HD3 Series
Golden Demo Guide

Setup:

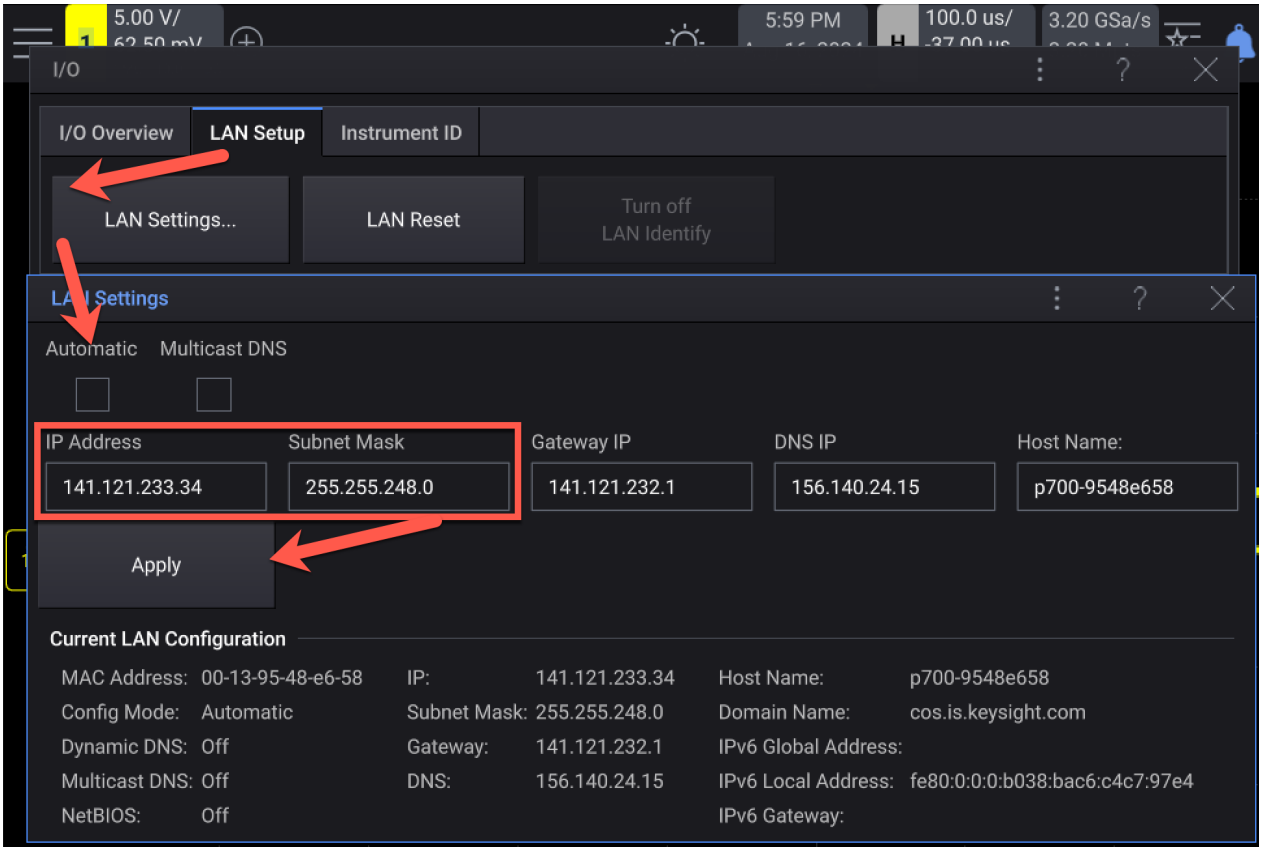
Connection for Projecting via PC

This use model allows you to show slides and demo without having to physically move the display cable or sync with USB-C dongles.

Requirements:

- A PC
- VNC (this guide uses RealVNC, which has options for Windows, MacOS, and Linux)
- A LAN cable (can be a standard cable – a crossover cable is not required for a direct connection)

1. Physically connect the LAN cable directly from your PC to the scope Gbit Ethernet port (on the back close to the power connector).
2. Set (Manual IP configuration) or Get (Automatic IP) in the LAN Settings dialog. Menu > Utilities > I/O > LAN Setup > LAN Settings



Automatic has fewer steps, but it will take longer and may not pair well with all OS/PCs. Manual will work immediately after boot and the IP won't change.

Automatic IP

a) Check the Automatic box
b) Apply
c) Wait for IP address to appear. Write it down.

Manual IP

Scope Side

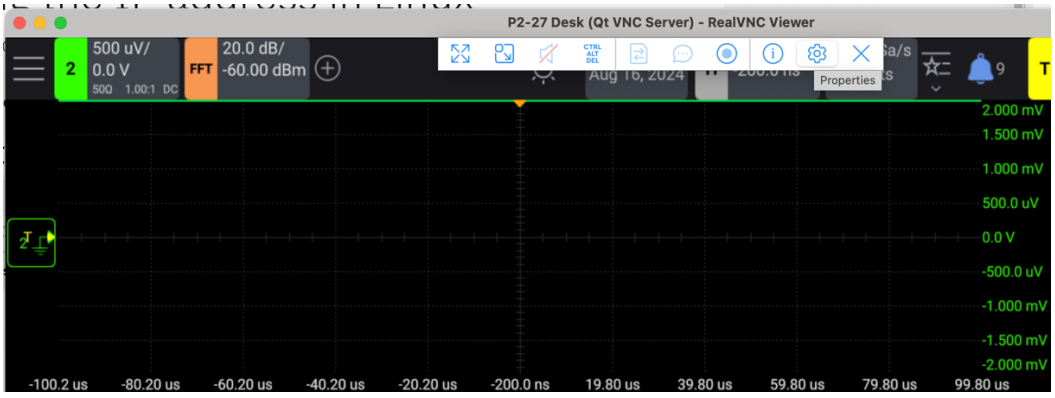
a) Set IP Address to 192.168.0.3 (or any address above 0 or 1)
b) Set Subnet Mask to 255.255.0.0
c) Apply

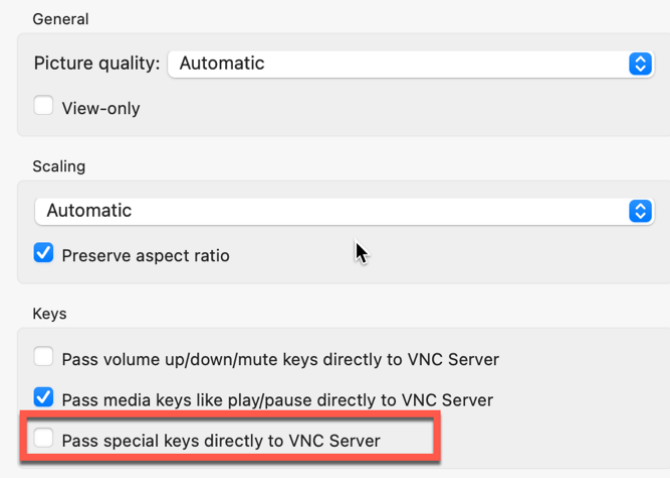
PC Side

a) Find Manual Settings
   - MacOS: Apple > System Settings > Network > [Device} > Details TCP/IP
   - Windows: Start > Settings > Network & Internet > Ethernet > Edit
   - Linux: ifconfig ethx xxx.xxx.xxx.xxx netmask xxx.xxx.xxx.xxx
b) Set IP Address to 192.168.0.2
c) Set Subnet Mask to 255.255.0.0

3. VNC Connection (***first time***) using RealVNC
   a) In the VNC application enter the IP Address from 2.a.iii or 2.b.i.1

   b) Ignore the Unencrypted Connection dialog
   c) In the Properties (Gear) Dialog (you see this dialog by mousing over near the title bar), uncheck the "Pass special keys directly to VNC Server" box. This lets you toggle applications through ALT-Tab or CMD-Tab, etc. without passing that command to the scope. This allows you to easily jump from presentation to demo and back.





d) (Optional) Save and rename the setting

4. VNC Connection (***after the first time***)
    a) Open the app
    b) Select the appropriate connection

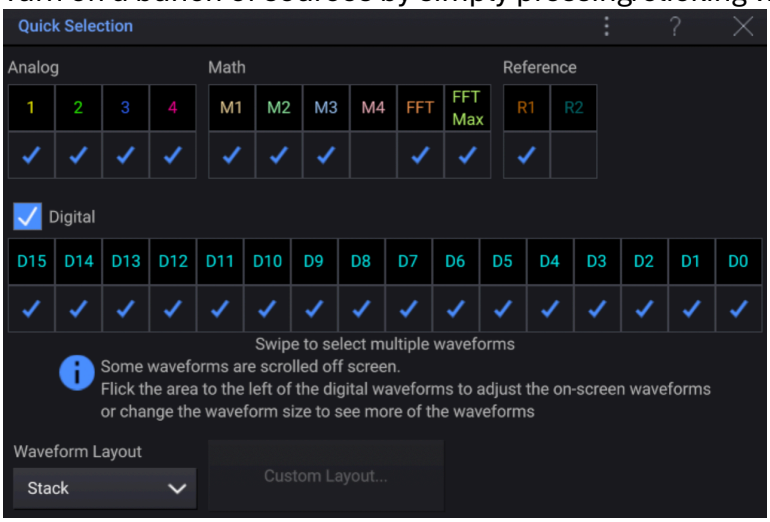
Scope Setup:

For the first couple demonstrations, you should not have anything connected to the oscilloscope channels or the demo pins.

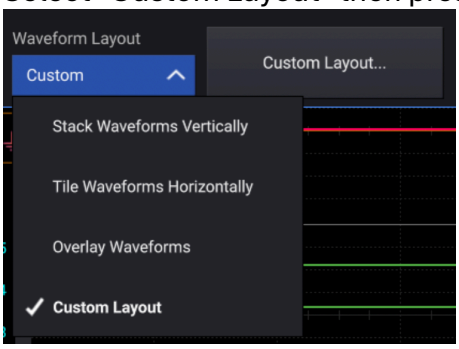
Demo #1: New User Interface

1. Press Default Setup
2. Press the + icon next to channel 1

3. Turn on a bunch of sources by simply pressing/clicking where the check marks are

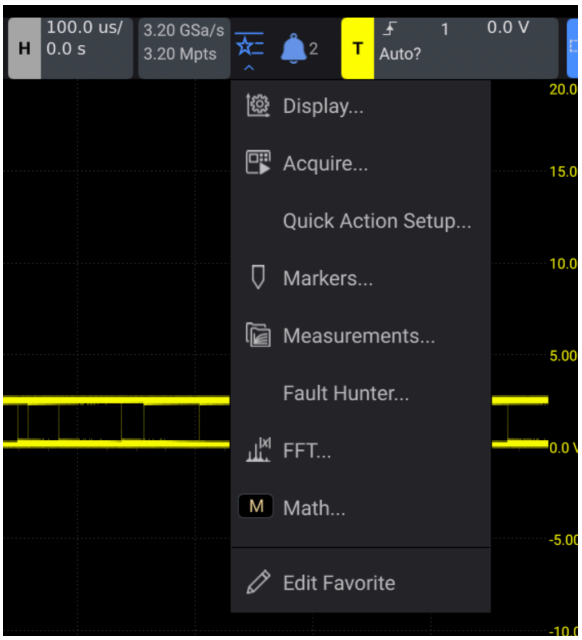


4. Open the drop down for “Waveform Layout”
5. Select “Custom Layout” then press the “Custom Layout” button



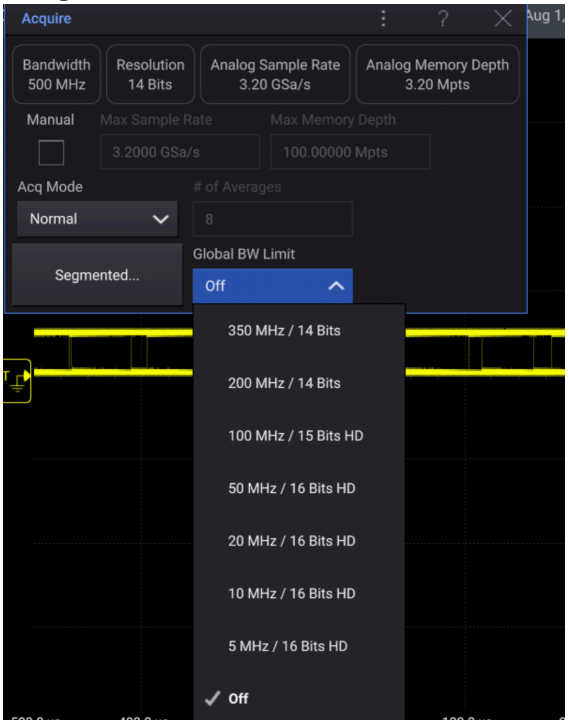
6. You can select Vertical or Horizontal for the “Grid Orientation” and then drag around which sources you want to show in each grid

7. Close out of the Custom Layout menu
8. Close out of the Quick Selection menu
9. Press Default Setup
10. Notice the new “Favorites” menu – this can be completely customized using “Edit Favorite” at the bottom!



11. Open the main menu on the top left of the touch screen

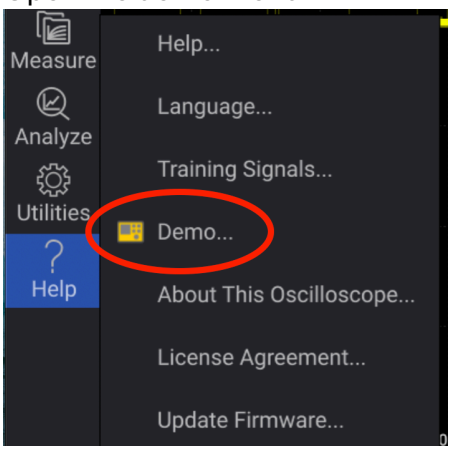
12. Press “Setup” and “Acquire”
13. Select the “Global BW Limit” drop down to see all the new bandwidth filters available. We used to only offer a 20 MHz filter, now we have several. Right now this is a global filter, but in the future will be moved to be within each channel.



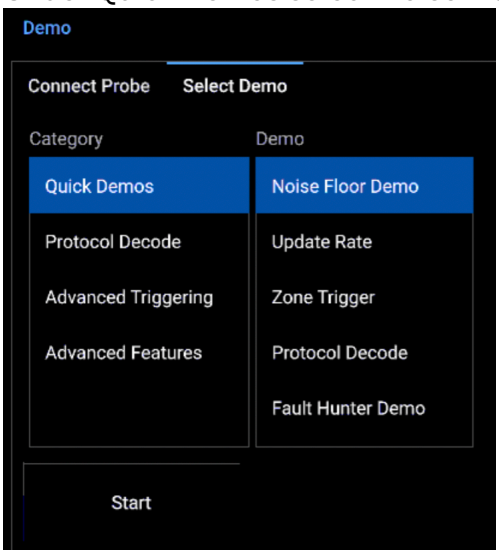
14. Step through the menu to show the customer what sit in each section, for example the Digital Voltmeter and Counters are under “Measure”
15. Open any application or menu
16. Notice there is a question mark in the top right corner that will open that section of the user guide to help understand how to use it

Demo #2: Ultra Low-Noise Front-End

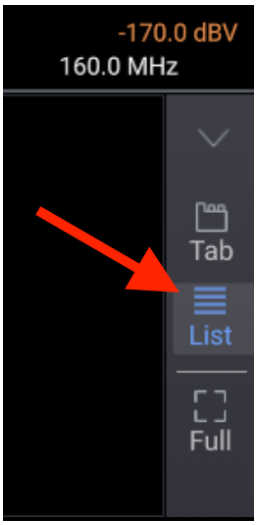
1. Open the demo menu



2. Go to the “Select Demos” tab
3. Under Quick Demos select Noise Floor Demo and Start!



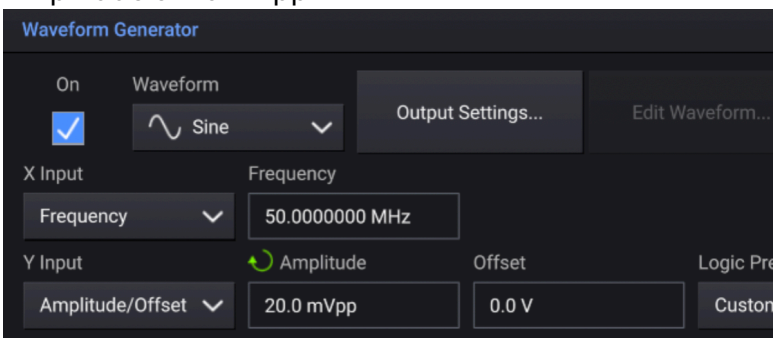
4. Follow the directions to unplug any probes
5. Press Next Step, the scope auto sets to 5mV/div and 50Ω and sets up the FFT
6. Press “Exit” to exit the demo mode and close out of the demo menu
7. Press “List” on the bottom right of the screen



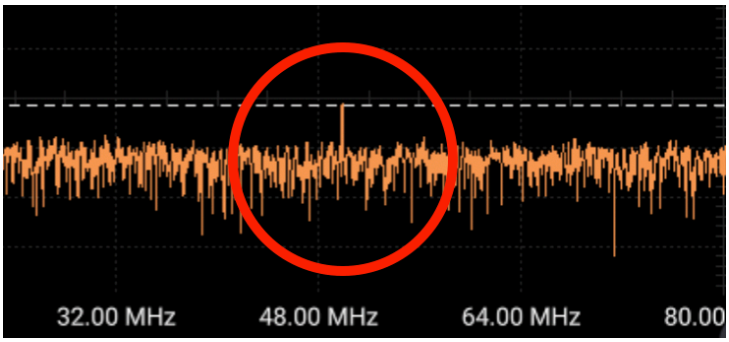
8. See the RMS measurement of 60μV_{RMS} for the 5mV/div setting, remarkably low for this class of scope! We are also seeing less than -104dBm on the FFT. The closest competitors FFT is around -85 dBm, meaning we can see significantly smaller tones than they can. Tones that could be causing interference, ripple, noise, or distortion, especially in low-level signals.

Demo #3: Measure the Smallest Signals

1. Now, connect the attenuator and cable provided with the demo kits to the Gen Out on the back of the oscilloscope to the channel 1 input
2. Go to Sources, then Waveform Generator
3. Turn on a signal with Waveform type Sine
4. Frequency should be set to 50 MHz
5. Amplitude of 20 mVpp



6. On the FFT you can now clearly see the 50 MHz tone. The 20 mVpp signal we are generating is passing through a 60 dB attenuator, so what we see on screen is an extremely small tone that is in the noise of all our competitors' oscilloscopes. You can connect this signal to a competitors FFT and you won't be able to see the tone at all!



Setup: For the rest of the golden demo, you will need to connect the default passive probe from channel 1 to the demo pin and the ground clip to the ground pin.

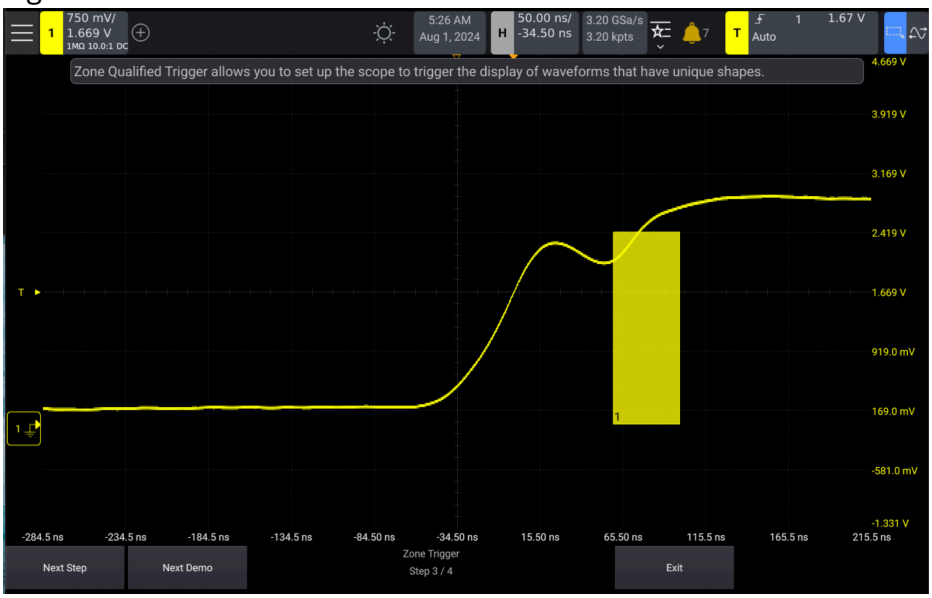
Demo #4: Only Uncompromised Waveform Update Rate

1. Press Default Setup
2. Go to Help, then Demo
3. Go to the Select Demo tab
4. Under Quick Demos select Update Rate and Start
5. First, with Keysight's industry-leading uncompromised 1,000,000 wfms/s you can clearly see an infrequent glitch popping up on the screen.
6. Press Next Step
7. Now, keep in mind that most vendors have a slower waveform update rate than Keysight does. Looking at a waveform update rate of 100,000 wfms/s we can barely even see the infrequent glitch.
8. Press Next Step
9. With an even slower update rate of only 3,000 wfms/s, which is equivalent to a few of our key competitors in this space, we cannot even see the glitch on screen. If we can't even see it, how can we fix it?
10. Now comparing to what you just saw, we have our extremely fast uncompromised waveform update rate again. You can see what a clear difference this makes. The faster the update rate, the more we can see, and the more we can debug.

Demo #5: Zone Trigger Demo

1. Press Next Demo
2. Now we see an even more complex signal on the screen. There is clearly some crosstalk and I want to isolate the different parts of this signal to characterize it

3. Press Next Step
4. Watch a box get drawn on the screen. This is a hardware-based zone trigger! You can have up to 4 zone working together now (used to only be 2) and you can use them on different channels with different logic, so you can easily isolate the most complex signals

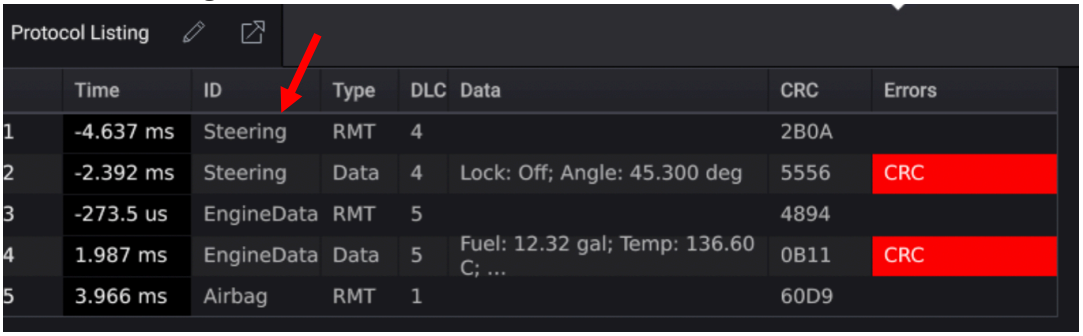


5. Press Next Step
6. Now you, or the customer can actually draw a zone on screen to isolate part of it. Give it a try!

Demo #6: Hardware-Based Protocol Decodes

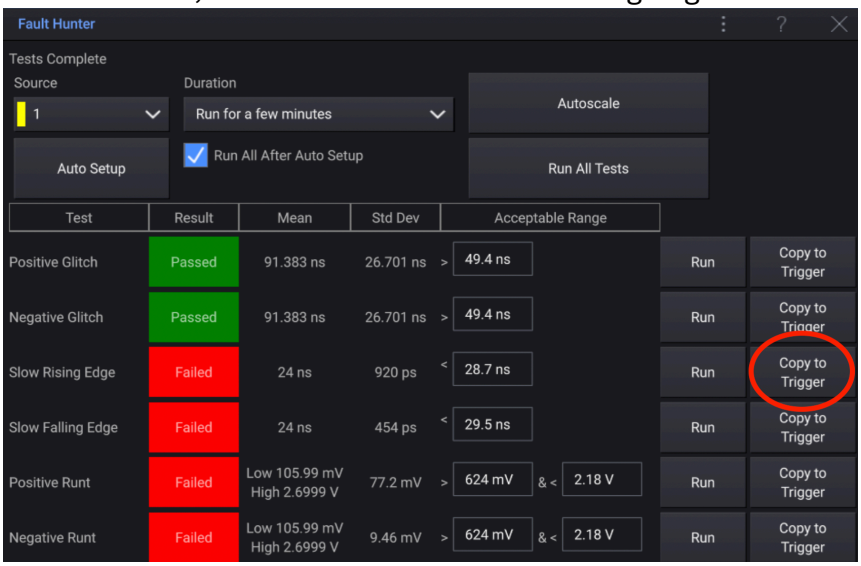
1. Press Next Demo
2. Not only are we the only oscilloscope in this class with hardware-based serial decoding, ensuring you are capturing any glitches on your serial buses, but we are also the only ones with this time correlated list of the various packets

3. Notice we also support symbolic decoding, meaning we can translate the packets from bits to English



Demo #7: Fault Hunter

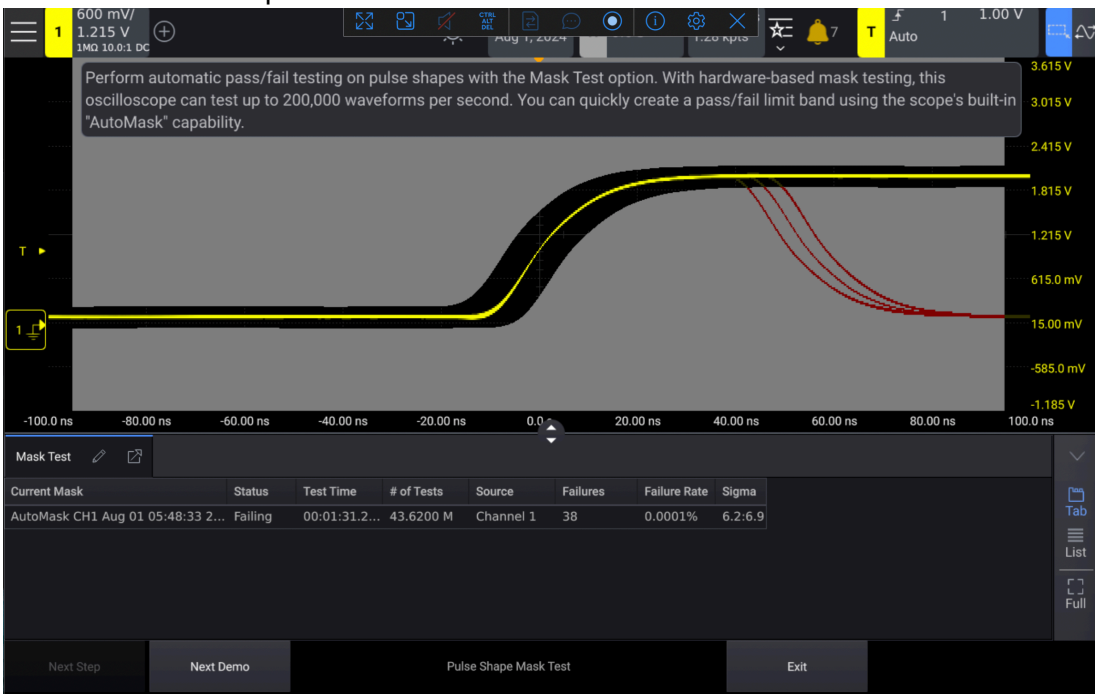
1. Press Next Demo
2. As it runs you can talk about this new feature: The industry's only automated application that can scan your signal and find errors for you. Just trigger on your signal, set your parameters (auto setup option), and run! Run for just a few minutes, or a couple days. Feel confident that you will catch any glitch or infrequent event interfering with your signals.
3. Notice there are a few errors. If we drag the fault hunter screen to the side for a moment we can see the scope is triggering on the original signal. Back in the fault hunter screen, we see a failure for "Slow Rising Edge". Press "Copy to Trigger"



4. Now if we move the fault hunter screen again, we can see the scope is only triggering on that slow rising edge that it captured. We didn't have to mess with the pulse width triggers or anything, the scope just automatically set those up. Now that the slow rising edge is isolated I can make more measurements on it and figure out what is causing it.

Demo #8: Hardware-Based Mask Testing

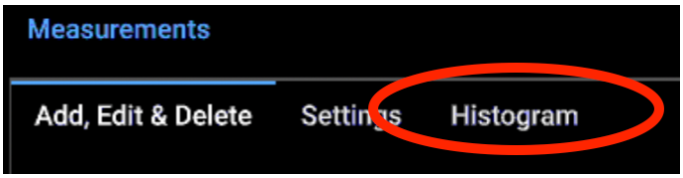
1. Press Exit
2. In the Demo Menu, select Advanced Features
3. Select Pulse Shaped Mask Test and Start
4. Notice in just a few seconds the mask test has performed millions of tests. This is again due to the fact we perform this in hardware in order to maintain that fast 1,000,000 wfms/s or higher. Our competitors perform this in software and run thousands of tests per second.



Masks tests are a great quick visual test to see if there is any abnormal behavior on your signal. You can also leave this running just for a few minutes or for days to capture extremely infrequent events.

Demo #9: Standard Waveform and Measurement Histograms

1. Press Next Demo
2. Now we can see a histogram build on screen. Right now we are looking at a waveform histogram, but there are also histograms available for every type of measurement in the measurements menu.



Histograms are a quick visual tool that tell us if there is any interference or deterministic jitter on our device, or if the amount of random jitter present is within specified tolerances

Bring up the measurements menu, the frequency response analysis application, the protocol decode menu, or other features in the oscilloscope if the customer is interested in seeing more!