Trainings 2019-2020
Charging Communication on ISO 15118
Basic Training

Get a perfect jumpstart into the industry-approved charging communication standard ISO 15118. Learn the key concepts across all communication layers of this future-proof technology so you can actively shape this thriving e-mobility market with your innovative and interoperable EV charging products.

WHAT YOU GET:

» Thorough introduction to the Combined Charging System (CCS)

» How the EV and charging station build up a stable communication link via CCS hardware, Pulse-Width Modulation (PWM), Signal Level Attenuation Characterization (SLAC), and the SECC discovery protocol (SDP)

» Mechanism used to mutually agree on DIN SPEC 70121 or ISO 15118 as the communication protocol

» Overview of the ISO 15118 document family and its relation to the seven ISO/OSI communication layers

» Identification mechanisms External Identification Means (EIM) & Plug & Charge

» In-depth walk-through of the communication sequence for AC and DC charging

» Available tools for the EV and charging station to do smart charging and renegotiate a charging schedule

» Global support of ISO 15118

» Features and outlook to the next edition of ISO 15118-2 (now called ISO 15118-20)

» Important forums, industry events, and further resources you don’t want to miss out on

YOUR TRAINER: Dr. Marc Mültin

Dr. Marc Mültin (V2G Clarity) is a recognized e-mobility expert and co-author of the ISO 15118 and related international standards. He works now with companies and research institutions across the globe to integrate ISO 15118’s promising Plug & Charge feature into their products and innovations. His mission has been to help bring convenient, secure and user-friendly electric vehicle charging to a global audience.

WHO SHOULD ATTEND:

» (Electrical) engineers, managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of e-mobility and charging communication.

» As this is an introductory course we welcome participants with no prior experience in the field. Although a background in engineering and/or computer science is beneficial it is not required to understand the topic.

HOW

Our renowned expert in the field of Charging Communication will guide you in an interactive workshop through the intricacies of ISO 15118, using illustrative examples and a memorable step-by-step guide.
Charging Communication on ISO 15118
Basic Training

AGENDA:

Welcome

The Combined Charging System (CCS) – Short introduction of CharIN’s CCS related documents

SLAC – The solution to crosstalk in powerline communication between EV & EVSE via CCS

Efficient XML interchange (EXI) - XML on a binary level

SupportedAppProtocol – Choosing a mutually supported protocol

Introduction to ISO 15118 – Overview of the use cases within the ISO 15118

The ISO 15118 document family
  » Set up of the ISO 15118 documentation family (15118-1 – 15118-9) and its connection to 7-communication layers of the Open Systems Interconnection (OSI)
  » Publishing timeline of the single ISO parts & outlook to additional functionalities with edition 2 of ISO 15118

AC and DC charging message sequence

PMaxSchedule and SalesTariff – Influencing the charging schedule
  » Negotiation of a charging profile for the vehicle in detail incl. sales tariff information
     (Grid & supplier oriented incentive to affect the charging profile) & charging parameters

Global support of ISO 15118

Important forums, industry events, and further resources

COSTS:

In-house trainings upon request.

Price and booking:
CharIN member: € 975.00 (excl. applicable VAT)
Regular: € 1490.00 (excl. applicable VAT)

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CharIN Academy
c/o theacademy GmbH
Kurfürstendamm 11
10719 Berlin

www.charin-academy.com
academy@charinev.org
Phone: +49 30 300 149 3294
Fax: +49 30 288 8388 19
Charging Communication on ISO 15118
Advanced Training

Take a deep dive into the topic of secure charging communication with the user-convenient Plug & Charge feature of ISO 15118. We’ll focus on the certificate concept, necessary public-key infrastructures, encrypted communication via TLS, and XML-based signatures. The conveyed knowledge will enable you to build state-of-the-art secure and user-friendly EV charging products that shape the e-mobility market.

WHAT YOU GET:
- The cryptographic foundations of ISO 15118 to secure the communication
- Understanding digital certificates and digital signatures
- An overview of the ISO 15118 public-key infrastructures
- How the EV and charging station encrypt the communication using Transport Layer Security (TLS)
- How a contract certificate enables a seamless identification and authorization via the Plug & Charge feature
- The backend processes and market roles needed to establish a well-orchestrated Plug & Charge ecosystem (VDE Application Guide VDE-AR-E 2802-100-1)

YOUR TRAINER: Dr. Marc Mültin
Dr. Marc Mültin (V2G Clarity) is a recognized e-mobility expert and co-author of the ISO 15118 and related international standards. He works now with companies and research institutions across the globe to integrate ISO 15118’s promising Plug & Charge feature into their products and innovations. His mission has been to help bring convenient, secure and user-friendly electric vehicle charging to a global audience.

HOW:
Our renowned expert in the field of Charging Communication, Dr. Marc Mültin (V2G Clarity), will guide you in an interactive workshop through the intricacies of ISO 15118, using illustrative examples and a memorable step-by-step guide. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

WHO SHOULD ATTEND:
(Electrical) engineers, managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of e-mobility and Charging Communication.

As this is an advanced course we recommend that participants have prior experience in the field. For the best possible preparation and a smooth learning experience we recommend that participants visit our Basic Training first.
Charging Communication on ISO 15118
Advanced Training

AGENDA:
Welcome

Cryptographic Foundations of ISO 15118: symmetric and asymmetric cryptosystems, digital certificates and signatures, and key-agreement protocols

The certificate concept and public-key infrastructures outlined in ISO 15118 and their relation to the various e-mobility market roles

Setup of an encrypted communication link between the EV and charging station via TLS (Transport Layer Security) and ISO 15118 certificates

Certificate installation: how a contract certificate enables a seamless identification and authorization via the Plug & Charge feature

In-depth training on the VDE application guide VDE-AR-E 2802-100-1, titled “Certificate handling for electric vehicles, charging infrastructure and backend systems within the framework of ISO 15118”. This application guide is the blueprint for establishing a well-orchestrated Plug & Charge ecosystem

COSTS:
In-house trainings upon request.

Price and booking:
CharIN member: € 1170.00 (excl. applicable VAT)
Regular: € 1790.00 (excl. applicable VAT)

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c/o thecademy GmbH
Kurfürstendamm 11
10719 Berlin
www.charin-academy.com
academy@charinev.org
Phone: +49 30 300 149 3294
Fax: +49 30 288 8388 19
Learn the fundamentals of high power charging and cooled cable technology. The conveyed knowledge will enable you to actively shape these key components of e-mobility. Join the seminar to be in the driver’s seat!

WHAT YOU GET:
You’ll learn the language, norms, and frameworks needed to:
» Get an overview of the standards regarding High Power Charging (HPC)
» Map the normative landscape of HPC
» Apply the relevant norms correctly
» Comprehend in depth how cooled cables are constructed and how they function
» Understand the technical limitations of cooled systems
» Get an overview of existing cooling techniques and the materials used in cooled cables
» Follow publications of relevant committees and meetings

HOW:
In our interactive lecture format you will be working through engaging real-life examples together with our renowned expert in the field of High Power Charging. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

YOUR TRAINER: Marc André Beck
Marc André Beck is the owner of grivix GmbH (Switzerland) and responsible for business development. He used to work as a Market Manager HPC at HUBER+SUHNER AG and to manage the product Cooled Cable to charge EVs at 500 ampere. Before that he was a Product Manager ACS responsible for the worldwide product portfolio Cable Systems Automotive. At Designwer GmbH he worked as an engineer and responsible developer for batteries and embedded systems.

WHO SHOULD ATTEND:
» (Electrical) engineers, managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of e-mobility and HPC.
» As this is an introductory course we welcome participants with no prior experience in the field. Although a background in engineering is beneficial it is not required to understand the topic.
# High Power Charging Standards and Cable Technology
## Basic Training

**AGENDA:**

<table>
<thead>
<tr>
<th>Welcome</th>
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<tbody>
<tr>
<td>Introduction in the overview of standards regarding high power charging and how they are related</td>
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<table>
<thead>
<tr>
<th>IEC 62893-4-1/2</th>
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<tbody>
<tr>
<td>» Why are the cooled cables so thin?</td>
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<tr>
<td>» How is the minimum size of the cooled cable calculated (I2t)</td>
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<tr>
<td>» What impact does I2t have on ground cables?</td>
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<tr>
<td>» Why is it still safe to use thin cables (fault cases)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>IEC 62196-3(-1)</th>
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<tbody>
<tr>
<td>» Y-capacitors and what impact do they have on HPC</td>
</tr>
<tr>
<td>» Contact resistance, coating (impact of cooling)</td>
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<tr>
<td>» What liquids may be used with a cooled cable</td>
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<tr>
<td>» How much cooling is required to use cooled cables (radiation, convection)</td>
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<tr>
<td>» What cooling techniques exist</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limitations</th>
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<tbody>
<tr>
<td>» What are the technical limitations of cooled charging systems</td>
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<tr>
<td>» What is the maximum power throughput of cooled cables</td>
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<tr>
<td>» What is the power / heat (loss) ratio at different current levels</td>
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<table>
<thead>
<tr>
<th>Physical background</th>
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<tbody>
<tr>
<td>Historical background of cooled welding cables</td>
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<thead>
<tr>
<th>Publishing timeline of IEC 61851-23, IEC 62196-3(-1) and IEC 62893-4-1/2</th>
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| Relevant committees and meetings |

**COSTS:**

In-house trainings upon request.

Price and booking:
CharIN member: € 975.00 (excl. applicable VAT)
Regular: € 1490.00 (excl. applicable VAT)

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Kurfürstendamm 11  
10719 Berlin  

www.charin-academy.com  
academy@charinev.org  
Phone: +49 30 300 149 3294  
Fax: +49 30 288 8388 19
Digital Communication: CCS Hardware Implementation
Basic Training

Learn more about the Hardware aspects of the PLC implementation. Get a better understanding about the application rules. Benefit from the lesson learned and learn how to avoid typical application failures.

WHAT YOU GET:
- Level 1&2 of the OSI model
- V2G Interface topology
- PWM handshake to high level communication
- PLC Hardware with an example and firmware selection
- SLAC function and differences of DIN SPEC 70121 vs. ISO 15118
- Component requirements
- Smart Grid approaches
- Design hints
- Best practice for system calibration (at EV and EVSE side)
- Public discussion and feedback

HOW:
In our interactive lecture format you will be working through engaging real-life examples together with our renowned expert in the field of Digital Communication. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

YOUR TRAINER: Michael Zeyen, Bernd Baranski

Michael Zeyen is CEO and the founder of Vancom, a highly specialized consulting and engineering service provider in the automotive sector. His area of specialization is electromobility with a focus on power electronics, thermal management and charging infrastructure. He advises international vehicle manufacturers and system suppliers on the strategic introduction and implementation of electromobility. Mr. Zeyen is a member of the board of the Central Association of the German Electrical Industry (ZVEI) and active in numerous international standardization committees.

Since 1995 Bernd Baranski is Executive Director at BBE (Hamburg). Previously he worked as development and service engineer at Spitzke GmbH & Co KG. His e-Mobility activities at PES, Intesys, Volkswagen and Porsche included working with Power Charger > 500 kW, Triple Charger < 50 kW, High Voltage Charging System Testing, PLC communication and more.

WHO SHOULD ATTEND:
This training is addressed to all R&D engineers and project team members who are involved in the design of the PLC interface.
Digital Communication: CCS Hardware Implementation
Basic Training

AGENDA:

- V2G Interface
- PWM
- PLC
- DIN spec 70121/22 vs. ISO 15118
- Component requirements
- Smart Grid approaches
- Design hints
- Open discussion and feedback

COSTS:

In-house trainings upon request.

Price and booking:
- CharIN member: € 975.00 (excl. applicable VAT)
- Regular: € 1490.00 (excl. applicable VAT)

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Digital Communication: CCS SLAC implementation and testing
Advanced Training

Get a deeper understanding how to implement the SLAC and get access on an expert level about the details of a robust design.

WHAT YOU GET:
» Test Cases
» PLC Calibration
» SLAC
  - functionality
  - calibration description EVSE to EV
  - Level measurement
» ISO 15118 / DIN 70121 expression
» PLC crosstalk and line adjustment
» Common mistakes and good practice
» Avoidance of known issues with examples
» Examples, hands-on demonstration
» How to use .pib files
» Public discussion and feedback

HOW:
In our interactive lecture format you will be working through engaging real-life examples together with our renowned expert in the field of Digital Communication. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

YOUR TRAINER: Bernd Baranski, Hind Dahi

Bernd Baranski is since 1995 Executive Director at BBE (Hamburg). Previously he worked as development and service engineer at Spitzke GmbH & Co KG. His e-Mobility activities at PES, Intesys, Volkswagen and Porsche included working with Power Charger > 500 kW, Triple Charger < 50 kW, High Voltage Charging System Testing, PLC communication and more.

Ms. Dahi graduated as a Master of Engineering from the University of Applied Sciences of Karlsruhe (Germany). Since 2018, she has worked on implementation of conformance tests for digital communication between an EV charging station and an electric vehicle. Previously she was engaged in Powerline Communication qualification for electric vehicle and EV charging station (DIN70121 & ISO15118) and firmware tests for the PLC chip.

WHO SHOULD ATTEND:
This training is addressed to all R&D engineers and project team members which are involved in the design of the PLC interface.
# Digital Communication:
## CCS SLAC implementation and testing
### Advanced Training

**AGENDA:**
- Test Cases
- SLAC functionality
- SLAC calibration EVSE <-> EV
- PLC cross talking and line adjustment
- Common mistakes and good practice
- Practical demonstration ("golden device")
- Open discussion and feedback

**COSTS:**
In-house trainings upon request.

Price and booking:
CharIN member: € 1.170.00 (excl. applicable VAT)
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e/o theacademy GmbH
Kurfürstendamm 11
10719 Berlin

www.charin-academy.com
academy@charinev.org
Phone: +49 30 300 149 3294
Fax: +49 30 258 8388 19
Understanding the eMobility ecosystem
Basic Training

This training enables every participant to understand the entire eMobility ecosystem. Participants will gain a first inside into the market framework, including all relevant market players, market roles, processes and interactions.

WHAT YOU GET:
- Overview of the eMobility ecosystem
- Description of stakeholders that are part of this market
- Core IT- and business processes between all relevant players
- Get to know relevant standards and regulations – on global, European and national levels
- Products and services for the different market roles
- Overview of an EV: how works an electric vehicle, how works the charging of an electric vehicle
- Insights into the next level of EV charging

HOW:
In our interactive lecture format, you will be working through engaging real-life examples together with our renowned experts with years of practical experience in designing and realizing eMobility services.

YOUR TRAINER: Oliver Adrian, Fabian Guse

Our training partner Hubject Consulting is an ensemble of hand-picked eMobility specialists, placing established professionals and young entrants right in the mobility market.

Fabian Guse (Head of Consulting) is a notable expert with several years consulting & industry experience who has led several consulting projects in eMobility, digitalization, telecommunication and auto-motive topics.

Oliver Adrian (Senior Consultant) is a distinguished expert with several years' experience in consulting major international companies in the area of mobility and digital platforms. Oliver has led various consulting projects with a focus on Strategic Positioning and Market Entries.

WHO SHOULD ATTEND:
Managers, product designers, entrepreneurs, technology consultants; anyone interested gaining an overview of the eMobility market.

As this is an introductory course, we welcome participants with no prior experience in the field.
Understanding the eMobility ecosystem
Basic Training

AGENDA:

Introduction and setting expectations

eMobility ecosystem – which roles and players are part of this market

What are the core IT- and business processes of the eMobility ecosystem?

Get an overview of the most relevant standards and regulations – on a global level, European level and national level

Product- and service portfolio for the different market roles

Overview of an EV: Concept of electric vehicles

Overview of the customer journey of charging an electric vehicle

Next level of EV charging: What are the trends of the future of EV charging?

Wrap-up

COSTS:

In-house trainings upon request.

Price and booking:
CharIN member: € 975.00 (excl. applicable VAT)
Regular: € 1490.00 (excl. applicable VAT)

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10719 Berlin

www.charin-academy.com
academy@charinev.org
Phone: +49 30 300 149 3294
Fax: +49 30 288 8388 19
Deep dive into the eMobility market
Advanced Training

This training enables every participant to gain a deeper understanding into the main topics of the eMobility market. It includes all topics to understand the market like systems and processes, grid integration and the legal framework for eMobility.

WHAT YOU GET:
» Get to know the main differences between the European, North American and Asian EV markets
» Understand systems and processes for the charging ecosystem – what needs to be considered for a technical realization
» Learn the basics about grid integration of electric vehicles
» Overview of legal requirements for offering EV charging services

HOW:
In our interactive lecture format, you will be working through engaging real-life examples together with our renowned expert with years of practical experience in designing and realizing eMobility Services.

YOUR TRAINER: Oliver Adrian, Fabian Guse
Our training partner Hubject Consulting is an ensemble of hand-picked eMobility specialists, placing established professionals and young entrants right in the mobility market.

Fabian Guse (Head of Consulting) is a notable expert with several years consulting & industry experience who has led several consulting projects in eMobility, digitalization, telecommunication and auto-motive topics.

Oliver Adrian (Senior Consultant) is a distinguished expert with several years’ experience in consulting major international companies in the area of mobility and digital platforms. Oliver has led various consulting projects with a focus on Strategic Positioning and Market Entries.

WHO SHOULD ATTEND:
Managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of eMobility.

As this is an advanced course, we welcome participants with at least some experience in the field.
Deep dive into the eMobility market

Advanced Training

AGENDA:

- Introduction and setting expectations
- Main Differences between the European, North American and Asian EV markets (focus standards, customers, restrictions)
- Systems and processes – what needs to be considered for a technical realization of EV-Charging
- Legal requirements for offering EV charging services
- Grid integration of electric vehicles – most relevant roles and processes
- Wrap-up

COSTS:

- In-house trainings upon request.

Price and booking:
- CharIN member: € 1170.00 (excl. applicable VAT)
- Regular: € 1790.00 (excl. applicable VAT)

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Phone: +49 30 300 149 3294
Fax: +49 30 288 8388 19
EU Normative Requirements for Charging Systems
2-day-training

Learn all about the CCS standard from true professionals. Get a much better understanding about the structure of the EU harmonized standards. Take a look together with your trainers inside the relevant requirements and get first hand answers to your questions.

WHAT YOU GET:
- Hierarchy of standards
- EU directives (General product safety, EMC, LVD)
- Introduction to the Official Journal of the European Union
- Basic standards (EN 61140, EN 61508)
- Product standards inside, e.g.
- Informative Guidelines (i.a. Blue Guide)
- Public discussion and feedback

HOW:
In our interactive lecture format you will be working through engaging real-life examples together with our renowned expert in the field of normative requirements. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

YOUR TRAINER: Wolfgang Hofheinz, Michael Zeyen

Since 2016 Wolfgang Hofheinz has worked as a Senior Consultant at Vancom, a highly specialized consulting and engineering service provider in the automotive sector, and since 2013 as a Management Consultant at BENDER GmbH & Co. KG. He is a holder of numerous awards from the German Commission for Electrical Engineering, Electronics and Technology (DKE), which he was previously a president of, and owns property rights for 22 technical papers and lectures and specialist book publications.

Michael Zeyen is CEO and the founder of Vancom. His area of specialization is electromobility with a focus on power electronics, thermal management and charging infrastructure. He advises international vehicle manufacturers and system suppliers on the strategic introduction and implementation of electromobility. Mr. Zeyen is a member of the board of the Central Association of the German Electrical Industry (ZVEI) and active in numerous international standardization committees.

WHO SHOULD ATTEND:
(Electrical) engineers, managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of e-mobility and Charging Communication.

Level: intermediate & expert
EU Normative Requirements for Charging Systems
2-day-training

**AGENDA:**

<table>
<thead>
<tr>
<th>Hierarchy of standards</th>
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<tbody>
<tr>
<td>EU directives (General product safety, EMC, LVD)</td>
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- EN 61851-1: General EVSE requirements
- EN 61851-23: Common part and annex CC for DC charging
- EN 61851-24: Digital communication
- EN 60364-7-722: Requirements for installations
- EN 62196-3: Charging couplers
- EN 61557-8: Insulation monitoring devices
- ISO 17409: Electric safety requirements

**Informative Guidelines (i.a. Blue Guide)**

**Public discussion and feedback**

**COSTS:**

In-house trainings upon request.

Price and booking:
- CharIN member: € 1.750.00 (excl. applicable VAT)
- Regular: € 2.660.00 (excl. applicable VAT)

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academy@charinev.org
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Fax: +49 30 288 8388 19
CE Conformity Declaration

Get a step-by-step guidance about how to proceed with the CE conformity declaration process. What is the legal basis, which items are mandatory, which ones are optional. Get useful hints how to implement the CE conformity process in particular for EV charging equipment.

WHAT YOU GET:
- Legal basis of regulations, directives and other EU legislative acts
- EU regulations (168/2008, Blue Guide)
- Essential EU directives (ProdSG, IVD, EMC, regulation 2014/94/EU)
- European standards, harmonized documents
- Legal obligations of the manufacturer and service provider
- Hazard and risk analysis (excursus to Functional Safety)
- Organizational requirements
- Documentation requirements
- Public discussion and feedback

HOW:
In our interactive lecture format you will be working through engaging real-life examples together with our renowned expert in the field of Conformity Declaration. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

YOUR TRAINER: Michael Zeyen, Saskia Wittbrodt

Michael Zeyen is CEO and the founder of Vancom, a highly specialized consulting and engineering service provider in the automotive sector. His area of specialization is electromobility with a focus on power electronics, thermal management and charging infrastructure. He advises international vehicle manufacturers and system suppliers on the strategic introduction and implementation of electromobility. Mr. Zeyen is a member of the board of the Central Association of the German Electrical Industry (ZVEI) and active in numerous international standardization committees.

Saskia Wittbrodt is an associate at Reuschlaw Legal Consultants. The emphasis in her consultancy work is on national and international industrial companies in the machine construction and engineering, medical device, and consumer goods sectors. Saskia Wittbrodt has come to specialise in the areas of product liability, product safety, compliance management and recall management. Other points of emphasis in her consultancy work as a lawyer are insurance law and litigation. She is a co-author of the practical handbook on machine safety and regularly conducts teaching events.

WHO SHOULD ATTEND:
Everybody who is involved in the CE declaration process, especially R&D team members, project leaders, quality managers and functional safety experts.

Level: Basic, intermediate & expert
CE Conformity Declaration

AGENDA:
- Legal basis of regulations, directives and other EU legislative acts
- EU regulations (168/2008, Blue Guide)
- Essential EU directives (ProdSG, IVD, EMC, regulation 2014/94/EU)
- European standards, harmonized documents
- Legal obligations of the manufacturer and service provider
- Hazard and risk analysis (excurse to Functional Safety)
- Organizational requirements
- Documentation requirements
- Public discussion and feedback

COSTS:
- In-house trainings upon request.
- Price and booking:
  - CharIN member: € 975,00 (excl. applicable VAT)
  - Regular: € 1490,00 (excl. applicable VAT)
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c/o thecademy GmbH
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10719 Berlin
www.charin-academy.com
academy@charinev.org
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Fax: +49 30 288 8388 19
Functional Safety of Charging Systems

Understand how to perform a risk analysis and – assessment which is required for each EVSE type. Get an understanding of the different approach of IEC 61508 and ISO 26262 which both involved in the charging process. Get also a profound understanding about the legal aspects of the Functional Safety by an attorney of law.

WHAT YOU GET:
- Introduction to Functional Safety
- Supervisory legal requirements
- Charging and Functional Safety standards
- Industrial vs. Automotive Functional Safety
- Overview of the Safety Lifecycle
- Update ISO 26262 Ed. 2
- Live example of a charging system’s Functional Safety
- Public discussion and feedback

HOW:
In our interactive lecture format you will be working through engaging real-life examples together with our renowned expert in the field of Functional Safety of charging systems. This limited-availability workshop, set in a unique automotive-related venue, is sure to be an invaluable learning experience.

YOUR TRAINER: Jürgen Hetzler, Daniel Wuhrmann

Jürgen Hetzler is an IEC 61508 & ISO 26262 Functional Safety Engineer (TÜV Rheinland) and Engineering Manager at Vancom, a highly specialized consulting and engineering service provider in the automotive sector. He is a member of the ZVEI (Central Association of the German Electrical Industry) committee on Functional Safety / ISO 26262.

Daniel Wuhrmann is a partner at Reuschlaw Legal Consultants. He is responsible for the firm’s automotive division. There, clients are supported in all legal aspects that are related to their product from a liability point of view: from designing and negotiating contracts, over defending or enforcing claims, to implementing product compliance structures in development, quality, manufacturing, purchasing and sales departments up to negotiations with customers, insurances and authorities in cases of recourse, recalls or any other liability related issue. Besides his work as a lawyer, he is teaching legal aspects of homologation for mechanical engineers (automotive) at the Technical University of Cologne (Germany).

WHO SHOULD ATTEND:
This training addresses EVSE as well as EV developers, quality managers, project managers, entrepreneurs, and technology consultants that are involved in the Functional Safety of charging systems.

Level: Basic & intermediate
Functional Safety of Charging Systems

AGENDA:

- Introduction to Functional Safety
- Supervisory legal requirements
- Charging and Functional Safety standards
- Industrial vs. Automotive Functional Safety
  - Introduction to IEC 61508
  - Introduction to ISO 26262
- Overview of the Safety Lifecycle
  - Item definition
  - Hazard & risk analysis
  - Functional safety concept
- Update ISO 26262 Ed. 2
- Live example of a charging system’s Functional Safety
- Public discussion and feedback

COSTS:

In-house trainings upon request.

Price and booking:
CharIN member: € 975.00 (excl. applicable VAT)
Regular: € 1490.00 (excl. applicable VAT)

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Plug & Charge based on ISO15118 for your business

Basic Training

This training will explain the principles of Plug&Charge, the benefits of integration in your business, and a practical approach of implementing Plug&Charge based on the ISO15118 standard in your business. This training is strongly based on the implementation guide, which was developed in collaboration between CharIN and Hubject.

WHAT YOU GET:
- Background information, objectives, and benefits for Plug & Charge based on ISO15118
- Understanding the different roles in the ISO15118 ecosystem
- Facilitate and derive your position in or in between these roles
- Learn about the impact on the eMobility ecosystem (OEM, CPO, MO, new market players)
- Understanding the necessary processes of Plug&Charge and the ISO15118 ecosystem, and the VDE Application Guide
- Identify your investments, possible new business models and strategies, involved with Plug&Charge and ISO15118

HOW:
In our interactive lecture format, you will be working on engaging real-life examples together with a Hubject expert, who has years of practical experience in designing and realizing Plug&Charge services based on ISO15118.

WHO SHOULD ATTEND:
Managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of Plug&Charge.

As this is an introductory course, all participants are welcomed. A prior more detailed experience in the field is not necessary.

YOUR TRAINER: Baran Yalcin, Jonel Timmergen, Steffen Rhinow

Our training partner Hubject is an eRoaming platform for customer-friendly charging of electric vehicles.

Baran Yalcin: A senior level process manager and Senior enterprise architect with long-term experience in multiple OEMs. The expert regarding PKIs, IT security and Plug&Charge with ISO15118.

Jonel Timmergen: A senior project manager specialized in eMobility protocols and ISO 15118. Multiple years of experience with vehicle OEMs, utilities and service provider. Working on Plug&Charge with ISO15118 since the beginning.

Steffen Rhinow: A Senior Consultant with several years of experience in consulting OEMs in the area of eMobility. Project Management with a problem solving approach.
Plug & Charge based on ISO15118 for your business
Basic Training

AGENDA:

Introduction and definition of expectation of this technology

Buzzword Bingo – What do you already know about the ISO15118 technology, Plug&Charge, smart Charging and value-added services?

Understanding the relevant roles and components of Plug&Charge

Understanding the ISO15118 ecosystem and the required processes

Key Benefits for the eMobility Partners of Plug&Charge based on ISO15118

Discussion of the central question: How will Plug&Charge redefine the customer journey? How will it affect your business?

Identify potential innovation impulses for your existing business model

Discussion of required investments to implement Plug&Charge

How did we build the first running ecosystem – Outline of a practical example

Key hurdles and strategies for implementing Plug&Charge

Impact on the EV ecosystem and what would be next steps for you?

Wrap-up

COSTS:

In-house trainings upon request.

Price and booking:
CharIN member: € 1170.00 (excl. applicable VAT)
Regular: € 1790.00 (excl. applicable VAT)

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CharIN Academy
c/o theacademy GmbH
Kurfürstendamm 11
10719 Berlin

www.charin-academy.com
academy@charinev.org
Phone: +49 30 300 149 3294
Fax: +49 30 288 8388 19
Using the CharIN guide to implement Plug & Charge based on ISO15118 for your business
Advanced Training

This training will explain the more advanced concepts of implementing Plug&Charge based on the ISO15118 standard. The training is strongly based on the implementation guide, which was created by CharIN and Hubject.

WHAT YOU GET:
- How did we build the first running Plug&Charge ecosystem – Outline of a practical example
- Description of needed Interfaces
- Concrete How-tos and deep-dive for the roles:Walkthrough the main implementation steps, identification of required role specific resources, organizational requirements and how to adapt business and IT-processes
- PnC-Best practices for the different roles based on reference projects
- Key hurdles and scenarios for implementing Plug&Charge
- Future Outlook

HOW:
In our interactive lecture format, you will be working on engaging real-life examples together with a renowned Hubject expert, who has years of practical experience in designing and realizing Plug&Charge services based on ISO15118.

YOUR TRAINER: Baran Yalcin, Jonel Timbergen, Steffen Rhinow
Our training partner Hubject is an eRoaming platform for customer-friendly charging of electric vehicles. Baran Yalcin: A senior level process manager and Senior enterprise architect with long-term experience in multiple OEMs. The expert regarding PKIs, IT security and Plug&Charge with ISO15118. Jonel Timmergen: A senior project manager specialized in eMobility protocols and ISO 15118. Multiple years of experience with vehicle OEMs, utilities and service provider. Working on Plug&Charge with ISO15118 since the beginning. Steffen Rhinow: A Senior Consultant with several years of experience in consulting OEMs in the area of eMobility. Project Management with a problem solving approach.

WHO SHOULD ATTEND:
Managers, product designers, entrepreneurs, technology consultants; anyone interested in the field of Plug&Charge. As this is an advanced course, we would like to welcome participants with at least some prior experience in the field.
Using the CharIN guide to implement Plug & Charge based on ISO15118 for your business
Advanced Training

AGENDA:
Introduction and setting expectations
Identify needs and roles of the audience
CharIN implementation guide – content and how to use it
Certificates in ISO 15118
Deep dive into processes and components of the ecosystem
Lets do it - A walkthrough to implement Plug&Charge from perspectives of different roles incl. a live demo of important API-Calls with our Hubject ecosystem
Challenges of ISO15118 implementation
Potential obstacles of realizing a Plug&Charge EV Charging infrastructure
Time scheduling and required resources for the implementation – get the features ASAP and reach out to the new business horizon
Outlook and discussion on future possibilities with ISO15118
Wrap-up

COSTS:
In-house trainings upon request.

Price and booking:
CharIN member: € 1170.00 (excl. applicable VAT)
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## Training dates 2019

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<td>01.10.2019</td>
<td>Charging Communication on ISO 15118</td>
<td>Advanced Training</td>
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<td>08.10.2019</td>
<td>Digital Communication: CCS Hardware Implementation</td>
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<td>CE Conformity Declaration</td>
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<td>Hotel Harbour Grand Kowloon, Hong Kong</td>
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<td>Understanding the eMobility ecosystem</td>
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The training dates and exact venues are subject to change.

book trainings at: [www.charin-academy.com](http://www.charin-academy.com)
# Training dates 2020

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