

RF Sampling Port

Product details

The RF Sampler or sampling port is designed to sit in-line with the transmitter and other components of the transmission line before the antenna. Its purpose is to allow a small, safe pick off voltage of the transmitted RF to be used to feed an oscilloscope or other monitoring instrument.

The sampler allows the transmitted RF to be examined and measured as required. The RF envelope of AM, CW or SSB transmissions can be viewed real time using this sampling port.

Precautions & Warnings

Whenever dealing with RF energy the user should make sure that they do not come into contact with the RF signal to avoid RF burns or shorting the RF signal and causing damage to the transmitting equipment or other items in the transmission line.

The Sampling Port is built on an exposed PCB so the possibility exists to touch or come in contact with terminals or PCB pads and components that are RF energized.

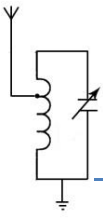
When using this port for sampling RF energy use the lowest power that gives good usable results, although tested to 100 Watts, we recommend starting all testing with around 10 Watts of power

Please ensure that as the user of this product, you exercise due care and attention to the above warning at all times.

Circuit Details

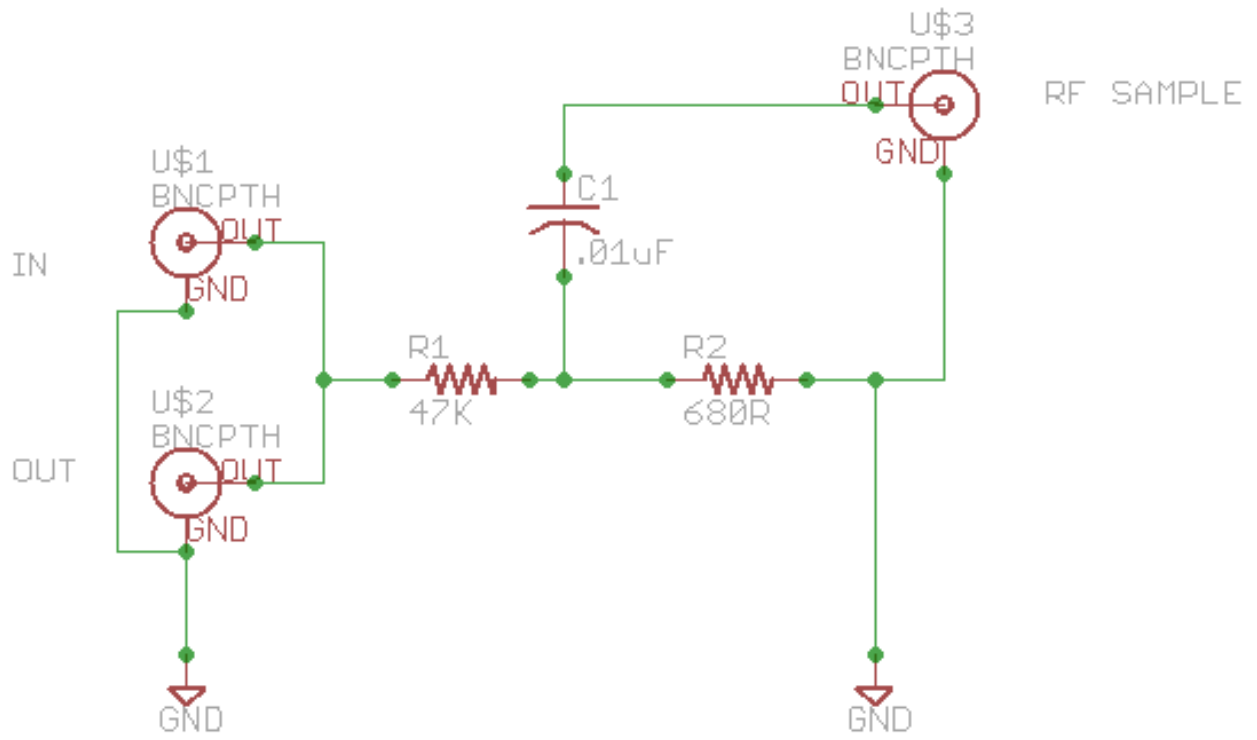
The port is built around a potential divider that allows the RF voltage generated by the transmitter to be tapped off to provide a safe usable voltage at the sampling port BNC. A DC blocking capacitor is also included to prevent unwanted DC components from passing through the sampling port. The sampler is suitable for transmitted RF monitoring from 1 – 100 Watts in all modes.

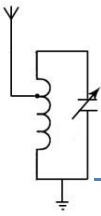
Please see the schematic for details.



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Schematic:





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How to use

Installing the sampler is very easy, for guidance please see the appendix item, How to connect the RF Sampler in the transmit chain; this diagram illustrates a typical set up.

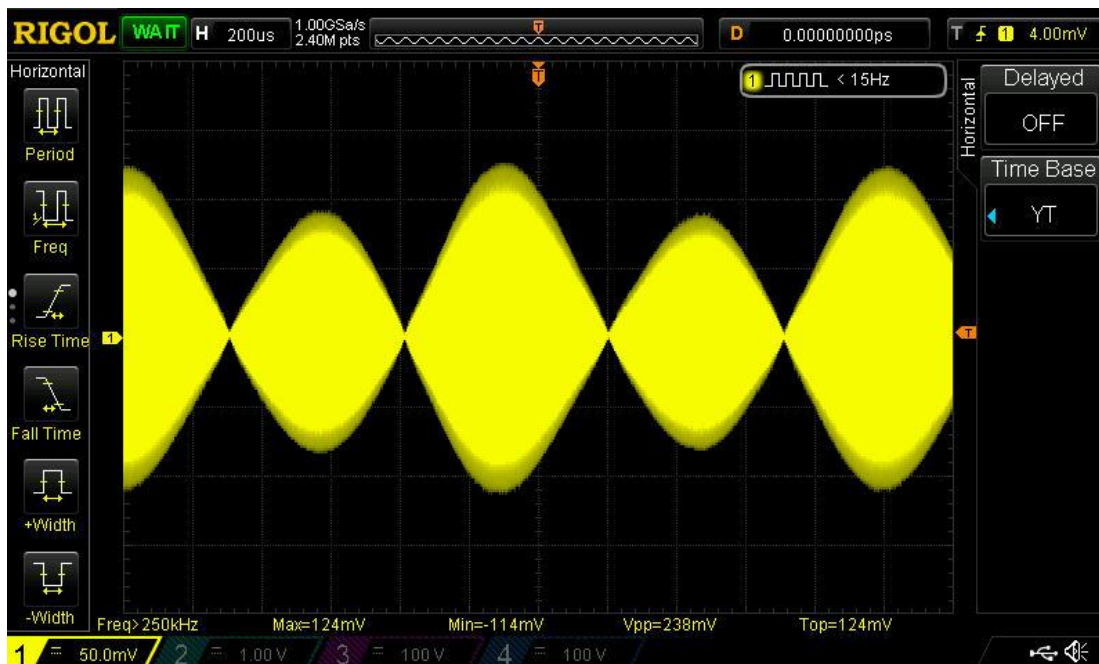
A typical arrangement will have one of the sampling port pass thru BNC connected to the antenna port on the transceiver; a suitably terminated coax cable is connected to one of the 'pass thru' sockets on the sampler, while another suitably terminated coax is connected to the other 'Pass Thru' socket. This coax continues the transmission path to the antenna or dummy load.

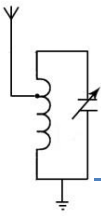
Never connect the 'Pass Thru' sockets to the monitoring device, as full RF load is on these sockets!

On the 'T' section of the port a third BNC is for tapping off the sampled RF, connect this socket using a suitably terminated coax cable to the monitoring device. With the sampled RF connected to the oscilloscope for instance, it is usual to set the scope timebase to 2uS, and adjust the other controls to allow the signal to be viewed. For initial testing set the transmit power level to about 10 Watts and the mode to AM. Keying the transmitter will show the AM carrier signal as a sine wave and by speaking into the microphone the audio should also be seen impressed on the carrier, see photo 1 below.

With SSB (USAB or LSB) the carrier will not be seen (suppressed) with audio seen when the microphone is spoken into.

Photo1. AM Transmit Audio



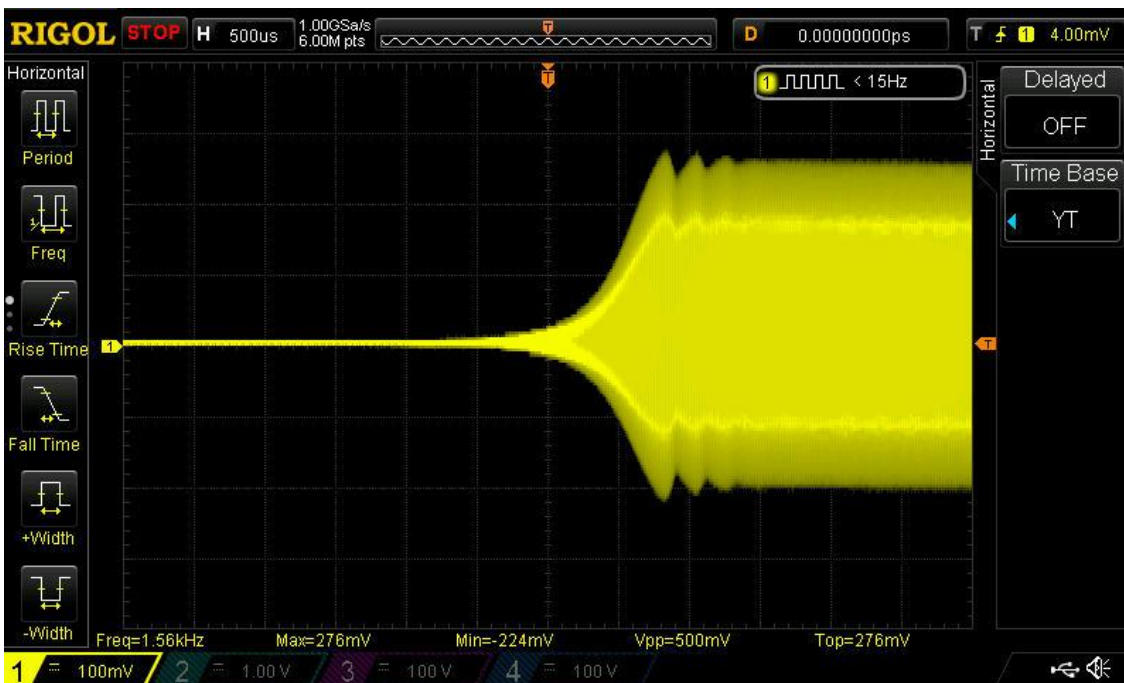


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Please note, this image was obtained using a digital scope, while digital scopes are great for this application, analog scopes can in some instances display more relevant 'real time' information.

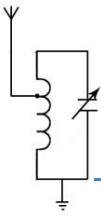
The sampler is suitable for use with AM, SSB, FM & CW modes, and can be used to both observe the signal quality and to make measurements if needed of the transmitted signal. Photo 2 shows a typical CW Keying waveform captured at 100 Watts, during a Dah key down.

Photo 2. - CW Keying waveform



Final Words

The sampling port is designed to provide an easy way to monitor the signal coming from a transmitter to either a dummy load or antenna, as damage to delicate equipment front ends is possible through the incorrect use of this sampling port, it should always be checked for correct connection to the equipment in use/test, and the port itself should be periodically examined to make sure it is in good working condition.



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The small Print

DISCLAIMER

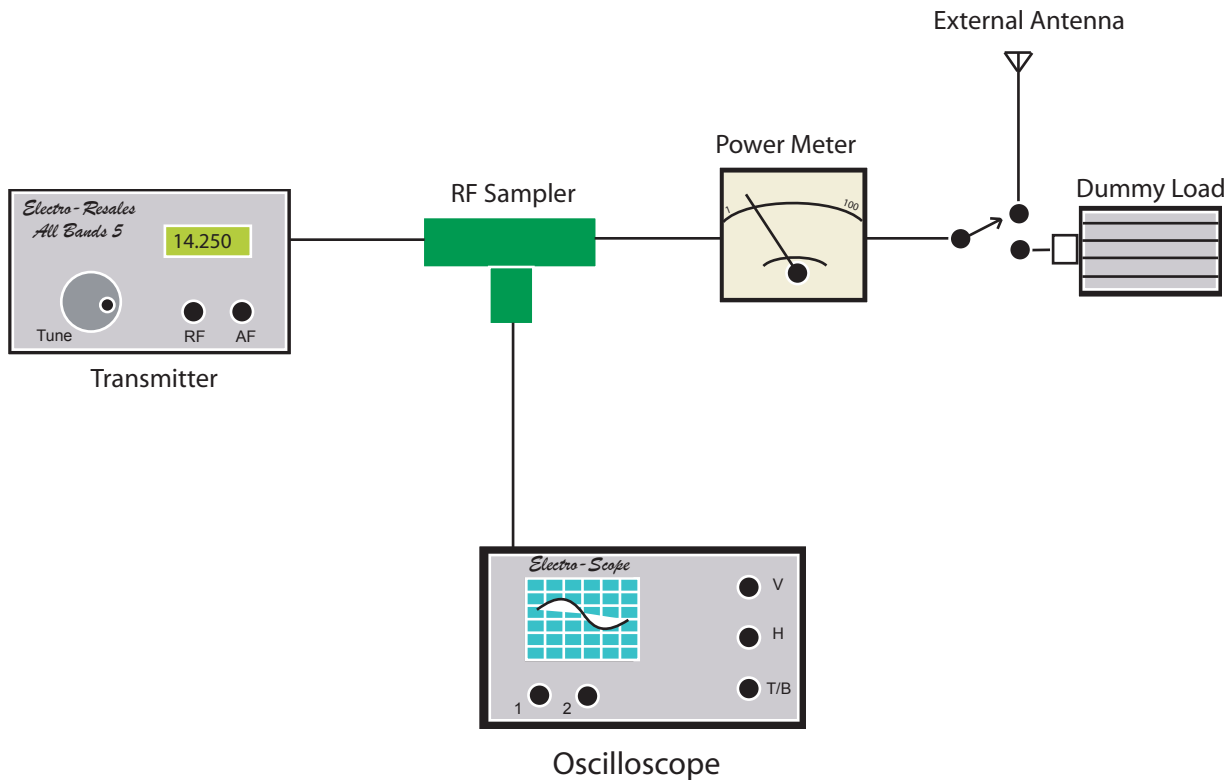
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There is a risk of electric shock, electrocution, burns, or fires that is inherent in the construction and use of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

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How to connect the RF Sampler in the transmit chain

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What does this Sampler do?

This RF Sampler allows the RF signal from a transmitter to be safely connected to a monitoring instrument such as an oscilloscope or spectrum analyser, this allows on or off air monitoring or measurements to be made of the RF signal coming from the transmitter, without the danger of destroying the delicate front end of the instrument.

Using a potential divider and DC blocking capacitor a small amount of the generated RF signal voltage is tapped off of the signal as it passes through the sampler to the in-line power meter, dummy load/antenna.

Tested to 100 Watts in all modes (AM/FM,SSB/CW) the sampler allows accurate, safe and usable signal monitoring or measurement to be made of the transmitted signal.