Perytons

Peryton-D

Multi-Antenna 802.15.4/ZigBee/6LoWPAN Protocol Analyzer - Overview

The Peryton-D analyzer is a full featured, single-channel 802-15.4/ZigBee/6LoWPAN protocol and network analysis tool, capturing data from any channel within the 2.4 GHz band. This analyzer model provides superior reliability through the unique use of antenna diversity techniques — reducing the number of packets lost due to RF indoor multi-path propagation conditions or interference from up to 15% to less than 0.1%.

Using the Peryton-D, the user can get a quick and complete picture of the RF environment and activity of the network or networks, easily identify erroneous or problematic messages, inspect messages content down to the bit level, and easily share scenarios of interest with colleagues, vendors, or customers using integrated built-in tools.

Data analysis is accomplished within the following analyzer sections:

The Time View window provides a unique two dimensional view of transmitted messages in the network. This is a time-line view that provides easy understanding of transactions and other time related processes. In a beacon network this view shows message transmission times relative to the beacon gridline verifying correct message timing. Messages can be sorted along the vertical axis by device ID, network (PAN) ID, or channel.

The Message View window allows to dive down to the bit level of message fields. The fields' content is shown numerically and textually, with text and hints showing the field name, description, and meaning of the current value. Data is displayed in an intuitive graphical structure allowing expansion or collapse of sub fields. Additionally fields deduced by the analyzer as well as data deciphered (for encrypted fields (when relevant) are clearly marked. These features greatly facilitate quick understanding, eliminating the need to refer to off-line documentation.

The Network View window shows the network topology and elements. Each device is drawn according to its type (e.g. coordinator, router, FFD) with hints showing all known information for the device. Links between devices and routes are clearly displayed. Devices can be also drawn over a map or floor plan. This view displays information on devices received directly by the analyzer as well as information received indirectly through other devices such as routes, coordinator assignments, neighbor lists, tunneling, etc.

Search for RF activity and Data Capture tool provides a picture of current RF activity by performing passive channel noise measurements. Passive and active search is used to help locate 802.15.4/ZigBee/6LoWPAN networks and devices, and then choose the channel for recording.

The Featured Toolbox provides even deeper analysis of captured data, including charts summarizing properties of captured data, flexible data search tools, message compare utilities, and data export tools to allow further analysis with external tools such as Excel and Wireshark.

Pack into Workspace - The full analyzer state including current view in each window, bookmarks, selected messages with their exact expended fields, message zoom status, and more can be easily saved and shared with colleagues for further inspection.

Peryton-D main features

- Full analysis of IEEE 802.15.4/ZigBee/6LoWPAN
  - IEEE 802.15.4-2006 and IEEE 802.15.4-2003 PHY and MAC layers
  - ZigBee and ZigBee-Pro NWL and APS layers
  - ZigBee RF4CE NWL and CERC (March 2009)
  - Decode MAC and NWL encrypted messages
  - 6LoWPAN (RFC 4944)
  - Captures data from any of the 16 channels within the 2.4Ghz band
  - Multiple antennas employing antenna diversity techniques for unmatched message reception
  - Graphical indication of channel noise level
  - Passive and active scan for 802.15.4/ZigBee/6LoWPAN devices and networks
- Smart Time View display
  - Shows message body and preamble, with color-coded message initiator and message content types
  - Displays beacon gridlines and beacon information (e.g. CAP, GTS)
  - Plots message time-lines sorted by ID, PAN ID and channel
  - Related messages (e.g. message and its ack) are connected with lines (including related data on the line's screen tips) for easier understanding of processes and transactions
  - Supports time bookmarks, for easy browsing between annotated time instances
- Intuitive Network View display
  - Shows directly received devices as well as indirectly received devices
  - Shows network devices, their type (e.g. Coordinator, Router, FFD, RFD) and all known properties
  - Shows neighbors, connections, and routes

- Devices can be drawn over a floor plan or map according to their actual location

- Friendly Message View window
  - Shows directly received devices as well as indirectly received devices
  - Shows message payload and PHY, MAC, NWL, APS[1] headers and payload
  - Shows field values, descriptions, and interpretation (including related data on the fields' screen tips)
  - Easy expansion/collapse of message sub-fields
  - Easy linking to messages in other windows
  - Automatic messages comparison
- Enhanced analysis tools and user settings
  - Flexible message searches from within any window by text, value, value range, screen-tip and field presence
  - Graphical summary of captured data properties
  - Exporting of detailed message analysis, including all fields and their interpretations, for processing by offline tools (e.g. Excel or WireShark)
  - The user can set the colors of different message types, connections (colors and line thickness), etc.
  - Use of Open Source Rules written for the analyzer (see following bullet)
- Customized Open Source Rules[2]
  - User defined statistics charts
  - Automatic setting of Time View message color and bookmarks
  - Automatic selection of relevant messages to Message View expanding the relevant fields
  - Automatic generation of events and e-mail notifications
  - Changing the device icons in the Network View
- Easy sharing
  - Full workspace state storage and recall for continued off-line analysis or sharing with colleagues, vendors or customers

[1] With the Peryton-SDK add-on, users proprietary protocol and application layers can be also displayed and analyzed

[2] With the Peryton-Monitor add-on installed