Anritsu
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MS27101A-IBCM
In-Building Coverage Mapper

Fully Integrated Coverage Mapping Solution
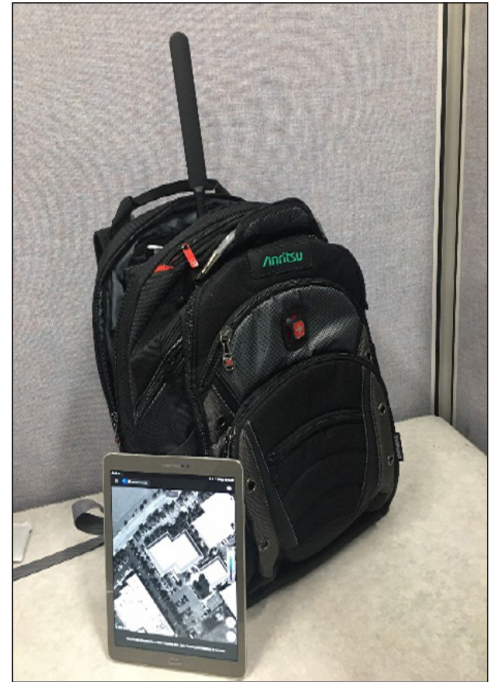
MS27101A-IBCM In-Building Coverage Mapper

Fully Integrated Coverage Mapping Solution

Ensure Proper In-Building Wireless Coverage of Public Safety, Commercial, and Private Networks

The MS27101A-IBCM In-Building Coverage Mapper solution enables technicians to verify proper signal power across multiple frequencies in a single walk-through. Any signal from 9 kHz to 6 GHz can be scanned including: all public bands (all LTE bands), Wi-Fi, NB-IoT, and public service bands (P25, DMR, LTE/FirstNet, UMTS/WCDMA, LMR channel).

Key Benefits

- **No GPS signal required:** the small NEON Tracker Unit actively records scanning position
- **Quickly import floorplans:** the NEON 3D mapping software seamlessly inputs floorplans from a photo or exterior building data from satellite imaging maps, simplifying setup time
- **Map stairwells, elevators, and other difficult areas easily:** as the software easily tracks your 3D position.
- **Easily document compliance tests:** coverage results can be saved both locally for security reasons or uploaded to the cloud for convenience and ease of record keeping

Fully Integrated Solution

The solution contains everything technicians need to perform a complete in-building coverage mapping exercise for multiple frequencies:

- Remote Spectrum Monitor MS27101A provides frequency coverage from 9 kHz to 6 GHz
- NEON® MA8100 Signal Mapper delivers real-time, 3D location information and enables technicians to import building floorplans as well as collect both RF data and coordinate it with position data. This solution includes:
    - NEON Tracking Unit to collect and process sensor data
    - NEON Signal Mapper application with intuitive Android interface locates and geo-references a user's location where GPS is not available
    - NEON Control Software running on a PC to analyze collected data and manage cloud storage
- Battery pack for up to 4 hours of coverage mapping
- Stylish Anritsu backpack for both convenience and unobtrusive scanning in public areas
- Designed to help network installers comply with government regulations (for example, NFPA 72 and IFC 510 in the United States)
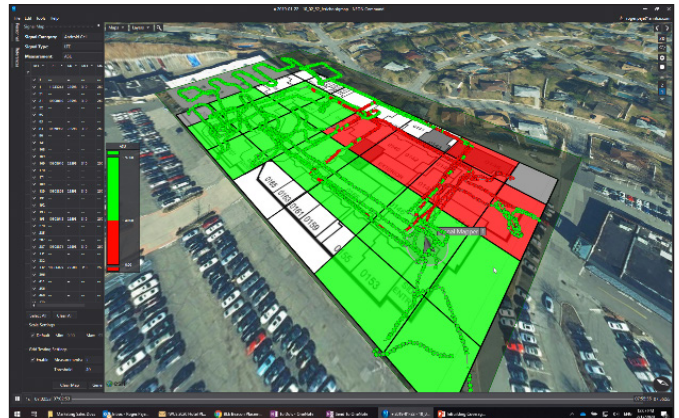
Note: The Android and PC devices as well as an antenna must be purchased separately. (Antennas are available from Anritsu. Please ask your sales rep.)

Backpack houses all components

Battery pack supports up to 4 hours of testing

Foam protects hardware while doing walk-through

Wireless Router – For tablet to spectrum analyzer communication Spectrum Analyzer

MS27101A Spectrum Analyzer

NEON Signal Mapper Application
(Android device not included)

NEON Tracking Unit

## Five Easy Steps to Complete In-Building Coverage Mapping

The MS27101A-IBCM In-Building Coverage Mapper simplifies a coverage mapping exercise. Once the solution is setup, technicians will be able to get a clear picture of a building's coverage in 5 easy steps.

2. Setup frequencies

Enter the frequencies of interest into the software (classified as channels). Up to 8 channels can be input at one time and include any frequencies from 9 kHz to 6 GHz. This range encompasses all Public Safety and commercial LTE bands commonly used inside buildings.

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1. Import building floorplan

Utilizing the NEON Signal Mapper application, import satellite images of a building and take pictures of the floorplan via an Android device. The application will automatically superimpose the building exterior onto the floorplan.
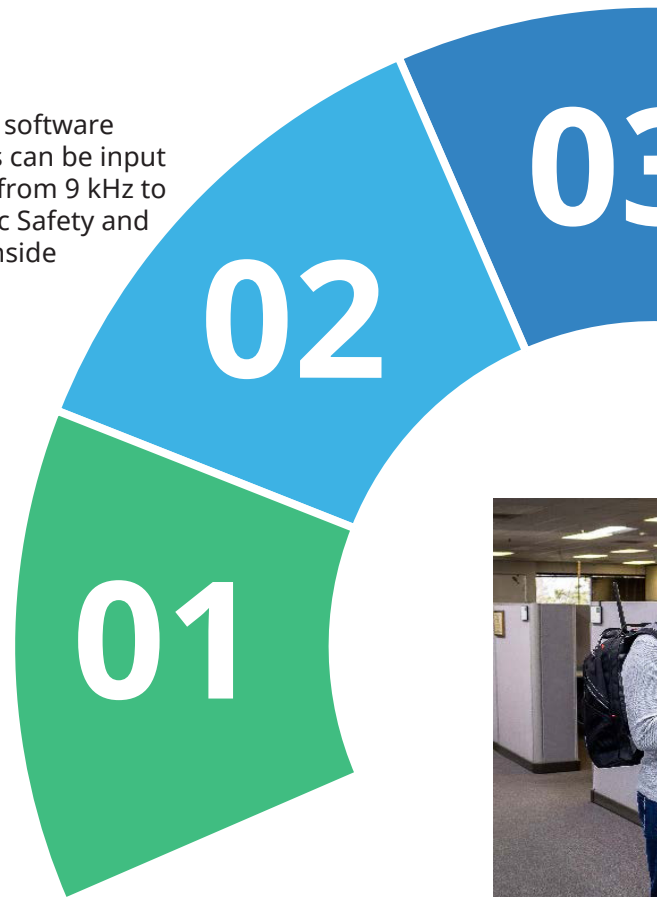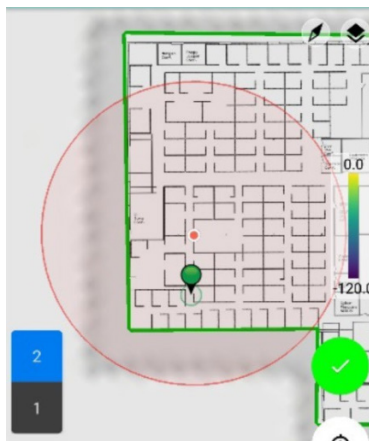
3. Start walk-through

Calibrate the system with your current position and orientation, then begin the walk-through according to compliance regulations or the user's preference. Data is kept compact, so the walk-through's maximum distance and data points are limited only by the battery pack (approximately 4 hours). Multiple runs can be stored and concatenated together in Step 5 Viewing Results.

4. Upload results to cloud or store locally

After the walk-through, store results locally on the Android device or in the cloud. The local storage assists with sensitive data not being transmitted outside the device, while cloud storage aids with documentation and collaboration.

5. View results through command software

Look at the results of the walk-through in 2D or 3D using the NEON Command software running on a user-provided PC. The results can be displayed with coverage grids for documentation compliance (for example, NFPA 72 and IFC 510 in the United States). Thresholds can be set to indicate pass/fail for any particular grid or area. Multiple floors can be viewed simultaneously.
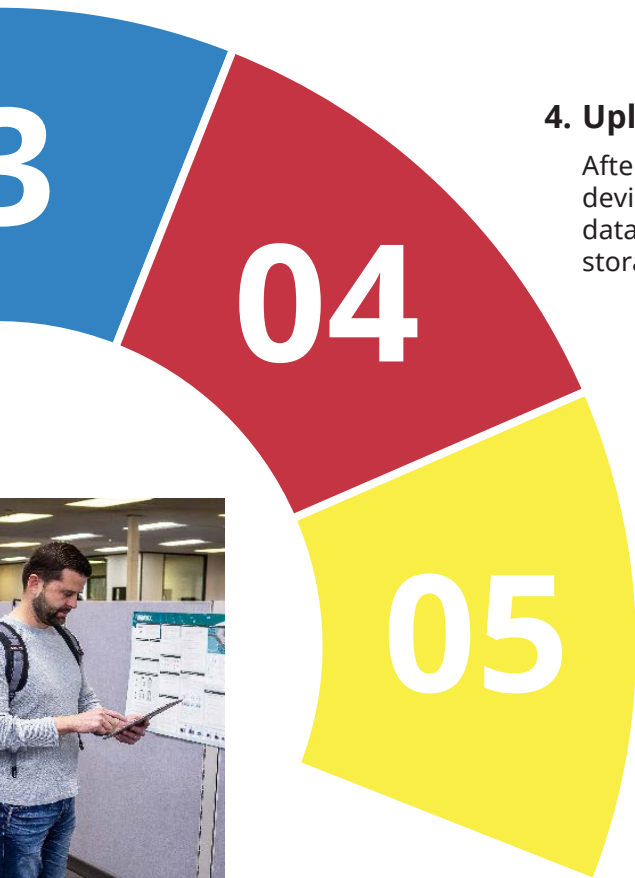
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High-Performance Spectrum Monitor Used to Collect RF Signals

The core hardware to collect the RF signals accurately is Anritsu's Remote Spectrum Monitor MS27101A. This unit has a frequency range of 9 kHz to 6 GHz, which encompasses all frequencies in the public safety bands, Wi-Fi, public LTE, and the unlicensed LTE band. The Remote Spectrum Monitor MS27101A has a number of advantages with regards to doing in-building coverage mapping:

- **Light and portable:** weighing 6.2 lbs (2.78 kb), this unit weighs less than most spectrum analyzers so technicians do not need to lug around heavy equipment

- **Low power:** using less than 11 watts, the Remote Spectrum Monitor MS27101A's battery is long-lasting and does not get hot, making it comfortable for the user

- **Wide frequency range and fast scanning:** allows multiple frequencies to be validated in a single walk-through

Key Specifications

| Specifications	
Frequency Range	9 kHz to 6 GHz (tunable to 0 Hz)
Tuning Resolution	1 Hz
Maximum Sweep Speed	24 GHz/s
Resolution Bandwidth (RBW)	10 Hz to 3 MHz in 1-3 sequence (–3 dB bandwidth)
Video Bandwidth (VBW)	10 Hz to 3 MHz in 1-3 sequence (–3 dB bandwidth) (auto or manually selectable)
SSB Phase Noise @ 1GHz	–98 dBc/Hz @ 10 kHz offset
Dynamic Range	> 106 dB at 2.4 GHz, 2/3 (TOI-DANL) in 1 Hz RBW
Measurement Range	DANL to maximum continuous input
Reference Level Range	–150 dBm to +30 dBm
Attenuator Range	0 dB to 50 dB in 5 dB steps
Amplitude Units	Log Scale Modes: dBm, dBμV
Amplitude Accuracy	±2.5 dB
Operating Temperature Range	–40 °C to 50 °C

NEON MA8100A Signal Mapper

The NEON MA8100A Signal Mapper is a 3D in-building coverage mapping solution that provides an intuitive Android user interface enabling technicians to collect position and RF data.

Building and floorplan setup

- The software will automatically read the current location once the Android device is connected to the Internet. It will provide the satellite image of building in your current position.

- The user then takes a photo of the floorplan of the particular floor they will be testing.

- The image can be overlaid on top of the building outline.
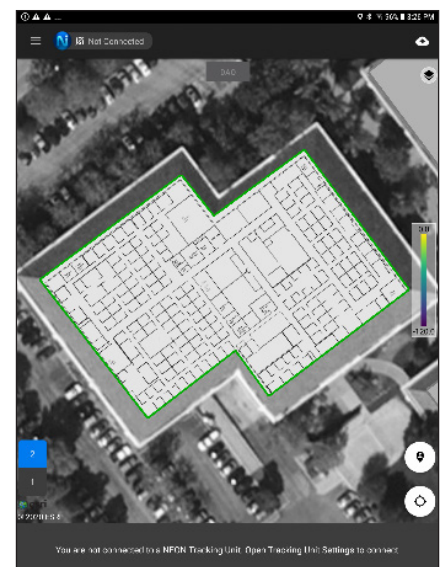
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NEON MA8100A Signal Mapper

Frequency setup

The frequencies needing to be scanned are input into the frequency list screen. The center frequency and bandwidth are required. Up to 6 frequencies can be scanned at one time.

Walk-through calibration

The unit must be calibrated to the user's exact location, which is a simple exercise of defining the positions within the building at 2 different points. After this step is done, the walk-through test can commence.
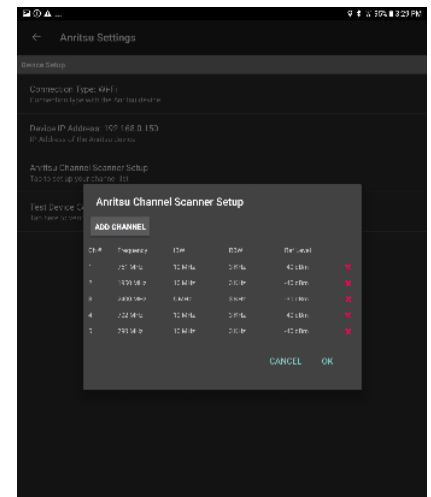

NEON Command Software (PC-based)

The NEON Command software is provided in order to view results of a coverage mapping exercise. The software contains a powerful 2D/3D viewer to display the results from different angles and elevations. Results of each floor can be displayed individually or altogether.

Multiple coverage exercise runs can be combined together, so there is no need to complete the entire building in a single walk-through.

Threshold limits can be set by the user, according to their own limits or limits imposed by published regulations. Certain regulations require coverage results to be display and tested by grids, and that is available in the software as well.

The software runs on a standard Windows PC. (Note: PC is not provided as part of this product.)
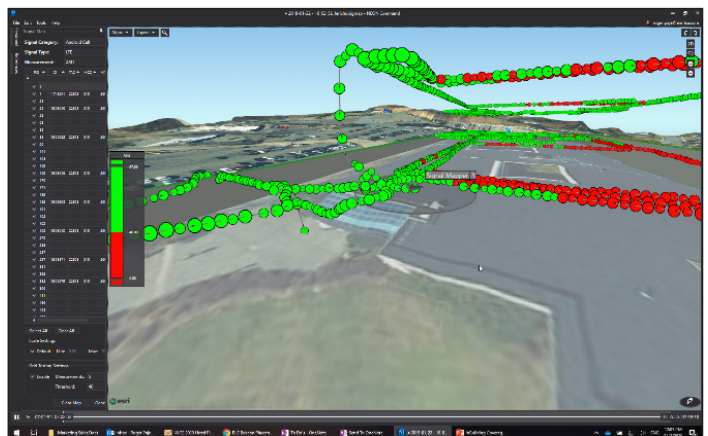
Applications

Public Safety Coverage Mapping

With the increasing requirements by various government agencies to comply with local requirements, network crews must validate compliance by ensuring that radio coverage meet these specifications.

The MS27101A-IBCM In-Building Coverage Mapper bundle is the ideal solution for technicians to validate and document their coverage tests. The software displays grids that help users view compliance with grid-based regulations.

Documentation is easy to satisfy compliance requirements and auditors by using the convenient cloud solution.
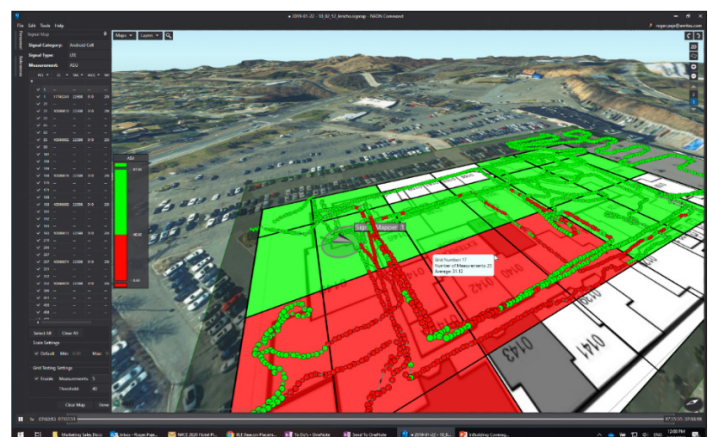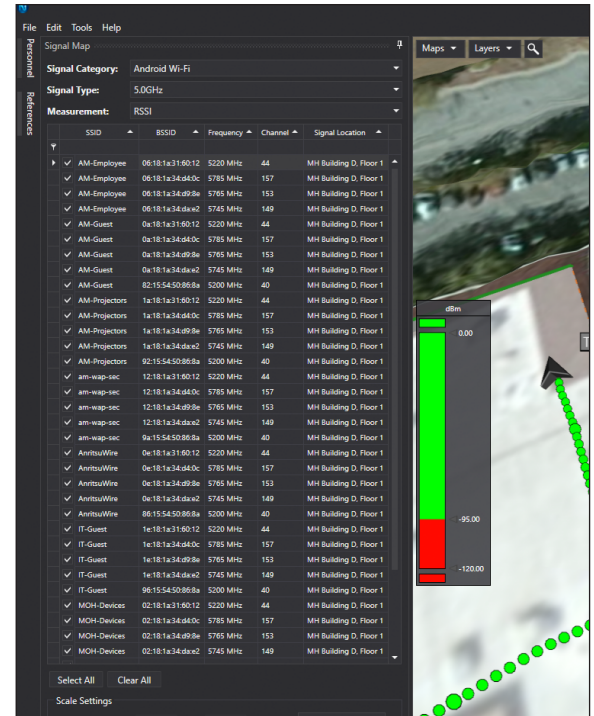
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Multiple Frequency Coverage Mapping Example

With more than 80% of mobile traffic coming from indoor or in-building networks, it is now common to have multiple wireless networks on the same floor. While this helps with user experience, coverage testing of complex RF environments is a challenge. However, with the fast channel scanning capability of the MS27101A-IBCM In-Building Coverage Mapper solution up to 6 channels or bands can be validated in one walk-through, saving time in both data collection and results documentation.

In this example, multiple frequencies are scanned simultaneously in the same walk-through. The results are then displayed in the NEON Command software and each individual frequency can be checked for proper coverage.

Ordering Information

When ordering the MS27101A-IBCM In-Building Coverage Mapper Bundle, the following parts are included in the package:

Ordering Information / Standard Accessories

Part Number	Description
MS27101A	Remote Spectrum Monitor with Integrated IP
MS27101A-0706	9 kHz to 6 GHz Frequency Range
MA8100A-001	NEON Signal Mapper with Anritsu integration includes: – NEON Tracking Unit – NEON Signal Mapper Application for Android Device – NEON Command Software for PC
SM7004	Omni Power Bank
SM7005	Power Bank Cable
2000-1752-R	Wireless Travel Router
SM7009	Protective Foam Pad Insert for MS27101A
10580-00470	Quick Start Guide
67135	Anritsu backpack

MS27101A-IBCM In-Building Coverage Mapper

Note: Customers are required to supply the following items:

1. Android device to run the NEON Signal Mapper software.
   - API level: 19 or higher
   - Operating system: Android OS v4.4.2 (KitKat) or later
   - Memory: Recommended 2GB RAM or higher
   - Processor: Recommended Quad Core 1.9 GHz or higher
   - Android Phone: Recommended Samsung Galaxy S7 or newer
   - Android Tablet: Recommended Samsung Galaxy Tab S2 or newer

2. Normal Windows PC to run the NEON Command software.
   - OS: Windows 7/8/10 with .NET 4.7.2
   - Memory: 4GB RAM or higher
   - Processor: Dual Core 2.0GHz or higher

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