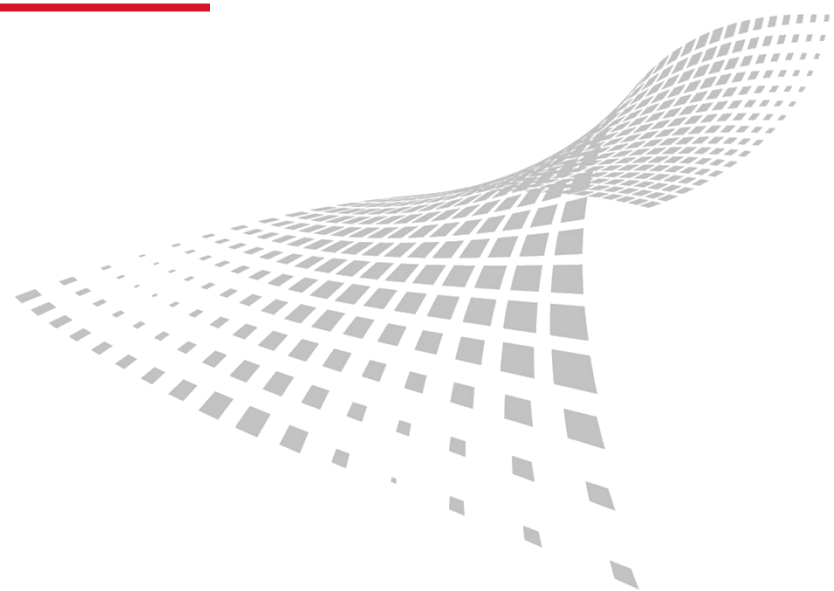
Handheld Spectrum Analyzer

SpecMini

Transcom Instruments



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Content

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Overview of SpecMini

- SpecMini is the first Android hand-held spectrum analyzer.
- It features high testing sensitivity, low weight, compact size and portable design.
- With excellent performance, SpecMini meets the testing and measurement requirements of the majority of RF signals.

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Spectrum Analyzer: Basic

Overview:

-What is spectrum analyzer?

-What measurements do we make?

-How to use spectrum analyzer?

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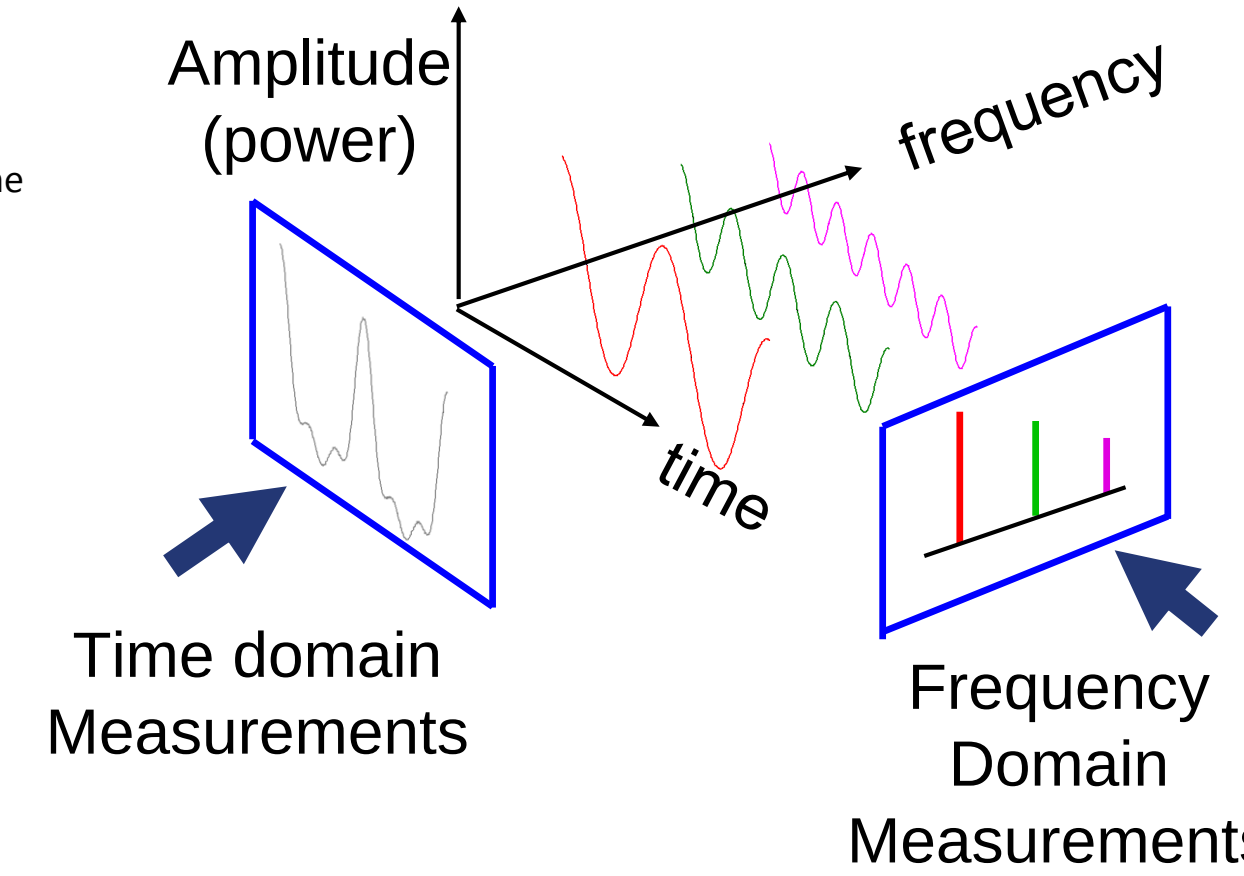
Spectrum Analyzer: Basic

what is Spectrum analyzer:

A measuring instrument designed to graphically present the energy distribution of an electrical signal as a function of frequency

Types of analyzers:

- Real Time Analyzers
- FFT (digital) Analyzers
- Swept-tuned Spectrum Analyzers



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Spectrum Analyzer: Basic

The Spectrum Analyzer is used to measure unknown signals.

What can Spectrum analyzer measurement?

- Off-air signal test
- Interference mitigation
- Harmonics
- Noise
- Broadband
- User definable

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Spectrum Analyzer: Basic

Key Terms in measurement

- Center Frequency, Frequency Span/Start and Stop Frequency
- Reference Level
- Sweep Time
- Resolution Bandwidth
- Markers

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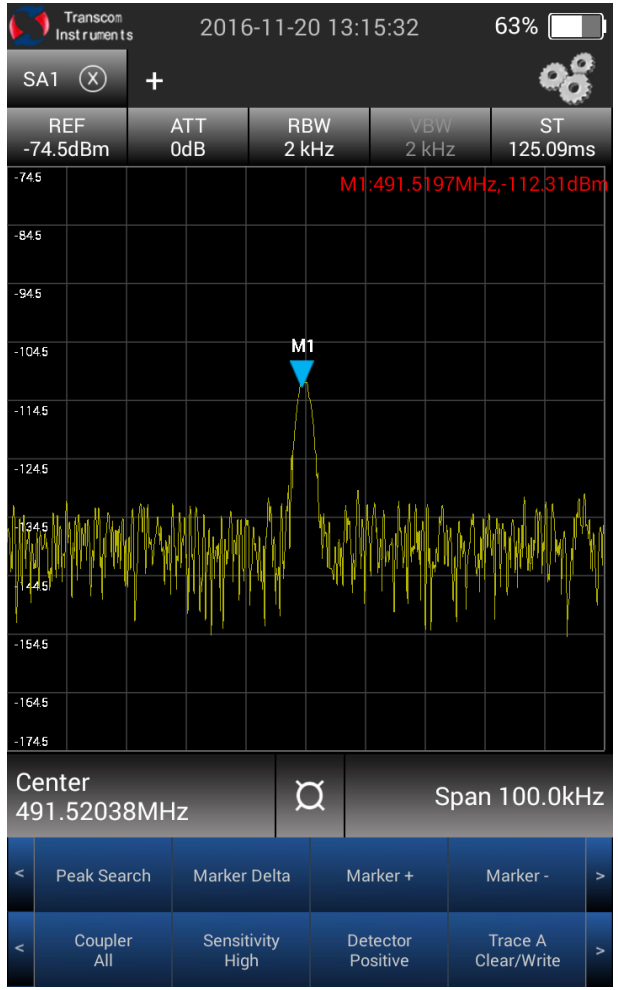
Product Features

- Excellent DANL, suitable for detecting weak signal
- Small size ,light weight.
- Easy to hold with one hand.
- Multi-screen Spectrum – can open 4 screens
- Multi-Traces – support 3 traces
- Android Based Operating System
- Touch Screen



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Comparison

Manufacturer	Transcom，SpecMini T8142	Keysight, N9340B	Rohde & Schwartz, FPH	Anritsu/ MS2712E/ MS2713E
Typical Price	$3980	$8,615	$5220 [2 GHz], $6090 [3 GHz], $6960 [4 GHz]	MS2712E: $8950 | MS2713E: $11,950
Frequency Range	10 MHz - 4.2GHz	100 kHz - 3 GHz	5 kHz - 2 GHz /3 GHz *[opt B3]* /4 GHz *[opt B3 & B4]*	MS2712E: 9 KHz - 4 GHz MS2713E: 9 kHz - 6 GHz
Frequency Reference	± 1 ppm	± 1 ppm	± 1 ppm	± 1.5 ppm < ± 50 ppb + GPS(optional)
Measurements	Occupied Bandwidth, Channel Power, ACPR, Phase Noise	Spectrum Emmission Mask, Field Strength, High Accuracy Power, Channel Power, OBW, ACPR	——	Occupied Bandwidth, Channel Power, ACPR, C/I
Interference Analyzer	Spectrogram, Mapping(optional)	Spectrogram	——	Spectrogram, Signal Strength, RSSI, Mapping
DANL	< –168 dBm @ 1 GHz	–144 dBm @ 1 GHz	< –158 dBm @ 1 GHz	–162 dBm in 1 Hz RBW

Comparison

Manufacturer	Transcom，SpecMini T8142	Keysight, N9340B	Rohde & Schwartz, FPH	Anritsu/ MS2712E/ MS2713E
Phase Noise	-96dBc/Hz,@1GHz （10kHz offset ） -118dBc/Hz,@1GHz （1MHz offset)	-89 dBc/Hz @ 1 GHz (30 kHz offset) -119 dBc/Hz @ 1 GHz (1 MHz offset)	–105 dBc (1 Hz) @ 100 kHz offset	–100 dBc/Hz max @ 10 kHz offset at 1 GHz
Size	200mm*99mm*67mm	318mm*207mm*69mm	202mm*294mm*76mm	273mm*199mm*91mm
Weight	1.25kg	3.5kg	2.5 kg	3.45 kg
Operating Time	6 hours	4 hours	8 hours	3 hours
Operation	Touch Screen	Keyboard	Keyboard	Keyboard + Touch Screen

Applications

- Set-up and maintenance of transmission system
- Interference Search
- Software customization

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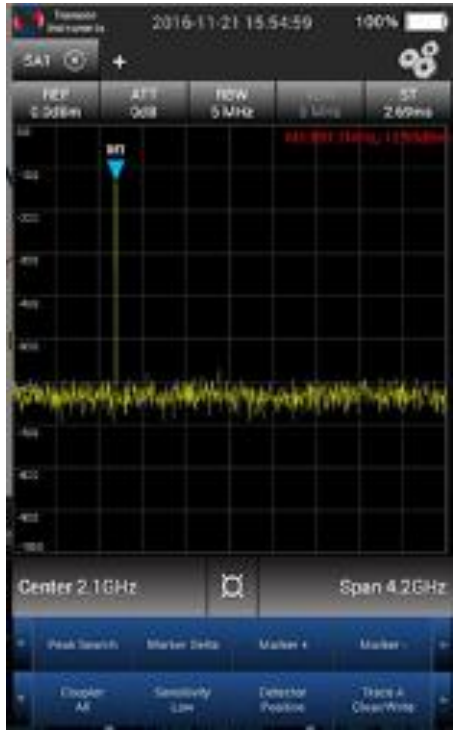
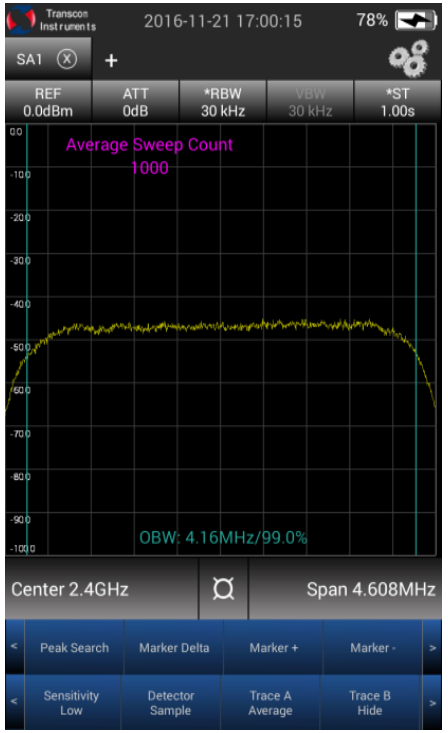
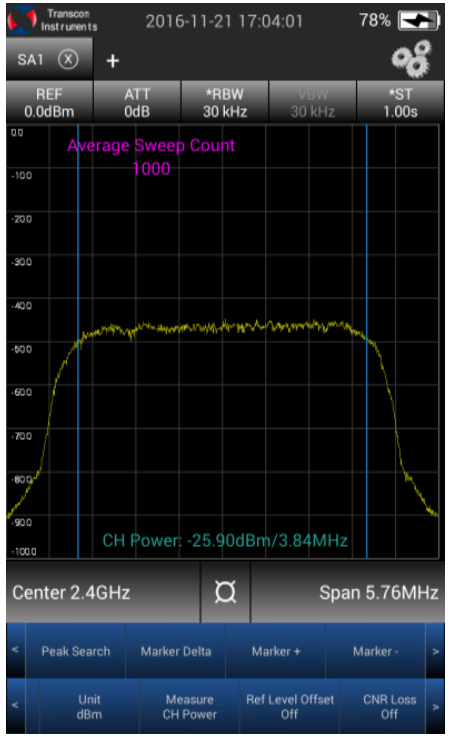
Applications:
Set-up and maintenance of transmission system



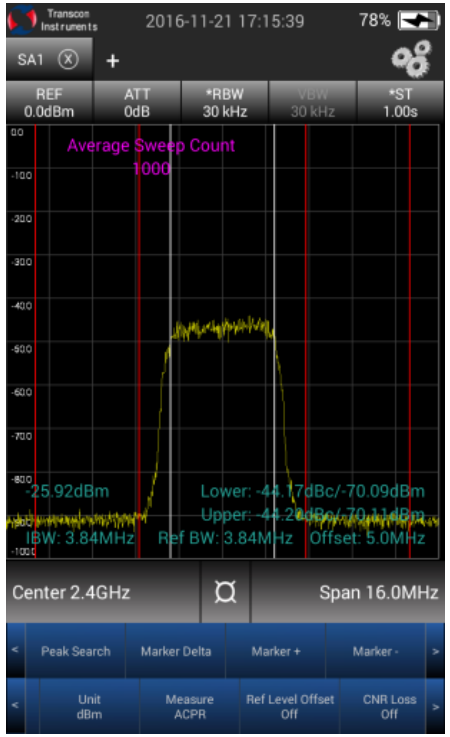
General spectrum test



Occupied bandwidth



Channel Power Measurement

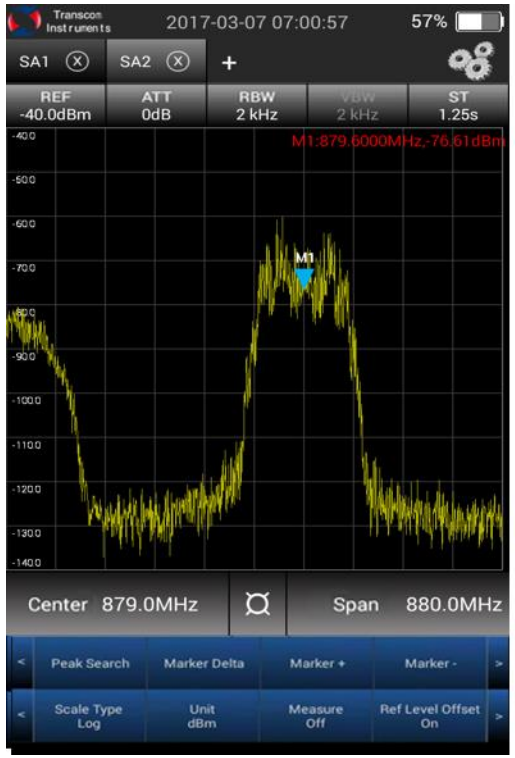


Adjacent channel leakage power ratio measurement

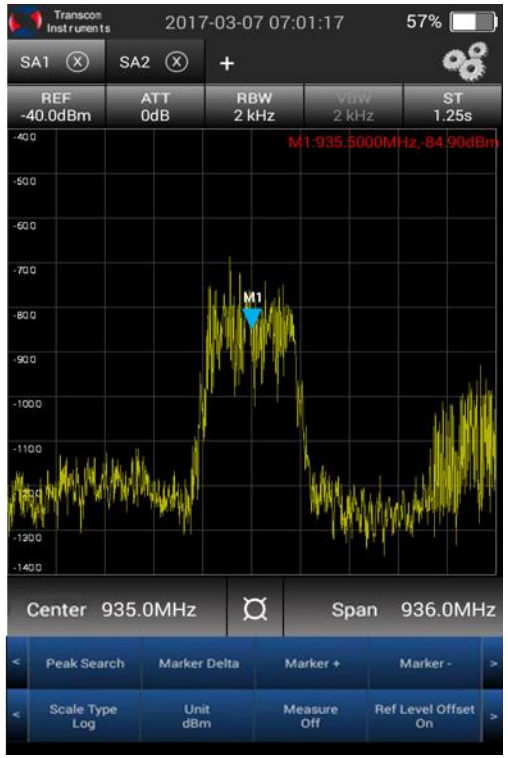
Applications:
Set-up and maintenance of transmission system (case1)

Case 1: NB-IoT Network Coverage Test

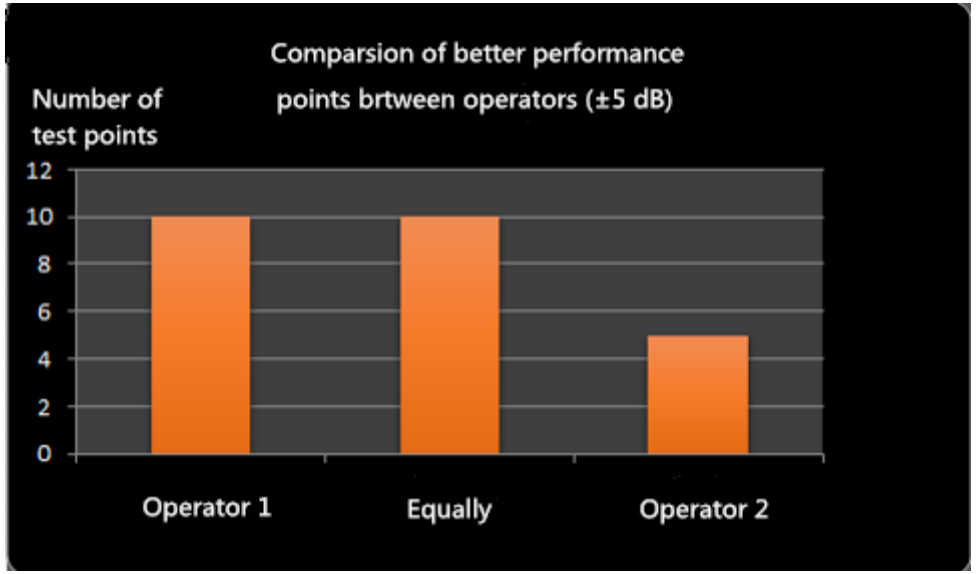
In target area, do network coverage test with SpecMini, compare network coverage results between two operators.



Operator 1



Operator 2



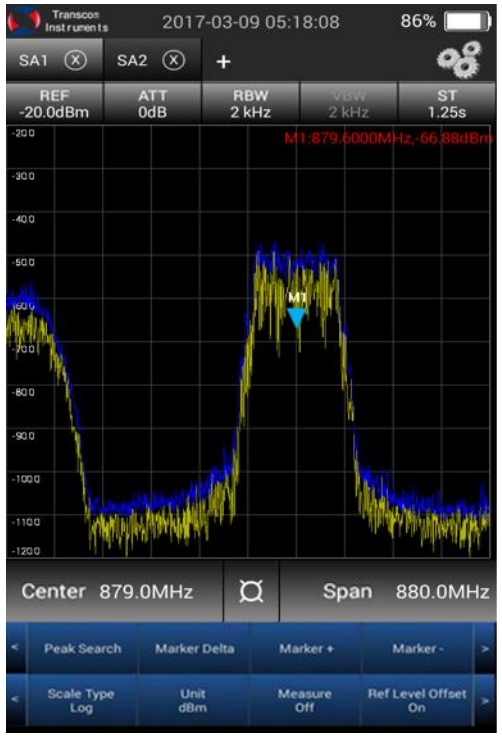
Comparison

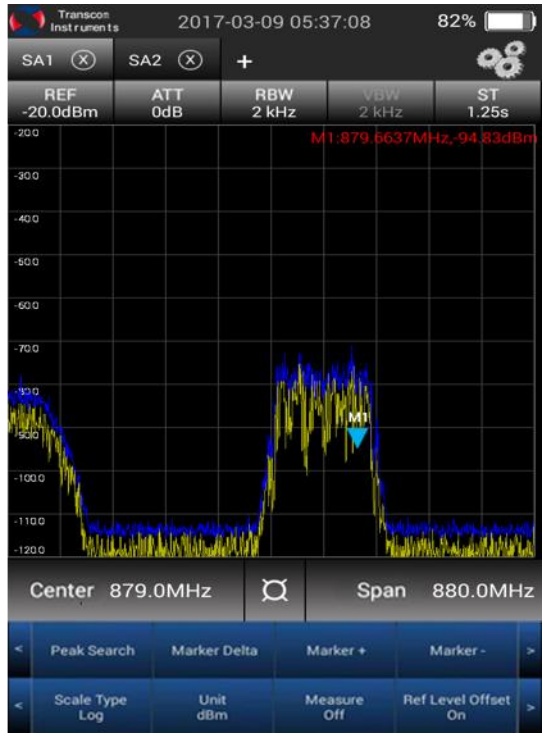
Applications:
Set-up and maintenance of transmission system (case2)

Case 2: Evaluation of signal loss in a pipeline system

Background Information: A wireless sensor is dispatched in the pipeline to monitor water level, and it would send data to sensor dispatched on the ground periodically.

Solution: To get a fully understanding of the actual signal coverage, depth coverage and penetration loss should be taken into consideration. Do test with Specmini inside and outside of the pipeline, collect and analyze the data.





Applications:
Interference Search (case)

In the wireless communication system, the existence of interference signal will result in poor quality of signal transmission. With excellent DANL, SpecMini could detect almost all of interference signals.

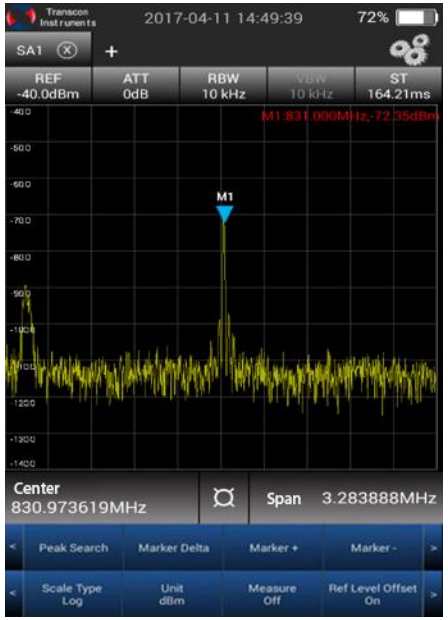
Applications:
Interference Search (case1)

Case1: Uplink interference search

Background Information: Operator (China Telecom) finds that there is uplink interference at 831.03MHz

Process: localize the interference source by using SpecMini and directive antenna.

Results: A illegal antenna amplifier is found.



Applications:
Interference Search (case2)

Case1: GNSS interference analysis

Background Information: A GNSS base station finds that at certain time period, there is plenty of errors in background system, it may suffer from interference signal.

Process: localize the interference source by using SpecMini, directive antenna and navigation antenna.

Results: Downlink channel of a FDD base station interfere the navigation channel.

Applications:
Software customization

Transcom provides SpecMini-based software customizing services.

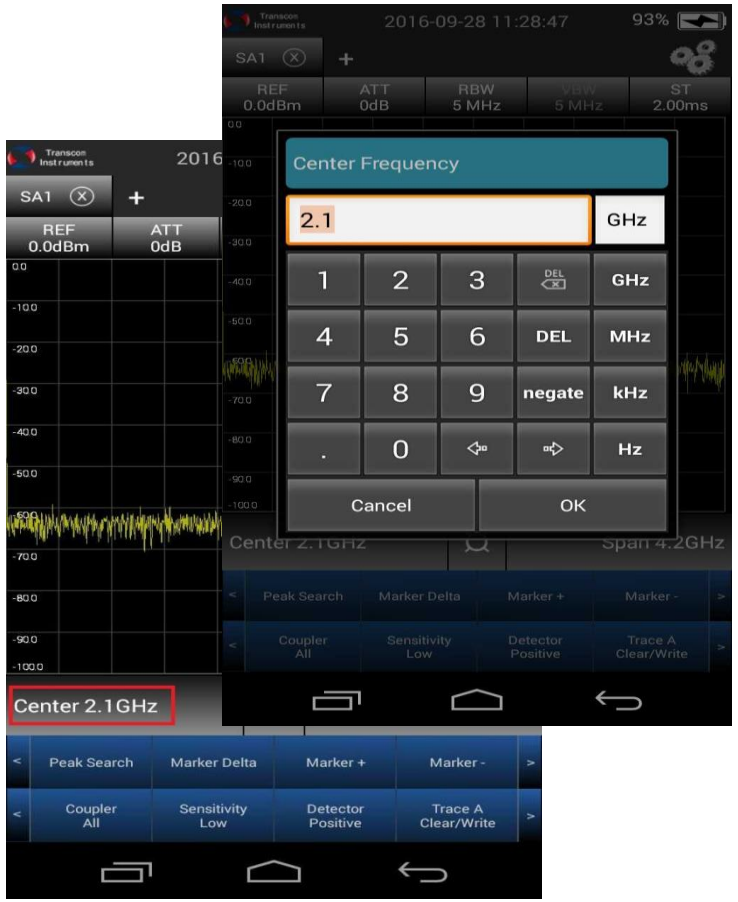
Case: The customized application can analyze GNSS (GPS, Beidou) signal quality through CNR loss and JNR. Spectrum function coordinating with customized application makes traditional testing more converient.

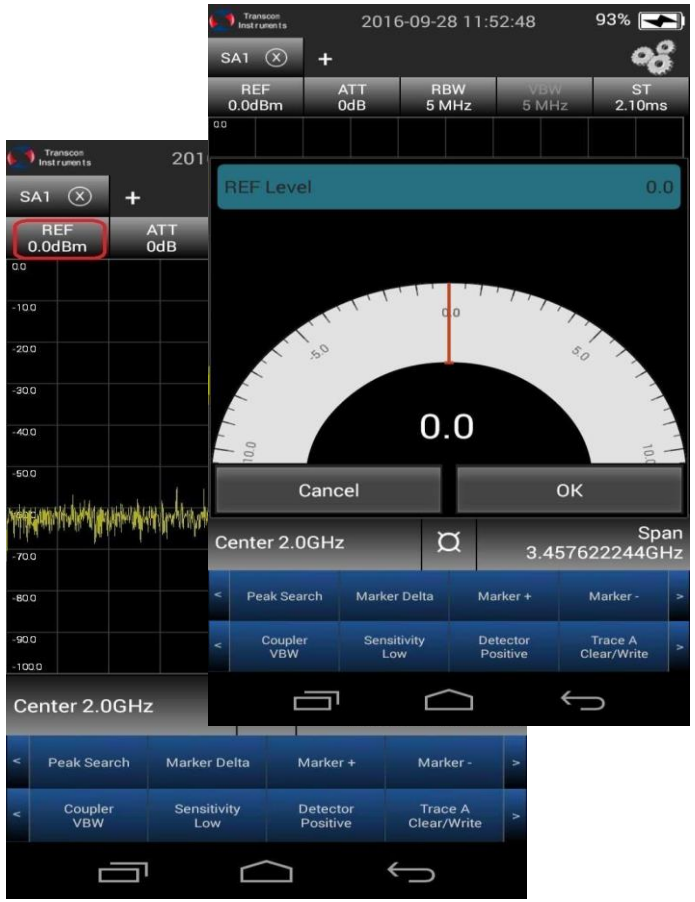
Technical Specifications

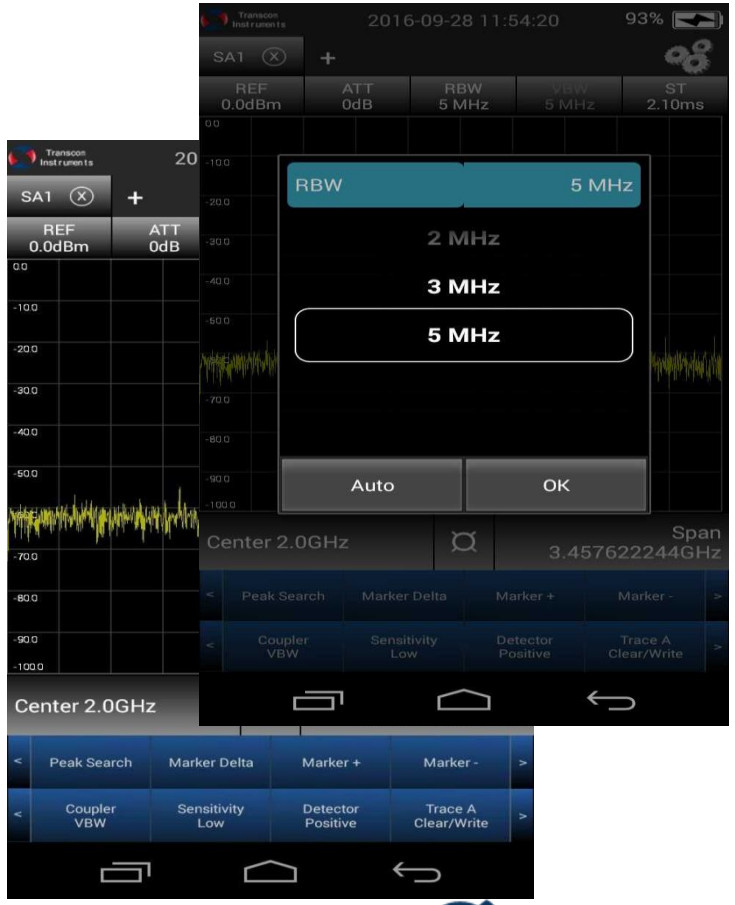
- Frequency range: 10MHz-4200MHz
- DANL: -168 dBm @1GHz (Sensitivity set to High , normalized to 1Hz)
- RBW: 10Hz-5MHz
- Multi-screen: maximum 4 windows
- Android operating system: touch screen operation, multitouch, easy-to-use.
- Compact size (200mm×96mm×67mm) and light weight (1.25kg, including the battery)
- 6 hours full operating time battery

Operating Features: Dialog

Operate the instrument like a smart phone !

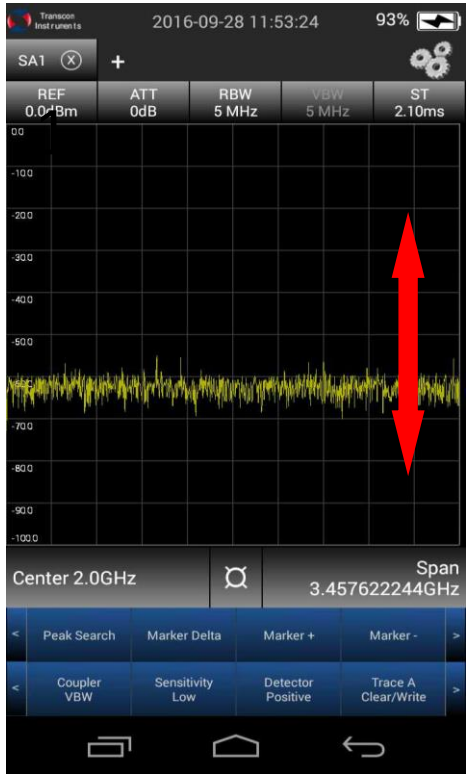




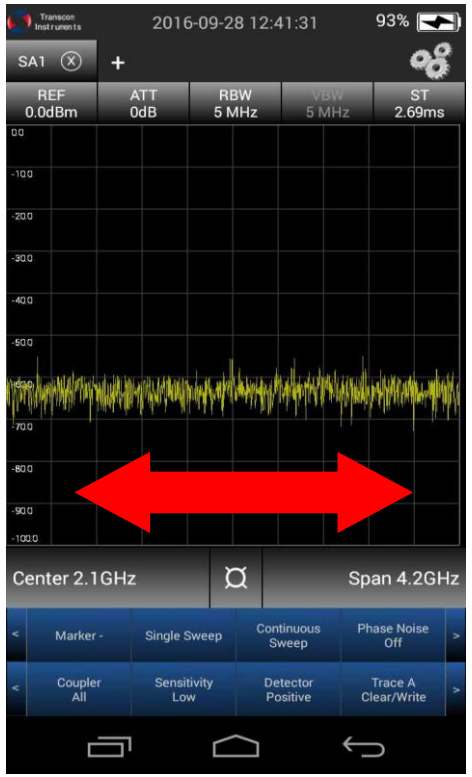


Operating Features: Slide

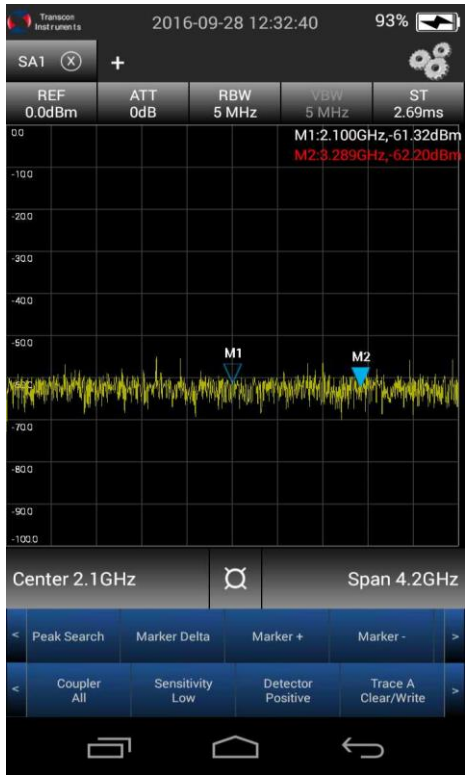
Operation: Sliding and tapping make operation be more user friendly.



- Slide up and down to change Reference Level



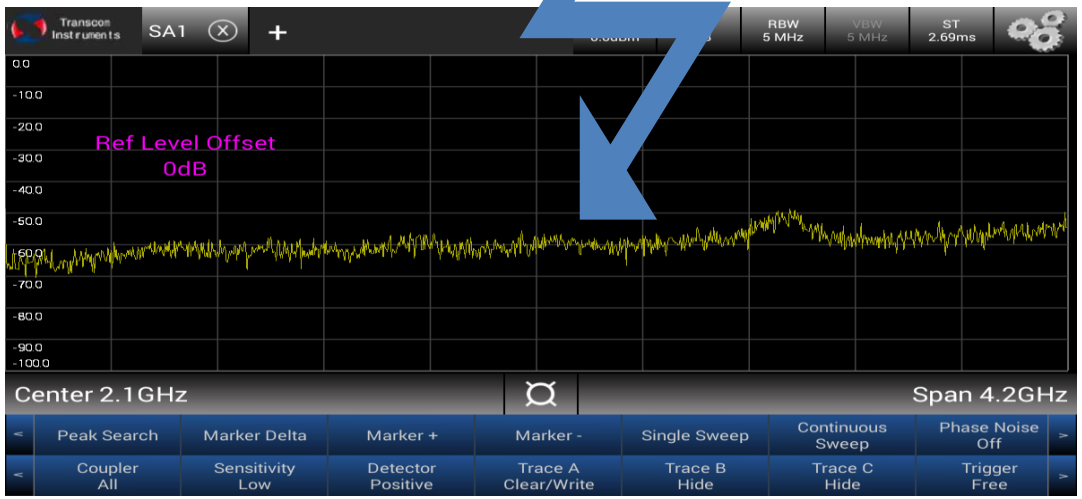
- Slide left and right to change Center Frequency



- Double click to search peak value

Operating Features: Display Mode

Display: Both vertical mode and landscape are available

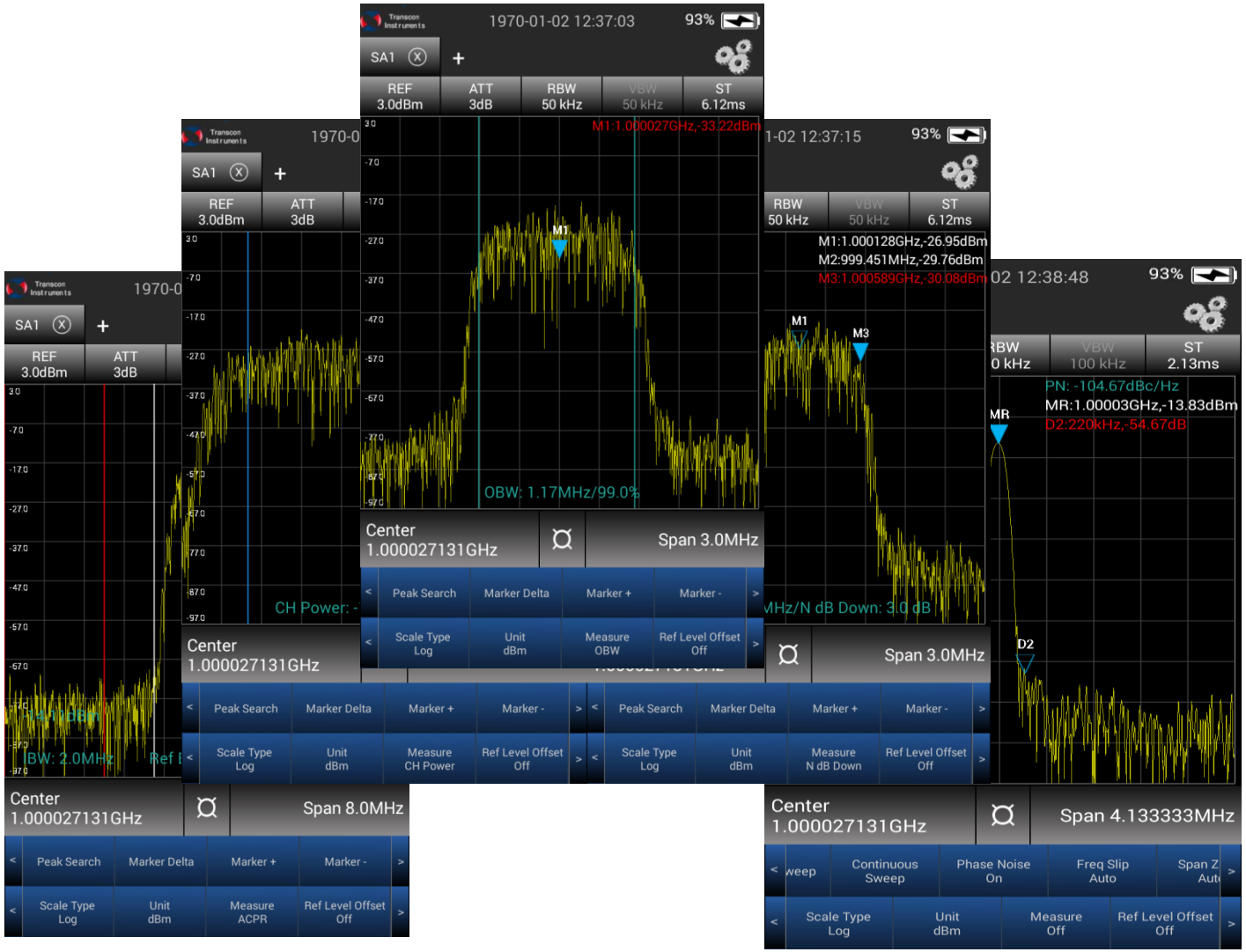


- Vertical mode

- Landscape mode

Operating Features: Easy operation

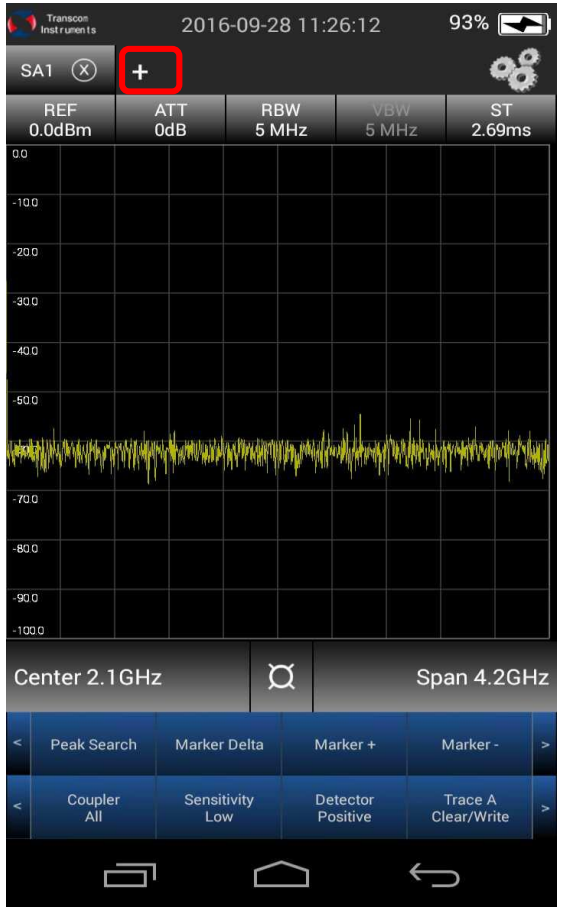
You can get what you want by tapping and sliding

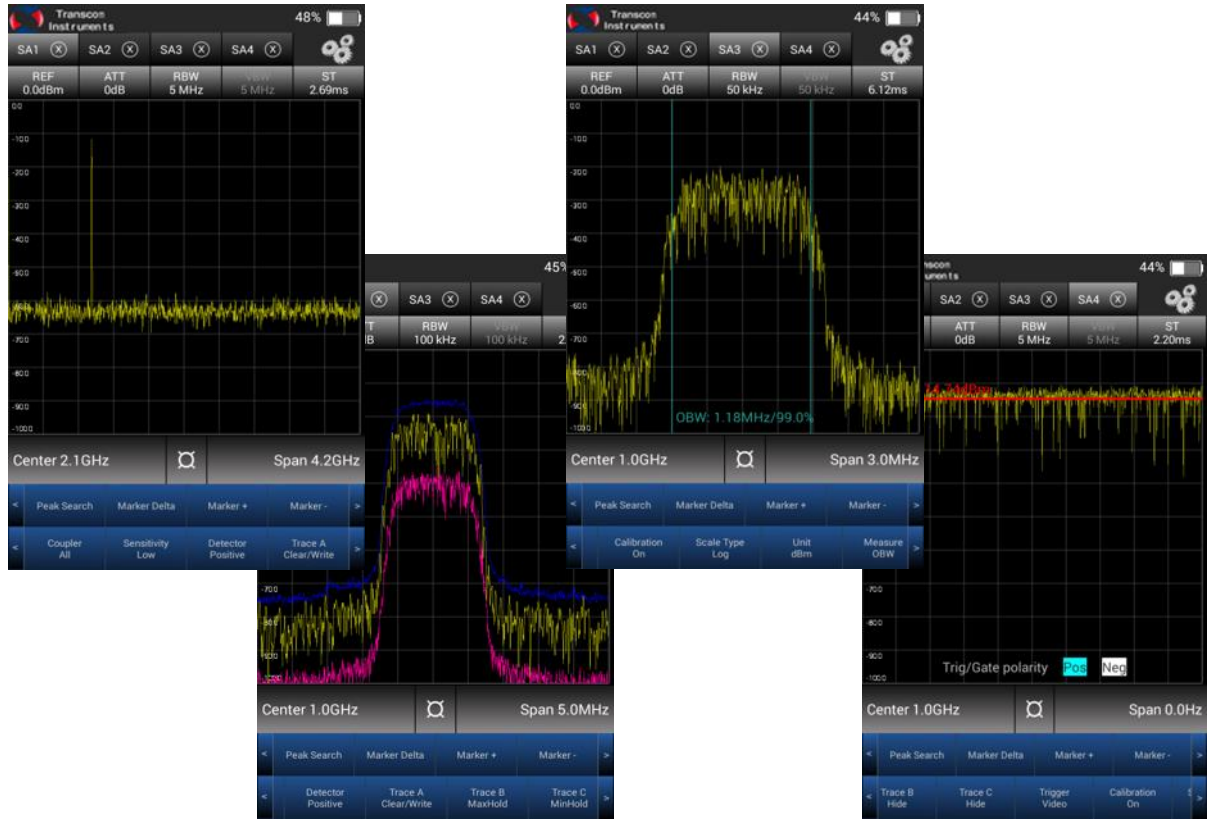


Measurements
ACPR
Channel Power
OBW
N dB Down
Phase noise

Operating Features: Multi-screen

- Multi-screen: maximum 4 windows





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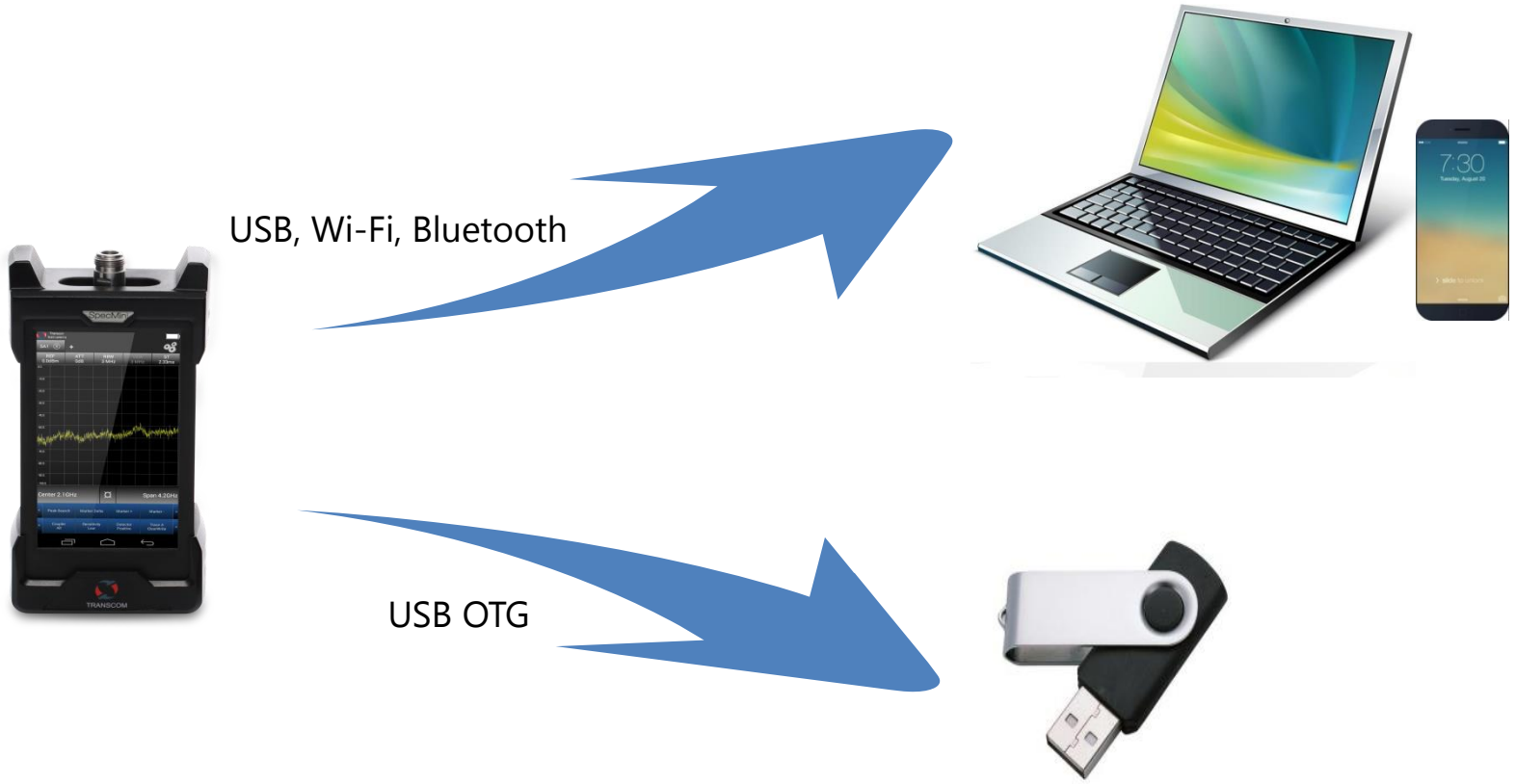
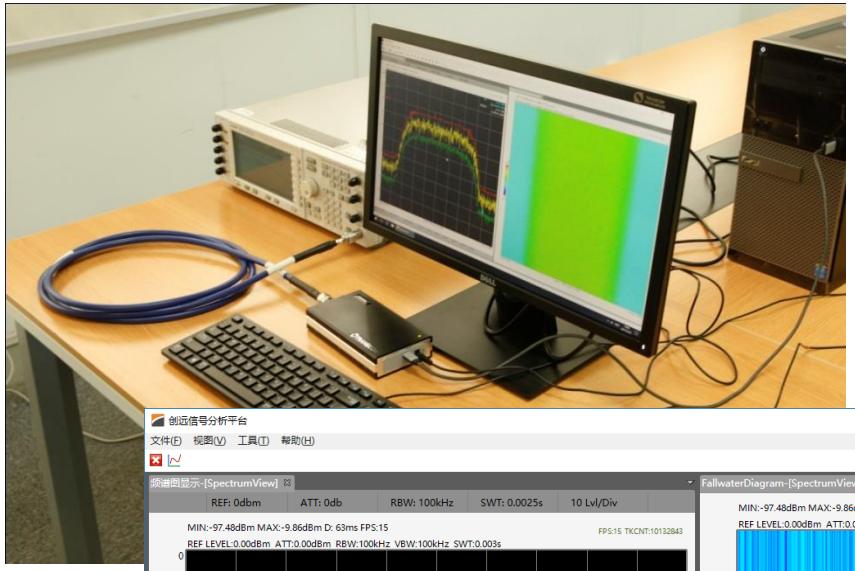
Operating Features: Data sharing

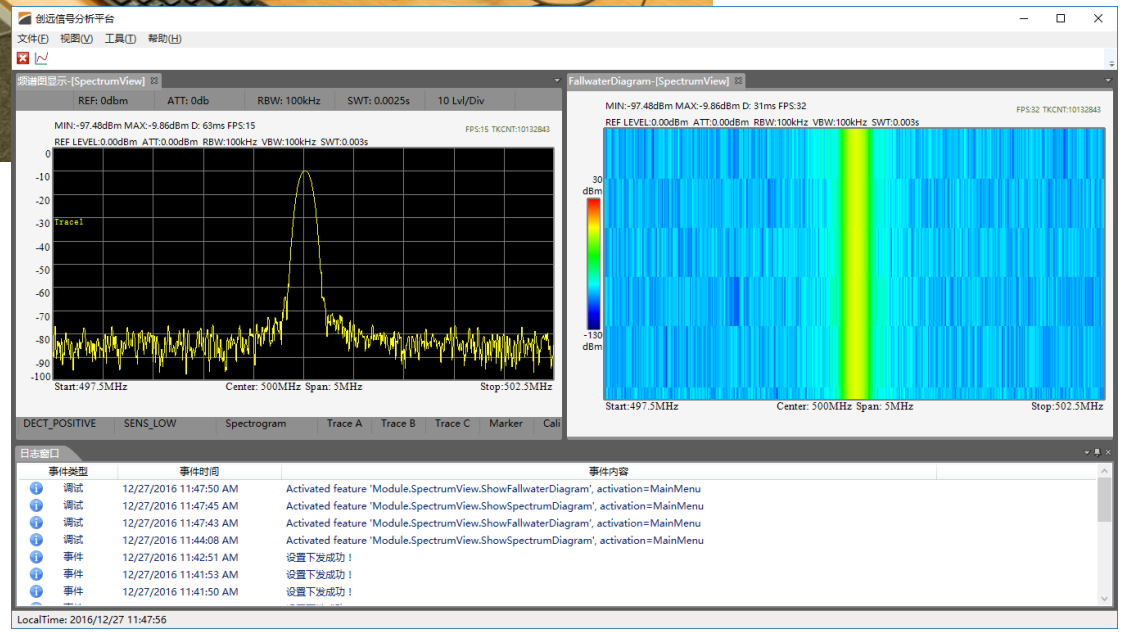
- Wired connection: USB 3.0 typeC, OTG
- Wireless connection: Wi-Fi, Bluetooth



Signal Analyzer Module

Micro-Rx designed with a small shape which allow it to be easily integrate to any instrument. With excellent testing performance and measurement sensitiveness, Micro-Rx suits the testing requirement of the majority of RF signals. Micro- Rx satisfy the needs of general spectrum test, and further secondary development is also allowed based on the API function library.





Signal Analyzer Module

- Frequency range: 10MHz-4200MHz
- DANL: -168 dBm @1GHz (Sensitivity set to High , normalized to 1Hz)
- RBW: 10Hz-5MHz
- Signal storage depth of 1Gbit for signal capture and analysis
- Small (193mm * 93mm * 34mm), light weight (only 0.8kg), and easy to carry.
- Provide API function library to support secondary development.

Preparing Today for 5G of Tomorrow

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