MultiDSLA Lab and Field Test system for Cellular

The Importance Of Prediction

Even in the age of the smartphone, poor or speech quality quickly causes dissatisfaction.

Manufacturers and network operators have a critical interest in optimising performance and maintaining user satisfaction.

What are the limits of user acceptance? What constitutes "good" performance? Subjective testing provides accurate answers to these questions, but is a lengthy and expensive process.

The ITU has standardised a new algorithm – ITU-T Rec. P.863, Perceptual Objective Listening Quality Analysis (POLQA). When combined with a high quality test system, POLQA provides realistic predictions of customers' experience of today's technology, and of emerging technologies.

Malden Lab and field test systems deliver reliable indicators of performance.   They are used during installation, commissioning and acceptance testing of wireless networks and in operational networks.

Key Features:

- Excellent performance/cost ratio
- Support for narrowband, wideband and super-wideband speech
- ITU speech quality metrics POLQA and PESQ
- Measure in the lab and in the field using the same system
- Speaking results/prompts – to alert the driver safely
- You own the whole test system - no service charges
- Smartphone Control feature takes care of call set-up and clear-down
- Precise control over speech levels with a configuration for each handset model
- GPS time/location with data export configurable for mapping engines – e.g. Google Earth
- Simple and flexible test design for special purposes
- Malden – the trusted leader in speech quality analysis

Drive Test Applications

MultiDSLA drive test systems with GPS provide a full range of performance measurements, including:

- Speech quality score (POLQA, PESQ)
- One-way delay
- Speech level
- Noise level
- GPS location
- GPS time
- Uplink/downlink analysis
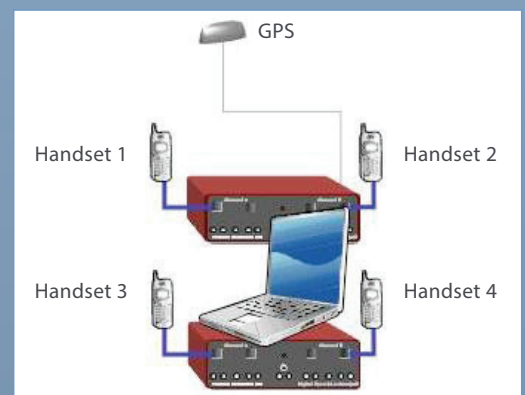
Applications include:

- Handset comparison, e.g. with 'reference' handset – any number of handsets may be used simultaneously, with separate reporting for each one.
- Competitive network comparison – for any number of networks. Using identical handsets will give a direct comparison of network coverage and general performance.
- Detailed network performance analysis – typically within a single network and with a reference handset. The objective may be to study network behaviour in particular circumstances, to investigate customer complaints or to confirm performance following a network upgrade or maintenance work.
- Fixed line to mobile.
- Mobile to mobile.

System Configuration

The MultiDSLA drive test configuration consists of one or two similar sets of equipment, one for the mobile terminal, one for the fixed terminal if required. Each set comprises:

- MultiDSLA Controller application and PC/laptop
- DSLAIIC two channel analogue test instrument(s) or DSLA C4 and C6 providing four and six channels respectively
- Garmin GPS 18 LVC receiver or equivalent
- Ethernet switch, if more than one mobile DSLAIIC is used

Handset Interface

Malden Electronics supplies cables to interface to a wide range of cellular handsets. The typical arrangement is shown here:
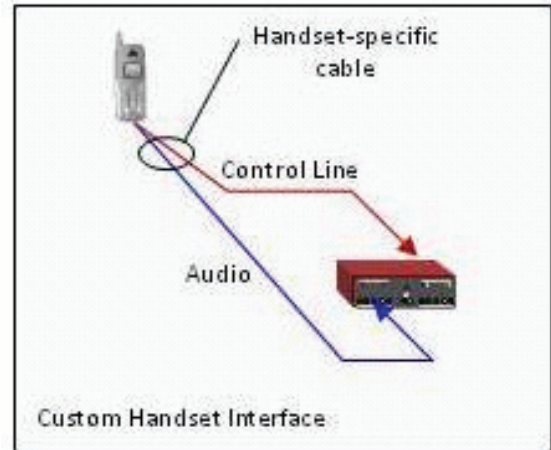
The cable carries microphone and earpiece audio signals between the handset and DSLAIIC. The Control Line works in conjunction with the Smartphone Control feature to automatically set up and clear down calls. Just configure the phone numbers and the test system does the rest.

Delay And Delay Variation

Accurate one-way delay measurements are made for both fixed-mobile and mobile-mobile testing.

Delay variation is a feature of packet transmission and arises when a gateway jitter buffer is re-sized. The effect on speech quality can be minimal if this occurs in a silence interval but can be detrimental if it occurs during active speech. The PESQ and POLQA algorithms measure the time offset between the reference speech samples and the captured degraded samples, for each speech utterance individually. Thus MultiDSLA reports the maximum, minimum, mean, median and standard deviation of these measurements, providing a thorough analysis of delay variation and the impact on user experience.

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