RigExpert STICK PRO Friendly Function Guide

The technical details, explained like a helpful field companion

A plain-language guide to all of the analyzer modes, cable checks, and calibration tools.

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Quick read summary

Think of the STICK PRO as a pocket-sized “what is my RF system doing?” tool. It sends out a very small test signal and listens to what comes back. That lets it show whether an antenna is happy at a frequency, where it wants to resonate, whether a feedline is hiding a problem, and how far away a cable fault may be. It covers 0.1 to 600 MHz.

There are two kinds of jobs here. Antenna modes answer “Does this antenna match my system?” Cable modes answer “Is the feedline the real culprit?” The best habit is to scan first, zoom in next, then use the impedance or cable tools only when you need the why behind the reading.

Figure 1. The analyzer sends a small test signal down the coax and uses the returning signal to describe the antenna and cable.

The modes at a glance

Mode	In everyday words	What it really measures
Single	One frequency, all the useful numbers	Use it to see SWR, return loss, impedance, R, X, L, C, magnitude, and phase.
Multé	A quick report card for many ham bands	Stars show how good the best SWR is in each scanned band.
HAM	A ready-made ham-band sweep	Shows where the SWR dip sits inside a selected amateur band.
Free	A sweep you set yourself	Best for zooming in around exactly the frequencies you care about.
Bound	A green-light or red-light tuner helper	Checks one frequency against your own SWR or return-loss limit.
TDR	Cable problem locator	Turns reflections into distance, helping you hunt down a break, open, or bad connection.
R and X	The “why is SWR high?” view	Separates resistance from reactance so tuning decisions make sense.
Return Loss	SWR in dB clothing	The same mismatch story, but shown as return loss; bigger dB is better.
Stub Tuner	Coax stub checker	Finds quarter-wave and half-wave resonances in an open or shorted stub.
Cable Length	How long is this cable really?	Estimates physical length from electrical delay and velocity factor.
Cable Impedance	What kind of line is this behaving like?	Checks the cable’s characteristic impedance and flags surprises.
Cable Loss	How much signal is the feeder eating?	Estimates attenuation, especially useful before blaming the antenna.
OSL Calibration	The accuracy reset button	Uses open, short, and load standards to move the reference plane where you need it.

A tiny bit of RF language

SWR is the “how well does it fit?” number. 1:1 is a perfect match; higher numbers mean more energy is bouncing back. Return loss says the same thing in decibels: bigger is better. R is the useful resistive part of impedance. X is the reactive part, which tells you whether the system is acting inductive or capacitive. A resonance often shows up where X crosses zero, but you still want R to be close to your system impedance, often 50 ohms.

The compact technical version is this: impedance is Z = R + jX. The reflection coefficient is Gamma = (Z - Z0) / (Z + Z0). From it, SWR = (1 + |Gamma|) / (1 - |Gamma|), and return loss in dB = −20 log10(|Gamma|). You do not need to calculate these by hand in the field, but they explain why a 50-ohm load measured in a 50-ohm system has Gamma near zero, SWR near 1:1, and a large return-loss value.

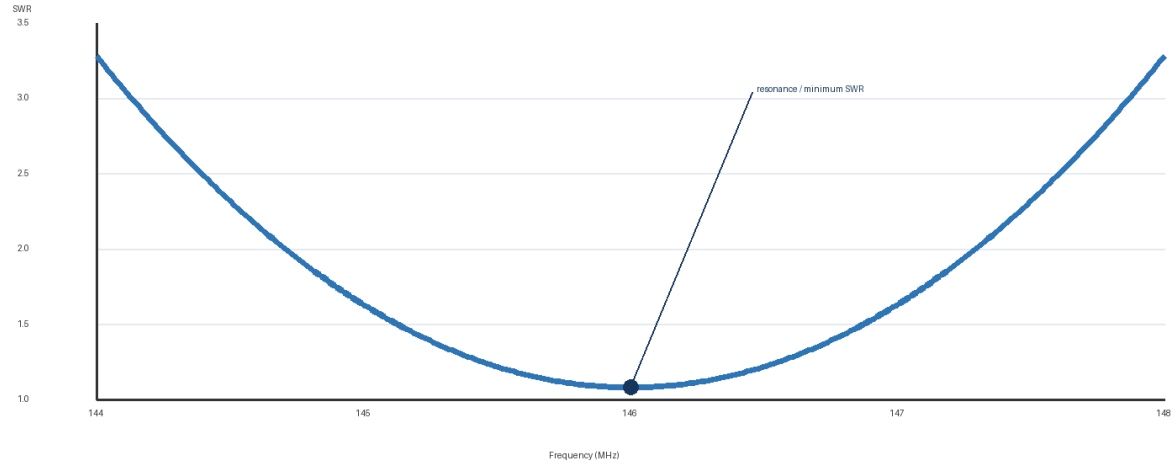

Figure 1. The dip is the useful clue. It shows where the antenna is most comfortable, not necessarily the exact frequency you should use.

Getting to any function

Start with the analyzer off: press the Power / Cancel key once to turn it on. From a measurement screen, a short press of Power / Cancel returns to the main menu; further short presses move through its three menu pages. On every page, the four function positions always follow the same physical keys: Minus selects the upper-left item, Plus selects upper-right, Left Arrow selects lower-left, and Right Arrow selects lower-right. This guide names the keys exactly that way so the routes stay easy to follow.

A handy shortcut: with the analyzer off, a long press of Minus, Plus, Left Arrow, or Right Arrow turns it on directly in the function assigned to that key on menu page 1. For all other functions, turn it on normally, short-press Power / Cancel until the right menu page appears, then press the stated key.

Single

The close-up view

Getting there: From menu page 1, press Minus. Or, with the analyzer off, long-press Minus to power on directly in Single.

Single is what you use after you have found an interesting frequency. Screen one gives SWR and return loss. Other screens unpack the impedance into |Z|, R, X, L, C, magnitude, and phase, in both series and parallel forms. The analyzer can show a minus sign beside L or C as a practical hint: it is telling you what kind of opposite reactance would cancel the one it sees.

Friendly field tip: Try this: set the exact operating frequency, then look at X first. X near zero means you are near resonance. Next compare R with your chosen Z0. If R is far away, a matching network or feedpoint change may be needed.

Multé

The fast “how are my bands doing?” check

Getting there: From menu page 1, press Plus. Or, with the analyzer off, long-press Plus to power on directly in Multé.

Multé scans the preset amateur bands and gives each good result one to five stars. Five stars means SWR from 1.0 to 1.1; four is 1.1 to 1.15; three is 1.15 to 1.3; two is 1.3 to 1.7; and one is 1.7 to 3.0. A band with no result may have a minimum over 3, or a damaged antenna or coax run.

Friendly field tip: Try this: use Normal search when you are in a hurry. Use Deep if the antenna has a sharp, narrow dip. Then jump to HAM mode for the band that looks most promising.

HAM

The “show me this ham band” chart

Getting there: From menu page 1, press Left Arrow. Or, with the analyzer off, long-press Left Arrow to power on directly in HAM.

HAM mode draws an SWR sweep across a selected amateur allocation, from 2.2 km through 70 cm. It reports the lowest SWR and the frequency of that dip. The bars at the chart edges are a friendly warning that the real resonance could be just outside the chosen band.

Friendly field tip: Try this: if the dip is below the part of the band you want, the antenna is electrically too long; if it is above, it is electrically too short. Make small changes and check again.

Free

Your custom magnifying glass

Getting there: From menu page 1, press Right Arrow. Or, with the analyzer off, long-press Right Arrow to power on directly in Free.

Free mode is the flexible SWR chart. Pick a center frequency and a bandwidth, as small as 10 kHz, and it will show the marker reading plus the best SWR it found. It is useful both for a wide look and for close-in tuning.

Friendly field tip: Try this: start wide so you understand the whole shape, then narrow the span around the dip. Judge the antenna at the intended operating frequency, not only at the lowest point on the screen.

Bound

A simple pass or fail indicator

Getting there: From the main menu, short-press Power / Cancel once to show menu page 2, then press Minus.

Bound watches one frequency and compares either SWR or return loss with the limit you choose. It uses large numbers and color so you can watch it while trimming, adjusting, or moving around the antenna.

Friendly field tip: Try this: decide your acceptance limit first. Bound tells you whether you are inside it. If you want to know why it is failing, follow up with Single or R and X.

TDR

The cable detective

Getting there: From the main menu, short-press Power / Cancel once to show menu page 2, then press Plus. Set cable velocity factor first in Settings.

TDR looks for reflections in a cable. The STICK PRO does this by measuring R and X over frequency and using an inverse fast Fourier transform to create impulse and step responses. In the trace, a reflection near −1 suggests a

short, 0 is a match, and +1 suggests an open. The horizontal scale becomes distance only when the cable velocity factor is right.

Friendly field tip: Try this: put in the cable maker's velocity factor, then investigate the first significant reflection. Check connectors, surge protectors, splices, and finally the antenna end. The impulse response is best for distance; the step response helps explain the fault.

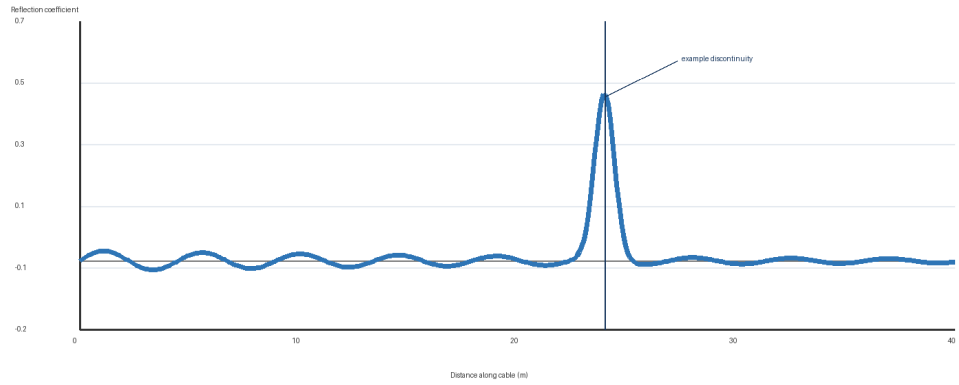

Figure 2. A made-up but realistic-looking reflection trace. The key is the distance to the first meaningful bump, not tiny ripples.

R and X

The explanation behind the SWR plot

Getting there: From the main menu, short-press Power / Cancel once to show menu page 2, then press Left Arrow.

R and X mode charts the resistance and reactance across your chosen frequency span. This is where you stop guessing. A poor SWR can be caused by the wrong resistance, too much reactance, or both. Pan mode lets you slide around an existing chart quickly without redrawing it.

Friendly field tip: Try this: find the point where X crosses zero, then inspect R at that same frequency. For a 50-ohm system, an R value near 50 and X near zero is the happy place.

Return Loss

Same story, different units

Getting there: From the main menu, short-press Power / Cancel once to show menu page 2, then press Right Arrow.

Return Loss mode tracks reflected energy in dB instead of using the SWR ratio. It shows the center frequency and span, the reading at the marker, and the largest return loss it found. Larger return loss means less energy is coming back.

Friendly field tip: Try this: use this mode when a requirement is written in dB. The return-loss peak lines up with the SWR dip, so choose whichever scale speaks the language of the job.

Stub Tuner

The coax-stub fit check

Getting there: From the main menu, short-press Power / Cancel twice to show menu page 3, then press Minus. Connect the open or shorted stub and press OK to begin.

A quarter-wave or half-wave coax stub only works as intended when its electrical length is right. Connect an open or shorted stub and the analyzer immediately reports its quarter-wave and half-wave resonant frequencies.

Friendly field tip: Try this: use the same termination the finished stub will use. Cut in small steps; every trim changes the resonances. Recheck before making the next cut.

Cable Length

Measuring cable with a stopwatch you cannot see

Getting there: From the main menu, short-press Power / Cancel twice to show menu page 3, then press Plus. Set the cable velocity factor in Settings first.

Cable length is really electrical delay translated into physical distance. The translation depends on velocity factor, which is why the correct cable specification matters.

Friendly field tip: Try this: enter the manufacturer velocity factor and keep short adapters out of the measurement plane. A wrong velocity factor makes the length result wrong by the same proportion.

Cable Impedance

Checking whether a cable is acting like itself

Getting there: From the main menu, short-press Power / Cancel twice to show menu page 3, then press Left Arrow.

This mode estimates the line's characteristic impedance. It can help separate a nominal 50-ohm cable from a 75-ohm one and reveal when a cable, connector, or termination is acting strangely.

Friendly field tip: Try this: compare with a known-good cable of the same family. Before blaming the cable, inspect adapters, connectors, moisture entry, and the far-end load.

Cable Loss

The "is the feedline quietly wasting power?" check

Getting there: From the main menu, short-press Power / Cancel twice to show menu page 3, then press Right Arrow.

Cable Loss estimates feedline attenuation. Loss gets worse at higher frequencies, and a lossy line can make an antenna look less dramatic while still wasting useful transmit power and received signal.

Friendly field tip: Try this: compare the suspect line with a known-good one of similar type and length. Treat this as a field diagnostic; use calibrated insertion-loss equipment when a formal lab result is required.

OSL Calibration

Putting the measuring tape at the right starting point

Getting there: From the main menu, press and hold OK. At the information screen, press OK again to enter Settings. Use Left/Right Arrow to reach OSL Calibration, use Minus/Plus to choose Calibrate, then press OK. Follow the prompts for Open, Short, and Load, pressing OK after each standard is connected.

OSL means Open, Short, and Load. The analyzer measures those three known standards and uses them to correct systematic error at the calibration plane. When it is active, the analyzer shows a C indicator. This is especially valuable when adapters, fixtures, or jumpers are part of the setup.

Friendly field tip: Try this: have the standards ready, connect each one exactly when prompted, and do not change the adapter chain afterward. Recalibrate when the setup or the reference plane changes.

A practical order of operations

1. Make sure the object is not connected to live transmitter power, choose the correct Z0, and check your adapters.
2. Calibrate with OSL when accuracy matters or anything stands between the analyzer and the device under test.
3. Scan with Multé or HAM, then use Free for a closer look.
4. Use Single and R and X when you need the explanation behind the chart.
5. If the results still look odd, disconnect the antenna and investigate the feedline with TDR and the cable tools.
6. Save the graph and write down your setup. A useful measurement is one you can repeat.

How to turn a reading into an action

The diagram below is the repeatable loop for most antenna work. Start with a sweep because it gives context. Then use Single or R and X to explain the shape. Do not change several things at once: a one-step change followed by another measurement makes the result trustworthy.

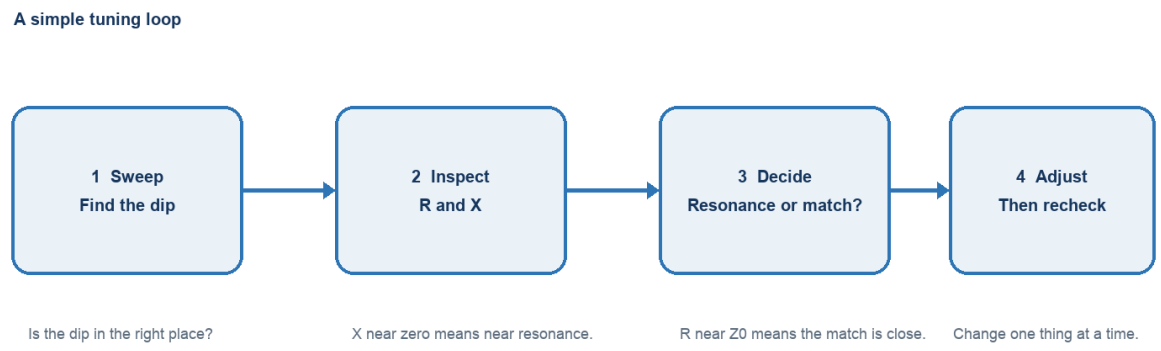

Figure 4. A practical measurement loop: first find the pattern, then use impedance data to explain it.

Worked examples

Example 1 Tuning a VHF antenna near 146 MHz

Illustrative setup: the system is 50 ohms, the analyzer is calibrated at the antenna end of the coax, and Free mode sweeps 144 to 148 MHz. Suppose the chart shows its minimum SWR of 1.30 at 145.6 MHz. At the intended operating point of 146.0 MHz, Single reads R = 43 ohms and X = +12 ohms.

How to read that: the system is close, but it is not yet a perfect 50-ohm resistive load. The sweep says the best match is slightly low in frequency. The positive X says the load is inductive at the frequency inspected. One sensible next step is a small, controlled antenna adjustment, followed by the same sweep. The goal is not merely the lowest SWR somewhere on screen: it is acceptable R, low |X|, and acceptable SWR at the frequency you will actually use.

Technical check: using Z0 = 50 ohms and the illustrative 43 + j12 ohm measurement gives a reflection coefficient magnitude of roughly 0.15. That corresponds to an SWR of about 1.35, which is in the same neighborhood as the

displayed result. Small differences are expected because the sweep point and the single-frequency point are not identical.

Example 2 Finding a cable discontinuity

Illustrative setup: a 30 m coax run has a published velocity factor of 0.66. Enter 0.66 in the analyzer settings, disconnect active equipment, and run TDR. Imagine the first large reflection appears at about 18 m, with a positive-going response. That is a clue to inspect the cable around 18 m from the analyzer, especially for a loose connector, water entry, or an open-like discontinuity.

What not to do: do not assume every small ripple is a fault. Short jumpers, adapters, normal cable loss, and the far-end termination can all create visible features. Start with the first meaningful reflection and verify it physically. If the velocity factor is entered as 0.80 when the actual cable is 0.66, the displayed distance will be wrong by roughly 21 percent.

Example 3 Deciding whether the antenna or feedline is the problem

Illustrative setup: Multé finds only one star on a band where the antenna previously worked well. Before trimming the antenna, disconnect it and check the feedline. If TDR reveals a new reflection and Cable Loss is higher than a known-good line of the same type, the feedline becomes the first suspect. If the feedline checks out, reconnect the antenna and use HAM plus R and X to focus on the radiator or matching network.

Why this saves time: a damaged coax line can make a good antenna look bad. The analyzer lets you separate those possibilities before making a mechanical change that could create a second problem.

Safety and source notes

Do not connect the analyzer to a live transmitter output. Avoid antenna work during a thunderstorm. The STICK PRO is specified for 0 to 40 C operation, uses a 18 650 Li-ion battery, and should be charged only from a 5 V source as specified by RigExpert.

Sources: RigExpert STICK PRO product page, user manual, and datasheet, accessed 27 September 2026. The charts in this guide are explanations, not captured STICK PRO measurements.

Product page: https://rigexpert.com/antenna-analyzers/stick-pro/

User manual: https://old.rigexpert.com/products/uhf-analyzers/stick-pro/users-manual/

Datasheet: https://rigexpert.com/files/product_documentation/Stick-Pro/Stick-Pro-Aantenna-and-Cable-Analyzer_Datasheet.EN.pdf