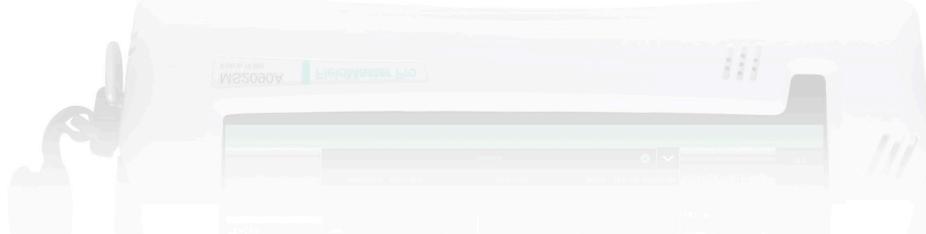


Field Master Pro™ MS2090A

High-Performance RF Spectrum Analyzer
9 kHz to 9/14/20/26.5/32/43.5/54 GHz



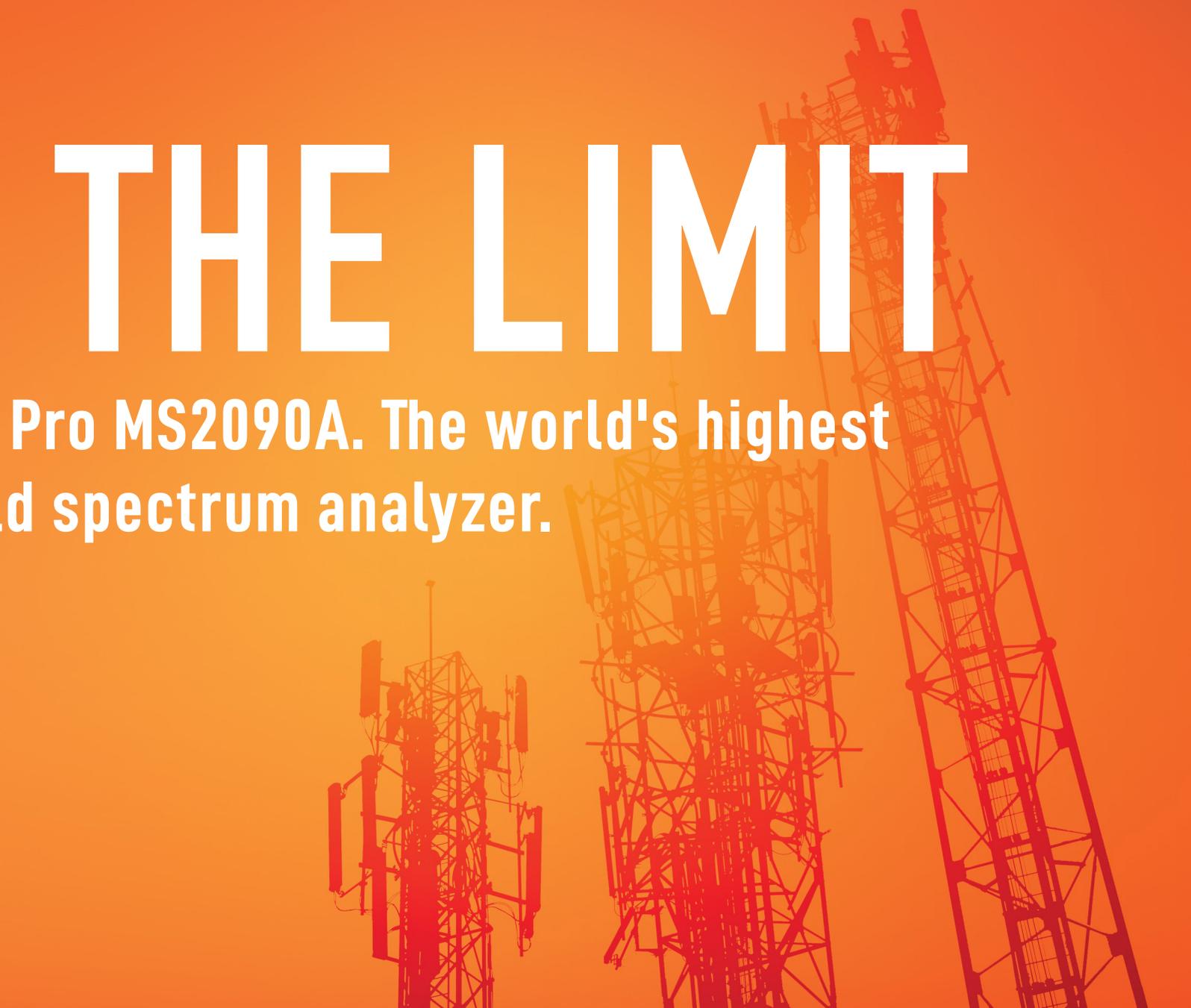
THE SKY'S

Anritsu introduces the Field Master
performance handheld



FieldMaster Pro™ MS2090A

THE LIMIT



Pro MS2090A. The world's highest
and spectrum analyzer.

No limits.

Delivering the highest levels of performance available in a handheld RF spectrum analyzer, the Field Master Pro MS2090A instrument gives field engineers and technicians unparalleled measurement accuracy previously reserved for only benchtop instruments.

No gaps.

The built-in real-time spectrum analyzer (RTSA) provides the ultimate signal analysis and interference capture tool. RTSA spans up to 110 MHz (option dependent) provide capability for cellular interference monitoring to full ISM band signal analysis.

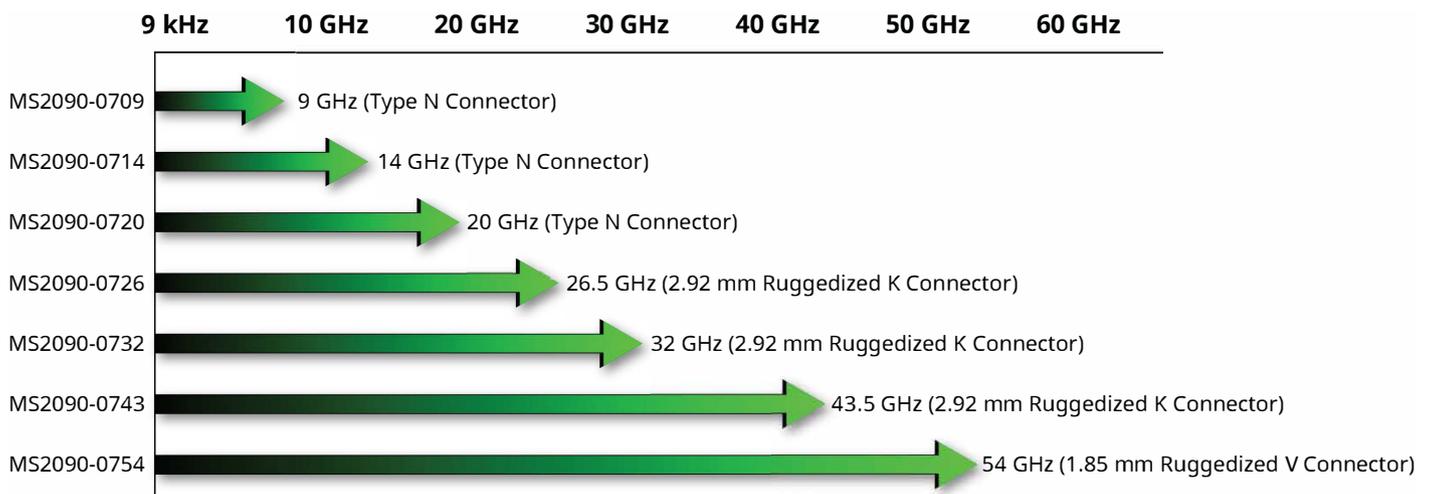
No misses.

Integrated and continuous frequency coverage from 9 kHz to 54 GHz provides the ability to view the RF spectrum and measure all transmissions in order to avoid interference. Unparalleled performance meets the latest 5G test challenges while maintaining support for a full range of wireless technologies in use today. IQ capture and streaming options for analyzing signals in the greatest detail.

Field Master Pro™ MS2090A

Overview

The Anritsu Field Master Pro MS2090A high-performance handheld RF spectrum analyzer is the culmination of over 60 years of microwave test and measurement equipment development that leverages the very latest technologies to deliver performance and accuracy previously reserved for only benchtop instruments. With continuous frequency coverage from 9 kHz to 9/14/20/26.5/32/43.5/54 GHz, the Field Master Pro MS2090A is leading the way for next-generation test equipment designed to meet the unique needs of technologies used in 5G networks (mmWave frequencies, active antenna systems, beamforming, and dynamic physical layer attributes) while maintaining support for the full range of requirements of today's wireless industries (wireless service providers, broadcasting, regulatory authorities, aerospace/defense, satellite systems, and radar).



As RF technologies continue to become more ingrained in our daily lives, the RF spectrum is becoming more crowded at all frequencies. 5G radios are now being deployed at 28 GHz and 39 GHz in addition to the spectrum demands of sub-6 GHz cellular systems for mobile applications. The use of electronics in the automotive industry is growing rapidly, now with sensors for autonomous driving becoming pervasive in today's vehicles. As we all continue to consume more data and expect faster access even in remote locations, point-to-point radio links are moving higher in frequency and expanding in bandwidth to support these demands. The ability to view the RF spectrum and measure the transmissions from all of these systems is critical in order to avoid interference and guarantee performance. The Field Master Pro MS2090A high-performance RF spectrum analyzer was developed to provide field service engineers and technicians with the unparalleled performance and functionality needed to meet the growing demands of these complex systems – all in a handheld, battery-powered instrument.



Key RF specifications

Parameter	Specification
Frequency range	9 kHz to 9/14/20/26.5/32/43.5/54 GHz
Analysis bandwidth	100 MHz
Demodulation	5G NR demodulation, RF and modulation quality plus SSB signal analysis
TOI	+20 dBm
DANL (with pre amp)	-164 dBm
Amp range	DANL to +30 dBm
Phase noise @ 1 GHz	-110 dBc/Hz @ 100 kHz offset (typical)
RBW/VBW	1 Hz to 10 MHz
Input SWR	1.5
Amplitude accuracy	< 14 GHz ±1.3 dB (±0.5 dB typ)
RTSA bandwidth	22 MHz, 55 MHz, 110 MHz (option dependent)

Key features

Feature	Specification
Display	10.1 inch, 1280 x 800 color touchscreen
Traces	6
Detectors	Peak, RMS/Avg., Negative
Gated sweep	For time gated spectrum measurements
Markers	12, fully featured with table
Limit lines	Complex limit lines with Pass/Fail
IQ	Capture and export of 5G waveforms
Connectivity	802.11
GNSS	GPS & GLONASS
Interfaces	USB 3.0, Ethernet
Battery life	>2 hours (function dependent)

Unmatched RF Performance

The Field Master Pro MS2090A device delivers the highest levels of RF performance available in a handheld, touchscreen spectrum analyzer. With a displayed average noise level (DANL) of -164 dBm and third-order intercept (TOI) of typically +20 dBm, measurements such as spectrum clearing, radio alignment, harmonic, and distortion are even more accurate than previously possible. For modulation measurements on digital systems, 100 MHz modulation bandwidth, coupled with best-in-class phase noise performance, maximizes measurement accuracy, while 0.5 dB typical amplitude accuracy provides confidence when testing transmitter power and spurious emissions.

Feature-Rich Device Enhances Usability

All Field Master Pro MS2090A models offer a comprehensive range of features to speed and simplify measurements.

- In addition to a **full span swept-tuned spectrum analyzer and amplitude**, all versions include a **spectrogram display**. Spectrograms are a view of how the frequency content of a signal changes with time. It is especially useful when monitoring the RF spectrum for intermittent or interfering signals.
- **Integrated Channel Power and Occupied Bandwidth (OBW) measurements** simplify the analysis and characterization of common radio transmissions. Regulatory authorities typically specify limits for transmitters based on these measurements.
- The **built-in Adjacent Channel Power (ACPR) measurement** simplifies the measure of out-of-band transmitter emissions, which is required to speed conformance testing.
- The **built-in RTSA** provides the ultimate signal analysis and interference capture tool. RTSA spans of 22, 55, 110 MHz (option dependent) with 2.05 μ s POI that provides capability for cellular interference monitoring to full ISM band signal analysis.
- **IQ data capture** enables the capture and saving of 5G IQ data for off-line processing on a PC using standard data analysis tools. In the early stages of product testing in field trials, this enables real-world signals to be saved and analyzed, providing true insight into a product's performance.

Rugged Design for Field Use

With years of experience designing instruments for the field, Anritsu knows how durable and robust test equipment needs to be. From cell sites in the extreme cold of the Antarctic to satellite earth stations on desert mountain tops, test instruments need to be ready, whatever the conditions. The ruggedized rubber over-mold case has been hardened to handle the knocks and blows that happen when field technicians are onsite. All connectors are protected from damage by covers or protruding instrument bezels. The large 10.1 inch color touchscreen is a toughened display designed to exceed the Impact Protection IK08 rating and standard, protecting it against 5 joules of impact (the equivalent to the impact of a 1.7 kg mass dropped from 300 mm above the impacted surface). A grab handle is located on the side and large D rings are mounted to attach the supplied shoulder strap when required.

High-Resolution Multi-Touch Screen and Modern User Interface Eases Usability

The Field Master Pro MS2090A spectrum analyzer features menus and user interface developed to meet industry-standard guidelines for touchscreen instruments. Frequently used functions are immediately accessible and touching on-screen values opens up dialog boxes for rapid changes. Menus can be collapsed to maximize the trace display area or detailed trace settings can be displayed on the screen so that complex configurations are easily understood. Support for familiar, multi-touch gestures allows you to swipe and scan across the frequency range or pinch and zoom to quickly view signals of interest. A stylus stored in the carry handle facilitates the use of the screen even when wearing gloves or if you simply prefer a tool to your finger.



Field Master Pro MS2090A features a 10.1 inch multi-touch screen

The 1280 x 800 resolution screen offers excellent brightness with high-contrast color schemes. Switch between the standard color palate for normal use or a black and white high-contrast display for use in direct sunlight.

Applications

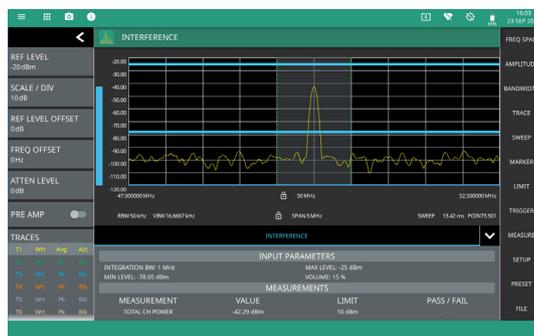
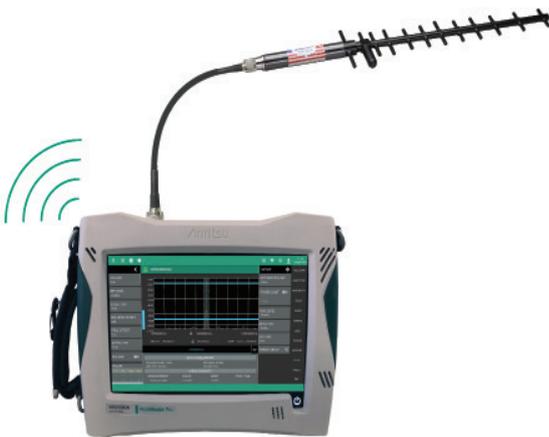
Interference hunting and spectrum clearing

The value of RF spectrum allocations has grown rapidly as cellular and broadcast operators expand their networks. Spectrum usage is changing as older technologies, such as broadcast television or private mobile radio, are moved out of the sub-6 GHz bands and new technologies take their place. Many national regulatory authorities have auctioned and reallocated the spectrum, reassigning the frequency bands for exclusive access. In order to deploy new networks efficiently, the owners of the spectrum must clear the spectrum and validate that all legacy users have stopped all transmission. The Field Master Pro MS2090A meets the requirements for spectrum clearance with its fast sweep speeds, low distortion front-end, and spectrogram display.

Utilizing the Mobile Interference Hunting MX280007A software and an omnidirectional antenna, all signals are captured across a defined frequency band. A built-in preamplifier optimizes the sensitivity of the Field Master Pro MS2090A instrument so that low-level signals are captured. To isolate and locate illegal or intermittent interferers, the Field Master Pro MS2090A spectrum analyzer has a range of features.

- Interference Finder Option 24 enables a smooth, fast audio response to changes in signal power
- Interfaces with the Mobile Interference Hunting MX280007A software for a fully integrated solution
- Up to 6 traces can be individually configured to display max or min hold
- Spectrogram displays facilitate the long-term monitoring of the spectrum so that intermittent signals are captured and stored
- Power spectral density mode in the RTSA enables the identification of interfering signals that are located at the same frequency as the wanted signal but lower in power

Selecting a directional antenna, such as one of the Anritsu Yagi antennas, the fast sweep rate of the Field Master Pro MS2090A unit provides a clear picture of RF activity across a wide frequency range and at low power levels.



Interference Finder Option 24 provides fast audio tone response to changing interference levels

Field Strength and Power Flux Density Measurements

Cross border interference between cellular networks has become a significant issue at many international borders. Regulatory authorities often require a measurement of field strength or Power Flux Density (PFD) from the operator before they will initiate any compliance enforcement with the interfering party.

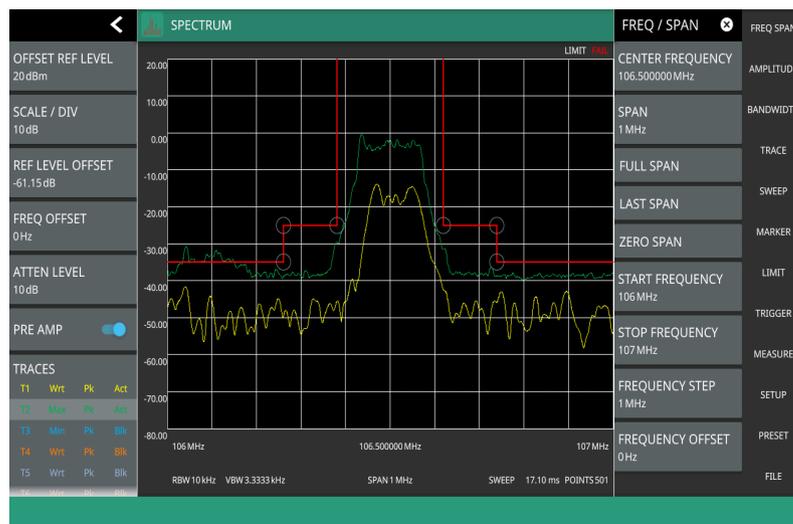
The MS2090A's interference finding features can also be used with field strength and power flux density measurements to check test power levels and create reports required by regulatory authorities for reporting possible power violations. With the field strength setting, users can apply antenna factors either from Anritsu's broad list of tested antennas or from a custom file, giving amplitude results in dBm/m². Those same factors can be applied to any measurement, including the channel power measurement where the user can then read out the power flux density in units of dBm/m²/MHz.



Broadcast Transmitter Analysis



RF transmitters need to be tested at the time of installation and then at regular intervals to confirm they conform to regulatory requirements. The Field Master Pro MS2090A RF spectrum analyzer is ideal for a comprehensive range of transmitter measurements. Harmonic and spurious tests are required to ensure that the transmitter does not interfere with other users of the RF spectrum. These tests can be performed by connecting a cable directly to a test port or over the air (OTA) using an accessory antenna. Built-in measurement routines for occupied bandwidth, channel power, and adjacent channel power speed and simplify additional regulatory measurements. The Field Master Pro MS2090A instrument also has excellent TOI performance and distortion-free dynamic range, ensuring accurate harmonic and spurious measurements to 54 GHz (option dependent).



Microwave Radio Links

Microwave radio links have become central building block of cellular and data networks. Installation crews need to align the radios over distances from a few tens of meters to several kilometers. The Field Master Pro MS2090A spectrum analyzer has frequency options to 54 GHz with exceptional sensitivity for dish alignment. Using a waveguide horn antenna, the power and modulation bandwidth can be verified at installation and during maintenance testing.



Pulse Radar Measurements

The wide bandwidth of the MS2090A enables detailed analysis of pulsed radar signals. In zero span the default bandwidth is 40 MHz and the minimum sweep time is 60 ns, and pulse rise time measurements as short as 20 ns are possible. Up to 12 markers can be positioned on the traces to simplify pulse repetition, pulse width and rise time measurements. In zero span a fixed frequency IF output option is also available to interface with external analysis tools.

Satellite System Monitoring

The United Nations Office for Outer Space Affairs estimates there are close to 2,000 active satellites orbiting the earth. Each of these communicates with the ground through dedicated earth stations. Common frequencies for satellite communications have been in the 2 to 4 GHz bands and 4 to 8 GHz bands. Now new bands are opening up in the 12 to 18 GHz and 26 to 40 GHz bands, and even 36 to 50 GHz. As the number of satellites increases the opportunity for interference between all the communications increases. The Field Master Pro MS2090A is ideal for monitoring downlink signals to search for interference and noise.



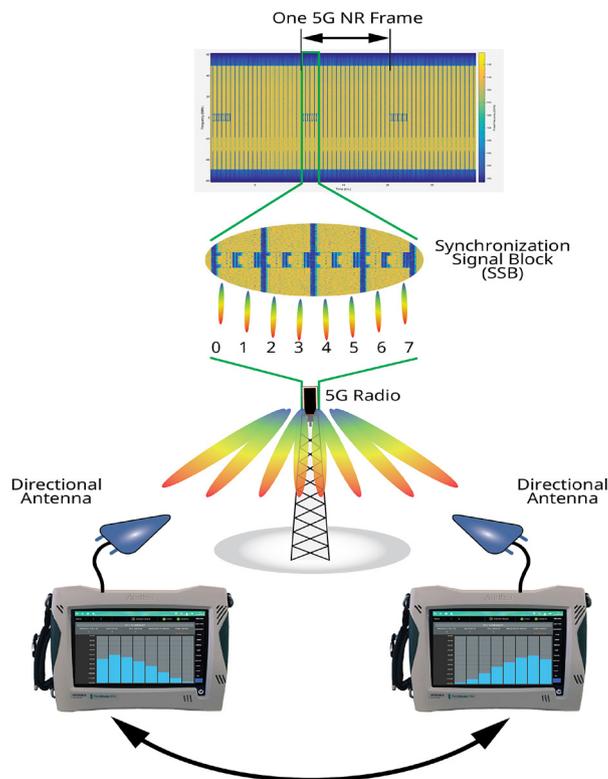
Option 888 5G NR Base Station Measurements

The rapid introduction of 5G NR networks requires an instrument that can validate the performance of the gNB base stations quickly in a field environment. In both the 3.5 GHz bands and the millimeter-wave (mmWave) 28 GHz and 39 GHz bands, the adoption of active antenna systems means that new test methods need to be considered. Some radios may have test monitor ports integrated, but many operators will make gNB transmitter measurements over-the-air (OTA).

The Field Master Pro MS2090A high-performance spectrum analyzer performs the essential measurements in full compliance with the 3GPP TS 38.104 V15. Measurements supported include:

- Frequency Error
- Time Offset
- Cell/Sector ID
- Modulation Quality (EVM)
- Unwanted Emissions
- Occupied Bandwidth
- Adjacent Channel Leakage Ratio
- Transmitter Spurious to 12.75 GHz
- EIRP
- SS-RSRP, SS-RSRQ, SS-SINR

A key part of 5G NR signals is the synchronization signal block (SSB). Decoding the SSB can reveal the important cell characteristics, like cell ID, frequency error, and beam powers. Making measurements on the SSB allows transmitter testing on a live gNB. As well as displaying beam ID, the RSRP is graphed for each of the beams in the SSB. In order to properly decode the signal, the user must know center frequency, bandwidth, and subcarrier spacing of the signal under test. This can be entered manually or by using a 3GPP defined band and ARFCN. It is also critical to know the the frequency position of the SSB relative to the center frequency of the signal. This can also be entered manually as an offset from center or by entering the GSCN. In cases where the SSB location is unknown, the MS2090A has an Auto SSB Detect feature that searches the 3GPP defined raster of potential SSB positions to find it automatically.

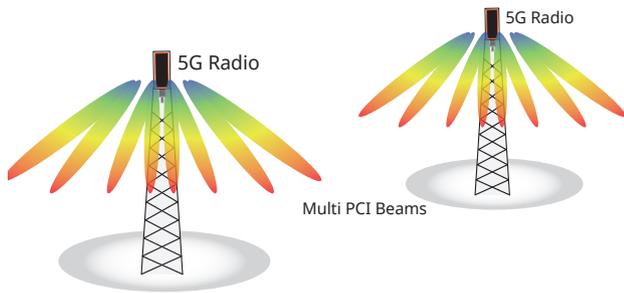


Field Master Pro MS2090A displays RSRP vs beam index based on OTA analysis of the 5G NR SSB

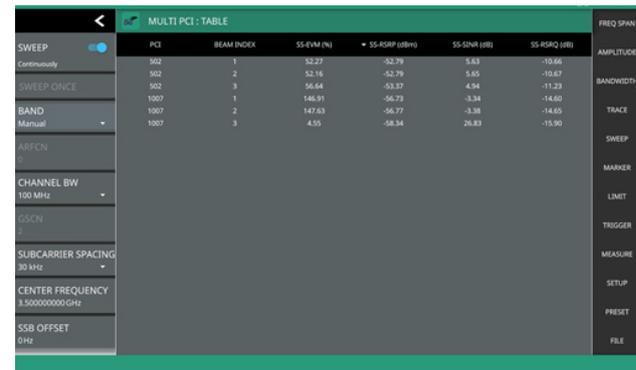
Field Master Pro™ MS2090A

Where direct access to an RF test connector is not possible, 5G NR installation testing must be performed over the air with a directional antenna or waveguide horn antenna. Because the SSB is always transmitted, the easiest way to test an active gNB is to make measurements on these elements. The Field Master Pro MS2090A decodes all active beams in the signal, typically 8 beams for radios in the 3 to 6 GHz bands, and 12 to 64 beams in the mm wave bands around 28 GHz and 39 GHz. A measurement summary screen displays all the essential results to validate base station performance.

In cases where multiple cells are present, it may be helpful to use an omnidirectional antenna to measure the relative power of the different cells and track handover points where the power of two cells is close to equal. The MS2090A offers a Multi PCI measurement which utilizes advanced software processing to detect all active beams in a given location. The PCI, RSRP, SINR, and EVM of each beam is returned and can then be displayed as an RSRP histogram to monitor relative power, or as a table to summarize all results.

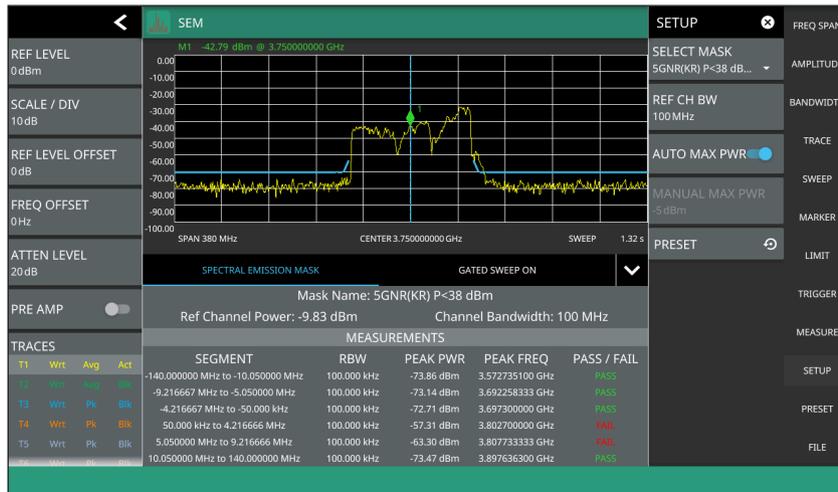


MS2090A Field Master Pro



MS2090A offers Multi PCI measurements for OTA testing of one or more 5G NR gNB

A range of 3GPP-compliant spectrum measurements are supported. To measure gNB transmit power, the Field Master Pro MS2090A instrument includes EIRP and channel power measurements. Both are made OTA using a waveguide horn or broadband antenna to receive the signal. In cases where the gNB can be put into test modes and test model waveforms transmitted, a gated sweep feature enables measurements to be made on defined symbols in the 5G frame. Occupied bandwidth (OBW), adjacent channel power (ACP), and spectral emission mask (SEM) measurements have pre-configured setups to speed testing.



OTA SEM measurement on a 5G NR transmission with pass/fail results

The MS2090A is designed to support EIRP measurements according to 3GPP definition. Section 6 of TS 38.141-2 provides specific definitions and instructions for measuring radiated transmit power. By utilizing a dual polarized directional antenna, users can save the EIRP from each pole and the MS2090A software will sum them to provide a total EIRP, which equates to the total radiated power of the radio.



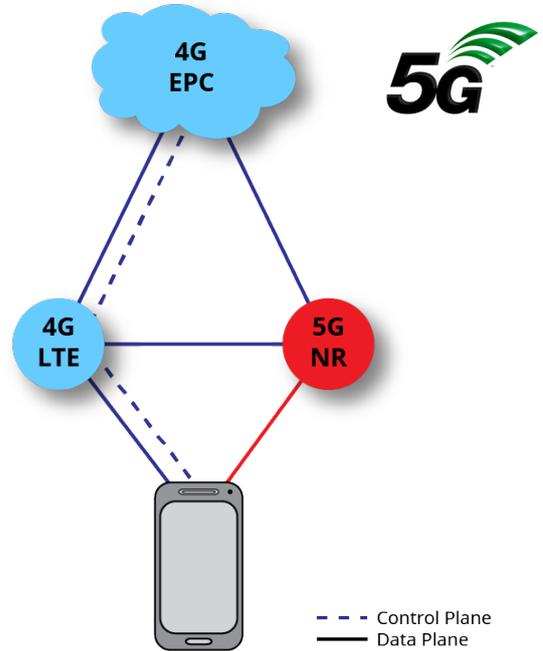
The EIRP results 'Quick View' screen provides a graphical display of measurement configuration and total EIRP power

Option 883 LTE Base Station Analyzer

The MS2090A features several measurements for LTE FDD radios. The goal of these measurements is to help maximize data rate and capacity with accurate power settings, ensuring low out-of-channel emissions, and good signal quality. These attributes help to create a low dropped call rate, a low blocked call rate, and a good customer experience. LTE sites also play a critical role in most early 5G deployments, acting as the anchor to 5G communications. Cell site technicians or RF engineers can make measurements Over-the-Air (OTA) to spot-check a transmitter's coverage and signal quality without taking the cell site off-line. When the OTA test results are ambiguous one can directly connect to the base station to check the signal quality and transmitter power.

The MS2090A offers the following LTE measurements:

- Cell ID, Sector ID, Cell Group
- Frequency error
- Time offset
- PBCH, RS and SS power
 - PBCH
 - PDSCH (QPSK, 16QAM, 64QAM, 256QAM)
- MIMO antenna power and time alignment error (TAE)
- Channel power
- Occupied bandwidth
- ACLR and spectral emissions masks



The screenshot shows the 'DEMOD SUMMARY' screen. It includes a 'MIMO ANTENNAS' section with three antennas, a 'SWEEP' section with 'Continuously' selected, and a 'CHANNEL BW' of 10 MHz. The 'CENTER FREQUENCY' is 751 MHz. The 'FREQ REFERENCE' is GPS Hi Accy. The 'PCF SUMMARY' table shows the following data:

PHYSICAL CELL ID	SECTOR ID	CELL GROUP	FREQUENCY ERROR	TIME OFFSET	CYCLIC PREFIX	STATUS
216	0	72	-29 Hz -0.038 ppm	3.52 µs 12% Hi Accy	Auto Detected	Normal

The 'POWER' section shows the following values:

Channel	Power (dBm)
PBCH	-84.43
SS	-88.35
RS	-87.52
RS (0)	-87.64
RS (1)	---
RS (2)	---
RS (3)	---

The 'EVM' section shows the following values:

MEASUREMENT	AVG EVM	PEAK EVM
PBCH (QPSK)	87.79 %	160.15 %
PDSCH (QPSK)	---	---
PDSCH (16 QAM)	34.85 %	134.53 %
PDSCH (64 QAM)	26.45 %	243.02 %
PDSCH (256 QAM)	17.65 %	335.38 %

LTE results summary display

Vision Monitor Software - Option 400 and 407

Vision Monitor software offers a range of applications for monitoring the RF spectrum over a period of time and storing results to a data base. Vision Monitor is an ideal tool for long term interference monitoring. Limits can be set with automated alarms for limit violations to capture short term or intermittent signals. Other features include a scanner option that enables the monitoring of a range of frequency bands or channels over time, with unique settings for each channel being monitored. A multi-trace view shows the spectrum for all channels being monitored on the same display.

The Vision Monitor application is fully automated. Measurements can be captured and periodically uploaded to a database for further processing. Depending on need and storage capacity, users can store spectrum history over many months or years with a user defined capture interval.

All spectrum measurement databases are searchable, allowing the user to quickly locate patterns of signal activity relevant to an investigation. The spectrum history can also potentially be used in legal proceedings for documenting illegal or unlicensed broadcast activity. Other functions provided by Vision Monitor include the following:

- Threshold and trace mask settings for alarm generation
- Reporting on spectrum integrity on a daily or weekly basis
- Email alerts

Vision™ runs on a PC/laptop using the Windows operating system (Windows 7/8/10).

MS2090A Use with Mobile Interference Hunter (MIH) — MX280007A

Anritsu's Mobile Interference Hunter MX280007A is a quick and reliable way to find single or multiple sources of interference that are degrading the performance of an RF communications network. MIH can distinguish between multiple signal sources, reflections, RF shadows, drifting signals, bursty signals, and multi-path transmitters making it a cost effective solution for a wide range of interferences.

Interference hunting is achieved by applying proprietary algorithms to channel power data captured with geolocation positioning information during an area drive in a vehicle.

When used with MS2090A, MIH provides interference hunting and spectrum clearing capability from 9 kHz to 54 GHz. The Mobile Interference Hunter is a quick, reliable, and multi-emitter enabled solution to interference hunting and spectrum clearing needs.

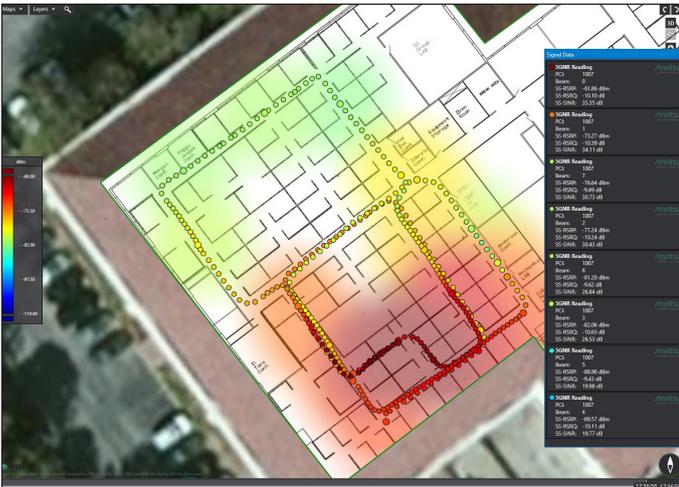


5G Coverage Mapping

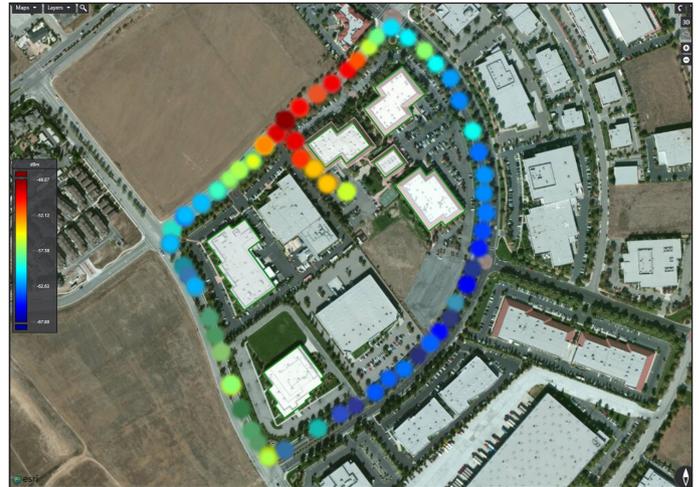
Coverage mapping provides a clear representation of the signal strength of 5G transmitters over intended geographic area. The Field Master Pro MS2090A spectrum analyzer is configured to continuously measure RF data including 5G channel power, EIRP, or RSRP. When used with the NEON® MA8100A Signal Mapper, the results are graphically displayed on a digital map or building floor plan. The NEON MA8100A supports outdoor coverage mapping using GPS coordinates taken from the Field Master Pro MS2090A instrument's built-in GNSS receiver and indoor coverage mapping using the NEON Tracking Unit.

The NEON MA8100A solution consists of a NEON Tracking Unit, NEON Signal Mapper Software for Android devices, and NEON Command Software for a PC. For indoor coverage mapping, the NEON Tracking Unit supports the collection and processing of sensor data that delivers 3D location information. The NEON Tracking Unit connects to the NEON Signal Mapper application that is run on an Android device. The NEON Signal Mapper application provides an intuitive Android user interface, enabling lightly trained users to map RF signals within buildings. RF data is captured by Field Master Pro MS2090A unit and the data is sent to the Android device. For outdoor coverage mapping applications, the Field Master Pro MS2090A instrument provides both location and RF data directly to the Android device. When in 5G demod mode, for each data point the application shows which SSB beam was recording the highest signal level.

12 markers facilitate the rapid identification and analysis of all signals on the screen. Delta and fixed The combined spectrum and spectrogram display shows activity over time in a given spectrum band. In dynamic environments, such as the 2.4 GHz ISM band, and WiFi activity can be recorded over time to assess the spectral occupancy. Six cursers positioned in the spectrogram time domain define the active spectrum traces.



Typical result screen for indoor coverage mapping

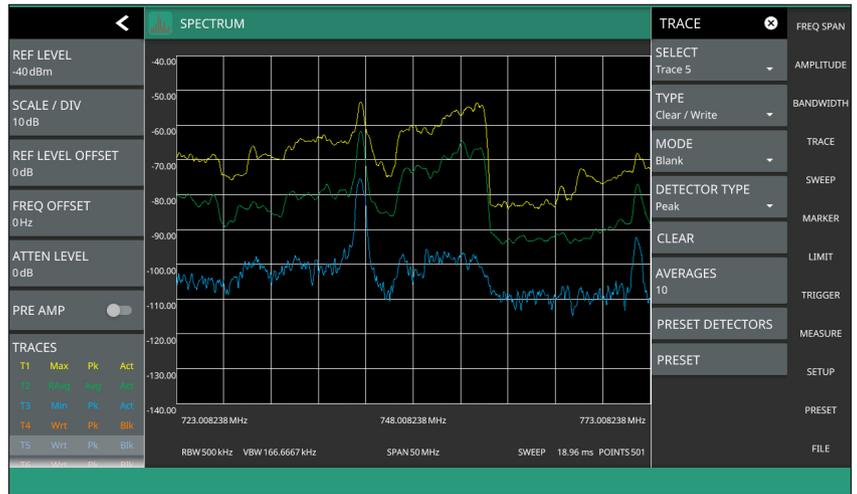


Typical result screen for outdoor coverage mapping

Key Features

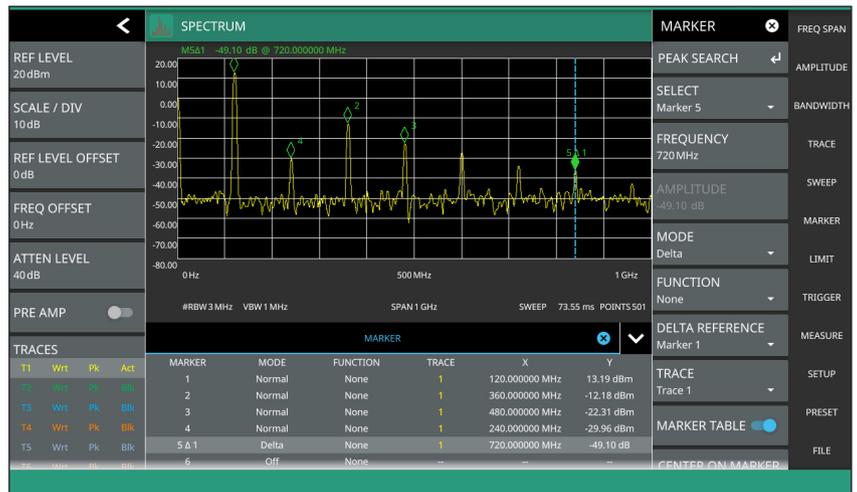
Multiple Traces and Detectors

Up to 6 traces can be displayed simultaneously, with each trace able to use different detector and averaging. Each trace is color-coded with an information table highlighting the detector type, averaging and status of each active trace.



Comprehensive Markers

markers, with detailed results table, enable recording and archiving of results. A noise marker can be activated for noise power measurements in a 1 Hz bandwidth, and each marker can be set to initiate a true frequency count at the end of a sweep. Double tap a marker to open peak search options.



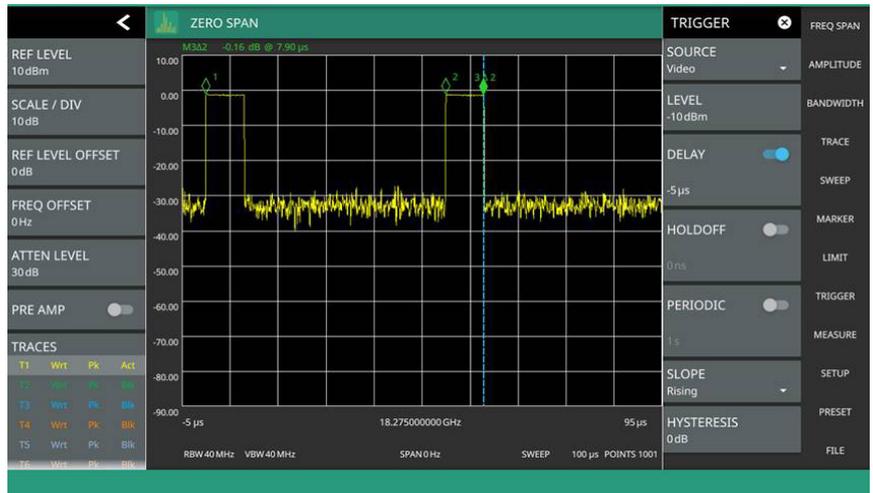
Limit Lines with Pass/Fail

Flexible limits, from simple maximum level lines to complex envelope shapes, provide automated pass/fail indication and can be used to trigger remote alarms. Limits can be entered manually to conform to international standards or automatically generated based on the signals measured in the current trace. Save on event facilitates the capture of intermittent interferers by storing a trace each time a limit line is violated.



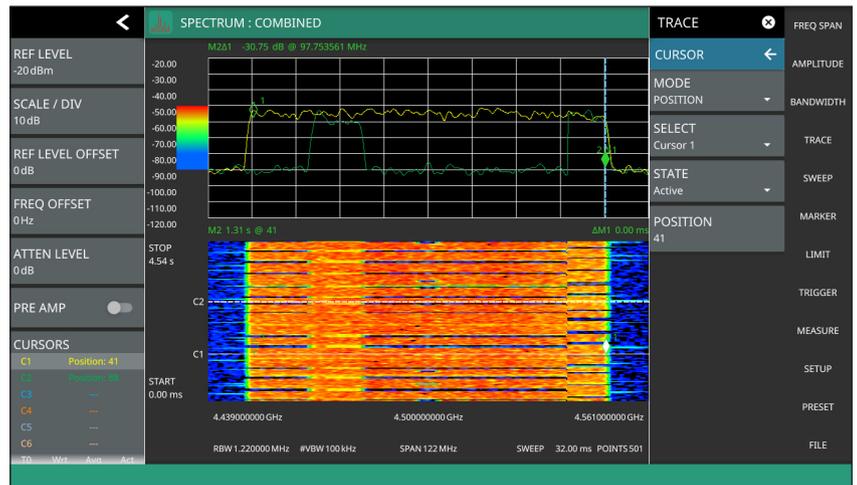
Zero Span

Selecting zero span in the spectrum analyzer mode enables the analysis of pulsed and time varying signals. Zero span is ideal for capturing the profile of short duration radar pulses and validating the length of data packets in wireless systems. Comprehensive markers facilitate the measurement of pulse width, pulse repetition frequency, and pulse rise time. A 40 MHz resolution bandwidth in zero span allows a minimum sweep time of 60 ns to be set and measurement of rise time as short as 60 ns to be measured.



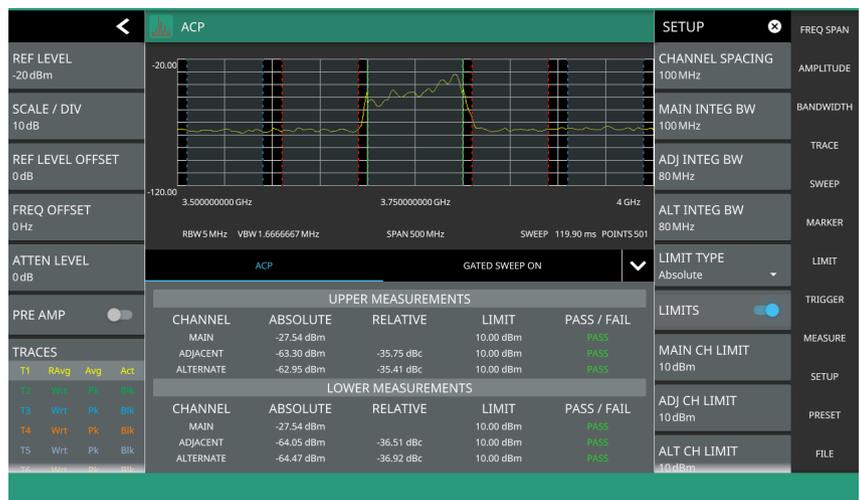
Spectrogram

The combined spectrum and spectrogram display shows activity over time in a given spectrum band.



Smart Measurement

The Field Master Pro MS2090A includes smart measurements for channel power, occupied bandwidth, adjacent channel power and spectral emission mask. Smart measurements provide dedicated set up menus to quickly configure the instrument and display results in industry standard formats. For TDD radios, a gated sweep feature captures data only when the radio is transmitting, providing accurate and stable measurement results.



RTSA and IQ Waveform Capture and Streaming

For many spectrum and network stakeholders, basic spectrum sweeps may not give enough information. The real-time spectrum analyzer (RTSA) option provides real-time signal capture with 110 MHz bandwidth and the ability to capture signals down to 2.05 μ s duration with 100% probability-of-intercept (POI) at full amplitude. This provides unrivalled insight into interference in the wireless spectrum, capturing interfering signals that are too short in duration to be seen with conventional spectrum analyzers yet may be degrading system performance. A power spectral density display shows the relative time that RF power is present at all levels and frequencies within the capture span. This is a powerful tool to find interfering signals within the same band as known/wanted signals. The spectrogram displays the maximum output of the RTSA FFT over time with settable 50 ms to 5 seconds resolution. Spectrogram provides a history of spectral activity enabling intermittent interferers to be detected and recorded.



This is a powerful tool to find interfering signals within the same band as known/wanted signals. The spectrogram displays the maximum output of the RTSA FFT over time with settable 50 ms to 5 seconds resolution. Spectrogram provides a history of spectral activity enabling intermittent interferers to be detected and recorded.

For users who want to go even deeper into building blocks of signals captured over the air, the Field Master Pro MS2090A also offers options for IQ Waveform Capture (Option 124) and IQ Waveform Streaming (Option 125). With 2 GB of internal memory dedicated to IQ captures, users can capture data at a 200 megasamples per second sample rate and 110 MHz capture bandwidth for up to 5 seconds. For users who need more data over a longer period of time, the Field Master Pro MS2090A supports gapless streaming of data over Ethernet, USB 3.0, or directly to the IQC5000B series RF record and playback system from Bird Technologies (bandwidths dependent on transfer speeds). Whether captured or streamed, users also need tools to process the data that has been captured. Information on the data format is explained in detail in the instrument user guide for anyone using custom Matlab, Python, etc. tools. For users who want a more generic tool, Field Master Pro MS2090A data can be easily converted to .xdat format for evaluation with Bird's Spectro-X data analysis tool.

Ethernet and WiFi Connectivity

Full remote control of all instrument functions are available using the standard Ethernet interface. The Field Master Pro MS2090A conforms to standard SCPI protocols. 802.11b/g/a/n connectivity is also supported. The Field Master Pro MS2090A connects to Wi-Fi routers enabling remote control of the instrument using IP protocols. A remote desktop tool comes standard with the Field Master Pro MS2090A solution, enabling control of the device over an internet and Wi-Fi connection from any location.

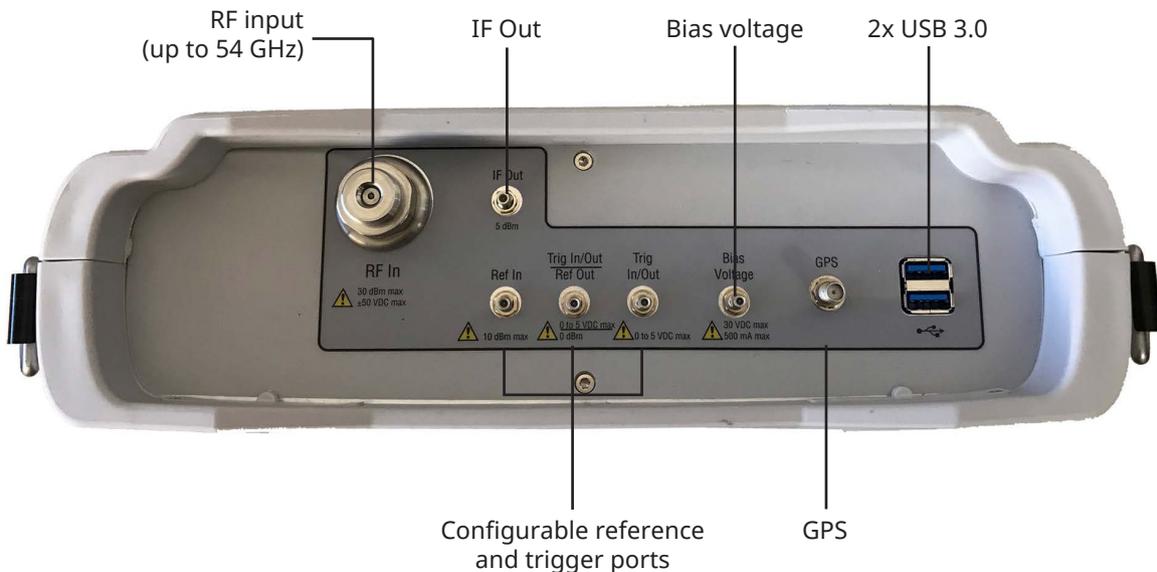
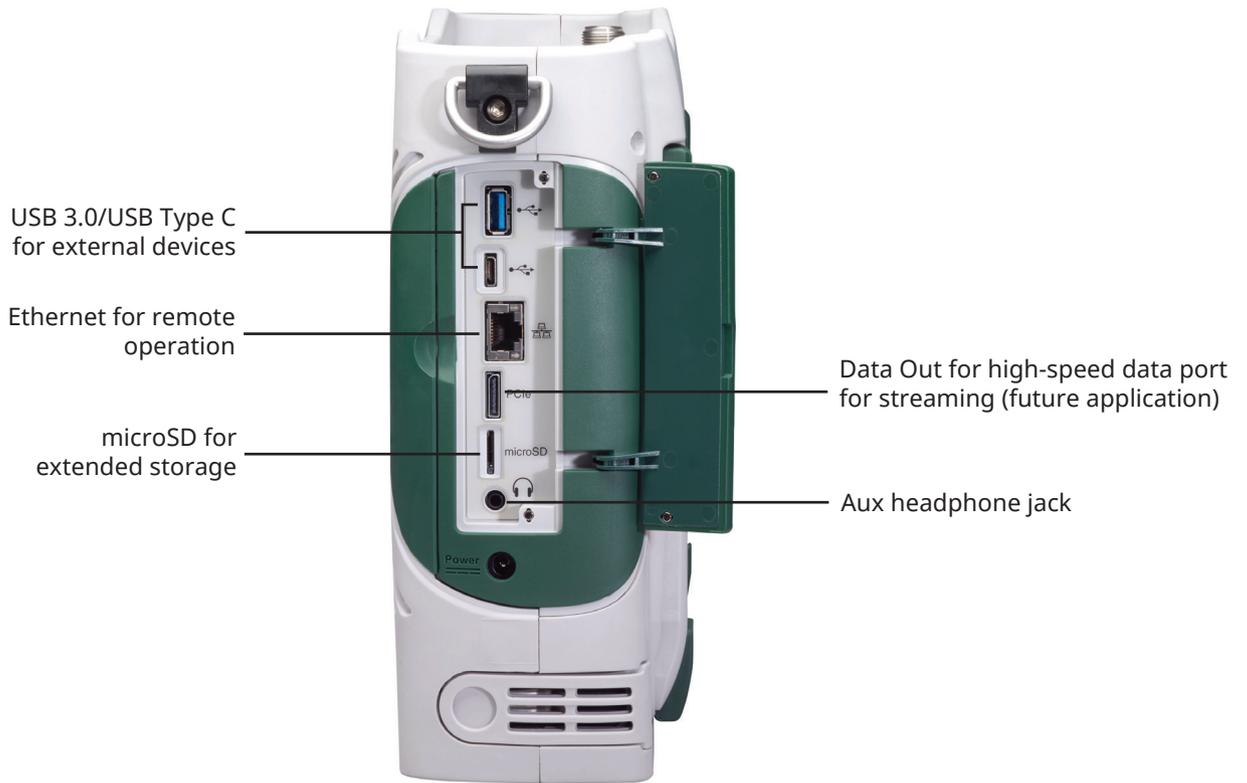


Wirelessly control Field Master Pro MS2090A from a PC

Field Master Pro™ MS2090A

Comprehensive Interface Selection

The Field Master Pro MS2090A spectrum analyzer comes standard with: 3 x USB 3.0 type A host ports; 1 x USB 3.0 Type C device port; and, Data Out and microSD interfaces. USB 3.0 host interfaces can be used to save screen images as a .png file, IQ data files, and facilitate software and option updates. USB Type C, Data Out, microSD, and headphone jack interfaces are provided to support future applications.



Ordering Information – Instrument Options

PartNumber	Description
MS2090A	Field Master Pro (Requires Option 709, 714, 720, 726, 732, 743, or 754)
Options	
MS2090A-0709	Frequency Range 9 kHz to 9 GHz
MS2090A-0714	Frequency Range 9 kHz to 14 GHz
MS2090A-0720	Frequency Range 9 kHz to 20 GHz
MS2090A-0726	Frequency Range 9 kHz to 26.5 GHz
MS2090A-0732	Frequency Range 9 kHz to 32 GHz
MS2090A-0743	Frequency Range 9 kHz to 43.5 GHz
MS2090A-0754	Frequency Range 9 kHz to 54 GHz
MS2090A-0024	Interference Hunter
MS2090A-0031	GPS Receiver (Requires GPS Antenna, sold separately)
MS2090A-0089	Zero span IF output
MS2090A-0090	Gated Sweep
MS2090A-0103	50 MHz Analysis Bandwidth
MS2090A-0104	100 MHz Analysis Bandwidth
MS2090A-0124	IQ Waveform Capture
MS2090A-0125	IQ Waveform Streaming (Requires Option 124)
MS2090A-0199	Real-Time Spectrum Analyzer
MS2090A-0883	LTE FDD Summary Measurements (requires GPS option MS2090A-0031)
MS2090A-0888	5G NR Downlink Measurements (requires GPS option MS2090A-0031)
MS2090A-0400	Vision Monitor Enabled
MS2090A-0407	Vision High-Speed Port Scanner Enabled
MS2090A-xxxx-0097	Accredited Calibration to ISO17025 and ANSI/NCSL Z540-1 (xxxx is the frequency option number)
MS2090A-xxxx-0098	Standard Calibration to ISO17025 and ANSI/NCSL Z540-1 (xxxx is the frequency option number)
MS2090A-xxxx-0099	Premium Calibration to ISO17025 and ANSI/NCSL Z540-1 plus test data (xxxx is the frequency option number)

For a full list of all accessories for the Field Master Pro MS2090A, please refer to our product data sheet : 11410-01000.

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