode to non-roaming mode.

## **Cash Drawer**

The docking station supports a cash drawer port. It uses a RJ 11 connector and has the same pin out as used on the EPSON printer and Aures products. Either a +12V or 24V cash drawer can be supported with no jumper. An OPOS driver are supplied. The Cash Drawer is controlled via special command to the Device Controller serial port (normally COM5) with a proprietary command.

## **Electronics Unlocking Mechanism**

The docking station has a mechanical locking mechanism that is unlocked by an electronically activated mechanism. The unit is unlocked via a signal to the controlling electronics. This signal is sent by the tablets Embedded Controller to the docking stations electronics. The signal could be activated from a button on the tablet, MSR, RFID card, a key code entered on the tablet or other software or hardware method. There is a hidden unlock button on the docking station as a backup if the tablet battery is discharged. The docking station must be powered for the unlock mechanism to work.

When the unlock signal is received the charging station turns on a small motor to activate the unlock mechanism. The unlock/lock motor is controlled by a small microcontroller.

The Swing can be attached to the DOCK at any of 4 rotation angles, 0, 90, 270 and 360 degrees.

## Software Operation

There are three special utilities that control special features on the Swing Docking Station. They are the Swing Unlock utility, the Set Roaming Mode utility and the Swing DOCK configuration utility. In addition to these there is the Roaming Mode service software, Virtual Here. These are all described in this manual.

### Swing Unlock Utility

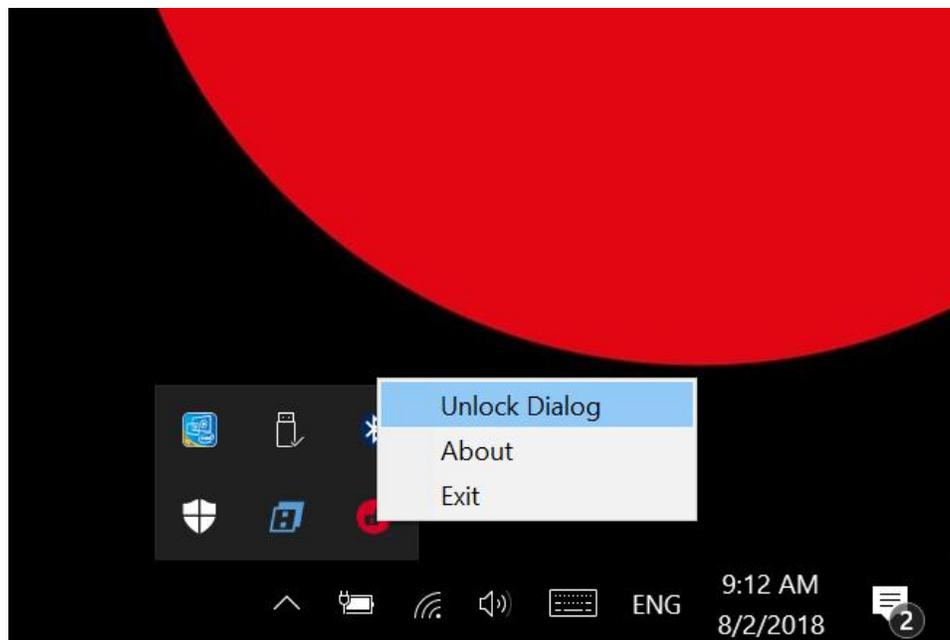
An icon for the Swing Unlock Utility is located in the task bar tray. It is shown below circled in yellow. The Swing Unlock program is called FTAUX5CTL.exe but referred to as the Unlock Utility.



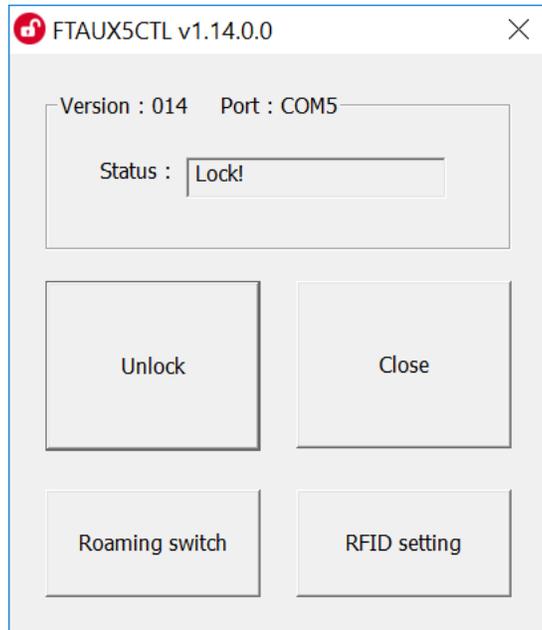
By clicking on the icon, the unlock program will run and unlock the Swing from the base. If the Swing is not removed within 5 seconds, the docking station will relock. If run when undocked the program does nothing.

If a POS application wants to unlock the screen this can be done by running this program with the /u option on the command line. [FTAUX5CTL.exe /u](#) The program is located in the [C:\Program Files\Aures\Swing Unlock](#) folder.

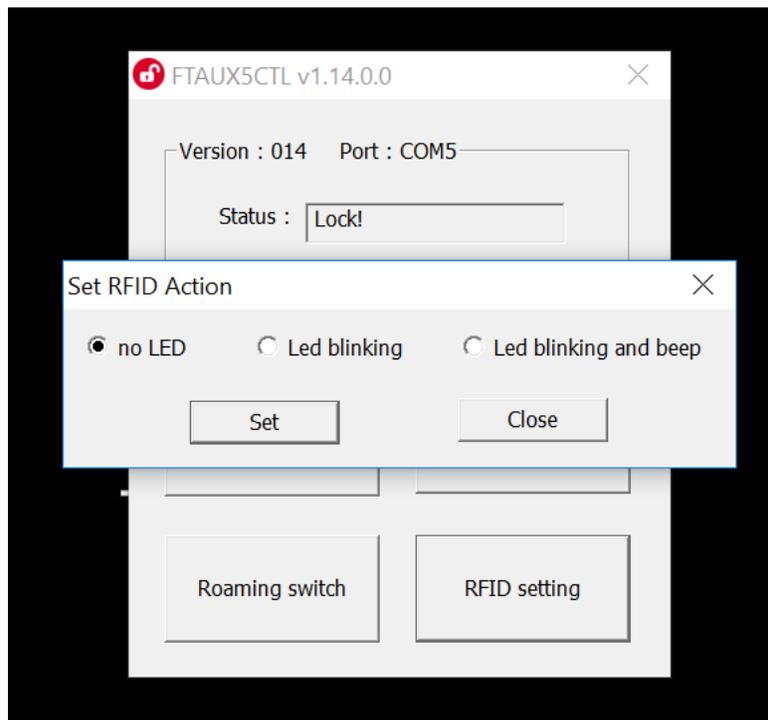
The full version of this program can be run from the hidden icon tray by selecting the unlock icon. This provides for some additional functions as described below.



By selecting the Unlock Dialog the utility will launch. One function is to unlock the Swing. This is the same as touching the Unlock Icon in the task bar. The utility can also be used to force a switch from roaming mode to non-roaming mode. The other function is to be able to set the options for the optional RFID reader.



RFID indicator options.



## Manual Unlock

If for some reason the software unlock is not working, there is a manual way to unlock the Swing from the Dock. There is a button located under the back cover of the dock that can be pushed to activate the unlock mechanism. Use a paper clip or something similar to press this button. The Swing should unlock.



## **Non-Roaming Mode \***

By default, the Swing Docking Station runs in non-roaming mode. In this mode all communication to the Swing Tablet is via USB signals on the docking station pogo pin connection. This same connection also provides power to charge the tablet.

Once the Swing Tablet is undocked the USB connection is lost and the Swing Tablet can no longer use any the ports on the docking station. Once redocked then the tablet can once again use the USB ports on the docking station. This is how all current tablet docking stations on the market work.

## **Roaming Mode \***

When the Swing Docking Station is placed into roaming mode all communication to the ports on the docking station is done via the network. This means when the Swing Tablet is removed from the docking station all the ports on the docking station can still be used as long as the Swing Tablet is connected to the network via WiFi. Even when docked communication is still via the network.

In roaming mode any device attached to the docking station such as say a barcode reader can be used even if undocked. This is a unique feature in the market.

## **Before Changing to Roaming Mode**

Before changing to roaming mode, the user must insure everything is working correctly in non-roaming mode. Both the Wire-less and wired networks must be up and running on the Swing Tablet when docked. All peripherals attached to the docking station should be tested to insure they are working.

This is necessary as if both network connections are not working roaming mode will not work. Keep in mind all communication from the tablet to the docking stations is via the network when in roaming mode, docked or not.

Roaming mode may be used with a DHCP IP address or a Static IP address. If it is intended to use a static IP address, please set the static IP address before switching to roaming mode. Using a static IP address is normally recommended. It is a good idea to set a static IP address in Windows for the wire ethernet connection although not 100% necessary.

<https://support.microsoft.com/en-sg/help/15089/windows-change-tcp-ip-settings>

**\*Note: The Swing with the Dock is not designed to switch back and forth from roaming to non-roaming mode in normal use, only at setup. It is intended to stay in one mode in normal operation. Switching modes can be problematic under some conditions and is not recommended for normal operation.**

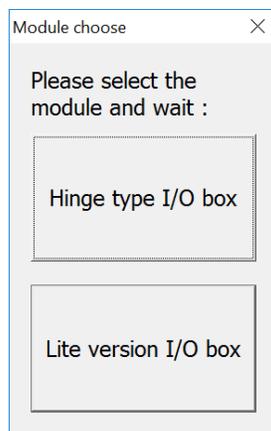
## Switch to Roaming Mode

The program SwingRoamingSet is used to switch to roaming mode. A short cut for this program is located in the task tray. It can also be found in the <C:\Program Files\Aures\Swing Roaming Set> Folder.

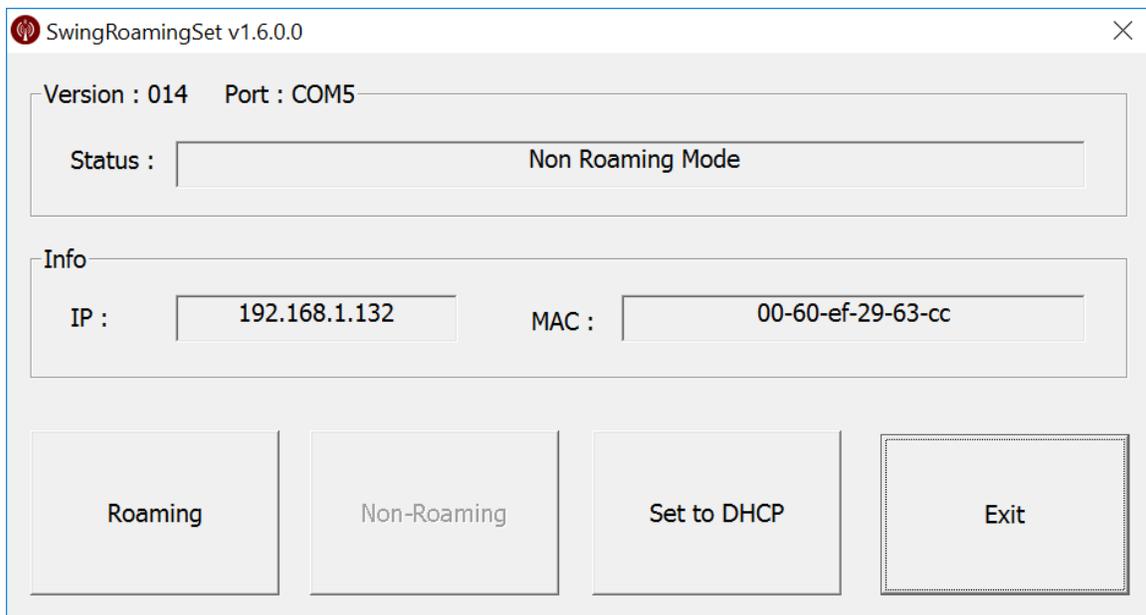
*SwingRoamingSet Circled in Yellow*



The Swing Tablet must be docked to run SwingRoamingSet. When run Windows will display the screen shown below.

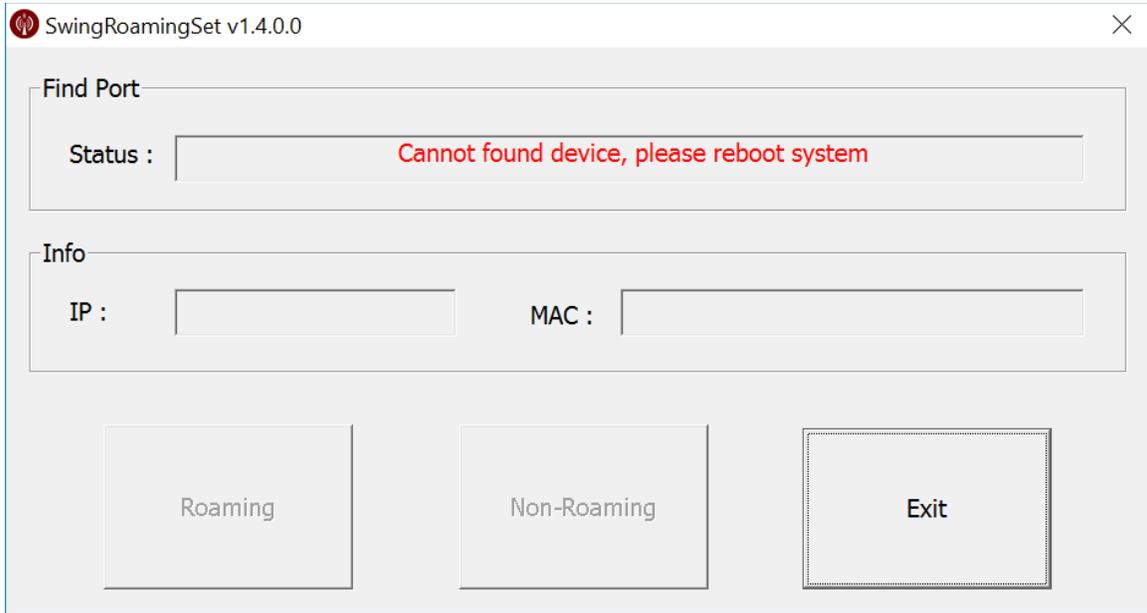


Select Hinge type for the Swing Docking Station. The next screen shown below will display.



At this point it is a good idea to record the IP address and MAC address displayed. This may be needed later.

Select Roaming to switch to roaming mode. The system will now reboot. Once rebooted the SwingRoamingSet program will wait about 70 seconds for the Docking Station to boot (it has its own small CPU and OS). The Dock's Power LED should be on steady once rebooted fully. If blinking it is still booting. At this point roaming should be working, you can exit the program.



If the above screen displays roaming may still be working. Just exit and test to see if the ports are working. If not working reboot as instructed. Assuming the network is working, and the dock has the correct IP address it should work on a reboot.

## Configuring Network Router

Depending on the type of network router being used it may need to be configured. The roaming mode depends on the Docking Station wired network controller always being assigned the same IP address. With most newer routers this is not a problem as once a device is assigned and IP address from the DHCP list the router will assign the same IP address to that MAC address. This feature is normally called auto reserved IP address.

For best practices though it is a good idea to manually assign the IP permanently to the MAC address. How to do this varies from Router to Router manufacture. Below is one example. Use the IP and MAC addresses recorded earlier for this.

**Manual Assignment**

Enable Manual Assignment  Yes  No

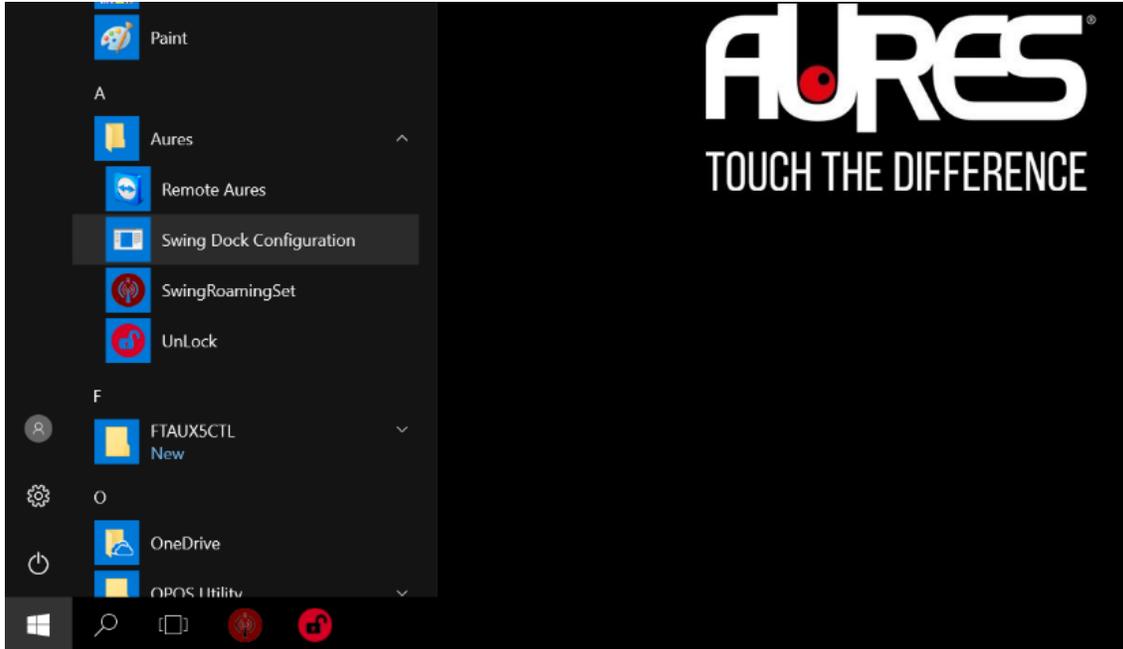
**Manually Assigned IP around the DHCP list (Max Limit : 64)**

Client Name (MAC Address)	IP Address	Add / Delete
<input type="text" value="00:60:EF:01:81:4D"/>	<input type="text" value="192.168.1.130"/>	
 00:60:EF:01:81:4D 00:60:EF:01:81:4D	192.168.1.130	

**Apply**

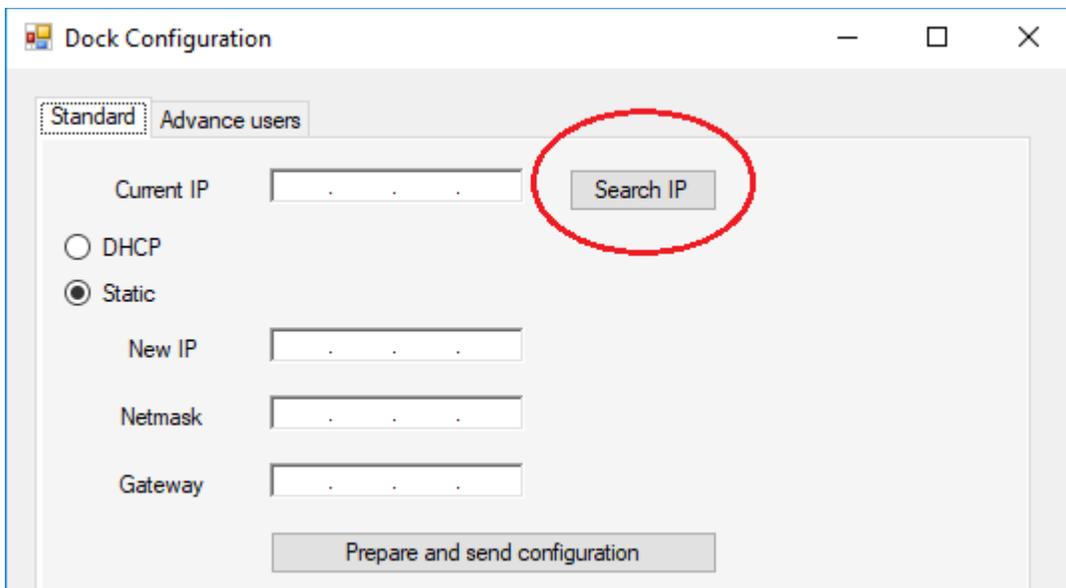
## Using A Static IP Address

If using a static IP address, it is necessary to set this address for the docking stations. Aures supply a software utility to do this, Swing Dock Configuration. This is located in the <C:\Program Files\Aures\Swing Dock Configuring> folder and can be run from there.

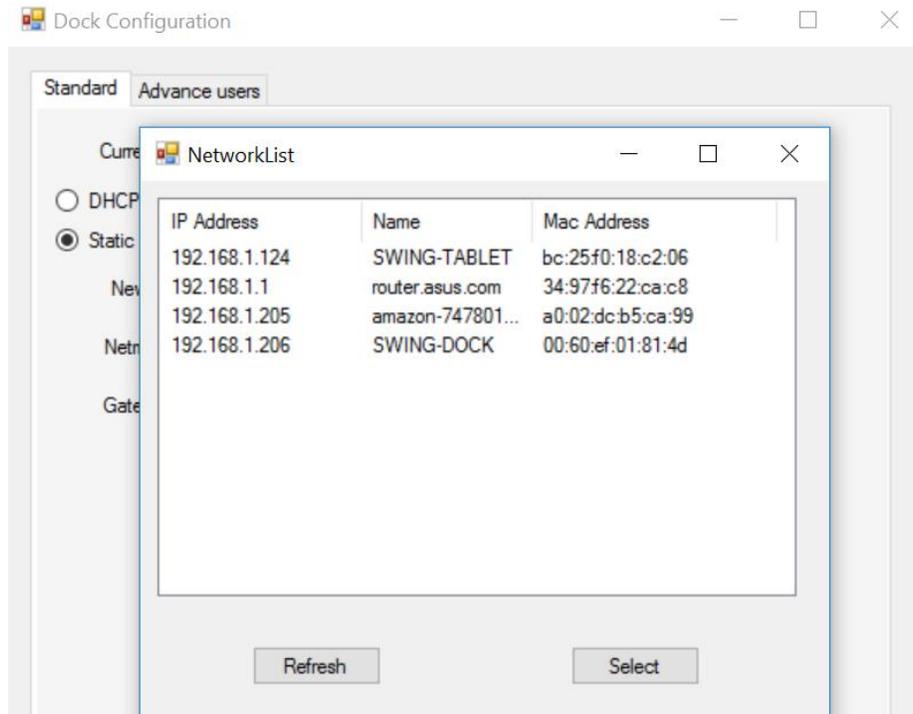


## Swing Dock Configuration Software

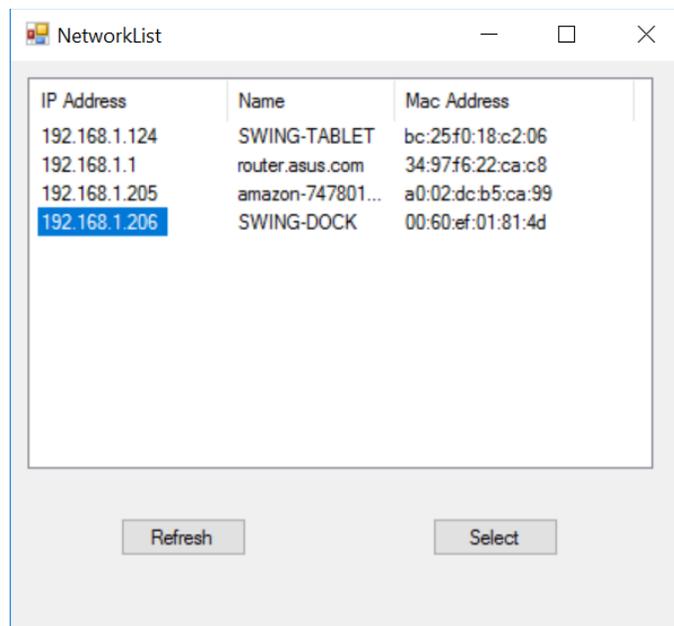
When run the Swing Dock Configuration utility displays the screen shown below. Once the utility is launched use the Search IP button to scan for the Dock IP address.



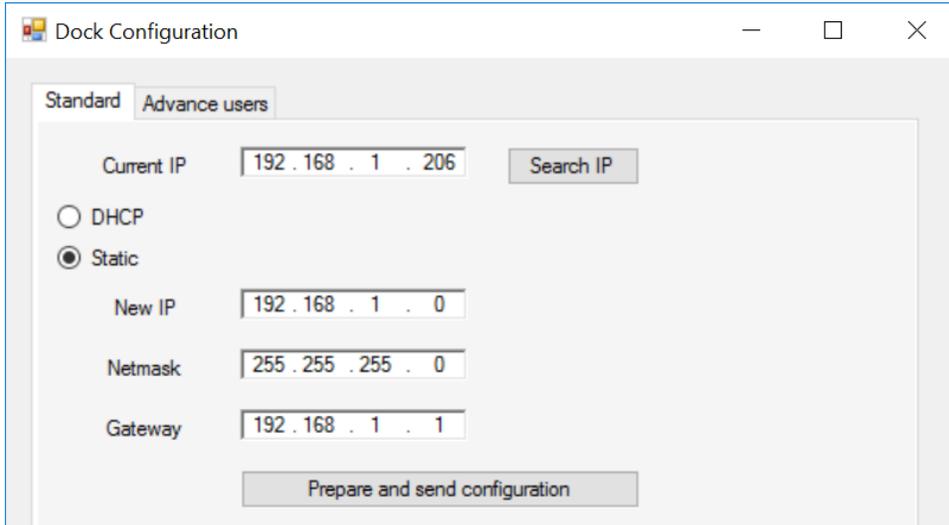
The Search IP will show a list of all IP addresses in use on the local network. Find the IP address for the Swing Dock that matches the MAC address of your dock. The MAC address for the dock is printed on a label located on the bottom of the unit or obtained before switching to roaming mode.



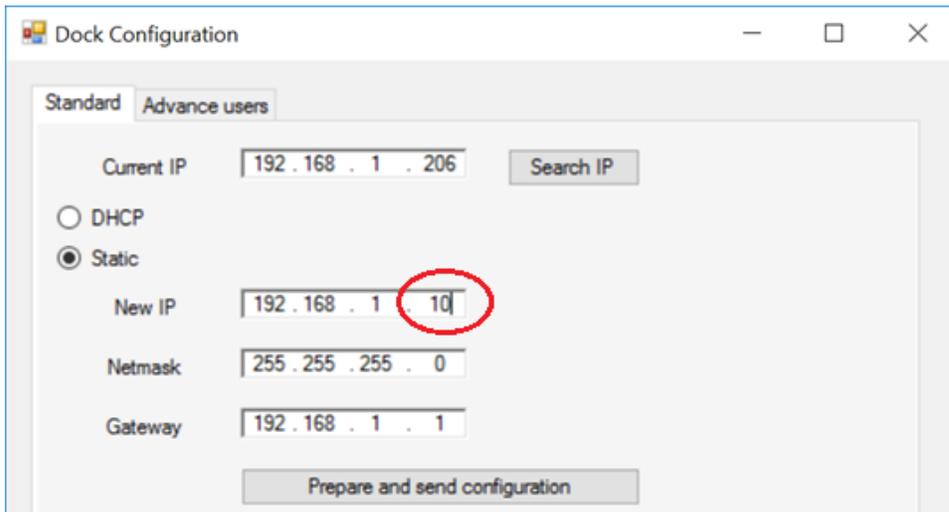
Select the IP address for the SWING-DOCK whose Mac Address matches the Mac address of the DOCK being setup. There may be more than one SWING-DOCK listed as all on the network will show up. The IP address is selected by touch or click on that address.



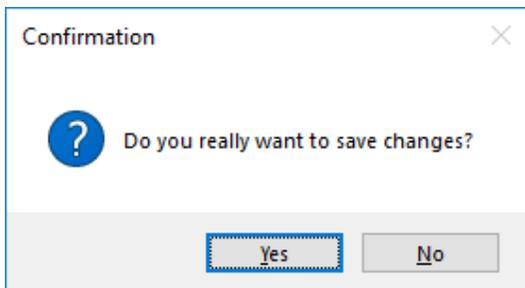
Once the correct IP address is highlighted then selected the fields will populate as shown below.



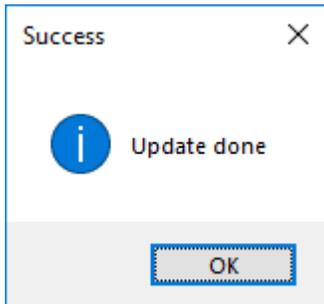
Now enter the desired Static IP LSB address in the field shown below. Then select “Prepare and send configuration”.



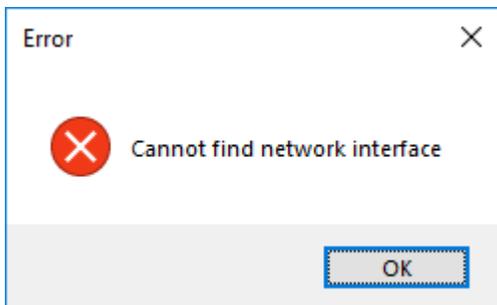
The following message will pop up. Select Yes to continue.



If all is OK, the next message will display.



If there is an error this message will display. Check that the Current IP matches the scan.

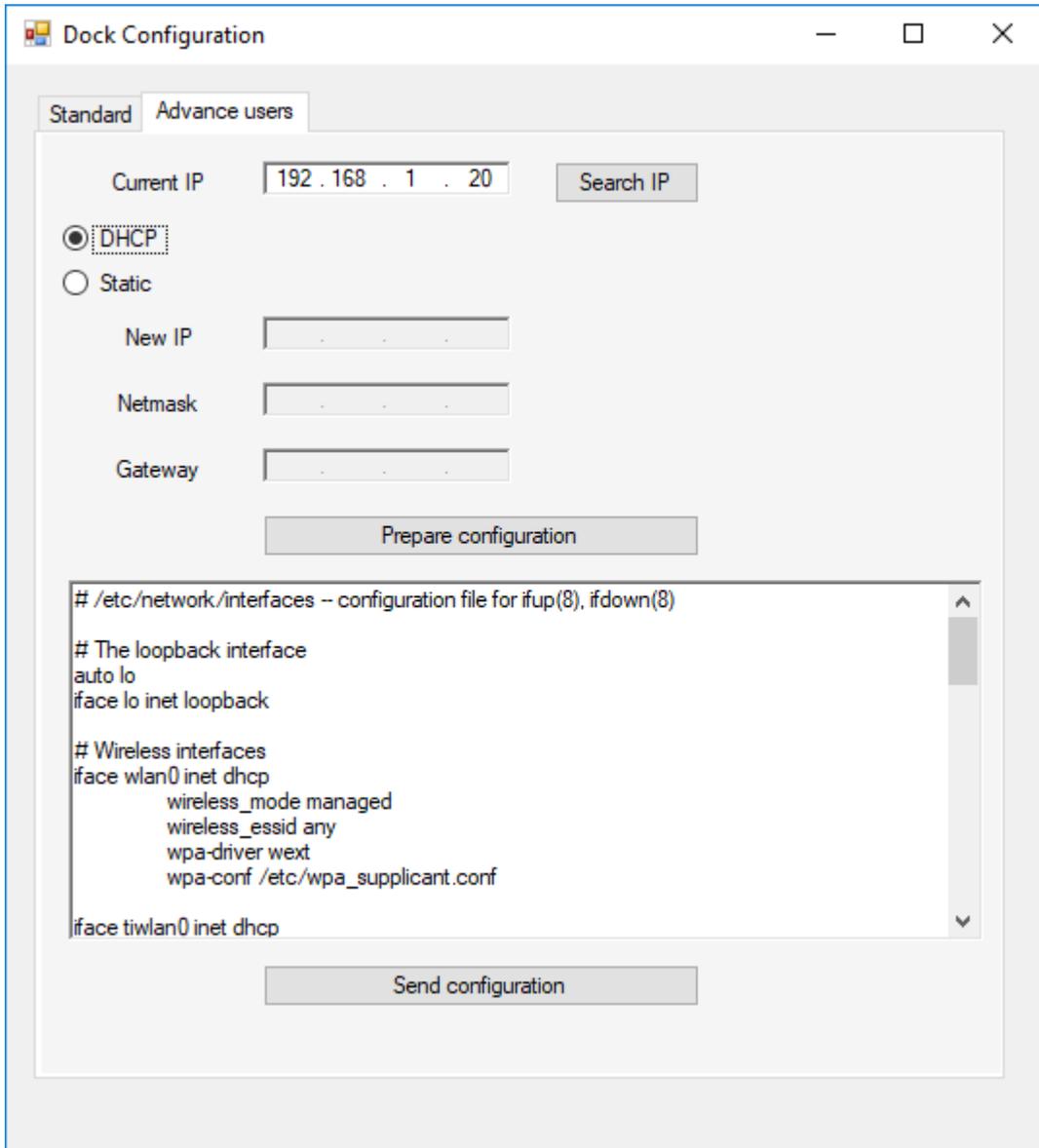


After waiting 10 to 15 seconds you can use the Search IP to check to verify the IP changed correctly.

At this point all the DOCK ports will not be working. The new static IP address must be set in Virtual Here's roaming software (in the future this will be done by the Swing Dock Configuration utility).

To do this you the touch screen to launch the Virtual Here (VH) user interface. This can be found in the hidden icon tray. Please see next section Roaming Mode Software to update the IP address to the static IP address.

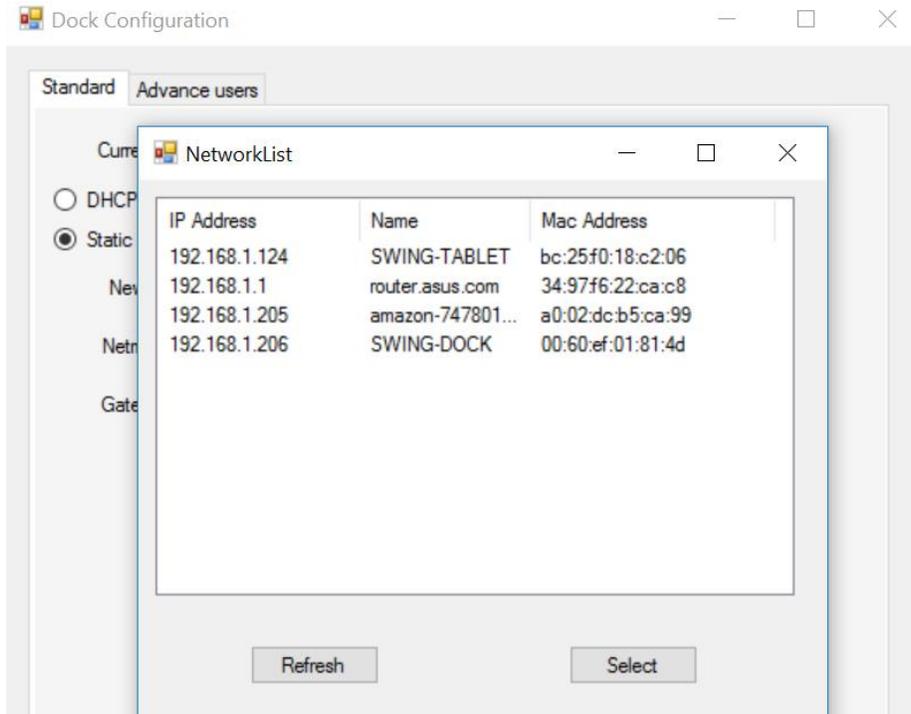
The utility also supports and advance users' mode that allows direct editing of the configuration file. This should only be used under special circumstances.



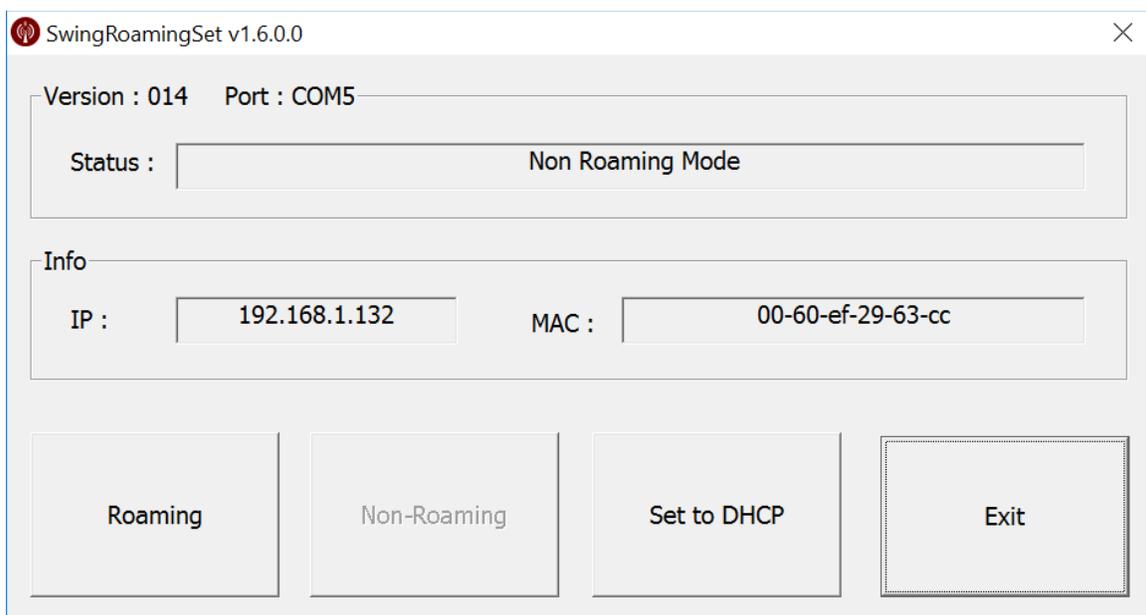
I can also be used to set the DOCK Linux Network interface file back so it use a DHCP IP Address.

## Clear Static IP Address Dock

To clear a Static IP address on the Dock you need to use the Swing Dock Configuration utility. Scan for the Dock IP address using the utility.

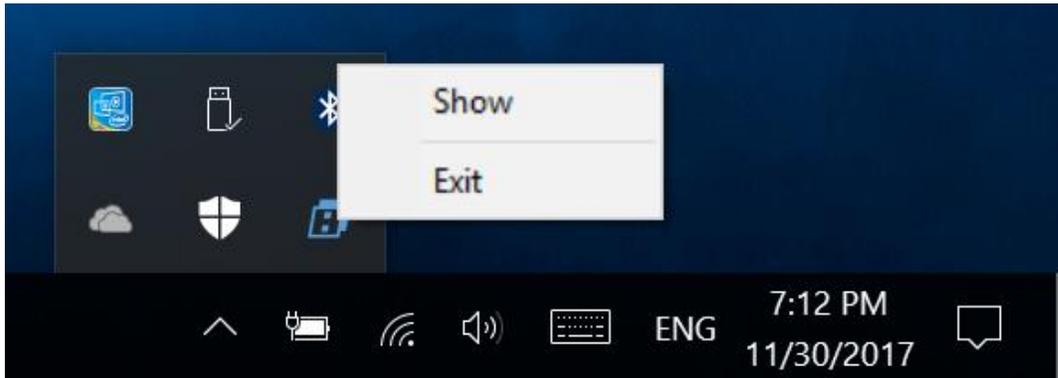


Once found and selected and DHCP is selected run “Prepare and send configuration”. This will change the Dock back to DHCP mode. After this is done use the Unlock dialog box to switch to non-roaming mode. Then run SwingRoamingSet and select “Set to DHCP”. Now both the Dock and VH are set to use DHCP.

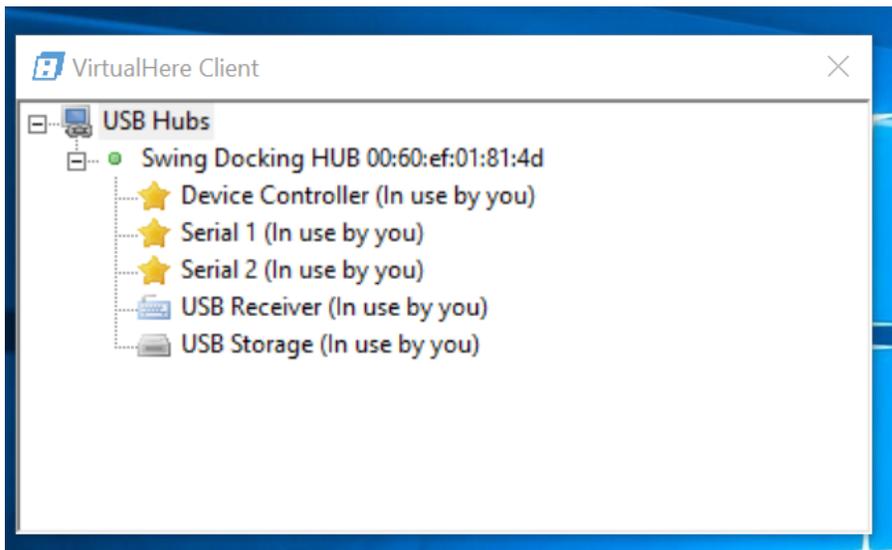


## Roaming Mode Software

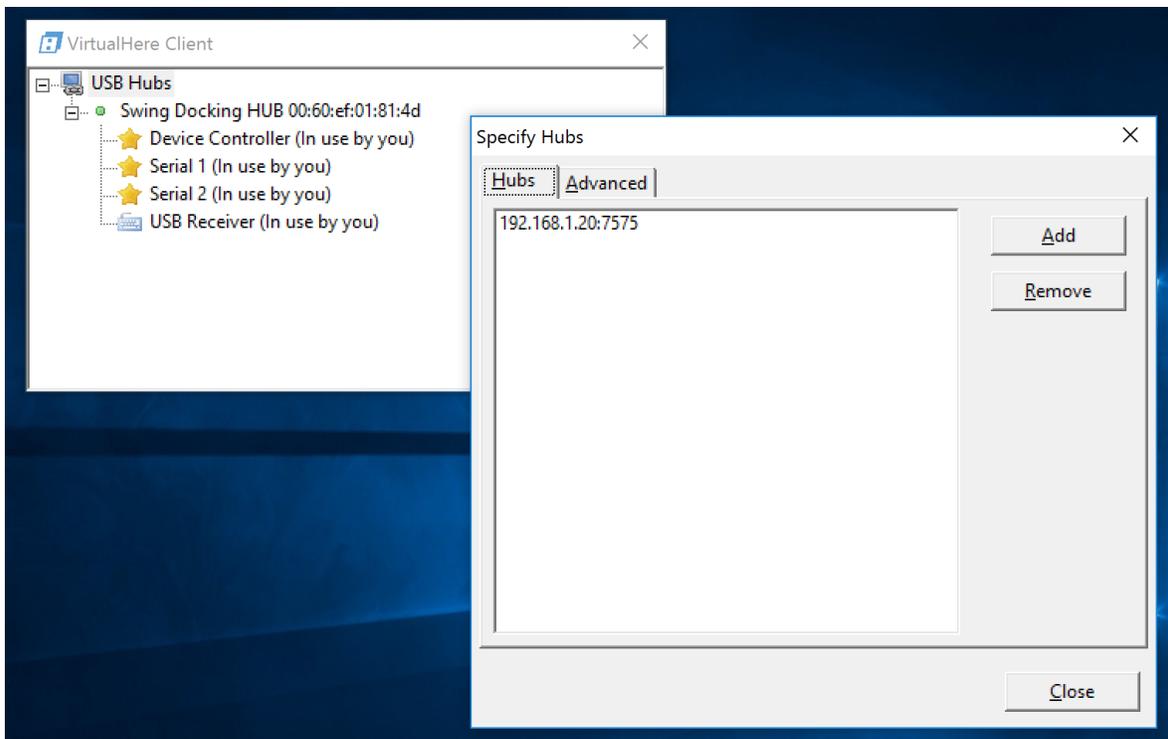
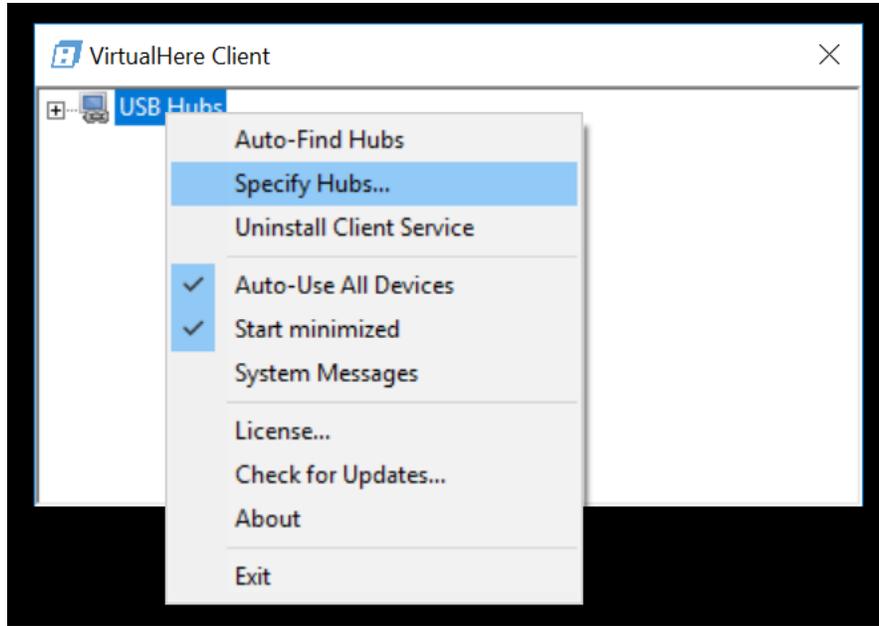
In normal operation the roaming mode application software does not need to be accessed. It is running as a service. But for advance users there is a control panel available to check the status of the service. This can be launched from the hidden icon in the task bar. This is the Blue “H” shown below. Click Show to launch the user interface. This will be needed to set a Static IP address.



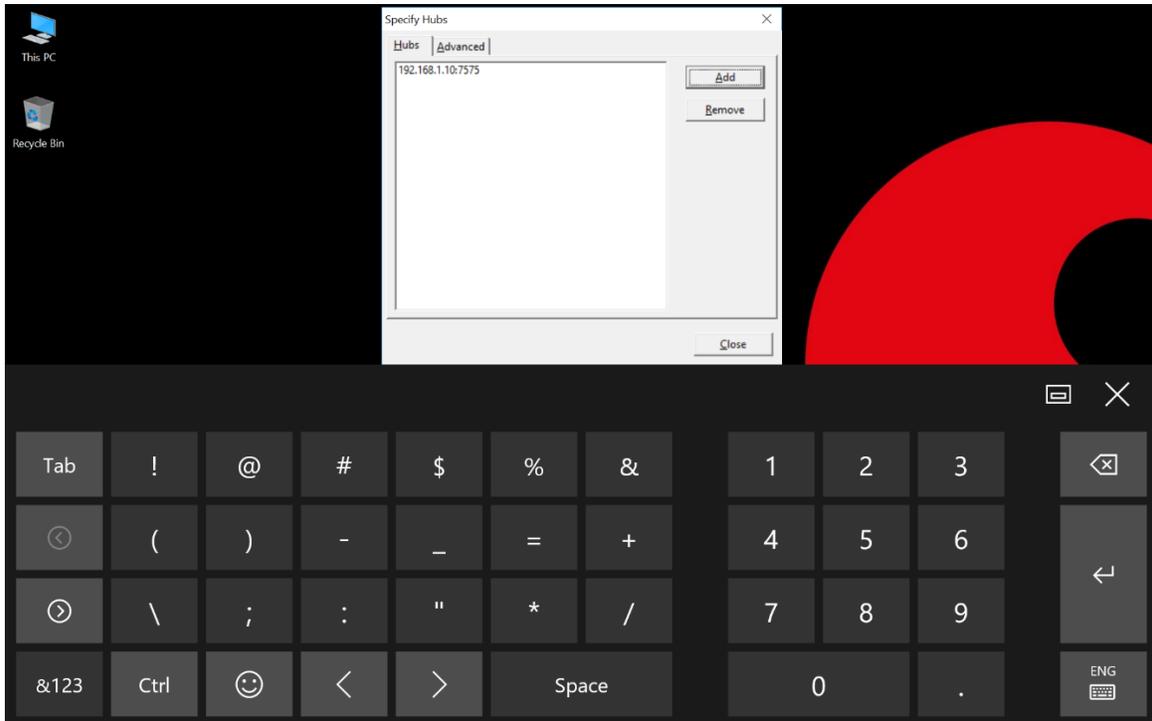
The following screen will display. It will display USB ports currently in use.



The IP address used by the roaming software can be seen by expanding the USB Hubs tab and selecting Specify Hubs. This must match the IP address set on the router or the static IP configured. This is configured by the Roaming Set utility. It can be manually set with the Add and Remove buttons.



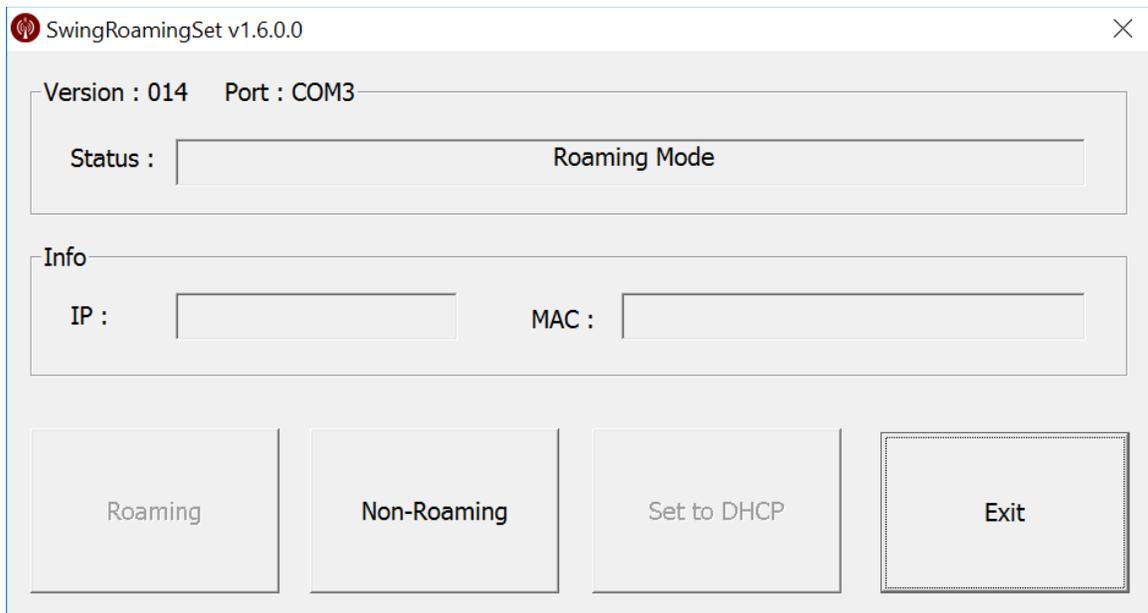
To set a new IP address first remove the old one and then replace with new one using Add. This would be used to set a Static IP address. The Windows on screen keyboard will be needed to do this. Only the IP address is self is entered, not the port number.



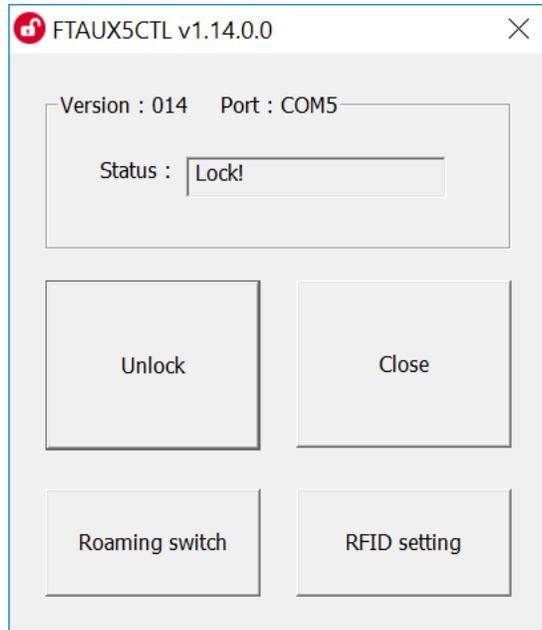
## Exiting Roaming Mode

In normal use a user would either use Roaming Mode or Non-roaming mode. The software and hardware are not designed to switch back and forth frequently. There are a number of reasons for this. But in some cases, it may be necessary to turn off roaming mode. There are two methods to do this. By selecting the Unlock Dialog the utility will launch. One function is to unlock the Swing. This is the same as touching the Unlock Icon in the task bar. The utility can also be used to force a switch from roaming mode to non-roaming mode.

If roaming mode is up and working the correct way to switch roaming mode off is to use the SwingRoamingSet program. The Swing must be docked to run SwingRoamingSet. Just run the program as before, select Hinge and the below screen will display. Select Non-Roaming and the system will reboot and be in non-roaming mode when the reboot completes.



If the roaming mode is not working for some reason, say if the WiFi is down, then there is a failsafe way to disable the roaming mode. By selecting the Unlock Dialog the utility will launch.



Just select the Roaming switch button. The next screen will show. Select Switch the system will change to non-roaming mode immediately. Hit Exit, then Exit.



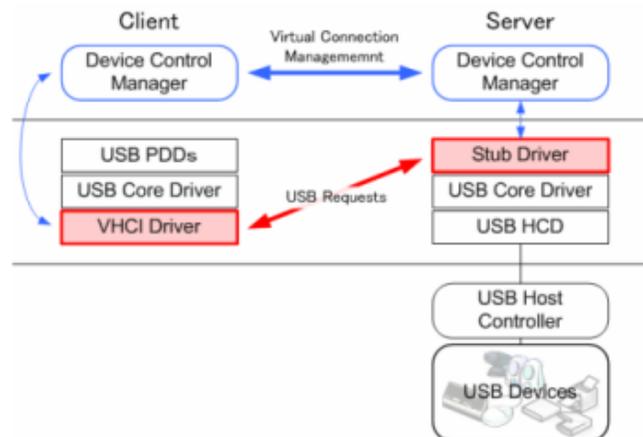
## Docking Station USB/IP (Roaming Mode)

There have been a number of requests from customers that when the tablet is not docked that it should still be able to use the peripherals attached to the docking station. Because there is not any physical connection to the docking station designing this feature was challenging. The below is included so the roaming mode feature can be better understood as it can be a bit confusing.

There were a few possible ways to implement this feature, but one stands out as the best. Ones that come to mind are Bluetooth and Wireless USB both which have range issues at 3~10 meters. For Bluetooth there, limited ways to convert the Bluetooth change to USB protocol and can be very problematic. For the Certified Wireless USB, a radio would need to be added to the tablet complicating the design and increasing cost.

The technology that works best to implement this feature is by using USB over IP (USB/IP). USB/IP uses the tablet's Ethernet WiFi connection to communicate to the docking station ports. To the tablet the connection appears the same as a local USB device and any USB driver for that device is loaded on the tablet. No application or Windows software needs to be modified. Windows thinks any docking station device is local to the tablet.

When in roaming mode the docking station itself has all the same I/O ports as in non-roaming mode. The big difference is rather than the tablet connecting directly to the USB hub chips it is connected to the docking ports via the WiFi Ethernet network connection. The docking station has a wired Ethernet connection. A low-cost ARM micro controls the docking station and has the firmware needed to function as an USB/IP server. The tablet is the client in this configuration. The USB/IP software/firmware converts USB protocol messages into TCP/IP packets and transmits them between tablet (client) and docking station (server).



With this approach almost, any USB device can be connected to the docking station. This includes printers, scanners, customer display, USB scales and other USB devices. The docking stations two serial ports and cash drawer port also connect via the USB/IP connection.