

Peryton-M

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

The Peryton-M analyzer is a fully featured, multi-channel 802-15.4/ZigBee/6LoWPAN protocol and network analysis tool. It is the first analyzer in the market capable of capturing data from all 16 channels in the 2.4 GHz band simultaneously. This is an essential tool for analyzing frequency related features such as "active scan", multi-network environment, device qualification, and more.

By using the Peryton-M analyzer, 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, IP address, MAC 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. Textual mode allow to see selected message fields in a table view. A tree View allow to see each one of the fields with its position over the message hexadecimal data stream.

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 and messages relevant to a specific link can be easily moved to the Message View window for detailed analysis. 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. Messages sent to/from a device or on a specific connections can be easily found with a single mouse click.

The Statistic View window allows dissecting data in easy to read pre-defined statistic charts and to get an overall picture on trends occurring within the network. The statistics charts can be shown for a specific channel or for all the channels being analyzed.

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 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 entire analyzer state including current view in each window, bookmarks, selected messages with their exact expanded fields, message zoom status, and more can be easily saved and shared with colleagues for further inspection.

The User Preferences window allows changing the default setups of the analyzer (colors, folders, predefined functional values) to match the preferred settings of the user.

Peryton-M 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 Profiles (ZSE, ZHC, ZHA, ZBA, ZTA, ZSL, ZIP)
 - ZigBee RF4CE NWL, ZRC (CERC) and ZID (HID) profiles
 - 6LoWPAN (RFC 4944, draft-ietf-6lowpan-hc-06), including IP, UDP, ICMP, TCP, HTTP, SOAP, DNS, DHCP, NR, Hop-to-Hop, Destination Options, Routing Header, Fragmentation Header
 - Decode encrypted messages
 - Captures data from all 16 channels within the 2.4Ghz band simultaneously
 - 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, IP address, Device 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, ZDP, Profiles¹ 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
 - Textual table view with user selected columns
 - Tree view for exploring fields with their location over the hexadecimal message data stream
- Statistics window
 - Graphical summary of captured data properties

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

- Enhanced analysis tools and user settings
 - Flexible message searches from within any window by text, value, value range, screen-tip and field presence
 - 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 Rules²
 - 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

Peryton-M available models

Peryton-M4 – for up to 4 simultaneous channels data capture capability

Peryton-M7 – for up to 7 simultaneous channels data capture capability

Peryton-M16 – capable to capture the whole 16 2.4GHz band channels simultaneously

² With the Peryton-Monitor add-on installed