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Wireless Protocol Suite Release Notes (BETA)

Updated: September 27, 2022

Overview

This document contains release notes for Wireless Protocol Suite software and various hardware products. For full instructions on using the software and the hardware, please see the user manual and other documents provided with the software.

1. Release Notes for 2.50

1.1. What's New

Release Notes	X500	X240	Sodera	802.11
Added support for HFP 1.90 and LC3 SWB playback.	*	*	*	
Added support for capturing 802.11 OFDMA data for one device.	*			
Added a python based sample automation script.	*	*	*	*
Added support to show bookmarks added to the Summary pane to other views, such as Timing Analysis, Spectrum, etc.	*	*	*	*

1.2. Bug Fixes

Release Notes	X500	X240	Sodera	802.11
Resolved an issue where Device Database is blank after stopping Record in Sodera+802.11 mode.			*	*
Resolved an issue showing special characters in Security pane.	*	*	*	
Resolved an issue where X240 firmware update showed downgrade complete after firmware upgrade.		*		
Improvements to HCI UART decoding when missing packets.	*	*	*	

1.3. Firmware Versions in Release 2.50

- X500 − FW: 202208151740; FPGA: 202207181138| 202207181100; CPLD: 4.11.

- X240 – FW: 202207180741; FPGA: 202207180902 (LE), 202207180753 (Classic); 202207181010 (Wi-Fi), 202207190620 (802.15.4); CPLD: 03.2.
- Sodera – FW: 202102221955; FPGA: 202204181613; PIC:1.12.
- 802.11 - FW: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

1.4.   *Expert Notes*

- We inform users about 250 device limit in the Timing Analysis view. We also recommend steps to help mitigate the problem: 1) Add filters in Wireless Filters tab in Record Options prior to recording. 2) Stop analyzing and deselect devices not of interest in the Device Database and analyze data again. 3) Turn on LE filters in Analyze options dropdown on the main toolbar.
- Users can now capture *full* Wi-Fi packets including 'data' extending the decoding beyond MAC layer or truncated packets for longer duration captures. Please use the software 1.70 and beyond to capture/view Wi-Fi capture files with full length packets. The software is backwards compatible only, which means, you can open and view old files in software but opening new files in the old software is limited.

1.5.   *Known Issues and Workarounds*

- After updating firmware on X500 to WPS 2.35 or later, the BT Rx1 LED does not illuminate if users go back to 2.20 or earlier. It is cosmetic and does not affect the data capture. The users are recommended upgrading to the latest software to avoid this backward compatibility issue.
- Occasionally when invalid data packets are received during a HCI UART capture users may see an error "HCI framing failure threshold exceeded. Please confirm HCI capture settings". The workaround is to stop and restart recording.
- Minor issues with Audio Expert window flickering when running the software on Windows 11.
- Reverting from WPS 2.10 to WPS 2.00 with the Wi-Fi 6e selected for capture can result in the Frontline X500 becoming unresponsive. *Workaround* If this occurs, shut down WPS and power cycle the X500. Then restart WPS with X500 and open the Record Options and turn off Wi-Fi and click OK. After that, you can reselect Wi-Fi on the Record Options and click OK and begin recording.
- When capturing Wi-Fi 5 using Frontline X500 hardware, it takes about 10 secs before new packets show up the first time you start recording for a session. Subsequent captures are faster. Also, there is no delay when capturing Wi-Fi 6/6e.
- Reanalysis of X500 captures that include Wi-Fi along with other technologies can show issues with timestamps/packet loss in the first few minutes of the capture.
- Users are recommended not to connect X240 and X500 on the same computer to avoid undesirable behavior, such as "Record Options" settings disappearing.
- When clicking on "Start Record" without saving the previous recording, users can save .CFA file but no SCAP or spectrum gets saved. SCAP allows reanalyzing data later. *Workaround*: To avoid this problem, ensure saving the file before starting new session. It works as expected if users close the software without saving the file. The "Save" prompt will allow users to save all data.

2. System Requirements

The following is a list of recommendations for the host machine that runs the Wireless Protocol Suite application and connects to Frontline hardware: X500, X240, Sodera, Sodera LE, and 802.11.
For optimal performance, the software should run on a recent generation computer. However, the software should also operate on machines that are below the minimum requirements specified here, at the cost of slower performance, provided the memory, storage and display requirements are satisfied.

2.1. Software

Operating System:

- Windows 10 & 11 with latest Service Pack.

2.2. Hardware

Processor:

- Core i5 processor at 2.7 GHz

Memory (RAM):

- This software application may use up to 4 GB of RAM in the host machine. For improved performance of the software, it is recommended that 8 GB of RAM be installed on the host machine.

Non-volatile Storage (SDD or Hard Disk):

- 250 MB is required for installing the Frontline Analyzer software on the host machine.
- At least 20 GB of additional storage space is needed for operation of the software application and for storing recorded data in files. Note that large captures can require multiple gigabytes and can quickly fill your available storage space.

Display:

- To take full advantage of the rich visualization and analysis of Wireless Protocol Suite application it is recommended that the display be set to at least 1050 lines of vertical resolution with at least 24-bit color depth.
- The minimum requirement for the display is a resolution of 1024x768 with at least 16-bit color depth.

3. Previous Release Notes
3.1. Release Notes for 2.40 (Release date: 8/5/2022)

3.1.1.   What's New

Release Notes	X500	X240	Sodera	802.11
Full support for Auracast broadcast audio. Updated all LE audio profiles to the latest released specification. Added two new sample files • Bluetooth LE Audio (LC3) Unicast.cfa • Bluetooth LE Audio (LC3) Broadcast.cfa	*	*	*	
Further updates to Bluetooth Channel Sounding draft FIPD r22 and HCI FIPD r13.	*	*	*	
Support for Wi-Fi WPA3 Enterprise decryption for 128-bit and 192-bit mode.	*	*		
Added support for ASHA encoded data playback.	*	*	*	
Added support for LDAC encoded data playback.	*	*	*	
Updates to UUIDs.	*	*	*	
Restored support for three panes in Raw data pane.	*	*	*	*
Restored back colors in raw data pane to match decode pane.	*	*	*	*
Added text to inform user about device limit in Timing Analysis view.	*	*	*	
Added support to decode Device Time Service (DTS).	*	*	*	
Improvements to HCI UART features • Improved autobaud feature to detect baud rate change during capture. • Fixed an issue where incorrect baud rate caused subsequent failures. • Fixed an issue with capturing logic signals at high rate.	*	*		

3.1.2.   Bug Fixes

Release Notes	X500	X240	Sodera	802.11
Minor stability improvements.			*	
Fixed an issue with Apple LEA G.722 mode 3 codec playback.	*	*	*	
Fixed decoding issue with Frame Control Power Management.	*	*		
Timing Analysis: Packet type hidden under certain zoom.	*	*	*	*
Resolved delay between BIS streams in AES.	*	*	*	
Resolved decode issues with "Attribute data".	*	*	*	
Improved showing mesh data In Timing Analysis view.	*	*	*	
Improved UI to indicate when filtering in no addresses.	*	*	*	
Improved AES for retransmissions/immediate repetitions.	*	*	*	
Fixed decoding error for EATT Packets.	*	*	*	
Improved stability.	*	*	*	

3.1.3.   Firmware Versions in Release 2.40

- X500 – FW: 202207131646; FPGA: 202207181138| 202207181100; CPLD: 4.11.

- X240 – FW: 202207180741; FPGA: 202207180902 (LE), 202207180753 (Classic); 202207181010 (Wi-Fi), 202207190620 (802.15.4); CPLD: 03.2.
- Sodera – FW: 202102221955; FPGA: 202204181613; PIC:1.12.
- 802.11 - FW: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.2.   Release Notes for 2.35 (Release date: 5/24/2022)
3.2.1.   What's New

Release Notes	X500	X240	Sodera	802.11
Added support for Antenna Diversity that utilizes both Bluetooth receivers (Rx1 and Rx2) for improved capture performance.	*			
Initial support for Channel Sounding HCI decoding.	*	*	*	
Improved LC3 audio playback to detect codec parameter automatically without user defined LC3.ini file.	*	*	*	
Added support for CAP v1.0 and PBP (VSr04).	*	*	*	
Updates to LE Audio specs – HAS d1.0r01, BAP d1.01r03, CSIS d1.0r01, PACS d1.0r01, BASS d1.0.1r00, MCP d1.0.1r00.	*	*	*	
Updated GATT Supplement Specification (GSS) to v6.	*	*	*	
Updated Battery Service (BAS) to v1.1.	*	*	*	
Added ability to export Stats view data.	*	*	*	*

3.2.2.   Bug Fixes

Release Notes	X500	X240	Sodera	802.11
Resolved an issue where X500 battery won't indicate fully charged.	*			
Resolved an issue with LC3 audio playback for 16kHz 32kbps.	*	*	*	

3.2.3.   Firmware Versions in Release 2.35

- X500 – FW: 202205131820; FPGA: 202204211101| 202204211025; CPLD: 4.11
- X240 – FW: 2021040270842; FPGA: 202204140914 (LE), 202201111312 (Classic); 202103311538 (Wi-Fi), 202103311631 (802.15.4); CPLD: 03.2 (No change).
- Sodera – FW: 202102221955; FPGA: 202102160739; PIC:1.12 (No change).
- 802.11 - FW: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.3.   Release Notes for 2.30 (Release date: 5/2/2022)
3.3.1.   What's New

Release Notes	X500	X240	Sodera	802.11
Initial support for the draft Bluetooth spec features: • Enhancements for Improved ISOAL Mode. • Decision-based Advertising Filtering.	*	*	*	

	X500	X240	Sodera	802.11
• HADM Channel Sounding (CS) LL decodes. • Encrypted Advertising Data (EAD). • Periodic Advertising with Responses (PAwR). • Coding Scheme Selection on Adv. (CSSA).				
Added support for 802.15.4 MAC protocol decoding.	*	*		
Timing Analysis now shows 802.15.4 packets.	*	*		
Support for HCI ISO.	*	*	*	
Support for GATT Constant Tone Extension Service (CTES).	*	*	*	
Support for GATT Binary Sensor Service (BSS).	*	*	*	
Support for A2DP 1.4 AAC object type decodes.	*	*	*	
Support for HFP 1.90 Super Wide Band (SWB) decodes.	*	*	*	
Support for Telephony Media and Audio Profile (TMAP).	*	*	*	
Updated 16-bit UUID to Rev 2022-04-04.	*	*	*	
Allows capturing spectrum data with full and truncated 802.11 packets.	*			
Added keyboard shortcuts for the following operations. • Start Record (Ctrl+E) • Start Analyze (Ctrl+Shift+E). • Clean (Ctrl+R) • Follow live (Spacebar)	*	*	*	*
Measurement modes are sticky in Timing Analysis view.	*	*	*	*
"Wi-Fi Security" dialog box is available in the main toolbar.	*	*		*
Added support for AAC-ELD codec for audio data playback.	*	*	*	
Added Role Summary Column to LE tabs - DATA/LL/SMP/CIS.	*	*	*	

3.3.2.   Bug Fixes

Release Notes	X500	X240	Sodera	802.11
Fixed an issue with MSC synchronization with other panes.	*	*	*	
Resolved an issue with SCMS-T protected audio playback.	*	*	*	
Improved playback for AAC-ELD data for Apple-LEA devices.	*	*	*	
Fixed an issue with AES extracted file naming.	*	*	*	
Resolved LE retransmitted packets were not yellow colored on WPS PER pane.	*	*	*	
Fixed X500 packet timestamps out of frame number order (WCI-2 + 5GHz) issue.	*			
Resolved HCI_LE_Create_CIS_Connection incorrect order of arrayed parameters in decode.	*	*	*	
Resolved an issue with "Attribute data".	*	*	*	
Resolved an issue with Timing Analysis view packets with zero delta.	*	*	*	
Resolved incorrect direction in MSC.	*	*	*	
Resolved an issue with Timing Analysis view nicknames.	*	*	*	
Resolved an issue in X500 - Values for Antenna Signal Measurements for 802.11 are not Populated.	*			
Improvements to WPS automation – • Resolved issues with exporting specific tabs • Allow auto reversal of LTK and Link Key via automation.	*	*	*	

	X500	X240	Sodera	802.11
Fixed an issue with supervision timeout parsing.	*	*	*	
Documentation updates for TKIP.	*	*	*	
Fixed an issue with Service Discovery GroupID attribute parsing.	*	*	*	
Fixed an issue with Analyzer toolbar missing in very rare cases.	*	*	*	
Search in Summary view does not highlight in decode pane.	*	*	*	*
Resolved retransmit rate was wrong for LE ISO packets.	*	*	*	
Resolved a stability issue with LiveImportAPI_x64.dll.	*	*	*	*
Resolved an issue with Virtual Sniffing warning popup.	*	*	*	*

3.3.3. Firmware Versions in Release 2.30

- X500 – FW: 202205101843; FPGA: 202204211101| 202204211025; CPLD: 4.11
- X240 – FW: 2021040270842; FPGA: 202204140914 (LE), 202201111312 (Classic); 202103311538 (Wi-Fi), 202103311631 (802.15.4); CPLD: 03.2 (No change).
- Sodera – FW: 202102221955; FPGA: 202102160739; PIC:1.12 (No change).
- 802.11 - FW: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.4. Release 2.20 (Release date: 2/1/2022)
3.4.1. What's New

Release Notes	X500	X240	Sodera	802.11
Added support for automation server for BR/EDR and LE in X500 (this feature is already supported in X240 and Sodera).	*			
Added support for automation server for Wi-Fi 5 and 6e in X500 (Wi-Fi 5 automation is already supported in X240).	*			
Added support for automation server for HCI UART and USB in X500 (this feature is already supported in X240 and Sodera).	*			
Added support for automation server for 802.15.4. Supports exporting data to .csv and byte format.	*	*		
Added support for automation server for spectrum.	*		*	
Improved timestamps for Wi-Fi 5 and Bluetooth Coexistence analysis.	*			
Added support for *beta* WPA3 decryption for 802.11 technology. WPA3 Decoder Updates per spec 802.11-2020 and 802.11ax_D8.0_Oct2020. *Note: Please contact technical support to get assistance on WPA3 decryption.*	*			
Support for 160 MHz channel width for 6/6e technology.	*			
Improved support for G.722 and Heimdall codecs for Apple LE Audio.	*	*	*	
Timing Analysis View: Added technology-based filters.	*	*	*	*
Timing Analysis (TA) View: Added option to add nicknames to devices (Bluetooth, Wi-Fi, wired, logic signals). Bluetooth custom device name in TA is synchronized with Bluetooth device database.	*	*	*	

	X500	X240	Sodera	802.11
Timing Analysis View: Added measurements on hover over logic signals.	*	*	*	
Timing Analysis View: Added ability to move vertically using hand mode.	*	*	*	
Added automatic/manual clean up options to device database.	*	*	*	
Improvements to FW update dialog window.	*	*	*	
Added Record Options to menu item.	*	*	*	
Added support to automatically scroll to raw data for a selected field in the decode view.	*	*	*	*
Added indication that release notes are also available in Welcome Tour in Help menu.	*	*	*	*
Added support for Windows 11.				

3.4.2. Bug Fixes

Release Notes	X500	X240	Sodera	802.11
Fixed a decoding issue with LMP_supervision_timeout.	*	*	*	
Fixed a ATT decoding error for virtual sniffing capture files.				
Fixed an issue with manually entering desired Baud Rate.	*	*	*	
Fixed a direction issue on CONNECT_IND in MSC.	*	*	*	
Improved BR/EDR capture performance in X240 and X500. Resolved an occasional issue with EDR synchronization detection.	*	*		
Improved opening capture files from MS OneDrive and .bes file type.	*	*	*	*
Fixed an issue where fields were not highlighted in decode view after search.	*	*	*	*
Fixed an issue where PBAP property mask bits were flipped.	*	*	*	
Fixed a minor issue with LL_CHANNEL_STATUS_IND decoding.	*	*	*	
Fixed an issue with MAP protocol filter decoding.	*	*	*	
Fixed an issue with erroneous "unknown channel" for Wi-Fi 6 GHz.	*			

3.4.3. Firmware Versions in Release 2.20

- X500 – FW: 202201242216; FPGA: 202201251303 | 202112270054; CPLD: 4.11
- X240 – FW: 2021040270842; FPGA: 202201241007 (LE), 202201111312 (Classic); 202103311538 (Wi-Fi), 202103311631 (802.15.4); CPLD: 03.2 (Update needed).
- Sodera – FW: 202102221955; FPGA: 202102160739; PIC:1.12 (No change).
- 802.11 - FW: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.5.　　Release 2.10 (Release date: 11/9/2021)
3.5.1. What's New

Release Notes	X500	X240	Sodera	802.11

	X500			

Added new features on X500 product (HCI is already supported on X240 and Sodera)
 	
• Support for Wi-Fi ax 2.4/5/6 GHz channels.
    ○ Spatial Streams 1 - 2
    ○ Channel Width 20, 40, 80 MHz
    ○ MCS 10/11 (1024 QAM)
• Support for HCI UART (H4, H5, BCSP, and WCI-2)
• Support for HCI SPI.
• Support for HCI USB (two ports).
• Support for Device Scanner for 2.4/5/6 GHz channels.
• Support for 802.11 ax Radio Tap decoding v2020.
• Support for optional external battery pack that allows about two hours of capture time.
	*			

Improved LHDC decoding.	*	*	*	

3.5.2. Bug Fixes

Release Notes	X500	X240	Sodera	802.11
The issue "Under certain known conditions, no packets show in the summary pane when clicking on Start Analyze" has been resolved now.	*	*	*	
Resolved the issue Stream RECONFIGURE transaction causes Audio Expert waveform to not display/playback.	*	*	*	
Resolved the issue AAC stream stops - 'Audio is muted' and 'Transport error' seen in Audio Expert System.	*	*	*	
Resolved timing issues with connecting three X240s that occurred on some PCs.		*		
Resolved an issue where Multi tech captures with Wi-Fi stop recording after some time with no reason.	*			

3.5.3. Firmware Versions in Release 2.10

- X500 – FW: 202111011734; FPGA: 202109080846 | 202109211115; CPLD: 4.10
- X240 – FW: 2021040270842; FPGA: 202103311449 (LE), 202103311400 (Classic); 202103311538 (Wi-Fi), 202103311631 (802.15.4); CPLD: 03.2 (No change).
- Sodera – FW: 202102221955; FPGA: 202102160739; PIC:1.12 (No change).
- 802.11 - FW: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.6.　　　Release 2.00 (Release date: 9/28/2021)
3.6.1. What's New

Introducing an All-in-one Wireless Protocol analyzer – Frontline X500. Includes two Bluetooth and Wi-Fi modules to capture all wireless technologies simultaneously. Details below:

- Supports capturing the latest Bluetooth 5.3 specification - **Bluetooth BR/EDR and LE**.
- Supports **capturing Wi-Fi 5 a/b/g/n/ac 4x4** (both truncated and full packets). Channels 20, 40, 80 MHz, 256 QAM. (Support for "Network Scanning" and Wi-Fi 6e is coming in the next release).
- Supports **capturing 802.15.4** technology.
- Supports **capturing 2.4 GHz spectrum**.
- **Automatic and manual gain** controls of Bluetooth radios. AGC is ON by default.
- Supports capturing up to **24 logic signals** via three logic pods.
- Supports **Excursion** captures.

Release Notes	X500	X240	Sodera	802.11
Introducing a new docking framework to allow custom views. • When you click and drag the title bar of a pane, a guide diamond appears. During the drag operation, when the mouse cursor is over one of the arrows in the diamond, a shaded area will appear that shows you where the window docks if you release the mouse button now. • Resolves an issue where settings reset when moving Windows on multiple monitors. • Allows docking panes in an undocked pane. • Indicates which pane is in focus with color coding. • Allows any number of splits horizontally and vertically. • Allows changing the width and height of the panes. • Allows docking panes by grabbing the top or bottom of a pane.	*	*	*	*
Improved "Record Options" dialog with new user interface.	*	*	*	
User interface improvements to the 'Capture File Changing' dialog.	*	*	*	*
User interface improvements to the Packet Error Rate view. Updates to tooltips.	*	*	*	
Updated 16-bit UUID to Rev 2021-09-21.	*	*	*	
Support for official BAP decoders v1.0.	*	*	*	
Updates to HAS decoders d09r02.	*	*	*	
Added a new sample capture files for Bluetooth Audio LE.	*	*	*	
Updates to Wi-Fi decoders to 2016 specification.	*	*		*

3.6.2. Bug Fixes

- Fixed MSC to show baseband connection created event some layers.
- "Updated channel map used" event points to the expected packet/time/event in MSC.
- Fixes to adjust scaling used for Absolute Volume 0,1.

3.7.   Release 1.80 (Release date: 8/3/2021)
3.7.1. What's New

Release Notes	X240	Sodera	Sodera LE	802.11
Improvements to the Wi-Fi packet decoding.	*			*
Added support for virtual sniffing to allow sniffing HCI data via LiveImport API.				
Added support to export 802.15.4 raw packets to pcapng format.	*			
Improved pcapng export feature. Added support to allow exporting data from GUI.	*	*	*	*
Allows "Byte export" via Automation.	*	*	*	*
Added support to analyze LE packets with CRC errors.	*	*	*	
Official support for Bluetooth 5.3 released specification.	*	*		
Updated terminologies according to the Bluetooth 5.3 specification for Central/Peripheral, etc.	*	*	*	
Updates to Hearing Aid Spec (HAS) decoders to d09r02.	*	*		
Updates to Apple Hearing Aid decoders to R36.	*	*	*	
Improvements to Timing Analysis view. Supports navigation bar feature. Improved showing packet type information when zoomed out to certain level.	*	*	*	*
Enhanced tooltips information for various Views.	*	*	*	*
Added 10ms & 20ms zoom option for LE Timeline.	*	*	*	

3.7.2. Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Resolved DUT1 and DUT2 show same address for two CIS streams in Audio Expert.	*	*	*	
Fixed an issue in Message Sequence chart that showed some AUX ADV coming from wrong side.	*	*	*	
Improved BIS capture to account for the Extended Adv packet having the TxPower bit set in the packet when calculating the offset to the ACAD data.	*	*		
Minor enhancements to HTML export.	*	*	*	*
Fixed MAP decoder issue related to folder-listing version.	*	*		
Fixed an issue to show Japanese characters appropriately in title bar and recent files.	*	*	*	*
Expandable nodes field can be added in the Summary pane as separate column to ease debugging.	*	*	*	*
Fixed event counter issue when error packets for LE overlap.	*	*	*	
Fixed an issue with incorrect direction for large connection interval.	*	*	*	
Fixed stability issue with BIS data.	*	*		
Minor decoding fixes to HCI_LE_Set_Extended_Advertising_Enable command.	*	*	*	
Fixed a decoding issue with WCI-2 data.	*	*		

Release Notes	X240	Sodera	Sodera LE	802.11
Improved software behavior where orphaned processes caused undesirable behaviors.	*	*	*	

3.8.　　　Release 1.73 (Release date: 7/13/2021)
3.8.1. Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Cleaned up installers.	*	*	*	*

3.9.　　　Release 1.72 (Release date: 6/22/2021)
3.9.1. Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed a licensing issue with X240.	*			

3.10.　　　Release 1.71 (Release date: 6/4/2021)
3.10.1.　　　Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed software update notification that erroneously indicated that there was no internet connection.	*	*	*	
Minor documentation updates	*			
Fixed an issue with recognizing Bluetooth Expert license.	*	*	*	

3.11.　　　Release 1.70 (Release date: 5/4/2021)
3.11.1.　　　What's New

Release Notes	X240	Sodera	Sodera LE	802.11
Added support to capture **full Wi-Fi packets** using X240. Please see Expert Notes #1 below.	*			
Added support for filtering **FCS and Frame Type** packets for improved Wi-Fi capture performance.	*			
Added support to capture **HCI SPI** using X240 hardware. Supports timing measurement of these packets in "Timing Analysis" view.	*			
Migrated Logic Analyzer view as dockable pane and rebranded as **Timing Analysis view** to improve usability. The view is available through View menu item in toolbar.	*	*	*	*
Migrated **Security view as a dockable pane**. The view is available through View menu item in toolbar.	*	*	*	
Updated decoders for **HFP** v1.80, **A2DP** v1.3.2, **MAP** v1.4.2 and **PBAP** v1.2.3.	*	*		

	X240	Sodera	Sodera LE	802.11
Update **BAP** to validation_r16 Update **ASCS** to validation_r11 Update **PACS** to validation_r08 Update **BASS** to validation_r12	*	*		
Updates for **Bluetooth Sydney spec** – LE Enhanced connection update and AdvDataInfo in periodic advertising.	*	*		
Updated **CCP/TBS/GTBS/MCP/MCS** to revision 1.0.	*	*		
Updated **16-bit UUID** and Company ID.				
Added support for **show MIC** for both encrypted and decrypted CIS and BIS data.	*	*		
Added support to display **CIS payload counter** for all CIS packets.	*	*		
Added support for saving setting for **Raw Data** view.	*	*	*	*

3.11.2.   Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed multiple issues with CIS data packets decryption.	*	*		
Enhanced decoding for identifying vendor-specific A2DP commands.	*	*		
Improved display of HID report.	*	*		
Fixed an issue where occasionally Sodera stopped showing new devices in the software.	*	*		
Fixed an issue where DM3 packets are shown as 2DH3 packet types.	*	*		
Fixed an issue with mesh decoding related to sensor cadence status/set message.	*	*	*	
Fixed an issue with SPP packets were decoded as SCO improperly.	*	*		
Fixed an issue with link key copy paste.	*	*		
Stability improvements.	*	*	*	
Fixed an issue with packet tool tips in "Coexistence" view.	*	*	*	*
Improved X240 connectivity on certain PCs.	*			
Fixed an issue where default 'My Capture Files' save location not sticking.	*	*	*	*
Fixed a decoding issue with AdvData field for AUX packets not formatted into AD Elements.	*	*		
Updated Application Error Codes for GATT.	*	*	*	
Fixed an issue when it's all-zero IRK on Public Addresses triggered an auto-checkbox to Analyze.	*	*	*	
Fixed typos for some fields using microseconds.	*	*	*	

3.11.3.   Firmware Versions in Release 1.71

- X240 – Firmware: 202104020709; FPGA: 202103311538 (LE), 202103311400 (Classic); 202103311538 (Wi-Fi), 202103311631 (802.15.4); CPLD: 03.02 (**FW update required**).

- Sodera – Firmware: 202102221955; FPGA: 202102160739; PIC:1.12 (**FW update required**)
- Sodera LE – Firmware: 2.03; FPGA 16908385 (No change)
- 802.11 - Firmware: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.12.   Release 1.60 (Release date: 2/1/2021)
3.12.1.   What's New

Release Notes	X240	Sodera	Sodera LE	802.11
LE Audio updates: Added support for the following LE profile and services: * Bluetooth Audio Profile (BAP) validation_r07, BASS validation_r03, PACS validation_r03, ASCS validation_r05. * Audio Input Control Service (AICS) v1.0 * Microphone Input Control Service (MICS) d1.0r01 * Volume Control Offset Service (VOCS) v1.0 * Volume Control Service (VCS) v1.0 * Coordination Set Identification Service (CSIS) d1.0r06 * Hearing Aid Service (HAS) d07r05 * Updated adopted 16-bit UUID as on 2021-01-07.	*	*		
Bluetooth 5.2 Spec updates: Added support for BIS Subevent type classification.	*	*		
Bluetooth 5.2 Spec updates: Shows BIS payload counter for all BIS packets.	*	*		
Add support to show **ISO CIS/BIS packet on Throughput, Stats, Logic Analyzer and Coexistence view.**	*	*		
Migrated **Wireless Device dialog to a dockable pane**. Users can select, edit, search, etc., wireless devices from the main application.	*	*	*	
Support for **802.15.4** PHY packets at 250 kbps. Capture simultaneously with other technologies, such as LE using multiple hardware and CrossSync technology.	*			
Added capability to **auto detect baud rate** when configured for HCI UART.	*			
Added support for **Wi-Fi Device scanner** to help select channel to capture the data.	*			
Added "**Update PM**" button to check/update Premium Maintainence through the software.	*	*	*	

3.12.2.   Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed a decoding issue with HCI: Set CIG Parameters - RTN parameter marked as error	*	*		
Fixed an issue with opening capture files with Japanese character file name.	*	*	*	*

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed an with issue opening capture HCI btsnoop file.	*	*		
Fixed a packet reassembly issue with ISOAL framed PDUs.	*	*		
Fixed a minor handsfree +BIND decoder bug.	*	*		
Fixed a minor ATT_FIND_INFORMATION_RSP decoding issue.	*	*	*	
Fixed an issue with decoding Attribute ID 0x0023000b appearing as "unknown" for PnP SDP records.	*	*		
Fixed a minor decoding issue with OBEX Header - ApplicationParamaters - Tag (ID).	*	*		
Fixed Minor class - 'undefined' format is inconsistent with defined values format.	*	*		
Fixed automation server stability issue if 'Get... Info' or 'Get... FW' commands used before 'Start FTS'.	*	*		
Stability improvements.	*	*		

3.12.3. Firmware Versions in Release 1.60

- X240 − Firmware: 202101121016; FPGA: 202011171256 (LE), 202011171204 (Classic); 202101131201 (Wi-Fi), 202101071229 (802.15.4); CPLD: 03.02 (**FW update required**).
- Sodera − Firmware: 201911141635; FPGA: 202006090729; PIC:1.12 (No change)
- Sodera LE − Firmware: 2.03; FPGA 16908385 (No change)
- 802.11 - Firmware: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.13.   Release 1.50 (Release date: 11/06/2020)
3.13.1.   What's New

Release Notes	X240	Sodera	Sodera LE	802.11
Added initial support to **capture a/b/g/n/ac 802.11 packets** using X240 hardware. The data payload is truncated from the packets. This allows saving more packets in the capture file, faster processing, and not dropping packets. Users will be able to do the following operations: • Set channel (2.4 GHz and 5 GHz) • Set channel width (20, 40, 80) • Record/analyze/save/open 802.11 packets • Decode 802.11 packets with Radio Tap header (i.e. meta data) • Shows 802.11 packets on **all** views – Coexistence View, Throughput, Airtime Utilization, Logic Analzyer and Stats View. • Shows **RSSI** for 802.11 packets. • Capture 2.4 GHz **Spectrum** data along with 802.11 packets.	*			

	X240	Sodera	Sodera LE	802.11
• Capture 802.11 data via **Excursion** mode for PC free capture. • Capture 802.11 and **logic/UART data** simultaneously from a single hardware. • Added support to capture data based on **MAC addresses (**allows up to 8 MAC addresses).				
Added support for capturing **Bluetooth and 802.11 wireless** technologies simultaneously using multiple X240 hardware.	*			
Displays **packet's center frequency** in Decode pane, timeline and Coexistence View for BR/EDR and LE packets.	*			
Supports **HCI ISO data** classification for UART and USB.	*	*		
Support for Bluetooth LE Audio **LC3 playback** in Audio Expert for CIS and BIS data. Please see "2.3. Known Issues and Workarounds" below.	*	*		
Updated to the **latest support for BAP** to revision d09r07 and ASCS, BASS and PACS to revision d09r08.	*	*		
Added support for **Telephone Barrier Service** (TBS) and Call Control Profile (CCP) d1.0r00.	*	*		
Added support for **Media Control Service** (MCS) d09r12.	*	*		
Added support for **Bluetooth Sydney** draft spec d1.0r06_ext.	*	*		
Added support for **timing measurement in Logic Analyzer** view. The timing measurements are automatically shown when mouse hovers over a packet.	*	*	*	*
Improved **scroll and zoom feature** on Logic Analyzer view to **match** with the rest of the application.	*	*	*	*
Improved **packet selection between Logic Analyzer** and rest of the application. Selecting packet on the summary or other views automatically selects packets in Logic analyzer.	*	*	*	*
Displays **UTF-8 Japanese characters** in Raw data view profiles, such as MAP or AVRCP.	*	*	*	*

3.13.2.   Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixes the issue where CIS HCI packets were decoded as SCO with error.	*	*		
Fix for column created from duplicate field name shows only first field decoded.	*	*	*	
Shows reassembled packets correctly in the raw data pane.	*	*	*	*
Fixed a minor decoding issue with HCI AVRCP browsing.	*	*		
Fixed a Mesh decoding issue.	*	*	*	

Stability improvements.	*	*	*	*

3.14. Release 1.40 (Release date: 8/18/2020)

Release Notes	X240	Sodera	Sodera LE	802.11
Explore the *new* analyzer toolbar to manage hardware settings from within the main application. Check out the "Welcome Tour" that guides you through the new changes when you launch the software for the first time or via "Help" menu later.	*	*	*	
Added support to capture Bluetooth Classic and LE data using two X240 hardware synchronized using a CATC Sync cable.	*			
Added support for Bluetooth 5.2 ISOAL features for CIS and BIS.	*	*		
Added a toolset to export 802.11 packets to pcapng format.				*
Added support to reassemble packets for Authorization Control Profile (ACP).	*	*		
Added sample captures. Links to the capture files are available on the Start page or via the File menu.	*	*	*	*
Improvements to the Stats view to show stats on each technology row.	*	*	*	*
Added C# sample for Automation.	*	*	*	*
Added the ability to open the relevant help section of the user manual via F1.	*	*	*	*
Indication of a view's current open/close status added to View menu.	*	*	*	*

3.14.1. Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed an issue with identifying direction on the first CIS Event Counter packet.	*	*		
Fixed an issue where VERSION_IND packets were marked with incorrect BDADDR.	*	*	*	
Fixed an issue with unexpected header bytes in SBC frames.	*	*		
Fixed an issue with capturing 2M AUX_ADV_IND or subsequent AUX_CONNECT packets in Sodera LE.			*	
Fixed a stability issue with MWS-WCI2.	*			
Fixed an issue where frame lost focus after adding bookmark and users were unable to navigate using arrow keys.	*	*	*	*
Fixed an issue where bookmark shortcut executes twice.	*	*	*	*
Fixed an issue with navigating using keyboard keys (arrows up/down) in the Decode pane.	*	*	*	*

Fixed an issue in the Coexistence view where error packets were not outlined in red.	*	*	*	*
Fixed an issue with column filtering LMP opcode.	*	*		
Fixed a decoding issue with 'Conn_Latency' field units.	*	*		
Fixed an issue with HTML export of baseband layer.	*	*	*	
Significant performance and stability improvements.	*	*	*	

3.14.2.   User Notes

- The following analyzers - Sodera, Sodera LE, X240 and 802.11 are **compatible** with laptops with Device Guard Credential software.
- It is occasionally observed that on certain laptops, the X240 analyzer does not connect back after firmware update. To fix the problem, disconnect all power sources to the analyzer and connect again.

3.14.3.   Firmware Versions in Release 1.40

- X240 – Firmware: 202007151427; FPGA: 202007230758 (LE), 202007230700 (Classic); CPLD: 03.02 (**FW update required**).
- Sodera – Firmware: 201911141635; FPGA: 202006090729; PIC:1.12 (**FW update required**)
- Sodera LE – Firmware: 2.03; FPGA 16908385 (No change)
- 802.11 - Firmware: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.15.   Release 1.30 (Release date: 5/11/2020)

Release Notes	X240	Sodera	Sodera LE	802.11
Allow capturing data for wired technologies – 16 Logic signals and HCI-UART.	*			
Added Hotkey options for various common operations.	*	*	*	*
Added ability to drag n' drop fields from "Decode" view to "Summary" view as a new column.	*	*	*	*
Added ability to dynamically expand/collapse tree nodes in "Decode" view based on packet context.	*	*	*	*
Added ability to grab pane via left click on the mouse and make small moves in the pane.				*
Added support to Channel Map Update Indication (0x28) and LE Supported Features (0x27) that comes over ACAD.	*	*		
Added a new "Stats View" to show data rates for BR/EDR, LE and 802.11 packet by data types and rates.	*	*	*	*
Added support for aptX-HD decode, playback and export.	*	*		
Added a new "Automatic Gain Control" feature that helps user control the gain on the hardware and improves sensitivity in the upper range.	*			

Release Notes	X240	Sodera	Sodera LE	802.11
Added a new "Manual Gain Control" feature that lets user control the gain manually in preset intervals.	*			
Added a toolset to export LE packets to Wireshark.	*	*	*	
Further improvements to ISOC-BIS decryption.	*	*		
Improvements to column filtering on "Summary" View.	*	*	*	*
Added support for BAP Profile – BASS, ASCS, and PACS services.	*	*		
Added an option to synchronize PER Stats with other views.	*	*	*	
Minor improvements to Logic Analyzer view.	*	*	*	

3.15.1.   Bug Fixes

Release Notes	X240	Sodera	Sodera LE	802.11
Fixed burst number (BN) decoding bug in the LL_CIS_REQ PDU.	*	*		
UPF65: Fixed an issue with LEPC decoding of TxPower in LL_POWER_CHANGE_RSP and L_POWER_CHANGE_IND.	*	*		
UPF65: Fixed an issue with traversal of BIS data packets with CRC errors.	*	*		
UPF65: Fixed UUID mapping issue with ATT_Multiple_Variable_RSP in EATT.	*	*		
Fixed an issue with remembering last file location folder.	*	*	*	*
Fixed an issue where close LAP addresses caused failure to decrypt data during reconnection.	*	*		
Fixed several issues with Automation feature.	*	*	*	*
Stability improvements while saving large capture files.				*

3.15.2.   Firmware Versions in Release WPS 1.30

- X240 – Firmware: 202005071347; FPGA: 202004061643 (LE), 202005061533 (Classic); CPLD: 03.02 (FW update required).
- Sodera – Firmware: 201911141635; FPGA: 202001271042; PIC:1.12 (No change)
- Sodera LE – Firmware: 2.03; FPGA 16908385 (No change)
- 802.11 - Firmware: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.16.   Release 1.21 (Release date: 3/14/2020)

Release Notes	X240	Sodera	Sodera LE	802.11
Performance improvements to the Frontline X240 analyzer.	*			

- Firmware Versions in Release WPS 1.21
  - X240 – Firmware: 202002270737, 202002270842; FPGA: 202003120018; CPLD: 03.02 (FW update required).

- o Sodera – Firmware: 201911141635; FPGA: 202001271042; PIC:1.12 (No change)
- o Sodera LE – Firmware: 2.03; FPGA 16908385 (No change)
- o 802.11 - Firmware: FPGA: 2.9; Application: 1.5; Interface: 1.4 (No change)

3.17.   Release 1.20 (Release date: 1/31/2020)

Release Notes	X240	Sodera	Sodera LE	802.11
Added support for Bluetooth 5.2 BIS decryption.	*	*		
Added support for Bluetooth 5.2, HCI commands (CIS/BIS).	*	*		
Added support for Bluetooth 5.2 feature - Power Control (LE and HCI)	*	*		
Added support for Bluetooth 5.2 feature - EATT (LE and HCI).	*	*		
Added support for ASHA protocol decoding.	*	*		
Added a toolset to export BR/EDR packets to Wireshark.	*	*		
Added a new feature "Airtime Utilization" that shows packet duration over time for Bluetooth and Wi-Fi packets.	*	*	*	*
Introduced a new feature to allow filtering on columns in Summary Pane. Please see user manual to learn more about the feature.	*	*	*	*
Added support for Automation. Compatible with previous scripts using Legacy software.	*	*	*	*
Updated decoders and methods support to Visual Studio 2019. Customers should recompile their existing methods in Visual Studio 2019.	*	*	*	*
Improvements to Zoom functionality. Added consistency across all views.	*	*	*	*
Added legend to Timeline and Coexistence views. In the view, go to "Display" and select "Show Legend".	*	*	*	*
Resolved an issue related to not capturing BIG INFO on sub-event 0.	*	*		
Fixed decoding of LE extended header (ACAD).	*	*	*	
Fixed a Subinterval decoding issue.	*	*		
Fixed an issue where packet footnote text overlapped at certain Zoom level.	*	*	*	*
Fixed an issue where packets were delayed in high RF environment.		*		
Fixed a minor decoding issue with HCI supervision timeout.	*	*	*	*

3.18.   Release 1.10 (Release date: 12/18/2019)

- Launching a brand new Frontline X240 Wireless Wideband Analyzer. Please refer to datasheet and QSG to learn more about the hardware.

- o Supports capturing released and draft Bluetooth specs for both Bluetooth BR/EDR and LE.
- o Supports capturing spectrum data.
- o Supports Excursion mode for PC free captures.
- o Flexible configuration options are available.
- o Note: For the best user experience, it is recommended to use the X240 analyzer on a PC that supports USB Power Delivery.
- Known Issue: Occasional issues with USB connection and enumeration.
- No changes in other products – Frontline Sodera, Sodera LE, and 802.11.

3.19. Release 1.01 (Release date: 11/19/2019)

Release notes	Sodera	Sodera LE	802.11
Added scale markers for Throughput view.	*	*	*
Added show packet and packet outline in Coexistence View.	*	*	*
Added a feature to copy data from Decode pane.	*	*	*
Added support for decoding characteristics for Authorization Control Service (ACS).	*	*	
Early access support for Bluetooth Milan.SPEC.d1.0r06_CSS.d9.0r06_ext sniffing. Supports capturing and decoding all CIS data. Supports capturing and decoding unencrypted BIS data.	*		
Fixed an issue where occasionally Sodera failed with error message "signal strength too strong".	*		
Fixed a decoding issue with HCI decode for "AVDTP_GENERAL_REJECT".	*		
Added shortcut for release notes on Start Page.	*	*	*
Added support to capture 802.11 data using Frontline 802.11 hardware.	*		
Added support to capture Bluetooth and 802.11 data concurrently using ProbeSync functionality.	*		*
Added a feature to show number of bytes for highlighted field in decode pane.	*	*	*
Added a feature to show multiple panes (e.g. hex and binary pane) simultaneously. Please note - the user settings are not persistent after closing and reopening the application.	*	*	*
Added functionality to zoom using mouse wheel + CTRL key on various views.	*	*	*
Updated to Apple Accessory Interface Specification Release R31 for LEA, iAP and hearing aid.	*		
Resolved an issue related to pasting security information (Link key, LTK) from external program, e.g. btsnoop files.	*	*	
Other bug fixes and stability improvements.	*	*	*

Firmware Versions in Release WPS 1.01

- X240 – Firmware: 202001281019; FPGA: 202001270852; CPLD: 03.01

- Sodera – Firmware: 201911141635; FPGA: 202001271042; PIC:1.12
- Sodera LE – Firmware: 2.03; FPGA 16908385
- 802.11 - Firmware: FPGA: 2.9; Application: 1.5; Interface: 1.4

User notes

On certain systems running McAfee anti-virus or Device Guard software, they might interfere with software installation process, causing some or all of the following issues:

- "Driver Installer" error during the installation.
- Frontline Protocol Analysis application fails to launch after installation.
- Delay in receiving packets from the hardware.

Software packages signed by Teledyne LeCroy, Inc., do not contain any malware nor viruses. If you encounter any of these issues, please contact your IT administrator about adding Teledyne LeCroy, Inc in whitelist or exception list.

3.20.   Release 1.00 (Release date: 8/9/2019)

- Launching new "Wireless Protocol Suite" application based on feedback from customers to improve user experience with "ComProbe Protocol Analysis Software (CPAS)" software.
- The "Main Window" with single docking framework contains most views.
- The new "Start Page" shows connected hardware, recent files and other useful links for easy access.
- Modern toolbar buttons and revised menu items for contemporary look and ease of use.
- Simplified, standardized and improved various plugins by removing visual clutter, and redundant items.
- Supports data capture using Frontline Sodera and Sodera LE hardware.
- Compatible with CPAS captures file created with Sodera or Sodera LE hardware.
- The software installs under new location - "Teledyne LeCroy Wireless" folder in Start Menu.

User Notes

- Premium Maintenance (PM) *must* be up to date to use the new software. PM status can be check via Renew PM tool or through Event log in Sodera Datasource Window.
- To capture data with other hardware, such as BPA range of products and HSU, please use old CPAS software.
- To open capture files created with other hardware, such as BPA range of products and HSU, please use old CPAS software.
- Support for Automation is coming in the future releases.
- Beta support for custom decoders and methods is included in this release. Users must copy methods and decoders files from old location "user\Public\Documents\Frontline Test Equipment" to the new location "\Users\Public\Documents\Teledyne LeCroy Wireless" and recompile custom methods.
- Support for Live Import API is not included in this release.

- Older versions of the Apple LE Audio decoder fileset is not support in Wireless Protocol Suite software. Please contact to Teledyne LeCroy Support to receive an updated version of the Apple LE Audio fileset.
- Some performance degradation seen on large captures performed overnight.

4. Support

Online Download
Please periodically check Teledyne LeCroy Protocol Solutions Group's web site for software updates and other support related to this product. Software updates are available to those users with current Maintenance Agreements.

Web (SW downloads): http://www.fte.com/products/default.aspx

Online Support
Web: http://www.fte.com/support/supportrequest.aspx
E-Mail: Frontline_TechSupport@Teledyne.com

Sales Information
Web: http://www.fte.com/support/supportrequest.aspx