

# Bluetooth® Protocol Expert System

## Diagnostic Software Module and Testing Toolbox for Frontline Software



### Key Features and Benefits

- Makes the novice an expert, and the expert's job easier
- Data is displayed in more useful formats to make root cause analysis simpler and more efficient
- Automatically identifies not only errors, but violations of best practices, protocol violations and ambiguities
- References relevant sections of the Bluetooth specification for greater insight into protocol issues and standards
- To-the-packet integration with Frontline software means quick navigation between data views
- Graphical interface allows clear and concise views of protocol configurations, statistics and results
- Works on both live capture data and pre-captured CFA files
- Analyzes data captured over the air and over the wire (HCI)
- All information displayed can be exported to CSV for archiving and offline review
- Highlights connections associations between different protocol layers
- A2DP Sink tool uses HCI trace to provide more accurate Bluetooth audio score
- LE Jammer tool creates user-adjustable traffic to create challenging environmental scenarios for more robust outcomes

**The Bluetooth Protocol Expert System is a software add-on that complements the decoding power of the Frontline Software by providing developers at all experience levels with concise in-depth analysis of configuration, HCI/transport, and Bluetooth profile issues and errors. Additionally, it provides test tools which allow the user to actively enhance their debugging scenarios for greater precision and more robust products.**

### Bluetooth Expertise on Demand

Most Bluetooth analysis tools just identify errors. The Bluetooth Protocol Expert System goes further by providing specific and useful contextual references and statistical information which helps to simplify root cause analysis of what's causing those errors, and which, in turn, leads to faster and more successful product development. This makes it an indispensable module for new Bluetooth developers and for Bluetooth experts who require greater efficiency in the lab during the development and QA cycles.

### How the Expert Can Help

The Bluetooth Protocol Expert System automatically analyzes Bluetooth packets to reveal when your implementation is violating protocol (currently A2DP and L2CAP with more profiles coming), and even identifies, with **references to the relevant entries in the Bluetooth specification**, violations of best practices and protocol ambiguities to be removed or avoided.

Using the concise and clear graphical interface provided by the Bluetooth Protocol Expert System, users with any level of Bluetooth experience can easily break down complex information into more useful views and statistical analysis, including:

- L2CAP: ERTM vs Basic Mode
- A2DP and SCO codec configurations
- Average packet size used
- MTU size
- Average audio packet size
- Bit rates for audio
- Running tally of errors per channel

The Bluetooth Protocol Expert System also indicates connections associations between different protocol layers, and is fully integrated with the familiar Frontline Software views and the Bluetooth Audio Expert System software module. Follow any packet from the Bluetooth Protocol Expert System to that moment in the Frontline Software's Bluetooth timeline, Frame Display, or other views. The Bluetooth Protocol Expert System leads you intuitively right to that needle in the haystack.

● Attempt to open A2DP stream has not been configured. A2DP

REFERENCE: Bluetooth AVDTP Specification version 1.3, Section 6.2: Transaction Model of AVDTP Command/Response

Packaged with the Bluetooth Protocol Expert System are exclusive tools for greater precision and more control over your testing environment:

## A2DP Sink

For Bluetooth developers who want to improve their audio quality, the Bluetooth Protocol Expert System toolbox contains the A2DP Sink tool, which allows Sodera to become a user-controllable sink device, and utilizes the HCI trace to guarantee no packet loss when performing audio measurements. Using this tool provides a much more accurate depiction of the source device's Bluetooth audio score.

Even in ideal air sniffing scenarios, discrepancies between what a sink device receives and what is captured over the air between the sink and the source are inevitable.

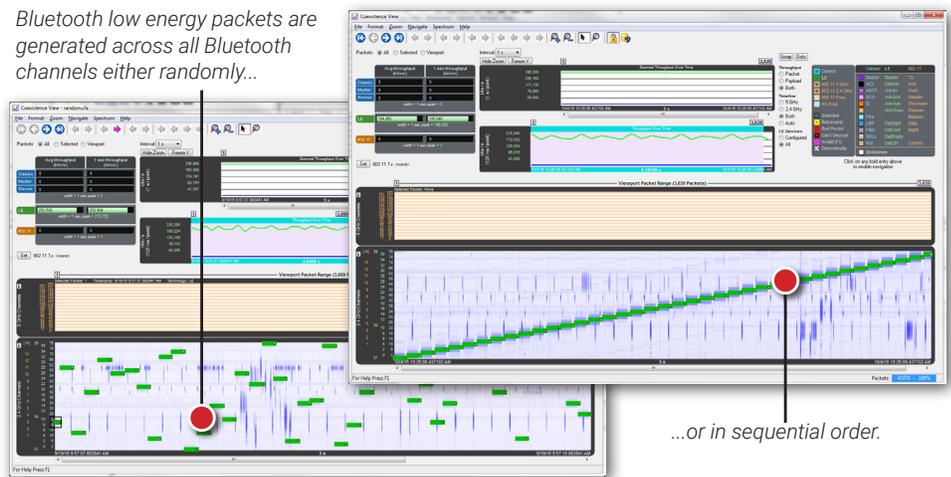
The A2DP Sink tool allows Sodera to become the sink device in the conversation instead of a passive listener. This eliminates one point of ambiguity, which greatly hones the accuracy of the capture and ensures that Sodera is receiving Bluetooth audio from the source exactly as the speaker would receive it.



## LE Jammer

Developers who want to develop robust products that will work dependably in even challenging environments can use the LE Broadcaster to create traffic on all Bluetooth channels, either randomly or sequentially. This gives the user the ability to see how their device's communications perform on each channel even in very noisy environments, resulting in thorough and highly reliable quality of service testing.

Bluetooth low energy packets are generated across all Bluetooth channels either randomly...



Specifications	
Minimum System Requirements	Microsoft Windows® 10, Windows 8 Windows 7; 4 GB of RAM; Core i5 processor at 2.7 GHz 20 GB of free hard disk space
Required Protocol Analyzer Hardware	Frontline BPA 600; Frontline Sodera

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