

Demo Guide

# Keysight Multi-Operator with M937xA PXIe Vector Network Analyzers



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# Preparation for Demo

## Equipment Requirements

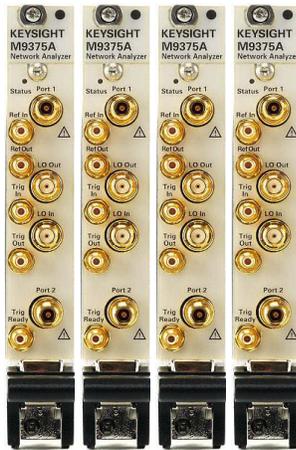
- PXIe Chassis (PXIe or PXI-H slot)
- PXI Express embedded controller or remote controller

**NOTE** For list of hardware and software requirement of PXI embedded controller or remote controller compatibility, refer to the Configuration Guide Note (literature no. 5991-7632EN).

- PXIe M937xA Vector Network Analyzer.<sup>1</sup>
- Any computer touch screen display for remote desktop.<sup>2</sup>
- USB to video converter or USB to DVI converter.<sup>3</sup>
- USB 3.0 HUB.



M9037A PXIe High Performance Embedded Controller



M9375A-CFG001 PXI VNA 26.5 GHz Software option fully loaded



4 Touch Screen Display



USB 3.0 HUB



USB 3.0 to DVI Converter

<sup>1</sup> Qty (8) PXIe VNA.

<sup>2</sup> Qty (4) touch screen display.

<sup>3</sup> Qty (2) USB to DVI converters.

## Setup Four Operators Configuration Using 4 x 4-Ports PXI VNA

While multi-site is often applied in highly automated environments, there are also cases where multi-site is desired for multi-operator testing. **Figure 1.** Shows an example of tuning four independent filters using the multi-site configuration of the PXI VNA with a multi-operator. Four 4-port VNA multi-site configuration would provide a work station for 4 test operators. The limit on the number of test stations is dependent on available hardware and ports for both the PXI embedded controller and the computer peripherals.



**Figure 1.** Tuning 4 independent filters using the multi-site configuration with multi-user and multi-display

### Setup the Four Displays

Configuring the PXI VNA for multi-user setup requires the use of multiple computer display, USB to video convertor or USB to DVI and USB hub. Sometimes, manufacturers of USB to video or DVI convertors requires the installation of drivers. So, if required, please make sure to install the driver of the USB to video convertor before you plug it in to the controller. **Figure 2** shows a multi-user configuration using the Keysight M9037A embedded controller.

#### NOTE

This configuration is compatible with any PXI chassis and embedded controller that had a display ports.

**NOTE** For better performance, the DVI to USB adapters is preferred to be plugged in the USB 3.0 ports.

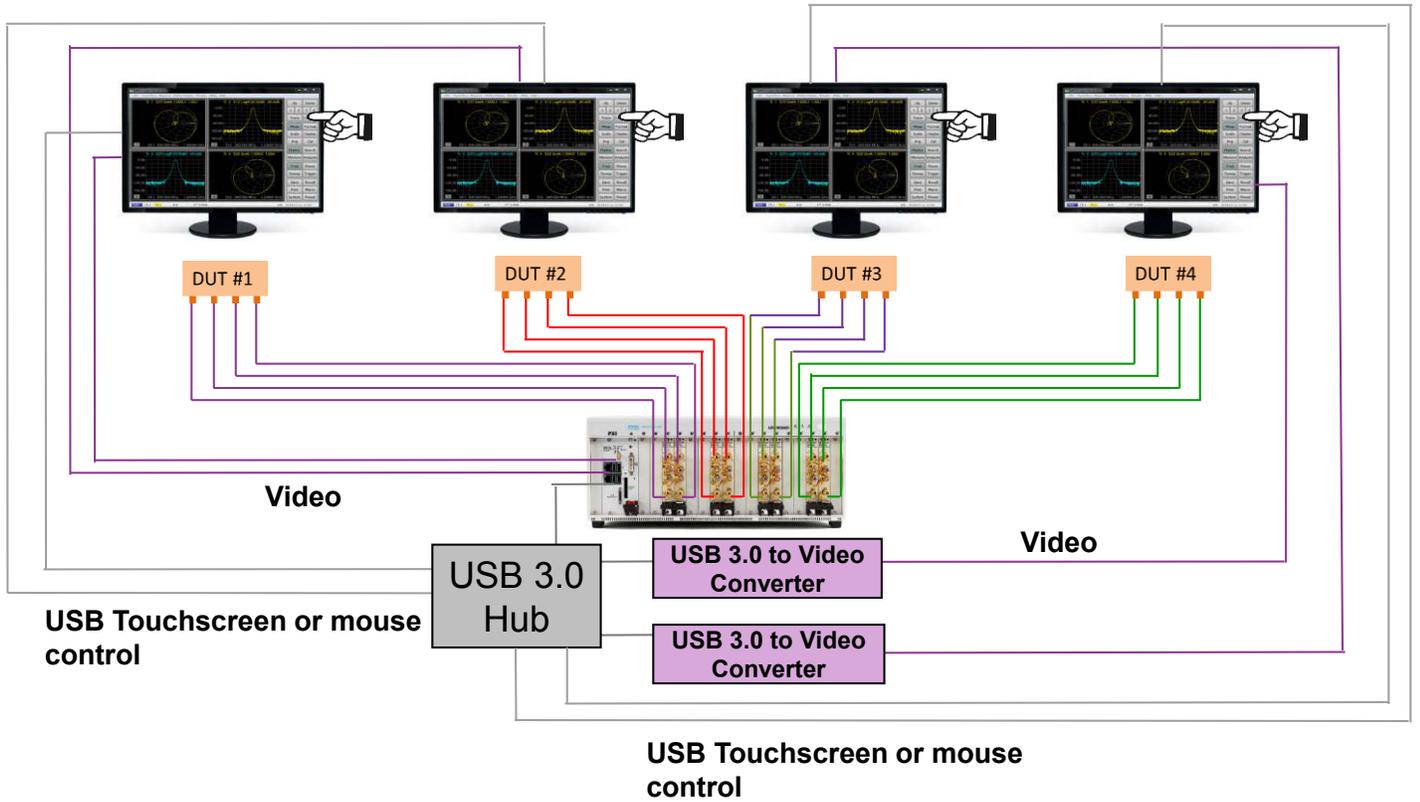


Figure 2. Enable multi-user test solutions.

1. The embedded controller (M9037A) has two Display Ports outputs (Figure 3) which may be routed directly to two of the monitors (Figure 2).
2. From the Super Speed SS USB 3.0 Ports in the embedded controller we route a path to an external USB 3.0 hub.

**NOTE** The USB 2.0 Ports can be used as well for this operation. However, for better performance the USB 3.0 is recommended.

3. Two paths from the USB hub were routed to the two USB 3.0 to DVI video converters.
4. In this example the USB 3.0 hub is also being used to route the USBs touch screen control for each monitor.

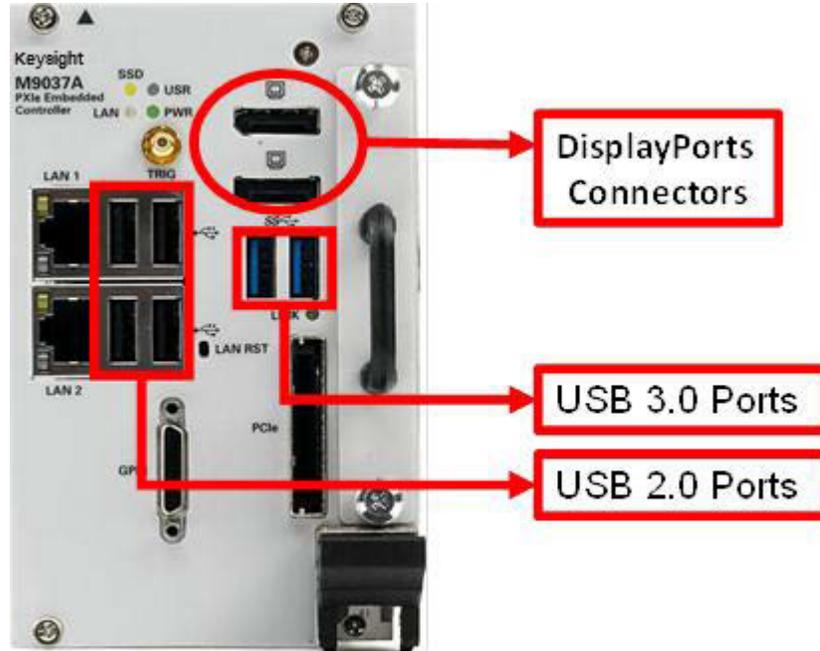


Figure 3. Available display and USB Ports on the M9037A embedded controller.

### Configure and Calibrate the Multi-display

The computer operating system has to be configured to support the multi-display capability and to be able to recognize one test station from the other. These are standard capabilities of Microsoft Windows.

First, the computer needs to be setup to recognize each of the monitors. Right click on the desktop and select Screen Resolution, this will allow you to change the appearance and the order of your display as shown in Figure 4.

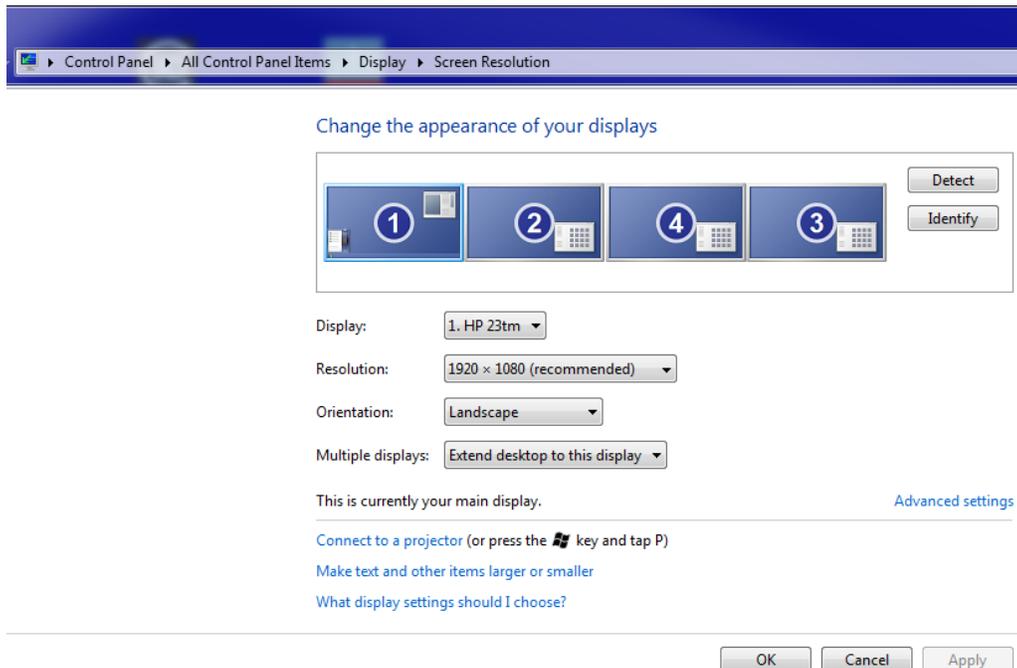
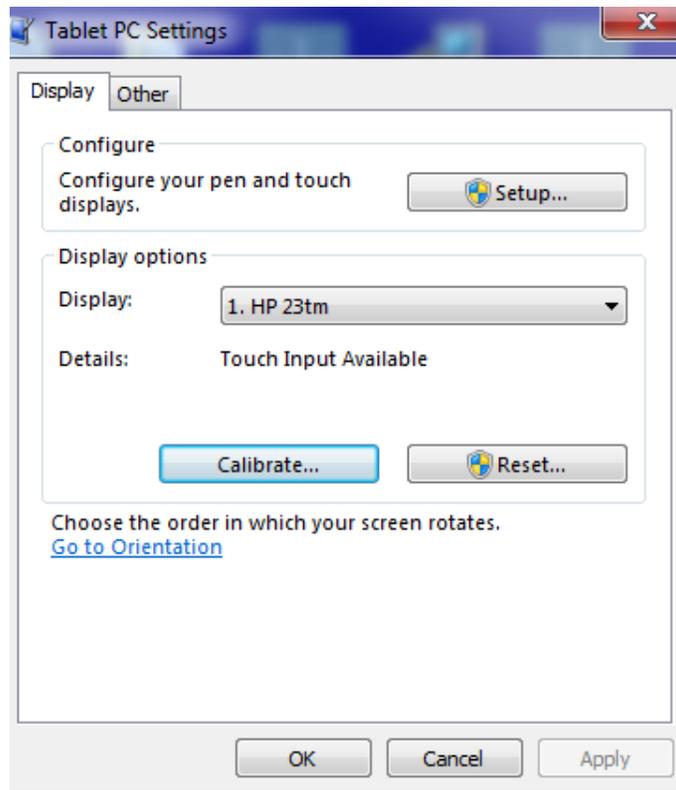


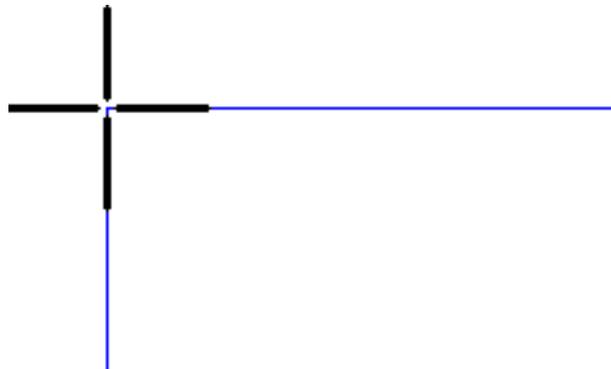
Figure 4. Setup the computer to recognize each of the monitors.

Next, each of the monitors need to be configured to be recognized as a particular test station. From the control panel click on the Tablet PC Settings (**Figure 5**). The Setup button will guide you to configure each display to be identified as touch screen.



**Figure 5.** Configure and calibrate each test station display to be recognized by the computer.

After identifying all the touch screens, it is highly recommended to calibrate the pointing device of the primary touch screen. Within the display option, select the primary display and perform calibration samples by clicking on the calibrate button. The calibrate button will guide you to perform a calibration sample by tapping the crosshair each time that it appears on the screen as shown in **Figure 6**.



**Figure 6.** The crosshair during the touch screen calibration

## Demonstrating Multi-Display / Multi-User

1. Launch four 4-ports instances of the PXI VNAs as multi-site configuration.

**NOTE** For multi-site configuration, refer to the PXI VNA Demo Guide at <http://literature.cdn.keysight.com/litweb/pdf/M9370-90006.pdf>

2. Drag and drop each instance of the PXI VNA soft front panel in each display as shown in **Figure 7**

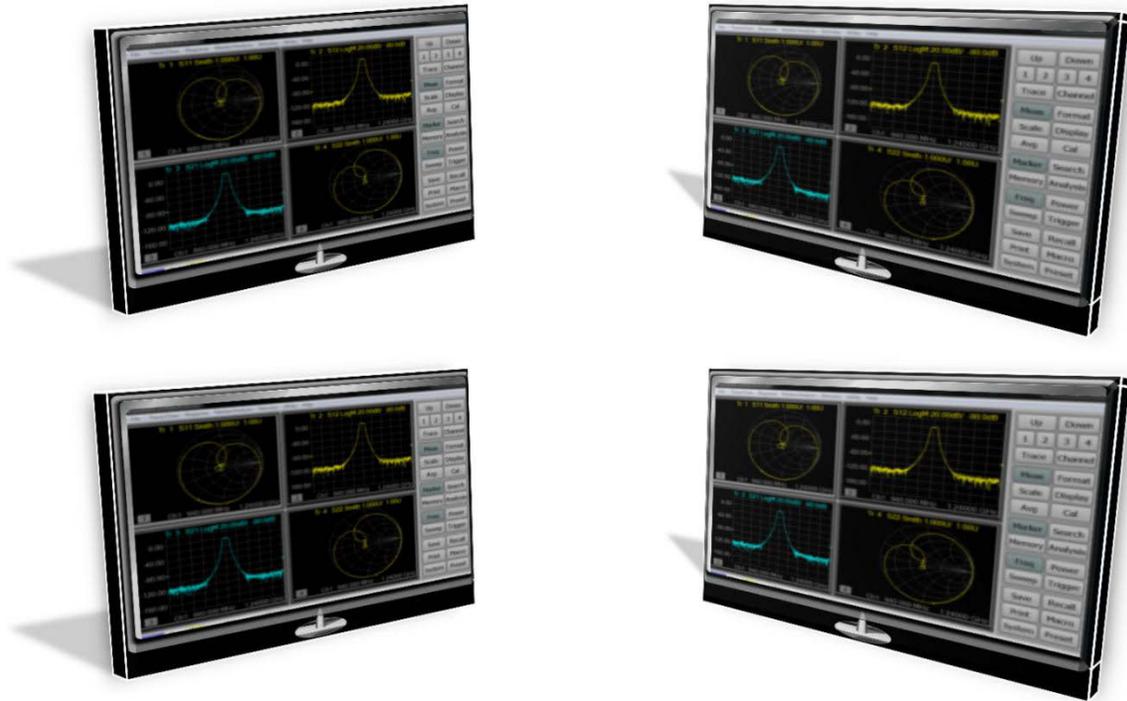


Figure 7. Allocate each instance of the PXI VNA in each touch screen display.

## Consideration When Configuring Multi-Users Solution

Microsoft operating systems has limitation with respect of the multi-user capability which needs to be recognized. If two or more operators try to control the computer at the EXACT same time then NO display response will occur (Figure 8). As with most PCs no two people can drive a single computer at the same time. Special consideration should be used to minimize the amount of operator control time in the multi-user environment.

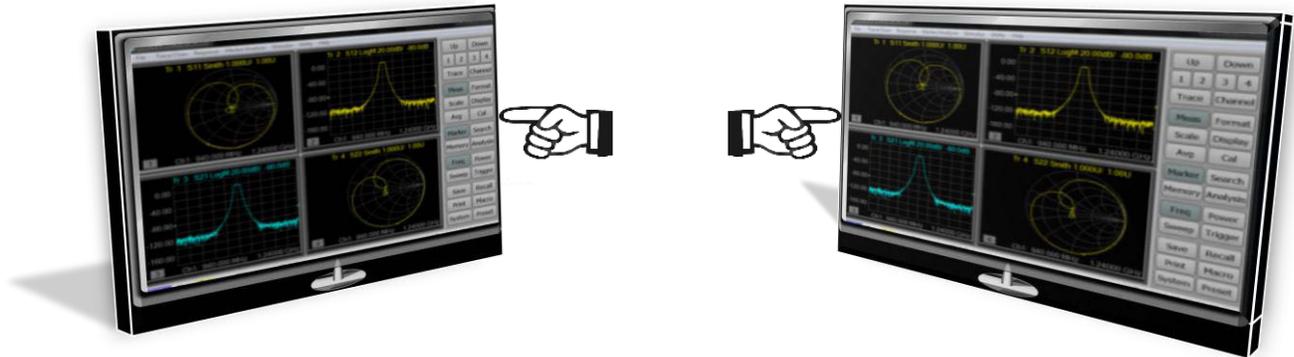


Figure 8. Standard Microsoft operating systems do not allow simultaneous user inputs.

## Minimizing Operator Control Time with Macros

One method of minimizing the need for operators to interface with the computer is to simplify and limit control access. One way to achieve this is by setting up graphical macros to cover any needed changes during testing (Figure 9). This minimizes the need for keyboard data entry and accessing drop down menus. Keeping all activity to simple pointing and clicking greatly reduces the likelihood of operators simultaneously trying to control the system.

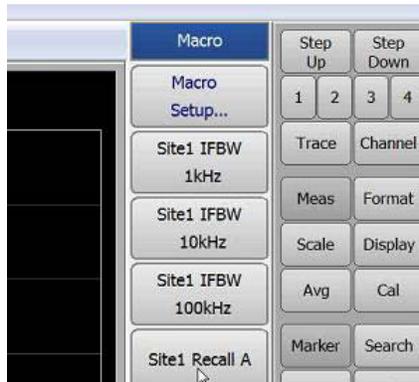


Figure 9. Macros can be set up to minimize the duration of test operator access of controlling the computer.

## Reference documents

Multiport and Multi-site Test Optimization Techniques

<http://literature.cdn.keysight.com/litweb/pdf/5992-0681EN.pdf>

M937X Brochure

<http://literature.cdn.keysight.com/litweb/pdf/5992-0098EN.pdf>

M937X Keysight product page

<http://keysight.com/find/pxivna>

M973X Help

<http://na.support.keysight.com/pxivna/help/index.html>

M937X Technical Overview

<http://cp.literature.keysight.com/litweb/pdf/5991-4884EN.pdf>

M937X Configuration Guide

<http://cp.literature.keysight.com/litweb/pdf/5991-4885EN.pdf>

PXI VNA Demo Guide

<http://literature.cdn.keysight.com/litweb/pdf/M9370-90006.pdf>

Technical Overview: PXI and AXIe Moduler Instrumentation – Tested computer list

<http://cp.literature.keysight.com/litweb/pdf/5990-7632EN.pdf>

## Carry Precision With You

Every piece of gear in your field kit had to prove its worth. Measuring up and earning a spot is the driving idea behind Keysight's FieldFox analyzers. They're equipped to handle routine maintenance, in-depth troubleshooting and anything in between. Better yet, FieldFox delivers precise microwave measurements—wherever you need to go. Add FieldFox to your kit and carry precision with you.

Related literature	Publication number
M937xA PXIe Vector Network Analyzers, Demo Guide	M9370-90006
M937xA PXIe Vector Network Analyzers, Data Sheet	M9370-90002
M937xA PXIe Vector Network Analyzer, Configuration Guide	5991-4885EN
M937xA PXIe Vector Network Analyzer, Product Fact Sheet	5991-4883EN

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