

# Wireless Protocol Suite (**BETA**) Release Notes

Updated: December 17, 2020

This software is made available to allow for early evaluation and testing of new functionality and enhancements before it is formally released. The software is still under active development and has not completed product design verification or quality assurance. This software is intended for use only by the person or organization that Teledyne LeCroy had provided the software to, and only for the purpose of evaluation. Please do not distribute this software to other people inside or outside your organization.

## 1. 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.

## 2. Release Notes for 1.60

### 2.1. *What's New*

Release Notes	X240	Sodera	Sodera LE	802.11
Bluetooth Spec updates: Added support for Audio and Microphone Input Control Service (AICS d1.0r04 and MICS d09r07).	*	*		
Bluetooth Spec updates: Added support for BIS Subevent type classification.	*	*		
Initial support for 802.15.4 technology. Captures 802.15.4 PHY packets at 250 kbps.	*			
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.	*			

### 2.2. *Bug Fixes*

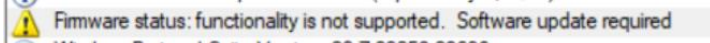
Release Notes	X240	Sodera	Sodera LE	802.11
Fixed an with issue opening capture HCI btstnoop file.	*	*		
Fixed a packet reassembly issue with ISOAL framed PDUs.	*	*		
Fixed a minor handsfree +BIND decoder bug.	*	*		
Fixed a minor ATT_FIND_INFORMATION_RSP decoding issue.	*	*	*	
Fixed an issue with decoding Attribute ID 0x0023000b appearing as “unknown” for PnP SDP records.	*	*		
Stability improvements	*	*		

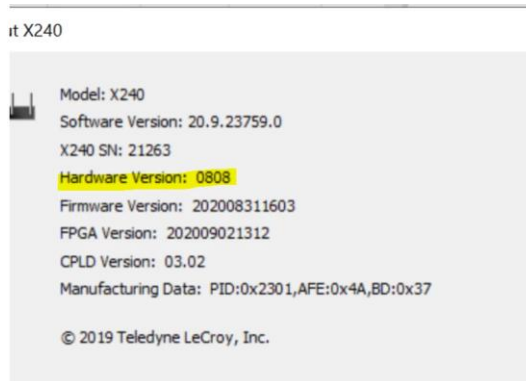
## 2.3. *Known Issues and Workarounds*

- We have added support for Bluetooth LE Audio playback for LC3 encoded CIS and BIS data. The software extracts audio configuration information from the OTA LE data. However, users who are still developing this feature can force the playback via a ini file.

1. Create a file lc3.ini in C:\Users\Public\Documents\Teledyne LeCroy Wireless\lc3.ini.
2. Add the content based on your codec configuration to the ini file, for example

```
[LC3]
SampleRate=48000
FrameDuration=10
Channels=1
OctetsPerFrame=120
LC3BlocksPerSDU=1
```

- The captures created with WPS 1.50 software cannot be reanalyzed with previous versions of the software. User will be able to open the CFA but SCAP file (used for reanalysis) will not work and will prompt users to upgrade to latest software - "This capture file has some unsupported content. For best results, upgrade SW." User will be able to open all old captures with the new software.
- After loading WiFi feature on X240, users cannot use an older version of the software, such as 1.40 or earlier. They will see a message in the "Event log" asking them to upgrade their software.  
  
Alternatively user can load Bluetooth feature on X240 via "Record Options" to allow them to correctly use an older version of the software.
- Occasionally, after loading the new firmware on X240, the unit disconnects and does not appear in the software. To resolve the problem, disconnect the hardware and completely power down the unit and reconnect.
- While capturing standalone 802.11 data with X240 with spectrum, users are highly recommended to capture at 200 usecs resolution to avoid performance and stability issues at higher resolution, such as 50 usec or 20 usec.
- While capturing Bluetooth and 802.11 using multiple X240 hardware, users are highly recommended to enable spectrum on the Bluetooth hardware to avoid performance issues.
- Users are recommended to only reanalyze the data after the prior analysis has completed.
- Please use X240 hardware version 0808 only as shown in the screenshot below:



### 3. System Requirements

The following is a list of recommendations for the host machine that runs the Wireless Protocol Suite application and that connects to Frontline hardware: 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.

#### 3.1. Software

##### **Operating System:**

- Windows 10 (32 and 64 bit) with latest Service Pack.

#### 3.2. 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.

## 4. Previous Release Notes

### 4.1. Release 1.50

#### 4.1.1. What's New

Release Notes	X240	Sodera	Sodera LE	802.11
Added initial support to <b>capture a/b/g/n/ac 802.11 packets</b> 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: <ul style="list-style-type: none"> <li>• Set channel (2.4 GHz and 5 GHz)</li> <li>• Set channel width (20, 40, 80)</li> <li>• Record/analyze/save/open 802.11 packets</li> <li>• Decode 802.11 packets with Radio Tap header (i.e. meta data)</li> <li>• Shows 802.11 packets on <b>all</b> views – Coexistence View, Throughput, Airtime Utilization, Logic Analyzer and Stats View.</li> <li>• Shows <b>RSSI</b> for 802.11 packets.</li> <li>• Capture 2.4 GHz <b>Spectrum</b> data along with 802.11 packets.</li> <li>• Capture 802.11 data via <b>Excursion</b> mode for PC free capture.</li> <li>• Capture 802.11 and <b>logic/UART data</b> simultaneously from a single hardware.</li> <li>• Added support to capture data based on <b>MAC addresses</b> (allows up to 8 MAC addresses).</li> </ul>	*			
Added support for capturing <b>Bluetooth and 802.11 wireless</b> technologies simultaneously using multiple X240 hardware.	*			
Displays <b>packet's center frequency</b> in Decode pane, timeline and Coexistence View for BR/EDR and LE packets.	*			
Supports <b>HCI ISO data</b> classification for UART and USB.	*	*		
Support for Bluetooth LE Audio <b>LC3 playback</b> in Audio Expert for CIS and BIS data. Please see "2.3. Known Issues and Workarounds" below.	*	*		
Updated to the <b>latest support for BAP</b> to revision d09r07 and ASCS, BASS and PACS to revision d09r08.	*	*		
Added support for <b>Telephone Barrier Service (TBS)</b> and Call Control Profile (CCP) d1.0r00.	*	*		
Added support for <b>Media Control Service (MCS)</b> d09r12.	*	*		

Added support for <b>Bluetooth Sydney</b> draft spec d1.0r06_ext.	*	*		
Added support for <b>timing measurement in Logic Analyzer</b> view. The timing measurements are automatically shown when mouse hovers over a packet.	*	*	*	*
Improved <b>scroll and zoom feature</b> on Logic Analyzer view to <b>match</b> with the rest of the application.	*	*	*	*
Improved <b>packet selection between Logic Analyzer</b> and rest of the application. Selecting packet on the summary or other views automatically selects packets in Logic analyzer.	*	*	*	*
Displays <b>UTF-8 Japanese characters</b> in Raw data view profiles, such as MAP or AVRCP.	*	*	*	*

#### 4.1.2. 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.	*	*	*	*

## 4.2. Release 1.40

Release Notes	X240	Sodera	Sodera LE	802.11
Explore the <i>new</i> 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.	*	*	*	*

### 4.2.1. 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.	*	*	*	

### 4.2.2. 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.

### 4.2.3. Firmware Versions in Release WPS 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)

## 4.3. Release 1.30

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.	*			
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.	*	*	*	

#### 4.3.1. 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.				*

#### 4.3.2. 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)

## 4.4. Release 1.21

- Performance improvements to the Frontline X240 analyzer.

- No changes in other products – Frontline Sodera, Sodera LE, and 802.11.
- Firmware Versions in Release WPS 1.21
  - X240 – Firmware: 202002270737, 202002270842; FPGA: 202003120018; 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)

## 4.5. Release 1.20

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.	*	*	*	*

## 4.6. Release 1.10

- Launching a brand *new* Frontline X240 Wireless Wideband Analyzer. Please refer to datasheet and QSG to learn more about the hardware.
  - Supports capturing released and draft Bluetooth specs for both Bluetooth BR/EDR and LE.
  - Supports capturing spectrum data.
  - Supports Excursion mode for PC free captures.



- Flexible configuration options are available.
- *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.

## 4.7. Release 1.01

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.	*	*	*

### 4.7.1. 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

### 4.7.2. 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.

## 4.8. Release 1.00

- 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.

### 4.8.1. 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.

## 5. 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](mailto:Frontline_TechSupport@Teledyne.com)

## Sales Information

**Web:** <http://www.fte.com/support/supportrequest.aspx>

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SyncML decoder written by ARS Software GmbH, Munich/Germany, [www.ars2000.com](http://www.ars2000.com).

This product contains features utilizing the Qt open source library, licensed under LGPL.

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