



FIELD TRAINING

How to use a VIAVI meter

A breakdown of the Viavi ONX 620/630 Signal meter

THE BASICS

What the meter does, components and how to care for it.

USING THE READINGS

General interpretation of what the data means, how it will help you on the job and importance of using the meter.

FEATURE OVERVIEW

The viavi meter can be a wonderful asset if used correctly, understanding the information and implementing it into your work space.

What is “Tilt” ?

Tilt is the slope of the signal from the low end of the band to the high end.

Cable loses more signal at higher frequencies, so the print is not one flat number. It is built with more level at the high end so the whole band lands where it should.

How do you actually see it?

On the print, look at 258 MHz and 1002 MHz. Those two levels together are the tilt.

Then look at the same two frequencies on the meter.
The difference between them should match the difference on the print.



What we are going over

AGENDA

INTERNAL TRAINING

We will walk the meter the same way you will use it on the job. Slow on the first pass.

01

Meet the meter

Two RF ports on top. Port 1 is the main test port for this job. Port 2 is there, we just do not use it today.

02

Hook up at the active

Jumper on Port 1, probe in the -20 test port. The active has to settle first or the numbers are still moving.

03

Check test ports on QuantumLink Local

The phone app that shows which test ports are actually live. Wrong port, wrong number. Swap in the app if you need to.

04

Open RSG Loopback

The screen you actually read at the active. That is how you check signal and tilt against the print.

05

Use the readings (and the 20 dB trap)

The print is the answer key. A -20 test port reads 20 low, so add 20 in your head. Do not crank a good plant.

06

OneCheck at the tap, house box, or modem

A different test, for practice at a tap, house box, or modem.

Two RF ports on top. We use Port 1 for this job.



Two RF ports on top of the meter. Each one has an F-81 barrel. The purple sticker between them is labeled 1 and 2.

Port 1 — RF US/DS analysis. This is the measurement port. DOCSIS, QAM, signal, tilt, RSG Loopback. Jumper and probe go here for this project.

Port 2 — RF ingress port. Built to look at upstream from the house (ingress scan) and to run TDR. That is what it is for, not a generic spare.

What we are using today
Port 1 only

**Same two ports on every VIAVI.
Find the #1 port before you screw anything on.**

A chewed-up barrel or a loose F gives you a number you cannot trust.



The barrels on Port 1 and Port 2 are F-81s.

They are replaceable. They will wear. How you treat them is how long they last.

Take care of them! If you strip a barrel, you strip a reading. A chewed-up or cross-threaded barrel will show a number you cannot trust.

They are going to wear out. That is normal. A little care (no cross threading, snug not gorilla hand of god, keeping them clean etc) makes them last a lot longer. When one is junk, swap it. Do not keep using a wrecked barrel and then chase the plant.

The jumper, Same deal. Protect it. A bad jumper looks like a bad active. If the reading is crazy, check the jumper and the barrel.

Snug, don't strip. They wear. Take care of them and they last.



This meter has to last the night. Treat it like a tool, not a brick.

Battery

- It drinks power. If you leave it on, it will be dead by lunch.
- Turn it off when you are done testing, and when you walk away from the pole.
- Keep an inverter in the truck so you can charge between stops. Plug it in on the ride, not after it dies!!!!!!!!!!!!!!
- Do not leave it sitting in your truck left on for no reason.

Water

- It can take a splash and light rain. It is not waterproof.
- Do not dunk it. Do not set it in a puddle or in the bed in standing water.
- Wipe it off before it goes back in the case. If it is pouring, test and get it back in the cab.

Jumper and barrels

- They will wear. That is normal. The better you treat them, the longer they last.
- Start the F square, snug it, stop. Do not crank until it strips.
- Keep a spare barrel in the truck. If one looks chewed, swap it. A bad barrel or a kinked jumper gives you a bad number.

Off when you are done. Charge in the truck. Keep it dry. Snug the barrels, carry a spare.

The app shows which test ports are live. Wrong port = wrong number.

See which test ports are active

- Open QuantumLink Local after the active has settled.
- Live means RF is coming out that test point.
- Look at the phone, not the meter, to see which port you are actually on.

Swap if you need to

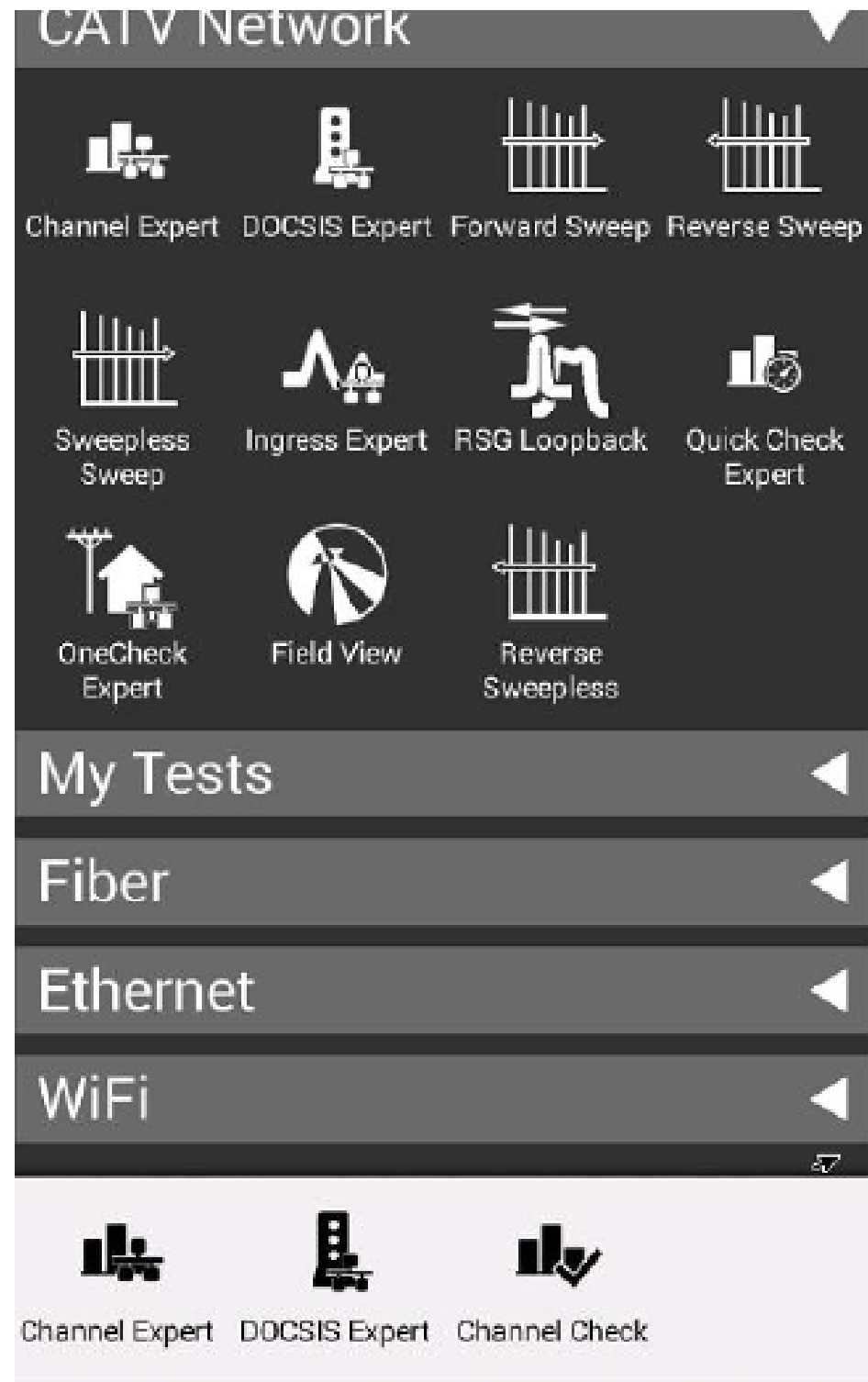
- Match the port to the print before you probe.
- Example: print is the LE output. App shows the input live and the output off. Swap so the output is live, then probe that port.
- A live port on the wrong leg is still the wrong number.

This is also how you change output later

- If Loopback does not match the print, you come back to this same app.
- Manual rebalance: raise or lower output, Save, wait a few seconds, then read the meter again.

Do this on the phone before you trust the meter.

The field test at the active lives in CATV Network.



Turn the VIAVI on. You are looking at the home screen.

You will see a few menus:

If CATV Network is closed, tap the arrow on the right. That opens the dropdown and the icons show up.

Find RSG Loopback

Look in that row for RSG Loopback. Pipes with arrows above it style icon.

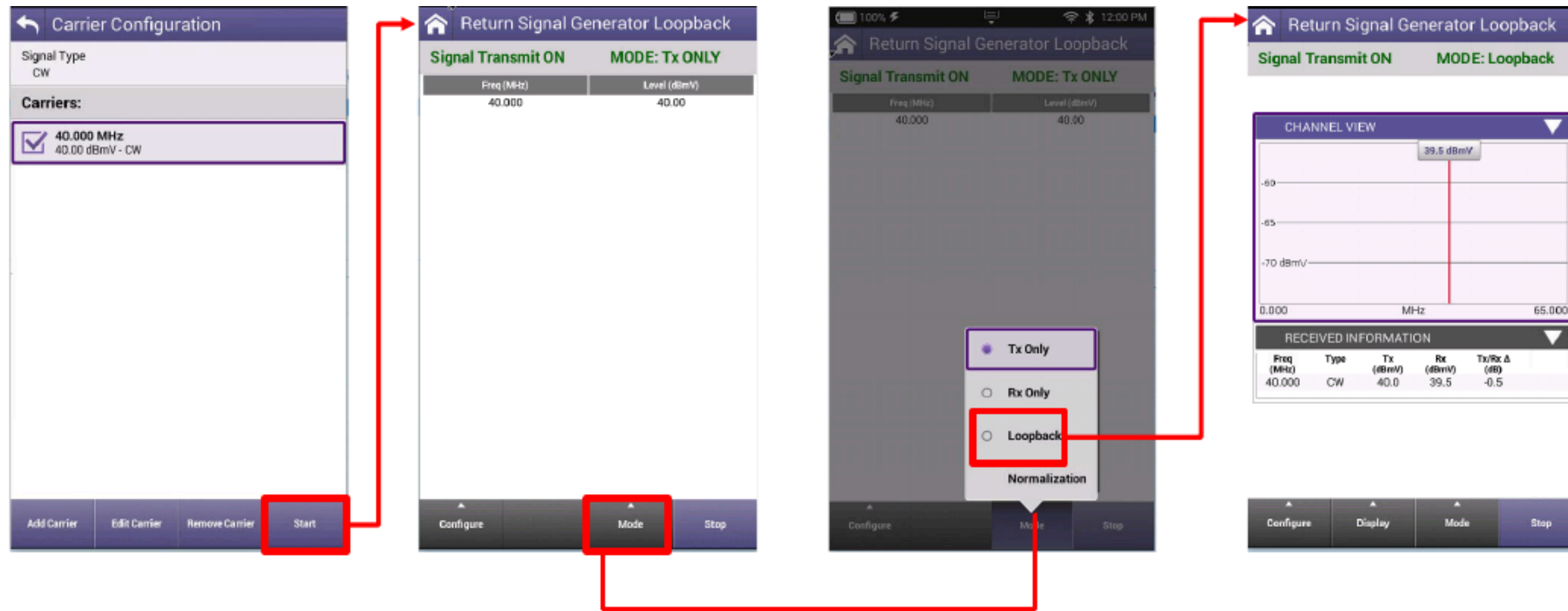
Park it on the dock

If you have not done this already: tap and hold RSG Loopback, then drag it down to the dock at the bottom of the screen.

Next time you turn the meter on, it is right there for quick access.

Once you have it on your dock, click the RSG loopback app to open it.

Start the carrier, then put it in Loopback mode. That is the screen you read.



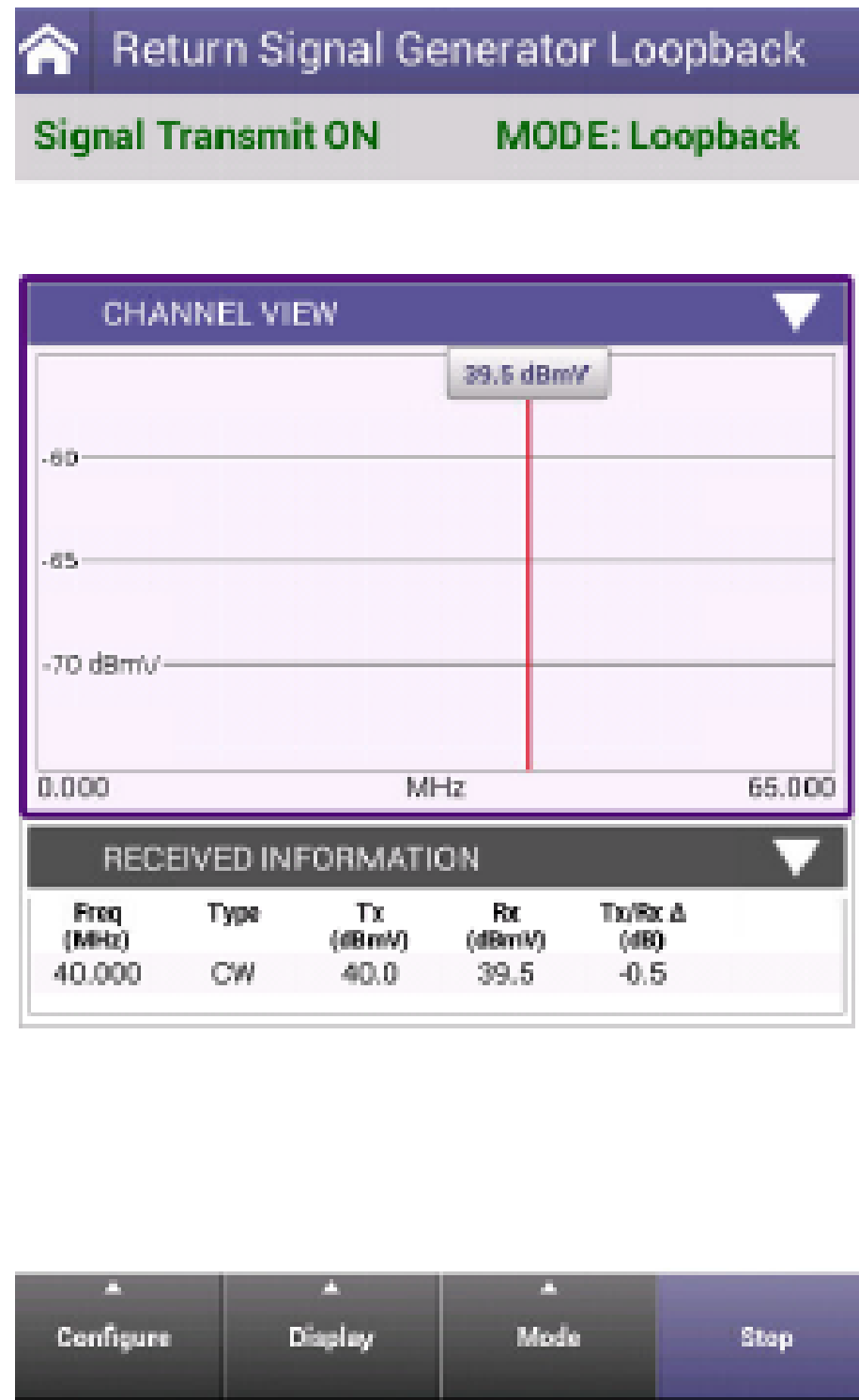
Make sure correct carrier config, set to 258 or 1002

Click on mode at the bottom of the screen

Select Loopback from the dropdown menu

Review the graph for a proper titlt "Linear line" touch the graph to check signal levels at certain points

MODE should say Loopback. Now we read signal and tilt.



This picture is from the VIAVI book. Your numbers will not match this screen. Use the number on YOUR print.

What you are looking at:

MODE: Loopback (green) means you are in the right test.
If it still says Tx ONLY, you are not on the correct screen yet.
CHANNEL VIEW is the picture of the carrier.
RECEIVED INFORMATION is the table. That is where you read.

What the table means

Freq = the carrier you are on. (In our case this would be 258 or 1002MHz)
Tx = what the meter sent.
Rx = what came back. This is the number you care about.
Tx/Rx Δ = the difference. Close to 0 means the path is about even.

How to use it

Look at Rx. If the meter is not adding 20, add 20 in your head.
Compare that to the print at that same frequency.
Example: print says 36 at the 204. Rx about 16 means signal is actually 36.

The print is the answer key. Walk one example together.

01 Look at the print first

Find your active. This print is 34 dBmV at 258, and 46 at 1002. Those two together are level and tilt. Use YOUR print if the numbers are different.

INPUT								OUTPUT			
12 MHz	258 MHz		204 MHz		5 MHz			1002 MHz	258 MHz	204 MHz	5 MHz
A	D	A	D	A	D	A					
	N/A		N/A		N/A		46	34	11	11	
2	20.3		24.03		19.63		46	34	11	11	
5	17.11		26.48		17.48		46	34	11	11	
9	20.11		23.61		16.08		46	34	11	11	
	21.01		22.76		14.6		46	34	11	11	
	6.87		36.57		26.57		46	34	11	11	
3	20.58		22.87		12.87		46	34	11	11	
5	20.19		23.48		15.07		46	34	11	11	

02 Now look at the meter

Probe is in the test port (Output).

RSG Loopback is running, carrier settings are set to 258MHz

The screen shows about 14. But label on the test port for the LE says -20DB

$14 + 20 = 34$. That matches. Then check 1002 the same way.

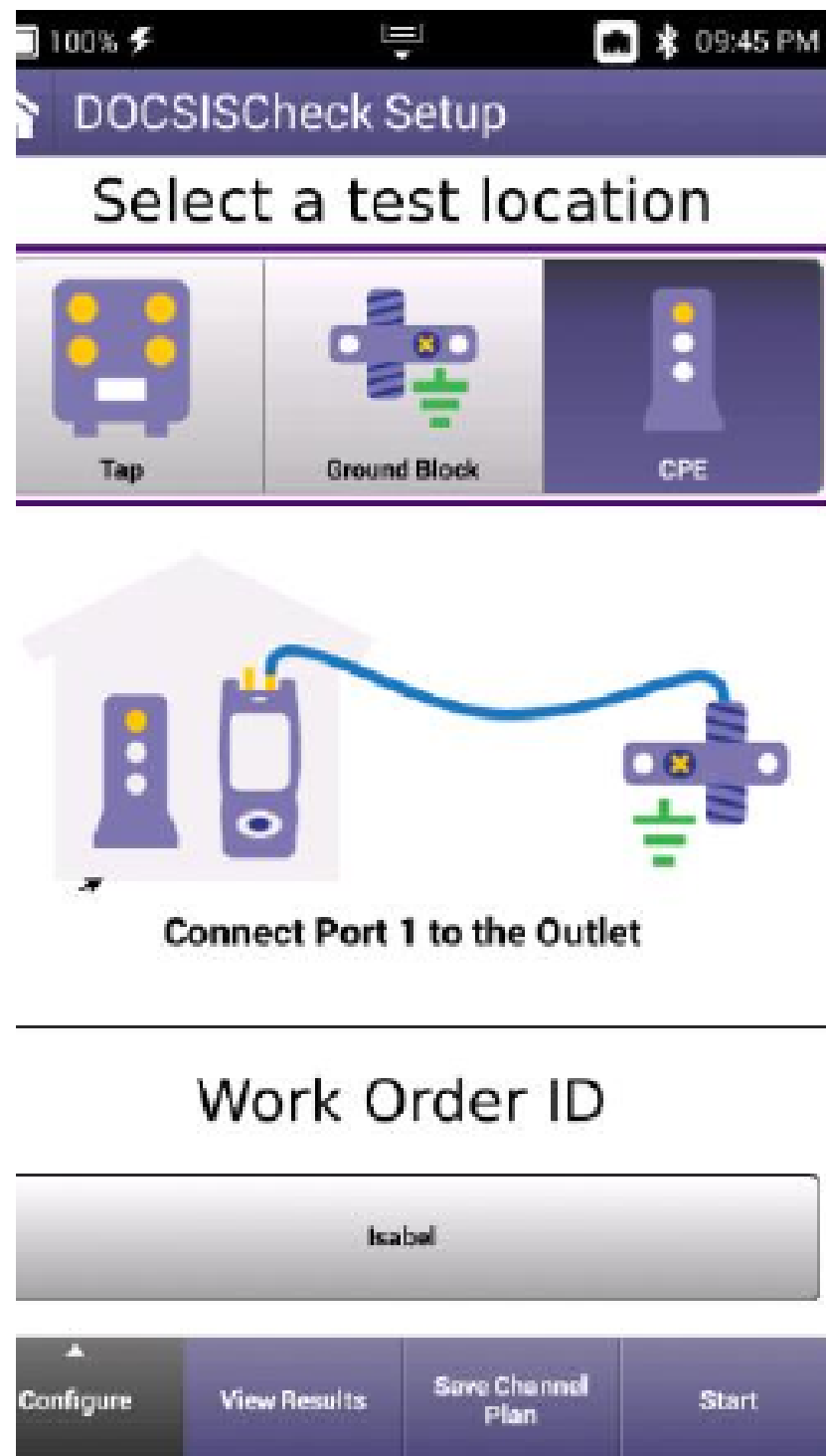
03 Important Notes

We will configure everyones meters to automatically account for the standard 20DB loss at the high and low freq for test points via a template.

If we loaded the template, the screen should already say 34. Do not add 20 on top of it. Only add it in your head when the meter is still showing the raw test-port number.

Always add Test Port Loss in your head unless the meter is already doing it for you.

Loopback is at the active. OneCheck is at the tap, the house box, or the modem.



OneCheck is a test available on the meter. These checks can be synced with ISP's for internal monitoring/verification.

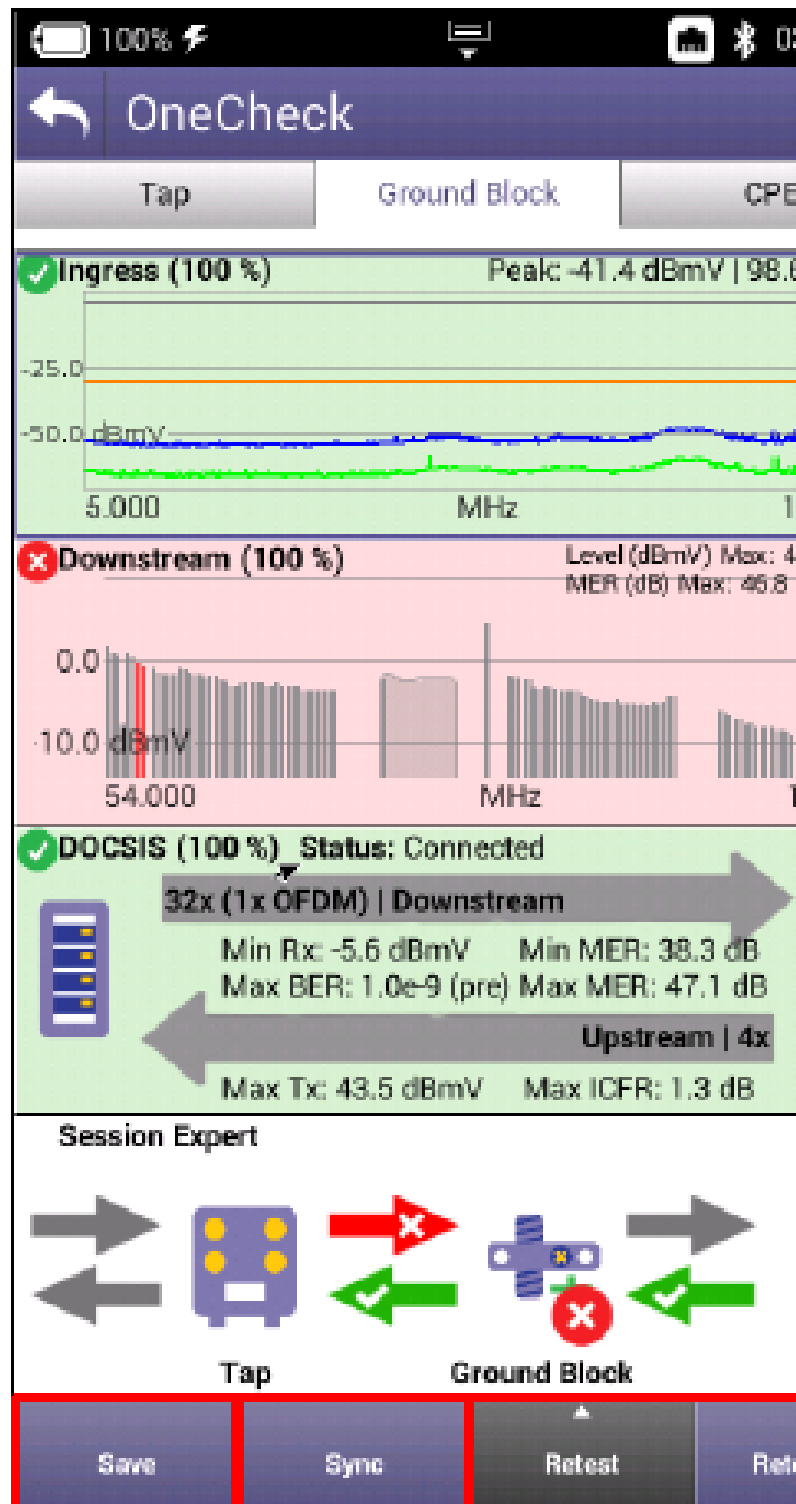
Hook jumper to Port 1 at the tap, the house box, or the modem. It takes a snapshot of the signal there and grades it pass or fail.

Pick the location at the top before you hit Start.
That location is where you are standing.
The meter uses it for the pass/fail limits.

TAP = you are at the tap
Ground Block = the house box
CPE = the modem

You pick this first, not after you see a number. Wrong location uses the wrong limits, so a good plant can still fail.

The tabs at the top have to match where you are standing.



This is the screenshot after onecheck finishes.

- Green is pass. Red is fail.
- Ingress, Downstream, and DOCSIS are the chunks of the test. Tons of information is available by selecting any of these subtopics.
- Session Expert at the bottom is the drop path. Tap, then house box, then modem. An X is where that path failed.
- If you started on tap, you are looking at the tap test. Do not jump over to Ground Block or CPE unless you actually tested there.



DO THIS EVERY TIME

The meter shows a number. The print is the answer.

Know where you are hooked up. Then decide if the number is right.

THE JOB AT THE ACTIVE

Power it first. Wait for auto rebalance. Check live test ports in QuantumLink Local. Jumper on Port 1, probe in the test port. Then open RSG Loopback.

HOW TO READ IT

Signal and tilt have to match the print. A -20 test port reads 20 low unless the meter is already adding it. That is not a trick to use everywhere. Know what you are looking at.

IF IT DOES NOT MATCH

Manual rebalance in QuantumLink Local. Raise or lower output. Save. Wait. Read it again. If it matches, unplug. You are done.

ONECHECK

A separate test on the meter. Pick TAP, Ground Block, or CPE first, then Start. It snapshots that spot and grades it pass or fail.