Audio Streaming Integrity

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

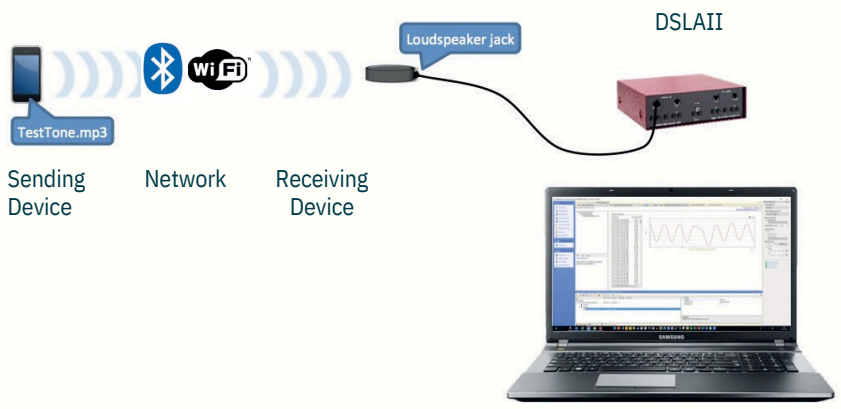
The Audio Streaming Integrity (ASI) metric is an option to the **Opale MultiDSLA** test system. ASI detects, qualifi es, records and logs breaks or distortions in audio continuity over any test period, providing a cumulative count plus the duration and timestamp of each anomaly.

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 points

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 identifi ed.

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:

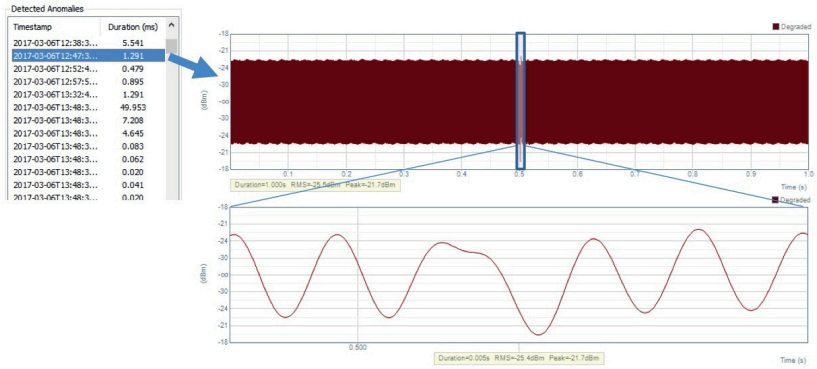
- Unsuitable paring combinations
- Radio-frequency interference - e.g. Wi-Fi interference to Bluetooth
- Multi-path signal fading due to radio signal reflections
- Equipment used close to the limit of its range

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, MultiDSLA.



Specifications		
Indicator	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	000107	ASI