

Audio Streaming Integrity

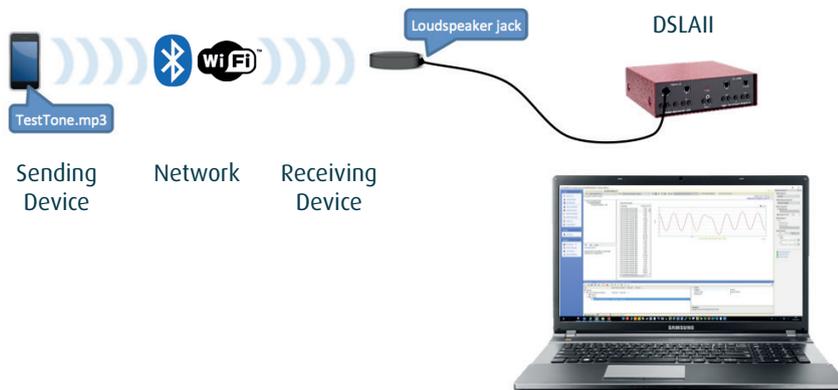
An innovative metric for continuous assessment of audio streaming over Bluetooth and Wi-Fi.

The Audio Streaming Integrity (ASI) metric is an option to the **Opale MultiDSL** test system. ASI detects, qualifies, records and logs breaks or distortions in audio continuity over any test period, providing a cumulative count plus the duration and timestamp of each anomaly.

Local Audio Streaming

The use of cordless headphones and loudspeakers is growing rapidly in popularity, accompanied by a parallel progression in Bluetooth audio codec development and Wi-Fi streaming solutions. Many of the headphones and loudspeakers are high-end products, and are typically purchased for listening to music, by users expecting "hi-fi" performance.

Domestic audio streaming applications include Bluetooth and Wi-Fi streaming of music from either a local server, or from a server reached over the Internet via a wired or wireless connection. Streaming music from a mobile device to a vehicle audio system via Bluetooth also falls into this category.



Key Features & Advantages

Long-Duration Testing

Audio Streaming Integrity must be performed typically over 24 to 48 hours of continuous test periods.

Automatic

Tests run automatically in the background, leaving QA staff free, and saving time-consuming manual test iterations.

Back In Time Troubleshooting

ASI logs and measures each single anomaly, enabling back-in-time analysis of every anomaly identified.

End-User Experience

ASI stores recordings of each anomaly, allowing playback and subjective assessment of the audible effect.

End User Satisfaction

Streaming errors often result in audible noises which disrupt listening pleasure and can give rise to acute user dissatisfaction.



Applications

- Validation of local streaming performance.
- Evaluation of Bluetooth pairing combinations.
- Characterisation of Bluetooth and Wi-Fi range.



Created for

Quality Assurance Lab engineering teams validating products such as:

- Subscription media services
- Mobile phones and tablets
- Home media servers
- Wireless loudspeakers and headphones
- Automotive audio systems with Bluetooth



Why Streaming Integrity?

Under ideal conditions, the streaming process has no effect on the listening experience, which is governed principally by the factors mentioned above. But under non-ideal conditions the streaming process can give rise to breaks in the decoded audio delivered to the loudspeaker or headphones. Potential causes of non-ideal performance include:

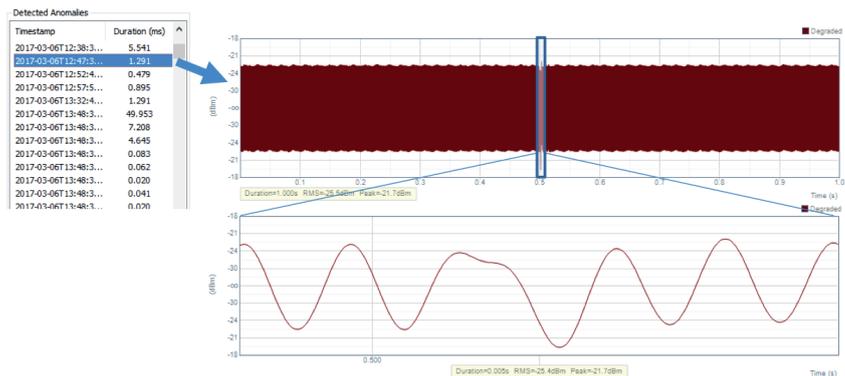
- Unsuitable pairing combinations
- Radio-frequency interference - e.g. Wi-Fi interference to Bluetooth
- Multi-path signal fading due to radio signal reflections
- Equipment used close to the limit of its range

Listening Experience and Customer Satisfaction

The factors combining to influence listening experience include the performance of the codec employed, the inherent quality of the transducers and their enclosures, the nature of the music being played and the expectation of the user.

There is an additional factor which may have a major influence on the quality of experience. This is the integrity of the streaming mechanism - in other words, its ability to convey the music to the headphones or loudspeaker without discontinuities.

We call this the Audio Streaming Integrity or ASI. Opale Systems has implemented ASI evaluation in its flagship test system, MultiDSL (previously Malden MultiDSL).



Specifications		
Indicators	Duration	Per anomaly
	Timestamp	
	Recording (1s)	
Sample rate	8k, 16k, 48k samples per second	
Test Signal Frequency range	150Hz – 650Hz	at 8k rate
	150Hz – 1.3kHz	at 16k rate
	150Hz – 3.9kHz	at 48k rate
Order code	Model number: ASI > Please refer to ordering guide below	

Product No.	Model	Description
MultiDSL System		
User Interface & Controller Software		
000106	MUI-ESSENTIALS-DKM	MultiDSL software essentials bundle includes PE EQ DTMF and PESQ. Dongle Key Management.
MultiDSL Options		
000003	MUI-DS	Multi DSL User Interface 5 additional devices.
000007	FP	File Processor
000008	SC	Smartphone Control
000103	SM	Speciality Metrics
Speech & Audio Quality Metrics - PESQ and related		
000098	PESQBE	PESQ P.862 speech quality metric w/h British English
000099	PESQAE	PESQ P.862 speech quality metric w/h American English
000101	PAMS	PAMS speech quality metrics. Requires either PESQAE or PESQBE
000102	PSQM	PSQM Speech Quality Measure. Requires PAMS.
POLQA (Small Systems)		
000090	POLQA2EC	POLQA® P.863 speech quality metric for 2 effective channels
000091	POLQA4EC	POLQA® P.863 speech quality metric for 4 effective channels
000092	POLQA6EC	POLQA® P.863 speech quality metric for 6 effective channels
000093	POLQA8EC	POLQA® P.863 speech quality metric for 8 effective channels
000094	POLQA10EC	POLQA® P.863 speech quality metric for 10 effective channels
000095	POLQA12EC	POLQA® P.863 speech quality metric for 12 effective channels
POLQA (Large Systems)		
000096	POLQA14EC	POLQA® P.863 base license for large systems (14EC).
000097	POLQA14EC-2EC	POLQA® P.863 add'l 120 minutes (eq. 2EC) of speech processing. Requires POLQA14EC.
Audio Metrics		
000100	PEAQ	PEAQ Audio Quality metrics. Requires DSLAIC 48k
000107	ASI	Audio Streaming Integrity Metric