Spirent Umetrix® LM

Powered by Link Master Logging™

5G Solution for QoE Evaluation with RF & IP Logging

Umetrix LM enables users to better understand and triage the root cause of problems that impact the user experience of 5G mobile services.

Use Cases

1. **Reduce the mean time to identify and resolve QoE issues.**
   The powerful combination of Umetrix QoE measurements alongside RF and IP signaling enables efficient debugging of network or device related problems, leading to a shorter time to problem resolution.

2. **Pre-testing for carrier device acceptance programs with QoE and logging.**
   Umetrix LM enables device manufacturers to pre-test new device models prior to submission to carrier acceptance programs. By addressing QoE issues proactively with additional RF and IP KPIs, technical acceptance can proceed without delay.

3. **Launch readiness assessment for voice services (VoWi-Fi, VoLTE, OTT, etc.).**
   Compare the user experience of new voice services to legacy or competitive services prior to launch. Set launch criteria and evaluate trial, soft launch and commercial networks to determine readiness.
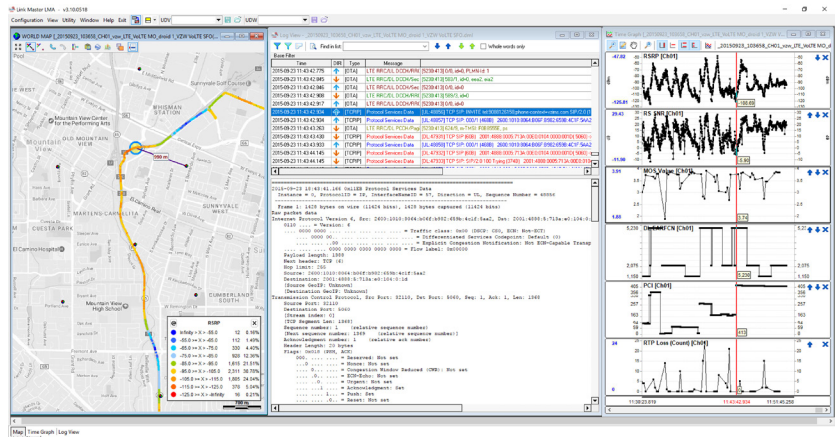
Highlights:

- Evaluate the user experience of 5G mobile services in a live 5G network using actual consumer mobile devices.

- Correlate RF and signaling information with voice, call, and data QoE metrics for up to 12 devices simultaneously.

- Assess the launch readiness of voice and data services for 5G, VoLTE, VoWi-Fi, OTT and more.

- Execute Umetrix Data test campaigns with logging to collect layer 1 and layer 3 data to determine possible sources of application throughput bottlenecks.

Key Metrics

5G	5G baseband chipset logging
	Speech Quality MOS (POLQA)
	Call Completion Success Rate
	Audio Delay

Maximize KPIs, Reduce Churn

It is critical in today's competitive environment to meet key performance indicators (KPIs) to minimize dropped and blocked calls and maximize data throughput. Umetrix LM collects the underlying RF, IP, and signalling data to determine your KPIs and allows you to analyze and easily identify where you can boost your network and device performance.

Air Interface Data Collection

Umetrix LM enables complete collection of all the parameters characterizing wireless device performance. Setting up a test configuration is quick and easy via the intuitive graphical user interface.

Key Features

- Connect up to 12 UEs plus a scanning receiver (hardware sold seperately)
- Supports any network type: 5G NR NSA/ SA, LTE-A, LTE, CDMA / EVDO, WCDMA / HSPA+ / GSM / EDGE
- VoLTE testing
- Collect layer 1 and layer 3 data
- Real-time mapping with trace lines to the serving cell sector
- Simple multi-floor in-building network characterization
- Full playback capability and one-click synchronization
- Collect LTE-A data on the primary and secondary bands
- Includes MIMO Testing
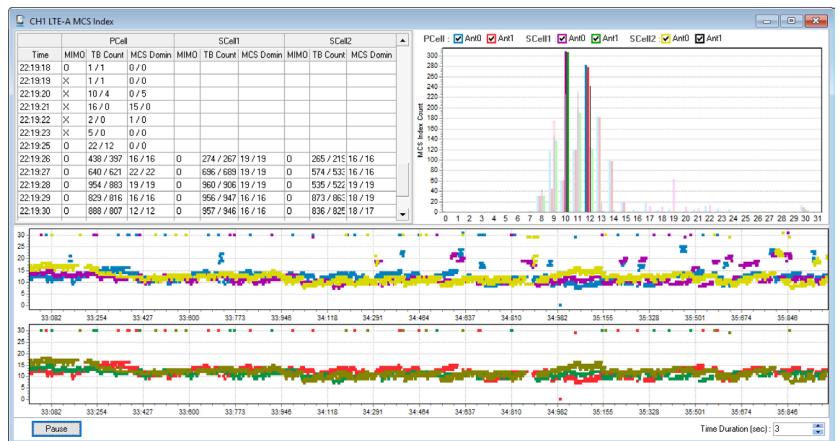
Ease of Use

- Set up fast and get going
- Voice, data call configurations
- Voice, data call monitors
- Robust, no system crashes

Get All the Data You Need

- Integrated mapping with trace line
- Full replay
- Analyze LM data with Umetrix Analysis or other third-party analysis tools

View synchronized map, charts, logs and messages
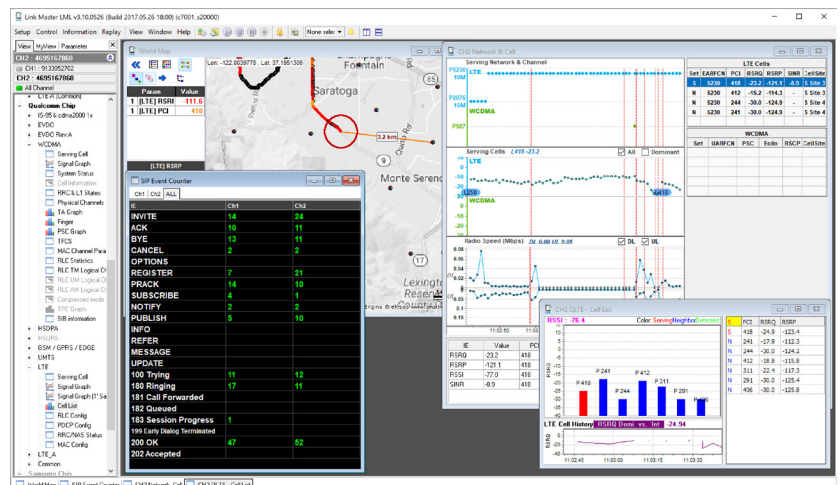
LM provides real-time views of key parameters

Identification of modulation and coding scheme usage

Umetrix LM Measurements and Views

For 5G NR NSA/SA, LTE/LTE-A, W-CDMA/HSPA+, and/or GSM/EDGE

Layer 1–3 Measurements

Active set EC/No Finger Combined Handover State Spreading Factor	Estimated SIR Power Control Frequency (MHz)	Num of CC	SCC Information
Active Set RSCP	MAC Throughput	Path Profile	SCS
AGC Report	MIMO Statistics	PBCH BLER	Serving Beam RSRP (dBm)
Application Layer Throughput	Modulation Statistics	PCC Information	Serving Beam RSRQ (dB)
Band	Neighbor Intra/Inter/EUTRA NR/E-ARFCN	PCI	Serving Beam rxbeamid
Bandwidth	Neighbor Intra/Inter/EUTRA PCI	PDCCH Detection Rate Rl	Serving Beam SINR (dB)
BLER (%)	Neighbor Intra/Inter/EUTRA RSRP	PDCCH SER	Serving Beam SSB
Cell RSRP	Neighbor Intra/Inter/EUTRA RSRQ	PDCP DL In-Traffic Leg Switch	Serving Cell RSSI
Cell RSRQ	Neighbor Intra/Inter/EUTRA RSSI	PDCP DL RRC Leg Switch	Serving Cell SNR
CFI Information	Neighbor Intra/Inter/EUTRA SINR	PDCP Throughput	SSB Index (Mode)
Channel Information	NR+LTE Throughput	PDCP UL RRC Leg Switch	System Bandwidth Information
CRI	NR-ARFCN	PDSCH BLER	Tx Power
CSI-RS		PDSCH SER	Tx Power
DCI		PDSCH Throughput	Tx Power/RB
DLACK Detection Rate		PPP Throughput	Tx State
DRX mode		PUSCH Thropughput	Wideband CQI Information Rank Information
EARFCN		RLC Throughput	
EC/No		RSCP	
		RSSI (dBm)	

Views

Beam List	MAC statistics	Quality Reporting	Signal Graph
CA Status	Map	RACH Reason Result MSG1-4	Sub Band CQI information PDCP UL/DL Throughput graph
Cell Information	Modulation Counts	RLC Statistics	System Information Block summary
Compressed Mode GSM Measurements	Neighbor Cell Information AGC Symbol Distribution Symbol Constellation Channel Information	RLC UL/DL Throughput graph MAC UL/DL Throughput graph	System Status
Debug messaging	Path Profile Information PRACH Information	RRC & L1 State	TA Graph
ENDC Status	PDCCH	RRC information / Statistics NAS information / Statistics	Timing Adjustment
Finger	PDCP Statistics	Scheduling/Grant Statistics	UE Information
Full L3 Decoding	PDSCH MAC BLER	Scrambling code graph RLC statistics and Logical Channels	Umetrix Data Monitor
GPS Status	Physical Channel		VOD Call Monitor
Handover			Voice Call Monitor
Layer 1 Graphs			
LLR Information			

Example overview of carrier aggregation status

Example view of 4G + 5G status

System Overview
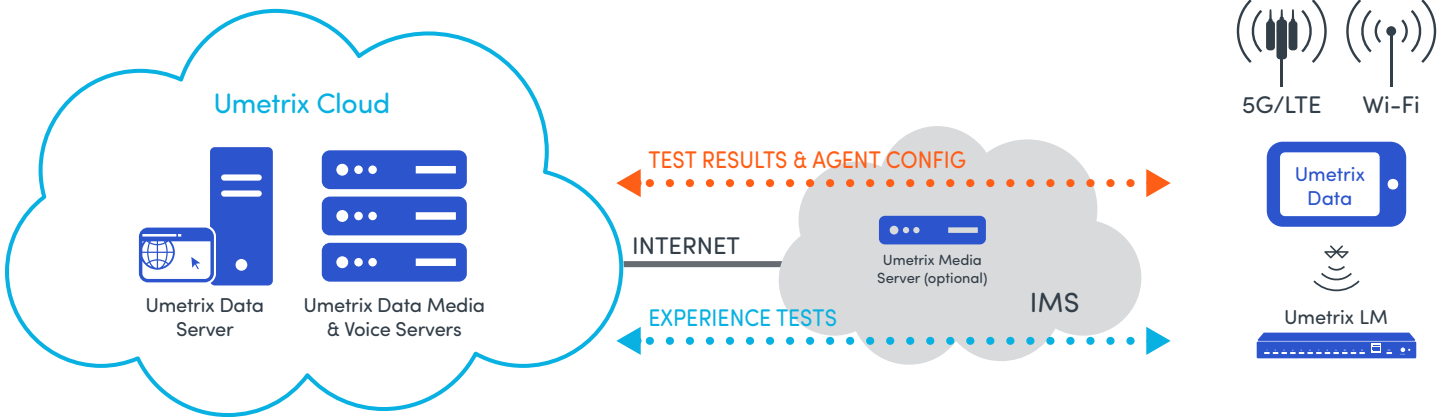
Umetrix LM. The Umetrix LM solution consists of small portable hardware units and PC-based software. For voice experience evaluation, the solution can perform three types of tests: mobile-to-mobile (between two devices on the same or different instruments), mobile-to-PSTN or mobile-to-IMS. Umetrix LM evaluates the voice experience of end-to-end connections by performing speech quality tests (POLQA), call initiation and retention tests, and audio delay tests. For data experience tests, Umetrix LM integrates with Umetrix Data to collect layer 1–3 logs. This can help determine possible sources of application throughput bottlenecks.

Umetrix HD Voice Server (optional). The HD Voice Server enables mobile-to-IMS tests using narrowband or wideband / HD codecs. The server is deployed within a carrier's core network and interfaces directly to the IMS, acting as a virtual SIP/IP device and experience testing endpoint. The HD Voice Server helps isolate issues by enabling independent analysis of the uplink and downlink for a specific mobile-to-IMS connection.

Umetrix Cloud. The Umetrix Cloud is a worldwide set of Spirent-hosted cloud endpoints for voice and data test services. The **Umetrix Voice Server** enables mobile-to-PSTN tests using narrowband codecs. With the Voice Server, customers can get

uplink MOS delivered to Umetrix LM in real-time while conducting field testing. The server is hosted in the Umetrix Cloud and connects to the PSTN via a T1 or E1 interface. The Voice Server acts as virtual landline phone and voice probe for performing end-to-end voice experience evaluation. The Umetrix Cloud also contains **Umetrix Data Media Servers**, which act as an endpoint for all data experience tests, hosting various types of media and services required to perform HTTP, FTP, and UDP file transfers and ping tests.

PC and Hardware Requirements	
CPU	i7 for MOS reporting
RAM	16GB or higher
OS	Windows 10 or higher
Display	1024 x 768 resolution
USB ports	For GPS, UEs, receivers, and USB license key, if used
Disk Space	30GB available, for log file storage
UE Chipsets	Qualcomm, Samsung, GCT, LG, Altair—Must match tool configuration; additional support always being added
Scanning Receivers	V-Comms; PCTel™ SeeGull LX and EX scanning receivers (single or multi-band technology support); Viavi or JDSU W1314A/B scanning receivers; R&S TSMW

Americas 1-800-SPIRENT
+1-800-774-7368 | sales@spirent.com

Europe and the Middle East
+44 (0) 1293 767979 | emeainfo@spirent.com

Asia and the Pacific
+86-10-8518-2539 | salesasia@spirent.com

◯spirent™