EVlink Pro AC

EVlink Pro AC Eichrecht Compliant Chargers

Operating Guide

Schneider Electric

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

Document Scope

The aim of this guide is to provide users, charge point operators (CPO), and electro-mobility service providers (EMSP), with the information and procedures needed to use the EVlink Pro AC Eichrecht compliant chargers.

Validity Note

This guide applies to the EVlink Pro AC Eichrecht compliant chargers.

Convention

EVlink Pro AC Eichrecht compliant charger is hereafter referred to as *EVSE* (Electrical Vehicle Supply Equipment).

Terminology

Acronym	Designation
CPMS	Charge Point Management System
CPO	Charge Point Operator
EMSP	Electro-Mobility Service Provider
EV	Electrical Vehicle
EVSE	Electrical Vehicle Supply Equipment
OCPP	Open Charge Point Protocol (communication protocol used between the charging stations and a central system.)

Online Information

The information contained in this guide is likely to be updated at any time. Schneider Electric strongly recommends that you have the most recent and up-to-date version available on www.se.com/ww/en/download.

The technical characteristics of the devices described in this guide also appear online. To access the information online, go to the Schneider Electric home page at www.se.com.
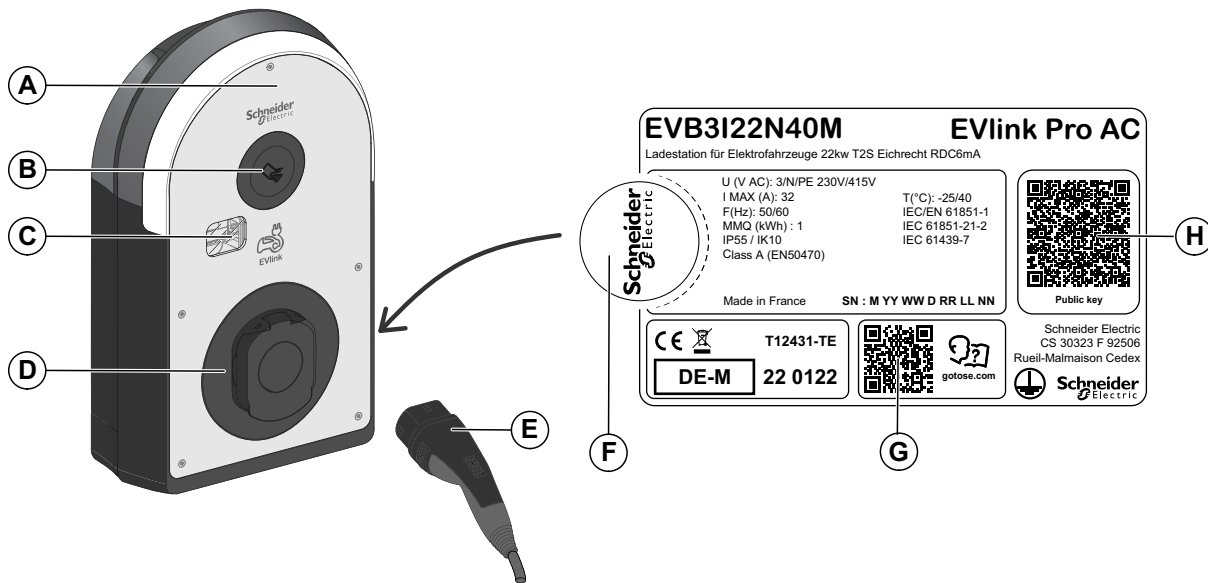
Related Documents

Title of documentation	Reference number
EVlink Pro AC Eichrecht - Instruction Sheet	PKR12258
EcoStruxure™ for eMobility - Electric vehicle charging solutions - Catalog	E-MOBILITY-EVL-CAT04_EN
EVlink Pro AC - OCPP Protocol - Connectivity Guide	GEX1969200

You can download these technical publications and other technical information from our website at www.se.com/ww/en/download.

Trademarks

QR Code is a registered trademark of DENSO WAVE INCORPORATED in Japan and other countries.

Description of EVSE

EVB3I22N40M   **EVlink Pro AC**

Ladestation für Elektrofahrzeuge 22kw T2S Eichrecht RDC6mA

U (V AC): 3/N/PE 230V/415V
I MAX (A): 32
F(Hz): 50/60   T(°C): -25/40
MMQ (kWh) : 1   IEC/EN 61851-1
IP55 / IK10   IEC 61851-21-2
Class A (EN50470)   IEC 61439-7

Made in France   SN : M YY WW D RR LL NN

CE   T12431-TE

DE-M   22 0122   gotose.com

Schneider Electric
CS 30323 F 92506
Rueil-Malmaison Cedex

Public key

A. Status indicator light

B. RFID/NFC reader for user authentication

C. Window for energy meter

D. EV T2-type socket-outlet with shutter T2S

E. Type 2 vehicle connector

F. Security label (warranty void if seal broken)

G. QR code to access device information

H. Public Key

Operations for the EV Driver

Introduction

The EVlink Pro AC Eichrecht compliant chargers (EVSE) provide accurate, secure, and transparent billing for EV drivers.

From charging the electric vehicle to billing check, the process concerning the EV driver is shown in the following diagram:
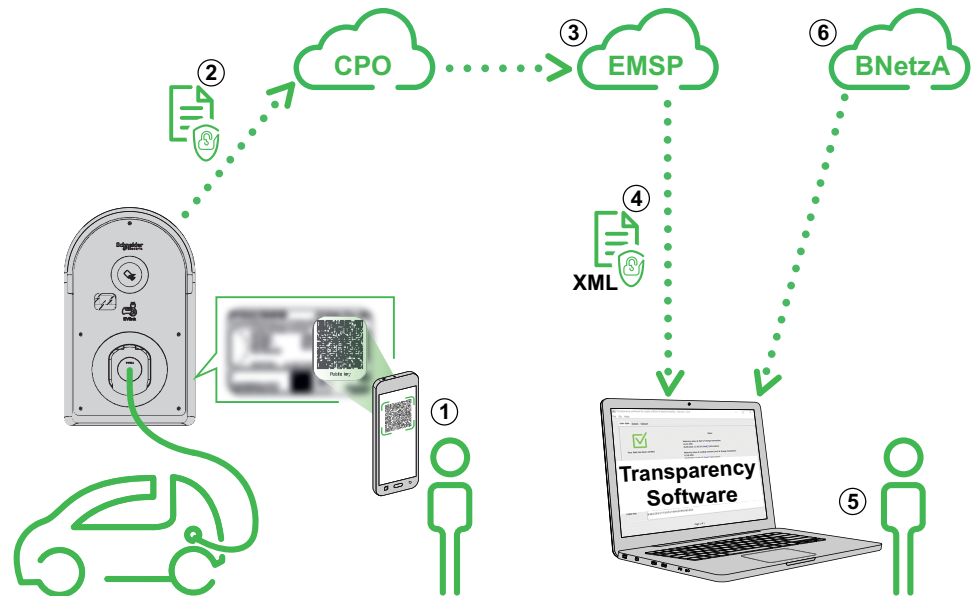
1. The EV driver charges the electric vehicle and scans the public key on the EVSE label.
2. Digitally signed data related to the charge is sent to the CPO.
3. The CPO sends data to the EMSP.
4. The EMSP sends bills to the EV driver and details of charging data in an XML file, including the public key.
5. The EV driver checks the delivered energy and charging data by using Transparency Software.
6. The EV driver can get the public key from the BNetzA (Bundesnetzagentur) database.

Operations to be carried out by the EV driver occur at the following times:

- During the EVSE charging.
- At reception of the bill.

# EVSE Information During the Charge

Presentation

By using the EVSE to charge the electric vehicle, the EV driver accesses charging data on the EVSE energy meter and informative data on the EVSE label.

Once the charging session has ended, the billing process starts with billing data sent with digital signature to the EMSP of the EV driver.

Display Screen

During the charge, the consumption of the electric vehicle is measured with accuracy by a MID-certified energy meter according to EN 50470-3.

The EV driver can check real-time charge on the energy meter display screen through the front cover window.
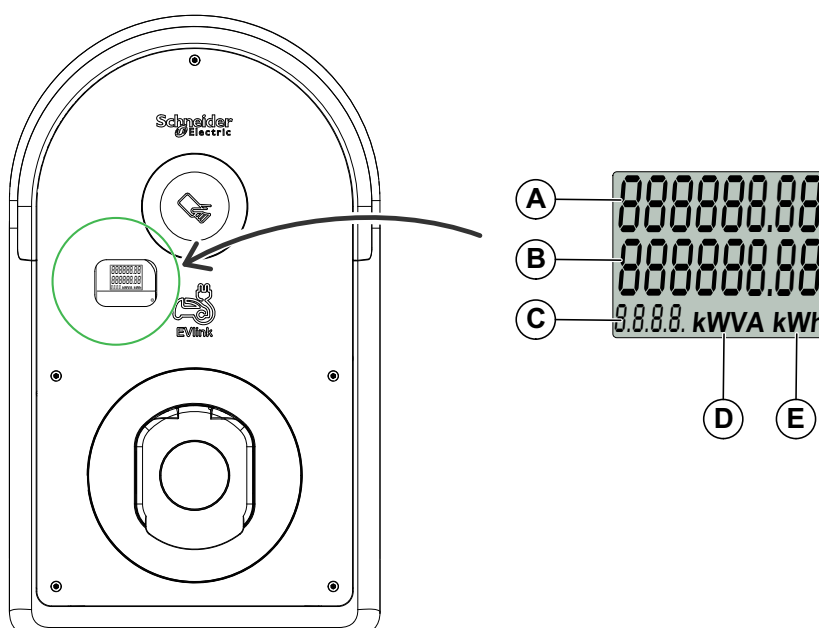
A. Total kWh import

B. User settable line

C. 4-digit label

D. kWVA display

E. kWh display

The MID-certified energy meter displays the following information on the second line **(B)** of the screen alternatively every 5 seconds:

- Active energy counter (kWh)
- Energy meter firmware version
- Energy meter serial number
- Time (hh:mm:ss)
- Date(dd-mm-yy)
- Transaction number (charging session unique identifier)
- Charging session duration (hh:mm:ss)
- Delivered energy (kWh)

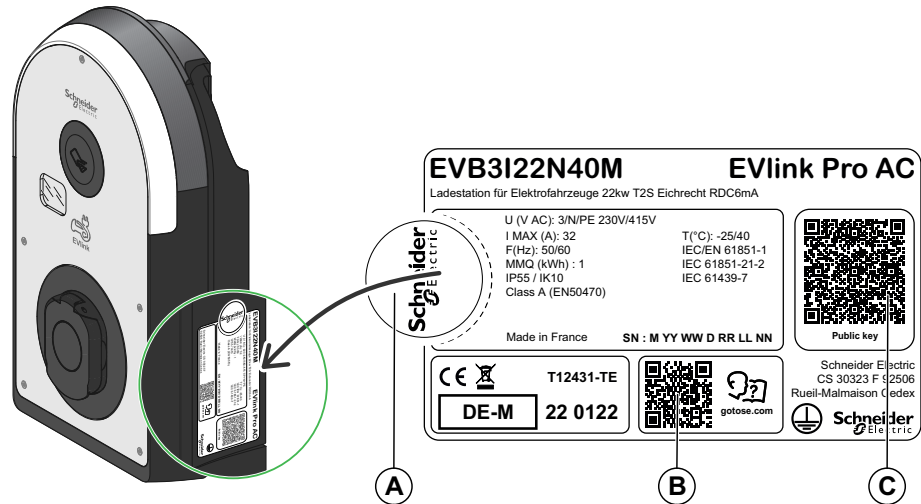The delivered energy remains on the screen at the end of the charging session.

Backlit Display Screen

The display is readable night and day thanks to backlight.

Backlight is on when a charging session is in progress and remains on 2 minutes after the charging session ends.

EVSE Label

The EVSE label is affixed on the right-hand side of the EVSE.

A. Security label

B. QR code to access product information

C. Public key

A security label helps guarantee the authenticity of the EVSE label. The security label is affixed partly on the EVSE and partly on the EVSE label.

Public Key

The EVSE is delivered with a unique public key visible on the EVSE label. The public key is in a QR code format.

The public key is the identifier of the charging point. Schneider Electric recommends that you scan and save the public key QR by using your smartphone.

IMPORTANT: The public key is also registered on Bundesnetzagentur (BNetzA) website (federal network regulatory authority in Germany).

Check Billing Data

Presentation

Schneider Electric has chosen Transparency Software from Software Alliance for Electric Mobility (S.A.F.E) to check the billing data that the EV driver receives from the electro-mobility service provider (EMSP).

Public Key

The public key format is as follows:

3059301306072A8648CE3D020106082A8648CE3D03010703420004300356 60359729F55972CE7076D3CCF5CE7AF149CC26698E5A5B5ACD4272F841 AECDEFED6A76E5396203F5E45F41F1D78E9DB3A1CF1177285175F08CF 6CB16D8

The public key includes the following header used by Transparency Software:

3059301306072A8648CE3D020106082A8648CE3D03010703420004

The public key is included in the file created by the CPO for billing the EV driver. XML file format is recommended. For more information, see XML file description, page 17.

Checking Billing

To check billing by using Transparency Software, refer to user manual of Transparency Software on S.A.F.E website.

The main stages are as follows:

1. Check the system requirements.
2. Download Transparency Software from the S.A.F.E website to your computer.
3. Install Transparency Software on your computer.
4. When you receive the XML file sent by email by the CPO, save it on your computer.
5. Open Transparency Software.
6. Open the XML file in Transparency Software.

   Result: Check is done instantaneously and the following information is displayed in the window that opens:
   • Message confirming data verification
   • Metering data
   • Charging data
   • Public key

     NOTE: If data is indicated not being verified, contact your EMSP immediately.

Operations for the CPO

Introduction

The main operations of the charge point operator (CPO) are as follows:

- To register the EVSE.

- To follow connectivity rules concerning signed dataset.

- To send the file of delivered energy and charging data to EMSP and EV driver.
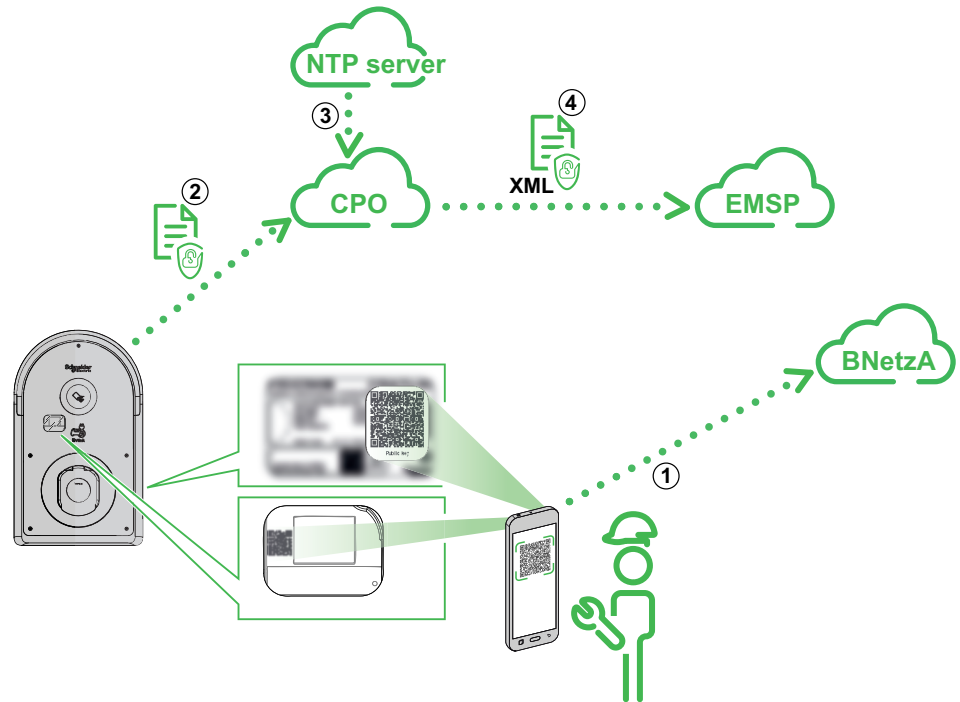
1. The CPO registers information about the EVSE into the BNetzA (Bundesnetzagentur) database and can get the public key by scanning the QR code.

2. Once the EV driver has charged the electric vehicle, digitally signed data related to the delivered energy and charging data is sent to the CPO.

3. The CPO synchronizes the EVSE date and time.

4. The CPO sends delivered energy and charging data, including the public key, to the EMSP in an XML file.

Installation

Energy Meter Seals

The seals on the MID-certified energy meter forbid access and help detect unauthorized physical access to the energy meter. The seals must not be removed after EVSE is installed.
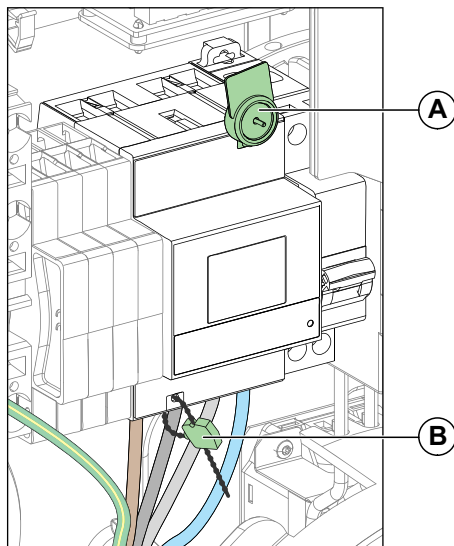
A. Schneider Electric seal

B. CPO seal

At installation, the CPO must proceed as follows concerning the seals:

1. The CPO checks that the Schneider Electric seal **(A)** is present and inviolate on the measuring capsule on the output terminal of the energy meter. This seal is affixed during manufacturing process by Schneider Electric, it has the Schneider Electric logo.

2. The CPO connects the power line to the input of the energy meter.

3. The CPO puts the meter security cover back in place and seals with a seal **(B)**.

For more information, refer to power connection in PKR12258 *EVlink Pro AC Eichrecht - Instruction Sheet*.

Registration of EVSE

At installation, the CPO must register legally required information (for example, EVSE type, location, public key) for the registry *Ladesäulenregister* on the Bundesnetzagentur (BNetzA) website (federal network regulatory authority in Germany).

The CPO can read the public key by scanning either QR code:

• On the energy meter when installing the EVSE.

• On the EVSE label once the EVSE is installed.

Connectivity Rules for CPO

Time Synchronization

The CPO is responsible to set the EVSE date and time. The CPO should set the EVSE date and time and synchronize it regularly with regular OCPP heartbeat message. As the EVSE is equipped with a real-time clock, it is recommended to synchronize it at least once a day. The CPO supervision infrastructure should also be synchronized with a NTP server. For more information about connectivity of EVSE, refer to GEX1969200 *EVlink Pro AC - OCPP Protocol - Connectivity Guide*.

> **NOTE:** Eichrecht implementation is entirely done with standard OCPP 1.6.

Export of Signed Dataset

The signed dataset is created by the MID-certified energy meter and retrieved by Modbus communication by the EVSE control unit (electronic board). The data format is OCMF v1.0 (Open Charge Metering Format).

OCMF|{"FV":"1.0","GI":"Gateway 1","GS":"0123456789","PG":"T44","MV":"Iskra","MM":"WM3M4C","MS":"W4155647","MF":"2.05","IS":true,"IF":["RFID_PLAIN","OCPP_RS_TLS"],"IT":"ISO14443","ID":"1F2D3A4F5506C7","CT":"EVSEID","CI":"Charge-box-ID","RD":[{"TM":"2022-03-24T18:56:01,000+0100 U","TX":"B","RV":1.01,"RI":"1-b:1.8.0","RU":"kWh","RT":"AC","EF":"","ST":"G"},{"TM":"2022-03-24T18:56:30,000+0100 U","TX":"E","RV":1.02,"RI":"1-b:1.8.0","RU":"kWh","RT":"AC","EF":"","ST":"G"}]}|

{"SD":"30460221008d595b43d4fbc98c37833df25189a131a2ea043d2e84c31cce00b9407d250ea1022100 edfc10fd7ee595fd6d48cb4e0ea649f0efde3fb8d2f5d6c8c7cbe78388a7767c"}

Public Key

The public key is accessible with the **getconfiguration** message (refer to the OCPP operations initiated by central system in GEX1969200 *EVlink Pro AC - OCPP Protocol - Connectivity Guide*). Getting the public key is an optional functionality, but it is recommended for an enhanced verification process.

The EVSE provides the public key including the header for Transparency Software

3059301306072A8648CE3D020106082A8648CE3D03010703420004

Sending of Signed Dataset to CSMS

The signed dataset is sent from the MID-certified energy meter to the Charging Station Management System (CSMS).

This OCPP message **StopTransaction** is created by the EVSE control unit, with hexadecimal encoding of the signed dataset to respect OCPP standard protocol. Refer to the OCPP operations initiated by charge point in GEX1969200 *EVlink Pro AC - OCPP Protocol - Connectivity Guide*.

Example: *Eichrecht StopTransaction.jsonc* file

```
[   "StopTransaction",
 {
      "timestamp":2022-03-24T18:56:30Z,
      "transactionId": 1234567,
      "meterStop": 0.01,
      "idtag": "9684AB65",
      "Reason": "Other",
      "TransactionData": [
        {
           "timestamp":2022-03-24T18:56:01Z,
           "SampledValue":[
             {
               "Unit": "kWh",
               "context": "Transaction.Begin",
               "value": "1.01"
             }
           ]
        },
        {
           "timestamp":2022-03-24T18:56:30Z,
           "SampledValue":[
             {
               "Unit": "kWh",
               "context": "Transaction.End",
               "value": "1.02"
             },
             {
               "Unit": "kWh",
               "context": "Transaction.End",
               "value":
```

"4F434D467C7B224656223A22312E30222C224749223A224761746577617920312C224753223A223031323334353637383839222C225047223A22543434222C224D56223A2249736B7261222C224D4D223A22574D334D3443222C224D53223A225734313535363437222C224D46223A22322E3035222C224953223A7747275652C224946223A0D0A5B22524649445F504C41494E452C224F4350505F52535F544C53225D2C224954223A2249534F3134343433222C224944223A2231463244243341344635353036364337222C224354223A22455653454944222C224349223A224368617267652D626F782D4944222C225244223A5B7B22544D223A22323032322D30332D32345431383A35363A30310D0A2C3030302B303130302055222C225458223A2242222C225256223A312E30312C225249223A22312D623A312E382E30222C225255223A226B5768222C225254223A224143222C224546223A2222C225354223A2247227D2C7B22544D223A22323032322D30332D32345431383A35363A33302C3030302B303130302055222C225458223A22450D0A222C22525622233A312E30322C225249223A22312D623A312E382E30222C225255223A226B5768222C225254223A224143222C224546223A2222C225354223A2247227D5D7D7C7B225344223A22333304363032323130303864353539356234336434666263393386333733833364663235313839613133331613265613034336432653834
6333310D0A636365303062393430376432353065561313032323130306564666631306664376565353935
66643664343863623234653065613634396630656564653336662386432663564366338633763626573783
3838613737363763227D",

```
               "measurand": "Energy.Active.Import.Register",
               "format": "SignedData"
             }
           ]
        },
    }
]
```

File Format for EMSP and EV Driver

XML File Presentation

The signed data is sent in an XML file created by the CSMS for transmission to EV driver.

NOTE: The signed dataset is transmitted by the EVSE in hexadecimal format. It must be converted to plain text before inserting in the XML file. If not, it raises an invalid data status flag in Transparency Software.

Note that Eichrecht certification law requests as mandatory to provide at least the signed data, but Schneider Electric proposes XML file to ease the verification step with Transparency Software for the EV driver. It is an all-in-one file including the public key.

This XML file is ready to be opened with Transparency Software.

```
<?xml version="1.0"?> <values>
   <value>
      <signedData>OCMF|{"FV":"1.0","GI":"Gateway
1","GS":"0123456789","PG":"T44","MV":"Iskra","MM":"WM3M4C","MS":"W4155647","MF":"2.05","IS":tr
ue,"IF":["RFID_PLAIN","OCPP_RS_TLS"],"IT":"ISO14443","ID":"1F2D3A4F5506C7","CT":"EVSEID","CI":"Ch
arge-box-ID","RD":[{"TM":"2022-03-24T18:56:01,000+0100 U","TX":"B","RV":1.01,"RI":"1-
b:1.8.0","RU":"kWh","RT":"AC","EF":"","ST":"G"},{"TM":"2022-03-24T18:56:30,000+0100
U","TX":"E","RV":1.02,"RI":"1-
b:1.8.0","RU":"kWh","RT":"AC","EF":"","ST":"G"}]}|{"SD":"30460221008d595b43d4fbc98c37833df25189a
131a2ea043d2e84c31cce00b9407d250ea1022100edfc10fd7ee595fd6d48cb4e0ea649f0efde3fb8d2f5d
6c8c7cbe78388a7767c"}</signedData>
      <publicKey>3059301306072A8648CE3D020106082A8648CE3D03010703420004a801fd6adfaf42
0250dd8b74f8c5aafbb7fd206e36e1776b36bb345769d7e18fcec107080fce325d442a56e06730f697b54
5d1e4418f89086cc553f78333807e</publicKey>
      </value>
   </values>
```

The charge data record has to be stored at least 3 years at the CPO level.

Implementation of Eichrecht OCPP Connectivity

The diagram below explains how Eichrecht OCPP connectivity should be implemented:
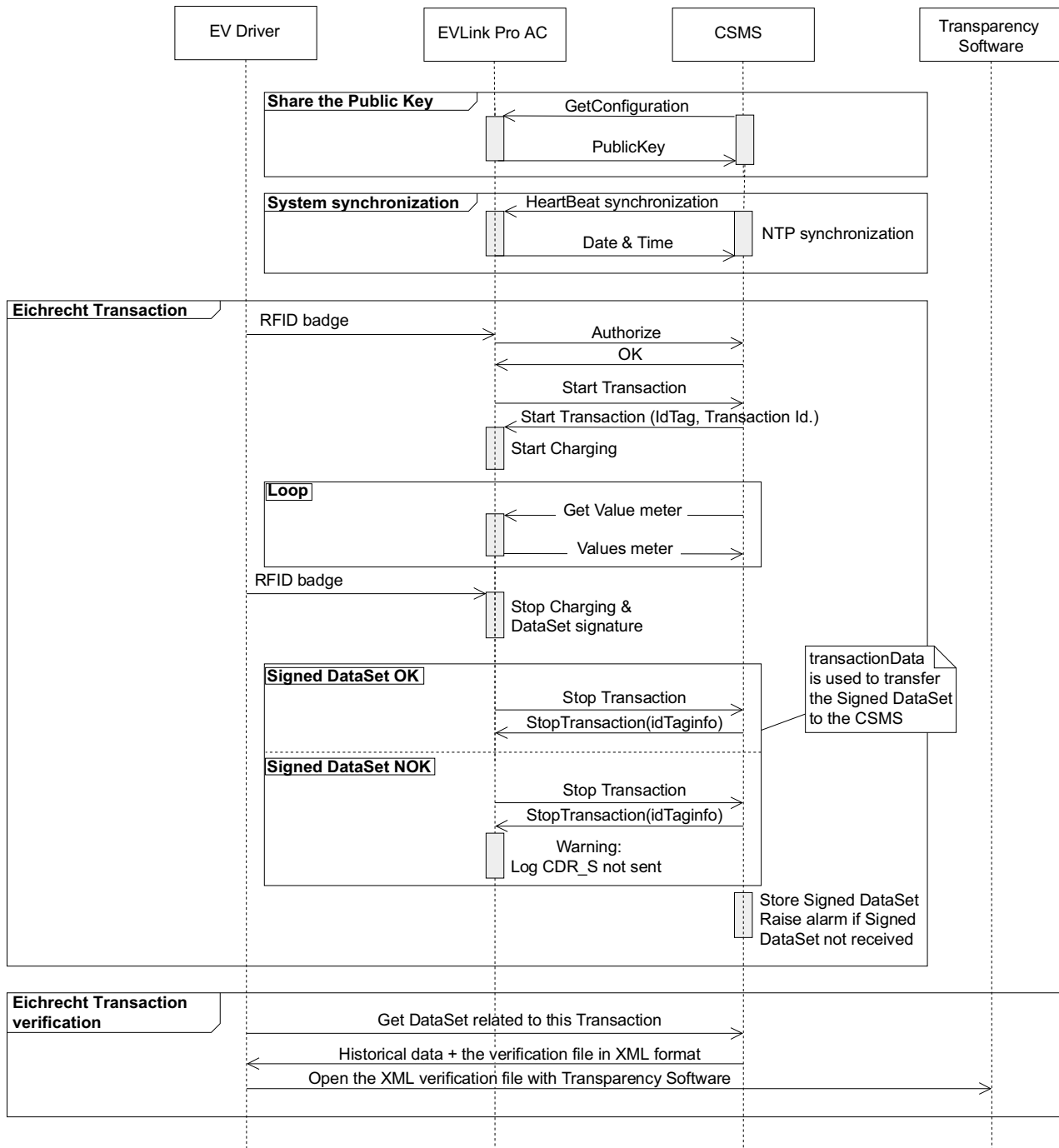
Guide for Market Surveillance Authorities

Presentation

The EVlink Pro AC Eichrecht compliant chargers provide information to the market surveillance authorities, with the following information:
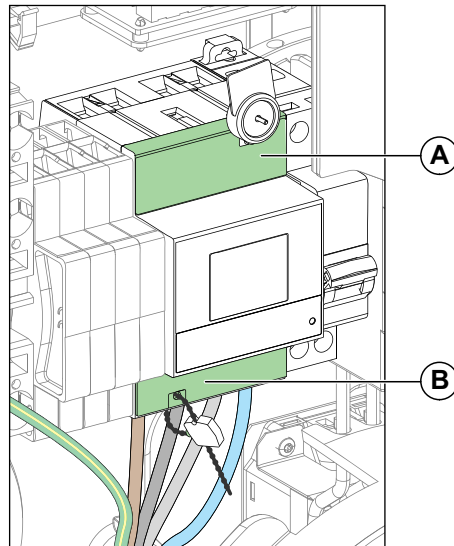
- Security elements inside the EVSE and on the case
- Energy meter display

Security Elements

Sealed Covers on Energy Meter

The energy meter must have sealed covers on top and bottom terminals:

- The upper cover must be sealed with a Schneider Electric seal, installed during manufacturing.

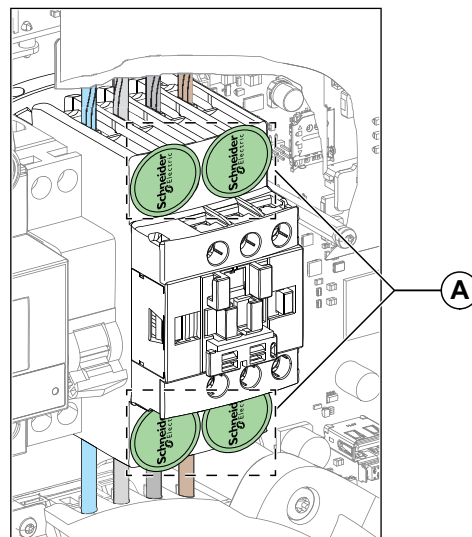- The lower cover must have a seal, installed by the CPO during installation.

A. Cover with Schneider Electric seal

B. Cover with CPO seal

Sealing on Contactor Terminals

The contactor must have security labels **(A)** on its terminals. The security labels let a white VOID marking when removed.

Security Label on EVSE Case

The EVSE label is affixed on the right-hand side of the EVSE. It includes legally required information.

This label is sealed with a security label, that let a white VOID marking when removed.
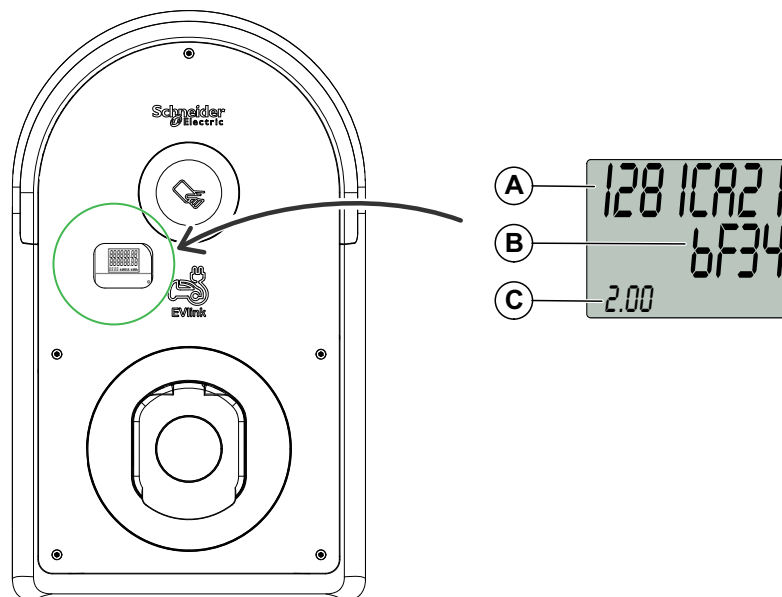
Energy Meter Display

Introduction

The energy meter display screen shows the following information:

- Firmware version
- Delivered energy and charging data

Firmware Version

During a few seconds at power on, the energy meter displays the firmware version and the cyclic redundancy check (CRC).

The following illustration shows an example of firmware version:

A. CRC of main firmware Micro Controller Unit

B. CRC of measuring module firmware

C. Main firmware version

Delivered Energy and Charging Data

The MID-certified energy meter displays the following information on the second line of the screen alternatively every 5 seconds:

- Active energy counter (kWh)
- Energy meter firmware version
- Energy meter serial number
- Time (hh:mm:ss)
- Date(dd-mm-yy)
- Transaction number (charging session unique identifier)
- Charging session duration (hh:mm:ss)
- Delivered energy (kWh)

Energy Meter Technical Characteristics

Commercial Reference

The commercial reference of the energy meter used in EVlink Pro AC is ISKRA WM3M4C.

Technical Characteristics

Characteristic	Value
Certification	Class 1 for active energy according to EN 62053-21
Approval	• MIC approval for class B according to EN 50470-3 • PTB approval for EV charging stations according to PTB-A 20.1 and PTB-A 50.7
Ambient operating temperature	-25 °C to +70 °C (-13 °F to +158 °F)
Maximum current (I_{max})	40 A
Reference current (I_{ref})	5 A
Reference voltage (U_n)	3 x 230 V/400 V
Voltage operating range	-20% to +15%
Frequency	50–60 Hz

DOCA0287EN-01