SL1487A PC Software CCS Charging Protocol Trace Viewer SW Version 1.2.0



USER GUIDE

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Notices

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A DANGER	A DANGER notice indicates a (extremely) hazardous situation which, if not avoided, will result in death or serious injury. Do not proceed beyond a DANGER notice until the indicated conditions are fully understood and met.
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NOTICE	A NOTICE indicates to pay attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a NOTICE until the indicated conditions are fully understood and met.
NOTE	A NOTE refers exclusively to application notes without any security relevance.

1 Symbols

For this document, the following abbreviations apply:

API	Application Programming Interface
CCS	Combined Charging System
СРТ	Charging Protocol Trace Viewer
EXI	Efficient XML Interchange
GPL	General Public License
HAL	Hardware Abstraction Layer
NSS	Network Security Services
SDP	Service Discovery Protocol
TLS	Transport Layer Security
V2G	Vehicle to Grid
XML	eXtensible Markup Language

2 License Management

The usage of the Keysight Charging Protocol Trace Viewer requires a valid license.

With order fulfillment, you should have received an email with instructions on how to register and redeem a license using the Keysight Software Manager (KSM).

For further assistance with the PathWave License Manager setup, please follow the proceeding defined in Keysight Licensing Quick Start Guide.

For a comprehensive understanding, please consult the Keysight Licensing Administrator's Guide.

3 Installation

This section describes how to install the CCS Charging Protocol Trace Viewer and the corresponding plugins for Wireshark.

Requirements

The following requirements are needed for using this software:

- Windows 10/11 (64Bit)
- Wireshark Version 4.2.X (64Bit)
 - o https://www.wireshark.org/
- WinPcap 4.1.3 or Npcap (Implicitly enabled during Wireshark installation, install in WinPcap API-compatible Mode)
 - o https://www.winpcap.org/
- PathWave License Manager

NOTE

- o PathWave License Manager V2.7
- Please use Version 2.7 under Previous Versions and not 7.2

The Software was tested with the Wireshark Version 4.2.0 (v4.2.0-0-g54eedfc63953).

PathWave License Manager Version 2.7 was used.

Installing the Keysight Charging Protocol Trace Viewer - Decoder

NOTICE

If a previous version is already installed, make sure to deinstall it first to prevent update issues. Uninstallation can be done in Programs and Features in the Control Panel.

To install the *Keysight Charging Protocol Trace Viewer - Decoder* software, please use the following procedure (see also Figure 1 - Figure 3):

1 Double-click on the installation file to start the setup wizard and confirm the process with "*Next*" button.



Figure 1: CPT - Decoder Installation - Welcome and EULA

- 2 Accept the license agreement with "I Agree" option and click on "Next" button.
- 3 Select the default installation path and click on "*Next*" button.

Weysight Charging Protocol Trace Viewer - Decoder − □ × Select Installation Folder KEYSIGHT	
The installer will install Keysight Charging Protocol Trace Viewer - Decoder to the following folder. To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse". Eolder: C:\Program Files\Common Files\Keysight\ Browse Disk Cost Disk Cost Install Keysight Charging Protocol Trace Viewer - Decoder for yourself, or for anyone who uses this computer: Everyone Just me	The installer is ready to install Keysight Charging Protocol Trace Viewer - Decoder on your computer. Click "Next" to start the installation.
< Back Next > Cancel	< <u>B</u> ack Next > Cancel

Figure 2: CPT- Decoder Installation - Installation folder selection

NOTICE

If the CPT Decoder is used with Wireshark, the default installation path must be used.

4 Start the installation with the "*Next*" button, and the software will be installed on your machine. Once the installation is complete, you can close the window.

	Keysight Charging Protocol Trace Viewer - Decoder – – × Installation Complete KEYSIGHT
Keysight Charging Protocol Trace Viewer - Decoder is being installed. Please wait	Keysight Charging Protocol Trace Viewer - Decoder has been successfully installed. Click "Close" to exit.
< Back Next > Cancel	< Back Close Cancel

Figure 3: CPT - Decoder Installation - Installation progress and completion window

Installing the Keysight Charging Protocol Trace Viewer

NOTICE

If a previous version is already installed, make sure to deinstall it first to prevent update issues. Uninstallation can be done in Programs and Features in the Control Panel. To install the *Keysight Charging Protocol Trace Viewer*, please use the following procedure (see also Figure 4 - Figure 7):

1 Double-click on the installation file to start the setup wizard and confirm the process with "*Next*" button.

The installer will guide you through the steps required to install Keysight Charging Protocol Trace Viewer on your computer. WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of I, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.	GNU GENERAL PUBLIC LICENSE Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed. <i>Preamble</i> The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software-to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to
< Back Next > Cancel	< Back Next > Cancel

Figure 4: Keysight CPT Installation - Welcome and GNU GPL 2 license notice

- 2 Confirm the GNU GPL v2 license notice with "Next" button.
- 3 Select the default installation path and click on "*Next*" button.

	Keysight Charging Protocol Trace Viewer − □ ×
Select Installation Folder	
The installer will install Keysight Charging Protocol Trace Viewer to the following folder. To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".	If this option is checked the source code for the dissectors will be installed to the user's programm application folder -> wireshark
Eolder:	Install dissector source code
C:\Program Files\Wireshark\ Browse	
Disk Cost	
Install Keysight Charging Protocol Trace Viewer for yourself, or for anyone who uses this computer:	
⊖ <u>E</u> veryone	
● Just <u>m</u> e	
< Back Next > Cancel	< Back Next > Cancel

Figure 5: Keysight CPT Installation - Installation path and source code

NOTICE

When prompted, select the installation path of Wireshark on your machine. If the wrong path is used, the dissectors cannot be used correctly.

4 As an option, the source code of the dissector can be installed under C:\Users\Username\AppData\Roaming\Wireshark\Source_Code_Wireshark_Disse ctor by enabling the checkbox "Install dissector source code".

Keysight Charging Protocol Trace Viewer – – × Confirm Installation KEYSIGHT	
The installer is ready to install Keysight Charging Protocol Trace Viewer on your computer. Click "Next" to start the installation.	Keysight Charging Protocol Trace Viewer is being installed. Please wait
< <u>Back</u> Next> Cancel	< <u>B</u> ack <u>N</u> ext > Cancel

Figure 6: Keysight CPT Installation - Installation progress

5 Start the installation with "*Next*" button, and the software will be installed on your machine. Once the installation is complete, you can close the window.

Keysight Charging Protocol Trace Viewer		_		×
Installation Complete	M K	FYS	SIGI	нт
Keysight Charging Protocol Trace Viewer has been successful	ully installed.			
Click "Close" to exit.				
< <u>B</u> ack	<u>C</u> lose		Cance	el

Figure 7: Keysight CPT Installation - Completion window

4 Keysight Charging Protocol Trace Viewer

Charging Protocol Trace Viewer

After the installation of the *Keysight Charging Protocol Trace Viewer* the plugin can be used in Wireshark. The CPT Decoder will always be executed with Wireshark on the startup. The decoder is started on port 1111 by default but can be changed to any number between 1023 and 65535 in the corresponding settings under **Tools** \rightarrow **Keysight CPT Plugin** \rightarrow **Keysight CPT Settings**. Besides that, the current decoder status is illustrated in the dissector settings as can be seen in Figure 8.

Keysight Dissector Setting	gs			
СРТ				
Decoder Status	Run	ning		
Port	1111	v A	Ар	ply / Restart
🚸 KEYSIG	HT			Close

Figure 8: Dissector settings for the CPT Decoder

NOTE A port change terminates all previous decoder processes and restarts them on the new port. This process may take a few seconds.

HAL Protocol

The CPT Decoder supports proprietary messages defined for the hardware abstraction layer (HAL). HAL messages consist of two parts: A header and a payload field. The protocol is used in the following scenarios:

- Internal VERISCO configuration messages for the CCS Hardware Test Adapter
- IEC 61851-1:2017 Control Pilot configuration and event messages related to PWM signal characteristics
- IEC 61851-1:2017 Proximity configuration and event messages

NOTICE

.pcap files with HAL messages that belong to previous Software versions released before 2021 are not displayed correctly due to major changes in the HAL library.

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72.709000 AAEONTec_70:4f:3a VERISCO HAL 60 RESET_ALL_ERRORS_REQ ACK_NOT_USED 72.710168 MS-NLB-PhysServe_AEONTec_70:4f:3a VERISCO HAL 60 RESET_ALL_ERRORS_RES ACK_NOT_USED 72.72060 MS-NLB-PhysServe_AEONTec_70:4f:3a VERISCO HAL 60 RESET_ALL_ERRORS_RES ACK_SUCCESS 72.702660 MS-NLB-PhysServe_AEONTec_70:4f:3a VERISCO HAL 60 MATCH_PERIODIC_STATUS 72.805032 MS-NLB-PhysServe_AEONTec_70:4f:7a VERISCO HAL 60 MATCH_PERIODIC_STATUS 72.902382 fe80::207:32ff:ffe80::207:32ff:f_Fe70_V26 ISO15118_20 134 SessionSetupRes COWKOM_Message 72.9045383 fe80::207:32ff:ffe80::207:32ff:f_0 fe80::207:32ff:f0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 72.9045383 fe80::207:32ff:f0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 72.9045383 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 72.9045383 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0 fe80::207:32ff:f_0	72.698866 MS-NLB-PhysServe… AAEONTec_70:4f	:3a VERISCO HAL	60 SET_TEMPERATURE_CHECK_2_RES ACK_SUCCESS	
72.7121636 MS-NLB-PhysServe. AAEONTec_70:4f:3a VERISCO HAL 60 RSET_ALL_ERRORS_RES ACK_SUCCESS 72.762660 MS-NLB-PhysServe. AAEONTec_70:4f:3a VERISCO HAL 60 NATCH_PERIODIC_STATUS 72.862632 MS-NLB-PhysServe. AAEONTec_70:4f:3a VERISCO HAL 60 NATCH_PERIODIC_STATUS 72.862632 MS-NLB-PhysServe. AAEONTec_70:4f:7a VERISCO HAL 60 NATCH_PERIODIC_STATUS 72.862632 MS-NLB-PhysServe. AAEONTec_70:4f:7a VERISCO HAL 60 NATCH_PERIODIC_STATUS 72.862632 MS-NLB-PhysServe. AAEONTec_70:4f:7a VERISCO HAL 60 NATCH_PERIODIC_STATUS 72.962832 MS-NLB-PhysServe. AAEONTec_70:4f:7a VERISCO HAL 60 NATCH_PERIODIC_STATUS 72.9648383 fe80::207:32ff:f.f.ef00::207:32ff:f.fe70 V26 ISO15118_20 123 SessionSetupRes COWON_Message 72.948383 fe80::207:32ff:f.fe70 V26 ISO15118_20 123 SessionSetupRes COWON_Message 72.948383 fe80::207:32ff:f.fe70 V26 ISO15118_20 123 SessionSetupRes COWON_Message 7 Frame 781: 60 bytes on wire (480 bits) bits 01 07 32 04 04	72.709000 AAEONTec_70:4f:3a MS-NLB-PhysSer	ver-3… VERISCO HAL	60 RESET_ALL_ERRORS_REQ ACK_NOT_USED	
72.762660 MS-NLB-PhysServe. A4EONTec_70:4f:3a VERISCO HAL 60 MATCH_PERIDOIC_STATUS 72.862632 MS-NLB-PhysServe. A4EONTec_70:4f:3a VERISCO HAL 60 MATCH_PERIDOIC_STATUS 72.862632 fe80::207:32ff:f. fe80::207:32ff:fe78 V26 ISOIS118_20 134 SessionSetupReg COWNON_Message 72.902382 fe80::207:32ff:f. fe80::207:32ff:fe78 V26 ISOIS118_20 123 SessionSetupReg COWNON_Message 72.904383 fe80::207:32ff:fe78 V26 ISOIS118_20 123 SessionSetupReg COWNON_Message fe80::207:32ff:fe78 V26 ISOIS118_20 123 SessionSetupReg COWNON_Message fe80::207:32ff:fe78 V26 ISOIS118_20 123 SessionSetupReg COWNON_Message fe80::207:32ff:fe78 V26 ISOIS118_20 fe80::207:32ff:fe78 V26 ISOIS118_20 fe80::207:21:40:40:40:40:40:40:40:40:40:40:40:40:40:	72.710168 MS-NLB-PhysServe… AAEONTec_70:4f	:3a VERISCO HAL	60 RESET_ALL_ERRORS_RES ACK_SUCCESS	
72.862632 MS-NUB-PhysFerve_AAEONTec_70:4f:3a VERISCO HAL 60 WATCH PERIDOIC_STATUS 72.896612 fe80::207:32ff:ffe80::207:32ff:fr70TCP 86 63496 + 60900 [ACK] Seq=13 Ack+94 Win=28672 Len=0 TSval=369245 72.902382 fe80::207:32ff:ffe80::207:32ff:fr70TCP 86 63496 + 60900 [ACK] Seq=13 Ack+94 Win=28672 Len=0 TSval=369245 72.948383 fe80::207:32ff:ffe80::207:32ff:fr70TCP 86 63496 + 60900 [ACK] Seq=13 Ack+94 Win=28672 Len=0 TSval=369245 72.948383 fe80::207:32ff:ffe80::207:32ff:fr70TCP 86 63496 + 60900 [ACK] Seq=13 Ack+94 Win=28672 Len=0 TSval=369245 72.948383 fe80::207:32ff:ffe80::207:32ff:fr70TCP 86 63496 + 60900 [ACK] Seq=13 Ack+94 Win=28672 Len=0 TSval=369245 72.948383 fe80::207:32ff:ffe80::207:32ff:fe70V26 [ISOIS118_20 123 SessionSetupRes [COWWO_Message 72.948383 fe80::207:32ff:ffe80::207:32ff:fe70TCP 86 0400 [ACK] Seq=13 Ack+94 Win=28672 Len=0 TSval=369245 72.948383 fe80::207:32ff:ffe80::207:32ff:fe70TCP 123 SessionSetupRes [COWWO_Message 123 SessionSetupRes [COWWO_Message 72.948383 fe80::207:32ff:ffe80::207:32ff:fe7003:00:00:00:05 (02:23:00:00:00:05), Dst 0010 0100 00 00 00 00 00 00 00 00 00 00 00 00	72.762660 MS-NLB-PhysServe… AAEONTec_70:4f	:3a VERISCO HAL	60 WATCH_PERIODIC_STATUS	
72.896612 fe80::207:32ff:f=70V26 ISO1S118_20 134 SessionSetupReq COWMOM_Message 72.996323 fe80::207:32ff:f=70V26 ISO1S118_20 123 SessionSetupReq COWMOM_Message 72.996333 fe80::207:32ff:f=70V26 ISO1S118_20 123 SessionSetupReq COWMOM_Message 72.948333 fe80::207:32ff:f=70V26 ISO1S118_20 123 SessionSetupReq COWMOM_Message 7 7.948333 fe80::207:32ff:f=70V26 ISO1S118_20 123 SessionSetupRes Commod.AKM_Message 7 Frame 781: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) 0000 00 7 32 70 4f 3a 02 23 00 00 00 05 48 41 fa of 0200 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 12 00 06 00 20 00 00 20 00 00 10 00 00 00 00 00 00 00 00 00 00	72.862632 MS-NLB-PhysServe… AAEONTec_70:4f	:3a VERISCO HAL	60 WATCH_PERIODIC_STATUS	
72.902382 fe80::207:32ff:f.f. fe80::207:32ff:fe70 TCP 86 63496 + 60900 [ACK] Seq=13 Ack=94 Win=28672 Len=0 TSval=369245 72.948383 fe80::207:32ff:f.f. fe80::207:32ff:fe70 V2G ISOI5118_20 123 SessionSetupRes COWMON_Message * Frame 781: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) 123 SessionSetupRes COWMON_Message * VERISCO HAL Protocol 0000 00 07 32 70 4f 3a 02 23 00 00 00 05 48 41 fa aft * VERISCO HAL Protocol 01 07 03 00 11 00 00 01 20 00 f0 00 21 95 00 02 08 00 12 00 0f 00 12 00 00 00 00 00 00 00 00 00 00 00 00 00	72.896612 fe80::207:32ff:f fe80::207:32ff	:fe70… V2G ISO15118_20	134 SessionSetupReq COMMON_Message	
72.948383 fe80::207:32ff:ffe80::207:32ff:fe70V2G ISOISIL_20 123 SessionSetupRes COMMON_Message 6 123 SessionSetupRes COMMON_Message 7 Frame 781: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) <td>72.902382 fe80::207:32ff:f fe80::207:32ff</td> <td>:fe70 TCP</td> <td>86 63496 → 60900 [ACK] Seq=13 Ack=94 Win=28672 Le</td> <td>n=0 TSval=3692451</td>	72.902382 fe80::207:32ff:f fe80::207:32ff	:fe70 TCP	86 63496 → 60900 [ACK] Seq=13 Ack=94 Win=28672 Le	n=0 TSval=3692451
<pre>> Frame 781: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) > Ethernet II, Src: MS-NLB-PhysServer-32_03:00:00:00:05 (02:23:00:00:00:05), Dst VERISCO HAL Protocol > HAL Header Component: CONTROL_PILOT Sub Component: MEA5_STATUS_SUB Command: WATCH_PERIODIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp: : Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 + HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B</pre>	72.948383 fe80::207:32ff:f fe80::207:32ff	:fe70 V2G ISO15118_20	123 SessionSetupRes COMMON_Message	
Prame 781: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) Ethernet II, Src: HS-NLB-PhysBerver-32_03:00:00:00:05 (02:23:00:00:00:05), Dst VERISCO HAL Protocol VERISCO HAL Protocol VHAL Header Component: CONTROL_PILOT Sub Component: MEAS_STATUS_SUB Command: WATCH_PERIDOIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp:: Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B Commond: MATEL State: STATE_B Commond: STATE_B Commond: MATEL State: STATE_B Commond: Mateleuropaische Zeit Payload Size: 18 Commond: Mateleuropaische Zeit Commond: Mateleuropaische Zeit	<			>
b Ethernet II, Src: MS-NLB-PhysServer-32_03:00:00:05 (02:23:00:00:00:55), Dst VERISCO HAL Protocol tHAL Protocol Header Component: CONTROL_PILOT Sub Component: MEA5_STATUS_SUB Command: WATCH_PERIODIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp: : Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 1.658 proximity: 1457 cpState: STATE_8	> Frame 781: 60 bytes on wire (480 bits), 60 b	ytes captured (480 bits)	0000 00 07 32 70 4f 3a 02 23 00 00 00 05 48 41 fa af	··2p0:·# ····HA <mark>··</mark>
<pre>> VERISCO HAL Protocol > HAL Header Component: CONTROL_PILOT Sub Component: MEA5_STATUS_SUB Command: WATCH_PERIODIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp: : Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 > HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_8</pre>	> Ethernet II, Src: MS-NLB-PhysServer-32_03:00	0:00:00:05 (02:23:00:00:00:05), Dst	0010 01 07 03 00 01 00 00 00 00 00 12 00 07 00 12 00 0020 0f 42 40 00 00 13 88 00 00 21 95 00 00 24 88 05	.BØ
<pre>> HAL Header Component: CONTROL_PILOT Sub Component: MEAS_STATUS_SUB Command: WATCH_PERIODIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp: Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 > HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B</pre>	✓ VERISCO HAL Protocol		0030 b1 fb bf 00 00 00 00 00 00 00 00 00	
Component: CONTROL_PILOT Sub Component: MEAS_STATUS_SUB Command: WATCH_PERIDDIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp:: Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 V HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	✓ HAL Header			
Sub Component: MEAS_STATUS_SUB Command: MATCH_PERIODIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp: : Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 V HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	Component: CONTROL_PILOT			
Command: WAICH_PERIODIC_STATUS Mode: MODE_EV Ack: ACK_SUCCESS Timestamp: : Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 V HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	Sub Component: MEAS_STATUS_SUB			
Ack: ACK_SUCCESS Timestamp: : Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload V HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	Command: WATCH_PERIODIC_STATUS			
Timestamp:: Jan 1, 1970 01:00:00.001179663 Mitteleuropäische Zeit Payload Size: 18 V HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	Ack, ACK SUCCESS			
Payload Size: 18 V HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_8	Timestamp: : Jap 1 1970 01:00:00 001	179663 Mitteleuropäische Zeit		
<pre>> HAL Payload frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_8</pre>	Pavload Size: 18	175005 Mittelied opdische zeit		
frequency: 1000.000 dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_8	✓ HAL Pavload			
dutyCycle: 5.000 posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	frequency: 1000.000			
posVoltage: 8.597 negVoltage: 11.658 proximity: 1457 cpState: STATE_B	dutyCycle: 5.000			
negVoltage: 11.658 proximity: 1457 cpState: STATE_B	posVoltage: 8.597			
proximity: 1457 cpState: STATE_B	negVoltage: 11.658			
cpState: STATE_B	proximity: 1457			
	cpState: STATE_B			
	<	>		
✓ VERISCO HAL Protocol (hal), 46 bytes	VERISCO HAL Protocol (hal), 46 bytes		Packets: 1319 · Displayed: 1319 (100.0%)	Profile: Default

Figure 9: Example for HAL message decoding

V2G Protocol

The CPT Decoder supports message decoding of Combined Charging System (CCS) charging protocols according to DIN 70121, ISO 15118-2/-20. All relevant messages are listed in the following:

- DIN 70121:2014
 - o SDP Messages
 - o EXI-encoded SupportedAppProtocol messages
 - EXI-encoded V2G Protocol messages
- ISO 15118-2:2014
 - o SDP messages
 - o EXI-encoded SupportedAppProtocol messages
 - o EXI-encoded V2G Protocol messages
- ISO 15118-20

- o SDP messages
- o EXI-encoded V2G messages

NOTE All EXI-e

All EXI-encoded V2G messages are dissected to humanreadable plain XML data format

```
NOTE
```

In case of TLS, V2G messages can only be dissected, when the randomly generated shared TLS session key is available (see section

Homeplug AV Extended Protocol

This dissector extends the regular Homeplug AV dissector which is part of Wireshark already. In this build there are the following messages that are being able to be decoded further, or to hold some extra information.

Description
Displays the gro filed.
Displays inform
Displays additic

Table 1: Supported messages by the Homeplug AV Extended dissector

NOTICE

If the Ethernet Frame containing the Home using the optional VLAN tag inside the hea the header for 2 more bytes.

To still be able to decode the messages go "Edit \rightarrow Preferences... \rightarrow Protocols \rightarrow Hon and check the box "VLAN Tag is used by E

TLS Session Master Key).

2022-07-25_17-15-27_TC_SECC_D	C_VTB_SessionStop_002.pcap			– 🗆 X
<u>File Edit View Go</u> Capture	Analyze Statistics Telepho	ony <u>W</u> ireless <u>T</u> ools <u>H</u> elp		
🧖 🔳 🖉 💿 📜 🛅 🔀 💼	९ 🗢 🕾 🗿 🕹 📃	📃 Q Q Q 🎹		
Apply a display filter <ctrl-></ctrl->				
Time Source	Destination	Protocol	Length Info	^
12.133441 fe80::d06d:f21	9:… fe80::207:32ff:fe7b	V2G ISO15118_2	159 SessionSetupReq EXI_Message	
12.158221 fe80::207:32ff	:f fe80::d06d:f219:866	V2G ISO15118_2	175 SessionSetupRes EXI_Message	
12.188886 fe80::d06d:f21	9:… fe80::207:32ff:fe7b	V2G ISO15118_2	159 ServiceDiscoveryReq EXI_Message	
12.211545 fe80::207:32ff	:f fe80::d06d:f219:866	V2G ISO15118_2	175 ServiceDiscoveryRes EXI_Message	
12.257928 te80::d06d:t21	9: fe80::207:32ff:fe7b	V2G IS015118_2	159 PaymentServiceSelectionReq EXI_Message	
12.282614 te80::207:32tt	:t te80::d06d:t219:866	V2G ISO15118_2	159 PaymentServiceSelectionRes EXI_Message	
12.300013 Te80::d00d:T21	9: Te80::20/:32TT:Te/D		175 DaymentDetailsReq EXI_Message	
12.357415 Te80.:207.3211	1 fe80207.32ff.fe7k	V26 TS015118_2	463 AuthorizationReg EXI_Message	
12.502873 fe80::207:32ff	:f fe80::d06d:f219:866		159 AuthorizationRes EXI Message	
12.567813 fe80::d06d:f21	9: fe80::207:32ff:fe7b	V2G ISO15118 2	175 ChargeParameterDiscoveryReg EXI Message	
12.597178 fe80::207:32ff	:f fe80::d06d:f219:866	V2G IS015118 2	399 ChargeParameterDiscoveryRes EXI Message	
12.729711 fe80::d06d:f21	9:… fe80::207:32ff:fe7b	V2G ISO15118_2	159 CableCheckReq EXI_Message	
12.755128 fe80::207:32ff	:f fe80::d06d:f219:866	V2G ISO15118_2	159 CableCheckRes EXI_Message	
<				>
 > Frame 1188: 223 bytes on 0 > Ethernet II, Src: AAEONTer > Internet Protocol Version > Transmission Control Protocol > V2G Header Protocol Version: 1 Inverted Protocol Version Payload Length: 85 > V2G Payload decoded by > V2G Payload Raw XML 	<pre>vire (1784 bits), 223 by _7b:30:f6 (00:07:32:7b 6, Src: fe80::207:32:ff ccol, Src Port: 60542, 1 rsion: 254 ssage Keysight</pre>	/tes captured (1784 bin :3b:f6), Dst: AsixElec. :fe7b:3bf6, Dst: fe80:: sst Port: 58582, Seq: 5	s) b3:15:80 (0010 11 76 86 00 e0 00 00 25 80 98 02 00 f8 04 0 0020 11 38 00 02 01 02 41 38 04 18 50 f8 18 05 0030 c0 10 11 44 52 41 42 37 24 43 38 34 30 3 0040 38 c5, Ack: 0050 64 04 f5 10 18 80 20 a9 cc da 02 00 00 64 04 f5 10 18 80 20 a9 cc da 02 00 00	3 9d 0 C2 0 C2
<			> Frame (223 bytes) Decrypted TLS (93 bytes)	
2022-07-25_17-15-27_TC_SE	CC_DC_VTB_SessionStop_002.pc	ар	Packets: 1262 · Displayed: 1262 (100.0%)	Profile: Default

Figure 10: Example for V2G message decoding

There are two different views for decoded V2G messages:

1 V2G payload as a Key Value Pair representation (see Figure 11). This view can be used to get a quick overview of the data that is exchanged via the V2G protocol.

```
    V2G Transport Protocol

       ✓ V2G Header
            Protocol Version: 1
            Inverted Protocol Version: 254
            Payload Type: EXI Message
            Payload Length: 35
      ✓ V2G Payload decoded by Keysight
             V2G Message
              Header
              | | SessionID : 00000000002A450
              Body
              ServiceDiscoveryRes
              | | ResponseCode : OK
              | | | PaymentOptionList
              | | | PaymentOption : Contract
               | | ChargeService
              | | | | ServiceID : 1
              | | | ServiceCategory : EVCharging
               | | | FreeService : true
              | | | SupportedEnergyTransferMode
              | | | | EnergyTransferMode : DC_extended
               ServiceList
              | | | Service
              | | | | ServiceID : 2
               | | | | ServiceName : Certificate
              | | | | ServiceCategory : ContractCertificate
              | | | | FreeService : true
       > V2G Payload Raw XML
1 <
```

Figure 11: Decoded V2G payload with the Key Value Pair representation

2 V2G payload in the RAW XML format (see Figure 12). This view shows the unfiltered XML messages that are used for the V2G communication.



Figure 12: Decoded V2G payload with the Raw XML representation

Homeplug AV Extended Protocol

This dissector extends the regular Homeplug AV dissector which is part of Wireshark already. In this build there are the following messages that are being able to be decoded further, or to hold some extra information.

Message type	Description
VS_ATTEN_CHAR (Qualcomm)	Displays the groups + average attenuation in the info filed.
VS_GET_PWM_STATS.IND (Vertexcom)	Displays information that the Sniffer took
VS_HOST_ACTION.REQ (Qualcomm)	Displays additional info about the payload

Table 1: Supported messages by the Homeplug AV Extended dissector

NOTICE

If the Ethernet Frame containing the Homeplug AV Protocol is using the optional VLAN tag inside the header, this will extend the header for 2 more bytes.

To still be able to decode the messages go to: "Edit \rightarrow Preferences... \rightarrow Protocols \rightarrow Homeplug AV Extended" and check the box "VLAN Tag is used by Ethernet Frame".

TLS Session Master Key

This section outlines the usage of a TLS Session Master Key and automated decryption of V2G messages encrypted with TLS. An example of a TLS Session Master Key message is shown in Figure 13.

If the dissector identifies an UDP package matching the standards from the NSS Key Log Format the transmitted key will be saved in a log file located in "C:\Users\username\AppData\Roaming\Wireshark\TLS_Keys".

2020-11-11_11-03-	34_TC_EVCC_DC_VTB_WeldingI	DetectionOrSessionStop_001.pcap	7747 2							- 0	×
<u>File</u> <u>Edit</u> <u>Vie</u>	w <u>Go C</u> apture <u>A</u>	nalyze <u>S</u> tatistics lelephony	<u>Wireless</u>		elp						
			સ્લ્લ	* #							
Apply a displ	ay filter <ctrl-></ctrl->										+
Time	Source	Destination	Protocol		_		Length	Info		_	-
27.026649	fe80::230:abff:f	ff02::1	VERISCO T	LS Sessio	n Maste	r Key	239	TLS Session Master	Кеу		
27.070197	fe80::230:abff:f	fe80::c132:6f38:8f4	TLSv1.2				175	Application Data			
27.079670	fe80::c132:6f38:	fe80::230:abff:fe29	TLSv1.2				143	Application Data	c		
27.089493	te80::230:aDtt:t	te80::c132:6t38:8t4	TCP				74	49153 → 53525 [ACK]	Seq=3/3	ACK=1892 Win=16	
27.095245	fe80::230:aDTT:T	Teo0::C132:0T30:0T4	TLSv1 2				150	Application Data	49155 →	55525 [ACK] Sec	
27,156216	fe80::c132:6f38:	fe80::230:abff:fe29	TI Sv1.2				175	Application Data			
27.164850	fe80::230:abff:f	fe80::c132:6f38:8f4	TCP				74	49153 → 53525 [ACK]	Sea=458	Ack=1993 Win=16	
27.169814	fe80::230:abff:f	fe80::c132:6f38:8f4	TCP				74	[TCP Window Update]	49153 →	53525 [ACK] Sec	
27.210112	fe80::230:abff:f	fe80::c132:6f38:8f4	TLSv1.2				159	Application Data		–	
27.220426	fe80::c132:6f38:	fe80::230:abff:fe29	TLSv1.2				175	Application Data			_
<										>	
 > Frame 185: > Ethernet I > Internet P > User Datag > TLS Sessio Key: CL 	239 bytes on wir I, Src: DeltaNet_ rotocol Version 6 ram Protocol, Src n Master Key IENT_RANDOM 5FABC	e (1912 bits), 239 byte 29:c5:be (00:30:ab:29:c , Src: fe80::230:abff:f Port: 53185, Dst Port: 517552DBA291508A192FD80	s captured 5:be), Dst e29:c5be, 53186 330593CF06	0000 :: 0010 : 0020 : 0030 : 0040 : 0050 : 0060 : 0050 : 0060 : 0060 : 0060 : 0060 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080 : 0080	33 33 0 00 00 0 ab ff f6 00 00 0 43 4c 4 44 45 3 30 38 4 38 39 46 38 39 46 31 32 3 33 13 3 34 46 3 34 46 3 34 46 3 34 46 3	0 00 0 0 b9 1 e 0 00 0 9 45 4 3 35 3 1 31 3 0 32 3 1 37 3 0 31 3 0 34 3 0 34 3	0 01 00 1 40 fe 5 be ff 0 01 cf 1 37 35 9 32 46 10 45 37 1 36 34 1 34 43 3 46 45 6 34 37 3 39 46 3 39 45 1 33 33	30 ab 29 c5 be 86 80 00 00 00 00 00 00 200 00 00 00 00 00 00 00 1 cf c2 00 b9 9f 55 32 44 42 41 32 44 38 30 33 30 32 36 32 37 41 41 36 32 37 34 31 42 36 35 38 32 34 34 31 42 36 34 35 34 45 30 34 35 34 35 34 35 34 35 30 33 30 33 30 33 31 31 38 30 33 45 32 44 37 37 32 46 32 33 33 33 33 33 33	dd 60 60 80 00 02 30 00 </th <th>330.) CLIENT_R ANDOM ABC51755 20BA29 08A192FD 803305 CF060E72 627AA4 7EA21641 A8B050 89A714C8 2441B8 9F013FEE F7BA09 0FE3F474 6454EE 1280C9F0 05D315 316600E8 03E205 4F041337 72F239</th> <th>5F 915 593 48D 562 598 562 560 548 560 548</th>	330.) CLIENT_R ANDOM ABC51755 20BA29 08A192FD 803305 CF060E72 627AA4 7EA21641 A8B050 89A714C8 2441B8 9F013FEE F7BA09 0FE3F474 6454EE 1280C9F0 05D315 316600E8 03E205 4F041337 72F239	5F 915 593 48D 562 598 562 560 548 560 548
🔵 🎽 Key:	(tls.session_masterke	ey_key), 175 bytes					Pac	kets: 254 · Displayed: 2	54 (100.0%	6) Profile: Defau	lt

Figure 13: Example for a TLS Session Master Key message

Additionally, an empty Debug.txt file will be created to log potential issues. If a TLS Master Key message is detected in the pcap trace, the TLS decryption can be enabled by selecting

the corresponding protocol as defined in the following proceeding (see also Figure 14):

- 1 Right-click on one of the encrypted TLS packages and select "Decode as".
- 2 Select "V2G" from the dropdown menu and confirm the selection with "OK".

.5v	1.2	1/5 AD											
5	Mark/Unmark Packet	Ctrl+M											
C F	Ignore/Unignore Packet	Ctrl+D											
CF	Set/Unset Time Reference	Ctrl+T											
<u>-</u>	Time Shift	Ctrl+Shift+T	Wireshard	· Decode	As								×
.s	Packet Comments	•	Field	Value	Туре	Default	Current						
CF .	Edit Resolved Name		TLS Port	49153	Integer, base 10	(none)	V2G						-
.≤	Apply as Filter						SIP						$^{}$
.5	Apply as Filter						SMTP						
	Prepare as Filter						SOME/IP						
c	Conversation Filter						SPDY						
b	Colorize Conversation	•					Socks						
9	SCTP	•					Thrift						
P	Follow	•		D			V2G						,
	Сору	•		-	<u>-0</u>				Save	Copy from	Cancel	Help	1
	Protocol Preferences	•						OK	Jave	сорупош	Cancer	Theip	-
	Decode As												
	Show Packet in New Window												
_													

Figure 14: Context menu to specify a decoding protocol

Afterwards, the pcap trace will be reloaded with the decrypted V2G data content (see Figure 15).

2020-11-11_11-03	-34_TC_EVCC_DC_VTB_WeldingD	etectionOrSessionStop_001.pc	ар					- 🗆 ×
<u>File Edit V</u> ie	w <u>G</u> o <u>C</u> apture <u>A</u> i	nalyze <u>S</u> tatistics Te	ephon <u>y</u> <u>W</u> ireles	is <u>T</u> ools <u>H</u>	lelp			
🦲 🔳 🙇 💿	📜 🛅 🔀 🗳 🍳	🗢 🔿 🗟 🗿 🕹	<u> </u>	Q. 🞹				
Apply a disp	lay filter <ctrl-></ctrl->							+ 🗸
Time	Source	Destination	Protocol			Lengt	th Info	^
27.026649	fe80::230:abff:f.	ff02::1	VERISCO	TLS Sessio	on Master	Key 2	39 TLS Session Master Key	
27.070197	fe80::230:abff:f.	. fe80::c132:6f38	:8f4 V2G SU	JPPORTED_A	Р	1	75 SupportedAppProtocolReq EX	I_Message
27.079670	fe80::c132:6f38:.	fe80::230:abff:	fe29 V2G Sl	UPPORTED_A	Р	14	43 SupportedAppProtocolRes EX	I_Message
27.089493	fe80::230:abff:f.	fe80::c132:6f38	:8f4 TCP				74 49153 → 53525 [ACK] Seq=373	Ack=1892 Win=16
27.095243	fe80::230:abff:f.	fe80::c132:6f38	:8f4 TCP				74 [TCP Window Update] 49153 →	53525 [ACK] Sec
27.149438	fe80::230:abff:f.	fe80::c132:6f38	:8f4 V2G IS	5015118_2		1	59 SessionSetupReq EXI_Messag	e
27.156216	fe80::c132:6f38:.	. fe80::230:abff:	fe29 V2G I	5015118_2		1	75 SessionSetupRes EXI_Messag	je
27.164850	te80::230:abtt:t.	te80::c132:6t38	:8†4 ICP				74 49153 → 53525 [ACK] Seq=458	ACK=1993 Win=16
27.169814	fe80::230:aDTT:T.	fo90::c132:6738	- 854 V26 1 T	015119 2		1	74 [ICP window opdate] 49155 →	SSSZS [ACK] Sec
27,220426	fe80::c132:6f38:	fe80::230:abff:	fe29 V26 T	5015118_2		1	75 ServiceDiscovervRes EXI_Me	ssage
<	1000110192101901.			5015110_2		-	/ ServiceDiscoverynes Exi_ne	>>ugc
Ename 185	239 bytes on wire	(1912 hits) 230	hytes cantur	ed 0000	33 33 00	00 00 01	00 30 ab 29 c5 be 86 dd 60 00	33
> Ethernet T	T. Src: DeltaNet 2	9:c5:be (00:30:ab	29:c5:be). D	st. 0010	00 00 00	b9 11 40	fe 80 00 00 00 00 00 00 02 30	
> Internet P	rotocol Version 6.	Src: fe80::230:a	bff:fe29:c5be	0020	ab ff fe	29 c5 be	ff 02 00 00 00 00 00 00 00 00 00	• • •) • • • • • • • • • • • • • • • •
> User Datag	ram Protocol, Src	Port: 53185, Dst	Port: 53186	0030	00 00 00	00 00 01	cf c1 cf c2 00 b9 9f ac 00 00	CLITENT D ANDOM EE
✓ TLS Sessio	n Master Key	-		0050	41 42 43	35 31 37	35 35 32 44 42 41 32 39 31 35	ABC51755 2DBA2915
Key: CL	IENT_RANDOM 5FABC5	17552DBA291508A19	2FD80330593CF	0060 0060	30 38 41	31 39 32	46 44 38 30 33 33 30 35 39 33	08A192FD 80330593
				0070	43 46 30	36 30 45	37 32 36 32 37 41 41 34 38 44	CF060E72 627AA48D
				0080	37 45 41	32 31 36 37 31 34	34 31 41 38 42 30 35 43 20 36 43 38 32 34 34 31 42 38 32 43	7EA21641 A8B05C 6
				00a0	39 46 30	31 33 46	45 45 46 37 42 41 44 39 42 46	9F013FEE F7BAD9BF
				00b0	44 46 45	33 46 34	37 34 36 34 35 34 45 45 36 32	DFE3F474 6454EE62
				00c0	31 32 38	30 43 39	46 30 44 35 44 33 31 35 30 44	1280C9F0 D5D3150D
				0000	33 31 36	36 30 30 4	45 38 30 33 45 32 44 35 34 38	316600E8 03E2D548
				0000	54 40 50	. ככ דכ דכ ייכ	2F 6C 6C 2C 0F 2C 1C 1C 6C	41041557 7212550
<				>				
💛 🎽 Key:	(tls.session_masterke	y_key), 175 bytes				P	Packets: 254 · Displayed: 254 (100.0%	 Profile: Default

Figure 15: Decrypted V2G messages using the TLS Session Master Key

NOTICE If multiple charging sessions with different TLS keys are located in a single .pcap file, this could lead to a decryption failure for the TLS messages that are not similar to the first key/charging session. In that case the charging sessions should be split to their own .pcap files.

> Select all packets needed in Wireshark then click on: "File -> Export Specified Packets..." Enter a new file name and select the option "Selected packets only", hit "Save" and open the new .pcap file and decode a above.

NOTICE In case of a packet loss (TCP segment not captured, TCP retransmission, etc.) this could lead to a bahavior where some TLS messages are not decrypted. A possible solution for this is to active the option "Message Authentication Code (MAC), ignore "mac failed" Found in: "Edit -> Preferences... -> Protocols -> TLS"

NOTE

Example PCAP-Traces can be found in the following path: "C:\Users\USERNAME\AppData\Roaming\Wireshark\Example PCAPs".

Coloring rules

For better readability, each protocol is assigned to a different color. To apply the coloring rules used in this document, the user can import them as defined in the following:

- 1 Go to the menu and open "View" \rightarrow "Coloring Rule".
- 2 Click on "*Import*" to select pre-defined filters.
- 3 Navigate to the file that contains the color rules. For the CPT protocols, this file can be found at: "*C*:*Users\username\AppData\Roaming\Wireshark\Colorfilter_CPT*".

After importing, the new rules will appear at the bottom. To display packets in the correct color, select the imported rules and drag them to the top. The order defines the priority of the color rule. Your coloring rules should now look like Figure 16 below for the first four entries. To change the displaying colors simply click on "Foreground" / "Background" and choose a color you would like.

4 Click "OK" to apply changes.

Wireshark · Coloring Rules Default	×
Namo	Filter
	tis_session_masterkey
	v2g.sdp_payload
	V2g
✓ Bad ICP	tcp.analysis.flags && !tcp.analysis.window_update && !tcp.ana
✓ HSRP State Change	hsrp.state != 8 && hsrp.state != 16
Spanning Iree Topology Change	stp.type == 0x80
✓ OSPF State Change	ospf.msg != 1
✓ ICMP errors	icmp.type eq 3 icmp.type eq 4 icmp.type eq 5 icmp.type e
ARP	arp
✓ ICMP	icmp icmpv6
✓ TCP RST	tcp.flags.reset eq 1
SCTP ABORT	sctp.chunk_type eq ABORT
TTL low or unexpected	(! ip.dst == 224.0.0.0/4 && ip.ttl < 5 && !pim && !ospf) (ip.
Checksum Errors	eth.fcs.status=="Bad" ip.checksum.status=="Bad" tcp.checl
SMB	smb nbss nbns netbios
HTTP	http tcp.port == 80 http2
✓ DCERPC	dcerpc
✓ Routing	hsrp eigrp ospf bgp cdp vrrp carp gvrp igmp is
✓ TCP SYN/FIN	tcp.flags & 0x02 tcp.flags.fin == 1
✓ TCP	tcp
UDP	udp
🗹 Broadcast	eth[0] & 1
✓ System Event	systemd_journal sysdig
<	>
Double click to edit. Drag to move. Rules are	processed in order until a match is found.
+ - b Es Foreground	Background Apply as filter <u>C: Useilters</u>
OK Copy from	Cancel Import Export Help

Figure 16 - Coloring Rules

5 Charging Protocol Trace Viewer – Decoder

To start the CPT Decoder, please use the following procedure:

- 1 Open a console window (cmd.exe).
- Navigate to the charging_protocol_decoder.exe and press enter. The executable file can be found in the following path:
 Or Brack and Files Norman Fil

C:\Program Files\Common Files\Keysight\Charging Protocol Trace Viewer

NOTICE The path can be different if the default installation path has been changed during installation. In this case, the CPT Decoder cannot be used within Wireshark.

2.

In general, the CPT Decoder can be used in two modes.

Standalone decoding via console

To use the decoder in simple application mode, the user must specify a protocol and the encoded hex data as can be seen in the following examples (see also Figure 17 - Figure 18):

Command: C:\Path\to\my\File\charging_protocol_decoder.exe HAL faaf010300f0e000000185df105125000101fbbf



Figure 17: Example for HAL message decoding

Command: C:\Path\to\my\File\charging_protocol_decoder.exe V2G 01fe80020000001380940433f88205a4d3eed3898dac6f8dd30228

C:\Program Files\Common Files\Keysight\Charging Protocol Trace Viewer>charging_protocol_decoder.exe V2G 01fe800200000013
80940433f88205a4d3eed3898dac6f8dd30228
{
"protocolVersion" : 1,
"invProtocolVersion" : 254,
"payloadTypeRaw" : 32770,
"payloadType" : "COMMON_Message",
"payloadLength" : 19,
"payloadData" : "gJQEM/iCBaTT7tOJjaxvjdMCKA==",
"decoder" : "IS015118_20",
"payload" : " xml version=\"1.0\" encoding=\"UTF-8\"? <ns5:sessionstopreq xmlns:ns5='\"urn:iso:std:iso:15118:-20:Commo</td'></ns5:sessionstopreq>
nMessages\" xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\" xmlns:ns3=\"http://www.w3.org/2001/XMLSchema\" xmlns
:ns4=\"http://www.w3.org/2000/09/xmldsig#\" xmlns:ns6=\"urn:iso:std:iso:15118:-20:CommonTypes\"> <ns6:header><ns6:session< td=""></ns6:session<></ns6:header>
ID>67F1040B49A7DDA7 <ns6:timestamp>1674484755736</ns6:timestamp> <ns5:chargingsession>Termina</ns5:chargingsession>
te"
}

Figure 18: Example for V2G message decoding

Any invalid data input will result in an exception or error message containing further information.

Decoding as a WebSocket service

To use the decoder as a WebSocket service, the user must add a port number to the command line as can be seen in the following example:

Command: C:\Path\to\my\File\charging_protocol_decoder.exe 1234

Afterwards a WebSocket application is started on the local host and the defined port address. This approach is used by the *Keysight Charging Protocol Trace Viewer* as defined in the next section.



Figure 19: Example for a WebSocket based decoder



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