HUBJECT

CONDAX

DATEX II Data Conversion for OICP

Module Documentation

Version 1.0

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Version History

Version	Contributor	Approved by
1.0	Hubject GmbH	Now GmbH

- Version 1.0
  Original version.

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Introduction

The underlying documentation describes the CONDAX (DATAX II CONVERTER) module, a service, which transforms static and Point-of-Interest (POI) data from the OICP data (version 2.3) format into DATEX II (version 3.2).

DATEX II is the electronic language used in Europe for the exchange of traffic information and traffic data. The development of DATEX II was initiated in the early 90s because of the need to exchange information between traffic centers of motorway operators.[1]

OICP[2] is (Open Intercharge Protocol) is a de-facto standard in e-mobility being used by thousands of Charge Point Operators (CPOs) and E-Mobility Service Providers (EMPs) to exchange data through Hubject's eRoaming hub, the Hubject Brokering System (HBS).

In a first instance the CONDAX is a service provided by NOW GmbH / Nationale Leitstelle Ladeinfrastruktur in cooperation with Hubject. It allows market participants connected to the HBS, to transmit their data to the Mobilitäts Daten Marktplatz (MDM) in DATEX II format through their existing OICP connections. The CONDAX will take over the conversion of beforementioned data and deliver it to the MDM. The MDM is Germany's marketplace for mobility data, operated by the Bundestanstalt für Straßenwesen. The MDM is continuously working to make as much mobility data as possible accessible, across different means of transport, network elements and actors.[3]

However, the CONDAX has been published under the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) license. So, it's

[1] https://www.datex2.eu/datex2/about
[2] The OICP has been published under a Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) license and is accessible at https://github.com/hubject/oicp
[3] https://www.mdm-portal.de/about-mdm/?lang=en

documentation and source code are freely available for everyone to distribute, remix, adapt, and build upon the material in any medium or format. The material itself can be accessed under: https://github.com/hubject/hbs2-datex-II

1. Function

The CONDAX effectively converts data from OICP to DATEX II data format, within the boundaries of structural compatibility. The data converted includes:

1.1. Static POI Data

Static POI data contains a charging points permanent data set, including parameters like its

- Operator (CPO)
- unique ID[4],
- geographic location
- street address
- type of charging infrastructure
- connectors
- opening hours
- supported payment methods

Changes to static POI data will be processed and forwarded to the MDM once every 24 hours.[5]

1.2. Dynamic POI Data

Dynamic POI data describes the charging points state regarding availability to an EV driver. Dynamic POI data will be transmitted every 10 minutes to

[4] The EVSEID (Electric Vehicle Supply Equipment)
[5] Please note, that only data originating from charging infrastructure located in Germany will be automatically transferred to the MDM.

the MDM.

2. Mapping of Data Fields

2.1. Structural Difference between OICP and DATEX II

While there are only few content-related differences between OICP and DATEX II (the later covers all information of the former), there are some substantial structural differences. The OICP applies a charging point-based structure, where the EVSEID of a charging point is the main parameter to identify a possibility for an EV driver to charge their car ('bottom-up' methodology). In consequence, that means, the charging point is the leading data object, which must exist in the HBS. Whether it belongs to a specific charging station or even a charging site is of minor significant and seen as optional information (and therefore might not be available for all charging points).

In contrast, DATEX II is applying a 'top-down' (multi-layered) hierarchical structure when it comes to objects, which contain location data. At the very top of that hierarchy sits a location site, which possess one or charging stations, which possess one or more charging points.

This raises the complexity, that where DATEX II might require a site or a station, the OICP does not possess that data and a workaround must be found how to deal with this problem. Theoretically two solutions present themselves:

A) Try to cluster the charging points to stations and sites based on data fields, which actually exist, e.g., geographical vicinity or street address. Unfortunately, this is more of a hypothetical possibility as it would lead to a lot of data inconsistencies and flawed clustering.

B) Create a site and station object in DATAX II format for every individual charging point.

The CONDAX currently applies workaround B) as it less prone to error and mirrors 'lived' market structures.

2.2. Mapping Tables

MAPPING // GENERAL		
Requirements	**DATEX II**	**OICP**
Geo Coordinates	Facility/LocationReference	EvseDataRecord/GeoCoordinates
Street Address		
Type of Charging Infrastructure	ElectricChargingPoint	EvseDataRecord/ChargingFacilities
Connectors/Plugs	ElectricChargingPoint/Connector	EvseDataRecord/Plugs
Opening Hours	Facility/OperatingHours	EvseDataRecord/OpeningTimes
Payment Methods	EnergyInfrastructureStation/ AuthenticationAndIdentificationMethods	EvseDataRecord/AuthenticationMode
Contact Details Operator	locationExtension	NOT (YET) AVAILABLE
EVSEID	ElectricChargingPoint	EvseDataRecord
Ad-hoc Pricing	ElectricChargingPoint/ElectricEnergyMix/Rates	NOT (YET) AVAILABLE

MAPPING // Connectors		
OICP	**OICP Description**	**DATEX II**
Small Paddle Inductive	Defined plug type.	Other
Large Paddle Inductive	Defined plug type.	Other
AVCON Connector	Defined plug type.	Other
Tesla Connector	Defined plug type.	teslaConnectorEurope
NEMA 5-20	Defined plug type.	Other
Type E French Standard	CEE 7/5	domesticE
Type F Schuko	CEE 7/4	domesticF
Type G British Standard	BS 1363	domesticG
Type J Swiss Standard	SEV 1011	domestic
Type 1 Connector (Cable Attached)	Cable attached to IEC 62196-1 type 1, SAE J1772 connector	iec62196T1
Type 2 Outlet	IEC 62196-1 type 2	iec62196T2

Type 2 Connector (Cable Attached)	Cable attached to IEC 62196-1 type 2 connector	iec62196T2
Type 3 Outlet	IEC 62196-1 type 3	iec62196T3A
IEC 60309 Single Phase	IEC 60309	iec60309x2single16
IEC 60309 Three Phase	IEC 60309	iec60309x2single16
CCS Combo 2 Plug (Cable Attached)	IEC 62196-3 CDV DC Combined Charging Connector DIN SPEC 70121 refers to ISO / IEC 15118-1 DIS, -2 DIS and 15118-3	iec62196T2COMBO
CCS Combo 1 Plug (Cable Attached)	IEC 62196-3 CDV DC Combined Charging Connector with IEC 62196-1 type 2 SAE J1772 connector	iec62196T1COMBO
CHAdeMO	DC CHAdeMO Connector	chademo

MAPPING // Payment & Authentication		
OICP	**OICP Description**	**DATEX II**
NFC RFID Classic	Defined authentication	mifareClassic
NFC RFID DESFire	Defined authentication	mifareDesfire
PNC	ISO/IEC 15118	plc
REMOTE	App, QR-Code, Phone	apps
Direct Payment	Mobile website	website
Nor Authentication Required	No Authentication Required	unlimitedaccess

MAPPING // Type of Charging Infrastructure	
OICP	**DATEX II**
Voltage (EvseDataRecord/ChargingFacility)	ElectricChargingPoint/AvailableVoltage
Power (EvseDataRecord/ChargingFacility)	ElectricChargingPoint/AvailableChargingPower*

MAPPING // Status and Availability	
OICP	**DATEX II**
EvseStatus	RefillPointStatus

3. Frequently Asked Questions (FAQ)

- *How can I use CONDAX as a service?*

  CONDAX as service requires a working OICP connection to the Hubject's HBS as well as a valid CPO User Agreement and Eroaming Agreement.[6]

- *Can I use the CONDAX, if I am not a Hubject customer?*

  While you cannot use the CONDAX module as a service, you can use its source code to build your own data converter and run it on your own infrastructure. However, the prerequisite would be, that your POI data is stored in the OICP data format.

- *How can I contribute to the further development of CONDAX?*

  If you have suggestions how to further develop or improve the CONDAX service please issue a pull request through Github.

- *Can I make changes to the CONDAX?*

  The CONDAX service can only be changed through requests. However, if you are planning to use the CONDAX source code to build a conversion layer of your own, you are free to make any changes as the CONDAX has been published under a license, which allows for adaptations and distribution of changes.

[6] For more information, please visit hubject.com

4. License