



# Anritsu LMR Master S412E

The premiere tool to install and maintain European Train Control Systems (ETCS)



## Verify ETCS GSM-R Communications

The S412E is an industry leading handheld RF measurement system that can make the various measurements needed to verify and maintain the GSM-R systems required for a ETCS system.

## Reduce RF Interference

The S412E has a number of robust interference hunting features that speed the time it takes to locate and abate interference.

## Map Signal Coverage

Using GPS coordinates, watch the S412E quickly map the route and locate coverage gaps due to physical barriers and other issues.



*Maintain maximum performance and reliability of ETC systems with the Anritsu LMR Master S412E. (Shown with Tx/Rx input protection module for high power portable and BTS test applications.)*

## Features

- Cable and Antenna Analyzer: 500 kHz – 1.6 GHz, optional to 6 GHz
- Return Loss, VSWR, Insertion Loss, S11 / S21, DTF
- Spectrum Analyzer: 9 kHz – 1.6 GHz, optional to 6 GHz
- NBFM Signal Analyzer with Coverage Mapping
- LMR Signal Analyzers with Coverage Mapping: PTC, P25, P25 Phase 2, NXDN, DMR, TETRA
- Broadband Signal Analyzers: LTE, WiMAX
- Interference Analyzer with Interference Mapping and support for MA2700A Handheld InterferenceHunter
- Internal Power Meter, optional External Power Sensor
- Quick transition from low power portable tester to high power base station and mobile transmitter tester
- Handheld, battery-operated design
- Weighs less than 7.6 lbs. (including battery)
- Rugged, proven design using Anritsu's 9th generation hardware platform
- Daylight viewable color touchscreen display
- Superior Immunity to RF interference
- Standard 3 year warranty (battery 1 year warranty)

# LMR Master S412E

## Land Mobile Radio Modulation Analyzer

9 kHz to 1.6 GHz (can be extended to 6 GHz with options)

### Rugged, Portable, Powerful

The S412E LMR Master is a compact handheld multi-function analyzer that has been specifically developed for technicians and engineers who install and maintain public safety, utility and private mobile communications systems. The S412E combines our industry-standard cable & antenna analysis with the unmatched performance of our spectrum analyzers, then adds in powerful signal analysis and generation capabilities — including coverage mapping tools for both outdoor and indoor performance analysis — to create the ultimate battery powered LMR field service instrument for system commissioning, preventative maintenance, troubleshooting and compliance testing of mission critical systems.

### Land Mobile Radio Analyzer Highlights

- Optional analyzers for GSM-R, ITC-R PTC, P25 Phase 1 and Phase 2, NXDN™, DMR, MotoTRBO™, TETRA, FirstNet LTE, WiMAX 802.16d (fixed) and WiMAX 802.16e (mobile)
- ITC-R PTC Mode analyzes BER, EVM, Received Power, Frequency Error, Phase Error, Magnitude Error, IQ Imbalance, Symbol Error Rate
- NBFM Mode analyzes Carrier Frequency, Carrier Power, Deviation, CTCSS/DCS/DTMF, Occupied Bandwidth, SINAD and Quieting
- NBFM Auto Scan locates and locks on to transmitter carriers
- TIA-603-D compliant SINAD and 20 dB Quieting analysis modes
- Coverage Mapping (Outdoor and Indoor) for LMR standards
- Analysis of data and BER on P25/P25p2, NXDN, and DMR2 control channels
- Signal Generator: 500 kHz to 1.6 GHz, 0 dBm to -130 dBm
- P25/P25p2, NXDN, and DMR2 modes offer signal generation of standard BER test patterns including 1011 Hz, 1031 Hz, and O.153/V.52

### Vector Network Analyzer Highlights

- 1-path, 2-port VNA w/ quad trace display
- Distance Domain option for Distance-to-Fault analysis
- Adjustable data points up to 4001
- IF Bandwidth selections of 10 Hz to 100 kHz
- 100 dB transmission dynamic range to 4 GHz
- 850  $\mu$ s/data point sweep speed
- Vector Voltmeter option for matching section and phasing harness construction

### Spectrum Analyzer Highlights

- Dynamic Range: > 95 dB in 10 Hz RBW
- DANL: -152 dBm in 10 Hz RBW
- Phase Noise: -100 dBc/Hz max @ 10 kHz offset at 1 GHz
- Frequency Accuracy: 120 ppb, < 50 ppb with GPS locked
- Options: Interference Analyzer, Spectrogram, AM/FM/SSB Audio Demod

