

SH-CCS03
CCS Sniffer Kit

USER MANUAL



CONTENT

Hardware Overview – CCS Sniffer	3
Included in the CCS Sniffer Kit	4
Technical Data Sniffer.....	4
Warranty.....	5
Conformity	5
Disposal.....	5
Product Overview	6
Features	6
Get Started.....	7
Setup Procedure	7
Install the Software	7
Run the Software	7
Troubleshooting.....	9
GreenShark SOFTWARE LICENSE AGREEMENT	10


Hardware Overview – CCS Sniffer

Front

- LAN Ethernet Interface 10/100 MBit/s, Auto-Negotiation
- LED 1 Turns on once the sniffer is powered.
- LED 2 Starts Blinking when HomePlug Beacons are received



Back

- CP BNC Connector to connect the inductive coupler or the CP lines
- 
- MQS Power Supply via the provided MQS/Banana-Plug-Adapter-Cable



Included in the CCS Sniffer Kit

- Ruggedized Case
- CCS Sniffer SH-CCS03
- Inductive Coupler Premo MICA 300A-S/LF see [https://www.grupopremo.com/upload/cat/MICU%20300-S-LF%20Low%20Frequency%20\(30-500kHz\).pdf](https://www.grupopremo.com/upload/cat/MICU%20300-S-LF%20Low%20Frequency%20(30-500kHz).pdf) for details
- BNC-Banana-Converter
- BNC-Banana Cable
- Ethernet Network Cable
- Ethernet-USB Converter
- MQS/Banana-Plug-Adapter-Cable
- User Manual
- 1x GreenShark Single Workstation License (refer to “GreenShark SOFTWARE LICENSE AGREEMENT” for details)
- GreenShark Download Information Sheet
- evtl. Disposal Information Sheet (depending on sales region)

Technical Data Sniffer

Dimensions	ca. 106 x 109 x 35 mm
Weight	ca. 0,23 Kg
Environmental Conditions	to be used indoors only, max. ambient humidity 60 % RH, temperature range: 0-60 °C
Safety Class	III
IP Protection Class	30
Power Supply	12VDC / 0,3A, not included in delivery
Control Pilot	HomePlug GreenPHY Powerline Communication, 2-28 MHz

Warranty

Claims by the buyer for physical defects are time-barred after a period of one year from delivery to the buyer.

Conformity



This product is compliant with the following guidelines:

- Richtlinie 2011/65/EU (RoHS-Richtlinie)
- Richtlinie 2014/30/EU (EMV-Richtlinie)

The following standards have been applied:

- DIN EN IEC 61326-1:2022-11
- DIN EN IEC 63000

Disposal



Dispose of old devices in accordance with the rules and regulations applicable in your country. A Disposal Information with additional information might be included in the delivery.



Product Overview

SEVENSTAX CCS Sniffer Kit is used to capture Charging Communication conforming to the DIN 70121 and ISO/IEC 15118 standard between a (Plug-In) Electric Vehicles (PEV / EV) and an Electric Vehicle Supply Equipment (EVSE). The Capturing Process can be executed without the need of an electrical connection to the Control Pilot Wire by using the provided inductive coupler.

Please ensure that the provided coupler meets the technical specifications of your PEV/EVSE combination (refer to section "Included in Delivery" for details).

A suitable Capturing Software can be downloaded for free here: <https://www.wireshark.org/download.html>

The CCS Sniffer Kit also contains a license for SEVENSTAX GreenShark which is a commercial AddOn for the Wireshark and allows the dissection of DIN 70121 and ISO/IEC 15118-2 traffic.

Features

- "Non-Invasive" Real Time Capturing
- Capturing of HomePlug GreenPHY Powerline Traffic
- Dissector Plugin included (SEVENSTAX GreenShark):
 - ISO/IEC 15118-2:2014 Dissection
 - DIN 70121-2:2012 Dissection

Get Started

Setup Procedure

1. Do not yet start the Charging Process
2. Verify if the Inductive Coupler is suitable for your EV/EVSE combination – if so wrap the Coupler around the Charging Cable (refer to section “Included in Delivery” for technical specification of the coupler).
3. Use the BNC-Banana-Converter and BNC-Banana Cable to connect Coupler and CCS Sniffer via BNC
4. Connect USB-Ethernet Converter and CCS Sniffer using the Ethernet Cable
5. Connect the USB-Ethernet Converter with your PC and install required driver (if needed)

Notes:

- a) Some Ethernet Interfaces do not support the required promiscuous correctly: Thus using the provided USB-Ethernet Converter is strongly recommended.
- b) Do not connect the CCS Sniffer to a Network Switch

Install the Software

1. Download and Install Wireshark (<https://www.wireshark.org/download.html>). Ensure that the Wireshark Version matches with the GreenShark Version and that all needed Libraries are also installed (e.g. NPCAP)
2. Download and install GreenShark (Download Link is provided on a separate paper sheet)
3. Restart your Computer

Run the Software

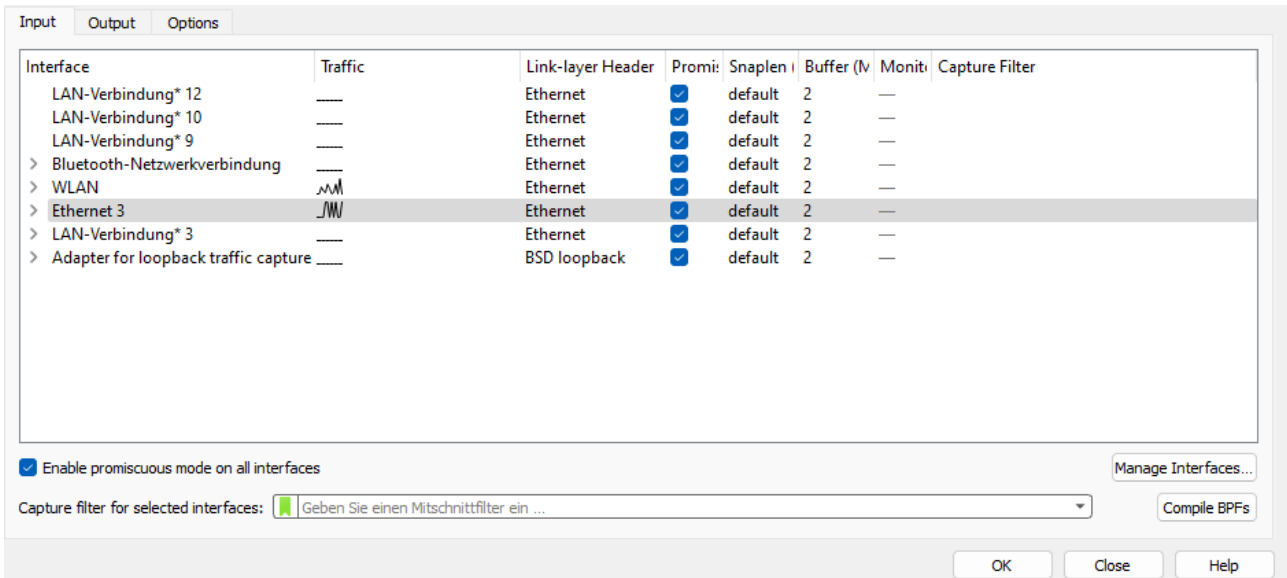
1. Run Windows Shell (cmd.exe) and type in “ipconfig /all” followed by the return key
2. Identify the right Network Interface Name of the USB-Ethernet-Converter

```
Verbindungsspezifisches DNS-Suffix:
Beschreibung. . . . . : Microsoft Wi-Fi Direct Virtual Adapter #3
Physische Adresse . . . . . : 38-00-25-EE-28-BC
DHCP aktiviert. . . . . : Ja
Autokonfiguration aktiviert . . . : Ja

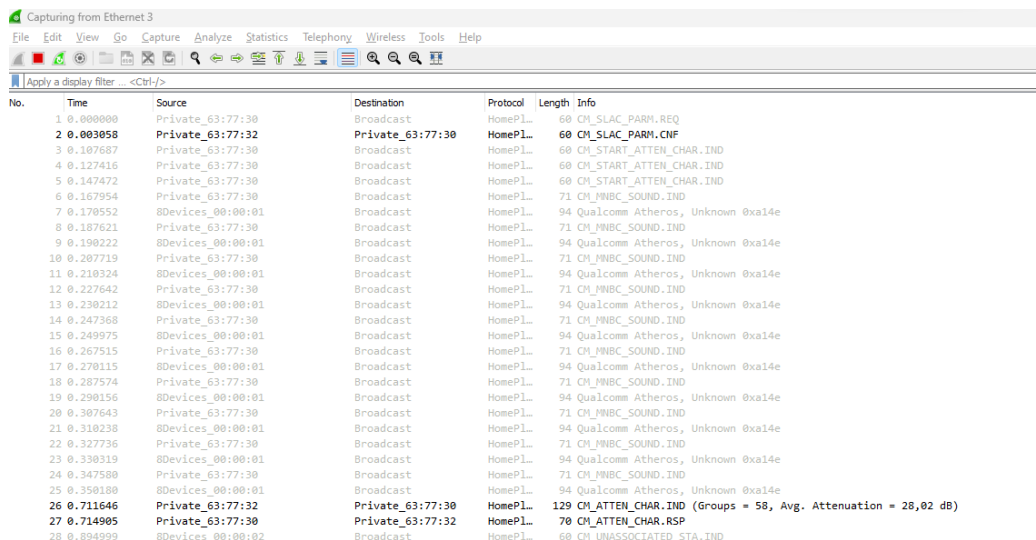
Ethernet-Adapter Ethernet 3:

Verbindungsspezifisches DNS-Suffix:
Beschreibung. . . . . : ASIX AX88179 USB 3.0 to Gigabit Ethernet Adapter
Physische Adresse . . . . . : A0-CE-C8-76-b9-3f
DHCP aktiviert. . . . . : Ja
Autokonfiguration aktiviert . . . : Ja
Verbindungslokale IPv6-Adresse . : fe80::c5eb:e7d2:c6b:b362%17(Bevorzugt)
IPv4-Adresse (Auto. Konfiguration): 169.254.89.41(Bevorzugt)
Subnetzmaske . . . . . : 255.255.0.0
Standardgateway . . . . . :
```

3. Open the Wireshark
4. Navigate to Capture/Options



5. Select the Interface you have just identified in the Windows Command Shell
6. Hit "OK" and Start a Capturing Process (Capture/Start)
7. Only now connect the Charging Cable and start the Charging Process
8. You should see the SLAC messages being exchanged as shown in the following picture.



Troubleshooting

I see HomePlug GreenPHY packets but none of them will be dissected by the GreenShark Plugin.

Make sure that the entire charging sequence is captured. It is essential that the SLAC handshake was completely captured as the last message includes a key for later decryption of the packets. If this key wasn't captured correctly, GreenShark is not able to dissect the high-level protocol.

I just see Broadcast Messages, but no further communication.

A typical observation is that EV sends CM_SLAC_PARM.REQ and CM_START_ATTEN_CHAR.IND without a captured Confirmation Response from the EVSE in between these messages (CM_SLAC_PARM.CNF).

The reason is typically a network adapter without correct support of promiscuous mode or a network switch used between the CCS Sniffer and the PC. Please use the provided USB-Ethernet Adapter for connection to the PC only.

Missing Packets or no captured packets at all.

Capturing using an inductive coupler is comparable with Wireless Communication. There are several reasons why a capturing process might fail (amplification levels of the EV/EVSE, environmental conditions, cable length, etc.). Please try to improve all corresponding conditions. Another option is to connect the Sniffer's CP interface in parallel to the CP/GND lines of the Charging cable between EV and EVSE.

GreenShark SOFTWARE LICENSE AGREEMENT

By installing and/or using this software (described as LICENSED SOFTWARE in the following) you (LICENSEE in the following) agree to the license terms which will bind you. Any documentation provided with or provided for the use of LICENSED SOFTWARE shall be understood as part of LICENSED SOFTWARE within this agreement. If LICENSEE do not agree to these terms LICENSER is unwilling to license the software to LICENSEE and may not continue the installation process now and LICENSEE may not access the software otherwise either. Thus please read carefully the following terms before installing or linking or compiling or embedding or using the relevant software.

This SOFTWARE LICENSE AGREEMENT is a legal agreement between LICENSEE and SEVENSTAX GmbH, Guenther-Wagner-Allee 19, 30177 Hannover, Germany (LICENSER) for use of the LICENSED SOFTWARE provided by the LICENSER.

1. Scope of this SOFTWARE LICENSE AGREEMENT

- a. In consideration of LICENSEE agreeing to abide by the terms of this SOFTWARE LICENSE AGREEMENT, the LICENSER hereby grants to LICENSEE a non-exclusive and non-transferable right to use the LICENSED SOFTWARE on the terms of this SOFTWARE LICENSE AGREEMENT.
- b. LICENSED SOFTWARE is provided under a Single Workstation License that allows the Software to be used on a single Workstation/PC only (node locked). For using it on further PC additional licenses need to be requested from LICENSER.

2. Obligations of the LICENSEE

- a. By using the software, except as expressly set out in this SOFTWARE LICENSE AGREEMENT or as permitted by any local law, LICENSEE agrees:
 - i. not to copy the LICENSED SOFTWARE;
 - ii. not to rent, lease, sub-license, loan, translate, merge, adapt, vary or modify the LICENSED SOFTWARE or any part of it;
 - iii. not to make alterations to, or modifications of, the whole or any part of the LICENSED SOFTWARE nor permit the LICENSED SOFTWARE or any part of it to be combined with, or become incorporated in, any other programs;
 - iv. not to disassemble, de-compile, reverse engineer or create derivative works based on the whole or any part of the LICENSED SOFTWARE;
 - v. to keep the LICENSED SOFTWARE secure;
 - vi. not to provide, or otherwise make available, the LICENSED SOFTWARE in any form, in whole or in part (including, but not limited to, program listings, object and source program listings, object code, binary code and source code) to anyone;
 - vii. not to use the software during development and/or debugging (and/or any other related action) of safety relevant applications to ensure that in no event a malfunction of the LICENSED SOFTWARE can later lead to a malfunction of the safety relevant system;
 - viii. to use the LICENSED SOFTWARE in a manner compliant with prevailing legal provisions. Licensee has to check all products incorporating LICENSED SOFTWARE for lawfulness according to applicable legal provisions. In the case of changes to the state of facts or the legal situation, LICENSEE is obligated to contact LICENSER or to make adjustments.

3. Intellectual Property (IP) Rights

- a. LICENSEE acknowledges that all intellectual property rights in the Software throughout the world belong to the LICENSER, that rights in the Software are licensed (not sold) to LICENSEE, and that LICENSEE have no rights in, or to, the Software other than the right to use them in accordance with the terms of this SOFTWARE LICENSE AGREEMENT.

4. LICENSER's Warranty

- a. LICENSEE bears sole responsibility for the choice, installation and use of LICENSED SOFTWARE as well as the results intended there from since LICENSED SOFTWARE may operate in numerous different

system environments which LICENSER can neither foresee nor test. Explicitly LICENSEE agrees that LICENSER cannot guarantee the correct functioning in a particular environment nor the suitability for a particular purpose. Thus to the maximum extent permitted by applicable law, the software is provided "as is".

- b. All implied warranties, implied conditions and/or implied Licenses are excluded from this SOFTWARE LICENSE AGREEMENT, including but not limited to implied warranties of quality and/or fitness for purpose (in all cases) to the fullest extent permitted by law.
- c. LICENSEE acknowledges that the Software has not been developed to meet LICENSEE's individual requirements and that the Software may not be uninterrupted or free of bugs or errors.
- d. Any Warranty is limited to a period of 12 months after entering into this agreement.

5. Liability of the LICENSER

- a. To the maximum extent permitted by applicable law, in no event shall the LICENSER be liable for any special loss or damage, incidental loss or damage, indirect or consequential loss or damage such as loss of income, loss of business, loss of profits, loss of revenue, loss of contracts, business interruption, loss of the use of money or anticipated savings, loss of information, loss of opportunity, loss of goodwill or reputation, and/or loss of, damage to or corruption of data (in each case) of any kind howsoever arising and whether caused by delict (including negligence), breach of contract or otherwise.
- b. To the maximum extent permitted by applicable law, in no event shall the LICENSER be liable for any infringements of third party property rights including patents. If LICENSEE receives information that the LICENSED SOFTWARE may potentially infringe any third party property right LICENSEE agrees to immediately inform LICENSER. LICENSER may change the LICENSED SOFTWARE that this infringement becomes irrelevant. LICENSEE agrees to update all affected devices with this modified software immediately.
- c. LICENSER total liability to LICENSEE in relation to the Software for material defects and legal defects shall not exceed 500 Euro.
- d. To the maximum extent permitted by applicable law Liability is limited to a period of 12 months after entering into this agreement.
- e. Nothing in this SOFTWARE LICENSE AGREEMENT limits or excludes liability for death or personal injury or for fraud.

6. Termination of the Agreement

- a. The LICENSER may terminate this SOFTWARE LICENSE AGREEMENT immediately if LICENSEE fails to comply with any of the terms and conditions of the SOFTWARE LICENSE AGREEMENT or LICENSEE commences or participates in any legal proceedings against the LICENSER.
- b. Upon termination:
 - i. all rights granted to LICENSEE under this SOFTWARE LICENSE AGREEMENT shall cease;
 - ii. LICENSEE must cease all activities authorised by this SOFTWARE LICENSE AGREEMENT; and
 - iii. LICENSEE must immediately delete or remove the Software from all computer equipment in LICENSEE's possession and immediately destroy all copies of the Software then in LICENSEE's possession, custody or control.

7. Transfer of Rights, Obligations

- a. LICENSEE may not transfer, assign, charge or otherwise dispose of this SOFTWARE LICENSE AGREEMENT, or any of LICENSEE's rights or obligations arising under it.
- b. The LICENSER may transfer, assign, charge, sub-contract or otherwise dispose of the license for LICENSED SOFTWARE, or any of his rights or obligations arising under it, at any time during the term of the SOFTWARE LICENSE AGREEMENT.

8. Waiver

- a. If the LICENSER fails, at any time during the term of this SOFTWARE LICENSE AGREEMENT, to insist on strict performance of any of LICENSEE's obligations under this SOFTWARE LICENSE AGREEMENT, or if

the LICENSER fails to exercise any of the rights or remedies to which he is entitled under this SOFTWARE LICENSE AGREEMENT, this shall not constitute a waiver of such rights or remedies and shall not relieve LICENSEE from compliance with such obligations.

- b. A waiver by the LICENSER of any default shall not constitute a waiver of any subsequent default.
- c. No waiver by the LICENSER of any of these terms and conditions shall be effective unless it is expressly stated to be a waiver and is communicated to LICENSEE in writing.

9. Severability Clause

- a. If any of the terms of this SOFTWARE LICENSE AGREEMENT are determined by any competent authority to be invalid, unlawful or unenforceable to any extent, such term, condition or provision will to that extent be severed from the remaining terms, conditions and provisions which will continue to be valid to the fullest extent permitted by law.

10. Miscellaneous

- a. This SOFTWARE LICENSE AGREEMENT constitutes the whole agreement between LICENSER and LICENSEE and supersedes any previous arrangement, understanding or agreement between us, relating to the licensing of the Software.
- b. Each party acknowledges that in entering into this SOFTWARE LICENSE AGREEMENT it does not rely on any statement, representation, warranty or understanding other than those expressly set out in this SOFTWARE LICENSE AGREEMENT. Each party agrees that it will have no remedy in respect of any statement, representation, warranty or understanding that is not expressly set out in this SOFTWARE LICENSE AGREEMENT. Each party agrees that its only remedy in respect of those representations, statements, assurances and warranties that are set out in this SOFTWARE LICENSE AGREEMENT will be for breach of contract in accordance with the terms of this SOFTWARE LICENSE AGREEMENT.
- c. The parties agree that nothing in this SOFTWARE LICENSE AGREEMENT will limit or exclude any liability they may have for fraud.
- d. This SOFTWARE LICENSE AGREEMENT does not create a partnership or joint venture between the parties to it, nor authorise a party to act as agent for the other.
- e. This SOFTWARE LICENSE AGREEMENT does not create any legal rights enforceable by any third party.
- f. This SOFTWARE LICENSE AGREEMENT may only be varied by express written legal agreement between the parties.

11. Jurisdiction and Law

This SOFTWARE LICENSE AGREEMENT, its subject matter or its formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with German law and submitted to the non-exclusive jurisdiction of the Hannover courts.

Document Revision Nr. 1.1

This document is an intellectual property of SEVENSTAX GmbH. Unauthorized copying and distribution is prohibited.

Copyright (c) 2023 by SEVENSTAX GmbH

SEVENSTAX GmbH

Günther-Wagner-Allee 19

30177 Hannover

GERMANY